

## Evaluating the Role of “Nothing to Lose” Attitudes on Risky Behavior in Adolescence\*

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### *Abstract*

*This article examines the extent to which adolescents' expectations about their future in terms of health and education affect their risk-taking behavior. With data from the National Longitudinal Study of Adolescent Health, we test the theory that a “nothing to lose” attitude about the future predicts greater involvement in risky behaviors involving early sexual intercourse, selling drugs, and weapon use. We examine the effects of both individual- and school-level conditions. Results provide mixed support for our “nothing to lose” hypothesis. We do find noteworthy school-level effects of “school climate,” including aggregate expectations, mental health, and the prevalence of single-mother families, that influence adolescent risk-taking behavior more than school measures of SES.*

Adolescence is typically viewed as a transitional period between childhood and adulthood, a time when young people continue to develop the social and intellectual skills that will prepare them for adult roles and responsibilities. During this period, adolescents reach physical and sexual maturity, develop more sophisticated reasoning ability, and look to their future by developing lifestyle expectations and

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setting educational and occupational goals that will shape their adult careers. These biological, cognitive, and psychosocial changes provide numerous developmental opportunities for adolescents to engage in behaviors that have important implications for health risks and the adoption of healthy lifestyles (Millstein, Petersen & Nightingale 1993).

Adolescence is a period of exploration and discovery. Self-reliance, self-control, and the capacity for independent decision making all increase over the adolescent years (Feldman & Elliott 1990). Adolescence is a time of choices. It involves gaining autonomy, assuming responsibility, and making choices about health, family, career, peers, and schooling (Furstenberg 2000). Choices regarding sexual intercourse or use of substances can have serious implications. However, the ability to comprehend health risks, weigh options, reflect on one's own behavior, and consider the long-term consequences of one's actions also increases during the adolescence (Greene 1986; Keating & Clark 1980; Weithorn & Campbell 1982). A decision process therefore underlies the behavioral choices adolescents make with varying risks to their health and well-being.

Our interest is in risky actions (e.g., carrying or using a weapon) and nonactions (e.g., not using contraception during sexual intercourse) that may have negative consequences (Beyth-Marom & Fischhoff 1997). Although many adults engage in risky behavior, adolescents do so more frequently (Jessor & Jessor 1977). For example, delinquency increases from early to midadolescence and declines sharply by late adolescence (Gans, Blyth & Gaveras 1990). Furthermore, adolescents experience the negative consequences of such behaviors to a disproportionately high degree (Dryfoos 1990).

Some authors suggest that adolescents engage in reckless or problem behavior to demonstrate a mature status or mark the transition to adulthood (Jessor 1987). Others argue that risk behavior is a consequence of heightened egocentrism and sensation seeking during adolescence (Elkind 1985). Many scholars view risk-taking behaviors as predispositions whose expression depends on social and environmental factors such as family, peers, school, community, and cultural belief systems (Arnett 1992; Dornbusch 1989; Dryfoos 1998; Jessor 1987).

Social and environmental factors that define the social contexts of adolescents' lives also impact the aspirations, expectations, and goals that adolescents develop for their futures. Moreover, the opportunities, pressures, and resources adolescents confront on a daily basis are influenced by key social, structural, and economic variables related to ethnicity, minority status, gender, and socioeconomic status (Millstein, Petersen & Nightingale 1993; National Research Council 1993; Ramirez-Valles, Zimmerman & Newcomb 1998), which in turn influence adolescents' expectations for their future lifestyles and careers. This article addresses the role that these expectations and orientations for the future play in adolescents' decisions to engage in risk behavior.

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In particular, we examine the extent to which youth expectations for future health and education affect risk-taking behavior in adolescence. We test the theory that a “nothing to lose” attitude or expectation about the future produces greater involvement in risky behavior. Adolescents who have low expectations for their future may feel that they have nothing to lose and engage in more risk behavior than adolescents with high expectations. For instance, teens with expectations of early mortality might be more likely to engage in delinquent or violent behaviors or become sexually active at a young age. We also expect the school context of adolescents’ expectations to influence individual behavior such that a “climate” of low future expectations promotes greater involvement in risk behavior by youth in that context than a school climate with high expectations. For example, adolescents who attend a school in which aggregate student expectations for a college education are low might be more likely to engage in illegal behavior regarding drugs or weapons than adolescents in a school with high aggregate educational expectations because the normative school climate would attach less risk to such behavior, with less to lose in terms of future education. We examine these hypotheses using data from the National Longitudinal Study of Adolescent Health, a study of a large nationally representative sample of children in seventh through twelfth grades in 1995.

### Background

Rising concern over the status of children in America has generated substantial research and policy interest in adolescent development and in the social contexts in which adolescents learn the social roles and responsibilities they must assume as they make the transition to adulthood (Amato & Booth 1997; Dryfoos 1998; Furstenberg et al. 1999; National Research Council 1993, 1996; U.S. Department of Health and Human Services 1996). Of particular concern is adolescent health and health behavior (Elliott 1993; Elster 1997). Thirty years ago, most adolescent morbidity and mortality was due to natural causes. Today the major sources of adolescent morbidity and mortality can be linked to two general factors: social environments that involve health risks; and preventable, personal behavior involving motor vehicle accidents, homicide, substance abuse, and the consequences of sexual behavior (Gans et al. 1990; Millstein, Petersen & Nightingale 1993).

Adolescents tend to take health for granted. Their energies are directed toward achieving popularity, autonomy from adults, success in school or sports, satisfying romantic and platonic relationships, and confidence in themselves (Crockett & Petersen 1993; Feldman & Elliot 1990; Millstein 1993). In trying to achieve such goals, however, the choices they make can involve health-related behavior. Some degree of behavioral experimentation in adolescence is normal and expected, and the challenge is to distinguish experimental, nonproblematic behavior from

behavior that is destructive (Beyth-Marom & Fischhoff 1997; Crockett & Petersen 1993).

The significance of various types of health risk behavior varies by developmental age (Elliott 1993; Koyle et al. 1989). Having sexual intercourse, although developmentally inappropriate for a 13-year-old, is quite normative for a 19-year-old. In general, when risk-taking behavior occurs early in adolescence, risks of negative consequences are heightened. Adolescents who initiate health-risk behaviors such as sexual intercourse and involvement with drugs at an early age frequently have poorer health later on in life, lower educational attainment, and less economic productivity than their peers (Warren et al. 1997). Early initiation of these behaviors is associated with longer periods of risk taking in later adolescence and early adulthood and also may be a marker for risk taking in adulthood (Dryfoos 1998).

Sexual experience, and particularly the age at first intercourse, represent critical indicators of the risk of pregnancy and sexually transmitted diseases. Youth who begin having sex at younger ages are exposed to these risks over a longer period of time (Wu, Cherlin & Bumpass 1997). Because sexual intercourse during the teen years, especially first intercourse, is often unplanned, it is often unprotected by contraception (Forrest & Singh 1990; Mosher & McNally 1991). In addition, youth who have early sexual experience are more likely at later ages to have more sexual partners and more frequent intercourse (Koyle et al. 1989).

Violence among youth is growing more rapidly than in any other subgroup. Between 1985 and 1994, the number of persons arrested for murder and nonnegligent manslaughter increased by 150% for persons under 18 years of age in comparison to only 11.2% for persons 18 years of age and older (Federal Bureau of Investigation 1995). The homicide rate for 14-17 year olds has risen from 7.0 to 19.1 per 100,000 in just a decade and is attributable to the availability of handguns beginning in 1985 (Fox 1996).

The interrelatedness of risk and problem behavior has been documented in several studies (Dryfoos 1990, 1998; National Research Council 1993). For instance, there is a positive correlation between delinquent behavior, involvement with drugs, and violence (Donovan & Jessor 1985). It is also well established that adolescents involved in delinquency and violence are more likely to be sexually active (Elliott & Morse 1989; Reiss & Roth 1993).

