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Individual, familial, friends-related and contextual predictors of early sexual intercourse

Marie-Aude Boislard P.^{*}, François Poulin*Université du Québec à Montréal, Department of Psychology, Montreal, Canada*

A B S T R A C T

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This study examined the unique and simultaneous contribution of adolescents' characteristics, parent–child relationship and friends' characteristics on early sexual intercourse, while accounting for family status. A longitudinal multi-sample design was used. The first sample was recruited in a suburban context ($n = 265$; 62% girls) and the second sample in an urban setting ($n = 136$; 61% girls). All predictors were measured in Grade 8 and age at first intercourse was assessed yearly for three years. Being in a non-intact family, low parental control, high antisocial behaviors, low self-disclosure, high proportion of other-sex friends and high substance use were associated with earlier sexual intercourse. When all predictors were considered simultaneously, more antisocial behaviors, high proportion of other-sex friends and non-intact family structure significantly discriminated youth reporting first intercourse at age 13 or less from those who reported first intercourse at age 14, at age 15, or were virgins at age 16 among both samples.

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In adolescence, most youth start to establish intimacy and explore their sexual universe with other-sex mates (Maccoby, 1998). About half of adolescents will have their first sexual experience of intercourse before the age of 17 (Maticka-Tyndale, 2001) whereas 60–70% report being sexually active by age 18 (Grunbaum et al., 2004). However, the age of onset of sexual activity varies widely, ranging from early adolescence for some youths to adulthood for others. Age of onset of sexual activity is a crucial component to explore because early sexual activity can have serious consequences on adolescents' development. Early starters (i.e. first sexual intercourse before 16 years old; Spriggs & Tucker Halpern, 2008) have more years to experiment with sex, tend to engage in sexual activity earlier in the course of a relationship (Miller, Christopherson, & King, 1993), accumulate more sexual partners over time (Capaldi, Stoolmiller, Clark, & Owen, 2002) and show higher rates of unprotected intercourse (Sonenstein, Pleck, & Ku, 1989), thus increasing their risks of contracting a sexually transmitted infection (STI) and of unwanted pregnancy (Aarons & Jenkins, 2002). Moreover, young adolescents are not always equipped with accurate knowledge concerning sexuality and contraception and often lack self-confidence and proper preparation to negotiate condom use. Younger teens may also have more difficulties obtaining contraceptives because early sexual activity has been considered derogatory to moral values by most adults in the last decades (Jessor, Costa, Jessor & Donovan, 1983; Sondage CROP, 2007). To summarize, early sexual intercourse may cause negative health and psychosocial consequences due to lack of the social, emotional and cognitive abilities usually increasing along with age and romantic partnerships (Ciairano, Bonino, Kliewer, Miceli, & Jackson, 2006; Giannotta, Ciairano, Spruijt, & Spruijt-Metz, 2009).

^{*} Corresponding author: Griffith University, School of Psychology, Gold Coast, Queensland 4222, Australia. Tel.: +61 7 5552 7498.

E-mail addresses: m.boislard-pepin@griffith.edu.au (M.-A. Boislard P.), poulin.francois@uqam.ca (F. Poulin).

Individual, interpersonal and contextual predictors of early intercourse

Research has shown that individual, interpersonal and contextual factors can contribute to the early onset of sexual activity (Friedlander, Connolly, Pepler, & Craig, 2007; Price & Hyde, 2008; Zimmer-Gembeck & Helfand, 2008). At the individual level, early sexual onset has been linked to internalizing symptoms such as depression and to externalizing behaviors like antisocial behaviors. Researchers have shown that compared to virgins, sexually active teenagers are more likely to feel depressed (Hallfors, Waller, Bauer, Ford, & Halpern, 2005; Waller et al., 2006) and that these higher levels of depressive symptoms seem to exist prior to first sexual intercourse (Grello, Welsh, Harper, & Dickson, 2006; Monahan & Lee, 2008). Early sexual activity has been strongly associated to antisocial behaviors, poor academic achievement and substance use in several studies (Ary et al., 1999; Capaldi, Crosby, & Stoolmiller, 1996; Fergusson & Woodward, 2000; French & Dishion, 2003). According to the Problem Behavior Theory (Jessor & Jessor, 1977), the strong relationship between antisocial behaviors, substance use, low academic achievement and early sexual activity are empirical evidence for an underlying disposition to unconventional and deviant behaviors (Costa, Jessor, Donovan, & Fortenberry, 1995; Jessor et al., 2003). These behaviors can be seen as different ways used by adolescents to transgress societal and legal norms (Costa et al., 1995; Giannotta et al., 2009).

