

CONTEXTUAL MEDIATORS BETWEEN ADOLESCENT SEXUALITY AND
NEGATIVE OUTCOMES

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These three papers form an argument that youths' sexual behavior and sexual-minority orientation are associated with negative outcomes of alcohol use, depression, and suicide via negative changes in perceived contextual support. They employ data from the first two waves of the National Longitudinal Survey of Adolescent Health (collected 1995 & 1996, Wave I N = 18,924, Wave II N = 13,570, <http://www.cpc.unc.edu/projects/addhealth>).

The first paper demonstrates reciprocal effects over one year between adolescent sexual activity and shared activities with opposite-sex parents, closeness with same-sex parents, and more problem-focused interactions with both parents. The second paper finds that initiating or continuing sexual activity predicts reduced integration with the school environment, increased number of close friends who use alcohol, and increased problem-focused interactions with parents. It is additionally associated with lower personal religiousness for young women only. The second paper finds further that ceasing sexual activity did not forestall negative changes in contextual supports, as the first paper's results implied, but rather that negative changes continued. The second paper also finds that levels of context factors significantly mediate the relationship between sexual activity and each of depression, suicidality, and alcohol use.

The third paper, using only Wave I data, applies the first two papers' contextual mediation concept to explain mental health risks associated with same-sex, both sex, and opposite-sex romantic attraction, dating, and sexual behavior. After testing every combination of subject's gender, object's gender, and domain of

expression for associations with depression and suicidality, the third paper finds several patterns – sexually/romantically active female, sexual-minority, and non-virgin – consistently associated with depression and suicidality. These patterns are suggested to be associated with risk because they impart stigmatized status to youth that impedes their access to needed social supports.

A theoretical model is advanced asserting that stigmatization of youth sexuality leads to both mental health risk and greater likelihood of risk behavior, the latter of which leads to even greater stigmatization and even greater likelihood of risk behavior. This model suggests that increasing support for non-virgin and sexual-minority youth and decreasing stigmatization of them would be most helpful approach for their health.

BIOGRAPHICAL SKETCH

Geoffrey L. Ream, a native of Kalamazoo, MI, graduated from the University of Michigan (Ann Arbor campus) with a Bachelor of Arts in 1999, majoring in psychology. In Fall 1999, he entered the graduate program in Human Development at Cornell University. He defended his Master's Thesis (entitled *The Development of Intrinsic Religious Commitment and Religious Participation in Young Adulthood, and the Religious Development of Gay, Lesbian, Bisexual, and Questioning Adolescents*) and passed his admission to candidacy examination in Summer 2001. His special committee for both Master's Thesis and Doctoral Dissertation defenses included chair Ritch Savin-Williams, with whom he has several papers published and in process, and minor members Elaine Wethington and Richard Darlington. Geoffrey Ream's early work focused on religion as a risk and resiliency factor for sexual-minority youth and broadened to include religion's role in positive youth development and contextual determinants of youth risk behavior and psychological health. He earned the prestigious Olin Presidential Fellowship, one of only eight awarded university-wide, for the 2000-2001 school year, and was one of two pre-doctoral students to receive the Roy Scrivner Memorial Research Grant from the American Psychological Foundation in 2003. He has reviewed for several journals, served as research assistant to Caitlin Ryan at San Francisco State University and Rachel Dunifon at Cornell, and worked on projects with Richard Lerner at Tufts, Stephen Russell at the University of Arizona, and Stephen Hamilton, Steve Ceci, and Wendy Williams at Cornell. He also served as Chair of the Steering Committee of the Episcopal Church at Cornell in 2002-2003 and was on the first steering committee for the Vocare program of the Episcopal Diocese of Central New York.

After Cornell, he will be a postdoctoral fellow at National Development and Research Institutes in New York City.

To Walter M. Ream, 1926-2003

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CHAPTER ONE

INTRODUCTION

The three papers that comprise this dissertation form an argument that social context is part of the explanation for why adolescent sexual activity and sexual-minority status are associated with negative health outcomes. Using data from the first two waves of the National Longitudinal Study of Adolescent Health (Add Health, Udry & Bearman, 1998), collected in 1995 and 1996 (age range at Wave I between 11 and 21 years, mean age 16), they test hypotheses regarding how relationships with parents, religion, school, and peers affect and are affected by the incidence of youth sexual activity, and also examine the extent to which context mediates the relationship between sexual activity and negative outcomes and apply a contextual explanation to the differential relationships of negative outcomes to same-sex, opposite-sex, and both-sex attraction, dating, and sexual behavior. They use the general framework of problem behavior theory (Jessor & Jessor, 1977) revised to include positive viewpoints of differential developmental trajectories (Savin-Williams & Diamond, 1999) and normative developmental perspectives on adolescent dating and romance (Welsh *et al.*, 2003). This introduction describes that synthesis of perspectives and how it guided the specification of hypotheses for the three papers.

Problem behavior theory (Jessor & Jessor, 1977) grew out of concern for adolescent problem behavior in the youth movements of the 1960s and 1970s. Problem behavior itself was not, by definition, necessarily evil, immoral, or unhealthy. Rather, problem behavior “refers to behavior that is socially defined as...undesirable by the norms of conventional society and the institutions of adult authority, and its occurrence usually elicits some kind of social control response” (Jessor & Jessor, 1977, p. 33). The Jessors’ original work classified activist protest as a problem behavior along with substance use and sexual intercourse, which would not make

sense in terms of modern perspectives which consider youth activism and volunteerism to be positive developmental outcomes (Youniss *et al.*, 1999). This is not evidence that problem behavior theory is outdated, but rather that what fits the definition of a problem behavior can be historically and culturally dependent.

Problem behaviors, in the Jessors' work, are also usually status offenses against social norms, i.e., behaviors that are defined as problems when youth do them but would not get adults in nearly as much, if any, trouble. Adolescents engage in problem behavior despite the social control response because, according to both the Jessors themselves and researchers who built upon their work (Udry, 1990; Udry & Billy, 1987), problem behaviors are part of the search for autonomy, a "strain toward maturity" in which adolescents attempt to attain adult goals and status by engaging in adult-like behaviors. Society is held to keep several dimensions of adult status in view of adolescents and yet just out of their reach.

Adolescence, after all, represents a socially structured position in a larger, age-graded system, a position that is marginal and that can be characterized most poignantly by its limited access to valued goals, whether those of personal autonomy, or economic self-sufficiency, or sexual gratification, or unrestrained mobility. At the same time, the larger system is unremittingly emphatic about the value of such goals and exhorts all its members to strive for them. The consequences in frustration, rebellion, or despair are not difficult to foresee, and such reactions are not foreign to the phenomenology of adolescent experience. (Jessor & Jessor, 1977, p. 7)

The central logical prediction made by problem behavior theory is that the marginal status of adolescents in society (in Bronfenbrenner's [1979] ecological systems typology, a macrosystem-level influence) is felt, to various

degrees, by adolescents themselves, through their connections to people and institutions which they perceive clearly and to which they relate directly – e.g., parents, peers, school, and religion. The Jessors (1977) called this the “perceived environment system,” a construct that basically means a youth’s-eye view of the microsystem (people and institutions with whom the youth relates directly) and mesosystem (relationships between people and institutions with whom the youth relates directly, see Bronfenbrenner, 1979). Youth who perceive themselves to be disconnected from or receiving little support from the perceived environment system, with conventional paths to their goals blocked, are more likely to attempt to achieve adult goals through unconventional means, i.e., by engaging in problem behavior.

Although there has been significant social change since problem behavior theory first emerged, problem behavior theory is still relevant. The idea that perceived lack of connection or strained connections with social supports leads to degenerate behavior was not new when the Jessors proposed it (see Durkheim, 1897/1966; Merton, 1957), and problem behavior theory has received empirical support since (Lynch, 2001). One of its key presuppositions, the inherent marginalized status of youth, definitely remains part of current thought on adolescence. Steinberg, in his textbook, calls it the “paradox” of adolescence that youth “have been asked to become more autonomous psychologically and socially” while “they have become less autonomous economically” (Steinberg, 2005, p. 298). Among the social forces bearing upon this has been the absence, relative to other industrialized countries, of institutions that would help youth transition from school to skilled trade work (Hamilton, 1990) and the increasing years of school required to obtain a job that would afford economic security and self-sufficiency. Sociologist Côté lays the blame for this squarely on social disorganization evident in institutions such as secondary

schools that would normally be responsible for helping youth become self-sufficient. High school, in his view, has become a “waste of time,” and youth, importantly, perceive this clearly. Côté perceives the unique life stage of “emerging adulthood” to be nothing more than the adolescent quest for autonomy stretching into people’s twenties because social disorganization continues to thwart it (Côté & Arnett, 2005).

Youths’ goals for intimacy and romance are, arguably, the most often-thwarted of all. Through support of abstinence-only sexuality education, society exerts normative pressure against youths’ engaging in adult-like intimacy. Beyond this, it demonstrates, by virtue of the fact that most abstinence-only curricula contain factual inaccuracies and say nothing about homosexuality (Waxman Report, 2004), unwillingness to trust youth, as independent decision makers, with correct information. Because the social forces and conditions that problem-behavior theory presupposes remain in place in society, problem-behavior theory remains a viable starting place for examining predictors and outcomes of youths’ sexual activity.

Although problem-behavior theory is not obsolete, it is incomplete as an explanation for the relationship between youths’ sexual activity and levels of contextual supports. It does not accommodate alternative developmental pathways like the one often identified in literature on sexual-minority youth, i.e., the behavior does not necessarily follow from but rather leads to the stigmatized social status. Nor does it accommodate alternative social meanings of the behavior, often found in other cultures in which adolescent male virility must be expressed through sexual conquest (Asencio, 2002). It does not accommodate alternative motivations for the behavior, such as hormone levels (Udry, 1990) or developmental functions of it, such as the achievement of developmental tasks with respect to intimacy and identity in general (Sullivan, 1953) or sexual-minority identity in particular (Savin-Williams, 1998). Therefore, in order to obtain a more multidimensional view of the phenomena under

study, this work had to incorporate other perspectives, elaborating upon the general framework of problem-behavior theory.

Normative developmental perspectives on adolescent romance and dating (Welsh et al., 2003) emphasize the importance of the context and meaning of romantic involvement and sexual activity. They also acknowledge that intimacy, including romantic intimacy, plays an important role in the development of self and identity, although they do not go as far as to say that sexual intercourse is necessary for a healthy path through adolescence. They also recognize that there is not necessarily any ulterior motive or pathology to adolescents' motivations to engage in intimate behaviors. After all, in a society that purportedly worships youth and youth sexuality, it is somewhat questionable to assert that young people necessarily have sex in order to achieve what adults have, when any informed consumer of popular culture sees several adults overt in their quest to achieve what young people have. This is probably not lost on young people, who may be disinclined to "wait" as the adult world would like them to when it offers them nothing certain to wait for except age.

Differential developmental trajectories theory (Savin-Williams & Diamond, 2000) similarly holds that not all youth follow the same developmental path with respect to the same issues. This perspective grew from a need of sexual-minority youth research to move beyond belaboring the point of group mean differences in stressors and negative life outcomes between sexual-minority youth and heterosexual youth by considering which sexual-minority youth are at risk, and why, so that specific environmental and personal stressors causing their life issues can be addressed and that whatever stress they may be under might not be automatically attributed directly to their sexual-minority status. Savin-Williams warns that scientists and clinicians who do not consider the diversity of sexual-minority youth experience may "have actually *repathologized* homosexuality by portraying gay teenagers as

exceptionally vulnerable individuals leading high-risk lives” (Savin-Williams, 2005, p. 183, emphasis in original). The three papers in this dissertation apply a similar critique to the status of non-virginity, dispensing with the assumption that sexual activity is inherently risky and asking rather under what circumstances is sexual activity associated with risk.

Even in research using these more positive perspectives, many of the more compelling findings have to do with psychological and behavioral risk. In her comments as a symposium discussant at the 2nd annual conference on Emerging Adulthood, Welsh theorized that this is because adolescence researchers generally have much more practice at measuring risk than at measuring desirable developmental outcomes (Welsh, 2005). When applied to sexuality and risk questions, though, positive perspectives provide several improvements over a pure problem behavior theory perspective. Sexuality and sexual behavior become multidimensional in their expression and suffused with differential meaning and function depending on personal characteristics and social contexts, which are aspects of an individual’s environment that are readily perceived by the individual and which work through or with personal characteristics to affect life quality and health outcomes. The roles of contexts are less fixed too, in that they can be either supportive or stressful.

This synthesis of problem behavior and positive perspectives is evident in how the hypotheses of the three papers were structured. Paper #1, “Reciprocal Associations between Adolescent Sexual Activity and Quality of Youth-Parent Interactions,” and Paper #2, “The Role of Diminishing Environmental Supports in Explaining Associations between Sexual Activity and Psychological/Behavioral Risk,” follow the rationale of problem behavior theory to the point of hypothesizing that weak contextual supports predict sexual activity. They factor in, however, a hypothesized effect often found and more often assumed about sexual-minority youth:

parents and other youth-serving contexts respond to being confronted with a youth's emerging sexuality by becoming less supportive of the youth. Conjoining the two expectations, Papers #1 and #2 specify bidirectional effects over the first two waves of Add Health in which reduced environmental support predicts sexual activity which, in turn, predicts the further reduction of environmental supports.

They are set up, however, to serve positive perspectives as well. Specifying a bidirectional effect between sexual behavior and environmental supports frees sexual activity from its usual role in problem behavior research as a dependent variable. Context factors can affect likelihood of sexual activity, which is the hypothesis that is normally tested in problem behavior theory research (Costa *et al.*, 1995; Lynch, 2001), or sexual activity can affect context factors and health outcomes, which is the hypothesis that is normally tested in research using normative developmental perspectives (Welsh *et al.*, 2003). Sexual activity need not be associated with problematic outcomes at all, hypothesizes Paper #2, except for the effect of context and its effects *on* context. The personal meaning and social implications of the behavior become central to determining both the likelihood of the behavior and its effect on the adolescent's life.

Paper #3, "Differential Associations with Adolescent Suicidality of Same-Sex and Opposite-Sex Attraction, Dating, and Behavior," applies the contextual argument articulated in papers #1 and #2 to findings on sexual-minority youth and also applies differential developmental trajectories theory. Previous research has linked psychological distress with every phase of adolescent dating and romantic attraction (Welsh *et al.*, 2003) and with seemingly every possible operationalization of sexual-minority status (Russell, 2003; Russell & Consolacion, 2003). It made sense to ask whether the special distress experienced by sexual-minority youth is attributable to

sexual-minority status period, or to romantic and sexual attractions and behaviors by which this population is defined.

Paper #3's hypotheses were guided by insights gained from Papers #1 and #2. *All* orientations and combinations of romantic/sexual attractions and behavior were expected to be correlated with suicidality, first because of the inherently stressful nature of adolescent romance (characteristic of reasoning based on normative developmental perspectives) and then because some impart to youth a stigmatized social status (characteristic of the revision of problem behavior theory explaining the results in Papers #1 and #2). Taking the recommendations of differential developmental trajectories theory, however, all permutations were tested without building any presumptions about dimensions of risk into the analyses, allowing for the possibilities that same-sex expressions may not be related to higher levels of risk than opposite-expressions, and that some may be related to similar or lower levels of risk than non-involvement with romance and sexuality.

Together, these papers synthesize a theory of the relationship between adolescent sexual activity, psychological/behavioral risk, and context factors that draws together problem-behavior theory and positive perspectives on the development of sexual-minority youth and heterosexual youth. Lack of a felt connection with context makes youth more likely to turn to romantic and sexual involvement, not necessarily to achieve adult goals but to master developmental tasks. Romantic and sexual involvement entails socially stigmatized status as a non-virgin, a sexual-minority, or a romantically/sexually active female. This stigmatized status adds to their problems, making them not only more likely to engage in sexual activity but to experience greater levels of psychological and behavioral risk. Recommendations follow, as they often do in practical research on sexual-minority youth, to aim interventions at schools, peer groups, religious organizations, and parents to forestall

stigmatization of youth sexuality (not just homosexuality) and keep support in place for youth who may or who do become sexually active.

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CHAPTER TWO
RECIPROCAL ASSOCIATIONS BETWEEN ADOLESCENT SEXUAL ACTIVITY
AND QUALITY OF YOUTH-PARENT INTERACTIONS

Geoffrey L. Ream and Ritch C. Savin-Williams

Abstract

The authors examined differences in adolescents' relationships with their parents before and after adolescent first sexual activity. Participants were 13,570 members of the core sample of the National Longitudinal Survey of Adolescent Health (Add Health) Waves 1 and 2. Path analyses examined changes in parent–adolescent closeness, shared activities, and problem-focused interactions associated with changes in sexual activity separately for sons and daughters and for mothers and fathers. Race, religion, age, urbanicity, and parents' education were controls. Results confirm that increased problem-focused interactions and decreased parental closeness and shared activities both precede and follow adolescent sexual activity. Maintaining positive parental relations after adolescent first sexual activity is discussed as a means to reduce risks associated with sex.