The social environment of adolescents changed rapidly in the 1980s, increasing risk for adolescent health behavior. The huge influx of mothers into the labor market and the rise in single-parent families has meant that adolescents now spend less time with parents or adults, leaving greater time unsupervised and with peers (Dornbusch et al. 1985; National Research Council 1996). Adolescents from single-parent families are more likely than their peers from two-parent families to engage in health-compromising behaviors, including delinquency, violence and unprotected sex (Dornbusch et al. 1985; Dornbusch & Gray 1988).

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Poverty and low socioeconomic status especially puts adolescents at risk. Youth from low-income families experience higher rates of poor physical and mental health, are more likely to engage in delinquent acts, have early and unprotected sexual intercourse, and are more likely to experience adolescent pregnancy, be arrested, and drop out of school (Duncan & Brooks-Gunn, 1997; Haveman & Wolfe 1994; Harris & Marmer 1996). Adolescents in welfare-dependent families exhibit the worst physical and mental health, and tend to engage in earlier onset of sexual activity and greater violence (Bridgman & Phillips 1998). There are cumulative disadvantages associated with poverty and welfare receipt. For example, economic stress reduces parents' abilities to be supportive and nurturing of children (Elder et al. 1992; McLoyd 1990), and family poverty is typically associated with other forms of deprivation in the social environment, including low-quality schools and unsafe neighborhoods.

Schools are an important context for the development of adolescent health behaviors. Because adolescents spend so much of their time in school, most of their social contacts are concentrated in the school environment where they develop social networks through interpersonal interaction with same-age peers (Feld 1981). Interactions with fellow students and exposure to friends' families and parents play important socialization roles, provide normative structuring of behaviors, and shape adolescents' aspirations for their future. School context can influence adolescent behavior through two mechanisms (Ku, Sonenstein & Pleck 1993). First, the school climate may structure norms and values — adolescents see what is common and assume such attitudes, expectations, and behaviors are socially acceptable. For example, if the school norm is to go on to college, adolescents will expect to do so (Meyer 1970). Second, school context impacts attitudes and behaviors through perceived social and economic opportunities available. The composition of the social and economic status of students' parents in the school serves as a model of what students themselves might expect to achieve in their adult lives.

Research has given insufficient attention to the impact of future orientations and attitudes on adolescent risk behavior, focusing on the issue only in regard to sexual behavior (Luster & Small 1994; Ohannessian & Crocket 1993; Plotnick 1992). We find it compelling to consider that adolescents with low expectations for their future have less to lose than adolescents who experience healthy lifestyles, educational accomplishment, and economic attainment, and thereby have greater expectations for their futures. Indeed, considerable empirical support in the teenage fertility literature suggests the “opportunity costs” hypothesis that teens with fewer economic opportunities, in particular minority and poor youth, choose to have children outside of wedlock at an early age because the costs of an early out-of-wedlock birth are small relative to those women with greater opportunities (see Duncan 1995). In this article we broaden this perspective and examine whether adolescents with “nothing to lose” attitudes for the future are more likely to engage in risk-taking behavior than adolescents who have more to lose in their future.

## Conceptual Model

Fishbein and Ajzen developed a theory of “reasoned action” that tries to account for the relationship between attitudes and behavior (Fishbein & Ajzen 1975; Ajzen & Fishbein 1980). They argue that an individual’s perception of the severity of expected outcomes of some behavior plays a major role in formulating behavioral intentions. Their theory and related research furthermore imply that adolescents possess the cognitive abilities to formulate rational behavioral intentions based on perceived attitudes about the risks and benefits associated with engaging in such behavior (Ajzen 1989; Fitzpatrick 1997).

We therefore hypothesize that adolescents who express high expectations for their future health and education will perceive greater risks associated with engaging in risk behaviors and will avoid risk taking in contrast to adolescents with low expectations for their futures. We address this hypothesis at two levels: individual and aggregate school-level expectations for the future. We expect the relationship to be stronger at the individual level because individual expectations would bear directly on individual behavior, whereas contextual effects operate through school climate, and are likely to be indirect and often quite modest (Duncan & Aber 1997). Nevertheless, we expect normative standards in the social networks of a school represented by classmates’ attitudes, mental outlook, and expectations for the future to influence teens’ involvement in risk behaviors (Billy & Udry 1985).

We examine three domains of risk taking: sexual behavior, drug dealing, and weapon carrying. Although our focus is on individual- and school-level expectations, our conceptual model includes other individual- and school-level variables that tap theoretical processes associated with the supervision of youth behavior, role modeling, and normative climate that operate to influence adolescents’ propensities to engage in risk behavior.

We model three social and economic conditions at both the individual and school level: parents’ education, family structure, and welfare receipt. The economic and social roles that parents assume serve as models and influence their children’s attitudes and expectations for their own futures (Wilson 1996). In addition, one-parent families are less effective in supervising youth and socialize children to be more accepting of alternative family forms (Hogan & Kitagawa 1985; McLanahan & Sandefur 1994; Wu & Martinson 1993).

Role modeling, supervision, and socioeconomic opportunity effects also operate at the school level (National Research Council 1996). The prevalence of single-mother families on welfare in a school operates as a model of future family structures and financial responsibility youth can expect to assume. Furthermore, schools provide more successful role models when the student body has many well-educated parents, few parents receiving welfare, and students from intact families. These schools also provide a collective supervision of youth, promoting high expectations for future adult attainments and fostering greater costs associated with risk behavior. School climate can also be characterized by classmates’ mental health.

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Schools in which aggregate mental health is poor are likely to create a climate for risk taking because aspirations and plans for the future may be muted by collective feelings of hopelessness and depression (Dryfoos 1998).

We control for several individual-level attributes associated with risk behavior, including mental health, cognitive ability, and physical developmental indicators, as well as for race and ethnicity (Earls 1993; Millstein, Petersen & Nightingale 1993). We also control for place and region of residence to account for regional and urbanicity differences in adolescent risk behavior (National Research Council 1993, 1996). In order to capture the onset of risk behavior and to focus on youth for whom the consequences of risk behavior may be especially critical, we limit our sample to younger adolescents and control for age.<sup>1</sup> We run all models separately for boys and girls.

### Data

We use data from the National Longitudinal Study of Adolescent Health (Add Health), a nationally representative study of adolescents in grades 7 through 12 in the U.S. in 1995. Add Health was designed to help explain the causes of adolescent health and health behavior with special emphasis on the effects of multiple contexts of adolescent life. The study used a cluster sample design that was multistage and school-based. The stratified sample of 80 high schools was selected with probability proportional to size.<sup>2</sup> For each high school, a feeder school was also selected with probability proportional to its student contribution to the high school. The school-based sample therefore has a pair of schools in each of 80 communities.<sup>3</sup>

An in-school questionnaire was administered to every student who attended each selected school on a particular day during the period of September 1994 to April 1995. The in-school questionnaire was completed by more than 90,000 adolescents. Using the school rosters, a random sample of some 200 students from each school pair were then selected for in-home interviews and produced the core in-home sample of about 12,000 adolescents. A number of special samples (e.g., ethnic and genetic) were also selected on the basis of in-school responses. The core plus the special samples produced a total sample size of 20,745 adolescents in wave 1.

The in-home interviews were conducted between April and December 1995, yielding the wave 1 data. A parent, generally the mother, was also interviewed in wave 1. The one- to two-hour interview was done using a laptop computer with confidential audio-CASI sections for the more sensitive questions such as those asking about illegal and other risk behavior. All adolescents in grades 7 through 11 in wave 1 (plus 12th graders who were part of the genetic sample) were followed up one year later for the wave 2 in-home interview in 1996. Bearman, Jones, and Udry (1997) provide a more detailed description of the Add Health study.

