

# S/He's a Rebel: Toward a Sequential Stress Theory of Delinquency and Gendered Pathways to Disadvantage in Emerging Adulthood\*

JOHN HAGAN, *Northwestern University, University of Toronto*  
HOLLY FOSTER, *Columbia University, Texas A & M University*

---

## *Abstract*

*Quantitative longitudinal research neglects theoretical and qualitative work indicating that delinquency is a developmental phase embedded in a chain of emotions leading to cumulative disadvantage in the life course. Building on prior work in the sociological subfields of mental health, delinquency, and the life course, we propose and test a gendered and age-graded sequential stress theory that treats delinquency as a transitional event or set of events that can play an additive and intervening role in the movement from earlier feelings of anger through rebellious or aggressive (i.e., delinquent) forms of behavior to later depressive symptoms, and, especially, for males, drinking problems. Our results fill in transitional spaces that include a mediating role of delinquency in the cumulation of disadvantage and downward trajectories in gendered pathways to emerging adulthood.*

*\* This research was supported by a grant from the National Science Foundation and is based on data from the Add Health project, a program designed by J. Richard Udry (PI) and Peter Bearman and funded by grant P01-HD31921 from the National Institute of Child Health and Human Development to the Carolina Population Center, University of North Carolina at Chapel Hill, with cooperative funding participation by the National Cancer Institute; the National Institute of Alcohol Abuse and Alcoholism; the National Institute on Deafness and Other Communication Disorders; the National Institute on Drug Abuse; the National Institute of General Medical Sciences; the National Institute of Mental Health; the National Institute of Nursing Research; the Office of AIDS Research, NIH; the Office of Behavior and Social Science Research, NIH; the Office of the Director, NIH; the Office of Research on Women's Health, NIH; the Office of Population Affairs, DHHS; the National Center for Health Statistics, Centers for Disease Control and Prevention, DHHS; the Office of Minority Health, Office of Public Health and Science, DHHS; the Office of the Assistant Secretary for Planning and Evaluation, DHHS; and the National Science Foundation. Persons interested in obtaining data files from the National Longitudinal Study of Adolescent Health should contact Francesca Florey, Carolina Population Center, 123 West Franklin Street, Chapel Hill, NC 27516-3997. E-mail: fflorey@unc.edu. Direct correspondence to John Hagan, Department of Sociology, Northwestern University, 1810 Chicago Avenue, Evanston, IL 60208. E-mail: j-hagan@northwestern.edu.*

Aggressive and violent forms of delinquency often are seen as having angrily and recklessly rebellious origins, yet there is little quantitative research that empirically models the sequence of the emotional causes and consequences of delinquency. Giordano, Cernkovich, and Rudolph (2002:1055) make this point explicit in their recent work on gender and desistance from crime when they report that they too have “bracketed off the entire area of the emotions” and urge that “future theory/research should add attention to emotions as they affect behavioral change.” To date, attention to the emotions of delinquency consists largely of theoretical speculation and qualitative research.

Our point is not to diminish the importance of past work, but rather to build on its insights, which are described in greater detail and with appropriate references below. Past work points to a sequential process that unfolds during the transition from adolescence and the emergence of adulthood (Arnett 2000). The process moves from childhood and early adolescent anger through middle adolescent delinquent behavior to later adolescent expressions of distress that notably include depression and drinking during emerging adulthood, and the process in turn likely leads to adult disadvantage. Past work indicates that like much else in adolescence, this sequence may be structured by gender, with females likely to become depressed and males more likely to develop drinking problems on their paths to emerging adulthood: “a time of life when many different directions remain possible, when little about the future has been decided for certain, when the scope of independent exploration of life’s possibilities is greater for most people than it will be at any other period of the life course” (Arnett 2000:469; see also Piquero et al. 2002).

Thus, delinquency is at least implicitly understood as a mediating stage in a stress process that is structured by gender and that may have important implications for success and failure in adulthood. Pearlin and colleagues’ (1981) classic stress process model examines the effects of structured stressors on mental health outcomes. Delinquency can be considered an interim adaptation to stress from this perspective, and it is therefore appropriately considered as an outcome in strain theories of delinquency (see Agnew 1992 and below); but it may also be important from this perspective to see delinquency itself as a stressor embedded in a chain of emotions linked to subsequent emotional and behavioral outcomes. The role of delinquency as a source of later problems in the stress process is not developed in quantitative, longitudinal research that is intended to assess social theories and guide health and crime policies about high-risk youth and the transition to adulthood. It is one thing to imply that delinquency is a phase in a stress or strain process. It is another to actually demonstrate the occurrence of such a stress process with identifiable emotions as causes and consequences in a testable theory that anticipates disadvantaged life outcomes.

## The Emotional Lives of Delinquents

The concepts of adolescence and delinquency are by definition developmental and inherently linked to ideas about the life course. In this sense, delinquency is a developmental stage. However, while the conceptual role of the life course in delinquency theory was implicit through much of the history of this field, it is only relatively recently that the life course perspective has become an explicit orienting feature of delinquency research (e.g., Hagan & Foster 2001; Hagan & Palloni 1988; Piquero & Mazerolle 2000; Sampson & Laub 1993; Thornberry 1997). While there is a growing interdisciplinary body of research on the progression of delinquency involvement (e.g., Loeber & Hay 1997) and substance use (e.g., Kandel, Yamaguchi & Chen 1992), there are relatively few studies that locate and isolate delinquency as a distinct phase or stage that typically occurs in middle to later adolescence as part of a longer-term chain that leads to problems during emerging and later adulthood (but see Maughan & Rutter 2001:533-34).

Nonetheless, adolescence is classically understood in sociological theories as a formative emotional period, with delinquency seen as an externalization of adolescent emotions that can collectively express an age-graded subcultural response to the demands of a dominant adult culture. The emotional quality of this adolescent response is captured in Cohen's (1955:25) early description of a delinquent subculture that is nonutilitarian, malicious, and negativistic, for example, when delinquency is given reckless and unremunerative expression through school vandalism. The role of teachers and schools as a source of distress as well as a symbolically salient target of rebellion for potential delinquents is a durable theme in delinquency theory and research (from Stinchcombe 1964 to Hagan & Parker 1999).

Classical sociological theories of delinquency go on to note a wider range of emotions to which delinquency is linked. For example, in addition to describing participation in stable criminal and delinquent conflict subcultures, Cloward and Ohlin (1960) also describe involvements in a retreatist subculture. Cloward and Ohlin draw attention in this latter part of their theory to problems faced in "sequences of adaptation" by older delinquents during emerging adulthood. They write (184) that "illegitimate avenues to higher status that were available during early adolescence become more restricted in later adolescence. These new limitations intensify frustration and so create pressures toward withdrawal or retreatist reactions." Although Cloward and Ohlin do not describe in detail the emotions of these delinquents, they clearly see them as distressed if not depressed, with these emotions expressed most notably in drinking and drug abuse. Their sequential analysis is grounded in assumptions about the life course and emerging adulthood, and their implication is that many if not most delinquents wind up in emotional distress, with male delinquents in particular using drinking and drugs to dull the pain and escape

their despair. Nearly a half century after Cloward and Ohlin, there is compelling evidence that older female as well as older male delinquents experience particularly high levels of emotional distress (Giordano, Cernkovich & Lowery 2001).

Robert Agnew's (1985; 1992) general strain theory (GST) is a modern descendant of the above delinquency theories, which in the case of Cohen can be traced even further back to Talcott Parsons (e.g., 1947) and in the case of Cloward and Ohlin to Robert Merton (e.g., 1957). Agnew and colleagues (2002) recently have emphasized the role of negative emotionality in their revision and elaboration of GST. Although Agnew initially more abstractly identified GST's orienting concept as strain, the more recent focus of this theory is on anger as a key element of negative emotionality that results in aggressive delinquent behavior.

Agnew et al. (2002:46) write that "individuals high in negative emotionality are much more likely than are others to experience events as aversive, to attribute these events to the malicious behavior of others, to experience intense emotional reactions to these events — particularly the key emotion of anger — and to be disposed to respond to such events in an aggressive and antisocial manner." Agnew's earlier work emphasizes the self-fulfilling, cumulative, and amplifying aspect of blaming processes that accompany the expression of anger by individuals. "Their greater tendency to blame adversity on others," Agnew (1997:109) explains, "increases the likelihood that they will react with anger. And this anger, in combination with their limited problem-solving skills, increases the likelihood that they will respond with delinquency."

Again, there is a sequential framework that underwrites this theory, for Agnew (1997) argues that angry, aggressive delinquency builds from childhood through adolescence and the reactions this delinquency provokes on the way to adulthood:

[S]uch individuals may be more likely to turn to delinquency at an early age. This delinquency may then contribute to a further increase in strain. The delinquent acts of the individual, in particular, are likely to anger others and result in negative treatment by such others. Individuals may be negatively treated by the victims of their delinquency, by parents and others responsible for their behavior, and by others who feel threatened by or upset with their behavior — such as neighbors and peers. (111-12)

Agnew's theory persuasively describes links between angry emotions and aggressive delinquency and further identifies the delinquent expression of anger as a subsequent source of distress. Broidy (2001) extends this theory by exploring gendered pathways that lead to delinquency, although she does not explore its consequences. The challenge is to specify how this sequence subsequently unfolds, where it leads beyond delinquent behavior on the path to emerging adulthood, and how this might vary by gender.

Giordano, Cernkovich, and Rudolph (2002:996) recently have observed that "the notion that there may be gendered pathways into crime leads us to assume

leads these authors to think of “actors making moves,” but doing so within “bounded territories,” with these territories denoted by gendered norms that establish “a specific nexus of opportunities and constraints.” Heimer and De Coster (1999) make a similar point when they note that the violent acts of the women they study vary in association with cultural processes and positions in the social structure.