First sexual activity changes adolescents' relationships with family members. Research has produced substantial evidence that family support and involvement delay youths' first sexual activity (Capaldi, Crosby, & Stoolmiller, 1996; Crockett, Bingham, Chopak, & Vicary, 1996; Hogan, Sun, & Cornwell, 2000; McNeely et al., 2002; Miller et al., 1997) but is only beginning to explore the question of how adolescents' relationships with family members change after the onset of sexual activity. If parental support decreases after adolescent first sexual activity, this loss of support might well place youth at risk for a downward spiral in which problem behavior increases as supports fall away (Benda & Corwyn, 1998; Benda, Corwyn, & Toombs, 2001; Davies & Windle, 2001; Windle, 2000). This study addresses how supportive aspects of the parent relationship change in relationship to adolescents' sexual behavior.

Several theories explain the role of family support in delaying and preventing first sexual activity. A youth's sexual behavior is traditionally regarded as one symptom of a syndrome of deviance or *problem behaviors* (Miller & Fox, 1987). Family is one of many agents of *social control* capable of preventing problem behaviors (Benda & Kashner, 1994). According to social control theory, deviant behavior should elicit a *control response* from the parents (R. Jessor, 1982). However, research has not yet addressed specifically how a control response to adolescents' sexual activity manifests itself in observable changes to the youth–parent relationship.

National health statistics indicate that this control response from parents and other concerned adults has not proven sufficient to prevent most adolescents from having sex during their teenage years, and neither has health education (Manlove et al., 2001). Adolescents' motivation to have sex often proves stronger than social control. Their physical maturity, both actual and self-perceived, is associated with their sexual activity, as is lack of restraint with respect to other risk behaviors

(Halpern, Udry, & Suchindran, 1997; Rosenthal, Smith, & de Visser, 1999). A “strain toward maturity” explanation for these findings proposes that, in having sex, adolescents may be pursuing autonomy by intentionally crossing adult-imposed boundaries and engaging in adultlike behaviors (Udry, 1990; Udry & Billy, 1987). This theory complements traditional social control perspectives by ascribing agency to adolescents and acknowledging that social control is not unidirectional. Through responding to their natural desires, asserting their own sense of proper behavior, and positioning themselves to draw on peers and romantic partners for support rather than on parents, adolescents are making a control response of their own (Kalof, 1995; Kinsman, Romer, Furstenberg, & Schwarz, 1998; Reiss, 1967).

A family system perspective, often used in work on sexual-minority youth (Savin-Williams, 1998; Savin-Williams & Ream, 2003), further explains how a youth’s sexual activity changes the dynamic of the parent–adolescent relationship. From a typical parent’s perspective, adolescent sexual activity transgresses parental control and makes it difficult to regard the adolescent as a child. Further, to the extent that parents perceive their son or daughter to have engaged in sex consensually or at least to have willingly entered a situation where such behavior could happen, the adolescent is understood to have placed him- or herself at risk, thus thwarting parents’ efforts to protect their child. Thus, adolescents’ emerging sexuality, expressed in sexual activity, forces parents to think about them differently (Udry, 1990; Udry & Billy, 1987). Their strain toward maturity should produce observable differences in the pattern of family interaction, such as reduced closeness in and satisfaction with relationship to parents, fewer activities shared with parents, and more interactions with parents focused on the adolescent’s life issues.

Longitudinal data provide an opportunity to test hypotheses about changes in the family relationship after a youth’s first sexual activity. According to social control

theory, diminished parental closeness and increased problem-focused interactions should both precede and follow a youth's sexual involvement. If the "problem behavior" continues, social control theory (R. Jessor, 1982) predicts that the control response will continue as well, resulting in greater problem-focused interactions, such as arguing about behavior. The strain toward maturity perspective further predicts that the parent-child bond will weaken, resulting in reduced everyday parent-child interactions, such as shopping together (Meier, 2004), and lower youth-rated parental closeness (Rosenthal et al., 1999; Udry, 1990). Identifying distinct and simultaneous effects of parent relations on sexual activity and effects of sexual activity on parent relations would establish a *reciprocal effect* of the type that other work has observed between sexual activity and educational aspirations (Schvaneveldt, Miller, Berry, & Lee, 2001) and between parent relations and delinquency (Jang & Smith, 1997).

Although several factors associated with adolescent sexual behavior that a well-developed research literature has already established could be tested as explanations for changes in the parent relationship after an adolescent's first sexual activity, in this study we seek to take a first step and establish that such trends exist and are measurable. We used data from two time periods within the participants' adolescence, 18 months apart, including quality of parental relationship at Time 1 and Time 2, and sexual behavior that occurred before Time 1 and between Times 1 and 2. To evaluate the predictions described above, we tested three hypotheses. They are arranged in a recursive pattern to reveal changes in the youth-parent bond related to a youth's sexual activity:

Hypothesis 1: Sexual involvement before Time 1 predicts lower Time 1 parental closeness, lower Time 1 shared activities with parents, and higher Time 1 problem-focused interactions with parents.

Hypothesis 2: Lower Time 1 parental closeness, lower Time 1 shared activities with parents, and higher Time 1 problem-focused interactions with parents predict sexual involvement between Times 1 and 2, controlling for sexual involvement before Time 1.

Hypothesis 3: Sexual involvement between Times 1 and 2, controlling for sexual involvement before Time 1, predicts lower Time 2 parental closeness, lower Time 2 shared activities with parents, and higher Time 2 problem-focused interactions with parents, all controlling for Time 1 levels of corresponding parental relationship variables.

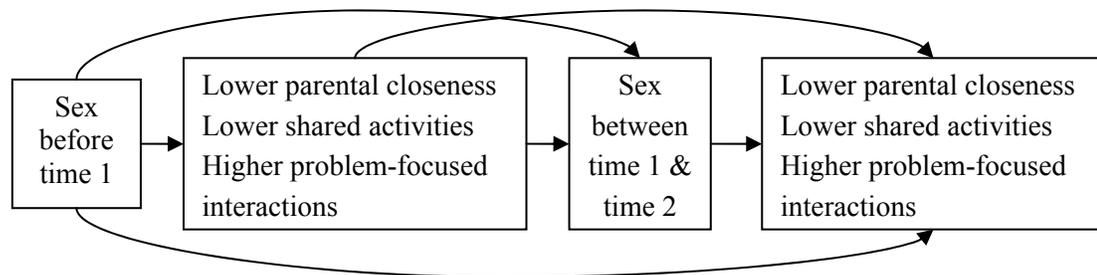


Figure 2.1: Illustration of Study Hypotheses

Figure 2.1 illustrates the three study hypotheses. The hypotheses follow the strain toward maturity expectation in that all three indicators of parent interaction should reveal diminished relationship quality associated with both first sexual activity and continued sexual involvement. Although there is little reason to suspect differences in findings based on gender of parent, gender of adolescent, or any interaction between the two, the sample was large enough to examine this question, by running separate analyses for mothers and daughters, mothers and sons, fathers and daughters, and fathers and sons. Thus, the unit of analysis is parent–adolescent dyad, not individual adolescent. Earlier findings with respect to gender differences have

been mixed, with some reporting significantly divergent patterns of predictors of first intercourse between young men and young women (Udry & Billy, 1987) and others reporting that the pattern of effects is similar (Rosenthal et al., 1999). In either case, there is little to guide hypotheses regarding how gender differences in adolescents' motivations to have sex will filter through measures of family interaction. Finally, in order to establish the utility of these models in light of competing alternative explanations, in all analyses we controlled for participant age, race, religion, whether only one parental figure was present in the home, urbanicity of the participant's school, and the parents' education.

Method

Participants and Recruitment

Data for this study were drawn from the National Longitudinal Survey of Adolescent Health (Add Health; Udry & Bearman, 1998a). Recapitulated here, the design and method of Add Health are described in greater detail elsewhere (Udry & Bearman, 1998b). The study assessed contextually mediated positive and negative effects on adolescent (Grades 7–12) health on the individual, family, and school levels, with significant information gathered on peer–peer and parent–youth dyads. The primary sampling frame was school based, with a nationwide sample of 80 high schools selected and a 70% response rate. Comparable replacement schools were selected for schools that declined to participate. If the recruited high school did not contain Grades 7 through 12, younger students were recruited from middle and junior high schools that fed into the sample high schools. Thus, a total of 132 public and private schools in a total of 80 communities participated.

In selecting students to participate in the in-home interviews, the within-school sample was split into gender-by-grade strata, and a random sample was taken within each stratum. Roughly 17 students per stratum per school pair were selected,

for a total of 12,105 students in the core sample. Special oversamples of Chinese, Cuban, Puerto Rican, disabled, twins, and Black youth with at least one parent holding a college degree were also collected. Additionally, the entire student body of 16 diverse schools was selected for in-home interviews to provide data on peer networks. The total Wave 1 in-home interview sample included 20,747 individuals. At Wave 2, 14,738 participants were successfully re-contacted and re-interviewed. Members of the special disabled oversample and those who had graduated since wave 1 were not re-contacted.

To be included in the current sample, cases had to have a valid grand sample weight value ($N = 13,570$), indicating a positive probability, however small, of inclusion in a national probability sample of American adolescents. Cases also had to have valid data on both Wave 1 and Wave 2 questionnaires. Finally, cases with logical inconsistencies in their reporting of sexual history (e.g., reporting having had sex in one part of the questionnaire but not listing any partners in a detailed relationship history, or reporting having had sex at Time 1 but reporting never having had sex at Time 2) were dropped. Two cases had invalid data for gender. Of 6,612 total cases of young men and 6,956 total cases of young women, 369 and 363, respectively, dropped out owing to missing data on controls. An additional 517 young men and 456 young women had no data for mother, and 1,910 young men and 2,303 young women had no data for father. Logically inconsistent data were provided by 1,293 young men and 956 young women, resulting in loss of data for 1,080 mother–son, 806 mother–daughter, 739 father–son, and 502 father–daughter dyads. The final sample for these analyses included 4,895 young men and 5,512 young women in 4,646 mother–son dyads, 5,331 mother–daughter dyads, 3,594 father–son dyads, and 3,788 father–daughter dyads.

Regarding the inclusion and exclusion of cases and independence of observations, consistency and validity of self-report data on sexuality are always suspect (Catania, 1999). Previous analysis of inconsistent reporting in the Add Health data set concluded that inconsistent responding with respect to the timing of sexual activity does not substantially change findings (Upchurch, Lillard, Aneshensel, & Li, 2002). Other analyses, however, found several differences on background and outcome variables between inconsistent and consistent responders and contend that their experience is probably not the same (Ream & Savin-Williams, 2003). The present study includes only consistent responses, leaving the difficult question of inconsistency to future work. Even with this stringency, a survey-corrected 0.12% of cases are still suspect because participants report having had penile–vaginal intercourse but all sexual partners they listed were of the same gender. Finally, a survey-corrected 18.6% of the core sample is also part of various genetic samples—twins, siblings, and so forth—and those whose counterparts in the genetic sample are also in the core sample compose pairs of respondents who reported on the same parent. This compromises the independence-of-observations assumption of regression and raises the probability of Type I error, and survey estimation, already controlling for the nonindependence of observations within communities and regions, cannot fully address this difficulty.

Measures

Parental closeness. Participants completed four measures, one per wave per parent, of 5-point Likert scale items regarding the quality of their parental relationships. All four measures had five items in common: “How close do you feel to your mom/dad?” (1 = *not at all*, 5 = *very much*); “How much do you think he/she cares about you?” (1 = *not at all*, 5 = *very much*); “Most of the time, your mother/father is warm and loving toward you” (1 = *strongly disagree*, 5 = *strongly*

agree); “You are satisfied with the way your mother/father and you communicate with each other” (1 = *strongly disagree*, 5 = *strongly agree*); “Overall, you are satisfied with your relationship with your mother/father” (1 = *strongly disagree*, 5 = *strongly agree*). These five items form the four parental closeness scales (for mother relationship, Time 1 $\alpha = .84$, Time 2 $\alpha = .88$; for father relationship, Time 1 $\alpha = .83$, Time 2 $\alpha = .87$).

Parent shared activities and parent problem-focused interactions. Participants were asked, “Which of the things listed on this card have you done with your [parental figure] in the past 4 weeks?” and handed a list of 10 activities. They answered this item for both a mother figure (if present) and a father figure (if present) at both waves. Each activity was coded 1 if selected and 0 if not. By themselves, each of these responses provides little information about an enduring pattern of parent–adolescent interaction. Together, however, they constituted two formative indicators of more general patterns. In formative indicators, items are not redundant, and all items of a scale together are required to form a construct (Bollen & Lennox, 1991; Diamantopoulos & Winklhofer, 2001). Therefore, interitem correlation and reliability were not expected to be high and did not need to be high to produce a valid construct. Five items—went shopping, played a sport, attended religious service, worked on school project, and went to movie—formed the shared activities index. Three—discussed personal problem, argued about behavior, and talked about life—formed the problem-focused activities index, so named because these interactions are focused on problems but are not necessarily problematic or detrimental. Originally developed by Geoffrey L. Ream, these constructs have appeared in other work (Meier, 2004).

Sexual activity. One part of the computer-aided self-interview asked participants, “Have you ever had sexual intercourse?” as a yes-or-no question. For a case to be included, answers had to be consistent with responses in another section,

which solicited detailed responses for up to six romantic partners (including a yes-or-no response to the statement “We had sexual intercourse”) and three nonromantic partners (including “Have you had sexual intercourse with [partner]?”) and asked catch-all questions after the relationship roster for data on sexual relationships not yet listed (including “In addition to [partner], [partner], and [partner] and anyone whose initials you gave as a romantic relationship partner, have you had a sexual relationship with anyone else?”).

Technical Details and Rationale of Analysis

The Add Health data set was designed as a survey data set with four sampling strata (north, south, east, and west), 132 primary sampling units (the schools), and a definite probability of each student within any of those schools to be included in the sample (grand sample weight). Survey procedures in Stata 7/SE (Statacorp, 2001) were used to adjust for clustering and unequal probability of inclusion in the sample. Survey estimation procedures properly weight the data and adjust the denominator degrees of freedom of F tests to be more realistically strict. Descriptive statistics were computed using *svyprop*, *svymean*, *svylc*, and *svytab* commands. The first and third steps in each of the 12 path analyses (one per parent interaction variable per dyad) are survey-corrected linear regression (*svyreg* in Stata) models, and the second step is a survey-corrected binary logistic regression (*svylogit* in Stata) model. Four subpopulations (*subpop*) were defined: sons with complete data for mothers, sons with complete data for fathers, daughters with complete data for mothers, and daughters with complete data for fathers. Adjusted means, when needed, were computed with *adjust* in Stata post hoc to survey-adjusted analyses.

Data are structured to represent four time periods: sexual activity before Time 1, parent relationship at Time 1, sexual activity between Times 1 and 2, and parent relationship at Time 2. Path analysis (Darlington, 1990) arranged the results of the

three hypotheses into a meaningful framework that depicted, recursively, changes in later variables attributable to changes in earlier variables. Although structural equations (Bollen, 1989) is usually considered preferable to path analysis for a recursive structural model, structural equations were undesirable for several reasons. First, sexual behavior between Times 1 and 2 is a dichotomous variable that is both predicted by and a predictor of other structural variables, and structural equations cannot easily model such an effect because dichotomous variables violate the assumption of multivariate normality. Second, survey-design-based analysis was required to avoid underestimating standard errors of parameter estimates and increasing the probability of Type I error (Chantala, 2003; Chantala & Tabor, 1999). Given the state of the art at the time of this writing, SUDAAN and Stata are the only programs that estimate a design-based model. Thus, although EQS, AMOS, and LISREL are the tools that would usually be used to estimate a recursive path analytical model, the awkward placement of a dichotomous variable in that model plus the inability of current structural equation modeling software to precisely correct for the sampling design led to the conclusion that a structural equations approach would inflate the probability of Type I error to an unknown degree. Therefore, path analysis was preferable.

Results

Descriptive Statistics

Demographic data are reported design corrected and according to estimated proportion of the general population that they would represent, not the raw numbers in the sample. With regard to race, 71% of the population was White, 13% Black, 10% Latino, 4% Asian, and 2% “other.” With regard to major religion with which the young people identified (which may or may not be the religion in which their parents raised them), 57% of the population was Protestant, including 27% Born Again, which

most religious researchers consider distinct from other Protestants (Gallup Brain, 2003). Catholics made up 26% of the sample, 1% was Jewish, 11% were not religious, and 5% were of non-Judeo-Christian religions. Mean educational level for both mothers and fathers was between high school graduate and college graduate. Mean age was 15.5 for young men ($SE = 0.12$) and 15.4 for young women ($SE = 0.12$). Sixty-seven percent of young men and 66% of young women had valid data for both a male and a female caregiver; 27% and 31%, respectively, had valid data only for a female caregiver; and 5% and 3%, respectively, had valid data only for a male caregiver. According to data from the school administrator questionnaire, 26% came from urban, 73% from suburban, and 24% from rural schools.