To help sort out the paths of causal influence, our analytic design is careful to take measures of expectations prior to our behavioral measures. Exploiting the longitudinal design of Add Health, we use expectation measures from the in-school interview and relate them to change in risk behavior between the wave 1 and wave 2 interviews. As a result, our sample is limited to those adolescents who completed an in-school interview and who were interviewed at both wave 1 and wave 2 ( $N = 10,192$ ). To ensure that our sample is not selected on the basis of achievement or behavior, we chose to limit the age range for our adolescents to 13 to 18 at the time of the wave 1 interview. While there were a few 11- and 12-year old respondents at wave 1, these students are much younger than the typical 7th or 8th grader and have probably been promoted to the upper grade level based on achievement. For each health risk behavior that we examine, we impose further sample restrictions (detailed below) on the basis of age in order to capture the period of early onset of the risk behavior in samples of teens for whom such behavior is far from normative.

Contextual information in Add Health is based on the expectations of all students in sampled schools. However, our analysis sample consists of the random 20% of all students who provided the in-person interview responses to the questions on risk-taking behavior. We therefore have data on expectations about the future at both the school and individual level, enabling us to examine both the school-level and the individual-level effects of future expectations on adolescent risk behavior, with the expectation that the combination of low expectations at both the individual and school level is more powerful than their additive effects. Our descriptive analysis is based on weighted data; regression analysis uses unweighted data with controls for the factors associated with differential sampling probabilities of youth. In all regression models, we also adjust our standard errors for the effects of student clustering within schools.

## Measures

### HEALTH RISK BEHAVIOR

We chose three domains of risk behavior for this analysis — sexual behavior, weapon use, and selling drugs — for which perceptions of the severity of expected outcomes is likely to be particularly salient. Early sexual behavior, drug dealing, and weapon use are behaviors that have long-term consequences, whereas other risk behaviors, such as fighting or use of marijuana, may not.

To ensure that attitudes precede behavior, we measure the “onset” of risk behavior in these three domains. We first identified the ages at which the majority of adolescents had not yet engaged in the risk behavior.<sup>4</sup> On the basis of this exploratory work, we restricted our samples to specific ages for analysis of each risk behavior to capture early onset. We did not include in our sample adolescents

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who experienced onset of risk behavior at ages beyond the most common onset ages. This is because of our interest in studying the high-risk adolescents who engage in these behaviors at the youngest ages when the probability of negative consequences is greatest, and because older adolescents at risk of onset are a highly selective subset of their agetates.<sup>5</sup>

Among adolescents in specified ages who had not yet engaged in the risk behavior at wave 1, we coded a dichotomous dependent variable equal to 1 if the adolescent experienced onset of the specific risk behavior by wave 2, and coded it equal to 0 otherwise. We use logistic regression models to estimate the effects of expectations and other covariates on the onset of risk behavior.<sup>6</sup> We examine the onset of sexual activity, selling drugs, and weapon use.

#### *Onset of Sexual Activity*

Adolescents were asked whether they had ever had sexual intercourse in both the wave 1 and wave 2 interviews. If they answer yes, they are asked the date of first sexual intercourse, from which we computed the age at first intercourse. Among those adolescents who had not had first sex by wave 1, onset of sexual activity is indicated by those who experienced first sexual intercourse by wave 2. Based on our exploratory analysis, we chose the wave 1 ages 13-15 as the sample's initial age range for our logistic analysis of onset of first sex ( $n = 1668$  boys; 2139 girls).

#### *Onset of Selling Drugs*

In both the wave 1 and wave 2 interviews, adolescents were asked how often they sold marijuana or other drugs. Among adolescents who reported that they had never sold drugs at wave 1, onset of drug selling is indicated for those adolescents who report involvement in selling drugs by wave 2. Because the incidence of onset for selling drugs is too infrequent for girls, we restrict our analysis of this risk behavior to boys aged 13-16 ( $n = 2925$ ).

#### *Onset of Weapon Use*

Adolescents were also asked how often they used or threatened to use a weapon to get something from someone at both the wave 1 and wave 2 interviews. Onset of weapon use is indicated for those adolescents who reported that they had never used or threatened with a weapon at wave 1, but had used or threatened with a weapon at least once by the wave 2 interview. Those at risk for onset but never experiencing onset are those adolescents who reported that they had never used or threatened with a weapon at both wave 1 and wave 2 interviews. Our analysis of weapon use onset is also limited to boys aged 13 to 16 ( $n = 2957$ ).

*Expectations*

A set of questions asked adolescents about their expectations in a number of life-course domains. Because several of the questions were overlapping and highly correlated, we selected two of these questions for analysis. On an 9-point scale from “no chance” to “it will happen,” adolescents were asked about the chance that they will: (1) live to age 35; and (2) graduate from college. We transformed the 9-category response scale into percentage chance by assigning 0 to a “0” on the scale (labeled “no chance”), .25 to a “2” (“some chance”), .50 to a “4” (“About 50-50”), .75 to a “6” (“pretty likely”), and 1.0 chance to a response of “8” (“it will happen”). The four unlabeled response categories between these values were assigned the midpoint of these scores.

We also constructed school-level measures of these two expectations to capture the school climate of same-sex grademates’ future expectations. We computed the grade- and gender-specific average response to the expectation of living to age 35 and graduating from college, expressed as a percentage chance.

*Mental Health Problems Index*

We constructed a mental health problems index based on seven items dealing with symptoms of emotional distress such as having trouble with eating, difficulty falling asleep, feeling depressed or blue, crying a lot, and being afraid. Response categories range from 0 (never) to 4 (every day). We divided the response range by 4 and created an index of the sum of the nonmissing rescaled items, divided by the number of nonmissing items, resulting in scores that range from 0 to 1. Exactly 10% of the in-school sample reported no symptoms; index scores averaged .249. The internal reliability of the index, as measured by Cronbach’s alpha, was .83 (based on 79,359 students with valid data).

A school-level mental health problems index is constructed as the average index for each gender and grade combination in schools. This measure represents the normative climate of mental health, reflecting aggregate feelings of hope or hopelessness, with implications for the collective future outlook among same-sex grademates.<sup>7</sup>

*Family Structure and Welfare Receipt*

Family structure is represented as three dummy variables at the individual level of measurement: two biological parents (reference category); two parents in which at least one parent is not biological (including step-, adopted, or foster parents or a parent’s partner); and other family structures (including mother- and father-only families, or families in which there is no “parent” but adolescents live with grandparents, other relatives, nonrelatives, or in a group home).

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Whether the adolescent lives in a welfare home at wave 1 is measured by parental reports of welfare receipt (AFDC or food stamps). We include an individual-level indicator of welfare receipt to control for family-level poverty status.

To capture the school context effects of both socioeconomic status and normative climate, we combined family structure and welfare receipt indicators and constructed a school-level measure of the average proportion of adolescents who live with a single mother who receives welfare. To capture school context effects of normative climate and collective supervision that might operate independently of school-level socioeconomic status, we also include a measure of the average proportion of adolescents in the school who live with a single mother who does not receive welfare.<sup>8</sup>

#### *Parents' Education*

Mother's and father's education is measured as completed years of schooling for each resident parent. A substantial proportion of adolescents has missing data on parents' education, especially adolescents who do not live with a father. To adjust for the potential bias associated with systematic differences between those with valid and missing data, we include a dummy variable for missing data on mother's and father's education in our regression models.