With regards to interpersonal factors, two systems of relational dynamics are expected to influence adolescent sexuality: family and peers. Three features of the parent–child dynamic are considered in this study: child's level of self-disclosure, parental control and parent–child conflict. All have been shown to be linked to early onset of sexual activity. For example, parental monitoring has been linked to the delay of sexual intercourse (Capaldi et al., 2002). However, according to Stattin and Kerr (2000), most of the studies measuring parental monitoring are in fact measuring the parents' level of knowledge of their child's whereabouts, friends and activities. They propose that a parent's level of knowledge is better looked at in terms of a bidirectional process in which each the parent and the adolescent have a unique contribution and react to each other rather than in terms of a parent-only oriented process. Furthermore, Stattin and Kerr (2000) demonstrated that parent's level of knowledge is an outgrowth of a child's level of self-disclosure and that high self-disclosure is an indicator of a child's positive adjustment. Parental control has also been shown to decrease externalizing behaviors (Barber, 1992) and increase positive adjustment among adolescents (Rogers, Buchanan, & Winchell, 2003). Additionally, previous research has shown that a high quality parent–child relationship is associated with delayed sexual intercourse among adolescents (Dittus & Jaccard, 2000; Smith & Guthrie, 2005). Finally, given that parent–child conflict has been associated with problematic behaviors in adolescence (Dishion, Patterson, Stoolmiller, & Skinner, 1991) and that frequent episodes of conflict may reflect low parent–child relationship quality, conflict is also likely to have an accelerating impact on age at first intercourse.

Because sexual activity involves interpersonal relationships with peers, the friendship network is likely to influence the timing of the onset of sexual activity. Friends represent important actors in shaping sexual behaviors through advice (Davis & Harris, 1982), approval (Connolly & Goldberg, 1999) and opportunities for sexual activity (Rowe & Linver, 1995). In the current study, three characteristics of the friendship network were expected to accelerate the onset of sexual activity: friends' gender, age and substance use. First, other-sex friendships become more common throughout adolescence, especially among girls who tend to associate with older males (Poulin & Pedersen, 2007). These new relationships seem to increase girls' risk for a variety of problem behaviors including delinquency (Haynie, Steffensmeier, & Bell, 2007), substance use and early onset of sexual activity (Cavanagh, 2004). Therefore, having a higher proportion of other-sex friends in one's friendship network might bring with it a greater chance that others will model risk behavior and provide greater opportunities for having sex. Second, two studies have shown that having older friends can accelerate the onset of intercourse (Dishion, Poulin, & Skaggs, 2000; Vanoss Marin, Cyle, Gomez, Carvajal, & Kirby, 2000) whereas another study has observed that associating with older peers was not a significant correlate of increases in dating (Friedlander et al., 2007). Hence, the linkage between associating with older friends and early onset of sexual intercourse remains unclear. Nevertheless, older adolescents continue to be expected to provide greater access to alcohol, drugs and situations (e.g. parties) in which sexual encounters may occur. Third, adolescents who spend time with deviant friends engage in sexual activity earlier (Capaldi et al., 1996; French & Dishion, 2003; Whitbeck, Yoder, Hoyt, & Conger, 1999). The hypothesized underlying mechanism is that problem behaving youth tend to associate with each other in deviant groups typically endorsing the violation of social rules (Dishion, Spracklen, Andrews, & Patterson, 1996), common substance use and sexual promiscuity (Dishion & Patterson, 1997). Affiliation with deviant friends often exacerbates previous problem behaviors and socializes deviancy (Boislard, Poulin, Kiesner, & Dishion, 2009).

Aim of the current study

It has become clear that adolescent sexual activity is shaped by a complex mix of individual characteristics, as well as the social context and relationships with their most proximal socialization agents: parents and peers. The goal of this paper is to discriminate young people who have sexual intercourse the earliest (*early starters*) from delayers and virgins using individual, family and friend features that have been associated with early sexual activity in previous research. Independent variables are youths' characteristics (i.e. age, depressive symptoms, academic achievement, antisocial behavior and substance use), parent–child relationship features (i.e. youth self-disclosure, parental control, conflict) and friends' characteristics (i.e. gender, age, substance use). In addition, previous studies have found that the odds of early sexual onset increase modestly but constantly when adolescents live in a single-parent or blended families rather than in intact families (Miller, Benson, & Galbraith, 2001;

Price & Hyde, 2008; Raffaelli & Crockett, 2003; Whitbeck et al., 1999; Zimmer-Gembeck & Helfand, 2008). Therefore, this family status was controlled for in this study (Monahan & Lee, 2008; Santelli, Lowry, Brener, & Robin, 2000).

Contributions of the study

In the past decades, research on adolescent early sexual activity and its predictors has faced several important conceptual and methodological limitations and challenges. Research in the area of sexual activity is typically cross-sectional (Miller, Sabo, Farrell, Barnes, & Melnick, 1998). The rare existing longitudinal studies with repeated assessments of sexual behaviors have used only two waves of data collection (Raffaelli & Crockett, 2003) and have found a large number of inconsistent answers from one wave to another (Alexander, Somerfield, Ensminger, Johnson, & Kim, 1993; Capaldi et al., 1996). Even in a time period as short as one-year, many adolescents experience problems for accurately recalling their age at first intercourse (Alexander et al., 1993; Capaldi et al., 1996). Researchers have dealt with these inconsistencies by deleting subjects with highly discrepant reports (Cavanagh, 2004; French & Dishion, 2003), thus raising questions about the validity of the findings. Other scholars have investigated the onset of intercourse retrospectively many years after the event, leading to difficulties with recall and mental reconstruction of event (Langille & Curtis, 2002). Prospective studies are highly needed to capture this developmental event when it appears and to enhance the confidence in the findings (Capaldi et al., 2002).