Table 2.1

Means of Parent Relationship Variables by Child–Parent Dyad Type and Time Period

Dyad type	Valid <i>N</i>	Time 1			Time 2		
		Parental closeness	Shared activities	Problem focused	Parental closeness	Shared activities	Problem focused
Son–Mother	4,646	4.54	1.62	0.92	4.43	1.38	1.00
Son–Father	5,331	4.36	1.49	0.70	4.27	1.29	0.69
Daughter–Mother	3,594	4.41	1.80	1.36	4.34	1.68	1.48
Daughter–Father	3,788	4.26	1.23	0.69	4.14	1.10	0.77

Note. Two-tailed survey-adjusted *t*-tests of differences between time 1 and time 2 values reveal significant differences at the $p < .01$ level for all dyads with respect to all indicators except for problem-focused interactions between sons and fathers, which does not significantly change.

Table 2.1 summarizes parent relationship variables by dyad type. Over the 18-month period between Times 1 and 2, according to design-corrected *t* tests of differences between Times 1 and 2 means, all dyad types experienced diminished closeness and shared activities. All dyad types except father–son experienced

increased problem-focused behavior. Table 2.2 summarizes basic data on participants' patterns of sexual behavior, separate by gender. Most participants were not sexually experienced by Time 2, and less than a quarter were sexually active both before Time 1 and between Times 1 and 2. The two groups expected to demonstrate variability in parent relationship variables associated with a change in pattern of sexual activity—those who had first sexual activity between Times 1 and 2 and those who ceased sexual activity after Time 1—represent a survey-corrected 15% of the sample.

Table 2.2

Participants' Pattern of Sexual Behavior, Separate by Sex

Sexual behavior response pattern	Male Total	Female Total
Not sexually active at all	62%	62%
First sexual activity between times 1 and 2	9%	11%
Sexually active, but only before time 1	9%	4%
Active both before time 1 and between times 1 and 2	21%	22%
Valid N	4895	5512

Note: Percentages do not add to 100% due to rounding error

Path Analysis for Study Hypotheses

Figures 2.2–2.5 each report the results of three path analyses. Each path analysis contains the results of three regression analyses, all of which include participant's race, religion, and age; urbanicity of the school; parent's education; and whether only one parent was present in the home as control variables. Figure 2.2 demonstrates reciprocal associations between young men's sexual activity and the mother-son relationship ($N = 4,646$); figure 2.3, the mother-daughter relationship ($N =$

5,331); figure 2.4, the father-son relationship ($N = 3,594$); figure 2.5, the father-daughter relationship ($N = 3,788$). In all figures, the numbers in normal type are the coefficients for parental closeness, those in bold are for everyday interactions, and those in italics are for problem-focused interactions. Straight arrows represent hypothesis tests and curved arrows represent correlations that are controlled. T1 is the abbreviation for Time 1 and T2 is the abbreviation for Time 2. Significance levels are indicated by $+p < .10$. $*p < .05$. $**p < .01$. $***p < .001$.

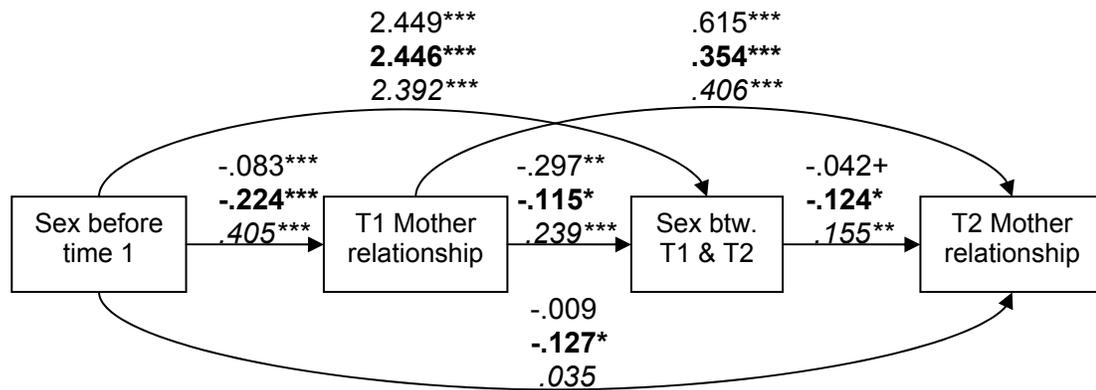


Figure 2.2: Path Analysis of Reciprocal Associations between Young Men's Sexual Activity and the Mother-Son Relationship

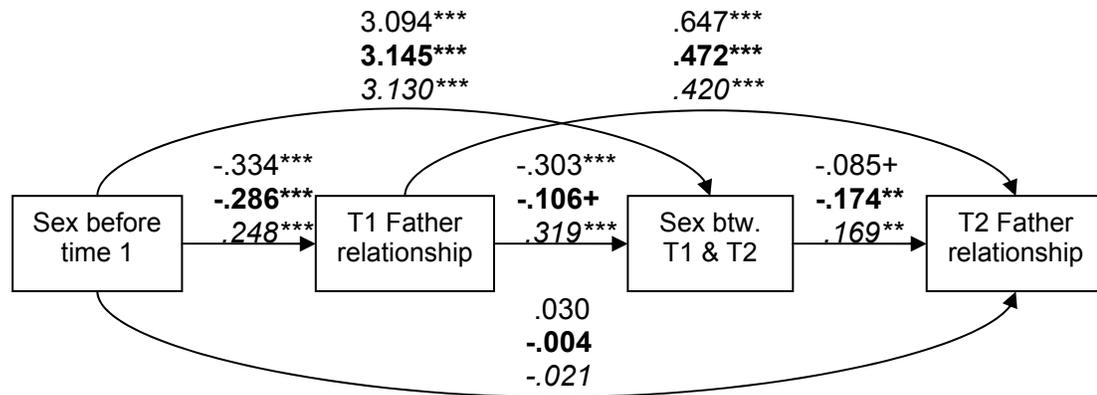


Figure 2.5: Path Analysis of Reciprocal Associations between Young Women’s Sexual Activity and the Father–Daughter Relationship.

Hypothesis 1. The first analysis in each of the 12 path models was a survey-corrected linear regression containing a Time 1 parent interaction variable (closeness, shared activities, problem-focused interactions) as the dependent variable and a consistent report of sexual involvement before Time 1 as an independent variable, plus controls as listed above. The coefficients tagged to the arrow leading from “Sex before Time 1” and “T1 mother/father relationship” are the β coefficients for the binary variable “Sex before Time 1.” Results uphold Hypothesis 1 for all three parent relationship variables in all four dyad types. By itself, this is not evidence that sex before Time 1 affects parent relationship, because problems in the parent relationship could have existed before the participant had sex. However, controlling for this association is helpful for supporting later causal hypotheses.

Hypothesis 2. The second analysis in each path model is a survey-corrected binary logistic regression, with sex between Times 1 and 2 as the dependent variable and a Time 1 parent interaction variable (represented by the straight arrow) and sexual activity before Time 1 (represented by a curved arrow) as independent variables, plus controls as listed above. The coefficients tagged to the arrow leading from “T1

mother/father relationship” and “Sex btw. T1 & T2” are B coefficients for the continuous Time 1 parent relationship variables, interpreted as the increase in log odds of sexual activity between Times 1 and 2 attributable to a one-unit increase in the parent relationship variable. Results support Hypothesis 2 with respect to problem-focused interactions for all dyad types, shared activities with mothers only (most strongly between mothers and daughters), and closeness for all dyad types except father–son.

Hypothesis 3. The third analysis in each path model includes three survey-corrected linear regressions, each containing a Time 2 parent interaction variable as the dependent variable and the corresponding Time 1 parent interaction variable (represented by a curved arrow), sex between Times 1 and 2 (represented by the straight arrow), and sex before Time 1 (represented by a curved arrow) as independent variables, plus control variables as listed above. The coefficients tagged to the straight arrow leading from “Sex btw. T1 & T2” and “T2 mother/father relationship” are β coefficients for the binary variable “Sex btw. T1 & T2.” Results confirmed Hypothesis 3 with respect to problem-focused interactions for all dyads (particularly strongly for same-gender dyads), shared activities with the opposite-gender parent, and closeness with the same-gender parent.

Model fit and follow-up analyses. For the final models, R^2 values ranged between .35 and .42 for parental closeness (the numbers in normal type), .26 and .33 for shared activities (the numbers in bold), and .16 and .23 for problem-focused interactions (the numbers in italic). Follow-up analyses were performed to explain the unintuitive pattern of effects in the closeness path of the mother–daughter relationship. If sex before Time 1 is removed from the model and only sex between Times 1 and 2 is hypothesized to influence mother closeness at Time 2 (controlling for age, race, religion, urbanicity, parent education, single parenthood, and mother closeness at

Time 1), then $\beta = .066$ ($p = .03$). If sex between Times 1 and 2 is taken out and sex before Time 1 is entered, then $\beta = .012$ ($p = .66$). The full model was run with an interaction term between sex at Time 1 and sex between Times 1 and 2. In this model, $\beta_{\text{sex before Time 1}} = .068$, $p = .18$; $\beta_{\text{sex between Times 1 and 2}} = .105$, $p < .01$; and $\beta_{\text{interaction}} = .008$, $p = .91$. The adjusted mean of Time 2 mother closeness if the daughter had never had sex was 4.41; if she lost virginity between Times 1 and 2, 4.23; if she ceased sexual activity after Time 1, 4.38; and if she was sexually active at both times, 4.26.

Discussion

Results confirmed all three hypotheses. Sexual involvement before Time 1 preceded reduced closeness, fewer shared activities, and higher problem-focused interactions for all four dyad types. Aspects of the parent relationship that predicted either continued or first-time sexual activity were more problem-focused interactions, fewer shared activities with mother, and reduced closeness (except between fathers and sons). Sexual involvement between Times 1 and 2 predicted higher problem-focused interactions with both parents, fewer shared activities with the parent of the opposite gender, and reduced closeness with the parent of the same gender. Sexual involvement before Time 1 directly predicted fewer shared activities with both parents at Time 1 and with the same-gender parent at Time 2.

Findings confirming Hypothesis 1 are already well documented (Davis & Friel, 2001; Lammers, Ireland, Resnick, & Blum, 2000; Moore, 2001; Rhodes, 2002; Tschann et al., 2002): Parent relations are significantly less close, are more problem focused, and involve fewer everyday shared activities for sexually active youth than for sexually inactive youth. Confirmation of Hypothesis 2 merely establishes a temporal order between parent relations and sexual activity: Parent relationships that are less close, involving fewer shared activities, and more problem focused contribute to an increased likelihood of first sexual activity or continued sexual activity. The

control response persists along with the problem behavior (R. Jessor, 1982). This formulation depends, of course, on the assumption that continued sexual activity is associated with the same factors as first sexual activity. Although we believe this assumption to be safe, we cannot verify it within this analytical framework, because it would be impossible to run these models if one of the lag variables (specifically, sexual behavior before Time 1) were a constant.

Confirmation of Hypothesis 3 provides evidence for a *reciprocal effect* between adolescent sexual activity and parent relations, which is observable even after controlling for age and other determinants of parent relations. In all dyad types, problem-focused interactions predict increased likelihood of sexual behavior, and sexual behavior predicts increased problem-focused interactions. A similar reciprocal effect exists with respect to parental closeness for same-gender dyads and shared activities in opposite-gender dyads. Sexual activity encourages, and is encouraged by, changes in the parental relationship that normatively happen over time (see Table 2.1). Both youth sexual activity and the changing parent relationships may be part of an intentional strain toward maturity by adolescents (Rosenthal et al., 1999; Udry, 1990; Udry & Billy, 1987) that includes other changes such as increasing reliance on peers for social support and behaviors such as alcohol use and other status offenses. This would explain why some observe a “syndrome” of status-related problem behaviors in adolescents (Corwyn, Benda, Clowers, & Liu, 1999).

If straining toward maturity factors into youths’ motivation for having sex, then fewer might do so if other means of establishing a more adult relationship with family and society were more available. One possible best-case scenario is for parents to maintain a warm relationship with their children while giving them room to grow and respecting their increasing autonomy. This would forestall the need to strain toward maturity via other, riskier means and would help parents maintain the

credibility necessary to encourage responsible sexuality. However, it appears from these data that the average reaction of families to adolescents' sexual activity is increased distance between adolescents and parents (reduced closeness, fewer shared activities) while parents—somewhat paradoxically—try to exert influence over their children's lives and behavior (increased problem-focused interactions). These data indicate that such changes are associated not with lower but rather higher likelihood of adolescent sexual activity.

Sex differences in our findings are evident but difficult to interpret. Increased closeness predicts reduced likelihood of sexual activity for every dyad category except father–son. Potentially, this dyad is uniquely comfortable with talk about sex, or perhaps the effects of some fathers discouraging their sons' sexual activity averages with the effects of other fathers encouraging it to produce a zero net effect. Increased shared activities with mothers, but not fathers, predicted reduced likelihood of sexual activity. Table 2.1 suggests that mothers are somewhat more involved with their adolescents than are fathers, indicating that this dimension has farther to fall in the relationship with mother than it does in the relationship with father.

Adolescent sexual activity produces greater problem-focused interactions for all dyad types, but there are differences in the pattern of effects with respect to the other two factors. Shared activities between mothers and sons are reduced both by the son's initial sexual activity and by his continued sexual activity, but closeness is not significantly affected. His relationship to father, in contrast, becomes somewhat less close, but the decrease in shared activities follows from whether he was ever sexually active; *change* in pattern of sexual activity does not significantly affect this dimension. The mother–daughter relationship dips in closeness after the daughter's first sexual experience but recovers markedly if she ceases sexual activity. Shared activities are not significantly affected. The father–daughter relationship, in contrast, which tends to

be the least close and involve the fewest shared activities of any dyad, does not become any less close but does involve fewer shared activities.

The self-report nature of the data is a limitation. Self-reports of sexual histories are notoriously inaccurate (Catania, Gibson, Chitwood, & Coates, 1990), inconsistent (Lauritsen & Swicegood, 1997; Rodgers, Billy, & Udry, 1982), and systematically biased (Catania, 1999). Although it is possible to exclude responses with logical inconsistencies, it is difficult to screen responses that are consistent but inaccurate. Examining responses that are inconsistent or otherwise suspect would be a useful follow-up to this work. Theoretically, making a strain toward maturity by eliciting a control response requires adolescents to report having had sex whether or not they actually did. Examining suspect responses to compare believable with less believable reports would address the question of how much variance is attributable to reporting and how much to actual sexual activity.

Another limitation of self-report data is that respondents may be reporting behavior as sexual intercourse that is not. Although study participants had to specifically report intercourse or respond negatively to all questions about intercourse in order to register a consistent report of sexual (in)activity, it is unknown how many respondents understood the word *intercourse* or the definition provided in the questionnaire. If they thought it was only another word for “having sex,” then these data face the limitation that young people’s definition of “having sex” is more inclusive of various behaviors than health researchers would like (Sanders & Reinisch, 1999; Savin-Williams & Diamond, 2004). Thus, our reporting of these data has used the term *sexual activity* throughout rather than *intercourse* to reflect this uncertainty. The problem is not, however, likely to have influenced the pattern of results. Although research of this type is, understandably, very concerned with intercourse because of

the risk of pregnancy, negative outcomes for adolescents are associated with less intimate sexual behaviors as well (O'Sullivan, 2004).

Encouraging and helping families to maintain warm, albeit more adult, relationships between parents and sexually active adolescents is only one way to prevent further risk behavior. Educators, researchers, and policymakers can contribute by ensuring that youth receive accurate and comprehensive information about sexuality (Haignere, Gold, & McDanel, 1999). Realistic knowledge about sexuality would help them make informed decisions; for example, fewer could be inspired by perceptions of their peers' frequent sexual activity if they knew that less than half of their age-mates (at least in early adolescence) were sexually experienced (Meschke, Zweig, Barber, & Eccles, 2000). Rather than admonishing them to keep their virginity intact, it might be more effective to impart to them an understanding that not even a small (but significant) chance of such life-altering consequences as HIV infection and pregnancy is worth the risk (Reyna, in press).

Future research should build on work that has comprehensively documented factors associated with adolescent sexual activity (R. Jessor, Costa, Jessor, & Donovan, 1983; S. L. Jessor & Jessor, 1975; Lammers et al., 2000; Meier, 2003; Savin-Williams & Diamond, 2004) to discern how adolescents' life and support structures, including the family system, change along with their emerging sexuality. Further inquiry should investigate ways in which family support can remain in place for youth as they negotiate their paths to adulthood, including adult sexuality.