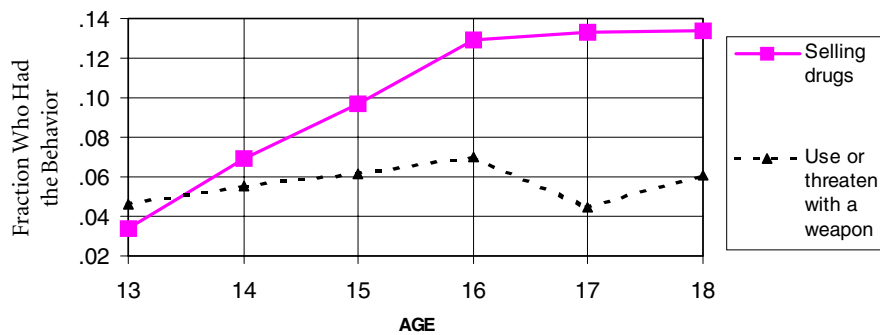
Our school-level socioeconomic status measure is the average level of mother's education in the school. Because our school-level measures are based on the school census using the in-school sample, this measure is based on all cases with valid data on mother's years of schooling from the in-school interview.

#### *Individual Characteristics*

Age is measured in years and we include dummy variables for the ages in the ranges specific to each analysis of risk behavior. Cognitive ability is measured by the Add Health version of the Peabody Picture Vocabulary Test-Revised (AHPVT). We use the age-standardized scores on this vocabulary test. Race and ethnicity is represented as four dummy variables: non-Hispanic white (reference category), non-Hispanic black, other races (Asian and Native American), and Hispanic.

We control for sex-specific physical development indicators. We include three indicators for boys: (1) amount of hair under arms, ranging from 1 (no hair at all) to 5 (as much hair as a grown man); (2) amount of hair on face, ranging from 1 (a few scattered hairs) to 4 (thick hair like a grown man's facial hair); and (3) whether their voice is lower than it was in grade school, ranging from 1 (no) to 5 (like an adult's man's voice). For each of these indicators, we transformed the response range to be 0 to 1. Girls report on (1) the size of their breasts relative to grade school, ranging from 1 (about the same) to 5 (like a grown woman's breasts) and (2) whether

FIGURE 1: Fraction of Boys, Ages 13 to 18, Selling Drugs or Threatening with a Weapon



their body is curvy compared to grade school, ranging from 1 (same as in grade school) to 5 (a whole lot curvier than in grade school). We also transformed the response range to be 0 to 1 for these two measures of girls' physical development. In addition, from reported age at first menstruation, we include (3) months old at first menstruation; and (4) months since first menstruation.

### *Residence*

A final set of dummy variables measures residential and school location. Regional dummies include West, Midwest, South, and Northeast (reference). School location dummies include urban, suburban, and rural (reference) locations.

## Results

### DESCRIPTIVE STATISTICS

Kaplan-Meier survival curves reveal that roughly equal fractions (around 22%) of boys and girls have had sex by age 15; at ages beyond 15, the survival curve of girls falls below that of boys, indicating a somewhat heightened onset of sexual intercourse for girls relative to boys between ages 16 and 19, the end of our data's observation window (results not shown). Our analysis of early transitions to first sex between the two in-home interviews is based on samples of boys and girls aged 13-15 who, as of the first in-home interview, had not engaged in sexual intercourse.

Age patterns of selling drugs and using or threatening to use a weapon for boys are displayed in Figure 1. These data are taken from the initial in-home survey, representing the incidence of ever engaging in each risk behavior. Both events are

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**TABLE 1: School Averages at the 10th, Median, and 90th Percentiles for Boys and Girls**

School Averages	10th Percentile	Median	90th Percentile
<b>Boys</b>			
1. Average mother’s education	11.917	12.995	14.131
2. Average proportion of single mothers	.098	.167	.318
3. Average mental health problems index	.150	.184	.217
4. Average expectation of living to age 35	.739	.819	.853
5. Average expectation of graduating from college	.643	.742	.840
<b>Girls</b>			
1. Average mother’s education	11.850	12.845	13.957
2. Average proportion of single mothers	.096	.193	.341
3. Average mental health problems index	.244	.312	.359
4. Average expectation of living to age 35	.775	.838	.876
5. Average expectation of graduating from college	.754	.817	.884

Source: National Longitudinal Study of Adolescent Health, in-school data

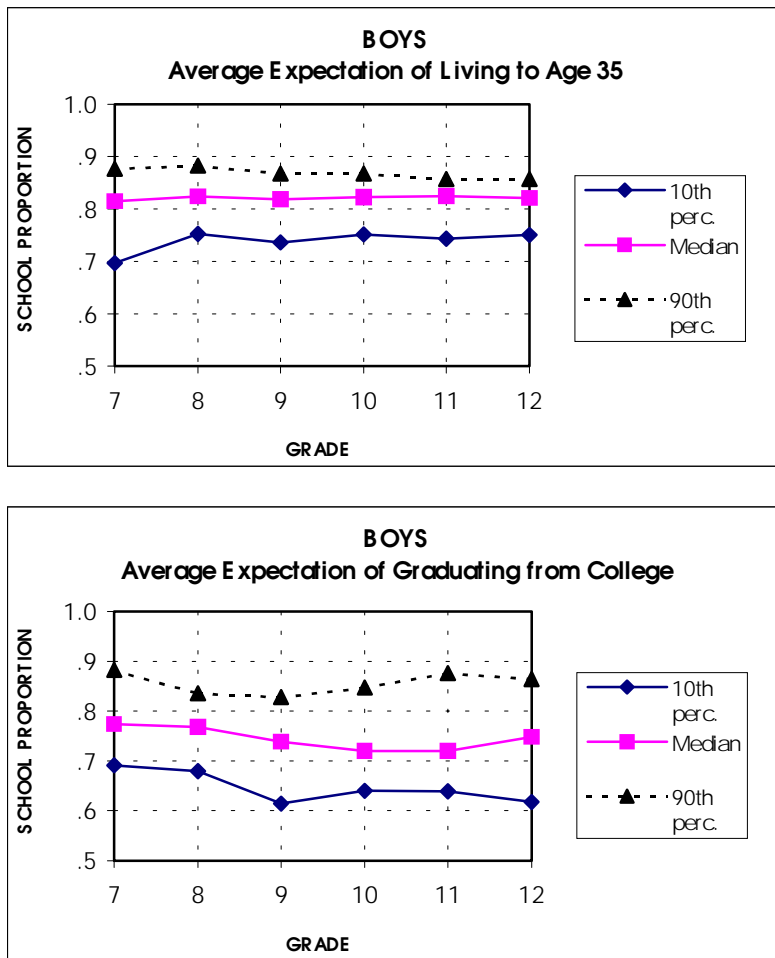
relatively rare, however there is a substantial increase in selling drugs by age, but no age pattern for weapon use. At age 13, around 4% of boys report both that they have sold drugs and have used or threatened others with a weapon. By age 17, the proportion involved in selling drugs increases to over 13%, whereas the proportion who used a weapon remains roughly the same.

Because of the interrelatedness of risk behavior, we were concerned that the same adolescents might be involved in drug selling and weapon use, especially at the ages with similar frequencies. However, these risk behaviors do not typically occur together for the same people at the same time. While a majority (61%) of the 13- year-old boys who reported selling drugs also reported using or threatening others with a weapon, comparable fractions at older ages fall steadily so that by age 18, less than one-quarter of reported drug sellers reported weapon use.

Table 1 presents descriptive data on our five school-based measures. To provide an idea of the range of school conditions, we ranked schools (in the case of the first two measures) and sex-specific grademates (in the case of the last three) according to average scores on these five measures. After weighting by the number of individuals in the given school or grade, we calculated the average scores across grades corresponding to the 10th, median, and 90th percentile schools for boys in the top panel and girls in the bottom panel.

