YOUTH VIOLENCE AND THE END OF ADOLESCENCE

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American youth experience high levels of violence, and increasingly the U.S. public policy response is to punish young perpetrators of violence through waivers and transfers from juvenile to adult courts. Adolescence is a time of expanding vulnerabilities and exposures to violence that can be self-destructive as well as destructive of others. Such violence can involve intimate relationships or strangers, and in addition to being perpetrators or victims, youth are often bystanders and witnesses to violence. The authors hypothesize that the life-course consequences of experiences with violence, especially violence in intimate adolescent relationships, include more than contemporaneous health risks, leading also to subsequent depression and premature exits from adolescence to adulthood. An analysis of panel data from the National Longitudinal Study of Adolescent Health indicates that violence in intimate adolescent relationships results in depressed feelings, running away from home, serious thoughts about suicide, dropping out of school, and teenage pregnancy. Among adolescent females, violence in intimate relationships is especially likely to lead to depression, and exposure to violence on the street combines with violence by intimate partners to result in especially high risks of pregnancy. Future work should consider how exposure to violence and premature exits to adulthood negatively affect adult life outcomes.

EVEN AFTER a decade-long decline (Fox and Zawitz 2000), homicide rates for youth in their late teens are six times higher in the United States than they are in neighboring Canada (Hagan and Foster 2000). Female victims of homicide are about 10 times more likely to have been killed by an intimate partner than are male victims (National Research Council 1996). American youth experience violence as victims and as perpetrators, in conflicts with intimates and strangers, and in ways destructive to themselves (e.g., suicide) as well as to others. Adolescents are further exposed to violence as bystanders and witnesses.

Programs designed to help youth who have been exposed to violence are rare, and American public policy is increasingly focused on restricting or eliminating protections based on adolescent status. Thus, a growing policy of "recriminalization" is reducing the ages at which youth charged with violent acts are waived or transferred to adult courts (Singer 1996). This is a retrenchment from the legal protection provided by the juvenile court movement and "child-savers" that emerged when adolescence was recognized as a "life stage" early in the last century (Modell 1989; Platt 1969). Furstenberg (2000) notes that "advanced industrial societies create adolescence and early adulthood as life stages in ways that inevitably render

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them problematic" (p. 897), and Tanner and Yabiku (1999) add that for contemporary American youth, "the economic climate and changing social norms have . . . complicated a once well-worn path from adolescence to adulthood" (p. 254; also see Rindfuss, Swicegood, and Rosenfeld 1987). For many youth, the transition to adulthood is Hobbesian: nasty, brutish, and short.

Relatively little is known empirically about links between American youth violence and transitions to adulthood. There is consensus that youth violence is a serious problem in America, but recently a broader view has emerged that the *consequences* of child and adolescent *exposure* to violence should be studied along with the *causes* of youthful *perpetration* of violence (Malik, Sorenson, and Aneshensel 1997). Silverman et al. (2001; also see Goode 2001) present evidence from a cross-sectional survey that exposure to intimate adolescent violence (dating violence) is associated with health risks.[1] However, the implications of this research extend beyond correlated health risks.

The key here is not just to see intimate partner violence cross-sectionally as one variable in a set of correlated adolescent health problems, but to longitudinally and dynamically identify this violence as a salient factor leading youth away from a protected adolescent role and into the vulnerabilities associated with adulthood. Thus, our broad thesis is that exposure to violence, especially violence in intimate romantic relationships, forces a premature end to adolescence through early exits from conventional teenage roles.[2] To test this thesis, we take into account a wider range of the types and timing of exposure to violence—as well as early patterns of childhood and adolescent behavior that may lead to exposure to violence—in relation to an array of potential consequences of this exposure. To explore this thesis, we examine connections across time between temperament (expressed as bad temper and involvement in past violent behavior), several kinds of exposure to violence (including street, intimate partner, and self-destructive violence), adolescent distress (e.g., depression), and ways in which youth exit from adolescence prematurely (including dropping out of school, teenage pregnancy, leaving home, and suicidality).

EXPOSURE TO VIOLENCE AND ADOLESCENT ROLE EXITS

The life-changing implications of adolescent exposure to violence have not been comprehensively examined in longitudinal research (see MacMillan 2001), and relatively little attention has been given to the life-course consequences of intimate adolescent violence. Yet "linked lives" is a central theme in life-course research (Elder 1974; 1994), and violence directed against an intimate partner implies a power relationship in which one actor seeks to dominate another (Hagan 1989). Our analysis adopts a life-course perspective on adolescent role exits that anticipates reductions of life chances in adulthood, with some consequences, involving depression and pregnancy, that are especially problematic for teenage girls.

The study of posttraumatic stress disorder postulates that childhood exposure to violence (ETV) leads to distress (e.g., Selner-O'Hagan et al. 1998). Broad life implications of exposures to violence in childhood also are vividly captured in journalistic accounts (e.g., Kotlowitz 1991). Margolin and Gordis (2000) emphasize the critical role of violence in childhood, noting, "[C]ontinued attention to identifying the variability in children's reactions to violence and how the nature of responses relates to developmental stage and environmental circumstances

[1] The results of this study were reported by the Associated Press and Reuters news services, as well as in stories on National Public Radio, ABC News, and ABC's Good Morning America program.

[2] Silverman et al. (2001) include teen pregnancy and suicidality among the health risks of dating violence. We consider exposure to violence generally and intimate adolescent/dating violence more specifically as antecedent to teen pregnancy and suicidality. We incorporate exposures to violence into multivariate longitudinal analyses of subsequent depression and a set of role exits from adolescence that include dropping out of school and running away from home as well as pregnancy and suicidality. Our analysis is distinctive in its comprehensive, gender sensitive, and sequential aspects and its accompanying life-course conceptualization.

will assist in identifying important targets for intervention and prevention" (p. 470; also see Kessler and Magee 1994; Osofsky 1997).

The current study extends prior work by examining the experience of violence in adolescence as a critical life event that often is followed by premature role exits to adulthood. The original concept of role exits derives from Merton's (1988:*xi*) work on role sets. Early work on role exits focused on transitions from work to retirement (Blau 1973; also see Ebaugh 1988:*xi*). Hagan and Wheaton (1993) have proposed adolescent role exits as a synthesizing concept that focuses on potentially problematic routes of departure from teenage roles and premature entries into adulthood (also see Krohn, Lizotte, and Perez 1997), including dropping out of school, leaving home, suicidality,[3] and teenage pregnancy. Adolescent role exits often are adaptations to stressful structural circumstances, including violence (Margolin and Gordis 2000).

Some adolescent role exits are normative, or at least are not very deviant. Marini (1984) emphasizes that early transitions to adulthood can be normative, for example, within groups that favor early marriage and childbearing. Nonetheless, adolescent role exits may also be seen as nonnormative. First, American adolescents often are caught in normative cross-currents, with mainstream adult culture pushing one way and peers pushing another. For example, while mainstream adult culture encourages adolescent sexual abstinence and delayed parenting, peers may advocate precocious sexual activity that can lead to teenage pregnancy. Second, nonnormative exits from adolescence may be provoked rather than chosen. For example, if we find that exposure to violence leads to teenage pregnancy, such an exit can be seen as nonnormative. Regardless of whether these adolescent role exits are designated as nonnormative, however, Aneshensel and Gore (1991) point out, "[I]t is important to differentiate events that happen to only some adolescents from those that occur to virtually all adolescents" (p. 61).

Hagan and Wheaton (1993) focus on the gendered roles that depression and teenage pregnancy play in structurally constraining role exits from adolescence, and Krohn et al. (1997) observe that "becoming pregnant, having a child, and moving out of the parental home are events that may have greater impact on females than males" (p. 100). Aneshensel and Gore (1991) and Rosenfeld (1999a) emphasize that depression, suicidality, and teenage pregnancy can be understood as internalized adaptations to stressors such as intimate partner violence, while leaving home and leaving school may be more externalized adaptations. The concept of adolescent role exits includes both internalized and externalized processes in the transition to adulthood.

EXPANDING THE COVERAGE OF EXPOSURE TO VIOLENCE

Although we, like Silverman et al. (2001), assign particular significance to violence in intimate adolescent relationships, our analysis requires a more comprehensive consideration of exposure to violence. The mental health literature reveals that stressors often appear in clusters. Mullen et al. (1993) point out that particular stressors can occur as part of a "matrix of disadvantage," and Wheaton, Roszell, and Hall (1997:51) observe that "studying a stressor on its own could be essentially misleading." Clearly, it is important to analyze exposure to "sets of violent traumas" or "clusters of violent stressors."

Recent studies in large American cities reveal that as many as a quarter of adolescents surveyed have been exposed to violence by witnessing someone being shot and/or killed sometime in their lives. Building on such findings, recent work by Selner-O'Hagan et al. (1998) and the Project on Human Development in Chicago Neighborhoods has produced highly reliable measures of exposure to neighborhood street violence (also see Leventhal and Brooks-Gunn 2000:326).