In addition, most studies on adolescents' sexuality have used samples of youths from the United States only, although the risk and protective factors for sexual activity can vary from one country to another. For example, religiosity has been associated to the delay of sexual intercourse in the United States (Meier, 2003) but not in Canada (Garriquet, 2005). Moreover, some differences prevail even amidst different states or provinces. In nationwide representative surveys of youths from all across Canada, Garriquet (2005) and Rotermann (2008) found that Eastern Canadians were sexually active significantly earlier than their western peers. Other scholars have detected neighborhood effects on the timing of first sexual intercourse (Dupere, Lacourse, Willms, Leventhal, & Tremblay, 2008; Roche et al., 2005). Because sexual activity tends to be influenced by context-specific norms, adolescents who grow up in urban and suburban contexts may have different experiences in their social environments and different opportunities for meeting romantic and sexual partners.

The current study tries to overcome a number of limitations of past research by prospectively assessing adolescents sexual activity (rather than *a posteriori*), using a longitudinal and multi-sample design of French-Canadians. The first sample was recruited in a suburban setting (suburban sample) whereas the second sample was recruited in a large metropolitan area (urban sample). Conducting such a study with two samples enhances the external validity of the findings, thus increasing the degree of generalization and confidence in the results.

Methods

The data presented in this paper were drawn from two longitudinal studies with French-Canadian adolescents. Despite the fact that they were not fully identical, the procedures and instruments used in both datasets were similar enough to test the same research question separately within the two samples.

Participants

Participants in the suburban sample were part of a longitudinal study on adolescent social development. They were originally recruited from eight Canadian elementary schools in a suburb of 350,000 residents, in May 2002, when they were in Grade 6. Except for family structure, which was collected in Grade 6, the data used in this paper cover the period from Grades 8 to 11. Among the sample of 8th grade students ($N = 282$), data on age at first intercourse was available for 265 participants (62% girls; 75% intact families; 96% French native language; $M_{age} = 14.38$; $SD = .42$).

Participants in the urban sample were part of a longitudinal study that began in May 2004, when they were in Grade 8, and lasted until Grade 10. Adolescents were drawn from two Canadian high schools of a large metropolitan area with a population of 1,817,200. Of the original sample ($N = 144$), data on age at first intercourse was available for 136 participants (61% girls; 46% intact families; 65% French native language; $M_{age} = 14.37$; $SD = .66$).

Procedures and study design

Letters were sent to all parents through the participating schools. These letters explained the nature of the study and invited parents to provide written consent if they agreed to participate with their child. Approximately 75% of the solicited families accepted to participate in the suburban sample whereas 60% of the urban families did so. The lower rate among the urban sample may be due to more demanding assessments in that specific study (i.e. monthly phone interviews, home visits; not used in the present article).

Each year, participants were invited to complete questionnaires during or after classes. Trained interviewers were present to give instructions, answer questions and outline the research process, including issues of confidentiality. In both samples, all independent variables were measured in Grade 8 using youth report, family structure was investigated among parents at first wave (Grade 6 for suburbanites and Grade 8 for urbanites), and age at first intercourse was assessed annually using youth report, from Grades 9 to 11 in the suburban sample and from Grades 8 to 10 in the urban sample.

Measures

The majority of measures were exactly the same in the two samples. The few response scales for measures derived from different questions were closely matched so that the questions could be compared (see Table 1 for the internal consistency of each scale).

Age at first intercourse

For three consecutive years, participants were asked whether or not they have ever had intercourse (with vaginal penetration) with someone of the other sex. Those who reported “yes” were asked how old they were the first time. We used three yearly waves of assessment given the issues previously identified related to the measurement of age at first intercourse in cross-sectional or two-wave longitudinal designs, hence enhancing the validity of the results.

As was the case in previous longitudinal studies (Alexander et al., 1993; Capaldi, et al., 1996; Palen et al., 2008), there were some discrepant reporting of sexual intercourse. We managed these discrepancies by setting a series of systematic rules for cleaning the data in a three-wave longitudinal design.¹ Based on the work of French and Dishion (2003) with two-wave data, the proximal rule was used when two different ages were reported (i.e. the earlier age was kept based on the presumption that it was closer to the occurrence of the event). However, because we had three waves of assessment available, we added the majority rule as an exception to the previous rule (i.e. the age reported twice out of three reports was kept). As in French and Dishion (2003), participants reporting intercourse before age 10 were excluded from the analyses, except if they reported an older age at the following waves. French and Dishion (2003) also suggested excluding the youths who reported ages differing by more than 2 years. However, we used a more liberal criterion of 3 years because of the additional wave. After determining the rules, two independent coders examined each participant's pattern of responses to mark those for whom data were inconsistent, generated a complete and consistent pattern of responses for each participant according to these rules and met to determine rater agreement. After applying this procedure, there were still a small number of participants for whom it was impossible to determine the age at first intercourse (i.e. $s: n = 15$; $u: n = 8$). These participants were removed from the final sample.

