Adolescent Sexual Initiation, Substance Use and Attachment to Conventional Institutions in Nine Western Nations

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INTRODUCTION

Initiation of sexual intercourse during adolescence is statistically normative among Western nations. According to the U.S. 2001 Youth Risk Behavior Surveillance Survey, 40.8% of tenth-graders and 60.5% of high school seniors reported ever having sexual intercourse (Brener, Kann, Lowry, Wechsler, & Romero, 2006). In a cross-national survey of 15 year olds in thirty-two Western nations conducted in the same year, the prevalence of ever having sexual intercourse was found to vary from a low of 15% in Poland to a high of 75% in Greenland (Ross, Godeau, & Dias, 2004). Researchers at the Guttmacher Institute, using data from the mid-1990s, found that differences between the United States and four other Western nations (Sweden, France, Canada and Great Britain) in adolescent sexual activity levels were insubstantive, although adolescents in the United States were slightly more likely to initiate sexual intercourse before age 15 (Darroch, Frost, & Singh, 2001).

Adolescent initiation of sexual intercourse has been the statistical norm for decades; the percentage of persons who initiated sexual intercourse during adolescence prior to marriage rose during the latter half of the 20th Century. For example, while only 26% of 55-64 year olds participating in the U.S. 2002 National Survey of Family Growth reported initiating sexual intercourse premaritally and prior to age 18, 54% of 15-24 year old participants reported adolescent premarital initiation (Finer, 2007). Similar trends – declining median age at first intercourse – have also been observed across many European nations (Teitler, 2002).

Despite the statistical normality of adolescent sexual initiation, adolescent involvement in sexual activity has typically been framed as a "problem behavior" in the U.S. Concern about unintended pregnancy and STIs, which are more likely with younger ages at debut (Edgardh, 2000; O'Donnell, O'Donnell, & Stueve, 2001), is one rationale used for this framing. Advocates and researchers in the U.S. also cite associations between adolescent sexual initiation and negative mental health symptoms (Hallfors et al., 2004; Meier, 2007; Spriggs & Halpern, 2008b), substance use (Jessor & Jessor, 1977; Mott & Haurin, 1988), and weaker attachments to conventional institutions (i.e., parents, school and religious organizations) (Billy, Landale, Grady, & Zimmerle, 1988; Ream, 2006; Rostosky, Wilcox, Wright, & Randall, 2004; Schvaneveldt, Miller, Lee, & Berry, 2001) as evidence for adolescent sexual activity being age-inappropriate, developmentally-risky behavior (Golden, 2006).

However, cross-national comparative studies of adolescent sexual activity demonstrate that some of the potential correlates and consequences noted above vary across Western nations. In the same study by the Guttmacher Institute researchers noted above, wide variations across nations were identified in adolescent birth and STI infection rates, despite the similar overall levels of sexual activity (Darroch, Frost, & Singh, 2001). In a qualitative study of family processes and adolescent sexual behavior in the U.S. and the Netherlands, families in the Netherlands were found to be more open to discussing and more accepting of adolescent sexual relationships within certain parameters; furthermore, initiation of sexual behavior was less disruptive to family dynamics in the Netherlands than the U.S. (Schalet, 2004). A different quantitative study, conducted with college students in the U.S. and Sweden in 1990, found that U.S. women reported significantly greater negative affective responses to their first premarital sexual experience (Schwartz, 1993). Together such findings raise the question of whether associations between adolescent sexual intercourse and other developmental risk and protective factors vary across cultures.

The purpose of this analysis is to examine the cross-national consistency in some of these associations – specifically, whether adolescent sexual initiation (prior to data collection) is consistently related to substance use, parent support, and attachment to school – across a sample of Western nations.

THEORETICAL MODEL

Because many studies frame adolescent sexual activity as a problem behavior, our analysis will be guided by the social-psychological tenants of Problem Behavior Theory (Jessor & Jessor, 1977). According to

this theory, there are three major systems that interact to influence the development of adolescent problem behavior: the personality system, the perceived environment system, and the behavior system. The behavioral system is made up of a continuum of behaviors, ranging from problem behaviors to conventional behaviors. Problem or conventional behaviors are thought to cumulate or "hang" together; for example, if one practices one problem behavior, the likelihood of practicing others is expected to increase. In the original model, developed by U.S. researchers in the 1970s, example problem behaviors included marijuana use, sexual intercourse, activist protest, drinking [alcohol], problem drinking (i.e., binge drinking or drunkenness), and general deviant behavior. Thus, the first hypothesis posed is:

H1. Sexual initiation will be positively associated with substance use.