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CHAPTER THREE

THE ROLE OF CONTEXTUALLY-MODERATED SUPPORT AND PROTECTIVE FACTORS IN EXPLAINING ASSOCIATIONS BETWEEN SEXUAL ACTIVITY AND PSYCHOLOGICAL/BEHAVIORAL RISK

Geoffrey L. Ream

Abstract

This study based on Add Health data empirically examines a mechanism explaining the association between adolescent sexual activity and negative health and behavior outcomes. Within one year, adolescent sexual activity is hypothesized to predict changes in contextually-moderated support and protective factors of personal religiousness, school integration, deviant peer associations, and parent problem-focused interactions. Those context factors are hypothesized to mediate relationships between sexual activity and outcomes of depression, alcohol use, and suicide. Results confirm hypotheses, finding that initiating or continuing sexual activity is related to deterioration in adolescents' relationships with potentially supportive people and institutions while maladaptive changes also continue for adolescents who cease sexual activity, and context also mediates relationships between sexual activity and psychological/behavioral risk. A novel explanation for current and previous findings is proposed, that sexually active youth become part of a stigmatized social category of "non-virgins" which they cannot leave by simply ceasing sexual activity.

Although adolescents are justifiably discouraged from sexual activity because of the inherent risk of pregnancy and disease (Alan Guttmacher Institute, 1994), other problems associated with sexual activity – e.g., depression, alcohol use, and suicidality (Kulbok & Cox, 2002; Udry & Chantala, 2002) – are not necessarily directly connected with sexual activity, in that they cannot possibly be the result of sexual activity itself. The purpose of this study is to construct and test an explanation for how psychological and behavioral risk factors are associated with adolescent sexual activity. This is in response, in part, to recent demand for new research that conceptualizes sex in adolescence as part of an environmentally moderated developmental process as well as an individual behavior (Savin-Williams & Diamond, 2004) and potential source of risk, and also to empirical evidence of the need for new attention to context in considerations of adolescent sexuality and risk (Meier, 2004; Ream & Savin-Williams, 2005; Schvaneveldt, Miller, Berry, & Lee, 2001). The explanation tested here contains elements from both sociological problem behavior theory (Jessor, 1982; Jessor & Jessor, 1977) and psychological normative developmental perspectives on adolescent romance (Furman, Brown, & Feiring, 1999), synthesized in a way that has not before been established in empirical and theoretical work on adolescent sexuality.

Problem behavior theories have long held that sexual activity is one of many problem behaviors in adolescence (Lynch, 2001). Whether or not it is “normal” in a raw prevalence sense for youth to have their first sexual experience before age 18, it is still not *normative*, in that adolescents violate society’s expectations of them by engaging in sexual activity. According to problem behavior theory, when youth test the strength of social control (Benda & DiBlasio, 1991; Miller & Fox, 1987) by engaging in problem behaviors, society pushes back via a control response (Jessor, 1982), upholding its values by punishing and marginalizing those who violate norms.

Since the establishment of problem control theory, longitudinal research has observed that not only do multiple problem behaviors tend to co-occur, but patterns of problem behaviors tend to be stable over time (Benda & Corwyn, 1998; Corwyn & Benda, 1999; Corwyn, Benda, Clowers, & Liu, 1999). Clearly, society's control response is inadequate to stop problem behaviors like sexual activity, leading some to look toward a rational choice explanation of how rewards for the behavior might outweigh the cost.

One such explanation is that sexual behavior is part of an adolescent's strain toward maturity (Udry, 1990; Udry & Billy, 1987), an attempt to attain adult goals and status by engaging in adult-like behavior. By this line of reasoning, adolescents' goals in problem behaviors are not to damage, but rather to redefine, their relationships with the contexts and institutions around them. Although it is difficult to ascertain whether they thus achieve a more adult-like relationship with family and school contexts, the evidence suggests that they achieve a more distant relationship, and it is to their cost. Longitudinal studies have revealed reciprocal relationships over time between sexual activity and both educational aspirations (Schvaneveldt et al., 2001) – arguably an indicator of felt connection to school contexts – and problem-focused relationships with parents (Meier, 2004; Ream & Savin-Williams, 2005). The reciprocal nature of these effects indicates a situation that can get progressively worse as sexual activity causes perceived (if not actual – because most investigations to date have used self-report data, there is no way to tell for sure) reductions in available contextual protective factors which cause the strain toward maturity via sexual activity option to be more attractive to youth which causes even further reductions in protective factors.

Observing the same set of issues from another angle, normative developmental perspectives on adolescent romance (for reviews, see Florsheim, 2003; Furman et al., 1999; Shulman & Collins, 1997) emphasize the important developmental tasks achieved in the context of romantic relationships despite the short-term emotional

strain, and hold that romantic involvement in adolescence is both normal and normative. The short-term emotional strain is, however, significant. Depressive symptoms are linked to problems with all stages of adolescent dating relationships—attractions (Welsh, Grello, & Harper, 2003), which may be unrequited (especially in the case of same-sex attractions, see Savin-Williams, 1996); being in the relationship itself, which can involve conflict that females in particular may be ill-equipped to handle (Joyner & Udry, 2000; Welsh et al., 2003); and breaking up, which is a notorious precursor to major depressive disorders in adolescence (Monroe, Rohde, Seeley, & Lewinsohn, 1999). Young women are held to be particularly psychologically vulnerable to the stressors of adolescent dating because they use more ruminative, less active, and overall less adaptive coping strategies than young men do (Welsh et al., 2003). At this point, it may be suspected that, given that sexual activity and romantic relations obviously tend to co-occur, detriments to mental health associated with sexual activity are not *uniquely* related to sexual activity but the variance is rather explained by romantic dating. Recent evidence suggests that this is not true. Both dating and sexual activity are uniquely related to depression and suicidality (Ream & Russell, in prep).

Consideration of normative developmental perspectives on adolescent romance is necessary in articulating why articulating contextual explanation for the relationship between sexual activity and negative outcomes is even necessary. It is not a safe assumption that the role of context is not important, given that it is known to be highly significant in many special populations of youth, within which contextual pressures are easier to observe and specify. Cultural values among certain ethnic-minority (Villarruel, 1998; Weekes, 2002) and religious (Bearman & Brueckner, 2001) groups require chastity of young women, restraint of young men, and heterosexuality (Savin-Williams, 1996) of everyone. Neither, however, is it a safe assumption that context

does account for significant variance in negative outcomes otherwise attributable to sexual activity, as an empirical investigation could reveal that the effects of context are insignificant relative to the psychological stressors associated with all dimensions of adolescent romantic involvement. Finally, if changes in relationships with individuals and institutions in the immediate context are indeed a path by which sexual activity is associated with negative health outcomes, it does not necessarily follow that societal punishment of sexual activity is solely responsible for pushing youth into a downward spiral in which problem behavior continues as contextual supports further deteriorate. Mere withdrawal of support along with the psychological stress inherent to adolescent romantic involvement would be sufficient conditions for this.

Previous research has already established that sexually active youth have less strong connections with religion (Holder et al., 2000), are more likely to be involved with delinquent peers (Beal, Ausiello, & Perrin, 2001; Benda & DiBlasio, 1991), lower school aspirations (Schvaneveldt et al., 2001), share fewer activities with their families, feel less close to their families, and experience more problem-focused relationships with their families (Meier, 2004; Ream & Savin-Williams, 2005) than sexually inactive youth. Although some studies have established bi-directional relationships over time between contextual supports and sexual activity, the current study will test hypotheses of reciprocal effects – i.e., circumstances in which initiating sexual activity coincides with maladaptive changes and ceasing sexual activity coincides with adaptive changes in context factors – more rigorously than past research has done. This study will also move beyond previous research to empirically test whether context factors (a shorthand term used here to mean indicators of the quality of connections with supportive individuals – parents, peers – and institutions of school and religion) mediate the relationship between sexual activity and negative outcomes.

Finally, in any consideration of these issues, societal double-standards with respect to gender must also be taken into account. Young women take romantic rejection more personally than young men (de Graaf & Sandfort, 2004). They also receive less frank and less frequent communication from parents about sex (Downie & Coates, 1999; Nolin & Petersen, 1992). In sexuality education material, they observe stereotypes acted out legitimizing male and marginalizing female sexual agency and desire (Hartley & Drew, 2001). Cultural and religious influences enforce double-standards to various degrees (Asencio, 2002; Sheeran, Spears, Abraham, & Abrams, 1996; Weekes, 2002).

There are, of course, several other factors connecting sexual activity, the contextual mediators under investigation here, and negative outcomes of suicidality, alcohol use, and depression. Sexual debut is accelerated for youth in single-parent families (Moore, 2001; Moore & Chase Lansdale, 2001). Ethnic group differences have been found in timing of first sexual activity and likelihood of pregnancy (Franklin, 1988), and socio-economic status differences have been found within ethnic groups (Holmbeck, Waters, & Brookman, 1990). Greater verbal intelligence is related to reduced likelihood of sexual activity (Halpern, Joyner, Udry, & Suchindran, 2000). However, comprehensive treatment of *all* of these factors is beyond the scope of a single investigation. Therefore, because of the pervasively different psychological and social risks faced by young men and young women, this study shall look for differences in patterns of effects based on gender, as any responsible investigation of adolescent sexuality should (Savin-Williams & Diamond, 2004). However, effects of race, SES, age, intelligence, urbanicity of the school district, and parents' marital status must simply be controlled out and fuller treatment of those factors left up to future research.

The first hypothesis this study will address is whether adolescent sexual activity is related to changes in levels of contextual supports. For lack of a more appropriate shorthand term, “contextual supports” here refers to indicators of sound, supportive, healthy relationships with significant people and institutions in an adolescent’s immediate contexts. These indicators include integration in the school environment, personal religiousness, problem-focused interactions with parents, and delinquent (operationalized here, according to the most convenient indicator available in the secondary data set, as alcohol-using) peers. Compared to adolescents who are not sexually active within the one-year time frame of the study, adolescents who experience sexual debut or continue an existing pattern of sexual activity will experience greater negative changes in levels of contextual supports, manifesting as lower school integration, lower religiousness, greater problem-focused interaction with parents, and more close friends who drink. Also compared to sexually-inactive adolescents, adolescents who cease sexual activity will experience a more positive change (or at least less of a negative change) in contextual supports.

The second hypothesis this study will test is whether the contextual supports under study actually mediate the relationship between sexual activity and negative outcomes of suicidal thoughts (Patton, Harris, Carlin, Hibbert, & et al., 1997), depressive symptoms (Joyner & Udry, 2000), and alcohol use (Zweig, Lindberg, & McGinley, 2001). If findings confirm both hypotheses, this will lend support to the overall theoretical assertion that part of the effect that sexual activity has on negative outcomes is *through* the erosion of contextual supports.

Method

Participants

Data for this study are drawn from the National Longitudinal Survey of Adolescent Health (Add Health) (Udry & Bearman, 1998a). Recapitulated here, the

design and method of Add Health is described in greater detail elsewhere (Udry & Bearman, 1998b). The study assessed contextually mediated positive and negative effects on adolescent (grades 7 through 12) health on the individual, family, and school levels, with significant information gathered on peer-peer and parent-youth dyads. The primary sampling frame was school-based, with a nationwide sample of 80 high schools selected and a 70% response rate. Comparable replacement schools were selected for schools that declined to participate. If the recruited high school was not for all grades 7 through 12, younger students were recruited from middle and junior high schools that fed into the sample high schools. Thus, a total of 132 public and private schools in a total of 80 communities participated.

In selecting students to participate in the in-home interviews, the within-school sample was split into sex by grade strata and a random sample was taken within each stratum. Roughly 17 students per stratum per school pair were selected for a total of 12,105 students in the core sample. Special over-samples of Chinese, Cuban, Puerto Rican, disabled, twins, and Black youth with at least one parent holding a college degree were also collected. Additionally, the entire student body of 16 diverse schools was selected for in-home interviews to provide data on peer networks. The total wave 1 in-home interview sample includes 20,747 individuals. Wave I data collection was completed primarily during the summer and fall months of 1995. Participants eligible for wave 2, completed primarily during the summer months of 1996, included all youth who were neither part of the disabled over-sample nor had graduated. The total wave 2 sample includes 14,738 individuals. To be included in the current sample, cases had to have a valid “grand sample weight” value ($n = 13,570$), indicating a positive probability, however small, of inclusion in a national probability sample of American adolescents. Twenty-two cases were excluded because of unrecoverable missing data on control variables, for a total sample N of 13,548.

Measures

Interviews with Add Health youth took place in two different modes, one with interviewers asking questions out loud and entering participants' answers into a laptop computer, and another (Audio Computer-Assisted Self-Interview, or CASI) with participants listening to recorded interview questions read to them via headphones plugged into the laptop and entering the responses themselves. ACASI was used for particularly sensitive questions

Several cases were missing data on control variables, and not completely at random (Little's MCAR χ^2 (1553 df) = 13337.438, $p < .001$). In order to ensure that patterns of non-response could not bias results, an expectation maximization imputation was run in SPSS 12.0 using study variables. For parent's education, 704 missing values were imputed, as well as 592 values for verbal ability and 9 values for participant's age at the first interview. EM imputation has the drawback of artificially tightening standard errors around variables for which values are imputed. However because only control variables were imputed in this case, it was an acceptable tradeoff for ensuring that systematic patterns of missing data did not bias results.

Control variables. Participant's age, ethnicity, and gender were taken from the oral interview, along with the resident parent's or mean of the resident parents' educational level and the household poverty status, coded as 1 if at least one resident parent received public assistance. On gender, 19 cases had data that were missing or were inconsistent across waves, which might indicate transgender status, but there is no way to know for sure because the questionnaire did not cover this topic. Parent marital status was coded as 1 if the parent answering the parent questionnaire indicated that he/she was married. Participant's verbal ability was indicated by the Add Health Picture Vocabulary Test. From the school administrator questionnaire

came an indicator of whether the school was urban, suburban, or rural, on which 3 cases had missing data.

School integration. This is the mean of all valid values for five 5-point Likert scale items from the oral interview with responses ranging from “strongly disagree” to “strongly agree”: “You feel close to people at your school,” “you feel like you are a part of your school,” “you are happy to be at your school,” “the teachers at your school treat students fairly,” “you feel safe at your school.” Wave I $\alpha = .78$, wave II $\alpha = .78$, valid N (because some participants did not attend school at Wave I and had stopped or started by Wave II) = 12,258.

Personal religiousness. This is the mean of all valid values for four items from the oral interview: How often the participant attended religious services, how important religion is to the participant, how often he/she prays, and how often he/she attended youth-oriented religious activities. Items were transformed to have the same numerical range, and values for non-religious participants were set to zero. Wave I $\alpha = .76$, wave II $\alpha = .76$, valid N = 13,548.

Parent problem-focused interactions. Participants were asked in the oral interview whether or not they had done any of several activities with up to two parents in the past 4 weeks. The three that formed the problem-focused interactions index were “had a talk about a personal problem you were having,” “had a serious argument about your behavior,” and “talked about someone you’re dating, or a party you went to.” Although none of these are particularly informative on their own, together they comprise a formative indicator of parent-adolescent conflict that has demonstrated construct validity in previous work with Add Health (Meier, 2004; Ream & Savin-Williams, 2005). Formative indicators do not depend for their reliability on inter-item correlation because their items are not redundant (as are, for example, the components of a depression scale), and all items together are required to measure a construct

(Bollen & Lennox, 1991; Diamantopoulos & Winklhofer, 2001). For participants with two parents at home, the average of the two measures was taken. Some youth, however, did not live with their parents or for other reasons did not provide data for either parent in one or both waves. Valid N = 12,968.

Friends who drink. This single-item ordinal indicator is the answer to the following question from the ACASI: “Of your 3 best friends, how many drink alcohol at least once a month?” Valid N = 13,548.

Depression. A composite scale of Add Health items selected to correspond as closely as possible to the standard CES-D measured depression (Ream & Russell, in prep). Respondents indicated whether the following things happened “never or rarely” (0), “sometimes” (1), “a lot of the time” (2), or “most of the time or all of the time” (3): “You were bothered by things that usually don’t bother you,” “You didn’t feel like eating, your appetite was poor,” “You felt that you could not shake off the blues, even with help from your family and your friends,” “You felt that you were just as good as other people” (reverse-coded), “You had trouble keeping your mind on what you were doing,” “You felt depressed,” “You felt that you were too tired to do things,” “You felt hopeful about the future” (reverse-coded), “You thought your life had been a failure,” “You felt fearful,” “You were happy” (reverse-coded), “You talked less than usual,” “You felt lonely,” “People were unfriendly to you,” “You enjoyed life” (reverse-coded), “You felt sad,” “You felt that people disliked you,” “It was hard to get started doing things,” and “You felt life was not worth living.” Respondents indicated whether, in the past 12 months, the following things happened “never” (0), “just a few times” (1), “about once a week” (2), “almost every day” (3) or “every day” (3): “trouble falling asleep or staying asleep” and “frequent crying.” Wave I $\alpha = .87$, Wave II $\alpha = .88$, Valid N = 13,539.

Alcohol use. This is an ordinal indicator based on several ACASI questions about alcohol use. 0 = only ever drank alcohol with family and never got drunk, 1 = been drunk but not in the past 12 months, 2 = got drunk less than once a month in the past year, 3 = got drunk more than once a month in the past year, and 4 = got drunk more than once a week in the past year. Valid N = 13,548.