Age at first intercourse was categorized to include in our analyses those participants who were still virgin at the last wave of assessment. Three alternative strategies were compared to determine the best way to create this categorical variable. In all strategies, consistent with previous research, participants reporting intercourse before age 16 were considered early starters (Spriggs & Tucker Halpern, 2008; Zimmer-Gembeck & Helfand, 2008) and those reporting first-time intercourse at age 16 were pooled with those reporting still being virgin at the last wave of the study. The first strategy identified three groups, including adolescents who reported first intercourse at age 13 or younger, those who reported first intercourse at ages 14–15, and those who reported first intercourse at age 16 or were virgins at last assessment. The second strategy also had three groups but included more adolescents in the earliest intercourse group by distinguishing adolescents who reported first intercourse at age 14 or younger from those with onset at age 15 or onset at age 16 combined with virgins. The third strategy had four groups making a distinction between adolescents who had first intercourse at age 13 or younger, at age 14, at age 15, and at age 16 combined with virgins. Using univariate ANOVAS, the average of the strengths of the effects (η^2) was computed for each strategy. In both samples, the third strategy explained a greater amount of the variance of the age at first intercourse (i.e. suburban sample: 8.8% compared 7.7% and 8.2%; urban sample: 6.6% compared to 6.1% and 5.4%). This classification of participants into four groups was treated as a categorical variable and used as the dependent variable.

Individual variables

The measured individual variables included *depressive symptoms*, *antisocial behavior*, *substance use* and *academic achievement*. Depressive symptoms were assessed using a French version of the Children's Depression Inventory (CDI; Kovacs, 1985) among the suburban sample. The original self-administered questionnaire includes 27 items and has demonstrated good reliability and validity using both nonclinical and clinic-referred samples of youths (Finch, Saylor, & Edwards, 1985; Fundulis et al., 1991). For each item, participants were asked to choose from three statements that were most likely how they felt for the past two weeks (e.g. “(a) I am tired sometimes; (b) I am tired often; (c) I am tired all the time”). Individual item scores range from 0 to 2. Three items of the original scale were deleted: the suicidal ideation item was eliminated for ethical reasons and two items were removed because of redundancy with other study variables (school performance, involvement in fights). All other items scores were summed, with higher ratings indicating more severe symptoms. For the urban sample, depressive symptoms within the past week were assessed using 20 self-reported items of the Center for Epidemiological Studies–Depression Scale (CES-D; Radloff, 1977). The CES-D is considered as a good screening instrument for depression in adolescent populations (Roberts, Lewinsohn, & Seeley, 1991). The original 4-point Likert scale was reduced to a 3-point scale to be consistent with the measure of depressive symptoms used among the suburban sample. The mean score was computed, with higher ratings also indicating more severe symptoms.

For both samples, antisocial behaviors were assessed with a self-report 9-item scale tapping a variety of problem behaviors (“Stole or tried to steal things worth \$5 or more”). Responses were given on a 5-point scale ranging from “never” to “more than 10 times”. The mean score was computed. For substance use, participants completed a 4-item

¹ A detailed summary of the procedure can be obtained by contacting the authors.

self-report scale asking how often, in the last month, they had smoked cigarettes, drank alcohol, used marijuana and other drugs. Responses were given on a 14-point scale, ranging from “0” to “41 or more times”. The mean score was computed. Academic achievement was computed using the mean of Mathematics and French-first language’s 8th Grade scores.

Parent–adolescent relationship

Three aspects of the parent–child relationships were measured including *adolescent self-disclosure*, *parental control* and *parent–adolescent conflict*. Adolescent self-disclosure and parental control were measured with two subscales of the Parental Monitoring Questionnaire (Kerr & Stattin, 2000), using a 5-point Likert scale ranging from “almost never” to “very often” (i.e. five items for self-disclosure, e.g. “How often do you spontaneously tell your parents what you have done during the evening?”; four items for control, e.g. “Do you need your parents’ permission before you spend money?”). The mean scores were computed. For *parent–child conflict*, participants answered four items using a 6-point Likert scale, ranging from “never” to “more than 6 times” (e.g. “During the last week, how often did you and at least one of your parents get angry at each other?”). The mean score was computed.

Friendship network characteristics

Three aspects of the friendship network were measured including the *proportion of other-sex friends*, *friends’ mean age* and *friends’ substance use*. Participants were asked to write down the names of their friends and to answer a series of questions for each of the nominated friends, including his/her gender, age and use of substances (i.e. tobacco, alcohol, marijuana, other drugs). In the suburban sample, participants could list up to 10 friends whereas in the urban sample, there was a maximum of five friends. The proportion of other-sex friends and friends’ mean age were calculated from these responses. Friends’ substance use was the average of the substance use reported for all nominated friends.

Family structure

Each family was first identified as either intact, single-parent, reconstituted, or other familial situation at time 1. In a next step, this variable was dummy coded (i.e. 0 = single-parent, separated and divorced families; 1 = intact families).

Results

Preliminary and descriptive analyses

First, all variables were examined for normality and missing values in both samples. Missing values were replaced with gender mean and modal values. To improve pairwise linearity and normality, logarithmic transformations were performed on youths’ substance use, youths’ antisocial behaviors and friends’ mean age. Because of high collinearity between youths’ and friends’ substance use ($s: r = .72, p < .001$; $u: r = .80, p < .001$), scores were standardized and averaged to create a composite score defined as common substance use. The means, standard deviations and distributions of all continuous variables are presented in Table 1.