Studies have also found that exposure to neighborhood violence is positively related

[3] The concept of "suicidality" includes the adolescent's thoughts and actions in relation to taking their own lives. These thoughts and actions are included in Hagan and Wheaton's (1993) original concept of nonnormative adolescent role exits.

to violent behaviors (DuRant et al. 1994; Malik et al. 1997; Song, Singer, and Anglin 1998), hostility (Moses 1999), depression in children and adolescents (Schwab-Stone et al. 1995; also see Gorman-Smith and Tolan, 1998; Margolin and Gordis 2000:458-59), and suicidal ideation and attempts (Pastore, Fisher, and Friedman 1996; see also Mazza and Reynolds 1999).[4] Schwab-Stone et al. (1995:1350-51) considered a range of outcomes and found that neighborhood violence is positively linked to diminished school achievement, perceptions of peer risk-taking, and expectations about future success.

Using data from 1994 and 1996 cohorts, Schwab-Stone et al. (1999) report a cross-sectional relationship between exposure to community violence, measured as a latent variable with dimensions of witnessing community violence and victimization, and internalizing and externalizing problems in adolescents. However, research in this area tends to focus on only one kind of violence exposure or fails to control for violence perpetration, individual temperament, or a wide range of background factors or other kinds of violence exposure.[5] That is, these studies tend to focus on exposure to community or street violence and fail to consider other causes of violent behavior that begin in childhood. These studies also do not use longitudinal measures to take into account the influence of shared causes of exposure to violence and behavioral outcomes.

Marans and Adelman (1997) observe that "as the adolescent withdraws from his or her parents, the intensity of the attachment to them is shifted to the peer group and new intimate relationships" (p. 215). This shift implies a new source of sensitivity as well as vulnerability to violence in adolescence. Marans and Adelman add that "adolescent experiences and perceptions of their own vulnerability may lead to increasingly risky reactions that interfere with the tasks and requirements of this phase of development" (p. 215). This vulnerability suggests our hypothesis that violence associated with intimate relationships in adolescence has a range of generic effects, beyond correlated changes in health status, that are independent of differences in temperament and that are expressed in the form of depression and early exits from adolescence.

The incidence of violence in intimate adolescent relationships is well documented in research on "date violence" and "date rape" (see Christopher and Spreecher 2000; James et al. 2000; Malik et al. 1997). Although prior to Silverman et al. (2001) this research concentrated more on college students than high school students, the findings suggest that one-fifth to one-quarter of all adolescents experience psychological and physical abuse in their dating relationships. In about two-thirds of the cases, males and females engage in about equal amounts of psychological abuse, but males more likely to use physical violence, especially sexual aggression, against women (see James et al. 2000).

The difficulties in distinguishing provocation, perpetration, and victimization in these intimate experiences encourage the treatment of reports of intimate violence as reflecting violent *relationships*. Again, we hypothesize that these violent relationships among intimates during the teenage years are especially likely to result in depression and role exits from adolescence. This hypothesis allows that such outcomes may emanate from background differences in temperament, while also predicting that the effects of experiencing intimate adolescent violence persist beyond controls for these background differences. That is, background and more proximate processes can act in combined and cascading ways. We further anticipate that the depression and role exits resulting from violence in intimate adolescent relationships have special significance for females. Females generally score higher on conventional measures of depression, reflecting females' tendency to internalize re-

[4] There also may be links to substance use (Schwab-Stone et al. 1995). We incorporate violence items that involve co-occurrence of carrying a weapon while using alcohol or drugs to capture potential consequences of this combination (also see Krohn et al. 1997).

[5] For example, a recent study considered the effect of exposure to peer suicide attempts and completed suicides on a range of outcomes, but attention was limited to peer suicidality effects (Ho et al. 2000:304). Exposure to peers' suicides increased adolescents' own suicidality and behavior problems. Our approach examines the effects of exposure to peer suicidality compared with other domains of violence exposure.

actions to distress (Aneshensel, Rutter, and Lachenbruch 1991; Rosenfeld 1999a).

Females' tendency to internalize depressive affect may result from the use of violence as an intimidating tactic of power and control (Hagan 1990; Johnson 2000). Adolescence is a time when females' internalizing tendencies toward depression confront the more violent externalizing tendencies of males (see Rosenfield 1999b). Bush and Simmons (1987) argue that, as a result, girls are more exposed to the sexual and interpersonal stresses of early to middle adolescence. Thus, we hypothesize that intimate partner violence results in special difficulties for female adolescents, including depression and teenage pregnancy.

Silverman et al. (2001), in their cross-sectional study of dating violence among Massachusetts high school students, find bivariate and multivariate evidence of the association between dating violence and health problems. A significant limitation of their study is its use of a single-item measure for intimate adolescent violence, which the authors emphasize should be replaced with "a detailed, multiple-item instrument with known psychometrics" (p. 578). The authors also urge that future research use large scale, longitudinal data, "to identify the direction of associations between dating violence and health risks" (p. 578). The Silverman et al. study was limited to intimate partner violence (excluding consideration of wider exposure to violence), reported in response to a written survey (without spoken instruction) of female (excluding male) students, in one state (rather than a national sample), with selected controls (of demographic and other health risk variables) analyzed in relation to health outcomes (excluding broader role exit measures of leaving home and leaving school, as well as depression that leads to these exits). All of these limitations are reduced or removed in the analysis we report below.

THE ADOLESCENT HEALTH SURVEY

THE NATIONAL SURVEY

We analyze data from the first two waves of the National Longitudinal Study of Adolescent Health (Add Health).[6] Add Health began in 1995 with a national stratified probability sample of 80 high schools. More than 90 percent of students in these schools participated in an in-school survey, yielding a sample of more than 90,000 students. A random sample of students in grades 7 through 11 was selected from the school rosters for a one-and-one-half hour in-home student interview and a half-hour interview with about 85 percent of the parents (Udry 1998:7). Sensitive data, including information about violence in intimate relationships, was 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 interviewer bias. About 88 percent of the Add Health students completed a second wave interview in 1996 (Chantalla and Tabor 1999) . Our analysis is based on the more than 10,000 youth remaining in the longitudinal sample after list-wise deletions because of missing data.[7]

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[6] The Add Health study is 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, Center 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.

[7] For the full set of variables in the equations estimated below, there are 10,259 cases. The full

Because the survey used a multistage cluster sample, the observations are not independent or identically distributed. Our analysis incorporates these design characteristics through the statistical software program Stata, which yields unbiased parameter estimates and "corrected" variance estimates and standard errors (Chantalla and Tabor 1999).

Measuring Violence

Violence, other than simple fighting, is relatively infrequent and so we treat violent behavior as a binary and count measure as well as a mean score. To establish the ordinality of our violence measures, we first estimated a Rasch measurement model[8] for possession or use of weapons items that varied in seriousness and that were either initially coded as dichotomies or were so highly skewed that they formed natural dichotomies. The measures of violence perpetration are for the year prior to the survey.

The items forming a scale of *weapon violence* vary in severity, involving a progression from the simple possession of a weapon to the use of weapons. The items include carrying a weapon to school or while using drugs or drinking. Thus, we can consider the consequences of the presence of weapons in potentially dangerous situations. At wave 1, 5 percent of the adolescents reported drinking or using drugs while carrying a gun, knife, or club, and just over 3 percent reported carrying a weapon at school. Four percent reported pulling a gun or knife on someone, and 6 percent reported using a weapon in a fight; less than 2 percent reported shooting or stabbing someone. Overall, about 15 percent of the youth reported one or more of these violent behaviors at wave 1 and 11 percent reported such behaviors at wave 2. The alpha level for the combined items is .72 at wave 1.[9] The fit of a Rasch model to the data confirms the ordinal properties of the combined items (BIC = –4.75).[10]

The weapon violence scale does not include some serious forms of *violent behavior*, such as assault causing bodily harm, gang fighting, and robbery. Four items reflecting these behaviors are self-reported in the survey as occurring "never" to "five or more times," during the last year. We standardized these items and the earlier items and then took their mean as a broad measure of the perpetration of violent behavior. The alpha score for this scale at wave 1 is .82.

Exposure to street violence that involved weapons is more common than acting violently with and without weapons. This suggests the relevance of broadening attention to such exposure. At wave 1, more than 13 percent of the adolescents reported having someone pull a knife or gun on them over the past year; more than 12 percent reported seeing someone being shot or stabbed; 13 percent reported being "jumped"; 5 percent reported being cut or stabbed; about 1 percent reported being shot. These items form an acceptable Rasch model of exposure to street violence (BIC = –98.32), with this scale assuming ordinal values from 0 to 5. This measure includes dimensions of both victimization and witnessing street violence (cf., Richters and Martinez 1993; Schwab-Stone et al. 1995). The alpha level for these combined items is .69 at wave 1. Overall, 23 percent of the youth reported being exposed to some form of street violence at wave 1, and 18 percent were exposed at wave 2.