A particularly interesting feature of this new theorizing about crime is that it is focused on females as well as males and transitions from crime as well into it (Heimer 1996). In fact, one of the most interesting possibilities raised by Moffitt and colleagues' (2001) recent longitudinal study of New Zealand youth is the suggestion that transitions subsequent to youth crime and other forms of antisocial behavior may actually be more gendered than its origins. Thus, on the one hand they report finding “remarkable similarities” between males and females in risk factors for antisocial behavior, while on the other hand they find significant gender differences in the results of antisocial behavior by gender. They conclude (182) that “in particular, antisocial behavior among young men is significantly more likely to be associated with subsequent problems in work, substance abuse, and legal arenas, whereas antisocial behavior among young women is significantly more likely to be associated with relationship problems, depression, tendency to suicide, and poor health.” It seems likely that these are emotionally gendered processes associated with emerging adulthood, but as Giordano, Cernkovich, and Rudolph (2002) emphasize, the emotional content of these patterns has to date largely been bracketed from explicit consideration in quantitative work. DeCoster<sup>5</sup> and Heimer (2001:825) similarly note that “a logical avenue for future research is to develop theoretically the role of sex in the role-taking process leading to crime and depression.”

### The Ethnography of Delinquent Emotions

Ethnographic research provides intriguing evidence that “life after delinquency” is characterized by emotional distress. Often ethnographic research makes this point while simultaneously and ironically noting that delinquents and young adult offenders seem to take joy in their pursuits. The apparent satisfactions of crime and delinquency are depicted most convincingly in Jack Katz's (1988) book *The Seductions of Crime*, and especially in his description of the “magic in motivation” experienced, for example, during the crime sprees of armed robbers. Yet Wright and Decker (1997:35) also find in their sample of armed robbers that “something far more serious was at stake.” Among their armed robbers there was “a growing sense of frustration and anger because they felt themselves to be locked into a cycle of events that was leading nowhere” (36).

These conflicting depictions of joyful and despondent youthful offenders may seem a contradiction until later stages of the delinquent career are given more concentrated attention. This kind of detailed analysis is found in the geographically disparate but ethnographically and conceptually connected British and American works of Willis and Sullivan. Willis (1977) explored the ways in which the “lads” he studied in a working-class English community learned to have a “laff” while learning to labor. These youth discovered that school was not a promising means of making it economically, and Willis observed that the lads therefore turned their energy and wit to “having a laff” by finding various ways to defy school culture and authority.

The key point Willis makes is that the youth he studied accurately see through the mobility myths of their surrounding middle-class society and through their delinquency achieve a rebelliously satisfying “partial penetration” of their circumstances. A result, Willis (1977:107) writes, is that “for a specific period in their lives ‘the lads’ believe that they dwell in towers where grief can never come.” However, this specific period is conspicuously transitory, and with time, Willis observes, the fun and excitement gives way to despair grounded in the looming reality of the bleak socioeconomic fates awaiting the lads in adulthood.

Willis makes it clear in the afterword to his book that he regards his findings as having wider application to cultural forms that include youth who are affected more broadly by the changing circumstances of the global economy, notably including girls as well as boys and North American as well as European youth. More than a decade later, Sullivan (1989) confirms that the youth he studied in three New York City neighborhoods also temporarily have a sense of achieving a “penetration of their condition.” Yet, like Willis, Sullivan also finds that “over time, this penetration becomes a limitation, binding them back into [the social] structure as they age out of youth crime and accept . . . low wage, unstable jobs” (250).

So the approaching end of adolescence and the discouraging prospects of adulthood are a likely explanation of the transition from the passing pleasures of delinquent rebellion to a despair that emerges in anticipation of adult disadvantage. Yet while this process is well described and explained in the above work, it has not been well developed in relation to female delinquency (but see Chesney-Lind & Shelden 1992), and it has proven elusive in quantitative studies. Indeed, the stress process we have described is in need of further study among both males and females, and in broadly based longitudinal panel studies, which we suggest next (in the context of delinquency research) may have been limited by a search for generic patterns and by a failure to carefully consider the sequential implications of the role of gender in processes that lead from delinquency to retreatist behavior involving excessive drinking.

## The Gendered and the Generic

Although there is an increasing amount of quantitative work on the linkage between depression and conduct disorder (e.g., Capaldi 1992; Fergusson, Lynskey & Horwood 1996), as defined by the DSM-III-R and DSM-IV criteria (American Psychiatric Association 1987, 1994), quantitative studies of the linkage between emotions and scales of the more explicitly antisocial and rebellious forms of adolescent delinquency are surprisingly rare. Two recent studies, the first based on Boston high school students by Aseltine, Gore, and Gordon (2000) and the second on college students at a northwestern university by Broidy (2001), give simultaneous quantitative attention to anger, delinquency, and other depressive emotions. Both studies find links between anger and delinquency, as does earlier research linking temperament and behavior problems among youth, net of social adversity (Earls & Jung 1987:495). However, Aseltine, Gore, and Gordon (2000:261) find no relationship between delinquency and depressive symptoms, and Broidy (2001:27) reports an unexpected negative relationship with a more broadly measured scale of depressive emotions. Broidy (2001:24 n.7, 26 n.8<sup>6</sup>) observes that the meaning of the latter relationship is complicated by the strong correlation between her measures of anger and her measures of depressive emotions.

Meanwhile, like Aseltine, an earlier Toronto-based study by Hagan (1997) reports no significant contemporaneous correlation between delinquency and depression in adolescence but does reveal a sleeper effect of delinquency on feelings of despair nearly twenty years later — after experiences with unemployment in early middle adulthood. The length of the time lag in the latter study, and its identification of depression in a cohort that experienced adolescence more than thirty years ago, leaves considerable uncertainty about the longitudinal process involved. DeCoster and Heimer (2001) find a more closely lagged, positive relationship between delinquency and depression using the National Youth Survey data collected by Elliott, Huizinga, and Ageton (1985).

The results of studies examining psychiatric patients, prison inmates, and general community epidemiological samples have consistently found evidence for an association between mental disorder and crime or violence (Eronen, Angermeyer & Schulze 1998). However, the magnitude of this association varies by type of disorder. For example, findings from a study using a national registry of births in a Danish cohort indicate that hospitalization for mental illness is associated with arrests for a violent offense. This association ranges from modest odds ratios of 2 for men and 3.9 for women between affective disorders and violence to a high of 8.8 for men between organic psychoses and violence and 23.2 for women between schizophrenia and violence (Brennan, Mednick & Hodgins 1998:497<sup>9</sup>). Research has also found an elevated risk between substance use disorders in particular and violence (Eronen, Angermeyer & Schulze 1998). However, firm conclusions on the causal pathways between disorder and crime

in these studies cannot be clearly drawn (Arboleda-Florez, Holley & Cristani 1998), and the forms of crime involved are characteristically much more serious than the delinquency involved in self-report studies of adolescents.

Uncertainty about the relationship between depression and delinquency is paralleled in the larger literature on the broader concept of conduct disorder and depression. For example, while Fergusson, Lynskey, and Horwood (1996) find limited support for a causal relationship in either direction between conduct disorder and depression, Rutter (1991; see also Rutter et al. 1997) finds that individuals with conduct disorder and no emotional disturbance in childhood have an increased rate of anxiety and depressive symptoms at age 23. Angold and Costello's (2001) recent review of research on conduct disorder and depression concludes that further research is needed to untangle the causal processes that likely link conduct disorder and depression, while Rutter (2001:565-66) offers this seemingly more certain conclusion:

The empirical research findings seem to suggest that the association works in only one direction. That is, the presence of depressive symptomatology in childhood or adolescence involves no increased risk for antisocial behavior in later adolescence or early adult life. On the other hand, antisocial behavior in childhood does involve an increased risk for depressive symptoms in early adult life (Rutter 1991; Rutter et al. 1997). Moreover, it seems that this is not simply a function of a pre-existing co-occurrence between antisocial behavior and depression in childhood. The increased risk is evident from antisocial behavior in childhood even when that was not accompanied by identifiable emotional disturbance at the time. The possible mechanisms involved in this association have been little investigated up to now. It is quite possible that the answer lies in the tendency for antisocial individuals to act in ways that generate interpersonal stresses and create disadvantageous psycho-social situations — a tendency first well demonstrated by Robins (1966) and confirmed in longitudinal studies undertaken since that time (Champion, Goodhall & Rutter 1995).

Rutter's speculation fits well with the sequential stress process model considered in this article.

We believe that the dearth of quantitative research and the uncertainty of the findings on the emotions of delinquency results in part from problems of conceptualization and measurement of the emotional lives of adolescents. Aseltine, Gore, and Gordon (2000:271) suggest a useful starting point for respecification when they draw on the mental health literature and the work of Aneshensel, Rutter, and Lachenbruch (1991) to note that delinquent behavior can be embedded in stress processes that vary in socially structured ways. Aneshensel, Rutter, and Lachenbruch make this point by insisting, in a study that emphasizes gender differences in depression and problem drinking, that "stress research that focuses on a single disorder fails to portray accurately social variation in stress processes and mental health outcomes" (176). Stress processes involve sequences of emotions,



and they may often be manifested in multiple stress disorders, with differentiation by gender.

Thus Aneshensel's work (see also Aneshensel & Gore 1991) makes the crucial point that males and females both respond to stress, but that they often do so in different ways. While women often express their distress with negative affect, men more often respond with substance use. Robbins and Martin (1993:304-5) suggest that this is a gender difference that should emerge with adulthood and the anticipated acquisition of maternal and other nurturing roles — and the absence of such constraints on males. The implication is that “gendered styles of deviance” emerge in later adolescence and during the emergence of adulthood, when in contrast to the limitations placed on young women, “males are likely to drink more than women and with less self-monitoring and greater abandon.”

Rosenfield (1999:212) draws on a power-control theory of gender and delinquency (Hagan, Simpson & Gillis 1987) to help explain origins of gender differences in such behavior in childhood and adolescence, noting that daughters are controlled more than sons by their parents and that this leads girls to more restrictively internalizing their expressions of distress and boys to more freely externalizing these feelings. Rosenfield then summarizes a large body of research that leads to pervasive gender differences in expressions of distress:

There is evidence that boys and girls receive messages from the adult world that become increasingly divergent during adolescence. These messages correspond to splits in basic assumptions: Over time, conceptions about self-worth, control in the world, autonomy, and importance relative to others heighten for boys and decline for girls. This divergence contributes to explaining the emergence of sex differences in internalizing and externalizing problems. (220)

These internalizing and externalizing problems may constitute important transitional stages in the formation of fateful trajectories that lead through emerging adulthood to longer-term adult disadvantage.