Second, a preliminary series of analyses was performed using the context variable (i.e. suburban *versus* urban sample) and all the selected variables. There was a significant difference between the groups for the age at first intercourse variable ($\chi^2 = 11.33, p < .01$). In the suburban sample, 60% of the participants reported still being virgins at age 16 whereas 46% of the urban sample reported so. Two additional significant differences were found between the two samples: parents from the suburban sample used more control ($F = 8.92, p < .01$) and there were more non-intact families in the urban compared to the suburban sample ($\chi^2 = 31.15, p < .001$).

Table 1
Means, standard deviations, distributions and internal consistency (Cronbach alpha) for all measures among each sample.

| | Suburban | | | | Urban | | | |
|--|---------------|-----------------|-----------------|----------|---------------|-----------------|-----------------|----------|
| | M (S.D.) | Skewness (S.E.) | Kurtosis (S.E.) | α | M (S.D.) | Skewness (S.E.) | Kurtosis (S.E.) | α |
| 1. Age | 14.38 (.42) | .90 (.15) | .55 (.30) | – | 14.37 (.66) | 1.32 (.21) | 1.65 (.41) | – |
| 2. Depressive symptoms | 9.30 (6.65) | 1.30 (.15) | 2.50 (.30) | .86 | .67 (.53) | 1.21 (.21) | 1.26 (.41) | .91 |
| 3. Academic achievement | 71.72 (10.73) | –.23 (.15) | –.28 (.30) | .65 | 71.74 (12.07) | –.59 (.21) | –.16 (.41) | .72 |
| 4. Antisocial behaviors ^a | 1.43 (.54) | 1.93 (.15) | 4.83 (.29) | .77 | 1.40 (.49) | 2.42 (.21) | 7.81 (.41) | .77 |
| 5. Youth’s disclosure | 3.27 (.97) | –.28 (.15) | –.38 (.29) | .70 | 3.40 (.90) | –.30 (.21) | –.53 (.41) | .75 |
| 6. Parental control | 3.83 (1.05) | –.65 (.15) | –.52 (.29) | .80 | 3.55 (.93) | –.46 (.21) | –.25 (.41) | .65 |
| 7. Parent–child conflict | 1.86 (.94) | 1.65 (.15) | 2.78 (.29) | .81 | 1.93 (.85) | 1.79 (.21) | 3.40 (.41) | .78 |
| 8. Common substance use ^{a,b} | 0 (.93) | 1.97 (.15) | 3.77 (.30) | – | 0 (.95) | 2.38 (.21) | 6.62 (.41) | – |
| 9. Proportion of o-s friends | .21 (.19) | .57 (.15) | –.42 (.29) | – | .19 (.21) | 1.07 (.21) | .83 (.41) | – |
| 10. Friends’ mean age ^a | 14.78 (1.77) | .56 (.15) | –.44 (.30) | – | 14.26 (1.15) | 1.61 (.21) | 4.72 (.41) | – |

^a = Logarithmic transformations were performed on these variables.

^b = Values are standardized.

Table 2

Means and standard deviations of each group for age at first intercourse among the suburban sample.

| | | (A) 13 or younger (6%) | (B) 14 (16%) | (C) 15 (18%) | (D) 16 or older/ virgins (60%) | F, p | Mean differences (<i>p</i> < .05) | | | | | |
|------------|-----------------------------------|------------------------|---------------|--------------|--------------------------------|----------|------------------------------------|------|--------|-----|-------|-------|
| | | | | | | | A-B | A-C | A-D | B-C | B-D | C-D |
| Individual | Age | 14.38 (.48) | 14.32 (.40) | 14.33 (.36) | 14.39 (.44) | .44 | - | - | - | - | - | - |
| | Depressive symptoms | 12.13 (8.85) | 11.13 (8.09) | 9.32 (6.54) | 8.48 (5.82) | 2.95* | - | - | - | - | - | - |
| | Academic achievement | 64.09 (10.01) | 67.47 (11.26) | 69.59 (9.32) | 74.37 (10.22) | 9.53*** | - | - | -10.27 | - | -6.90 | -4.78 |
| | Antisocial behaviors | 1.92 (.66) | 1.82 (.75) | 1.45 (.45) | 1.25 (.36) | 22.32*** | - | .46 | .66 | .37 | .57 | - |
| Familial | Youth's disclosure | 2.66 (1.31) | 2.84 (.79) | 3.07 (1.05) | 3.52 (.85) | 10.50*** | - | - | -.87 | - | -.68 | -.45 |
| | Parental control | 3.26 (1.09) | 3.42 (1.09) | 3.70 (1.14) | 4.07 (.93) | 7.39*** | - | - | -.81 | - | -.65 | - |
| | Parent-child conflict | 2.47 (1.44) | 2.04 (.94) | 2.16 (.97) | 1.67 (.83) | 6.69*** | - | - | .80 | - | - | .49 |
| Friends | Common substance use ^a | 1.43 (1.13) | .54 (1.04) | .05 (.80) | -.32 (.66) | 32.84*** | .89 | 1.38 | 1.75 | .49 | .86 | .37 |
| | Proportion of o-s friends | .29 (.18) | .30 (.18) | .26 (.20) | .17 (.17) | 8.96*** | - | - | - | - | .13 | .09 |
| | Friends' mean age | 14.55 (.80) | 14.28 (.94) | 14.00 (.47) | 13.96 (1.75) | 1.26 | - | - | - | - | - | - |

^a Values are standardized.