Classmates of the median student report mothers who have completed about 13 years of schooling with a 10th-90th percentile range of about two years. Between

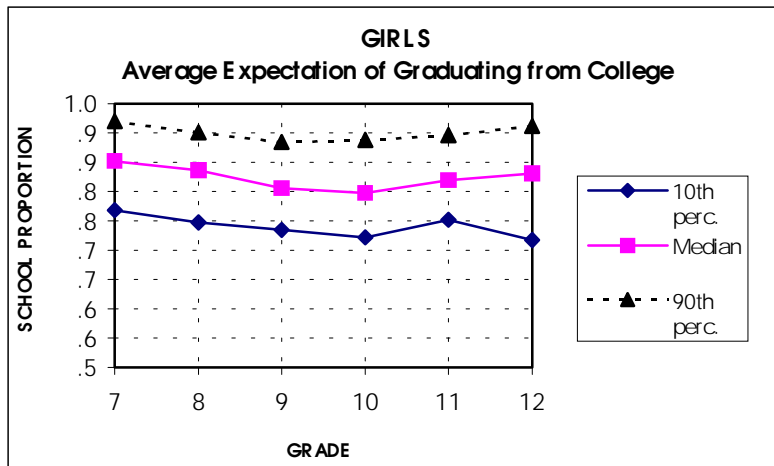
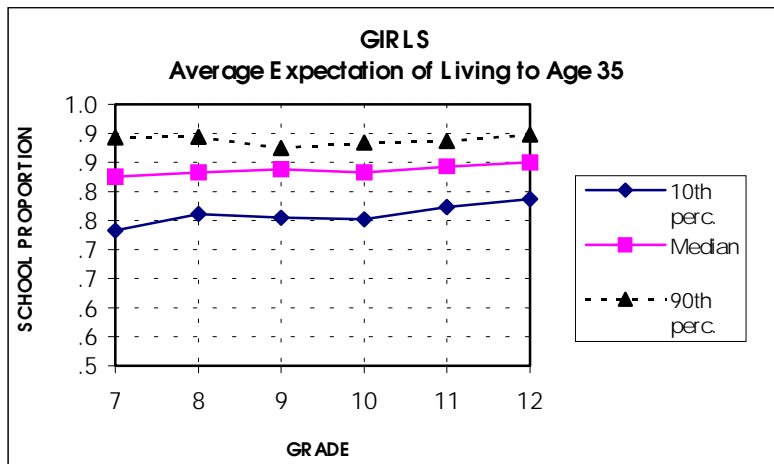
FIGURE 2A: Average Expectations of Living to Age 35 and of Graduating from College for Boys



17 to 19% of the median student's classmates reported single-mother family structures (the breakdown by welfare receipt indicates that less than 5% also receive welfare — not shown). Tenth to 90th percentile proportions of students living in single-mother families ranged from just under 10% to around 34%. The range for proportions of students living with a single mother on welfare is much smaller.

Our mental health and expectations measures are measured for same-sex grademates and display different patterns for the boys and girls in the same schools. Male grademates of the median male student reported lower average scores on the

FIGURE 2B: Average Expectations of Living to Age 35 and of Graduating from College for Girls



mental health problems index (.184) than female grademates of the median female student (.312), and have a smaller 10th-90th percentile range as well. In addition, the mental health problem index increases between grades 7 and 12, more so for girls than for boys, as does the 10th-90th percentile range, especially for girls who display greater variability on this measure (data not shown).

Male grademates of the median male student reported an 82% likelihood of living to age 35<sup>9</sup> and a 74% likelihood of graduating from college. Girls' female

**TABLE 2: Onset of First Sex for Boys Aged 13 to 15**

	Bivariate		Boys Ages 13 to 15
	Coef.	Std. Err. <sup>b</sup>	Coef.
School and grade/gender mates variables			
Average mother's education in school	-.307*	.085	-.118
Average single mothers on welfare in school	6.208*	1.310	3.400*
Average single mothers not on welfare in school	4.532*	1.169	3.496*
Average mental health problems index <sup>a</sup>	3.460	2.665	2.419
Average expectation of living to age 35 <sup>a</sup>	-3.055*	1.557	-.260
Average expectation of graduating from college <sup>a</sup>	-3.218*	.919	-.153
Individual and family characteristics			
Picture Vocabulary Test standardized scores	-.020*	.005	-.013*
Mental health problem index	.899*	.413	.836+
Age (13-year-old omitted)			
14-year-old	.704*	.208	.565*
15-year-old	.942*	.208	.730*
Physical development			
Hair under arms	1.590*	.321	1.107*
Hair on face	1.172*	.281	.612+
Voice lower than it was when in grade school	.657*	.250	.518+
Family structure (two biological parents omitted) and characteristics			
Two parents other than both biological	.609*	.173	.571*
Other (single mom, single dad, other)	.676*	.159	.482*
Mother's education	-.052*	.021	-.024
Father's education	-.046*	.023	.014
Welfare receipt	.730*	.208	.157

Race (Non-Hispanic white omitted)			
Non-Hispanic black	.899*	.206	.543†
Hispanic	.311	.237	-.072
Other	.290	.222	.160
Region (Northeast omitted)			
West	-.483+	.266	-.626*
Midwest	-.138	.230	-.244
South	-.207	.214	-.498*
Urbanicity (rural omitted)			
Urban	-.025	.205	-.205
Suburb	-.268	.180	-.195
Individual expectations			
Of living to age 35	-.698*	.275	-.117
Of graduating from college	-.918*	.256	-.630*
Constant			-.303*
(n = 1,688)			

*Notes:*

<sup>a</sup> Grade and gender specific average.

<sup>b</sup> Robust standard errors, correcting for clustering at the school, gender and grade level.

Mean on onset of first sex: .15. Missing value indicators are included in the regressions for the following variables: problems index, physical development variables, mother's and father's education, welfare receipt, race, and in

Source: National Longitudinal Study of Adolescent Health, in-school, wave 1 and wave 2 data.

†  $p \leq .10$  \*  $p \leq .05$

grademates report somewhat higher probabilities with an 84% and 82% likelihood of living to age 35 and graduating from college for the median female student. Figures 2A and 2B breaks these down further by grade to show the trend in expectations measures across the grade/school combinations for boys and girls in our sample. Although expectations of living to age 35 are roughly constant at around .8 for both boys and girls, there is some tendency for the distribution of scores to converge across grade. In contrast, average expectations of graduating from college fall from middle school to early high school, perhaps as students develop more realistic expectations. There is a much broader range of average expectations across grade/school combinations for graduation than living to age 35; and the dispersion of graduation expectations increases with age, especially for boys.

#### REGRESSION RESULTS

Table 2 summarizes results from our logistic regressions of onset of first sex for boys. To minimize bias associated with missing values and to maximize the number of cases for analysis, in all regressions we include dichotomous missing value indicators for respondents with missing data on any given variable included in our models, and we assign the mean sample value to those with missing data.<sup>10</sup>

The first two columns of Table 2 present coefficients and standard errors from a series of bivariate regressions in which onset is regressed on each (or, in the case of categorical measures, each set of) independent variable. We find 14- and, especially, 15-year-olds to be much more likely to report onset of first sex than 13-year olds. Onset is negatively correlated with school SES (as measured by school-level mother's schooling), but positively correlated with the prevalence of students living in single-mother families, especially the prevalence on welfare. Consistent with a nothing-to-lose interpretation, students whose same-sex grademates report lower expected probabilities of living to age 35 and lower expected probabilities of college graduation are more likely to report early onset of first sex.<sup>11</sup>

Among the family and individual characteristics, the bivariate associations proved statistically significant and negative (i.e., reduced the risk of onset of first sex) for age-standardized scores on the vocabulary test, years of schooling completed by mothers and fathers, and expectations of living to age 35 and of graduating from college; and positive (i.e., increased risk of onset) for the mental health problems index, the three physical development indicators, step-family and single-parent or other family structures, family welfare receipt, and black race/ethnicity.