Thus, from the life-course perspective, delinquency can be seen as a transitional event or set of events that mediates the movement from feelings of anger through rebellious or aggressive (i.e., delinquent) forms of behavior to depressive symptoms and, especially for males, drinking problems. Elder (1985) notes that “transitions are always embedded in trajectories that give them distinctive form and meaning” (31) and that “the same event or transition followed by different adaptations can lead to very different trajectories” (35). Depression and drinking may constitute gendered adaptations to problems that accompany delinquent behavior and form longer-term vulnerabilities in their likely adult trajectories.

In sum, Agnew's strain theory has life-course features in (1) seeing anger resulting in delinquency as an early phase of a stress process, and (2) delinquency itself as a further source of distress as a result of the responses that it provokes from others. Our literature review predicts (3) that the subsequent stages of this stress process may take gender-specific forms involving (3a) internalized feelings

of depression among females and (3b) externalized drinking problems among males. Aneshensel, Rutter & Lachenbruch's (1991) point is that these stress processes are easily obscured if they are not properly specified by gender, and that therefore increased attention should be given to male propensities for substance abuse as well as female tendencies toward depression. Embedded in this analysis is the further implication that depression is more likely to succeed than to precede delinquency, a point that may well be crucial in understanding the delinquency-depression relationship. Failure to meaningfully measure, order, and specify the sequential nature of the delinquency, depression, and drinking relationship may be a reason that important links between delinquency and distress have not been discerned in quantitative longitudinal studies.

### **Data and Methods: The Adolescent Health Survey**

Unique data and methods of measurement therefore may be required to assess a sequential stress perspective on gender and the delinquent emotions. These data must be longitudinal, include male and female adolescents, and incorporate meaningful measures of anger, juvenile delinquency, and later adolescent drinking problems and depression. Ideally, such data would be nationally representative of adolescents, and they should ultimately track these youth to emerging adulthood. Data meeting the teenage phase of these requirements (see Sieving et al. 2001) are available in the first two waves of the National Longitudinal Study of Adolescent Health (Add Health), which tracks youth to the cusp of emerging adulthood.

Add Health began in 1995 with a stratified probability sample of 80 high schools from a national sampling frame. More than 90% of enrolled students in most of these schools initially participated in a self-administered, in-school survey, yielding more than 90,000 students. A random sample of students in grades 7-11 was then selected from the school rosters for a one-and-one-half-hour in-home student interview and a half-hour interview with about 85% of the parents (Udry 1998a:7). About half the student survey was done by field interviewers, with sensitive data collected using a unique audio-assisted (A-CASI) self-interview technology. The A-CASI technology uses headphones and laptop computers to enhance confidentiality and reduce potential interviewer bias. About 88% of the Add Health students completed a second-wave interview in 1996 (see Chantalla & Tabor 1999). This analysis is based on 11,506 youth remaining in the longitudinal sample after listwise deletion of missing data.<sup>1</sup> Descriptive detail and statistics for the measures introduced below are presented in Appendices 1 and 2.

Because the Add Health data collection used a multistage cluster sample in which the clusters were sampled with unequal probability, the observations are not independent or identically distributed. We incorporate these design

characteristics into our analysis through the use of the statistical software program Stata, which yields unbiased parameter estimates and corrected variance estimates and standard errors (Chantalla & Tabor 1999).

The measure of anger in the Add Health survey is a binary parental report from the time 1 in-home interview that asked whether the youth involved in the study had a bad temper. Bad temper, which is also often called temperament and is treated here as a measure of anger, is widely regarded as an early emotional characteristic of the child that is relatively stable over time (Earls & Jung 1987:497; Lytton 1990:690; Sampson & Laub 1993:86). The parental indicator of bad temper we use is similar to the item that loads most heavily on the anger scale in Aseltine, Gore, and Gordon's (2000:265) study, but it differs in that it is taken externally from the parental respondents rather than internally from the adolescent respondents.

Piquero, MacIntosh, and Hickman (2000:923) emphasize that it is preferable to have external measures, such as "teacher, parent, and neutral observer reports." Such reports avoid issues of common method variance that result from having adolescents self-report both their temper and their delinquency, depression, and drinking behavior. The Add Health data include only parents' reports of anger; however, Moffitt and colleagues (2001:76) find that parental ratings of angry temperament yield the most stable coefficients for both male and female study members. Agnew and colleagues (2002:55) also report that they get very similar results when parent and teacher reports of variables like negative emotionality are used separately or together. It is possible that our models underestimate the effects of anger with the parental measure, but the previously cited studies diminish our concern. About one-third (31.7%) of the Add Health parents reported that their adolescent child had a bad temper.

Delinquency was measured with time 1 adolescent responses using the audio-CASI methodology to fifteen items that included subscales of violent and nonviolent delinquency. The nonviolent delinquency measure included public order and property items that ranged from being loud in a public place to breaking and entering or drug sales (see Appendix A). Mean scores were calculated with at least eight nonmissing responses and recomputed to the original 15-item metric with an alpha reliability score of .82. The violent delinquency items included using weapons to get something from someone and serious physical fights that resulted in injuries needing medical attention; the fights occurred both individually and in groups. At least two nonmissing responses were required for this scale, which was then recomputed to a 5-item metric. The alpha for the violent delinquency scale was .74, and the combined violent and nonviolent scale alpha was .86.

The Add Health Survey includes a 19-item depressive symptoms scale that asked the adolescents in both waves, "How often was each of the following things

true during the past week.” This set of items is derived from the slightly longer Center for Epidemiological Studies Depression (CES-D) Scale (Radloff 1977). Measures included modifications of such standard scale items as “I (you) felt sad” and “I (you) felt depressed.” Means were imputed on this scale for respondents who responded to at least 11 items, with the means multiplied by 19 to rescale the scores in the metric of the original scale. The alpha reliability score for this scale is .87. Although this scale formally focuses (Devins & Orme 1985:152) on state depression (i.e., “depressive features having occurred during the preceding one week interval only”), retest reliability scores are high with a time lag as long as a 12 months (see Devins & Orme 1985; Radloff 1977). Meanwhile, the relationship between the anger and depression measures is no larger than .134 within waves, and smaller between waves, thus avoiding the potential confounding problem noted above in Broidy’s (2001) Boston study.

The audio-CASI method was also used in both waves to measure alcohol problems. The adolescent respondents were asked to indicate five kinds of problems that resulted because of drinking. These problems included trouble with parents, schoolwork, friends, and someone the respondent was dating and doing things because of drinking that were later regretted. This scale reflects the impairment that alcohol use can impose on adolescent role performance. The alpha reliability score for this scale was .70. At the stage of middle adolescence reflected in this study, about 20% of the youth reported having one of these alcohol-related problems.

A variety of prior and contemporaneous control variables are also included in our analysis. These include age, gender, parental education, race/ethnicity, and family structure. The above variables are included in two-stage least-squares, logistic, Markov and change score, lagged-effects models. The analysis ultimately is directed to determining the role of delinquency as an additive and mediating factor in models of the anger, depressive symptoms, and drinking problems of male and female adolescents (see Baron & Kenny 1986:1176). We consider the antecedents of anger in Table 1 and links between anger and other factors with delinquency as our subsequent mediating variable in Table 2. The analysis then prominently involves regressing our measures of depression and drinking problems from the second-wave survey on earlier measures of depression and drinking problems as well as delinquency and the above control variables. The initial stages of the analysis are presented for the combined male and female sample, while in the latter parts of the analysis, which involve gender-specific predictions, the sample is divided by gender.

An important feature of the lagged-effects OLS models is that they allow us to further take into account the influence of unmeasured variables that already may have led to depression and drinking problems by time 1. In this way, these models effectively narrow the estimation of effects in anger and delinquency on depression and drinking problems to changes in the latter outcomes occurring between waves in this adolescent sample. We have argued that these processes may be structured

by gender, and, as noted previously, the analyses for depression and drinking problems in the following tables therefore are undertaken for females and males separately. It is important to emphasize that we are providing a conservative, restrictive test of our sequential stress model by limiting our attention to a one-year period in the lives of the Add Health respondents. The patterns that sequential stress theory predicts likely become more visible over time.

In a final part of our analysis we use logistic regression to fit simple first-order Markov chains, with drinking problems considered in binary form. The Markov chains estimate the odds of transitions occurring from states of drinking at time 1 to states of drinking at time 2, with the intervening role of delinquent behavior taken into account. The accent on transitions in this final part of our analysis uniquely captures the developmental logic of our sequential stress theory of gender and the emotions of delinquency and its subsequent externalized expression as drinking problems among males.

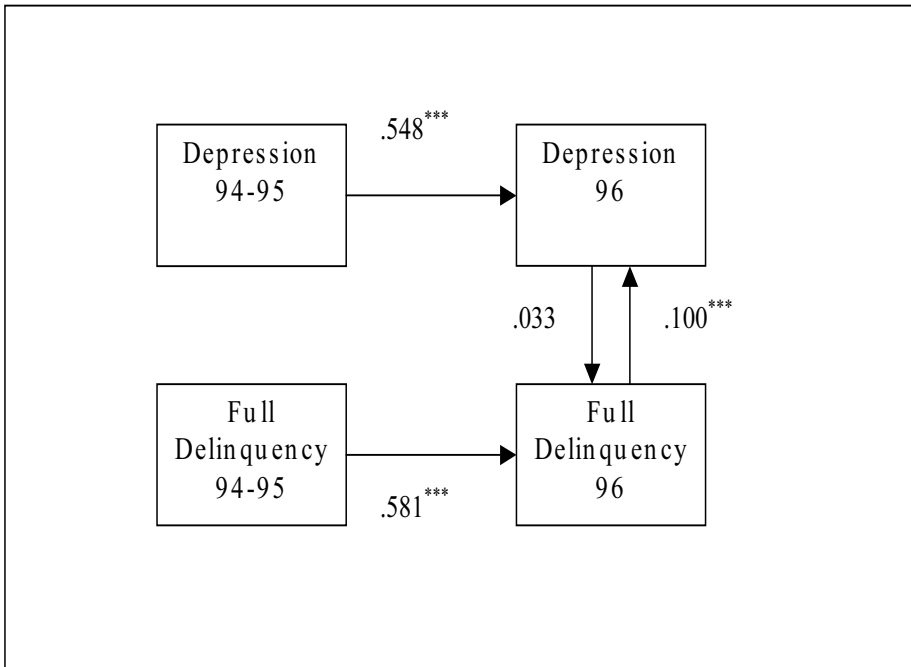
## Results

### THE DELINQUENCY–DEPRESSION RELATIONSHIP

Our analysis begins with the issue of the direction and sequence of the relationship between delinquency and depression. Our concern is that if the depression and delinquency relationship is not meaningfully ordered, then the relationship may not be observed or properly understood. The theoretical accounts we have reviewed seem clear in placing feelings of depression after delinquency. In fact, the qualitative studies we have considered argue that at earlier stages delinquency is more likely to be defined as pleasurable. Past quantitative studies, however, usually have assumed that depression precedes delinquency.