Exposure to family suicidality and *exposure to friend suicidality* were measured with interconnected items that asked whether over the past year family members

longitudinal sample consists of 13,568 cases with weights available. The majority of missing data results from the inclusion of the parental socioeconomic measures; removal of these variables from the equations results in retention of 90 percent of the sample. Removal of mean grade-point average and the measure for early intercourse further increases the retention level. Rerunning the equations without these variables does not substantively alter the results or their levels of statistical significance.

[8] O. D. Duncan (1984) notes, "The Rasch model is the *only* latent trait model for a dichotomous response that is consistent with 'number right' scoring" (p. 216).

[9] Although Cronbach's alpha is derived from classical measurement theory, and Rasch models are based on item-response theory (Suen 1990:9), we report alpha levels for purposes of comparison across the exposure-to-violence variables.

[10] The Bayesian Information Criteria (BIC) statistic used with Rasch models is discussed by Raftery (1995).

or friends had tried to kill themselves, and if so, whether they had succeeded in doing so. The results were separately scaled as ordinal scores ranging from no attempts (= 0), through one attempt (= 1), to attempts that resulted in deaths (= 2). At wave 1, about 5 percent and 19 percent of the youth reported being exposed to suicide attempts or deaths by family members and friends, respectively.

Intimate partner violence is measured by responses to direct and indirect questions about romantic relationships beginning before the second wave survey. The direct responses included self-identification of romantic relationships that involved holding hands, kissing, and telling this person they liked or loved them. The same behavioral questions were then asked of adolescents who did not initially report involvement in romantic relationships (Carolina Population Center 1999).

Incidents of violence were reported from the beginning of these romantic relationships. The five items measuring intimate partner violence are each dichotomies indicating any occurrence of the event. When responses for up to three reported intimate relationships were summed (i.e., to indicate whether the adolescent had ever experienced the event across relationships), more than 14 percent of the adolescents reported being sworn at, more than 10 percent reported being insulted, 6 percent reported being pushed or shoved, 3 percent reported being threatened with violence, and 2 percent reported having something thrown at them.

We performed a latent class analysis to assess whether the above items measure a common latent variable of intimate violence.[11] A three-class model gave the preferred fit (BIC = −130.44).[12] This model indicates ordinal distinctions across the latent classes by type of abuse experienced: none, verbal violence, and combined verbal and physical violence. The latent class probabilities derived from the model indicate that 17 percent of the sample experienced intimate partner violence. Exposure to physical and verbal violence is significantly more often reported by females (Totten 2000). In our analysis, intimate partner violence is a three-value ordinal measure ranging from none (= 1), through verbal (= 2), to verbal and physical violence (= 3).

The beginning of the intimate relationship was determined along with information on grade in school and age of partner and whether the partner lived in the same neighborhood. This information was used to establish objective benchmarks for measurement (Brewin, Andrews, and Gotlib 1993). Our emphasis on the effects of violence exposure requires establishing the temporal sequence of events. The timing of violence in these relationships was recorded and was used to restrict each of our measures of intimate partner violence to events that occurred before the reporting period (for violent behavior) and each of the role exit outcomes (school dropout, leaving home, serious thoughts of suicide, teen pregnancy).[13]

Because the measures of intimate violence include events that occurred right up to the time before the school and pregnancy outcomes, they are more proximate than the wave-1 measures used for other forms of violence and depression. While this "advantages" somewhat the measures of exposure

[11] The items included in this scale did not conform with the fit requirements involved in establishing the ordinality of a Rasch model. MacMillan and Gartner (1999) previously have used latent class analysis to model intimate partner violence among adults.

[12] This technique assesses qualitative distinctions between groupings within a latent variable. The latent class model is:

$$\prod_{ijklmt}^{ABCDEX} = \prod_{t}^{X} \times \prod_{it}^{\bar{A}X} \times \prod_{jt}^{\bar{B}X} \times \prod_{kt}^{\bar{C}X} \times \prod_{lt}^{\bar{D}X} \times \prod_{mt}^{\bar{E}X},$$

where the outcome is the probability that a randomly selected case will fall in cell $i, j, \ldots, m, t$; each of the latter five parameters of the model indicate the conditional probability of being at level i of variable A for a case in class t of latent variable X (and so on for each observed variable), and the π_t^X is "the probability of a randomly selected case being at level t of latent variable X" (Browning and Laumann 1997:559; also see McCutcheon 1987).

[13] In the case of violent behavior, leaving home, and suicidality, this meant stopping the measurement period for exposure to intimate partner violence 12 months prior to the second interview. In the case of dropping out of school and pregnancy, this meant stopping the measurement period at the time this event occurred.

to intimate violence relative to other measures, this is unavoidable given constraints built into the data collection. Recall that previous studies (e.g., Silverman et al. 2001) were unable to incorporate any controls for time-specific effects of variables. The detailed timing of the exposure to intimate violence and the less-than-perfect control over the timing of other measures is a major advance here, even if in the latter instance the control is less than ideal.

The range of experiences we measured suggests diverse and overlapping microecologies of violence exposure, that exposures to various kinds of violence are clustered in socially structured niches or settings (Elder and Conger 2000). This clustering is revealed by past research and is confirmed with these data (table is available on request). For example, *weapons violence, violent behavior,* and *exposure to street violence* are clustered among minority male adolescents from blended and single-parent families in poor neighborhoods. *Intimate partner violence* occurs among romantically linked individuals, with females and older youth at greater risk. Knowledge of self-destructive violence *(suicidality)* clusters within single-parent families and among friends, and is more often revealed to females than to males. We consider below whether the various forms of exposure to violence in adolescence have domain-specific or more generic effects in the transition to adulthood.

A preliminary analysis indicated that the measure of bad temper was significantly associated with all forms of perpetration and exposure to violence, net of control variables. Because we also use perpetration of violent behavior as a control for temperament, we note that these preliminary results were similar for Poisson models of weapons violence and OLS models of violent behavior. The latter approach is more comprehensive, so we use OLS models to analyze perpetration of violence.

MEASURING DEPRESSION

Our survey includes a 19-item scale of depressive symptoms that asked the adolescents "How often was each of the following things true during the past week." This set of items is derived from the slightly longer CES-D scale (Radloff 1977). Items included such standard statements as "I (you) felt sad" and "I (you) felt depressed." This scale can be treated as a continuous or as a binary measure of depression, with the latter indicating a threshold of intense depression. The cutoff point of 16 on a scale ranging from 0 to 60 is often used to dichotomize the full CES-D scale at a clinical threshold for depression (Radloff 1977). At wave 1, 21 percent of the youth exceeded this threshold. The fact that depression is measured only for the past week, while violence perpetration and exposure are measured for longer periods, limits the ways in which measures of depression can be entered and their effects interpreted in some equations.

MEASURING ADOLESCENT ROLE EXITS

The measures of nonnormative adolescent role exits include *running away from home, dropping out of school, teenage pregnancy,* and *serious thoughts about suicide.* Each of these experiences, whenever it occurs in the teenage years, represent an actual exit from adolescence, or in the case of suicide, serious contemplation of such an exit (Hagan and Wheaton 1993:957). Suicide is the third leading cause of death among adolescents (Aneshensel and Gore 1991:55). For a variable called *role exit three,* we also consider whether any of the three exit outcomes (omitting teenage pregnancy) has occurred for male and female adolescents; for female adolescents we separately consider whether any of the four outcomes has occurred in a variable called *role exit four.* The point is to illuminate how exposure to violence, especially in intimate teenage relationships, leads to exits from adolescence. More than 16 percent of the sample experienced an early exit from adolescence, with the estimate increasing to 21 percent when adolescent pregnancy is included. (The role exit items are described further in Appendix A.)

MEASURING POTENTIAL COMMON CAUSES

We have noted the importance of considering the role of temperament, violent behaviors, and other factors that may jointly cause exposure to violence, depression, and early

exits from adolescence. Sampson and Laub's (1993) research on crime in the life course further reinforces concern about temperament, which they measure with reports by parents and teachers of temper tantrums in childhood. Our measure is based on a parental report of whether the youth involved had a bad temper, which is often assumed to be a stable life trait (Earls and Jung 1987; Sampson and Laub 1993:86).

Other variables, in addition to role exit items, are described in Appendix A—(e.g., gender, age, parental education, family structure, urban residence, race/ethnicity, and poverty). These variables are included in the "change-score" and lagged-effect models that we estimate, which also incorporate specific causes of dropping out of school and teenage pregnancy, such as mean grade-point average and early transition to intercourse, as well as earlier wave measures of depression, running away from home, and serious thoughts about suicide (Kessler and Greenberg 1981). The latter measures are particularly important in incorporating effects on adolescent role exits that date from uncontrolled childhood experiences. Kessler and Greenberg (1981) explain that in these change-score or lagged-effects models, "the inclusion of X_1 in the equation for a change in X is a way of picking up these 'control' effects" (p. 12; also see Wheaton et al. 1977). The one-year lag in this analysis of adolescent experiences is consistent with the occurrence of rapid change in the teenage years. Finally, we also make use of a special sibling sample in the Add Health Study to control for unmeasured family background differences assumed to be common to siblings.