Regression-based adjustments reduce many of these associations to statistical insignificance.<sup>12</sup> As shown in the third and fourth columns of Table 2, the only aggregate measures still significant are those associated with single-mother family structures. Relative to students in schools with two-parent families, students in schools with a rate of single-mother families on welfare that is one standard deviation (5.1 percentage points) above the all-school mean have a 19% ( $e^{3.400 \times .051}$ ) higher risk of onset of first sex, and students in schools with a one standard

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deviation higher rate of single mother families *not on welfare* have a 22% ( $e^{3.496 \cdot .058}$ ) higher risk. School-level SES, as indicated by maternal schooling, is insignificant. Thus, role modeling and collective supervision mechanisms associated with the prevalence of single-parent households in a school context seem to be more important than the prevalence of low socioeconomic status of such families.

The boys' own family structures appear to matter as well: risks of first sex are 77% ( $e^{.571}$ ) higher for boys living in step families and 62% higher for boys in single-parent or nonparent family structures (as opposed to two biological parent). Boys with higher cognitive test scores have significantly lower risks, whereas boys with higher scores on the mental health problems index have marginally higher risks. Boys who are more physically developed in terms of hair under arms also have higher risks of sexual activity onset. Age continues to have statistically significant effects, while residence in the western and southern regions tends to reduce the risks of onset of sex for boys. Finally, the sense of having “nothing to lose,” reflected by low expectations of graduating from college, continues to increase the likelihood of onset of first sex for boys net of school- and family-level and other individual effects.

The significant bivariate effects of aggregate school-level expectations disappear in the presence of other school- and family-level conditions. The significant bivariate effect of the individual expectation of living to age 35 disappears once we adjust for boys' cognitive ability and mental health in the onset-of-first-sex model.

The regression models of onset of first sex for girls (Table 3) reveal fewer significant effects than the models for boys. Although there is bivariate support for our “nothing to lose” hypothesis, none of our expectations measures is significant in the presence of regression controls.<sup>13</sup> Neither school-level (mother's education) or individual-level SES (parental education and welfare receipt) is important for the onset of first sexual experience for girls. However, role modeling and the lack of collective supervision associated with the prevalence of single-mother families in a school is important only in the presence of low socioeconomic status measured by single mothers' welfare receipt. Girls in schools who are one standard deviation (5.4 percentage point) higher in terms of single-mother families *on welfare* have a 21% ( $e^{3.477 \cdot .054}$ ) higher risk of sexual activity onset. The prevalence of students living with single mothers who are not on welfare has a positive but statistically insignificant association with girls' onset of first sexual experience.

Both contextual and individual mental health problems increase the likelihood of onset of first sex for girls. Girls in schools with a one standard deviation higher score on the mental health problems index (relative to the mean across schools) have a 22% higher risk of onset of sex; while an increase in one standard deviation in girls' individual mental health problems was associated with a 26% increase in the risk of subsequent onset of first sex. This regression-adjusted association is stronger than that of boys. A striking difference between the models for girls and boys is that cognitive test scores had virtually no regression-adjusted associations with onset of first sex for girls.

TABLE 3: Onset of First Sex for Girls Aged 13 to 15

	Bivariate		Girls Aged
	Coef.	Std. Err. <sup>b</sup>	Coef.
School and grade/gender mates variables			
Average mother's education in school	-.112	.079	.079
Average single mothers on welfare in school	2.654*	1.305	3.477*
Average single mothers not on welfare in school	2.371*	1.170	1.960
Average mental health problems index <sup>a</sup>	7.360*	1.608	4.238*
Average expectation of living to age 35 <sup>a</sup>	-2.730*	1.343	.545
Average expectation of graduating from college <sup>a</sup>	-2.367*	1.170	.574
Individual and family characteristics			
Picture Vocabulary Test standardized scores	-.007	.004	-.004
Mental health problems index	1.977*	.296	.230*
Age (13-year-old omitted)			
14-year-old	.903*	.201	
15-year-old	.976*	.197	
Physical development			
Breast	1.024*	.215	.369
Body curves	1.144*	.215	.512+
Number of month old at first menstruation	-.009*	.004	.022*
Number of months since first menstruation	.021*	.003	.027*

Family structure (two biological parents omitted) and characteristics			
Two parents other than both biological	.616*	.160	.447*
Other (single mom, single dad, other)	.582*	.140	.426*
Mother's education	-.059*	.019	-.034
Father's education	-.056*	.019	-.029
Welfare receipt	.284†	.173	-.140
Race			
Non-Hispanic black	.262	.187	-.070
Hispanic	.230	.213	.006
Other	-.094	.174	-.238
Region			
West	-.157	.208	-.306
Midwest	-.036	.232	-.201
South	.213	.196	.159
Urbanicity			
Urban	-.302	.215	-.289
Suburb	-.135	.197	-.009
Individual expectations			
Of living to age 35	-.565*	.243	-.223
Of graduating from college	-.465†	.247	-.136
Constant			-8.681*
(n = 2,139)			

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*Notes:*

<sup>a</sup> Grade and gender specific average.

<sup>b</sup> Robust standard errors, correcting for clustering at the school, gender and grade level.

Mean of onset of first xex: .18. Missing value indicators are included in the regressions for the following variables: problems index, physical development variables, mother's and father's education, welfare receipt, race, and in Source: National Longitudinal Study of Adolescent Health, in-school, wave 1 and wave 2 data.

† p ≤ .10 \* p ≤ .05

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**TABLE 4: Onset of Selling Drugs for Boys Aged 13 to 16**

	Bivariate		Boys.
	Coef.	Std. Err. <sup>b</sup>	Coef.
School and grade/gender mates variables			
Average mother's education in school	-.045	.077	-.205
Average single mothers on welfare in school	.770	1.417	1.841
Average single mothers not on welfare in school	-.099	1.306	.351
Average mental health problems index <sup>a</sup>	5.771*	2.201	6.532*
Average expectation of living to age 35 <sup>a</sup>	1.161	1.402	2.415
Average expectation of graduating from college <sup>a</sup>	-.048	.933	2.430
Individual and family characteristics			
Picture Vocabulary Test standardized scores	.002	.005	.005
Mental health problems index	.885*	.453	.231
Age (13-year-old omitted)			
14-year-old	.196	.324	-.070
15-year-old	.423	.301	.097
16-year-old	.512	.281	.062
Physical development			
Hair under arms	1.482*	.325	1.370*
Hair on face	.775*	.309	.276
Voice lower than it was when in grade school	.135	.251	-.234
Family structure (two biological parents omitted) and characteristics			
Two parents other than both biological	.341†	.196	.168
Other (single mom, single dad, other)	-.107	.194	-.410†
Mother's education	-.014	.025	.009
Father's education	-.012	.030	.010
Welfare receipt	-.135	.251	-.275

Race (Non-Hispanic white omitted)			
Non-Hispanic black	.156	.209	.377
Hispanic	.318	.216	.408
Other	.289	.234	-.172
Region (Northeast omitted)			
West	-.209	.223	-.104
Midwest	-.404†	.222	-.467*
South	-.476*	.212	-.382
Urbanicity (rural omitted)			
Urban	-.054	.230	-.220
Suburb	.134	.207	.102
Individual expectations			
Of living to age 35	-1.114*	.270	-.946*
Of graduating from college	-.902*	.254	-.651*
Constant			-5.281*

(n = 2,925)

*Notes:*

<sup>a</sup>Grade and gender specific average.

<sup>b</sup>Robust standard errors, correcting for clustering at the school, gender, and grade level.

Mean of onset of selling drugs: .06. Missing value indicators are included in the regressions for the following health problems index, physical development variables, mother's and father's education, welfare receipt, race.

Source: National Longitudinal Study of Adolescent Health, in-school, wave 1 and wave 2 data.

† p ≤ .10    \* p ≤ .05

Although the breast and body curves physical development indicators are not important in the presence of regression controls, the length of time since first menstruation, controlling for the age at first menstruation, is an important exposure factor affecting onset of first sex. (Note that we cannot include age in the model with our menstruation timing and exposure measures because of high collinearity.)