We therefore began by looking at the order of the delinquency–depression relationship in two ways, with cross-lagged and two-stage least-squares models. The models incorporate a sizable time lag: anger, delinquency, and depression are initially measured one year before time 2, and depression at time 2 is measured in terms of days of the last week. We included the full set of gender, age, and family background factors described above as controls in these models, and the models were estimated separately with nonviolent, violent, and combined delinquency scales. The cross-lagged relationships between depression in times 1 and 2 and delinquency at times 1 and 2 were all strong and highly significant, indicating the stability and reliability of measurement of these feelings and behaviors across one year in time. The one-year lag between waves of the survey is sufficient to allow effects to emerge. The cross-lagged and two-stage least-squares models yielded the same substantive conclusions about the delinquency–depression relationship across

FIGURE 1: Two Stage Least Squares Regression Analysis: Reciprocal Effects between Delinquency and Depression (N = 11,474)



forms of delinquency: the direction of influence was uniformly clearer from delinquency to depression than from depression to delinquency.

Since cross-lagged models are reported in more detail below, the two-stage least-squares results are first presented in Figure 1 for a model with the full delinquency scale. The time 1 values were used as instrumental variables to define the reciprocal paths between depression and delinquency. An instrumental variable is a variable that is expected to have a direct effect on only one of the two variables in a reciprocal path. By omitting cross-lagged effects from the model (i.e., the effect of time 1 depression on time 2 delinquency and the effect of time 1 delinquency on time 2 depression), the reciprocal effects at time 2 could be estimated (see Kessler & Greenberg 1981). The latter effects represent the sum of the lagged and contemporaneous relationships between delinquency and depression. Figure 1 contains standardized coefficients from the reciprocal models. They indicate, for example, that the statistically significant standardized effect of the delinquency measure on depression is notably stronger ( $\beta = .10, p < 0.001$ ) than the negligible and nonsignificant standardized effect of depression on delinquency ( $\beta = .03, p > .05$ ). The cross-lagged models we estimated for violent and nonviolent delinquency produced substantively similar conclusions about the

**TABLE 1: Logit Regression of Adolescent Anger at Time 1 on Sociodemographic Factors**

	Logit Coefficients	Odds Ratios	95% Confidence Interval
Male	.104 <sup>†</sup>	1.110	[.990–1.244]
Parent education (t1)	-.241 <sup>***</sup>	.786	[.743–.832]
Age (t1)	.015	1.015	[.981–1.051]
African American	-.091	.913	[.775–1.076]
Hispanic American	.090	1.095	[.923–1.298]
Asian American	-.069	.934	[.590–1.478]
Other <sup>a</sup>	.516 <sup>**</sup>	1.675	[1.239–2.265]
Blended family: two parents (t1)	.274 <sup>**</sup>	1.315	[1.116–1.549]
Single-parent family	.509 <sup>***</sup>	1.664	[1.462–1.893]
Other family structure <sup>b</sup>	.122	1.130	[.872–1.465]
Constant	-.641 <sup>*</sup>		
Model-adjusted Wald statistic; $F_{(10,119)}$	14.67		

(N = 11,506)

<sup>a</sup> Reference category is Caucasian.

<sup>b</sup> Reference category is two-biological-parent family structure.

†  $p < .10$  \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$  (two-tailed tests)

direction of the relationship. The following analysis is therefore focused on the sequence that leads from involvement in delinquency to depression.

#### STRUCTURED SOURCES OF ANGER

The stress and strain theories of delinquency begin with the sources of stresses and strains that lead to delinquency. From Cohen (1955) through Merton (1957) and Agnew (1985, 1992, 1997), these theories have characteristically assumed that families who endure social and economic stress are more likely to have children who are frustrated and therefore angered by their disadvantaged circumstances. It is therefore noteworthy to incorporate these exogenous sources of adolescent anger into our analysis.

The logit regression results presented in Table 1 bring these exogenous forces into our analysis. The results of regressing adolescent anger, as measured by parental reports, on the demographic and family variables included in the analysis are consistent with the expectations of stress and strain theories. These results indicate that adolescent anger rises as parental education declines (OR = 0.786,  $p < .001$ ) and that this anger is also more common among youth who come from blended (OR = 1.315,  $p < 0.01$ ) and single-parent families (OR = 1.664,  $p < 0.001$ ) compared to two-biological-parent intact families.<sup>2</sup> Therefore, as the stress and

TABLE 2: Unstandardized Structural OLS Equations for Delinquency Scales at Time 1

	Delinquency Full (t1)	Violent Delinquency (t1)	Nonviolent Delinquency (t1)
Anger (t1)	1.622***	.519***	1.101***
Male	1.310***	.698***	.612***
Parent education (t1)	.128†	-.103***	.231***
Age (t1)	.093*	-.041**	.135***
African American	.032	.381***	-.349*
Hispanic American	.847**	.332***	.516*
Asian American	.336	-.095	.431
Other <sup>a</sup>	.554	.217†	.337
Blended family: two parents (t1)	.735***	.262***	.475***
Single-parent family	.981***	.330***	.651***
Other family structure <sup>b</sup>	1.137***	.438***	.700**
Constant	.849	1.199***	-.349
R <sup>2</sup>	.052	.092	.036
Model-adjusted Wald statistic; F <sub>(11,118)</sub> (N = 11,506)	29.63	61.85	18.12

<sup>a</sup> Reference category is Caucasian.

<sup>b</sup> Reference category is two-biological-parent family structure.

†  $p < .10$  \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$  (two-tailed tests)

strain theories predict, children of less-educated parents and disrupted families are more likely to be reported as being angry. This anger is not significantly related to the gender of the child, so that sons and daughters are about equally likely to be angry.

#### THE ANGER-DELINQUENCY LINK

The OLS regression results presented in Table 2 assess the link posited in stress and strain theories between anger and delinquency, with other antecedent and contemporary variables held constant. The results in Table 2 indicate that notwithstanding these controls, both violent ( $\beta = .519, p < .001$ ) and nonviolent ( $\beta = 1.101, p < 0.001$ ) forms of delinquency increase with anger.

As also found in prior research, males are more delinquent than females, and youth in blended and single-parent families are more delinquent than youth in two-biological-parent families. Hispanic and African American youth are also more likely than other youth to be involved in violent delinquency. Although, as is often true in delinquency research, the effects of other variables are less consistent in Table 2, the effects of parental reports of anger on delinquency are fully consistent,



and along with the family structure variables, fully supportive of stress and strain theories of delinquency.

While gender has the expected main effects on violent and nonviolent delinquency, the effects of anger and other variables on delinquency were much the same when these equations were estimated separately in male and female subsamples. Nonetheless, the theoretical work described above suggests that anger and delinquency have different consequences among males and females, which we consider next. As the preceding results were similar for violent and nonviolent delinquency, the following equations are presented only for the combined delinquency scale.

### The Gendered Stress Sequence

Tables 3a and 3b present the results of estimating the structural and reduced-form equations in sequential stress models of anger, delinquency, and depression for Add Health male and female adolescents. The results reported in the first two columns of these tables indicate that anger has a substantial and significant effect on depression net of a range of control variables, with the cross-wave effect of depression, which is substantial and significant, again indicating considerable stability in these feelings. The results in Tables 3a and 3b further indicate that the unmediated effect of anger on depression is statistically significant for *both* males and females, but that it may be slightly larger for adolescent females ( $\beta = 1.013$ ) than for adolescent males ( $\beta = .717$ ). Delinquency (i.e., full-scale) is also a significant predictor of depression in these models and mediates the effect of anger on depression, reducing the effect of anger by 10% (from .792 to .713) among females and 15% among males (from .626 to .531), as column 3 shows.

Tables 4a and 4b next present the results of estimating the structural and reduced-form equations involved in sequential stress models of anger, delinquency, and drinking problems for Add Health male and female adolescents. These further results lend support to Aneshensel, Rutter, and Lachenbruch's (1991) suggestion that the effects of stress can be gender-specific. In Table 4a we see that among females the effect of anger on drinking problems is nearly nonexistent (.020 to .055) and also nonsignificant ( $p > .10$ ), while in Table 4b among males the effect of anger is larger ( $\beta = .201$ ) and statistically significant ( $p < .05$ ). Delinquency is also a significant predictor of drinking problems, although it can play no role as a mediator among females, since there is no anger effect on drinking to mediate among females; but the effect of anger on drinking problems is mediated by delinquency (i.e., the effect of anger declines from .206 to .150, or about 27%) among males.