Univariate analyses

Chi-square analyses were performed to compare the proportions of adolescents in each age at first intercourse group by family structure and gender. Age at first intercourse differed significantly according to family structure in both samples (s: $\chi^2 = 8.15, p < .05$; u: $\chi^2 = 8.61, p < .05$). Adolescents living in two-parent families were more likely to be virgins (s: 48%; u: 29%) than adolescents in single-parent families (s: 11%; u: 18%). There were no difference in the proportion of boys and girls in each age of first intercourse grouping in either the urban or the suburban sample.

Second, univariate analyses of variance was used to examine differences between the four age at first intercourse groups on each individual, family and peer network measure. Bonferonni post-hoc tests were also performed to identify where significant differences among the groups were located (see Table 2 for results with the suburban sample, see Table 3 for results with the urban sample). As shown in Table 2, all variables differed between sexual intercourse age groups among the suburban sample except youths' and friends' age. For all the variables, the means for each group showed the expected pattern. Adolescents who reported earlier first sex were higher in depressive symptoms, antisocial behavior, parent-child conflict, common substance use, proportion of other-sex friends, and lower in academic achievement, disclosure to parents and parental control. This difference was most consistent when those who had first sex the earliest (at age 13 or earlier or at age 14) were compared to those who were still virgins or had first sex at age 16. However, there were also one difference between adolescents who reported first sex at age 13 or earlier compared to those who had first sex at age 14 (common substance use), and some differences between adolescents who reported first sex at age 13 or earlier compared to those who had first sex at age 15 (antisocial behavior, common substance use). In the urban sample (see Table 3), five variables significantly differed between groups: youths' antisocial behaviors, adolescents' disclosure, parental control, proportion of other-sex friends and common substance use. All group means were in the expected direction and similar to the findings for the suburban sample.

Multivariate analyses

Next, a hierarchical discriminant function analysis was performed among each sample using the nine significant univariate independent variables as predictors of membership in one of the four groups of age at first intercourse (youths' and friends'

Table 3

Means and standard deviations of each group for age at first intercourse among the urban sample.

| | | (A) 13 or younger (13%) | (B) 14 (15%) | (C) 15 (26%) | (D) 16 or older/ virgins (46%) | F, p | Mean differences (<i>p</i> < .05) | | | | | |
|------------|-----------------------------------|-------------------------|---------------|---------------|--------------------------------|---------|------------------------------------|-----|------|-----|-----|-----|
| | | | | | | | A-B | A-C | A-D | B-C | B-D | C-D |
| Individual | Age | 14.16 (.66) | 14.41 (.55) | 14.51 (.82) | 14.33 (.59) | 1.24 | - | - | - | - | - | - |
| | Depressive symptoms | .78 (.62) | .77 (.66) | .67 (.50) | .61 (.50) | .80 | - | - | - | - | - | - |
| | Academic achievement | 67.53 (10.43) | 70.20 (13.36) | 70.07 (12.70) | 74.35 (11.40) | 2.09 | - | - | - | - | - | - |
| | Antisocial behaviors | 1.65 (.72) | 1.38 (.47) | 1.55 (.54) | 1.25 (.31) | 5.09** | - | - | .41 | - | - | .30 |
| Familial | Youth's disclosure | 2.72 (.93) | 3.54 (.69) | 3.31 (.84) | 3.59 (.90) | 5.07** | -.82 | - | -.87 | - | - | - |
| | Parental control | 2.89 (1.08) | 3.55 (.93) | 3.50 (.85) | 3.71 (.92) | 3.73* | - | - | -.83 | - | - | - |
| | Parent-child conflict | 1.93 (1.07) | 2.11 (.84) | 2.01 (.78) | 1.82 (.83) | .75 | - | - | - | - | - | - |
| Friends | Common substance use ^a | .67 (1.41) | .17 (.55) | .14 (1.10) | -.32 (.63) | 6.59*** | - | - | .99 | - | - | - |
| | Proportion of o-s friends | .23 (.19) | .34 (.18) | .21 (.23) | .11 (.20) | 6.81*** | - | - | - | - | .22 | - |
| | Friends' mean age | 14.66 (1.47) | 14.64 (.98) | 14.37 (1.09) | 14.01 (1.12) | 2.58 | - | - | - | - | - | - |

Note: * = *p* < .05; ** = *p* < .01; *** = *p* < .001.

^a Values are standardized.

age were excluded). Results are presented in Table 4. The variables were entered in the model starting with the control variable, and then from the most proximal to the most distal: 1) demographic variables; 2) individual characteristics; 3) parent–child relationship features and 4) friends' characteristics.

In the suburban sample, seven of the nine variables had unique significant discriminant power. Specifically, living in a non-intact family, higher levels of depressive symptoms, lower academic achievement, higher antisocial behaviors, lower disclosure, a greater proportion of other-sex friends and higher common substance use significantly and uniquely discriminated adolescents in the groups with younger age at first intercourse. The strongest predictors were antisocial behaviors and common substance use. Parental control and parent–child conflict had no unique significant discriminant power in this model. In the urban sample, three variables demonstrated significant discriminant power: family structure, antisocial behaviors and proportion of other-sex friends. Adolescents in the younger age at first sexual intercourse groups could be discriminated from others by living in non-intact families, reporting more antisocial behaviors and reporting a higher proportion of other-sex friends.