Individual-level family structure also matters for girls. Girls living in step-parent families and in single-parent or nonparent structures have significantly higher risks of first sex than girls living with both biological parents. This is consistent with literature indicating precocious sexual behavior among girls in step-parent and single-mother families (Wu, Cherlin & Bumpass 1997).

In regard to selling drugs, the results suggest that our expectation measures have a stronger association with subsequent onset of drug selling than conventional demographic measures, and these findings remain in the adjusted regressions of Table 4. At the individual level, more positive expectations of both living to age 35 and graduating from college are associated with a reduced risk of onset of drug selling. Boys with a one standard deviation higher score on the expectancy measure have a 20% lower risk of selling drugs, while boys with a one standard deviation higher score on expectations of college graduation have a 16% lower risk. Worse mental health at the school level has a significant positive association with onset of drug selling. Again, the important physical development indicator for boys that is positively associated with onset of drug dealing is the amount of hair under arms.

Risk behavior involving the onset of weapon use is associated with aggregate and individual expectations for the future in bivariate analysis (Table 5). School contexts characterized by high average expectations of living to age 35 have lower risks of boys using or threatening with a weapon. Boys with more positive expectations of both living to age 35 and graduating from college experience lower risks of onset of weapon use.

Regression adjustments left only the aggregate expectancy coefficient significant, although the individual expectation of college graduation is still marginally significant ( $p < .10$ ).<sup>14</sup> Boys who attend schools with a one standard deviation higher expectation of living to age 35 have a 23% lower risk of onset of weapon use. For this risk behavior, we find that poor student mental health at the individual level is associated with a greater likelihood of using or threatening with a weapon. Finally, the most important physical development indicator that is related to onset of weapon use for boys is the growth of facial hair. Family structure, race, and regional measures had significant bivariate associations with onset of weapon use that were rendered insignificant in the presence of regression adjustments.

We explored possible interactions across the race/ethnicity subgroups in our sample as well as interactions between the individual and school-level measures (not shown — results available from authors). There were no consistent interactions across our set of outcomes. The deterring effect of high expectations of completing college in the onset to first sex model was less for girls in non-Hispanic black and

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“other” race categories (Asian and Native American) than it was for non-Hispanic white girls ( $p$  of log-likelihood test  $< .01$ ). Finally, the combined effect of high expectations of graduating from college at the school and individual levels was marginally ( $p = .07$ ) less than the sum of the main effects for boys in the weapon use models.

### Discussion

This article estimates association between adolescents’ expectations for their future in terms of health and educational attainment and their decisions to engage in risk behaviors involving early sexual intercourse, selling drugs, and weapon use. We argued that adolescents with low expectations would be more likely to engage in risk-taking behavior because the risks they face represent less “loss” than the risks for adolescents with high expectations. We also argued that a school climate in which classmates’ expectations for the future were low would foster greater involvement in risk-taking behavior for individual adolescents in such schools.

Our results are consistent with but not very strong for our “nothing to lose” hypothesis. Across all outcomes there were significant bivariate associations with at least one of the expectation measures and subsequent onset of risk-taking behavior. It is interesting that this result holds across the two sex groups and across the very different behavioral domains in our analysis. Tempering our enthusiasm is the realization that only about a third of these results survived the imposition of regression controls. Bolstering our enthusiasm is that as many subjective measures survived as demographic measures. Thus, these results add to what we know about these behaviors in potentially significant ways.

Risk behavior associated with selling drugs seems to be the most responsive to a “nothing to lose” attitude. Both of our expectations measures are significantly related to subsequent onset of drug dealing. Perhaps the health risks associated with involvement with drugs, as well as the danger of engaging in illegal behavior and of dealing with sometimes desperate and violent drug users are easily perceived by adolescents as potentially affecting their future health and education with severe consequences. In addition, adolescents may have more experience with examples of family members, schoolmates, or friends whose futures have been derailed by involvement with drugs, compared to sexual behavior or weapon use.

The theory of reasoned action argues that youth consider both the benefits and costs associated with engaging in various behaviors, and are likely to avoid those behaviors in which the costs far outweigh the benefits and adopt those behaviors in which the benefits outweigh the costs. All of the risk behaviors that we examine hold some benefits for youth, such as pleasure, status, and income. Evidently the potential losses, in terms of future health and education, are especially salient for drug dealing and far outweigh any benefits associated with income or status that drug dealing may confer. Youth therefore perceive drug dealing as particularly risky.

**TABLE 5: Onset of Use or Threaten with a Weapon for Boys Aged 13 to 16**

	Bivariate		Boys Aged 13 to 16
	Coef.	Std. Err. <sup>b</sup>	Coef.
School and grade/gender mates variables			
Average mother's education in school	.003	.138	.376†
Average single mothers on welfare in school	2.800	1.714	2.895
Average single mothers not on welfare in school	.308	1.950	-1.857
Average mental health problems index <sup>a</sup>	-2.007	3.106	-3.660
Average expectation of living to age 35 <sup>a</sup>	-4.197*	1.837	-4.850*
Average expectation of graduating from college <sup>a</sup>	-.979	1.604	-1.529
Individual and family characteristics			
Picture Vocabulary Test standardized scores	-.009	.006	-.003
Mental health problems index	1.564*	.480	1.365*
Age (13-year-old omitted)			
14-year-old	.005	.279	-.061
15-year-old	-.052	.263	.960*
16-year-old	-.043	.245	-.572†
Physical development			
Hair under arms	.090	.504	-.076
Hair on face	.916*	.378	.986*
Voice lower than it was when in grade school	-.554	.319	-.562

Family structure (two biological parents omitted) and characteristics			
Two parents other than both biological	.572*	.270	.506†
Other (single mom, single dad, other)	.565*	.229	.252
Mother's education	-.021	.034	-.021
Father's education	.033	.044	.080†
Welfare receipt	.347	.287	.074
Race (Non-Hispanic white omitted)			
Non-Hispanic black	.552*	.271	.294
Hispanic	.577	.307	.457
Other	.072	.316	-.098
Region (Northeast omitted)			
West	.017	.299	-.072
Midwest	-.610*	.307	-.487
South	-.190	.257	-.387
Urbanicity (rural omitted)			
Urban	.249	.332	.151
Suburb	.418	.299	.360
Individual expectations			
Of living to age 35	-1.090*	.375	-.466
Of graduating from college	-.984*	.375	-.695†
Constant			-2.367
(n = 2,957)			

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*Notes:*

<sup>a</sup> Grade and gender specific average

<sup>b</sup> Robust standard errors, correcting for clustering at the school, gender, and grade level

Mean of onset of use or threaten with a weapon: .03. Missing value indicators are included in the regressions for violent test, mental health problems index, physical development variables, mother's and father's education, well-being, and life satisfaction.

Source: National Longitudinal Study of Adolescent Health, in-school, wave 1 and wave 2 data.

† p ≤ .10 \* p ≤ .05

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Although our analysis focuses on risk behavior, the theory of reasoned action applies to prosocial behavior as well (Ajzen & Fishbein 1980). For example, adolescents with high expectations for educational achievement might adopt good study habits, choose an especially demanding course sequence in high school, or engage in intellectual extracurricular activities. We employ the theory of reasoned action, however, to understand why some adolescents avoid risk behavior and others engage in it in the natural course of adolescent development.

An important context for risk behavior in adolescence is the school and school-level characteristics appear to matter, even when adjusted for the individual-level counterpart measure. Omitted variable (at the individual level) bias is still possible, but these results suggest that one should pay attention to school-level conditions. Our main findings reveal that it is not socioeconomic status (i.e., mother's education) that matters, but rather "school climate" (expectations and mental health) and, for first sex, family structure. These results have implications for policies that might positively affect school climate.