Suicidality. This is an ordinal scale based on responses to ACASI questions about suicidal thoughts and attempts in the past 12 months. 0 = no suicidal thoughts or attempts, 1 = thought about it but never attempted, 2 = made at least one attempt, 3 = had to be hospitalized because of an attempt. Valid N = 13,348.

Sexual behavior. Logical inconsistency in responses within-waves and across-waves has long been a problem in studies of sexuality (Rodgers, Billy, & Udry, 1982). In Add Health, three sections of the CASI interview ask for information on sexual history. A section on contraception asks “Have you ever had sexual intercourse? When we say sexual intercourse, we mean when a male inserts his penis into a female’s vagina.” A separate romantic relationship roster asks participants to flag behaviors in the context of romantic relationships that occurred in the past 18 months, including “we had sexual intercourse.” A non-romantic sexual relationship roster asks about all other sexual relationships (this section in the Wave II questionnaire asks about sexual relationships since the last interview). Reports of sexual activity between the contraception section and the relationship rosters were not always internally consistent. Previous Add Health work indicated that several sexually experienced youth, particularly those with same-sex relationships, balked at the definition of “sexual intercourse” in the contraception section and answered “no,” but then provided details on sexual relationships in the relationship rosters. These youth were coded as sexually active during the time frame for which they were reporting and their responses were not flagged as suspect.

However, the most prevalent and most dubious inconsistent responses were those who answered “yes” to “have you ever had sexual intercourse?” in a contraception section but provided no details on sexual relationships in concurrent or previous relationship rosters (Ream & Savin-Williams, 2003). Cases with no opposite-sex sexual behavior (participants indicating any same-sex attraction or relationships were not excluded on this basis because of the wording of the question in the contraception section) reported in the relationship section of wave 1 but with an indication of having had sexual intercourse in the contraception section of wave 1 numbered an unfortunate 825, and 456 more indicated no opposite-sex behavior in any relationship roster but reported having *ever* had sexual intercourse by wave 2. Because the timing of their sexual activity, if any, could not be confidently imputed, they form their own category and are analyzed separately from the consistently-reported cases. Valid N = 13,548, including 1,281 inconsistently-reported cases.

Statistical Procedures

The Add Health data set was designed as a survey data set with four sampling strata (north, south, east, and west regions), 132 primary sampling units (the schools), and a definite probability of each student within any of those schools to be included in the sample (grand sample weight). Survey procedures in STATA 8/SE (Statacorp, 2001) were used to adjust for clustering and unequal probability of inclusion in the sample. Survey estimation procedures properly weight the data and adjust the denominator degrees of freedom of F-tests to be more realistically strict so that results are as close as possible to what they would be if they were based on a true national random sample of adolescents. Descriptive statistics were computed using the following special commands, listed here to make replication of the results easier: *svyprop* for within-category proportions of binary variables, *svymean* for within-category means of continuous variables, and *svytab* for cross-tabulation of multi-

categorical variables. Across-category comparisons of means and proportions were performed using *lincom* post-hoc to *svymean* and *svytab* commands. Multivariate models were estimated using *svyregress* for survey-adjusted multiple linear regression and *svylogit* for survey-adjusted ordinal logistic regression.

Results

Descriptive Statistics

Survey-adjusted mean age at Wave I was 15.6 (range 11.4 to 21.2), and mean age at Wave II was 16.5 (range 12.6 to 21.9). Ethnically, 65% of the sample was white, 15% black, 12% Latino, 4% Asian-American, 3% Native American, and 1% “other.” Of the parent respondents, 45% had completed high school and 64% indicated that they were married. The majority (58%) came from suburban schools, while 26% came from urban schools and 16% from rural schools. Of young men, 49% were not sexually active before wave II, 12% initiated sexual activity between waves I and II, 8% were sexually active before wave I but not between waves I and II, 20% were sexually active both before wave I and between waves II and II, and 11% provided inconsistent responses. The corresponding percentages for young women are 55%, 11%, 5%, 21%, and 8%.

Table 3.1 describes bivariate associations between sexual activity and both outcome and risk/protective factor variables, separately by sex. Because a category-by-category breakdown for the ordinal variables over both waves would require several pages, simplified versions are presented here. Within-category means and proportions are presented for participants who did not report any sexual activity at either Wave I or Wave II, those who were active before time I but not between Waves I and II, those who initiated sexual activity between Waves I and II, those who reported sexual activity at both times, and inconsistent responders. Results of survey-corrected tests of equality of means and proportions between Wave I and Wave II

Table 3.1

Bivariate Associations Between Sexual Activity and Other Study Variables

	Wave	Never	Btw. W1 & W2	Before W1 Only	Both W1 & W2	Incon- sistent
CES-D	1	10.80	12.75	14.42	14.80	13.43
Depression	2	10.78	13.48 *	14.00	14.19 **	13.81
Drinking	1	0.35	1.01	1.35	1.69	0.84
	2	0.60 ***	1.33 ***	1.35	1.78 **	1.17
Suicidality	1	0.12	0.23	0.24	0.28	0.19
	2	0.13	0.20 +	0.16 *	0.20 ***	0.18
School	1	2.87	2.64	2.54	2.51	2.65
Integration	2	2.84 *	2.56 *	2.54	2.52	2.61
Personal	1	2.67	2.41	2.39	2.17	2.33
Religiousness	2	2.62 **	2.34 +	2.36	2.04 ***	2.27
Close Friends	1	0.60	1.24	1.45	1.75	1.16
who Drink	2	0.81 ***	1.51 ***	1.30 **	1.72	1.26
Parent Problem	1	0.82	1.11	1.14	1.37	0.97
Focused Inter.	2	0.91 ***	1.25 ***	1.15	1.34	1.10

2-tailed tests of differences btw. waves + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

variables are reported in Table 3.1. Also according to survey-corrected linear comparisons of means, for all contextual mediators and dependent variables, sexually inactive youth had the most adaptive (lowest drinking, highest school integration, etc.) scores and youth who were sexually active during both time frames of the study had the least adaptive scores. This was significant at the $p < .001$ level for all tests except

for the test of whether sexually active youth had the greatest suicidal risk, for which $p = .030$.

Hypothesis 1: Sexual Activity and Change in Levels of Contextual Mediators

Table 3.2 presents the results of four survey-adjusted multiple regression models testing hypothesis 1 with respect to school integration, personal religiousness, close friends who drink, and parent problem-focused interactions. In each model, categorical variables of gender (reference category = male) and sexual activity (reference category = not active during either time frame) are entered as independent variables predicting the wave 2 level of each contextual mediator, controlling for its wave 1 level so that coefficients of independent variables are associated not with the absolute wave 2 level of the contextual mediator but rather with *change* in its level between wave 1 and wave 2. Control variables of age, race, verbal ability, household poverty, parent education and marital status, and school urbanicity were entered as well, but their coefficients are not displayed here in the interest of space. A similar method was used in a related study (Ream & Savin-Williams, 2005) to establish relationships between changes in certain dimensions of relationships with parents and changes in sexual activity. The advantage to the method used here is that it allows for the effects of initiating to emerge as distinct from the effects of ceasing sexual activity between waves 1 and 2.

Table 3.2

Changes in Contextual Mediators as Functions of Changes in Sexual Activity

	School Integration	Personal Religiousness	Close Friends who Drink	Parent Problem- Focused Interact.
Initiated Btw. W1 & W2	-0.162 ***	-0.001	0.415 ***	0.199 ***
Active Only Before W1	-0.112 *	-0.073	0.184 **	0.119 *
Active at Both Times	-0.094 **	-0.167 ***	0.420 ***	0.197 ***
Inconsistent Response	-0.123 **	-0.079	0.254 ***	0.160 **
Female Gender	-0.037 +	0.105 **	0.021	0.210 ***
Female*Initiated	0.000	-0.173 *	-0.007	0.034
Female*Only Before W1	-0.040	0.060	-0.104	0.060
Female*Active at Both	-0.082 +	-0.101 +	-0.047	-0.035
Female*Inconsistent	0.040	-0.083	-0.013	-0.023
Wave 1 Level of Mediator	0.526 ***	0.652 ***	0.407 ***	0.406 ***
Model Fit F(22,107)	123.2 7 ***	150.41 ***	82.84 ***	113.10 ***
% Variance Explained R ²	0.308	0.472	0.280	0.246

Results uphold hypothesis 1 with respect to every variable except religion. Initiating sexual activity between Wave 1 and Wave 2 is associated with lower integration with the school environment, greater number of close friends who use alcohol, and more problem-focused interactions with parents. Based on the significant interaction effect, it is associated with lower religiousness as well, albeit for young women only. Ceasing sexual activity is, according to post-hoc linear comparison tests performed on the coefficients, associated with less of an increase in close friends who drink than continuing or initiating sexual activity, but its association with school integration and parent problem-focused interactions is not significantly stronger or

weaker than that of the other patterns. Therefore, according to these results, initiating sexual activity is associated with changes in a less adaptive direction on three out of four contextual mediators for young men and on all four contextual mediators for young women, but ceasing sexual activity does little to weaken and certainly does not reverse existing detriments to contextual supports.

Hypothesis 2: Contextual Mediators of Health Outcomes

Table 3.3 represents the results of regression models testing Hypothesis 2, that the context factors – school integration, personal religiousness, close friends who drink, and parent problem-focused interactions – explain the association between sexual activity and changes in depression, alcohol use, and suicidality. Two models were run for each dependent variable. Depression is modeled as a continuous dependent variable using survey-adjusted multiple linear regression. Suicidality and alcohol use are modeled as ordered categorical dependent variables using survey-adjusted ordinal logistic regression, in which coefficients represent the log odds of membership in the next higher category attributable to a one unit change in the independent variable. Control variables of age, race, verbal ability, household poverty, parent education and marital status, and school urbanicity were entered into all six models, but their coefficients are left out in the interest of space. Inconsistent responders, having not distinguished themselves in tests of hypothesis 1 as closely resembling any other set of respondents whose time frame of sexual activity can be more definitely known, are excluded from these analyses.

Table 3.3

Context Factors as Mediators of the Relationship between Sexual Activity and Change in Depression, Alcohol Use, and Suicidality

	Depression		Alcohol Use		Suicidality	
	Partial	Full	Partial	Full	Partial	Full
Sexually Active	1.142 ***	0.458 +	0.638 ***	0.337 **	0.543 ***	0.150
W1 Functioning	0.572 ***	0.512 ***	1.255 ***	0.939 ***	1.284 ***	1.178 ***
Female Gender	1.132 ***	1.082	0.017	0.591 *	0.767 ***	0.370
Female*Active	0.241	-0.081	0.009	0.055	-0.511 **	-0.426 +
School Integration		-1.389 ***		0.025		-0.465 ***
Personal Religion		-0.269 *		-0.037		-0.035
Friends Drink		0.216 +		1.021 ***		0.168 *
Parent Prob. Inter.		0.530 ***		0.201 ***		0.352 ***
Female*School		-0.273		-0.090		0.069
Female*Religion		0.183		-0.063		0.087
Female*Friends		0.275 +		-0.200 ***		0.046
Female*Parent		0.088		0.004		-0.139
Valid N	12087	12087	12094	12094	11924	11924
F ^a	180.91 ***	158.97 ***	135.76 ***	127.50 ***	28.63 ***	25.14 ***
R ²	0.3945	0.4137				
Cut Point 1			3.282 ***	2.738 ***	1.851 **	0.173
Cut Point 2			4.916 ***	4.554 ***	3.226 ***	1.569 *
Cut Point 3			6.672 ***	6.493 ***	5.036 ***	3.391 ***
Cut Point 4			7.513 ***	7.387 ***		

+ p < .10, * p < .05, ** p < .01, *** p < .001. ^aF for partial models is (16,113), full models (24,105)

The first model for each outcome has the wave 2 level of the outcome as the dependent variable and sexual activity, female gender, their interaction, and the wave 1 level of the outcome as independent variables, along with the same set of control variables used in the tests of hypothesis 1. The second model for each outcome variable has all of the independent variables from the first model plus the four contextual mediators – school integration, personal religiousness, close friends who drink, and parent problem-focused interactions – and interaction terms indicating the extent to which these effects are moderated by gender. Model R^2 is reported for each linear regression model, and the cut points for each category are reported for each ordinal logistic regression model.

These models are necessarily simpler than those which would ideally test this hypothesis. Attempting to model changes in levels of negative outcomes as a function of changes in contextual mediators interacting with changes in sexual activity moderated by gender violated statistical assumptions too strongly and divided the sample too finely into sub-categories to produce any convincing findings. Therefore, models reported in Table 3.3 compare youth who were sexually active at either wave to those who never were. Although this implies the assumption that all patterns of sexual activity affect outcomes equally, this is an acceptable limitation given that it was indeed the case in the above test of hypothesis 1 that all patterns of sexual activity affected contextual mediators roughly equally, and attempting to more finely divide the categories did not produce any clearer or more convincing findings. Levels of contextual mediators are represented by the means of their Wave 1 and Wave 2 levels.

Results conclusively uphold hypothesis 2 with respect to depression and suicidality and partially uphold hypothesis 2 with respect to alcohol use. Entry of the set of contextual mediators reveals significant coefficients for some of the mediators

and the effect of sexual activity on alcohol use reduced in strength and its effects on depression and suicidality reduced to non-significance. School integration has a significant independent direct effect on change in depression and suicidality, but not alcohol use. Personal religiousness only has a significant effect on change in depression. Number of close friends who drink has a significant effect on alcohol use and suicidality, but not on depression; arguably, this can be interpreted to mean that it influences behavior or intended behavior but not affect. Parent problem-focused interaction is the only mediator that emerges as significant for all three dependent variables. Unexpectedly, entry of the set of contextual mediators also reduces the effect of female gender on changes in depression and suicidality to non-significance. Previous research can explain this, as described below. However, the emergence of a significant effect of female gender on alcohol use is difficult to explain.

Discussion

Study results confirm hypotheses 1 and 2 and thus uphold the unique role of changes in relationships with potentially supportive people and institutions in explaining the relationship between adolescent sexual activity and problems in behavior and mental health. Within a time frame of roughly one year, initiating or continuing sexual activity is related to significantly lower school integration, higher problem-focused interaction with parents, more close friends who drink, and (for young women only) lower personal religiousness. Levels of these factors explained changes in depression, suicidality, and (to a lesser extent) alcohol use that would otherwise be attributable to sexual activity within that same time frame.

The direction of effects between sexual activity and contextual mediators is a significant contribution of this study that is nevertheless difficult to interpret. Findings that sexually active adolescents have less strong relationships with school (Schvaneveldt et al., 2001) and religious (Holder et al., 2000) institutions, more

problematic attachment to parents (Capaldi, Crosby, & Stoolmiller, 1996; Crockett, Bingham, Chopak, & Vicary, 1996), and more involvement with peers engaged in problem behaviors (Beal et al., 2001; Benda & DiBlasio, 1991; Whitbeck, Conger, & Kao, 1993) have many precedents in previous research. The unique contribution of this research is investigation of the temporal ordering of those effects which allows for better informed inferences about the mechanisms by which they are related. Initiating or continuing sexual activity is related to levels of context factors changing in a less adaptive direction. Ceasing sexual activity, however, does not lead to any improvement, at least not over the course of a year.

This calls into question a problem behavior explanation of the relationship between contextual factors and sexual activity because, to the extent that the variables used here depend at least in part on adolescents' relationships with potentially supportive individuals and institutions, those relationships should improve if the problem behavior ceases. An explanation that better fits these findings comes from theory on sexual minorities (Russell, 2003; Sullivan & Wodarski, 2002): By engaging in sexual activity, the adolescent has changed membership in socially defined categories from virgin to non-virgin, similarly to how a youth who discloses same-sex attractions or behavior also joins a different socially defined category that does not benefit from society's approval. Thus, not only do sexually active adolescents experience a multi-contextual support failure, but they cannot stop the process simply by ceasing sexual behavior. This helps explain earlier findings that changes in contextual supports attributable to sexual activity actually make further sexual activity more likely (Ream & Savin-Williams, 2005; Schvaneveldt et al., 2001). It is, thus, questionably useful to conceptualize the phenomenon in this specific case as a control response (Jessor, 1982).

In finding that the observed changes in adolescents' relationships with social context help explain the known relationships between sexual activity and suicidal thoughts (Patton et al., 1997), depressive symptoms (Joyner & Udry, 2000), and alcohol use (Zweig et al., 2001), these results also suggest that if, indeed, adolescents are making a rational choice to engage in sexual activity as part of a "strain toward maturity" in which they turn from childhood support sources and rely more heavily on peers and romantic partners (Udry, 1990; Udry & Billy, 1987), they appear to be losing in the exchange. The theoretical construct that best fits these findings is, again, borrowed from work on sexual-minority youth (Herr, 1997): By engaging in sexual activity, youth join a stigmatized social class of non-virgins, and contexts diminish the support available to them accordingly.