To this point we have treated depression and drinking problems as continuous outcomes in a sequential stress process. It may be important to take

TABLE 3A: Unstandardized Structural and Reduced Form OLS Equations for Depression at Time 2 for Females

	1	2	3	4	5	6	7
Anger (t1)	1.013**	.792*	.713*	.699*	.744*	.764*	.793*
Depression (t1)	.568***	.553***	.539***	.540***	.543***	.545***	.553***
Drinking problems (t1)	.195*	.204*	.103	.140	.129	.164†	.205*
Parent education (t1)		-.278*	-.288*	-.249*	-.295**	-.262*	-.274*
Age (t1)		-.005	.021	.041	.007	.008	-.005
African American		.392	.344	.241	.387	.272	.388
Hispanic American		1.234*	1.150*	1.120*	1.186*	1.107*	1.233*
Asian American		.821	.722	.804	.736	.838	.822
Other		1.666†	1.669†	1.609†	1.684†	1.597†	1.671†
Blended family: two parents (t1)		.751*	.727*	.686*	.746*	.713*	.753*
Single-parent family		.697*	.677*	.649*	.691*	.640*	.687*
Other family structure		.942	.854	.832	.891	.866	.938
Full delinquency (t1)			.099**				
Violent delinquency (t1)				.353**			
Nonviolent delinquency (t1)					.089*		
Exposure to street violence (t1)						.498*	
Alcohol availability in home (t1)							-.089
Constant	4.574***	4.993***	4.555***	4.258***	4.784***	4.796***	5.006***
R <sup>2</sup>	.354	.362	.364	.365	.363	.364	.362
Model-adjusted Wald statistic	F <sub>(3,126)</sub> 499.92	F <sub>(12,117)</sub> 149.89	F <sub>(13,116)</sub> 141.52	F <sub>(13,116)</sub> 134.53	F <sub>(13,116)</sub> 144.62	F <sub>(13,116)</sub> 146.28	F <sub>(13,116)</sub> 144.28

(N=5,891)

† p &lt; 0.10 \* p &lt; .05 \*\* p &lt; .01 \*\*\* p &lt; .001 (two-tailed tests)

advantage of the continuous measurement of depression to capture its onset in adolescence. However, in the case of our measure of drinking, it is also possible to analyze transitions to the occurrence of one or more drinking problems (i.e., conditional on having no prior drinking problems) as a more intuitive way of capturing the stagelike sequence implied by our stress process model and the literature on the onset of drinking problems. We do this by recategorizing drinking into a binary form that can be analyzed with logistic regression models representing simple Markov chains of transition. As noted earlier, about 20% of the adolescent respondents report a drinking problem, while about 80% do not.

A first-order binary Markov chain is estimated in Table 5 for transition matrices formed by cross-tabulations of the cross-wave occurrence of problem drinking (see Diggle, Liang & Zeger 1994:194). The stability of having a drinking problem across waves of this analysis is reflected in the probability of having a drinking problem at time 2 ( $Y_{ij-1} = 1$ ) being 54% higher after the report of such a problem at time 1 ( $Y_{ij} = 1$ ). In the alternative condition of not having a drinking problem at time 1 ( $Y_{ij-1} = 0$ ), the probability of making the transition to the occurrence of a drinking problem at time 2 ( $Y_{ij} = 1$ ) is 12%.

TABLE 3B: Unstandardized Structural and Reduced Form OLS Equations for Depression Scale at Time 2 for Males

	1	2	3	4	5	6	7
Anger (t1)	1.013**	.792*	.713*	.699*	.744*	.764*	.793*
Anger (t1)	.717**	.626**	.531*	.583*	.544*	.587*	.645**
Depression (t1)	.594***	.570***	.559***	.567***	.559***	.563***	.570***
Drinking problems (t1)	.165*	.143*	.079	.122†	.078	.113	.130†
Parent education (t1)		-.467***	-.491***	-.462***	-.507***	-.464***	-.509***
Age (t1)		.159*	.163*	.165*	.158*	.152*	.152*
African American		.433	.440	.401	.479	.380	.493
Hispanic American		.982**	.956**	.964**	.967**	.915**	1.000**
Asian American		1.192*	1.223*	1.214*	1.210*	1.200*	1.201*
Other		-.312	-.333	-.319	-.333	-.343	-.279
Blended family: two parents (t1)		.223	.191	.210	.193	.193	.224
Single-parent family		.470†	.416	.447	.421	.411	.512†
Other family structure		.146	.109	.120	.125	.098	.173
Full delinquency (t1)			.065***				
Violent delinquency (t1)				.079			
Nonviolent delinquency (t1)					.090**		
Exposure to street violence (t1)						.209*	
Alcohol availability in home (t1)							.768**
Constant	3.506***	2.243†	2.115†	2.100†	2.228†	2.331†	2.214†
R <sup>2</sup>	.353	.365	.368	.366	.368	.367	.368
Model-adjusted Wald statistic	F <sub>(3,126)</sub> 387.66	F <sub>(12,117)</sub> 137.48	F <sub>(13,116)</sub> 127.54	F <sub>(13,116)</sub> 127.19	F <sub>(13,116)</sub> 128.37	F <sub>(13,116)</sub> 126.78	F <sub>(13,116)</sub> 136.20

Odds ratios of the effect of anger on the transition into drinking problems are presented in panel A of Table 5. As in the previous table, the first column of results in Table 5 represents the effect of anger on the transition to a drinking problem with drinking at time 1 taken into account. The next column reflects the results of introducing the sociodemographic controls. Here we see that among males who did not have drinking problems at time 1, anger increases the odds at time 2 of having drinking problems by 1.655 ( $p < .001$ ). In contrast, anger does not significantly increase the odds of drinking problems between time 1 and time 2 for females (1.031,  $p > .10$ ). The difference by gender in the effects of anger on drinking problems is statistically significant ( $z = 2.356$ ,  $p < .05$ ).<sup>3</sup> The third column of results introduces the mediating influence of delinquency at time 1. The anger effect is reduced by 13% among males (i.e., the odds are reduced to 1.438,  $p < 0.05$ ), again indicating a gendered mediation by delinquency of anger on drinking problems. The reduction in the size of this anger effect among males is also statistically significant ( $z = 10.53$ ,  $p < .05$ ).<sup>4</sup>

TABLE 4A: Unstandardized Structural and Reduced Form OLS Equations for Drinking Problems at Time 2 for Females

	1	2	3	4	5	6	7
Depression (t1)	.568***	.553***	.539***	.540***	.543***	.545***	.553***
Anger (t1)	.031	.055	.020	.039	.025	.050	.055
Depression (t1)	.013**	.016***	.009*	.013**	.009*	.014***	.015***
Drinking problems (t1)	.490***	.479***	.433***	.468***	.431***	.471***	.478***
Parent education (t1)		.032	.028	.037	.022	.036	.026
Age (t1)		.022	.034*	.030*	.030*	.025†	.022
African American		-.354***	-.376***	-.380***	-.358***	-.379***	-.348***
Hispanic American		-.176*	-.214*	-.195*	-.206*	-.201*	-.174*
Asian American		-.313*	-.358**	-.316*	-.367**	-.310*	-.315*
Other		-.165	-.163	-.175	-.154	-.179	-.173
Blended family: two parents (t1)		-.079	-.090	-.090	-.082	-.086	-.081
Single-parent family		.011	.001	.002	.007	-.001	.026
Other family structure		-.019	-.059	-.039	-.051	-.034	-.013
Full delinquency (t1)			.045***				
Violent delinquency (t1)				.061*			
Nonviolent delinquency (t1)					.057***		
Exposure to street violence (t1)						.101*	
Alcohol availability in home (t1)						.137*	
Constant	.184**	-.154	-.353	-.280	-.288	-.194	-.174
R <sup>2</sup>	.217	.224	.234	.226	.235	.226	.225
Model-adjusted Wald statistic	F(3,126)	F(12,117)	F(13,116)	F(13,116)	F <sub>(13,116)</sub>	F <sub>(13,116)</sub>	F <sub>(13,116)</sub>
	60.17	22.36	21.01	20.58	21.36	21.15	21.83

(N=5,891)

† p < .10   \* p < .05   \*\* p < .01   \*\*\* p < .001 (two-tailed tests)

### Toward a Sequential Stress Theory of Cumulative Disadvantage

The most influential application of the life-course perspective in the study of delinquency, Sampson and Laub's (1993) age-graded theory of social control, does not emphasize the negative emotions that we have argued link anger, delinquency, depression, and drinking problems. Their classic study is guided by an age-graded control theory that is more attentive to how and why individuals form positive social bonds that lead to conformity (cf., Hirschi 1969). For example, the explanation given by Sampson and Laub's age-graded theory for transitions of former delinquents to adult conformity is focused on favorable changes in marriage and employment. An important turning point finding in this analysis of the Gluecks' (see 1955) midtwentieth century Massachusetts data set is that successful marriages and stable jobs are salient sources of social bonds that constrain former delinquents to become conventional adults (see also Laub, Nagin & Sampson 1998). The moving force of classical control theory is the absence of such bonds rather than the presence of stressful emotions and

**TABLE 4B: Unstandardized Structural and Reduced Form OLS Equations for Drinking Problems at Time 2 for Males**

	1	2	3	4	5	6	7
Depression (t1)	.016*	.015*	.009	.013†	.009	.013†	.015*
Drinking problems (t1)	.326***	.304***	.267***	.290***	.268***	.295***	.304***
Parent education (t1)		.009	-.005	.012	-.014	.010	.007
Age (t1)		.136***	.138***	.140***	.135***	.134***	.136***
African American		-.284***	-.280***	-.306***	-.259***	-.301***	-.282***
Hispanic American		-.062	-.077	-.074	-.070	-.083	-.061
Asian American		-.321***	-.303***	-.306***	-.311***	-.319***	-.321***
Other		-.060	-.073	-.065	-.073	-.070	-.059
Blended family: two parents (t1)		.017	-.002	.008	-.000	.008	.017
Single-parent family		-.014	-.045	-.029	-.041	-.032	-.012
Other family structure		-.168	-.189†	-.186†	-.180	-.183	-.167
Full delinquency (t1)			.038***				
Violent delinquency (t1)				.053*			
Nonviolent delinquency (t1)					.051***		
Exposure to street violence (t1)						.066*	
Alcohol availability in home (t1)							.033
Constant	.166**	-1.812***	-1.886***	-1.908***	-1.820***	-1.784***	-1.813***
R <sup>2</sup>	.130	.149	.161	.152	.162	.151	.149
Model-adjusted Wald statistic F(13,116)	F(3,126)	F(12,117)	F(13,116)	F(13,116)	F(13,116)	F(13,116)	F(13,116)
	26.74	12.43	15.04	12.57	15.71	11.69	11.94
(N = 5,615)							

† p < .10   \* p < .05   \*\* p < .01   \*\*\* p < .001 (two-tailed tests)

rebellious reactions to surrounding structural conditions. This kind of emotion- and motive-free account is the signature stance that Hirschi (1969) made a distinctive feature of control theory — to contrast it with strain or stress theories that were previously more popular in sociological criminology and that are still dominant in the sociological study of mental health.