Generally, the personality and perceived environment systems are thought to interact to constrain or promote the continuum of behaviors in the behavior system. The personality system is made up of a motivational-instigation structure (i.e., values and expectations), a personal belief structure (i.e., social and self-attitudes), and the personal control structure (i.e., tolerance of deviance, religiosity, and positive-negative function discrepancy of problem behaviors). Attachment to conventional institutions, especially religion and school, are thought to act as a control against engagement in deviant behavior. Therefore, our second hypothesis is:

H2. Sexual initiation will be negatively associated with attachment to school.

The perceived environment system is made up of interactive influences of peers and parents. One source of parent influence is parent support; this source is thought to promote conventional behavior and suppress problem behavior. Therefore, our third hypothesis is:

H3. Sexual initiation will be negatively associated with parent support.

Another tenant of Problem Behavior Theory, one that is less studied in the literature, is that a specific behavior is only problematic to the extent that the society in which the adolescent is embedded defines it as such (Jessor & Jessor, 1977). Therefore, to the extent that Western societies differ in their conceptualization of adolescent sexual behavior as problematic, we may expect the associations between sexual initiation and other system components to vary. Alternately, relatively early sexual initiation may be more universally problematic no matter what the cultural context. As such, because we will be studying sexual initiation prior to age 16, we have no a priori hypotheses regarding cross-national variability in the associations between adolescent sexual initiation and other problem behavior system components.

METHODS

Data

Analyses will draw upon data from the U.S. National Longitudinal Study of Adolescent Health (Add Health, 1996) and the Health Behavior in School-Aged Children (HBSC, 1997-98) study conducted in 28 primarily European countries in collaboration with the World Health Organization Regional Office for Europe. Add Health was designed to examine the determinants of health and health-related behaviors of U.S. adolescents in grades 7-12 in the 1994-1995 school year. The primary sampling units were schools; in the secondary sampling stage, a representative core sample and several special samples (e.g., siblings, adolescents with disabilities, etc.) of adolescents were selected for in-home interviews (Harris, Florey, Tabor, & Udry, 2003). Over 21,000 in-home interviews were completed in 1995 (Wave I), almost 15,000 of whom were re-interviewed in 1996 at Wave II (88% of those eligible) (Chantala, Kalsbeek, & Andraca, 2004). Only data from Wave II will be included, as this corresponds most closely to the 1997/98 data collection period for HBSC.

HBSC was designed to examine the health and health behaviors of adolescents, but across national contexts (Currie, Hurrelmann, Settertobulte, Smith, & Todd, 2000). Schools were the primary sampling units in HBSC; children aged 11, 13, and 15 years were the target for the international study. Anonymous surveys were conducted by pen-and-paper within classrooms. Strict adherence to the data collection protocols was required

for inclusion in the international dataset. Over 120,000 students are included in the 1997-98 international HBSC dataset.

Analytic Sample

We anticipate having to apply a number of sample inclusion criteria. First, as sexual behavior questions were optional in the 1997-98 HBSC data collection, we will include only the eight countries that posed these questions (Finland, France, Hungary, Israel, Latvia, Northern Ireland, Poland and Scotland). Second, in HBSC, only 15 year old participants were asked sexual behavior questions; therefore, we will limit both the HBSC and Add Health samples to persons who were 15 years old at the time of the survey. This will leave us with an approximate sample size of 9,437 for the eight HBSC countries (approximately evenly distributed across countries), and 2,360 for Add Health.

Measures

A table providing comparisons of question wording between Add Health and HBSC is provided on the following page. There are some differences in the way questions are phrased, which will warrant caution in results interpretation; however, the level of similarity in content allows comparison.

Predictor. The main predictor variable, *sexual initiation*, will be based on a question querying whether the respondent ever had sexual intercourse. Because all respondents will be 15 years old, an affirmative response to this question will indicate relatively early sexual debut timing by Western European and U.S. standards (Darroch, Frost, & Singh, 2001; Spriggs & Halpern, 2008a, , 2008b).

Outcomes. Two substance use variables, *tobacco and alcohol use frequency*, will be examined as components of the behavior system potentially correlated with adolescent sexual initiation. Item responses will be recategorized to be as similar as possible (e.g., smoking daily / less than daily / not smoking; using alcohol Daily / Weekly / Monthly / Rarely / Never). One variable from the personality system, *attachment to school*, will be based on an index of questions querying feelings about and perceptions of the school environment. Factor analyses of standardized variables will be conducted to assess the appropriateness of grouping the school attachment items in the index. Consistency of the factor structure across countries will also be examined. Finally, one indicator of the perceived environment system, *parental support*, will be based on questions querying respondents' perceptions of communication with parents. We will explore associations separately by maternal and paternal communication, as well as the average response to these questions.