Discussion

This study brings our knowledge on the correlates of early intercourse a step further by examining the unique contribution of a series of variables from three domains of functioning (i.e. individual, family and friends) longitudinally, while controlling for family status, which has previously been associated with early sexual intercourse. This multivariate model of early sexual activity was tested among two samples of French–Canadian adolescents living in two different contexts (i.e. suburban area, metropolitan area). In the next section, we discuss the findings for each domain of functioning and their developmental significance, while focusing on the variables that have shown significant discriminant power among both samples. The influence of the context will also be examined. The limitations of this study, as well as the questions it raises for future research will be highlighted. Finally, the clinical implications of the findings will be discussed.

Individual correlates of age of first sexual intercourse

Consistent with previous research (Ary et al., 1999; Capaldi et al., 1996; Fergusson & Woodward, 2000; French & Dishion, 2003), early onset of sexual activity was associated with antisocial behaviors and substance use in both samples. According to the deviant syndrome theory (Jessor & Jessor, 1977), these interrelations are empirical evidence for an underlying disposition to unconventional and deviant behaviors (Costa et al., 1995; Jessor et al., 2003). Our findings support the hypothesis that adolescents involved in risky behaviors, such as substance use and antisocial behaviors, are often the same individuals who engage in the earliest first intercourse. However, even if these diverse behaviors tend to share common predictors, studies have also highlighted specific sources of influence for each of these risk behaviors. For example, Dishion and Owen (2002) found different antecedents and consequences for tobacco, alcohol and marijuana use when the use of each substance was modeled separately. For risky sexual behaviors, Boislard et al. (2009) have observed both direct and indirect effects of parenting practices on adolescents' number of sexual partners, whereas the effect of parenting practices was entirely indirect when predicting youths' condom use. Although problem behaviors may be correlated, the functional utility and the predictors of each may be distinct, thus suggesting the value of continuing to consider them separately.

Parent–adolescent correlates of age of first sexual intercourse

In the univariate analyses, three family factors discriminated between adolescents who started sexual activity earlier and those who postponed it until age 16 or later: child's disclosure, parental control and family structure. Although previously linked with multiple indicators of adjustment (Stattin & Kerr, 2000), the influence of adolescents' disclosure on early sexual

Table 4

Results of discriminant function analysis on age at first intercourse.

| | | Suburban sample | | Urban sample | |
|-------------|---------------------------|-----------------|-------------------|--------------|-------------------|
| | | χ^2 | $\Delta\chi^2, p$ | χ^2 | $\Delta\chi^2, p$ |
| Demographic | Family structure | 8.17 | 8.17* | 8.66 | 8.66* |
| Individual | Depressive symptoms | 16.07 | 7.90* | 10.68 | 2.02 |
| | Academic achievement | 36.05 | 19.98*** | 14.98 | 4.30 |
| | Antisocial behaviors | 72.87 | 36.82*** | 25.22 | 10.24* |
| Familial | Youth's disclosure | 81.66 | 8.79* | 32.46 | 7.24 |
| | Parental control | 83.36 | 1.70 | 35.37 | 2.91 |
| | Parent–child conflict | 89.64 | 6.28 | 37.16 | 1.79 |
| Friends | Common substance use | 123.56 | 33.92*** | 41.18 | 4.02 |
| | Proportion of o-s friends | 139.25 | 15.69*** | 54.39 | 13.21** |

Note: * = $p < .05$; ** = $p < .01$; *** = $p < .001$.

intercourse had not been previously empirically examined. Youth self-disclosure had good discriminant power for age at first intercourse: the more youth spontaneously talk with their parents about what they are doing during their free time, the longer they postpone sexual activity. In fact, adolescents who reveal themselves to their parents may have less to hide about their relationships with other-sex mates. High levels of disclosure are also likely to indicate high quality of parent–child relationship, which has been linked to the delay of intercourse in a previous study (Jaccard, Dittus, & Gordon, 1996). Furthermore, adolescents whose parents exerted less behavioral control had higher probabilities of engaging in early sexual activity. Low parental control is likely to indicate low parental involvement, fewer rules to follow in the household and more time spent with peers.

Friendship network correlates of age of first sexual intercourse

Empirical evidence suggests that mixed-gender peer groups facilitate the formation of adolescent couples partly because other-sex friends can become dating partners (Connolly, Furman, & Konarski, 2000). Our findings extend these to sexual partners: having several other-sex friends may indicate a greater interest in such relationships, thus increasing both the opportunities of engaging in intimate relationships and of meeting potential sexual partners. Second, common substance use also had strong predictive power: adolescents who spend time with friends with whom they use substances were more likely to be in the younger groups of age at first intercourse. Caspi and Moffit (1991) have argued that affiliation with deviant and older friends, as well as sexual activity, could be used by adolescents to counterbalance the perceived disequilibrium between their physical development and feelings of being adult-like when they are not yet considered as such by societal standards. Our findings bring partial support for this proposition. Friends' mean age did not have a significant effect on age at first intercourse in our samples.