THE VIOLENCE-DEPRESSION RELATIONSHIP

Preliminary Results

Table 1 presents change-score, lagged-effects models regressing depression and experiences of violent behaviors in the second wave survey on earlier measures of depression, violent behaviors, and relevant risk factors, including bad temper. The lagged-effects model allows us to take into account the influence of unmeasured variables that lead to depression and violent behaviors by wave one. This model helps to confine the estimation of effects to changes in outcomes occurring between waves in this adolescent sample.[14] Results are presented first for the full sample, and then for females and males separately. We must be cautious in interpreting the effects of depression on violence because depression could be included in a meaningful way as measured only for the week before the first wave survey.

The regression of violent behavior at time 2 on the measure for violent behavior at time 1 is strong and significant, indicating that violent behavior among adolescents is stable (i.e., recurs) when measured one year apart. Exposure to street violence also has a strong and significant positive effect on violent behavior, while depression at time 1 has no significant effect on violent behaviors at time 2. Bad temper significantly increases violent behavior among males, but not among females, and violent behavior is further increased by being a male, "other race/ethnicity" (i.e., most notably Native American), a child of less educated parents, and an early transition to intercourse.[15]

The regression of depression at time 2 on depression at time 1 is strong and significant, despite the one-year lag between measures, indicating a similar kind of recurrence and reliability that we observe for violent behavior. Violent behavior at time 1 has no net significant effect on depression. With depression at time 1 and other risk factors held constant, exposure to street violence has a significant effect in increasing depression for males, but not for females. Expo-

[14] An instrumental variables approach with two-staged least squares estimation would allow for simultaneity in the distress-violence relationship, although finding unique instruments for each outcome to identify the model is problematic. Our conceptualization of the distress-violence relationship emphasizes lagged effects, using longitudinal data to control for prior violence and distress (also see Ge et al. 1995).

[15] Poverty is the only counterintuitive relationship (and it is only marginally significant at $p < .10$) with violent behaviors. This negative effect likely results from its colinear relationship with minority status and education, as its zero-order correlation with violent behaviors is modestly positive.

Table 1. Unstandardized Ordinary Least Squares Coefficients from the Regression of Depression and Violence at Time 2 on Exposure to Violence and Risk Factors at Time 1: National Longitudinal Study of Adolescent Health, 1994–1995 and 1996

	Full Sample		Females		Males	
Independent Variable	Depression	Violent Behavior	Depression	Violent Behavior	Depression	Violent Behavior
Violent behavior (time 1)	.004	.424***	.038	.415***	−.004	.424***
	(.020)	(.037)	(.047)	(.068)	(.023)	(.044)
Depression (time 1)	.512***	.006	.502***	.017	.525***	−.003
	(.014)	(.011)	(.019)	(.011)	(.020)	(.021)
Ran away (time 1)	.535	.173	.617	.303	.367	.097
	(.385)	(.374)	(.528)	(.408)	(.531)	(.582)
Male	−1.047***	.753***	—	—	—	—
	(.154)	(.147)				
Parent education	−.232**	−.103	−.089	.061	−.366**	−.278*
	(.071)	(.064)	(.114)	(.054)	(.106)	(.134)
Age	.102*	−.052	.017	−.060	.201**	−.052
	(.051)	(.037)	(.069)	(.033)	(.065)	(.067)
Family Structure[a]						
Blended family (two parents)	.221	.134	.546	−.121	−.069	.348
	(.222)	(.167)	(.306)	(.136)	(.268)	(.277)
Single-parent family	.271	.207	.421	.139	.140	.204
	(.212)	(.136)	(.311)	(.149)	(.295)	(.245)
Other family structure	.049	.123	−.040	.213	.156	.005
	(.522)	(.379)	(.624)	(.367)	(.869)	(.700)
Race/Ethnicity[b]						
African American	.366	.250	.566	.299	.267	.214
	(.243)	(.206)	(.301)	(.190)	(.368)	(.359)
Hispanic American	1.110**	.160	1.475**	.021	.770*	.325
	(.320)	(.199)	(.496)	(.232)	(.293)	(.355)
Asian American	1.389**	.046	1.252	−.215	1.455**	.289
	(.465)	(.258)	(.737)	(.217)	(.530)	(.443)
Other	.373	.889*	1.222	.167	−.298	1.461*
	(.483)	(.349)	(1.004)	(.263)	(.708)	(.599)

(Continued on next page)

sure to intimate partner violence and friend suicidality also increases depression for both males and females, although exposure to family suicidality does not. Note that these regressions include controls for street violence and suicidality at time 1 and time 2 because depression at time 2 refers only to the week prior to the survey. The effect of exposure to intimate partner violence remains a highly significant factor. Depression is significantly increased by being female, Hispanic, or Asian American, and by having a low grade-point average. There is less consistent evidence of the operation of other risk factors. Bad temper significantly increases depression among males, but this effect is not apparent for females.

Overall, the data suggest that exposure to violence of various kinds may have more pervasive effects on depression than depression does on the perpetration of violent behaviors. However, more timely measures of depression are needed to confirm this impression. Our estimation may advantage the violence-causes-depression equation over the depression-causes-violence equation, but the inclusion of time 1 and time 2 measures in the first equation bolsters our confidence in its meaning—and this is central to our analysis. Both our intimate partner violence and

(Table 1 continued)

	Full Sample		Females		Males	
Independent Variable	Depression	Violent Behavior	Depression	Violent Behavior	Depression	Violent Behavior
Poverty	.442* (.181)	−.250 (.150)	.434 (.301)	.003 (.173)	.400 (.235)	−.492 (.254)
Mean grade-point average	−.507*** (.111)	−.132 (.074)	−.551** (.186)	.005 (.091)	−.457*** (.125)	−.266* (.132)
Suicidal thoughts	.497 (.269)	−.044 (.180)	.330 (.315)	−.041 (.195)	.636 (.436)	.010 (.393)
Early transition to intercourse	−.015 (.337)	.676* (.284)	.451 (.675)	.070 (.430)	−.328 (.408)	.986* (.425)
Bad temper	.491** (.173)	.462** (.131)	.486 (.324)	.204 (.145)	.520* (.221)	.724** (.249)
Urban	−.077 (.174)	−.091 (.118)	−.425 (.249)	−.160 (.137)	.260 (.227)	−.027 (.220)
Exposure to:						
Street violence[c]	—	.739*** (.158)	—	.788*** (.212)	—	.685** (.202)
Family suicidality	—	.613* (.270)	—	.578 (.296)	—	.719 (.523)
Friend suicidality	—	.100 (.142)	—	.029 (.143)	—	.296 (.263)
Intimate partner violence[d]	1.367*** (.197)	.632* (.302)	1.792*** (.273)	.346 (.186)	.853** (.264)	1.167 (.751)
Street violence (time 1 and time 2)	.162** (.051)	—	.138 (.117)	—	.177** (.062)	—
Family suicidality (time 1 and time 2)	.038 (.066)	—	.066 (.096)	—	-.003 (.077)	—
Friend suicidality (time 1 and time 2)	.259*** (.058)	—	.273** (.078)	—	.206** (.070)	—
Constant	3.765*** (.888)	−.313 (.684)	4.434** (1.325)	−.699 (.633)	1.923 (1.167)	.625 (1.268)
R^2	.397	.310	.394	.306	.380	.288
Model adjusted Wald statistic	130.33 $F_{(23,106)}$	26.93 $F_{(23,106)}$	88.14 $F_{(22,107)}$	8.99 $F_{(22,107)}$	86.93 $F_{(22,107)}$	17.95 $F_{(22,107)}$
Number of cases	10,259		5,306		4,953	

Note: Numbers in parentheses are standard errors.

[a] Reference category for family structure variables is "two biological parents."

[b] Reference category for race variables is "Caucasian."

[c] Exposure occurred up to twelve months before the time 1 interview.

[d] Dating of this measure is detailed in the measures section and Appendix A.

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

our gender internalization hypotheses are supported for depression: The effects of intimate violent relationships on depression in males and females are clear, and this effect is stronger for females than for males. The latter gender difference is statistically significant.[16] So there is consistent evidence here for the effect of exposure to violence on de-

[16] The adjusted Wald Test for this interaction term in the full sample equation yields an $F_{(1,128)}$ value of 5.76 ($p < .05$).

pression, although there is also evidence of the influence of bad temper on both violent behavior and depression among males.

Sibling Differences

Table 2 presents models in which differences in the occurrence of depression between siblings, measured for the week prior to the wave-2 interview, are regressed on differences between siblings in the measures of perpetration of and exposure to violence and other relevant control variables. This analysis was conducted for about 1,000 siblings in the longitudinal sample. Sibling-difference models are useful for controlling for family background factors, as siblings share family experiences (Aaronson 1997; G. Duncan et al. 1998). The shared family experience is probably greater for biological pairs than for blended-family sibling pairs, so Model 3 and Model 4 in Table 2 are restricted to biological pairs only. The sibling-difference model is especially useful for testing the impact of intimate partner violence, as violence arising from romantic relationships is usually specific to one member of a sibling pair, while exposures to violence in the family, neighborhood streets, and even among friends probably are more often shared by siblings.