Although hypotheses of this study did not concern gender, these findings can add something to discourse on gender, sexuality, and mental health. It has recently been suspected that young women's greater psychological vulnerability to the stressors of adolescent dating accounts for their greater levels of depression (Joyner & Udry, 2000; Welsh et al., 2003). The present study's findings on gender are cause for suspicion, although they do not clearly demonstrate, that young women suffer measurably from stronger social sanctions on their sexual activity. Almost all interaction effects that would have indicated a substantially different pattern of effects based on gender were statistically non-significant. Given double-standards with respect to women's sexuality in both society in general and several specific religious and ethnic sub-populations (Asencio, 2002; Downie & Coates, 1999; Hartley & Drew, 2001; Nolin & Petersen, 1992; Sheeran et al., 1996; Weekes, 2002), this non-finding is counter-intuitive. There were, however, significant independent direct effects of female gender on changes in depression and suicidality. These effects were independent of sexual activity, but not necessarily of romantic attractions and dating,

variables with which this study was unconcerned. Thus, although these findings do indicate that contextual supports help explain associations between female gender and mental health independently of sexual activity, explaining the relationship between female gender and negative outcomes is the task of other research.

Finally, a life-course perspective, taking into account the impact of history and life events on participants at their specific life stage, must be invoked to justify why data collected almost ten years ago are still relevant, speculate on how findings might be different now, and suggest practical implications of these findings. Most prevalent cultural and religious values systems in America have consistently discouraged sex before marriage throughout recent memory. Since (or perhaps by means of) the passage of the Adolescent Family Life Act in 1981 (White & White, 1991), American society has made it clear that adolescents are expected to, ideally, abstain from sexual activity until they are married. For several years before and after 1995 and 1996, when Waves I and II of Add Health data were collected, research and programming focused on delaying premarital sex or preventing it altogether, and a debate grew around the extent to which these efforts succeeded in meaningfully delaying sexual activity (Thomas, 2000) or preventing pregnancy and disease (Klerman, 2002). According to the current study's results, emphasis on abstinence may have an unintended consequence of delineating a stigmatized social class of non-virgins.

Since 1996, pressure on non-virgins can only have increased given renewed emphasis on abstinence and the increased religious undertones of those messages (Waxman Report, 2004). Without neglecting the clear and present concerns of preventing pregnancy and disease via delaying youth sexual debut, research and policy must also be concerned with sexually experienced youth and how to keep them both safe and integrated into their environments. Qualitative and ethnographic research would be useful in following up large scale studies like this to ascertain whether youth

perceive themselves to be experiencing the multi-contextual support failure that these results outline, and community-based research would be helpful in constructing and evaluating useful interventions. Policymakers and concerned adults need to watch out that abstinence only approaches to adolescent sexuality education do not generalize and become abstinents-only approaches to youth socialization, but that contextual supports continue to be in place for all youth.

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CHAPTER FOUR
DIFFERENTIAL ASSOCIATIONS WITH ADOLESCENT SUICIDALITY OF
SAME-SEX AND OPPOSITE-SEX ATTRACTION, DATING, AND BEHAVIOR

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Abstract

Conventional wisdom understanding of psychologically and contextually imposed risk factors associated with adolescent same-sex and opposite-sex romantic involvement and sexual behavior conflicts with theoretical assertions about the roles in normative development that such involvement plays. This study uses data from the National Longitudinal Study of Adolescent Health (Add Health) examines whether same-sex, opposite-sex, and both-sex romantic involvement and sexual behavior are unilaterally and uniformly associated with risk factors of depression and suicidality or if some patterns are uniquely and independently associated with risk while others are not. Results indicate that some patterns, controlling for the others, emerge as significantly associated with negative outcomes whereas others are not.

Adolescent romantic and sexual involvement, whether same-sex or opposite-sex, is associated cross-sectionally with depression and suicidality. This is partially because romantic and sexual involvement are psychologically stressful and partially because certain types of romantic and sexual involvement are stigmatized within social contexts. Having observed this in several studies to date, some researchers have concluded that “Smart Teens Don’t Have Sex (or Kiss Much Either)” (Halpern *et al.*, 2000). Indeed, the evidence suggests that a youth’s hypothetical decision to avoid problems by not spending any energy on dating or romantic intentions (Joyner & Udry, 2000; Monroe *et al.*, 1999; Welsh *et al.*, 2003) and by denying to themselves and others any same-sex inclinations they might have (Savin-Williams, 1996) might have empirical support.

It would, of course, neither be practically helpful nor consistent with the available evidence to suggest that adolescent romantic attractions, dating, and sexual activity are unilaterally maladaptive. They are normative in adolescence and play important roles in development (for reviews, see Florsheim, 2003; Furman *et al.*, 1999; Shulman & Collins, 1997), particularly for LGB youth, whose defining feature is same-sex romantic intentions and involvement (Savin-Williams, 1998). Researchers are, nevertheless, justifiably concerned for the health of adolescents involved in relationships, particularly with how such normative experiences can yet be so consistently associated with mental health problems. The current study takes the first step in addressing this question by first ascertaining which patterns of same-sex and opposite-sex attraction, dating, and behavior are most strongly related to depression and suicidality.

The most parsimonious explanation for the association between romance and mental health among general populations of youth is the inherently stressful nature of adolescent romantic involvement. Research has linked depressive symptomatology to

problems with all stages of adolescent dating relationships—attractions (Welsh et al., 2003), which may be unrequited (especially in the case of same-sex attractions, see Savin-Williams, 1996); being in the relationship itself, which can involve conflict that females in particular may be ill-equipped to handle (Joyner & Udry, 2000; Welsh et al., 2003); and breaking up, which is a notorious precursor to major depressive disorders in adolescence (Monroe et al., 1999). Same-sex oriented youth face both a far higher probability of unrequited attractions, simply because of the lower probability that someone of the same sex will return their feelings, but also because of social stigmatization of those desires (Hillier & Harrison, 2004).

A parallel explanation for the association between romance and mental health, most often associated with work on LGB youth issues, is that romantic attraction, dating, and sexual behavior are stressful because of social stigma. This can take effect when the behaviors themselves are stigmatized and when they indicate, to self and others, that youths may be members of an undesirable sexual-minority category of people. Youth classified as sexual-minorities, whether by attraction, behavior, or identity, report higher rates of suicide attempts (Russell & Joyner, 2002; Savin-Williams & Ream, 2003) and depressive symptoms (Radkowsky & Siegel, 1997) which are related to stigmatization experiences such as peer harassment (Hershberger & D'Augelli, 1995) and the withdrawal of contextual supports (Russell, 2003; Sullivan & Wodarski, 2002). There remains, however, the neglected consideration that sexual-minority youth are defined as a population by same-sex romantic intentions or involvement, and are arguably more likely to have experienced normative romance-related stress than a general population of youth.

Indeed, sexual-minority youth have often been compared, perhaps unfairly, to a general population of presumed heterosexual youth who may or may not have ever had sex, been involved romantically, or even experienced what they would identify as

romantic attractions. Although some new empirical studies have made up for these difficulties by more appropriately comparing same-sex involved youth to their heterosexually-involved peers (Russell & Consolacion, 2003; Udry & Chantala, 2002), conventional wisdom on the matter remains guided by the old paradigm of drawing a boundary around sexual-minority youth and looking for population differences. Although this research has been useful in identifying the unique risks faced by sexual-minority youth (Russell, 2003), newer perspectives are required for identifying what, specifically, is risky about the sexual-minority experience. Research is particularly helpful toward this end which compares aspects of the sexual-minority experience to equivalent aspects of the heterosexual experience within the same sample of youth who were all recruited into the study by the same means and asked the same questions (Russell & Consolacion, 2003; Udry & Chantala, 2002).

Sexual-minority and heterosexual youths' romance-related negative outcomes may actually arise from similar origins. Adolescent romantic and sexual involvement, both same-sex and opposite-sex, can be associated with poor mental health by several means: psychological stress, indication of membership in an undesirable category of people, and stigmatization within social context. Same-sex attractions and liaisons are not necessarily problematic to mental health simply because of stigmatization any more than opposite-sex expressions are detrimental to mental health simply because they are psychologically stressful. Examples include the one given above that part of the reason same-sex attraction is associated with psychological stress (Russell *et al.*, 2002) may be because of the simple higher probability unrequited love (Savin-Williams, 1996), and prior findings that the link between opposite-sex sexual activity and poor health outcomes (Udry & Chantala, 2002) is through social stigma (Ream, submitted; Ream & Savin-Williams, 2005), such as expectations that all youth should be abstinent.

Indeed, evidence of the stigmatized nature of opposite-sex sexual activity logically leads to the need for a broader perspective in explaining the relationship between adolescent romance and mental health. Despite the fact that heterosexual activity affirms heterosexuality in general and masculinity in particular among peers (Asencio, 2002; Savin-Williams, 1998), parents and other concerned adults discourage and condemn it. This results in lower perceived support from school and religious contexts, more associations with delinquent peers (Ream, submitted), and reduced closeness to (Meier, 2004; Ream & Savin-Williams, 2005) and increased conflict with (Ream, submitted; Ream & Savin-Williams, 2005) parents. These losses of support at least partially explain associations between sexual activity and negative outcomes of depression, alcohol use, and suicidality (Ream, submitted). Opposite-sex attraction and dating might be similarly stigmatized if concerned adults see them as potentially leading to sexual activity. Within more traditional cultural contexts, this is evident particularly in parents' attitudes toward young women (Asencio, 2002).

Although cultural contexts vary significantly in the strength of expectations of youth sexuality and in their double-standards with respect to gender, they are quite clear and consistent with respect to sexual activity and sexual orientation: Youth are supposed to be heterosexual and remain abstinent at least until their college years, if not until marriage. In consideration of the extent to which participation in stigmatized behaviors or assuming stigmatized identities – either because they are inherently stressful or because they are punished by society – affect mental health, this leads to a principle which will guide expectations of the results of this study: Same-sex attractions, dating, and behaviors will lead to poor mental health which have the clearest connotations for sexual-minority identity, and opposite-sex attractions, dating, and behaviors will lead to poor mental health which have the clearest connotations for being heterosexually active.

In order to more clearly specify the effects of attractions, dating, and behavior, these analyses will compare the effects of one domain at a time on depression and suicidality to assess their overall effects and then model all three domains together as predictors of depression and suicidality in order to assess their independent direct effects. Specific hypotheses include:

- 1) Modeling one domain at a time will result in significant overall effects of same-sex, opposite-sex, and both-sex attraction, dating, and sexual behavior on depression and suicidality
- 2) Modeling all three domains at once will reveal significant effects of same-sex and both-sex, but not opposite-sex, attraction on depression and suicidality.
- 3) Modeling all three domains at once will reveal significant effects of same-sex and both-sex dating on depression and suicidality.
- 4) Modeling all three domains at once will reveal significant effects of both-sex and opposite-sex sexual behavior on depression and suicidality.
- 5) Analysis of sex differences in the effects of attraction, dating, and behavior will reveal significantly stronger effects for young women than for young men.
- 6) The effects the three domains as a set will mediate the overall effect of female gender on mental health.

Results will, of course, be considered in light of the complex interplay of psychological and structural issues related to gender and sexual orientation that may bear upon them and the multiple theoretical perspectives that may explain them. This study, however, uniquely considers stigmatization of both same-sex and opposite-sex expressions of adolescent romance and sexuality as one of several factors that may explain their associations with negative mental health outcomes.

Method

Participants and Recruitment

Data for this study are drawn from the National Longitudinal Survey of Adolescent Health (Add Health) (Udry & Bearman, 1998a). Recapitulated here, the design and method of Add Health is described in greater detail elsewhere (Udry & Bearman, 1998b). The study assessed contextually mediated positive and negative effects on adolescent (grades 7 through 12) health on the individual, family, and school levels, with significant information gathered on peer-peer and parent-youth dyads. The primary sampling frame was school-based, with a nationwide sample of 80 high schools selected and a 70% response rate. Comparable replacement schools were selected for schools that declined to participate. If the recruited high school was not for all grades 7 through 12, younger students were recruited from middle and junior high schools that fed into the sample high schools. Thus, a total of 132 public and private schools in a total of 80 communities participated.

In selecting students to participate in the in-home interviews, the within-school sample was split into sex by grade strata and a random sample was taken within each stratum. Roughly 17 students per stratum per school pair were selected for a total of 12,105 students in the core sample. Special over-samples of Chinese, Cuban, Puerto Rican, disabled, twins, and Black youth with at least one parent holding a college degree were also collected. Additionally, the entire student body of 16 diverse schools was selected for in-home interviews to provide data on peer networks. The total wave 1 in-home interview sample includes 20,747 individuals. To be included in the current sample, cases had to have a valid “grand sample weight” value ($n = 18,924$), indicating a positive probability, however small, of inclusion in a national probability sample of American adolescents. Because our hypotheses were cross-sectional, only wave 1 of what is now a three-wave study was used for these analyses.

Of the 18,924 total cases, 9,288 were male, 9,634 were female, and two were missing data on biological sex. An additional 367 males and 213 females had to be dropped because, although they reported having “ever had sex” in a part of the ACASI that assessed experience with sex and contraceptives, they reported no romantic or non-romantic relationships. There was no way to discern their partners’ genders, and previous work revealed inconsistent responders to be a distinct population from those who gave consistent reports of never having had sex with respect to the outcome measures assessed (Ream, submitted). Whether those responses were erroneous, false, or reflective of pre-adolescent abuse that participants were not comfortable calling a “relationship” was out of the scope of this study, and so those cases could not be kept. Three more males were dropped due to missing data on school’s urbanicity. An additional eight males and 11 females were missing data on depressive symptoms, and 121 males and 88 females were missing data on suicidality. Missing data on other control variables was, however, recovered via an expectation maximization algorithm in SPSS 13.0, imputing missing values according to a regression equation with all other study variables. Total valid N was 8,797 males and 9,159 females in analyses of suicidality, and 8,910 males and 9,276 females in analyses of depression.

Measures

Depression. A composite scale of Add Health items that was as close as possible to the standard Center for Epidemiological Studies Depression scale measured depression. This 20-item scale measures four dimensions of depressive symptomatology, including depressive affect, well-being (reverse-coded), interpersonal issues, and somatic complaints. Eighteen of the items asked about symptoms experienced in the past week, and two asked about symptoms experienced in the last twelve months. Although this different time frame could have been a problem, in previous research on this measure’s factor structure in four ethnic groups,

they did not form their own factor among any group and only loaded onto the same factor among one ethnic group (Crockett *et al.*, 2005). In the current study, Pearson $\alpha = .88$. Depression is modeled as a continuous outcome variable in analyses.

Suicidality. Suicidality is modeled as an ordinal outcome variable in analyses. The base category was assigned to participants who answered “no” to “During the past 12 months, did you ever seriously think about committing suicide?” Category 1 was assigned to participants who answered “yes” to that question but “0 times” to the question “During the past 12 months, how many times did you actually attempt suicide?” Category 2 was assigned to participants who reported a single suicide attempt, and Category 3 to those who reported more than one suicide attempt.

Attractions. Participants’ attractions were coded based on their own gender and their responses to “have you ever had a romantic attraction to a female” and “have you ever had a romantic attraction to a male.”

Dating. Participants’ dating experiences were coded according to their own gender and whether the genders of their various dating partners had been male or female. The questionnaire asked for details on up to three romantic partners, either identified as such by the participant or brought up during the non-romantic relationships part of the questionnaire and inferred (by the computer program) to be romantic in nature because participants indicated having held hands with their partners, kissed them, and told them they liked/loved them.

Sexual_behavior. Data on partner’s gender for up to three romantic relationships, three non-romantic relationships, and some catch-all questions at the end of the non-romantic relationships roster were collapsed to indicate whether participants had been sexually active with same-sex and/or opposite-sex partners. Taking participants’ responses at face value, we assumed all relationships to be sexual on which they had given details in the non-romantic sexual relationships section

without attention to which behaviors they reported. Romantic relationships were coded as sexual if participants indicated having had sexual intercourse with their partners. No technical definition of sexual intercourse was provided at that point in the questionnaire.

Controls. In order to ensure that our findings were independent of other contextual explanations for them, indicators of disadvantage, including parents' education, school's urbanicity, race, whether parents were married and whether the family was receiving government aid were controlled (Moore & Chase Lansdale, 2001; Parfenoff & Paikoff, 1997). Other moderators of the relationship between romantic/sexual activity and negative outcomes, including age (Joyner & Udry, 2000) and verbal ability (Halpern et al., 2000), were controlled as well. Finally, given that gender is known to be a strong moderator of relationships between sexuality, sexual orientation, and outcomes (Russell & Consolacion, 2003), all analyses are run separately for gender.

Methodological Notes

The Add Health data set was designed as a survey data set with four sampling strata (north, south, east, west), 132 primary sampling units (the schools), and a definite probability of each student within any of those schools to be included in the sample (grand sample weight). Survey procedures in STATA 8/SE (Statacorp, 2001) were used to adjust for clustering and unequal probability of inclusion in the sample. Using these procedures makes sample means and standard errors based on the data set more accurately reflect what population means and standard deviations would be if the sample really was a random representative sample of American adolescents.