Controls and Modifiers. A number of potential confounders and effect modifiers will be explored. Given past findings of gender differences in associations between sexual behavior and other problem behaviors (Halpern et al., 2004), *gender* (male/female) will be treated as an effect modifier. *Living arrangement* (with both biologic parents / stepfamily / single parent / other) and *family socioeconomic status (SES)* will be investigated as potential confounders, because of their associations with adolescent sexual initiation (Cubbin, Santelli, Brindis, & Braveman, 2005; Pearson, Muller, & Frisco, 2006) and some forms of substance use (Bjarnason et al., 2003; Hanson & Chen, 2007). Because comparable measures of SES are not available across the datasets, a four-category ordinal indicator of parental education (higher of residential mother or father, less than high school / high school diploma or GED / some postsecondary / college graduate or more) will be used for Add Health, while the Family Affluence Scale (a seven-item family assets scale, converted to a four-level ordinal indicator) will be used for the HBSC countries (Currie et al., 2008). *Country* will be treated as a potential effect modifier, given we want to test cross-country differences in associations between adolescent sexual initiation and the outcomes. Indicators for other attitudinal or problem behaviors will not be included, as they may act as mediators between sexual behavior and other outcomes.

Analysis Plan

Analyses will begin by examining the distribution of analytic variables, overall and separately by gender and country. Bivariate relationships between the analytic variables will be examined using chi-square or ANOVA analyses, depending on the specification of the outcome variable. Multivariable models regressing the outcome variables on sexual initiation, country, controls for living arrangement and family SES, and an interaction between country and sexual initiation, run separately by gender, will test (1) the adjusted association between sexual initiation and the outcome variables net of the control factors, and (2) variability in the association between sexual initiation and outcomes by country of residence. Model form (i.e., ordinary least

squares, proportional odds, or logistic) will depend on the specification of the dependent variable. A high alpha level (α=0.2) will be used for significance testing of interaction terms, given the low power of such tests (Selvin, 2004). Including fixed effects for country of residence will allow for the control of other unmeasured differences between countries (e.g., racial/ethnic and immigrant composition) (Wooldridge, 2005), as well as permit significance testing of the between-country differences with the interaction term.

EXPECTED FINDINGS

In this analysis, we expect that overall there will be a positive association between adolescent sexual initiation and substance use, and negative associations with parental support and attachment to school. Whether these associations differ across nations will also be examined. Findings will have important implications for future research and public health. If differences are found across countries, this may suggest that the negative outcomes ascribed to adolescent sexual activity in the United States have at least some of their origins in the cultural construction of adolescent sexual behavior. From a public health perspective, such findings would suggest exploring the cultural processes that underlie this variation in future research. If no or small differences are found, this would suggest that adolescent sexual initiation prior to age sixteen is more universally problematic and should be directly targeted in prevention programs and across countries.

Table 1. Comparison of Add Health and HBSC Survey Question Wording

HBSC 1997/98:	ADD HEALTH 1996:
Sexual Intercourse	
Have you ever had sexual intercourse? Yes / No	Have you ever had sexual intercourse? Yes / No
Substance Use	
How often do you smoke tobacco at present? Daily / Weekly / <Weekly / Do not smoke	In the past 30 days, how many days did you smoke cigarettes? 0-30
How often do you currently drink [wine/ spirits/beer]? Daily / Weekly / Monthly / Rarely / Never	During the past 12 months, on how many days did you drink alcohol? Every/almost every day / 3-5 days/week / 1-2 days/week / 2 or 3 days/month / $\leq$1^{ce} per month or less / 1 or 2 days past year / Never
Parent support	
How easy is it for you to talk with your father? Very easy / Easy / Difficult / Very difficult	You are satisfied with the way [DAD] and you communicated with each other? Strongly agree / Agree / Neutral / Disagree / Strongly disagree
How easy is it for you to talk with your mother? Very easy / Easy / Difficult / Very difficult	You are satisfied with the way [MOM] and you communicate with each other? Strongly agree / Agree / Neutral / Disagree / Strongly disagree
School attachments	
I like school Like a lot / Like a bit / Not very much / Not at all	You are happy to be at your school. Strongly agree / Agree / Neutral / Disagree / Strongly disagree
Teachers treat students fairly Strongly agree / Agree / Neutral / Disagree / Strongly disagree	The teachers at your school treat students fairly Strongly agree / Agree / Neutral / Disagree / Strongly disagree
Teachers show an interest in me as a person Strongly agree / Agree / Neutral / Disagree / Strongly disagree	How much do you feel that your teachers care about you? Not at all / Very little / Somewhat / Quite a bit / Very much
I feel like I belong at school Strongly agree / Agree / Neutral / Disagree / Strongly disagree	You feel like you are part of your school. Strongly agree / Agree / Neutral / Disagree / Strongly disagree

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