Because they characteristically do not vary between siblings, the family structure measures are not included in the models. Most important, however, these models offer further control for shared family and childhood experiences, such as child abuse and violent conflict between parents, that are not measured or available for our analysis but which could lead to problematic adolescent outcomes. We focus on depression in Table 2 because it plays an overarching role in our analysis and is measured in a continuous form that avoids compounding the limitations of the much reduced sibling sample with the restricted variation in the role exit variables. As expected, in Table 2 depression has a strong and significant effect on violence between waves, along with mean grade-point average. Depression at time 1 increases while mean grade-point average reduces levels of depression in the second wave of the survey. The effect of school performance in these models is a reminder that educational experiences are also salient sources of adolescent role strains and exits. At the same time, equally striking is the continuing strong effect of intimate partner violence. More impressive is the significant male × intimate partner violence interaction effect in Models 2 and 4,[17] indicating again that it is females who are most depressed by intimate violence in adolescent relationships.

YOUTH VIOLENCE AND NONNORMATIVE ADOLESCENT ROLE EXITS

Table 3 presents the log odds and odds ratios resulting from the logistic regression of running away from home, suicidal thoughts, and dropping out of school on the full set of independent variables. We estimated these equations for the full sample and for males and females separately. A notable difference by gender was in the main effect of early transition to intercourse, which had a strong effect on dropping out of school for females and no effect for males. The exposure-to-violence effects did not vary substantially by gender, and so the results in Table 3 are for the full combined sample. The interaction effect of male × early transition to intercourse on dropping out of school between waves is significant in Table 3.

In the combined sample, running away from home and thoughts about suicide occur at young ages, while dropping out of school increases with age and bad temper. The most consistent result is that the log odds of all three role exits are significantly reduced by high grades. However, exposure to intimate partner violence again also significantly increases the log odds of all three role exits. Depression at time 1 also significantly increases the odds of all three role exits. Alternatively, exposure to street violence displays no significant effects, and the effects of exposure to family and friend suicidality are restricted to personal thoughts about taking one's own life. When the above factors are taken into account, the odds of African American youth taking these role exits (except leaving home) are significantly re-

[17] The adjusted Wald Test for this interaction term in the sibling difference equation yields an $F_{(1, 1082)}$ value of 10.235 ($p < .01$).

Table 2. Unstandardized Ordinary Least Squares Coefficients for the Regression of Sibling Differences in Depression at Time 2 on Differences in Exposure to Violence and Risk Factors at Time 1: National Longitudinal Study of Adolescent Health, 1994–1995 and 1996

	Sibling Differences in Depression							
	All Pairs[a]				Biologically Related Pairs			
	Model 1		Model 2		Model 3		Model 4	
Independent Variable	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Violent behavior (time 1)	.063	(.044)	.075	(.044)	.089	(.049)	.100*	(.048)
Depression (time 1)	.393***	(.028)	.396***	(.027)	.396***	(.028)	.397***	(.028)
Ran away (time 1)	2.281**	(.760)	2.319**	(.756)	2.162**	(.827)	2.308**	(.824)
Male	–.445	(.393)	2.411*	(.966)	–.038	(.408)	3.032**	(1.008)
Age	–.105	(.107)	–.105	(.107)	–.263*	(.119)	–.279*	(.119)
Race/Ethnicity								
African American	–2.828	(2.835)	–2.536	(2.824)	–3.475	(3.324)	–2.965	(3.310)
Hispanic American	–.301	(1.988)	–.400	(1.980)	–1.513	(2.589)	–1.852	(2.578)
Asian American	3.909	(5.611)	5.448	(5.606)	3.031	(5.384)	4.594	(5.375)
Other	–1.408	(1.795)	–1.254	(1.788)	–2.085	(1.935)	1.961	(1.925)
Poverty	–3.760	(2.568)	–3.620	(2.557)	–4.938	(2.981)	–4.667	(2.966)
Mean grade-point average	–.941***	(.280)	–.902**	(.279)	–1.048***	(.291)	–1.014***	(.289)
Suicidal thoughts	.155	(.558)	.163	(.556)	.101	(.581)	.127	(.578)
Early transition to intercourse	.129	(.774)	.181	(.771)	.335	(.878)	.415	(.873)
Bad temper	.346	(.403)	.352	(.402)	.075	(.421)	.054	(.418)
Urban	.778	(3.153)	1.118	(3.142)	.247	(2.993)	.702	(2.980)
Exposure to:								
Street violence	–.365	(.293)	–.372	(.292)	–.562	(.305)	–.515	(.304)
Friend suicidality	–.062	(.406)	–.039	(.404)	–.191	(.421)	–.171	(.419)
Family suicidality	–.326	(.707)	–.412	(.704)	–.294	(.752)	–.270	(.748)
Intimate partner violence[b]	1.720***	(.392)	2.861***	(.526)	1.588***	(.411)	2.767***	(.541)
Male × Intimate partner violence	—		–2.455**	(.759)	—		–2.688***	(.808)
Constant	.178	(.231)	.155	(.230)	.414	(.235)	.372	(.234)
Unadjusted R^2	.253		.260		.270		.278	
Adjusted R^2	.239		.246		.255		.263	
Number of pairs[c]	1,104				954			

Note: Numbers in parentheses are standard errors. The survey design characteristics are not used in the siblings analysis.

[a] The F-tests of the unadjusted R^2 statistics across nested equations (Knoke and Bohrnstedt 1994) indicates that there are statistically significant changes between models with the addition of the interaction effect ($F_{1,1082} = 10.235$), $p < .01$, and ($F_{1,932} = 10.327$), $p < .01$.

[b] Models use undated intimate partner violence information.

[c] Models 1 and 2 report the results of analyses with all pairs, Models 3 and 4 are restricted to a subset of biologically related pairs.

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

Table 3. Coefficients and Odds Ratios (OR) from the Logistic Regression of Role Exits on Exposure to Violence and Risk Factors at Time 1: National Longitudinal Study of Adolescent Health, 1994–1995 and 1996

Independent Variable	Ran Away from Home	OR	Suicidal Thoughts	OR	Dropped Out[a] of School	OR	Role Exit[b] Three	OR
Violent behavior (time 1)	.008 (.011)	1.008	.002 (.012)	1.002	.052** (.015)	1.053	.018 (.010)	1.018
Depression (time 1)	.026** (.009)	1.026	.042*** (.007)	1.043	.032** (.011)	1.032	.037*** (.006)	1.038
Ran away (time 1)	2.326*** (.168)	10.241	.190 (.161)	1.209	.153 (.301)	1.165	1.219*** (.129)	3.385
Male	−.321* (.147)	.726	−.445*** (.112)	.641	.175 (.265)	1.192	−.339*** (.092)	.712
Parent education	.028 (.067)	1.029	.072 (.050)	1.075	−.483** (.140)	.617	.016 (.041)	1.016
Age	−.084* (.042)	.919	−.134*** (.033)	.874	.288*** (.061)	1.334	−.070* (.028)	.933
Family Structure								
Blended family (two parents)	.177 (.173)	1.194	.213 (.121)	1.237	.582* (.247)	1.790	.263* (.104)	1.300
Single parent family	.155 (.157)	1.167	.080 (.140)	1.084	.603* (.255)	1.827	.191 (.120)	1.211
Other family structure	.273 (.287)	1.314	.162 (.255)	1.176	1.172** (.375)	3.230	.423* (.213)	1.527
Race/Ethnicity								
African American	−.372 (.197)	.689	−.581*** (.156)	.559	−.714* (.313)	.490	−.585*** (.147)	.557
Hispanic American	−.084 (.177)	.920	.000 (.140)	1.000	−.499 (.384)	.607	−.002 (.114)	.998
Asian American	.659* (.268)	1.933	.023 (.237)	1.023	−.601 (.904)	.548	.060 (.216)	1.062
Other	.223 (.379)	1.250	.104 (.291)	1.110	.203 (.461)	1.225	.280 (.218)	1.324

(Continued on next page)

duced. The negative effect of race/ethnicity in multivariate models that hold other variables constant is paralleled in the research literature on poverty (Haveman and Wolfe 1994). We could not add time 2 to the time 1 measure of exposure to street violence and suicidality in these equations because of the indeterminate temporal location of the former events between waves in relation to the known timing of the outcomes between waves.