Results

Descriptive Statistics

Survey-adjusted mean age of participants was 16 years. Sixty-five percent of participants were white, 15% were black, 11% were Latino, 4% were Asian, 3% were American Indian, and 1% were “other.” Twenty-six percent went to urban, 58% to suburban, and 15% to rural schools. Parents of 62% reported being married, and 11% had at least one parent receiving government aid. Same-sex attraction, dating, and/or behavior was reported by 8% of males and 7% of females.

Table 4.1 reports survey-adjusted raw prevalence data on attraction, dating, and behavior, separately by sex. Rates of same-sex, both-sex, and opposite-sex behavior are very similar between sexes. Substantially more young women than young men are involved in same-sex dating relationships. Young men, however, are far more likely to report both-sex attractions than young women.

Table 4.1

Raw prevalence of same-sex, both-sex, and opposite-sex romantic attraction, dating, and sexual behavior

		None	Opposite	Both	Same
Attraction	Male	15.4%	77.4%	6.3%	1.0%
	Female	12.2%	82.5%	3.9%	1.4%
Dating	Male	36.8%	62.0%	0.6%	0.6%
	Female	34.8%	63.3%	0.8%	1.1%
Behavior	Male	67.8%	31.2%	0.6%	0.4%
	Female	68.8%	30.1%	0.8%	0.4%

Multivariate Results

Tables 2 and 3 describe the results of survey-adjusted ordinal logistic regression models predicting suicidality and linear regression models predicting depression from same-sex, opposite-sex, and both-sex attraction, dating, and behavior, with control variables mentioned above. Each table reports a total of eight regression models, four with suicidality as a dependent variable and four with depression as a dependent variable. In the interest of space, model fit statistics and coefficients of control variables are not reported but are available from the first author. The left-hand column for each dependent variable reports the results of three models, one for each of attraction, dating, and behavior. In each of these models, control variables plus the single four-category independent variable (“none” is always the reference category) were entered as predictors of suicidality or depression. Coefficients for suicidality represent the difference in log odds of membership in the next higher category of suicidality – thought about it versus never thought about it, attempted versus only thought about it, etc. – attributable to membership in the corresponding category rather than “none.” Coefficients for depression represent the difference in depression attributable to membership in the corresponding category rather than “none.”

The right-hand column for each dependent variable reports the results of a single model in which all three domains were entered as categorical independent variables. This method controls for membership in multiple categories – e.g., both-sex dating but opposite-sex attraction and no sexual behavior – by mathematically separating out the variability in the dependent variable attributable to each domain individually. Thus, increases in suicidality attributable to patterns of behavior within each domain in the “all at once” models can be confidently said to be uniquely attributable to that domain and independent of patterns of behavior with respect to the other domains (Darlington, 1990). Placing them side-by-side in these tables allows for

easy comparison between overall effects in the one-at-a-time columns to independent direct effects in the all-at-once columns in order to ascertain which effects really are unique to specific patterns of behavior in specific domains and are not necessarily associated with other patterns of behavior that tend to co-occur in other domains. Null results do not necessarily mean that statistically insignificant independent direct effects do not exist, but rather that they are less prevalent or less strong than the ones that are statistically significant.

Table 4.2

Multivariate Analyses of Males' Health Correlates of Attraction, Dating, and Behavior

		Suicidality		Depression	
		One at a time	All at once	One at a time	All at once
	Opposite-Sex	0.303	0.095	0.016	-0.348
Attraction	Both-Sex	0.851 **	0.572 *	1.891 **	1.293 *
	Same-Sex	1.307 **	0.983 +	2.850 **	2.416 **
	Opposite-Sex	0.573 ***	0.335 *	0.865 **	0.413
Dating	Both-Sex	1.393 **	0.911	2.907 *	0.442
	Same-Sex	2.301 ***	1.976 ***	3.701	2.698
	Opposite-Sex	0.705 ***	0.551 ***	1.484 ***	1.312 ***
Behavior	Both-Sex	1.458 **	0.652	5.375 **	4.274 *
	Same-Sex	1.794 +	0.567	3.599	0.958

Note: Reference category for all categorical variables is "none."

*** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .10$.

Figures 4.1 and 4.2 are essentially graphical representations of the regression analyses. The suicidality graph is simplified from the regression analysis: The regression is an ordinal logistic regression which takes into account all levels of suicidality and thus does not simplify the data at all. It would be extremely difficult, however, to draw a graph that would represent all four levels of this variable and still make any visual sense. Therefore, the suicidality graph is based on a simplified version of the analysis predicting reported suicide attempt as a binary dependent variable. The depression graph, however, uses all of the information present in the depression analysis. The scale of the depression graph is somewhat awkward because it was set to the same scale as the graph for young women, who exhibit more depression, as the scale of the young women's suicidality graph was set to the same scale as young men. This is to make cross-gender comparisons easier.

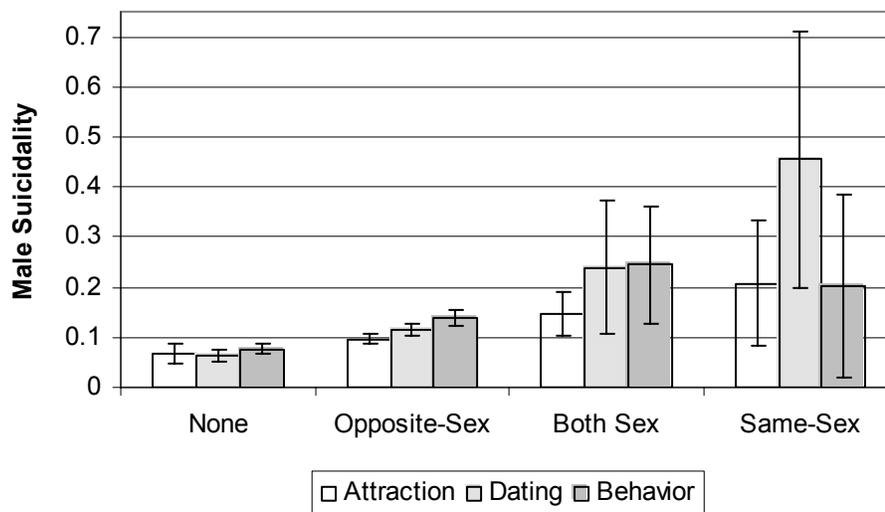


Figure 4.1: Adjusted Mean Probabilities of Reported Suicide Attempt for Young Men

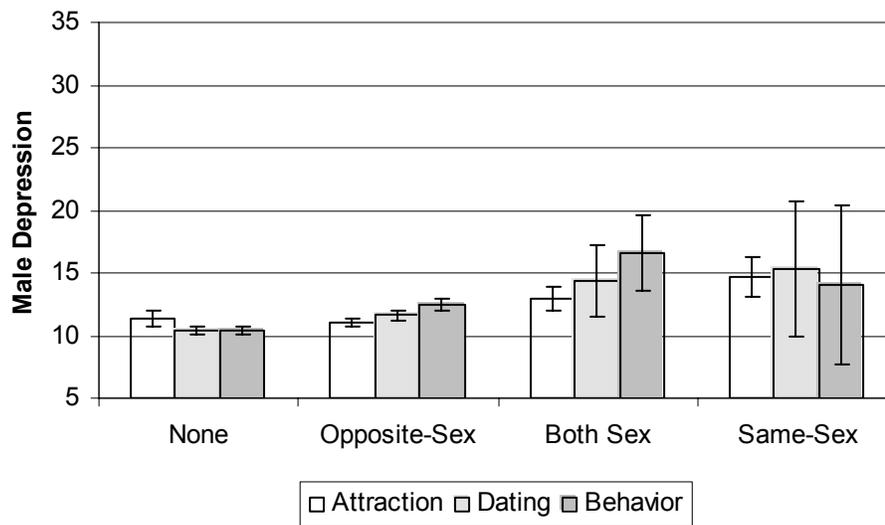


Figure 4.2: Adjusted Mean Depression Levels of Young Men

Findings support hypotheses with respect to young men. In the one-at-a-time analyses, the only pattern without even a trend toward an association with either suicidality or depression is opposite-sex attraction. In the all-at-once analyses, controlling for dating and behavior, both-sex attraction predicts both depression and suicidality. Same-sex attraction predicts depression and shows a trend toward an association with suicidality. Dating among young men is, however, uniquely associated with suicidality but not with depression. Indeed, same-sex dating among young men, holding all other effects constant, is the strongest predictor of a reported suicide attempt in the entire study. It is not, however, associated with significantly higher depression levels than not dating at all, not even in the one-at-a-time models. Finally, hypotheses are supported with respect to opposite-sex behavior. It is uniquely associated with suicidality and depression. Both-sex behavior is also uniquely associated with suicidality.

Table 4.3

Multivariate Analyses of Females' Health Correlates of Attraction, Dating, and Behavior

		Suicidality		Depression	
		One at a time	All at once	One at a time	All at once
	Opposite-Sex	0.923 ***	0.641 **	2.040 ***	0.781 +
Attraction	Both-Sex	1.788 ***	1.408 ***	5.063 ***	3.053 **
	Same-Sex	1.785 ***	1.483 **	5.904 ***	4.245 **
	Opposite-Sex	0.845 ***	0.613 ***	3.314 ***	2.224 ***
Dating	Both-Sex	1.706 ***	0.893 *	10.247 ***	7.076 ***
	Same-Sex	1.826 **	1.497 **	0.888	-0.555
	Opposite-Sex	0.658 ***	0.368 **	3.549 ***	2.385 ***
Behavior	Both-Sex	1.872 ***	1.037 +	7.892 ***	4.740 *
	Same-Sex	0.424	-0.027	14.989 ***	13.561 ***

Note: Reference category for all categorical variables is "none."

*** $p < .001$, ** $p < .01$, * $p < .05$, + $p < .10$.

Study hypotheses are supported with respect to young women. Opposite-sex, both-sex, and same-sex attraction, dating, and behavior are all associated in the one-at-a-time models with either suicidality or depression. The major difference between the findings for young women and those for young men, however, is the number of effects which remain significant even in the all-at-once models. Figures 4.3 and 4.4 detail adjusted probability of a reported suicide attempt and mean depression level associated with each domain.

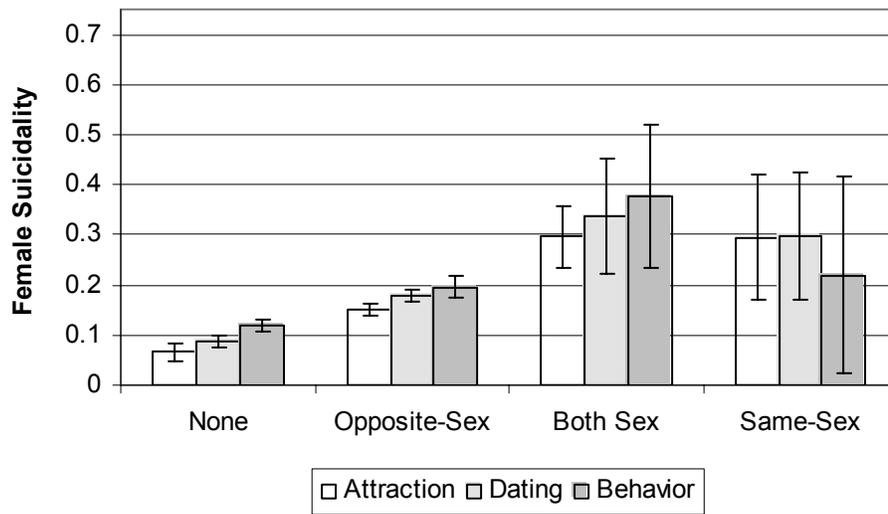


Figure 4.3: Adjusted Mean Probabilities of Reported Suicide Attempt for Young Women

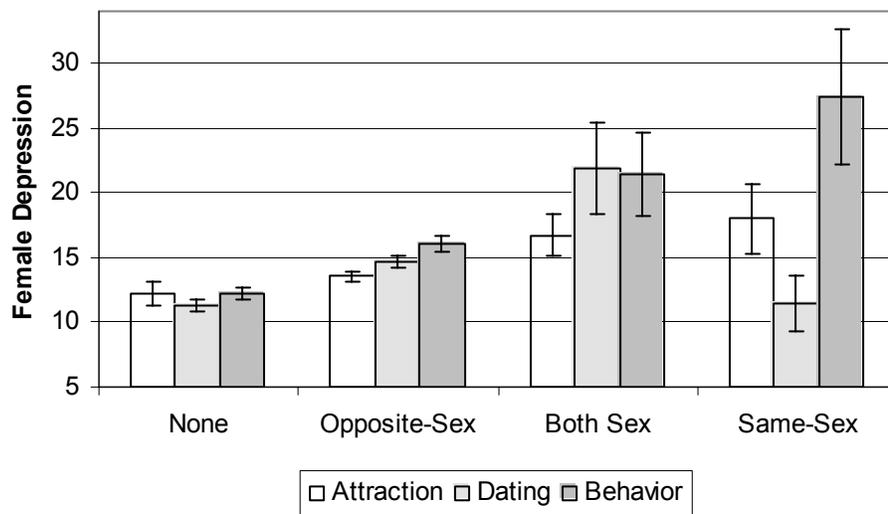


Figure 4.4: Adjusted Mean Depression Levels of Young Women

In the all-at-once analyses, controlling for dating and behavior, both-sex and same-sex attraction predict both depression and suicidality. An unexpected effect of opposite-sex attraction on suicidality emerges as well. Further, any pattern of dating is uniquely associated with suicidality, and all but exclusive same-sex dating are associated with depression. Finally, opposite-sex sexual activity is associated with both depression and suicidality, and both-sex sexual activity is associated with depression and demonstrates a trend toward an association with suicidality. Unexpectedly, same-sex behavior among young women is the strongest predictor of depression in the entire study.

After data for males and females were analyzed separately in order to evaluate hypotheses 1 through 4, they were analyzed together in order to evaluate hypotheses 5 and 6. Although sex differences would, ideally, have been evaluated using a full four-way ANCOVA with gender, attraction, dating, and behavior as independent variables free to interact with each other, this would have left too few cases per cell for any meaningful analysis. These analyses merely mirror those detailed in tables 4.2 and 4.3 with gender allowed to interact with only one domain at a time. The simple purpose of this is to determine whether the domains themselves and differences in effects based on gender account for the known overall higher depression and suicidality levels in young women (note that this latter does not address the higher probability of completing a suicide among young men; data on living youth obviously cannot evaluate hypotheses about completed suicides) and ascertain whether young women are overall more vulnerable to the vagaries of adolescent romance than young men.

Table 4.4

Sex Differences in Correlates of Attraction, Dating, and Behavior

		Suicidality		Depression	
		One at a time	All at once	One at a time	All at once
Attraction	Female Gender	-0.001	0.011	0.617	0.174
	Opposite-Sex	0.366 +	0.156	0.132	-0.152
	Both-Sex	0.896 ***	0.605 *	1.944 **	1.420 *
	Same-Sex	1.308 **	1.006 +	2.802 **	2.439 **
	Female*Opposite	0.519 +	0.455	1.793 **	0.785
	Female*Both	0.841 **	0.770 *	2.973 **	1.410
	Female*Same	0.472	0.489	3.001 +	1.669
Dating	Female Gender	0.368 **		0.733 **	
	Opposite-Sex	0.619 ***	0.346 **	0.945 ***	0.464 +
	Both-Sex	1.379 **	0.906	2.970 *	0.546
	Same-Sex	2.193 ***	1.867 ***	3.598	2.554
	Female*Opposite	0.160	0.231	2.235 ***	1.648 ***
	Female*Both	0.257	-0.050	7.105 **	6.380 *
	Female*Same	-0.403	-0.391	-2.794	-3.196
Behavior	Female Gender	0.570 ***		1.632 ***	
	Opposite-Sex	0.745 ***	0.599 ***	1.586 ***	1.419 ***
	Both-Sex	1.419 **	0.642	5.393 **	4.288 *
	Same-Sex	1.709	0.527	3.574	1.149
	Female*Opposite	-0.146	-0.296 *	1.798 ***	0.787 +
	Female*Both	0.415	0.357	2.357	0.330
	Female*Same	-1.345	-0.613	11.442 **	12.521 **

Data offer limited support to hypothesis 5. Looking at the domains individually, opposite-sex and both-sex attraction and dating along with opposite-sex and same-sex behavior are more strongly associated with depression for young women than for young men. The all-at-once models suggest that opposite- and both-sex dating, along with same-sex behavior, primarily account for this difference in vulnerability. Data also support hypothesis 6. A main effect for gender appears in models with dating and behavior, but it is rendered non-significant when attraction enters the model. Female gender is not a significant influence on suicidality or depression except via its exacerbation of the effects of attraction, dating, and behavior. Furthermore, the all-at-once models suggest that gender's strongest influence is via dating, not necessarily attraction itself.