In contrast, Giordano, Cernkovich, and Rudolph (2002) observe that the pervasive trajectories of cumulative stress and disadvantage they find in their contemporary longitudinal research impedes the success of their respondents in building their lives along the conforming paths emphasized in the control theory framework. Meanwhile, Sampson and Laub's subsequent work (e.g., 1997) also makes clear that their theoretical stance extends beyond the exclusive, classical confines of pure control theory. For example, in this later work they defy traditional restrictions of control theory by adding the concept of cumulative disadvantage to their age-graded approach. This concept gives a new edge to their theory, identifying cumulation of disadvantage as a likely

**TABLE 5: The Effect of Anger on Time 2 Outcome Transitions in First-Order Markov Models**

Panel A: Transition into T2 Drinking Problems ( $Y_{ij} = 1$ ) from T1 Nondrinking Problems ( $Y_{ij-1} = 0$ )			
	1 <sup>a</sup>	2 <sup>b</sup>	3 <sup>c</sup>
Full sample (N = 9,188)	1.251 <sup>†</sup> [1.038–1.509]	1.303 <sup>**</sup> [1.081–1.570]	1.145 [.940–1.394]
Male (N = 4,496)	1.543 <sup>**</sup> [1.182–2.015]	1.655 <sup>***</sup> [1.274–2.150]	1.438 <sup>*</sup> [1.089–1.898]
Female (N = 4,692)	.999 [.793–1.259]	1.031 [.814–1.306]	.930 [.732–1.181]
Panel B: Transition into T2 Drinking Problems ( $Y_{ij} = 1$ ) from T1 Drinking Problems ( $Y_{ij-1} = 1$ )			
	1 <sup>a</sup>	2 <sup>b</sup>	3 <sup>c</sup>
Full sample (N = 2,318)	1.240 <sup>†</sup> [.973–1.579]	1.266 <sup>†</sup> [.988–1.622]	1.199 [.931–1.543]
Male (N = 1,119)	1.353 <sup>†</sup> [.944–1.939]	1.334 [.935–1.904]	1.268 [.879–1.828]
Female (N = 1,199)	1.132 [.807–1.589]	1.206 [.847–1.719]	1.140 [.803–1.617]
N = 11,506			

<sup>a</sup> Model controls for binary form of depression at time 1. Odds ratios are presented with 95% confidence intervals.

<sup>b</sup> Model with full sociodemographic controls added

<sup>c</sup> Model with delinquency score at time 1 added

source of distress and the emotional motivation to deviate, indeed to rebel, including through escape and retreat. That is, a new conceptual edge is gained by fortifying their age-graded theory of social control with the motivational concept of cumulative disadvantage that is more characteristic of strain and stress theories. The age-graded, cumulative aspect of this integration is particularly attractive because it underlines the importance of telescoping forward and backward through various stages of the life course — including backward from the cusp of emerging adulthood and transitions to marriage and employment to preceding adolescent involvement in delinquency as a mediating phase where negative emotions previously accumulate.

An early mediating role of delinquency is elaborated in the current research by integrating prior findings from ethnographic studies of delinquency with classic assumptions of stress and strain theories of mental health and delinquency and a power-control theory of delinquency. This theoretical integration gives special attention to work in the mental health field. For example, the development of Agnew's (1992) general strain theory draws on this literature to focus on family and school-linked angry and aggressive emotions as causes of delinquent behavior. As Cohen's (1955) early theory of status frustration also previously predicted, less-educated parents and disrupted families are a source of disadvantage for children in schools whose status competitions make these youth angrily and aggressively rebellious. From Pearlin and colleagues' (1981) perspective, and the integrated sequential stress theory proposed in this article, delinquency can be seen as both a consequence and a cause of distress.

Meanwhile, Hagan's power-control theory (Hagan, Simpson & Gillis 1987) has been extended in the mental health literature to suggest that expressions

of emotion can be gendered by parental controls and role expectations, leading females to internalize their distress as depression and allowing males to further externalize their distress through excessive drinking. Robins and Martin (1993) similarly suggest that differences in styles of deviant expression result from socialization experiences of males and females. The result is a sequential stress theory of gender and delinquency that predicts that males in particular will tend to move through a sequence of adaptations, from anger to delinquency to drinking problems, while females will be more likely to move from anger through delinquency to symptoms of depression. The point, provocatively made in the work of Aneshensel and Gore (1991) and Rosenfield (1999), is that both males and females respond to stress in their social and family environments, but that the results may take distinctive forms. We are able to explore this possibility more clearly as gendered expressions of emotional distress are granted an enlarged place in longitudinal quantitative studies of the life course.

The results of our research are consistent with the integrated theoretical account we have proposed, and in this way our findings begin to fill in transitional spaces that include a mediating role of delinquency in an emerging understanding of cumulative disadvantage and downward trajectories in the life course. Thus, our results parallel previous studies in indicating that anger follows from disadvantaged and therefore stressful family circumstances and is a source of delinquent behavior. Our findings further indicate that anger is a source of depression among both adolescent boys and adolescent girls, while also indicating that depression may be slightly more common among adolescent girls in possible anticipation of larger gender differences to follow in the linkage of anger and depression in adulthood. The effect of anger on depression is in part mediated by involvement in delinquency, both among male and among female adolescents. Our analysis indicates that anger also leads to drinking problems among males, but not among females, and that for males involvement in delinquency is also a mediating link between anger and drinking. The connecting link delinquency plays in the transition from anger to depression and drinking may be especially important for understanding the cumulative and gendered nature of downward trajectories in human lives, leading, for example, to variation in the kinds of marital and employment outcomes that Sampson and Laub (1993, 1997) have usefully studied.

Future research could usefully test the suggestion of Moffitt and colleagues (2001) that the kind of gendered differences we have found in drinking problems after delinquency are more likely than gendered variations in the early causes of this behavior. A full test of this possibility will require differentiating the forms that delinquency itself takes, including examination of the distinction increasingly drawn between the indirect, relational forms of aggression that are more common among girls, and direct, physical aggression that is more frequent

among boys. There is also a question about whether the gender differences we have observed in postdelinquent drinking behavior will accumulate and intensify or converge and diminish over the subsequent transition from emerging to later adulthood. Moffitt and colleagues (2001:179) speculate that the cumulation of disadvantage will not continue unabated in their sample, saying “we think that the Study men will catch up in a few years when they get around to taking up the developmental task of forming their own homes and families.” We are less optimistic, but the point is that such predictions merit test. Finally, while this article has emphasized a causal sequence that leads from delinquency to depression, we do not intend to minimize the importance of future research that attempts to more clearly establish what more specific manifestations of depression might lead in the opposite direction, from depression to delinquency.

The results of the research presented here are unique in their use of longitudinal measures of emotions such as depression, which are well developed in the mental health literature, to provide new quantitative evidence of the linking motivational mechanisms emphasized in previous theoretical and ethnographic studies of delinquency. Linkages between structurally embedded feelings — in sequences connecting family disadvantage with anger, delinquency, depression, and drinking — are much discussed in delinquency theory and ethnographic research, such as the landmark studies of Willis (1997) and Sullivan (1989). The challenge is to capitalize on this earlier work by combining the new possibilities presented in quantitative panel studies with bridging concepts and measures drawn from the field of mental health research. The promising prospect is a more revealing picture of the emotional lives of delinquents and of cumulative disadvantage in the life course. Ultimately, sequential stress theory is a gendered and age-graded approach for the study of cumulative disadvantage in emerging and later adulthood.

## Notes

1. With the full set of variables in the equations estimated below, there are 11,506 cases. The full longitudinal sample consists of 13,568 cases. Most of the missing data results from the inclusion of the parental education measure. Reestimating the equation without the parental education variable does not substantively alter the results or their levels of statistical significance.
2. A small and highly diverse “other” race/ethnicity group is also significantly more likely to be reported as angry (OR = 1.675,  $p < 0.01$ ).
3. This formula for this significance test is provided in Paternoster and colleagues (1998:862).
4. The formula for this significance test is provided in Clogg, Petkova, and Haritou (1995:1285-87).