Table 4 presents the log odds among female adolescents resulting from the logistic regression of teen pregnancy on the set of independent variables. As expected, living in a blended family, single-family, or other family structure, significantly increases the log odds of teen pregnancy. Neither the controls for bad temper nor violent behavior at time 1 have significant effects on teen pregnancy. However, exposure to intimate partner violence strongly and significantly increases the log odds of teen pregnancy. Exposure to street violence and to family suicidality at time 1 also have significant effects, although the latter effect is negative. Again, the time 2 exposure measures could not be added to the time 1 exposure measures because of the indeterminate temporal location of the former relative to the known timing of the pregnancy between waves. The outcome variable role exit four, which represents the likelihood of any one of the four role exits occurring among females, reveals

(Table 3 Continued)

Independent Variable	Ran Away from Home	OR	Suicidal Thoughts	OR	Dropped Out[a] of School	OR	Role Exit[b] Three	OR
Poverty	.234 (.146)	1.264	−.076 (.102)	.927	−.028 (.216)	.972	.063 (.084)	1.065
Mean grade-point average	−.445*** (.095)	.641	−.152* (.060)	.859	−1.002*** (.154)	.367	−.317*** (.057)	.728
Suicidal thoughts	.497** (.165)	1.643	1.610*** (.103)	.002	−.056 (.291)	.946	1.341*** (.098)	3.821
Early transition to intercourse	.119 (.278)	1.127	.068 (.280)	1.070	1.062** (.381)	2.893	.316 (.258)	1.371
Male × Early transition to intercourse	−.264 (.379)	.768	−.065 (.340)	.937	−1.366** (.512)	.255	−.329 (.324)	.719
Bad temper	.253 (.138)	1.288	.151 (.121)	1.163	.771*** (.202)	2.162	.298** (.097)	1.347
Urban	.081 (.135)	1.085	.042 (.103)	1.043	−.087 (.213)	.917	−.004 (.088)	.996
Exposure to:								
Street violence	.093 (.077)	1.097	−.040 (.067)	.961	.004 (.099)	1.004	−.027 (.061)	.974
Family suicidality	.120 (.222)	1.128	.405** (.148)	1.499	−.017 (.273)	.983	.371* (.155)	1.450
Friend suicidality	.154 (.129)	1.166	.389*** (.099)	1.476	−.140 (.174)	.869	.264** (.082)	1.302
Intimate partner violence	.528* (.211)	1.695	.484* (.205)	1.623	.722*** (.177)	2.059	.604*** (.144)	1.829
Constant	−2.113** (.595)		−1.264* (1.237)		−6.821*** (.475)		−1.379**	(.685)
Model adjusted Wald statistic	24.23 $F_{(24,105)}$		36.23 $F_{(24,105)}$		9.24 $F_{(24,105)}$		34.89 $F_{(24,105)}$	

Note: Nunbers in parentheses are standard errors; number of cases = 10,259.

[a] After time 1.

[b] Any one or more of the three role exits.

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

the strong and consistent significance of the effect of intimate partner violence on premature exit to adulthood.

PREDICTED PROBABILITIES

Because log odds are difficult to interpret, we used the logistic regression equations to calculate predicted probabilities for the various adolescent role exits. These predicted probabilities are expressed as percentages of adolescent role exits at given values of selected violence exposure measures with the effects of other variables set at their means (Knoke and Bohrnstedt 1994).

Figure 1, which presents results for the combined sample of male and female adolescents, shows that without exposure to intimate violence, about 10 percent of the youth have either had serious suicidal thoughts, run away from home, or dropped out of school (i.e., role exit three). Figure 1 reveals that exposure to intimate partner violence increases the probabilities of all the above outcomes. The probability of experiencing one of the three adolescent role exits increases from about 10 percent to about 17 percent with exposure to intimate partner *verbal* violence. With exposure to *both verbal and physical* intimate partner violence,

Table 4. Coefficients and Odds Ratios (OR) from the Logistic Regression of Female Role Exits at Time 2 on Exposure to Violence and Risk Factors at Time 1: National Longitudinal Study of Adolescent Health, 1994–1995 and 1996

	Teenage Pregnancy[a]			Role Exit Four		
Independent Variable	Coef.	S.E.	OR	Coef.	S.E.	OR
Violent behavior (time 1)	–.008	(.019)	.992	.017	(.014)	1.017
Depression (time 1)	.003	(.015)	1.003	.036***	(.008)	1.037
Ran away (time 1)	.085	(.335)	1.089	1.222***	(.155)	3.395
Parent education	–.191	(.107)	.826	.014*	(.053)	1.014
Age	.312***	(.059)	1.366	–.094	(.038)	.910
Family Structure						
Blended family (two parents)	.742*	(.319)	2.100	.370**	(.128)	1.448
Single-parent family	.758**	(.256)	2.134	.217	(.150)	1.243
Other family structure	1.731***	(.369)	5.647	.634*	(.279)	1.885
Race/Ethnicity						
African American	.416	(.295)	1.516	–.504**	(.178)	.604
Hispanic American	.724*	(.315)	2.064	.002	(.141)	1.002
Asian American	–.001	(.626)	.999	.107	(.280)	1.113
Other	.840	(.572)	2.317	.311	(.318)	1.365
Poverty	–.319	(.221)	.727	–.044	(.099)	.957
Mean grade-point average	–.180	(.141)	.836	–.320***	(.079)	.726
Suicidal thoughts	.375	(.287)	1.456	1.220***	(.116)	3.386
Early transition to intercourse	.546	(.300)	1.726	.424	(.251)	1.528
Bad temper	.278	(.190)	1.320	.256*	(.127)	1.292
Urban	–.590**	(.220)	.554	–.084	(.119)	.919
Exposure to:						
Street violence	.526**	(.177)	1.693	.095	(.092)	1.099
Family suicidality	–.977*	(.440)	.376	.465**	(.148)	1.592
Friend suicidality	.070	(.184)	1.073	.196*	(.091)	1.217
Intimate partner violence	1.228***	(.211)	3.416	.748***	(.170)	2.113
Constant	–9.553***	(1.152)	—	–.963	(.635)	—
Model adjusted Wald statistic		11.47 $F_{(22,106)}$			26.87 $F_{(22,106)}$	

Note: Numbers in parentheses are standard errors; number of cases = 5,263

[a] Pregnancies are restricted to those occurring after time 1.

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

the percentage experiencing at least one of the three role exits increases from about one-fifth to nearly 28 percent of the sample.

Figure 2 restricts attention to the female adolescents and shows that exposure to verbal and physical intimate violence clearly increases the risk of teenage pregnancy: About 16 percent of the females experiencing combined forms of intimate partner violence are at risk for pregnancy as teenagers.

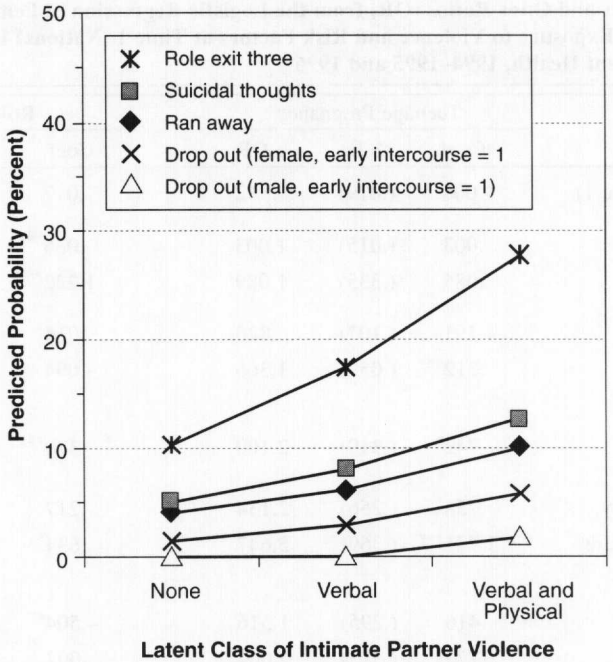

Figure 1. Estimated Effects of Intimate Partner Violence on the Predicted Probabilities of Specific Adolescent Outcomes

Note: Number of cases = 10,259; includes males and females.

More striking, however, are the elevated probabilities that females will experience any one of the four nonnormative adolescent role exits with exposure to intimate partner violence: While just over 16 percent of the adolescent girls are likely to experience one of these role exits without exposure to violence, nearly one-third are likely to exit from adolescence with exposure to verbal intimate violence, and nearly half are predicted to exit adolescence in one of the four specified ways with exposure to some combination of verbal and physical violence.

Exposure to street violence may combine with intimate partner violence to greatly increase the probabilities of teenage pregnancy. Figure 3 demonstrates that while the risk of teenage pregnancy among adolescent girls who are exposed to combinations of verbal and physical violence is about 15 percent, when this exposure to intimate partner violence is combined with high levels of exposure to street violence, the risk of pregnancy among adolescent girls increases to 60 percent. This implies that adolescent girls who are exposed to high levels of both street violence and intimate violence may be at especially high risk of becoming pregnant.

THE END OF ADOLESCENCE

Adolescence emerged through the first half of the last century as a legally institutionalized life stage. By mid-century, norms of adolescence prescribed periods of schooling to precede entry into adult work and marriage (Neugarten, Moore, and Lowe 1965). The literature of this era warned that variations from expectations negatively influenced marital and occupational outcomes (Hogan 1978), while more recent work raises the possibility that some "off-time" variations from the conventional normative timetable could be benign (Rindfuss et al. 1987). These alternative possibilities may be dependent on the cause and context of early transitions to adulthood.