The only significant contextual effect of expectations was found for onset of weapon use among boys. In a school climate characterized by students who do not expect to live beyond age 35, taking risks, such as threatening to use a weapon or carrying and using a weapon, would appear to have fewer consequences than such risk-taking in a school climate where most students do expect to live into middle adulthood.

The importance of family structure variables at both the family and school level in the onset of sexual activity regressions is striking. The family-level step-parent and single-parent results have been found in prior research (McLanahan & Sandefur 1994; Wu, Cherlin & Bumpass 1997). New here is that school-level family structure matters in addition to the individual-level family circumstances. The theoretical literature on contextual effects suggests several possible mechanisms. Role modeling influences through the prevalence of single-mother families among friends and classmates and the lack of responsible and successful male role models may socialize youth to view early sexual behavior as expected and of little consequence for their future (Wilson 1996). A climate in which many families are headed by single mothers creates a normative environment that finds nonintact family structures more acceptable. In addition, the collective absence of fathers from families and mothers who may work reduces the supervision and monitoring of adolescents and makes it easier for youth to engage in risk behavior with fewer social controls (Dornbusch et al. 1985; Hogan & Kitagawa 1985).

Role modeling and collective supervision mechanisms associated with the prevalence of single-mother families in a school seem to influence boys' transitions to sexual activity regardless of the economic status of such families. For girls, however, the prevalence of single-mother families in a school is important only to the degree that such families are poor, as indicated by welfare receipt. Since a lack of collective supervision associated with father absence and working single mothers in the families of classmates and peers would operate regardless of family poverty

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status, perhaps supervision mechanisms are especially important for boys' sexual behavior, and role-modeling mechanisms associated with the prevalence of welfare mothers are especially important for girls' sexual behavior.

We also note the importance of school-level and individual-level mental health in all domains of risk behavior studied here. Aggregate mental health problems in a school increase the risks of onset of first sex for girls and drug dealing for boys. Individual-level mental health problems increase the risks of onset of first sex for boys and girls and using or threatening to use a weapon for boys. A climate of poor student emotional health and individual depressive symptoms are likely to diminish youths' aspirations and hopes for their futures, reducing perceived risks associated with unhealthy or dangerous behaviors. Our research suggests that policies focused on youth mental health could be effective in curbing involvement in risk behavior. Interventions designed to identify mental health problems among youth and improve the emotional health of youth in schools are certainly more feasible than programs to address family structure or poverty status.

Finally, the unpredictability of the weapon use outcome is surprising. James Q. Wilson, Richard Herrnstein, and others have emphasized the role of IQ in criminal behavior (Wilson & Petersilia 1995). Herrnstein's chapter in Wilson and Petersilia's 1995 book, *Crime*, states: "After sex and age, the single most firmly established psychological fact about the population of offenders is that the distribution of their IQ scores differs from that of the population at large" (p. 54). Even our bivariate evidence fails to support any such link. Perhaps this discrepancy can be explained by a difference between who commits crimes and who gets caught and convicted. It is possible that adolescents who *report* weapon use are those adolescents who do not get caught or get in trouble with the law. Perhaps cognitive ability interacts with age such that the relationship between IQ and violent behavior is only important beyond the adolescent ages. The research on delinquency and problem behavior indicates that delinquent behavior is more common in adolescence than in adulthood, reflecting the exploratory nature of adolescence. Most adolescents abandon negative behaviors as they make the transition to adulthood, presumably because the risks of negative consequences are greater than any present benefit of delinquent behavior. Thus, those who become adults and are still engaging in negative and delinquent behaviors are selectively different from the more heterogeneous group of adolescents who have yet to seriously invest in their life careers.

#### Notes

1. As we detail in subsequent notes, when we relax this constraint by including youth of all ages in our analyses, we obtain similar results. We maintain this constraint because certain behaviors, such as sexual intercourse, are ambiguous "risk behavior" at the older adolescent ages.

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2. Schools were stratified by region, urban/rural status, school sector type (public, private, parochial), ethnic mix, and size.

3. Some high schools spanned grades 7 through 12 and therefore served as their own “feeder” school, so the “pair” was in fact a single school. There are 134 discrete schools in the study.

4. We examined the age distribution of involvement in various risk behaviors at wave 1 to identify the age groups of boys and girls in which less than 10% of adolescents had engaged in the behavior.

5. When we relax this constraint and include youth who experience onset of the risk behavior at older ages, our results remain nearly identical. We never truncate our sample at the young ages because less than 10% of the youngest adolescents have engaged in each risk behavior.

6. To examine potential selection bias due to the exclusion of adolescents who had already engaged in the risk behavior by wave 1, we used a Heckman sample selection correction in models with all adolescents to estimate our substantive equation conditional on a selection equation of not engaging in the risk behavior by wave 1. The Heckman models produced the same results as our single equation model, probably because we eliminate very few young adolescents who had already engaged in the risk behavior by wave 1.

7. At the individual level, mental health is closely linked to risk taking behavior; at the aggregate level, collective feelings of positive well-being, or hopelessness at the other extreme, should create a climate for different evaluations of loss associated with risk for individuals in each climate. This type of school climate measure is intriguing and no study has had a good measure of it before.

8. We use same-sex grademates as the normative group for measuring collective expectations and mental health problems because adolescents primarily relate to their peers in developing their aspirations and feelings of hope or despair; but we use the entire school as the relevant context for collective supervision because the presence of parents as a supervision mechanism operates at the broader neighborhood level in which students from a school live and where parents monitor kids’ social activities and time with friends.

9. Adolescents’ expectations of living until age 35 are somewhat lower than the reality of their longevity. National estimates of the actual likelihood that adolescents in these ages will live to age 35 based on census and vital statistics data indicate that well over 95% of both male and female adolescents aged 13 to 18 should live to age 35. For instance, among adolescents alive at age 13 in 1993, 96.4% of males and 98.7% of females will survive to age 35 if the prevailing rates of mortality were to continue for the next 22 years. Among 18-year olds in 1993, 96.9% of males and 98.9% of females will live to age 35 (National Center for Health Statistics 1995, Table 6-2).

10. Missing values can result from the typical item nonresponse, but also from the fact that some respondents did not participate in all interview components of the complex Add Health survey design that we exploit in this analysis. For example, some adolescents in sampled schools were absent on the day of the in-school interview administration, but were sampled from the school roster and participated in the in-home interview.

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These adolescents will not have in-school data, but will have in-home data. Not all adolescents in the in-home sample have parent data. A few cases had missing school codes and could not be linked to our school census variables. Because we are focusing on the onset of risk behavior and limiting our sample to the younger adolescents, we felt that it was important to maintain as many cases as possible and minimize bias from missing values in this way.

11. The interpretation of the coefficients on the school-level measures is aided by a reference to the standard deviations listed in the final column of the table. In the case of grademate expectations of graduating from college, the standard deviation is .069, indicating a rather narrow range of average expectations across the sampled schools. The “-3.218” coefficient is based on a one-unit (i.e., zero to one in this case) change in each independent variable, which, for this and several other school measures, is well beyond the sample range. In the case of the aggregate expectations measures, it makes more sense to translate the coefficient by multiplication by the sample standard deviation. Since the product of -3.218 and .069 is -.222; the bivariate regression in Table 1 indicates that a one standard deviation increase in aggregate expectations of attending college is associated with a 20% (i.e.,  $1 - e^{-.222}$ ) decrease in the relative risk of engaging in first sex.

12. The loss of significant effects is not due to multicollinearity.

13. Again, school-level expectations are not significant in the presence of other school and family context measures, and individual expectations of living to age 35 lose significance once we adjust for family structure and father’s education.

14. No one variable or theoretical group of variables are responsible for eliminating the significance of our individual expectations measures found in the bivariate analysis.

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