Discussion

Results support study hypotheses with respect to sexual orientation. With the exceptions of opposite-sex attraction and same-sex behavior for young men, all permutations of opposite-sex, same-sex, and both-sex attraction, dating, and behavior are associated with either depression or suicidality among both young men and young women. Same-sex and both-sex attraction are associated with depression and suicidality for both genders. Same-sex dating is associated with suicidality but not depression for both genders. Both-sex dating is uniquely related to depression and suicidality for young women only. Opposite-sex behavior is associated with depression and suicidality and both-sex behavior is associated with depression only for both sexes. Results also support study hypotheses with respect to sex differences. The effects on depression of romance in general and dating in particular are stronger for young women than for young men. As a set, attraction, dating, and behavior explain the association between gender and mental health.

Some results were at variance with expectations. Same-sex dating for both sexes was associated with suicidality, but not with depression. This appears anomalous given the strong association between suicidality and depression until one considers findings that high-lethality “true suicide attempts” among those who report suicide attempts are rare (Patton *et al.*, 1997) – indeed, in one study of gay youth, *none* of those who reported having attempted suicide indicated that their attempt was highly likely and definitely intended to be lethal (Savin-Williams & Ream, 2003). Some have proposed a “suffering suicidal script” (Savin-Williams, 2001); that is, gay youth learn somehow that they’re *supposed* to be suffering and suicidal and merely report on the survey what is expected of them. Respondents’ following the script may explain why exclusive same-sex dating is so strongly and uniquely associated with suicidality among males: acknowledged romantic feelings put them closest to the stigmatized status of homosexuality.

The breadth of significant results for young women was also unexpected. It appears as though the conventional wisdom that guided the hypotheses needs to be revised: Psychological and contextual forces conspire against youth who are sexually active, same-sex oriented, *and/or romantically or sexually involved females* (Halpern *et al.*, 2000). There was support here for the assertion that known overall differences within general populations between young women and young men in depression and suicidality are at least partially the fault of greater vulnerability of young women to stressors inherent to romantic attractions and dating (Joyner & Udry, 2000; Welsh *et al.*, 2003). With respect to sexual-minorities specifically, although male homosexuality is arguably more persecuted than female homosexuality, young women’s greater vulnerability leaves them just as strongly at risk for suicidality and *more* at risk for depression given the same pattern of same-sex involvement.

These results indicate that both psychological stressors and contextual pressures simultaneously explain the relationships between romantic/sexual involvement and mental health. Contextual pressures clearly discourage homosexuality, sexual activity, and female romantic/sexual involvement. Prior research has shown that risk is associated with any attitude or behavior that gives youth themselves or the people around them the idea that they might be members of the stigmatized class of sexual minorities (Hershberger & D'Augelli, 1995; Hillier & Harrison, 2004; Radkowsky & Siegel, 1997; Savin-Williams, 1994a, 1994b). Prior research has also demonstrated that family, school, and religious contexts withdraw support from sexually active youth (Meier, 2004; Ream, submitted; Ream & Savin-Williams, 2005). Within certain contexts, youth also face a double-standard with respect to gender, with abstinence expected of all youth (Thomas, 2000; White & White, 1991) but a special degree of chastity expected of young women (Asencio, 2002).

The three criteria specified above for associating a pattern of romantic involvement with negative outcomes – normal psychological stress and angst associated with early relationships, stigmatization of the behavior itself within social context, and meaningfulness of the attraction or behavior for the adolescent's membership in a stigmatized social category – are all important on their own and may all conspire together to create particularly difficult situations. Same-sex dating may have been so strongly associated with suicide among young men because, although attractions may be benign and sex may be meaningless, dating is most likely to be visible and is a clear indication to self and others of sexual-minority status. Similarly, same-sex sexual activity may have been so strongly associated with depression among young women because attractions and “passionate friendships” (Diamond *et al.*, 1999) with romantic qualities between young women may feel normal and natural enough,

but sexual behavior is a clear indication to self and anyone who finds out about it of sexual-minority status.

With respect to all domains and orientations of attraction, dating, and behavior, there remains no good excuse for why something so normative and so important to the achievement of developmental tasks should yet be so strongly associated in the short term with negative mental health outcomes. Theory and research in this area has astutely moved beyond consideration of simple population differences between sexually active and abstinent youth or between sexual-minorities and presumed-heterosexual youth in order to consider dimensions of heterosexual and sexual-minority experience. Within the integrative perspective articulated here, psychological stress and contextual pressures associated with specific experiences create problematic outcomes, not necessarily membership in a population. Research and policy work based on this perspective can competently address the negative mental health outcomes associated with adolescent attraction, dating, and sexual behavior by looking comprehensively at all sources of risk and addressing inequality based on gender and sexual orientation with respect to the supportiveness of social contexts for all youth (Barber & Eccles, 2003).

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CHAPTER FIVE

CONCLUSION

The three papers that comprise this dissertation form an argument that context, the “perceived environment system” (Jessor & Jessor, 1977, p. 17), explains associations between adolescent sexuality and negative psychological/behavioral outcomes. Using data from the first two waves of the National Longitudinal Study of Adolescent Health (Add Health, Udry & Bearman, 1998), they test hypothesized connections between contextual mediators, sexual behavior, and negative outcomes and then apply a contextual explanation to findings of differential levels of risk attributable to multiple dimensions of youth sexuality. The purpose of this conclusion is to review the important findings of the three papers as a set and give further details about their implications for theory, research, and application.

The first paper, “Reciprocal Associations between Adolescent Sexual Activity and Quality of Youth-Parent Interactions,” demonstrated the existence of reciprocal effects between youth sexuality and three dimensions of the parent-youth relationship: shared activities, closeness, and problem-focused interactions. Parent-youth relationships that were relatively less close and involved fewer shared activities and more problem-focused interactions both predicted, and were predicted by, the onset and continuation of youth sexual activity. Of the three dimensions, effects on and of problem-focused interactions were the strongest and most consistent for both sexes.

The second paper, “The Role of Diminishing Environmental Supports in Explaining Associations between Sexual Activity and Psychological/Behavioral Risk,” extended and refined reciprocal relationship findings from the first study. The analyses of the association between sex and context had originally been designed to follow those in the first paper, hypothesizing reciprocal relationships between sexual activity and four perceived environment variables: school integration, personal

religiousness, close friends who drink (an operationalization of delinquent peer association), and problem-focused interactions with parents (the operationalization of parent relations with the strongest and most consistent effects for both sexes). At a reviewer's request, however, the analyses were changed to clearly differentiate the effects of ceasing from the effects of initiating sexual activity. Although initiating (or continuing) sexual activity consistently led to lower levels of contextual supports, ceasing sexual activity led to no improvement. Apparently, sexual activity was not so much a "problem behavior" to which the control response would relent once the behavior itself ceased, but rather gave youth a non-virgin status that could not be dispensed with, at least in the short term, by discontinuing the behavior. The second set of analyses of the second paper confirmed that levels of contextual supports were connected with psychological and behavioral risk, in that levels of contextual supports strongly mediated the relationship between sexual activity and negative changes in levels of context supports.

The third paper, "Differential Associations with Adolescent Suicidality of Same-Sex and Opposite-Sex Attraction, Dating, and Behavior," applied the theory from the first two papers that stigmatized sexual social status explained differential levels of risk associated with various dimensions and expressions of sexuality. Same-sex and opposite-sex sexual behavior, dating, and attraction were examined for unique associations with suicidality and depression. Dimensions of romantic/sexual expression were associated with risk if they were either inherently psychologically stressful, such as dating (Welsh *et al.*, 2003), or earned youth any or all of the following stigmatized labels: non-virgin, sexually-active female, or sexual-minority. Although same-sex attraction was associated with depression and same-sex dating with suicidality, same-sex behavior was uniquely associated with neither. Behavior

alone, apparently, did not confer sexual-minority status. It had to “mean something” in order to be associated with sexual-minority status and thus be associated with risk.

The theoretical product of these papers is a revision of problem behavior theory (Jessor & Jessor, 1977) synthesized to include elements of differential developmental trajectories (Savin-Williams & Diamond, 1999, 2000) and normative developmental perspectives on adolescent romance and dating (Florsheim, 2003; Welsh et al., 2003). Problem behavior theory states that the inherent marginal status of adolescence leads to felt disconnection and lack of support from perceivable contextual sources, which leads to attempts to achieve adult social goals via problem behavior and, predictably, a social control response against youth. According to these papers’ results, youths’ behavior is not only affected by but affects the perceived environment system, in that levels of contextual supports decrease for youth who deviate (or further deviate) from expectations.

As pessimistically as this is framed, it actually upholds positive perspectives (Savin-Williams & Diamond, 2004; Welsh, 2005; Welsh et al., 2003), in that sexual behavior is neither assumed to be pathological nor found to be necessarily so. The finding that sexual activity need not be associated with problems is consistent with differential developmental trajectories. The finding that meaning and context of the behavior are important determinants of its impact on outcomes and the youth’s other relationships is consistent with normative developmental perspectives on adolescent dating and romance. Also consistent with normative perspectives is the third paper’s finding that variability in depression and suicidality not otherwise attributable to the psychological stress associated with adolescent romance is attributable to the meaning of the feelings/behavior in a specific context. Consistent with both positive perspectives employed within is the recurring conclusion that life consequences of youths’ emerging sexuality depend on how concerned adults around them react to it.

Figure 5.1 represents a composite image of these studies' theoretical insights. Sexual behavior leads to stigmatized sexual social status, which elicits a social control response from the youth's environment, which erodes connections between the youth and contextual supports, which then leads to both psychological risk and (further) sexual behavior. The pathway depicted in Figure 5.1 is a cycle, reflecting the

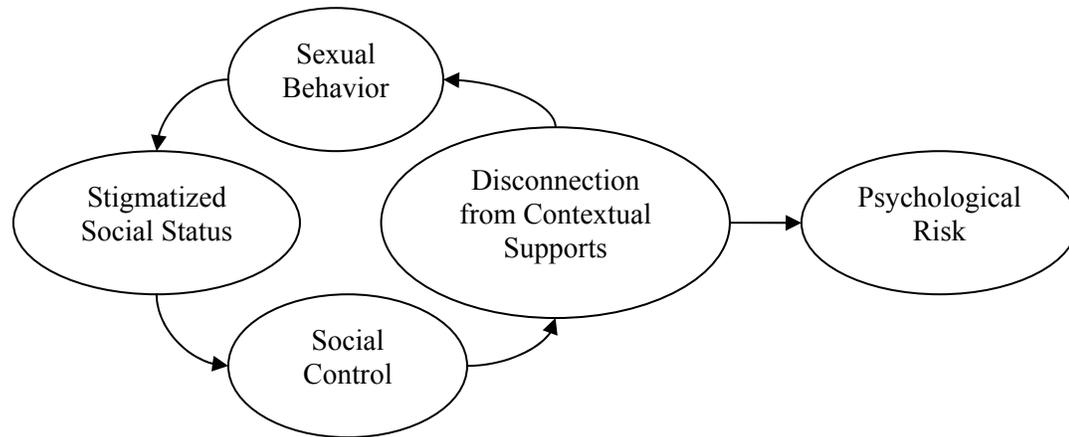


Figure 5.1: Composite Conceptual Model of the Three Papers

downward spiral that the reciprocal effects findings suggest, and an individual's path can start anywhere on that cycle. Lack of a felt connection with the perceived environment system need not result from social control, sexual behavior need not result from disconnection with contextual supports, stigmatized sexual social status (as in the case of sexual-minority status) need not result from sexual behavior, and a harsh social control response (e.g., to drug use or other deviance) need not result from stigmatized sexual status.

However, once a youth's developmental path touches this cycle, there is no specified limit to how often it can repeat. With greater degrees of risky sexual behavior may come greater degrees of stigmatization, leading to both greater degrees of risk and even greater degrees of risky sexual behavior. Although youth can never

become non-virgins again, they can earn themselves even darker labels from their peers, parents, schools, and religious organizations, which will push them even further away from the support they need in development. If the conventions they live with are such that they can never fully redeem themselves anyway, they may perceive little incentive to stop having sex.

Future research evaluating and elaborating this model should examine whether it generalizes to other problem behaviors. “Non-virgin” is not the only stigmatized label one can earn via behavior and “sexual-minority” is not the only stigmatized label attached based on temperaments and predispositions that one cannot help. Every high school has its “druggies,” its “smokers,” and its “geeks.” Some have a “trench coat mafia.” In all cases, it is a valid empirical question whether attempts to bring youth into line and put a stop to deviance have succeeded in stigmatizing all “different” youth (Ream & Savin-Williams, 2004), not just those who are engaged in health risk behaviors, and whether social control processes are not just pushing youth away from needed contextual supports and toward risk behaviors. Similar analyses to the ones reported in the first two papers could identify a similar relationship between the perceived environment system and other problem behaviors, e.g. substance use and delinquency.

Future research should also include qualitative interview and observational methods over time to see whether the pathway specified here accurately describes the world as adolescents experience it. Socialization messages are aimed at adolescents from many sources, and they are often contradictory and conflicting. Further, adolescents’ lives, as a differential developmental trajectories perspective (Savin-Williams, 1998) holds, are far more complex and diverse than any conceptual or statistical model. Other mechanisms might actually explain these relationships;

mechanisms which would only become clear once distilled from youths' reports in their own voices.

Practical implications of this work follow from the observation that all paths in the conceptual model (Figure 5.1) except those leading from “disconnection from contextual supports” depend on the meaning of the behavior in context and the reaction of the perceived environment system. There is probably no preventing disconnection from social supports from leading to psychological risk and further risk behavior. However, sexual behavior, even if discouraged, need not lead to stigma. Stigmatized status, even if assigned according to a definition that holds true for all of society (such as gay/lesbian, non-virgin, or drug-user), need not lead to social control sanctions against young people in their own immediate context. Social control, even if targeted at discouraging a behavior known to be unhealthy, need not lead to lack of connection with social supports.

None of this is to say, of course, that young people should not be encouraged to delay sexual activity. The risk of disease is real and pregnancy is known to set a chain of events in motion that leads to attenuated life outcomes on several dimensions (Hamburg & Dixon, 1992). Rather, in addition to the risk of pregnancy and disease, youth must also be shielded from another sexual risk factor: that of stigmatized social status. Socially excluding young people who, by chance or by choice, are beyond the bounds of what a culture deems morally acceptable is arguably good for upholding society's values but may only lead youth themselves to further psychological and behavioral risk. Both sexual-minority and sexually active youth more easily and more often find a support structure of out-group and potentially troubled peers (Benda & DiBlasio, 1991; Russell, 2003) than they regain the full acceptance and support of concerned adults. The burden on them lightens considerably when they do not suffer loss to their social supports. According to the theoretical perspective articulated here,

“tough love,” which sets boundaries and discourages risky behavior yet embraces youth for who they are no matter what they do, is far more effective at improving health than the threat of stigmatization and exclusion.

This leads to a critique of policies that are already in place, the most obvious target being abstinence-only sex education. Currently strongly encouraged by the United States government, these programs teach that abstinence is the only safe pattern of sexual behavior, that there are dire health consequences to sexual activity before marriage, that safer-sex is a myth because condoms and other methods often fail, and make their point about homosexuality clear by almost never addressing it at all. To drive the point home, 11 out of 13 often-used curricula stretch the facts or just lie, representing conservative religious ideology as fact or misrepresenting science by citing such “findings” as 50% of homosexual male teens and 41% of heterosexual female teens have HIV, that HIV can be transmitted via sweat and tears, that abortion has dire physical and psychological consequences, and that several mental health problems can be ameliorated by abstaining from sex (Waxman Report, 2004).

Applying this dissertation’s final conceptual model, it is little surprise that abstinence-only education, as a combination of easily seen-through propaganda and patriarchal normative pressure, has demonstrated little effect on the sexual beliefs and even less on the sexual behaviors of participants (Rothenberg & Weissman, 2002; Starkman & Rajani, 2002). Indeed, it might actually be making the problem worse (Brückner & Bearman, 2005). Constantly warning youth of the negative impact of sexual activity on their lives not only increases stigmatization by teaching young people and adults concerned about them to fear and suspect sexual-minority and sexually active youth as possessors of some contagion that other youth might contract, but ends up becoming a self-fulfilling prophecy as the increased stigmatization pushes youth away from needed supports and makes sexual behavior more likely.

In contrast to abstinence-only education, comprehensive sex education has shown more promise at forestalling pregnancy and disease, but the problem is bigger than one curriculum or another can address. Abstinence-only youth sexuality education is part of a greater process of *abstinents*-only youth sexuality socialization. Sexual feelings, behaviors, and values define in-groups and out-groups. This is not at all a social convention or public policy that ensures, so to speak, “no child left behind.” Rather, contextual support that would encourage healthy behavior, acknowledge youths’ romantic feelings and dating as normal and healthy parts of development fulfilling needed developmental tasks, accept diversity of youths’ sexual orientations, and avoid exerting normative pressure via stigma or exclusion would help improve psychological health outcomes for all youth.

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