Much past research has focused on causes of adolescent violent behavior, while our attention is directed to the consequences of exposure to violence during adolescence. However, we emphasize the importance of taking into account other causal anteced-

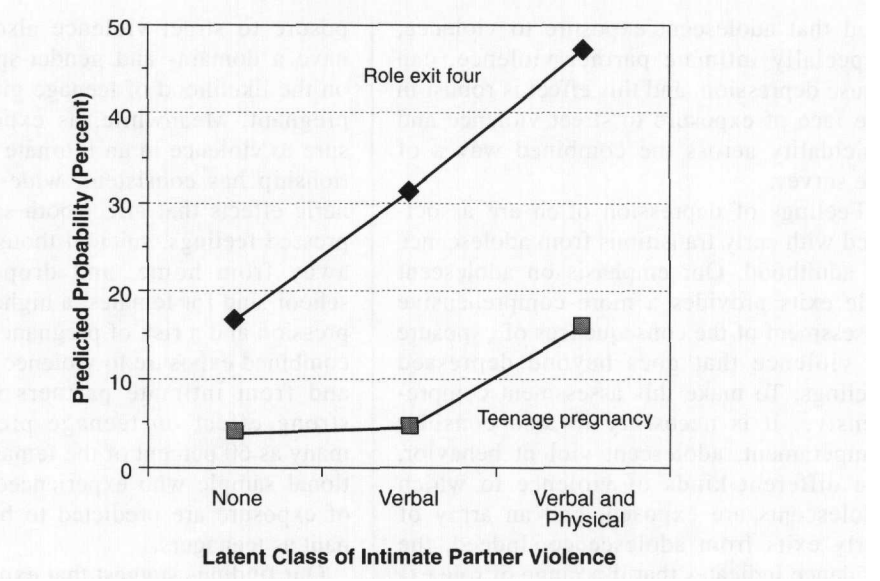

Figure 2. Estimated Effects of Intimate Partner Violence on the Predicted Probability of Female Adolescent Outcomes

Note: Females only; number of cases = 5,361.

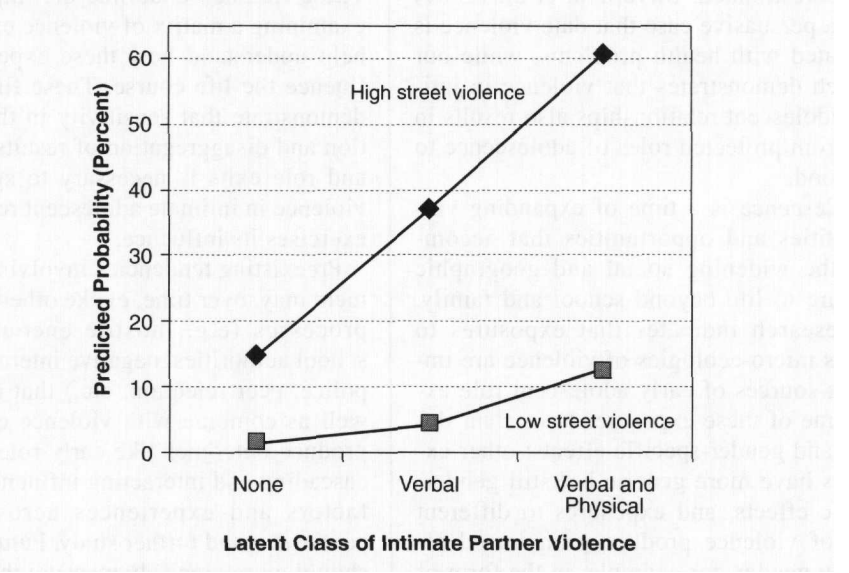

Figure 3. Estimated Effects of Exposure to Street Violence and Intimate Partner Violence on the Predicted Probability of Teenage Pregnancy

Note: Females only; number of cases = 5,263.

ents, such as temperament and prior involvement in violence. Sampson and Laub (1990) note that "sociologists need not be hostile to research establishing early childhood differences in delinquency and antisocial behavior—influences that may persist well into adulthood" (p. 625). We find that temperament does play a part in the causation of violent behaviors and depression among males, while controls for such influences do not eliminate or explain the consequences of exposure to violence. Although we do not find that teenage feelings of depression cause adolescent violent behaviors, this result may reflect the time-bound limitation in our measure for depression. We

find that adolescent exposure to violence, especially intimate partner violence, can cause depression, and this effect is robust in the face of exposure to street violence and suicidality across the combined waves of the survey.

Feelings of depression often are associated with early transitions from adolescence to adulthood. Our emphasis on adolescent role exits provides a more comprehensive assessment of the consequences of exposure to violence that goes beyond depressed feelings. To make this assessment comprehensive, it is necessary to also consider temperament, adolescent violent behavior, the different kinds of violence to which adolescents are exposed, and an array of early exits from adolescence. Indeed, the evidence indicates that if a range of role exits from adolescence is not taken into account, the harmful effects of violence in intimate adolescent relationships will likely be underestimated. Silverman et al. (2001) make a persuasive case that date violence is associated with health problems, while our research demonstrates that violence in intimate adolescent relationships also results in exits from protected roles of adolescence to adulthood.

Adolescence is a time of expanding vulnerabilities and opportunities that accompany the widening social and geographic exposure to life beyond school and family. Our research indicates that exposures to various micro-ecologies of violence are important sources of early adolescent role exits. Some of these exposures have clear domain- and gender-specific effects; other exposures have more generic but still gender-specific effects, and exposures to different kinds of violence produce pronounced effects by gender, for example, in the form of teenage pregnancy.

Our overarching hypothesis was that the new vulnerabilities associated with the adolescent life stage would result in violence in intimate partner relationships which have the most clearly generic effect but also gender-specific effects. We found that exposures to the suicidal thoughts and actions of friends and family members have pronounced, but largely domain- and gender-specific effects on female adolescents' thoughts about taking their own lives. Exposure to street violence also appears to have a domain- and gender-specific effect on the likelihood of teenage girls becoming pregnant. Meanwhile, as expected, exposure to violence in an intimate partner relationship has consistent, wide-ranging, generic effects that affect both sexes—of depressed feelings, suicidal thoughts, running away from home, and dropping out of school, and for females, a higher risk of depression and a risk of pregnancy. Moreover, combined exposure to violence on the street and from intimate partners may have a strong effect on teenage pregnancy: As many as 60 percent of the females in the national sample who experienced both forms of exposure are predicted to become pregnant as teenagers.

Our findings suggest that exposure to violence in romantic relationships has generic, wide-ranging effects on adolescents and influences their early transitions to adulthood. These findings underline the importance of examining a matrix of violence exposures to help understand how these experiences influence the life course. These findings also demonstrate that sensitivity in the aggregation and disaggregation of results by gender and role exits is necessary to specify how violence in intimate adolescent relationships exercises its influence.

Preexisting tendencies involving temperament may, over time, evoke other events and processes (e.g., hostile encounters with school authorities, negative interactions with police, peer rejection, etc.) that compete as well as combine with violence exposure to produce outcomes like early role exits. The cascading and interacting influences of such factors and experiences across the life course demand further study. Future research should more precisely measure the timing of events. Further work is also needed to sort out the commission, victimization, and witnessing components in violent relationships and experiences. Spending time in a jail or a juvenile facility is an important adolescent role exit for youths involved in violence that was not tracked in the first two waves of the Add Health Survey. Exclusion of imprisoned youth from our study could increase selectivity bias, as the risk of institutionalization grows with age, and this bias should be addressed in future work.

Exposures to violence through family, friends, and intimate relationships have not been studied as extensively as exposure to street or community violence. Our work emphasizes the importance of adolescence as a formative stage that involves new and consequential vulnerabilities to violence, including new risks of violent victimization by intimate partners. Future work should explore how adolescent exposures to violence and role exits negatively affect adult life outcomes.

