Adolescent Sexual Debut and Psychological/Physical Symptoms: Do Associations Vary Across 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 physical/psychosocial indicators of well-being 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 (defined as sexual intercourse initiation prior to data collection) is consistently related to physical and psychological symptoms – 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). This

perspective postulates a social mechanism for the relationship between adolescent sexual debut and subsequent negative outcomes. Specifically, early initiation of a developmental transition can evoke negative or control reactions from the environment, because the transition violates socially defined norms for the timing of transitions. In the context of the United States, sexual debut during adolescence prior to marriage is generally thought to be precocious (Golden, 2006; Smith, 2005). Research in this context has found that, after sexual debut, adolescents experience an increase in problem-focused interactions with parents, a decreased feeling of belongingness at school, and decreased participation in religious activities (Ream, 2006; Ream & Savin-Williams, 2005). These authors also found that even when sexual activity ceased, relationships with parents, school and religious institutions did not improve, suggesting that in U.S. culture "sexually active adolescent" is an irreversible stigmatized label (Ream, 2006). Such negative environmental reactions could account for depressive symptom increases observed after sexual debut (Meier, 2007; Spriggs & Halpern, 2008a). As such, our first hypothesis is:

H1. Sexual initiation will be positively associated with physical and psychological symptoms.

We include both physical and psychological symptoms because physical symptoms (headaches, sleep disturbance, appetite disturbance, etc.) commonly co-occur with depressive symptoms, and are included on screening instruments for depression such as the CES-D (Goodyer, 1996). Reports of physical symptoms also predict later depressive episodes (van Lang, Ferdinand, & Verhulst, 2007).

Another finding in the literature, however, is that control reactions to sexual intercourse initiation are not equitably applied to both male and female adolescents. Qualitative studies have found females in the U.S. are subject to more negative social sanctions after debut than males, including pejorative labeling by peers and problem-focused parental interactions (Shoveller, Johnson, Langille, & Mitchell, 2004; Tolman, 2002). Such negative environmental feedback has likewise been connected to post-debut depressive symptom changes (Ream, 2006); depressive symptom changes have also been found to be greater for females than males (Meier, 2007; Spriggs & Halpern, 2008a). Following from these findings, our second hypothesis is:

H2. Positive associations between adolescent sexual initiation and physical/psychological symptoms will be greater for female compared to male adolescents.

One tenant of Problem Behavior Theory 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 physical and psychological symptoms 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 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. Physical and psychological symptoms will be assessed with six items included in both Add Health and HBSC: general happiness, feeling low/sad, feeling lonely, feeling moody or irritable, frequency of headaches, and difficulty sleeping. All items are assessed on ordinal scales ranging from four to five levels. After standardizing items, we will conduct factor analyses to assess if items can be combined into a single symptoms index, or if physical and psychological items should be assessed separately. Further, similarity of factor structure across countries will be examined. Item factor loadings will be used as weights to generate the outcome variable with an anticipated standard normal distribution.

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 depressive symptoms (Meier, 2007; Spriggs & Halpern, 2008a), *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 depression (Cavanagh, 2008; Lemstra et al., 2008). Because comparable measures of family 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 intercourse 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 and outcomes will be examined using t-tests or ANOVA analyses, depending on the specification of the analytic variable. Multivariable ordinary least squares 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 symptoms net of the control factors, and (2) variability in the association between sexual initiation and symptoms by country of residence. 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 physical and psychological symptoms; we also expect such associations to be stronger for female than for male adolescents. 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
Psychological Symptoms	
In general, how do you feel about your life at present? Very happy / Quite happy / Not very happy / Not happy at all	How often, in the past seven days, did you feel happy? Never or rarely / Sometimes / A lot of the time / Most or all of the time
In the past 6 months, how often have you had the following: feeling low? About every day / >1ce a week / About every week / About every month / Rarely or never	How often, in the past seven days, did you feel sad? Never or rarely / Sometimes / A lot of the time / Most or all of the time
Do you ever feel lonely? No / Yes, sometimes / Yes, rather often / Yes, very often	How often, in the past seven days, did you feel lonely? Never/rarely / Sometimes / A lot of the time / Most/all of the time
In the last 6 months, how often had you had the following: irritability / bad temper? About every day / > 1ce a week / About every week / About every month / Rarely or never	In the past 12 months, how often have you been moody? Never / A few times / About once a week / Almost every day / Every day
Physical Symptoms	
In the last 6 months, how often had you had the following: headache? About every day / > 1ce a week / About every week / About every month / Rarely or never	In the past 12 months, how often have you had headaches? Never / Just a few times / About once a week / Almost every day / Every day
In the last 6 months, how often had you had the following: trouble sleeping? About every day / > 1ce a week / About every week / About every month / Rarely or never	In the past 12 months, how often have you had trouble falling asleep or staying asleep? Never / Just a few times / About once a week / Almost every day / Every day

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