## References

- Agnew, Robert. 1985. "A Revised Strain Theory of Delinquency." *Social Forces* 64:151–67.
- . 1992. "Foundation for a General Strain Theory of Crime and Delinquency." *Criminology* 30:47–87.
- . 1997. "Stability and Change in Crime over the Life Course: A Strain Theory Explanation." Pp. 101–32 in *Developmental Theories of Crime and Delinquency*, edited by Terence Thornberry. Transaction.
- Agnew, Robert, Timothy Brezina, John Paul Wright, and Francis Cullen. 2002. "Strain, Personality Traits, and Delinquency: Extending General Strain Theory." *Criminology* 40:43–71.
- American Psychiatric Association. 1987. *Diagnostic and Statistical Manual of Mental Disorders*, 3d ed., rev. American Psychiatric Association.
- . 1994. *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed. American Psychiatric Association.
- Aneshensel, Carol S., and Susan B. Gore. 1991. "Development, Stress, and Role Restructuring." Pp. 55–77 in *The Social Context of Coping*, edited by John Eckenrode. Plenum Press.
- Aneshensel, Carol S., Carolyn M. Rutter, and Peter A. Lachenbruch. 1991. "Social Structure, Stress, and Mental Health." *American Sociological Review* 56:166–78.
- Angold, Adrian, and E. Jane Costello. 2001. "The Epidemiology of Disorders of Conduct: Nosological Issues and Comorbidity." Pp. 126–68 in *Conduct Disorders in Childhood and Adolescence*, edited by Jonathan Hill and Barbara Maughan. Cambridge University Press.
- Arboleda-Florez, J., H. Holley, and A. Cristani. 1998. "Understanding Causal Paths between Mental Illness and Violence." *Social Psychiatry and Psychiatric Epidemiology* 33:S38–S46.
- Arnett, J.J. 2000. "Emerging Adulthood: A Theory of Development from the Late Teens through the Twenties." *American Psychologist* 55:469–80.
- Aseltine, Robert H. Jr., Susan Gore, and Jennifer Gordon. 2000. "Life Stress, Anger and Anxiety, and Delinquency: An Empirical Test of General Strain Theory." *Journal of Health and Social Behavior* 41:256–75.
- Baron, Reuben, and David Kenny. 1986. "The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations." *Journal of Personality and Social Psychology* 51:1173–82.
- Brennan, Patricia A., Sarnoff A. Mednick, and Sheilagh Hodgins. 2000. "Major Mental Disorders and Criminal Violence in a Danish Birth Cohort." *Archives of General Psychiatry* 57:494–500.
- Broidy, Lisa M. 2001. "A Test of General Strain Theory." *Criminology* 39:9–36.
- Capaldi, Deborah M. 1992. "Co-occurrence of Conduct Problems and Depressive Symptoms in Early Adolescent Boys II: A Two-Year Follow-up at Grade 8." *Development and Psychopathology* 4:125–44.
- Champion, L.A., G.M. Goodhall, and M. Rutter. 1995. "Behavioral Problems in Childhood and Stressors in Early Adult Life: A 20-Year Follow-up of London School Children." *Psychological Medicine* 25:231–46.
- Chantalla, Kim, and Joyce Tabor. 1999. *National Longitudinal Survey of Adolescent Health: Strategies to Perform a Design-Based Analysis Using the Add Health Data*. Carolina Population Center, University of North Carolina at Chapel Hill.

- Chesney-Lind, Meda, and Randall Sheldon. 1992. *Girls, Delinquency, and Juvenile Justice*. Brooks/Cole.
- Clogg, Clifford, Eva Petkova, and Adamantious Haritou. 1995. "Symposium on Applied Regression: Statistical Methods for Comparing Regression Coefficients between Models." *American Journal of Sociology* 100:1261–93.
- Cloward, Richard, and Lloyd Ohlin. 1960. *Delinquency and Opportunity: A Theory of Delinquent Gangs*. Free Press.
- Cohen, Albert. 1955. *Delinquent Boys: The Culture of the Gang*. Free Press.
- DeCoster, Stacy, and Karen Heimer. 2001. "The Relationship between Law Violation and Depression: An Interactionist Analysis." *Criminology* 39:799–836.
- Devins, Gerald, and Carolee Orme. 1985. "Center for Epidemiologic Studies Depression Scale." Pp. 144–60 in *Test Critiques*, vol. 2, edited by D.J. Keyser and R.C. Sweetland. Test Corporation of America.
- Diggle, Peter J., Kung-Yee Liang, and Scott L. Zeger. 1994. *Analysis of Longitudinal Data*. Oxford Statistical Science Series, no. 13. Oxford University Press.
- Earls, Felton, and Kenneth Jung. 1987. "Temperament and Home Environmental Characteristics As Causal Factors in the Early Childhood Development of Childhood Psychopathology." *Journal of the American Academy of Child and Adolescent Psychiatry* 2:491–98.
- Elder, Glen. 1985. *Life Course Dynamics*. Cornell University Press.
- Elliott, Delbert, David Huizinga, and Suzanne Ageton. 1985. *Explaining Delinquency and Drug Use*. Sage Publications.
- Eronen, M., M.C. Angermeyer, and B. Schulze. 1998. "The Psychiatric Epidemiology of Violent Behaviour." *Social Psychiatry and Psychiatric Epidemiology* 33:S13–S23.
- Fergusson, David M., Michael Lynskey, and L. John Horwood. 1996. "Origins of Comorbidity between Conduct Disorder and Affective Disorders." *Journal of the American Academy of Child and Adolescent Psychiatry* 35:451–60.
- Giordano, Peggy, Stephen Cernkovich, and Allen Lowery. 2001. "Longitudinal Follow-up of Serious Female Offenders." Paper presented at the annual meetings of the American Society of Criminology, Atlanta, Nov.
- Giordano, Peggy, Stephen Cernkovich, and Jennifer Rudolph. 2002. "Gender, Crime, and Desistance: Toward a Theory of Cognitive Transformation." *American Journal of Sociology* 107:990–1064.
- Hagan, John. 1997. "Defiance and Despair: Subcultural and Structural Linkages between Delinquency and Despair in the Life Course." *Social Forces* 76:119–34.
- Hagan, John, and Holly Foster. 2001. "Youth Violence and the End of Adolescence." *American Sociological Review* 66:874–99.
- Hagan, John, and Alberto Palloni. 1988. "Crimes As Social Events in the Life Course: Reconceiving a Criminological Controversy." *Criminology* 26:87–100.
- Hagan, John, and Patricia Parker. 1999. "Rebellion beyond the Classroom: A Life-Course Capitalization Theory of the Intergenerational Causes of Delinquency." *Theoretical Criminology* 3:259–85.
- Hagan, John, John Simpson, and A.R. Gillis. 1987. "Class in the Household: A Power-Control Theory of Gender and Delinquency." *American Journal of Sociology* 92:788–816.

- Heimer, Karen. 1996. "Gender, Interaction, and Delinquency: Testing a Theory of Differential Control." *Social Psychology Quarterly* 59:39–61.
- Heimer, Karen, and Stacy De Coster. 1999. "The Gendering of Violent Delinquency." *Criminology* 37:277–317.
- Hirschi, Travis. 1969. *Causes of Delinquency*. University of California Press.
- Kandel, Denise B., Kazuo Yamaguchi, and Kevin Chen. 1992. "Stages of Progression in Drug Involvement from Adolescence to Adulthood: Further Evidence for the Gateway Theory." *Journal of Studies on Alcohol* 53:447–57.
- Katz, Jack. 1988. *The Seductions of Crime: Moral and Sensual Attractions in Doing Evil*. Basic Books.
- Kessler, Ronald, and David Greenberg. 1981. *Linear Panel Analysis: Models of Quantitative Change*. Academic.
- Laub, John, Daniel Nagin, and Robert Sampson. 1998. "Trajectories of Change in Criminal Offending: Good Marriages and the Desistance Process." *American Sociological Review* 63:225–38.
- Loeber, Rolf, and Dale F. Hay. 1997. "Developmental Approaches to Aggression and Conduct Problems." Pp. 488–516 in *Development through Life: A Handbook for Clinicians*, edited by Michael Rutter and Dale F. Hay. Blackwell Scientific.
- Lytton, Hugh. 1990. "Child and Parent Effects in Boys' Conduct Disorder: A Reinterpretation." *Developmental Psychology* 26:683–97.
- Maughan, Barbara, and Michael Rutter. 2001. "Antisocial Children Grown Up." Pp. 507–52 in *Conduct Disorders in Childhood and Adolescence*, edited by Jonathan Hill and Barbara Maughan. Cambridge University Press.
- Merton, Robert. 1957. *Social Theory and Social Structure*. Free Press.
- Moffitt, Terrie, Avshalom Caspi, Michael Rutter, and Phil Silva. 2001. *Sex Differences in Antisocial Behavior*. Cambridge University Press.
- Parsons, Talcott. 1947. "Certain Primary Sources and Patterns of Aggression in the Social Structure of the Western World." *Psychiatry* 10:167–81.
- Paternoster, Raymond, Robert Brame, Paul Mazerolle, and Alex Piquero. 1998. "Using the Correct Statistical Test for the Equality of Regression Coefficients." *Criminology* 36:859–66.
- Pearlin, Leonard, Morton A. Lieberman, Elizabeth G. Menaghan, and Joseph T. Mullan. 1981. "The Stress Process." *Journal of Health and Social Behavior* 22:337–56.
- Piquero, Alex, Robert Brame, Paul Mazerolle, and Rudy Haapanen. 2002. "Crime in Emerging Adulthood." *Criminology* 40:137–69.
- Piquero, Alex, Randall MacIntosh, and Matthew Hickman. 2000. "Does Self-Control Affect Survey Response? Applying Exploratory, Confirmatory, and Item Response Theory Analysis to Grasmick et al.'s Self-Control Scale." *Criminology* 38:897–930.
- Piquero, Alex, and Paul Mazerolle. 2000. *Life-Course Criminology: Contemporary and Classic Readings*. Wadsworth.
- Radloff, Lenore Sawyer. 1977. "The CES-D Scale: A Self-Report Depression Scale for Research in the General Population." *Applied Psychological Measurement* 1:385–401.
- Robins, Cynthia, and Steven Martin. 1993. "Gender, Styles of Deviance, and Drinking Problems." *Journal of Health and Social Behavior* 34:302–21.