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APPENDIX A

Descriptive Statistics and Descriptions of Variables Used in the Analysis

Variable	Mean	S.D.	Range	Variable Description
Male	.497	.500	0 to 1	Respondent's gender.
Parent education	2.596	1.002	1 to 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 four-item ordinal measure was constructed: 1 = less than high school graduation; 2 = high school graduation; 3 = some post-secondary; 4 = college graduate or more.
Age	14.943	1.600	11 to 20	Age in years.
FAMILY STRUCTURE:				
Blended family: Two parents	.167	.373	0 to 1	A five-category family structure typology variable using adolescent reported household information was recoded into four categories.
Single-parent family	.227	.419		
Other family structure	.033	.179		
Two biological parents	.573	.495		
RACE/ETHNICITY:				
Hispanic American	.109	.312	0 to 1	This measures uses adolescent self–report data to construct dummy variables. Hispanic status was used to first categorize respondents, followed by the other racial/ethnic group designations. This coding scheme assigns respondents to only one racial/ethnic group.
African American	.141	.348		
Asian American	.031	.172		
Other ethnicity	.029	.167		
Caucasian	.691	.462		

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(Appendix A continued)

Variable	Mean	S.D.	Range	Variable Description
Poverty	.262	.439	0 to 1	Positive parental responses to questions asking about the receipt of any forms of assistance were coded 1; no assistance was coded as 0. Parents of adolescents participating in the in-home sample were asked: "Last month, did you or any member of your household receive: 'Social Security or Railroad Retirement?'; 'Supplemental Security Income (SSI)?'; 'Aid to Families with Dependent Children?"; 'food stamps?'; 'unemployment or worker's compensations?'; 'a housing subsidy or public housing?' "
Mean grade-point average	2.829	.775	1 to 4	A mean score was derived from adolescent self–reported grades in English or language arts, mathematics, history or social studies, and science. The response scale was: 1 = A, 2 = B, 3 = C, 4 = D or lower. The response was reverse coded to construct the grade point average.
Suicidal thoughts (time 1)	.129	.335	0 to 1	"During the past 12 months, did you ever seriously think about committing suicide?" 0 = no, 1 = yes.
Suicidal thoughts (time 2)	.111	.314	0 to 1	"During the past 12 months, did you ever seriously think about committing suicide?" 0 = no, 1 = yes.
Early transition to intercourse	.018	.268	0 to 1	This measure uses responses to the question "Have you ever had sexual intercourse? When we say sexual intercourse, we mean when a male inserts his penis into a female's vagina" (0 = no, 1 = yes). Those who had not reported intercourse were coded 0. Among those who have had intercourse, a variable was constructed to date the age of first intercourse. The age corresponding to one standard deviation below the mean age of intercourse was used to define early intercourse = 1.
Bad temper	.310	.463	0 to 1	Parent reported item from the in-home survey at time 1: Does [name] have a bad temper? 1 = yes, 0 = no.
Urban	.502	.500	0 to 1	This was constructed from the Census of Population and Housing 1990 data (1 = the residence block group has all individuals living inside urbanized areas).
EXPOSURE TO:				
Street violence (time 1)	.369	.812	0 to 5	Five items listed in the text were used to construct the exposure to violence scale.
Family suicidality (time 1)	.054	.263	0 to 2	This measure was constructed from responses to the question: "Have any of your family tried to kill themselves during the past 12 months?" 0 = no, 1 = yes. Those who responded "yes" were asked: "Have any of them succeeded?" 0 = no, 1 = yes. The variable was constructed using these items, where 0 = no attempts, 1 = yes, an attempt, 2 = an attempt was made and a positive response was successful.
Friend suicidality (time 1)	.221	.486	0 to 2	This measure was constructed from responses to the question: "Have any of your friends tried to kill themselves during the past 12 months?" 0 = no, 1 = yes; and "Have any of them succeeded?" The variable was constructed using these items where 0 = no attempts, 1 = yes, an attempt, 2 = an attempt was made and was successful.
Street violence (time 2)	.293	.747	0 to 5	Five items were used to construct this measure. Items were asked with the stem question: "During the past 12 months, how often did each of the following things happen?": "You saw someone shoot or stab another person"; "Someone pulled a knife or gun on you"; "Someone shot you"; "Someone cut or stabbed you"; "You were jumped." These items

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(Appendix A continued)

Variable	Mean	S.D.	Range	Variable Description
EXPOSURE TO (*Continued*):				
Street violence (time 2) (*continued*)				used a response scale of 0 = never, 1 = once, 2 = more than once. The measures were recoded into dichotomies to indicate the item had ever (= 1) or never (= 0) happened. These dichotomies were then modeled using a Rasch measurement model and were summed to form an ordinal scale.
Family suicidality	.044	.246	0 to 2	Time 2 measure, as measured at time 1.
Friend suicidality	.191	.475	0 to 2	Time 2 measure, as measured at time 1.
Intimate partner violence	1.184	.445	1 to 3	An ordinal measure in which latent class 1 indicates no intimate partner violence, class 2 indicates exposure to verbal intimate partner violence, and class 3 indicates exposure to both physical and verbal intimate partner violence over up to three relationships over the respondent's lifetime.
Intimate partner violence, *drop out date criteria*	1.054	.256	1 to 3	As above, but with date of occurrence. Incidents occurring prior to the date of dropping out were used in this version of the exposure to intimate violence variable. The date of dropping out was used as the criteria, where dropping out was counted if it occurred after the time one interview.
Intimate partner violence, *pregnancy date criteria*	1.051	.250	1 to 3	As above. The date of the most recent pregnancy was used to establish the date criteria, where the abuse must have occurred prior to the pregnancy. The pregnancy was counted if it occurred after the time one interview date.
Intimate partner violence, *minimum date criteria*	1.050	.248	1 to 3	As above. The criteria indicates that the abuse had to occur prior to the minimum role exit date.
Intimate partner violence, *general date criteria*	1.043	.230	1 to 3	Used for the outcomes of violent behaviors, suicidal thoughts, and running away from home where the date criteria is the time 2 interview date minus the 12 preceding months, the time period covered by the stem questions to establish these outcomes. The equations predicting depression at time 2 use the undated version of intimate partner violence as depression is assessed over the week prior to the interview.
Street violence (times 1 and 2)	−.099	1.636	−.892 to 11.154	The time 1 and time 2 measures were standardized to a mean of zero and a standard deviation of 1 and summed.
Family suicidality (times 1 and 2)	.010	1.579	−.379 to 15.114	The time 1 and time 2 measures were standardized to a mean of zero and a standard deviation of 1 and summed.
Friend suicidality (times 1 and 2)	.086	1.666	−.815 to 7.952	The time 1 and time 2 measures were standardized to a mean of zero and a standard deviation of 1 and summed.
Weapons violence (time 1)	.245	.717	0 to 5	Five items were used to assess violence with weapons at time 1 as described below.
Weapons violence (time 2)	.193	.669	0 to 5	Five violent behaviors were summed at time 2. The items included: "you pulled a knife or gun on someone"; "you shot or stabbed someone"; "drunk alcohol while carrying a weapon, such as a gun, knife, or club;" "used drugs while carrying a weapon, such as a gun, knife, or club" (the latter two questions were combined to yield a composite measure of carrying weapons while using substances); "used a weapon in a fight;" "carried a weapon at school." This scale was summed as an ordinal count of the five items.

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(Appendix A continued)

Variable	Mean	S.D.	Range	Variable Description
Violent behavior (time 1)	–.210	5.323	–2.178 to 51.114	This measure is a standardized sum of the items used in the weapons violence scale with the addition of four items: "Did you get into a serious physical fight" (0 = never, 1 = 1 or 2 *times*, 2 = 3 *or* 4 *times*, 3 = 5 *or more times*); "Did you hurt someone badly enough to need bandages or care from a doctor or a nurse?" "Did you use or threaten to use a weapon to get something from someone?" "Did you take part in a fight where a group of your friends was against another group?" This scale uses mean imputation for missing data ($\alpha = .82$).
Violent behavior (time 2)	–.154	5.320	–2.978 to 43.991	Same items as above. The item, "Did you hurt someone badly enough to need bandages or care from a doctor or nurse?" used a filter question, where those who had responded that they had not been in a serious fight were coded as legitimate skips, and therefore as zeroes on this score ($\alpha = .83$).
Depression (time 1)	10.617	7.352	0 to 54	A 19-item scale was administered to adolescents with questions from the Center for Epidemiological Studies Depression Scale (Radloff 1977). Respondents were asked, "How often was each of the following things true during the past week?" ($\alpha = .87$).
Depression (time 2)	10.450	7.318	0 to 56	The same 19 item scale was at time 2 ($\alpha = .88$).
School dropout	.019	.136	0 to 1	At the time 2 in-home interview, respondents were asked: "Are you presently in school?"; or if the interview occurred during the summer: "Were you in school during this past school year?" If respondents answered "no", they were asked "Why aren't/weren't *you going to school*?" *or* "Why did you stop going to school during the school year?" Respondents were coded as having dropped out if they answered that they had dropped out, had been "expelled," or were pregnant. Otherwise, respondents were coded as not having dropped out.
Teenage pregnancy	.028	.164	0 to 1	Using information on the date of occurrence, this variable indicates the occurrence of a pregnancy after the time 1 interview.
Role exit three	.162	.368	0 to 1	A composite outcome of any or all of dropping out of school after the first interview, having suicidal thoughts, or having run away from home in the 12 months preceding the second interview.
Role exit four	.213	.404	0 to 1	A composite outcome of any or all of dropping out of school and/or having experienced a pregnancy after the first interview, having suicidal thoughts, and/or having run away from home in the 12 months preceding the second interview.
Ran away (time 1)	.071	.257	0 to 1	In the past 12 months, how often did you: "run away from home?" Responses range from 0 = never or 1 = 1 or more times.
Ran away (time 2)	.057	.226	0 to 1	Time 2 measure, as measured at Time 1.

Note: Number of adolescents = 10,259; number of female adolescents = 5,263.

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