- Robins, Lee. 1966. *Deviant Children Grown Up*. Williams & Wilkins.
- Rosenfield, Sarah. 1999. "Gender and Mental Health: Do Women Have More Psychopathology, Men More, or Both the Same (and Why)?" Pp. 348-62 in *A Handbook for the Study of Mental Health: Social Contexts, Theories, and Systems*, edited by Allan Horowitz and Teresa Scheid. Cambridge University Press.
- Rutter, Michael. 1991. "Childhood Experiences and Adult Psychosocial Functioning." Pp. 348-62 in *The Childhood Environment and Adult Disease*, edited by G.R. Bock and J.A. Whelan. Wiley.
- . 2001. "Conduct Disorder: Future Directions: An Afterword." Pp. 189-200 in *Conduct Disorders in Childhood and Adolescence*, edited by Jonathan Hill and Barbara Maughan. Cambridge, U.K.: Cambridge University Press.
- Rutter, Michael, Barbara Maughan, Joanne Meyer, Andrew Pickles, Judy Silberg, Emily Siminoff, and Eric Taylor. 1997. "Heterogeneity of Antisocial Behavior: Causes, Continuities, and Consequences." Pp.45-118 in *Motivation and Delinquency*, edited by D. Wayne Osgood. Vol. 44 of the Nebraska Symposium on Motivation. University of Nebraska Press.
- Sampson, Robert, and John Laub. 1993. *Crime in the Making: Pathways and Turning Points through Life*. Harvard University Press.
- Sampson, Robert, and John Laub. 1997. "A Life-Course Theory of Cumulative Disadvantage and the Stability of Delinquency." Pp. 138-62 in *Developmental Theories of Crime and Delinquency*, edited by Terence Thornberry. Transaction.
- Sieving, Renee E., Trisha Beuring, Michael D. Resnick, Linda H. Bearinger, Marcia Shew, Marjorie Ireland, and Robert W. Blum. 2001. "Development of Adolescent Self-Report Measures from the National Longitudinal Study of Adolescent Health." *Journal of Adolescent Health* 28:73-81.
- StataCorp. 1999. *Stata Statistical Software*. Release 6.0 [software]. College Station, Tex.: Stata Corporation [producer and distributor].
- Stinchcombe, Arthur. 1964. *Rebellion in the High School*. Quadrangle.
- Sullivan, Mercer. 1989. *'Getting Paid': Youth Crime and Work in the Inner City*. Cornell University Press.
- Thornberry, Terence. 1997. "Some Advantages of Developmental and Life-Course Perspectives for the Study of Crime and Delinquency." Pp. 1-10 in *Developmental Theories of Crime and Delinquency*, edited by Terence Thornberry. Transaction.
- Udry, J. Richard. 1998a. "Design Features of the Add Health Study." Working Paper 98-04. Carolina Population Center, University of North Carolina at Chapel Hill.
- . 1998b. *The National Longitudinal Study of Adolescent Health (Add Health), Waves 1 and 2, 1994-1996* [machine-readable data file and documentation]. Chapel Hill, NC: Carolina Population Center, University of North Carolina at Chapel Hill.
- Willis, Paul. 1977. *Learning to Labor: How Working Class Kids Get Working Class Jobs*. Columbia University Press.
- Wright, Richard, and Scott Decker. 1997. *Armed Robbers in Action: Stickups and Street Culture*. Northeastern University Press.

## APPENDIX A: Items Used in Full, Violent, and Nonviolent Delinquency Scales

Time 1 (1994–1995)	Time 2 (1996)
In the past 12 months:	In the past 12 months:
1. How often did you paint graffiti or signs on someone else's property or in a public place? <i>0 = never, 1 = 1 or 2 time(s), 2 = 3 or 4 times, 3 = 5 or more times</i>	1. How often did you paint graffiti or signs on someone else's property or in a public place?
2. Did you deliberately damage property that didn't belong to you?	2. Did you deliberately damage property that didn't belong to you?
3. Did you lie to your parents or guardians about where you had been or whom you were with?	3. Did you lie to your parents or guardians about where you had been or whom you were with?
4. Did you take something from a store without paying for it?	4. Did you take something from a store without paying for it?
5. Did you run away from home?	5. Did you run away from home?
6. Did you drive a car without its owner's permission?	6. Did you drive a car without its owner's permission?
7. Did you steal something worth more than \$50.00?	7. Did you steal something worth more than \$50.00?
8. Did you go into a house or building to steal something?	8. Did you go into a house or building to steal something?
9. Did you sell marijuana or other drugs?	9. Did you sell marijuana or other drugs?
10. Did you steal something less than \$50.00?	10. Did you steal something less than \$50.00?
11. Were you loud, rowdy, or unruly in a public place?	11. Were you loud, rowdy, or unruly in a public place?
12. Did you get into a serious physical fight?	12. Did you get into a serious physical fight?
13. Did you hurt someone badly enough to need bandages or care from a doctor or nurse?	13. Did you hurt someone badly enough to need bandages or care from a doctor or nurse?
14. Did you use or threaten to use a weapon to get something from someone?	14. Did you use or threaten to use a weapon to get something from someone?
15. Did you take part in a fight where a group of your friends was against another group?	15. Did you take part in a fight where a group of your friends was against another group?

## APPENDIX B: Descriptive Statistics and Variables Description

	Mean	Subgroup Mean Differences t-values	Standard Deviation	Observed Range	Variable Description
Depression (t1)	10.796	F > M t = 10.206	7.446	0–54	A 19-item scale was administered to adolescents with questions from the Center for Epidemiological Studies Depression Scale (see Radloff 1977). Respondents were asked, "How often was each of the following things true during the past week?" The mean was imputed on this scale for respondents with at least 8 nonmissing responses of 19 items. The mean score was multiplied by 19 to rescale the mean score in the metric of the original scale ( $\beta = 0.87$ ).
Depression (t2)	10.679	F > M t = 11.216	7.503	0–56	The same 19 items administered at time 1 were asked of respondents at time 2. At the time 2 interview, respondents were asked how often each of the following things were true during "the past seven days." The scale was coded as a mean score as described above.
Binary form of depression (t1)	.219	F > M t = 9.192	.413	0–1	The depression scale was dichotomized with a cut point of 16 (see Radloff 1977).
Binary form of depression (t2)	.224	F > M t = 9.796	.417	0–1	As above.
Drinking problems (t1)	.608	t = -.825	1.705	0–20	<i>Audio-CASI</i> : A mean score of five items: Over the past 12 months, how many times has each of the following things happened? You got into trouble with your parents because you had been drinking. You've had problems at school or with school work because you had been drinking. You had problems with your friends

## APPENDIX B: Descriptive Statistics and Variables Description (Cont'd)

	Mean	Mean Differences t-values	Subgroup Deviation Standard Deviation	Observed Range	Variable Description
					because you had been drinking. You had problems with someone you were dating because you had been drinking. You did something you later regretted because you had been drinking. 0 = never, 1 = once, 2 = twice, 3 = 3-4 times, 4 = 5 or more times ( $\alpha = 0.70$ )
Drinking problems (t2)	.616	t = .807	1.745	0–20	Audio-CASI: A mean score as constructed at time 1.
Binary form of drinking problems (t1)	.207	t = .837	.406	0–1	The drinking problems scale was dichotomized at a score of 1 or higher indicating the presence of problems in this sample of adolescents.
Binary form of drinking problems (t2)	.206	t = 1.659	.405	0–1	As above.
Full delinquency (t1)	4.280	F < M t = -10.057	5.191	0–45	Audio-CASI: Fifteen items were used to create a scale of delinquency (see Appendix 2). The mean of this scale was calculated for respondents with at least 8 nonmissing responses to 15 items. The mean score across these items was multiplied by 15 to scale the mean score back to the metric of the original scale ( $\beta = 0.86$ ).
Violent delinquency (t1)	1.071	F < M t = -16.738	1.753	0–12	Audio-CASI: A mean score constructed using items 12–15 in Appendix 1. Mean scores were computed for respondents with at least 2 nonmissing responses ( $\beta = 0.74$ ).

APPENDIX B: Descriptive Statistics and Variables Description (Cont'd)

	Mean	Subgroup Mean Differences t-values	Standard Deviation	Observed Range	Variable Description
Nonviolent delinquency (t1)	3.209	F < M t = -6.267	4.060	0-33	Audio-CASI: A mean score constructed using items 1-11 in Appendix 1. Mean scores were computed for respondents with at least 5 nonmissing responses to these items ( $\beta = 0.82$ ).
Anger (t1)	.317	F < M t = -1.678	.465	0-1	A parent reported assessment of "Does {NAME} have a bad temper?" 0 = no; 1 = yes
Exposure to street violence (t1)	.471	F < M t = -12.137	1.104	0-10	Audio-CASI: This scale was constructed as a mean score of 5 items measuring exposure to violence either in the form of direct victimization or as a witness. The following 5 items were used to measure witnessing or having experienced violent victimization: 1. "You saw someone shoot or stab another person." 2. "Someone pulled a knife or gun on you." 3. "Someone shot you." 4. "Someone cut or stabbed you." 5. "You were jumped." These items used a response scale of 0 = never, 1 = once, 2 = more than once. The mean was imputed on this scale for respondents with at least 3 nonmissing responses of 5 items. The mean score was multiplied by 5 to rescale the mean score in the metric of the original scale ( $\beta = 0.69$ ).
Male	.503	—	.500	0-1	AH: We use the designation AH to indicate that this variable was constructed through the Adolescent Health Study's Constructed Variables data set or through sample code provided on the Add Health Web site. Respondent's gender obtained from the 1996 file (recoded to 1 = male, 0 = female).



## APPENDIX B: Descriptive Statistics and Variables Description (Cont'd)

	Mean	Subgroup Mean Differences t-values	Standard Deviation	Observed Range	Variable Description
Parent education	2.560	t = -1.597	1.010	1-4	At time 1, the In-Home Adolescent Sample's parents were interviewed. Using parental responses to the question "How far did you go in school?" a 4-item ordinal measure was constructed with the following categories: 1 = less than high school graduation; 2 = high school graduation; 3 = some postsecondary; 4 = college or university graduation or additional postsecondary beyond the four-year college degree.
Age	14.982	F < M t = -4.059	1.622	11-21	AH: Age in years using Adolescent Health data repository code with the time 1 interview data.
Blended family two parents	.170	t = -.931	.376	0-1	AH: A five-category family structure typology variable using adolescent reported household roster information was recoded into four categories. The two single-parent categories (both mother- and father-only families) were recoded into single-parent family status. The other three categories are two biological parents, two blended parents, and other family structure.
Single-parent family	.236	t = 1.194	.425	0-1	AH
Other family structure	.038	t = .113	.191	0-1	AH
Two biological parents	.556	t = -.362	.497	0-1	AH

APPENDIX B: Descriptive Statistics and Variables Description (Cont'd)

---

	Mean	Subgroup Mean Differences t-values	Standard Deviation	Observed Range	Variable Description
Hispanic	.117	t = -.144	.321	0-1	AH: This measure uses adolescent American self report data to construct race dummy variables. Any incidence of Hispanic status was used to first categorize respondents, followed by the other racial group designations. This coding scheme assigns respondents to only one racial/ethnic group.
African American	.147	t = 1.275	.354	0-1	AH
Asian American	.030	t = -.877	.171	0-1	AH
Other	.031	t = -1.240	.172	0-1	AH: (includes Native American)
Caucasian	.676	t = .002	.468	0-1	AH

---

(N = 11,506)

---