Multivariate results

When all of these variables were considered together, three of them significantly discriminate the groups among both urban and suburban samples. Specifically, living in a non-intact family, reporting high levels of antisocial behaviors and having a larger proportion of other-sex friends all contributed uniquely to distinguishing early starters from delayers and virgins. Consistent with previous research, our results suggest that living in a non-intact family increases the probability of early first intercourse (Longmore, Manning, Giordano, & Rudolph, 2004; Price & Hyde, 2008). Several factors can explain this finding. First, adolescents living in non-intact families may have more time to spend without parental supervision, because high monitoring is more likely when there are two, rather than one, parents available to assist with family tasks and who each take responsibility for parenting. Second, adolescents without masculine or feminine role models in their family can compensate with romantic and sexual relationships with other-sex peers, and turn to peers as main socialization agents. Third, researchers have argued that if single parents develop new relationships after separation and engage in dating, the adolescent may replicate such behaviors and engage in sexual activity by modeling (Thornton & Camburn, 1987).

The second consistent pattern in our findings is the unique contribution of antisocial behaviors for discriminating adolescent who had first intercourse earlier from those who delayed, thus replicating previous findings from Capaldi et al. (1996, 2002), arguing that antisocial behaviors were at the core of adolescent involvement in delinquency and substance use, which have both been associated with early onset of intercourse (Donovan & Jessor, 1985). Youths engaging in antisocial behaviors are likely to be attracted to sexuality and to have more opportunities of unsupervised and unstructured situations with other-sex mates favorable to sexual encounters.

During the last decade, several authors have highlighted the important contribution of the peer groups on the emergence of adolescent romantic relationships (Brown, 1999; Connolly et al., 2000). In our final model of early sexual intercourse, a high proportion of other-sex friends had a strong and unique contribution for distinguishing early starters from those who postpone first intercourse until later in adolescence or beyond (O'Donnell et al., 2006).

Context

Because sexual activity tends to be influenced by context-specific norms, adolescents who grow up in urban and suburban contexts may have varied experiences in their social environments and different opportunities for meeting romantic and sexual partners. Although Levine and Coupey (2003) found no significant effect of the "metropolitan status" on the occurrence of risky sexual behaviors in adolescence, other researchers have detected neighborhoods' effects on the timing of first sexual intercourse (Dupere et al., 2008; Roche et al., 2005). In the present study, 15% more subjects reported having had sex before age 16 in the urban compared to the suburban sample. A possible explanation is that urban youth may have access to larger groups of peers, both at school and in their neighborhoods, considering the higher population in urban settings. This can make it harder for parents to be constantly aware of their child's friends and whereabouts. Another possible explanation is that these youths experience a lack of parental control due to competing demands common to urban city dwellers of single-headed households, for instance having to work multiple jobs leaving youth with more opportunities of unsupervised and unstructured situations.

Moreover, although the tendencies were quite similar among the two samples, more significant effects were detected among the suburban sample because its sample size was twice as large as in the urban sample. For instance, when all

independent variables were taken into account, academic achievement and common substance use discriminated uniquely and significantly between the groups in the suburban sample. Consistent with Perkins, Luster, and Villarruel (1998) and Price and Hyde (2008) who found that grade point average was a significant predictor of sexual activity, this result suggests that adolescents who are successful and involved academically are more likely to postpone sexual activity. Conversely, suburban adolescents performing poorly at school and consuming psychotropic substances with their friends have increased probabilities of starting their sex life earlier.

Furthermore, future research should investigate the interaction of family structure and parental control in urban settings and suburban settings. Considering a larger proportion of adolescents living in urban settings come from non-intact families (in this study it was 54% versus 25% for suburbanites), perhaps teaching parental control techniques to parents is more feasible and productive than increasing intact families (e.g. some families may be intact but dysfunctional). In fact, previous studies have shown that parents can indeed learn and efficiently apply new parenting practices (Bogenschneider, Wu, Raffaelli, & Tsay, 1998; Patterson, 1986).

Limitations and future research

This study has limitations that we would like to acknowledge. Regarding the independent variables, it should be first noted that the proportion of other-sex friends was measured slightly differently among the two samples, which could potentially affect the results. However, significant differences were observed for this variable among the age groups in both samples, both the univariate and the multivariate analyses, thus confirming the strength of the effect found even when the measures were not entirely identical. Second, a slight proportion of youths have already had sex before the assessment of the predictors. For those very early starters, it is possible that having had sex early have affected their other behaviors, such as academic achievement, for instance. It would be desirable in future researches to assess all the predictors among a baseline-virgin sample, earlier in the youths' development.

Moreover, two issues were confronted with the covariates. A previous study has found that mother's level of education showed a small delaying effect on the age at first intercourse (Raffaelli & Crockett, 2003). Unfortunately, due to low response rates of the parents at the first wave on this question, this variable could not be included. Moreover, although we controlled for family structure like in previous studies (Miller et al., 2001; Price & Hyde, 2008; Raffaelli & Crockett, 2003; Whitbeck et al., 1999), this variable has been created from Time 1 in both studies (i.e. Grade 6 among the suburbanites, Grade 8 for the urban sample). The proportion of non-intact families slightly increased among the suburban sample when measured 3 years later (3.3% of the sample), but there were no differences on age at first intercourse.

Finally, the exclusive reliance on self-reported data for most predictors (except family structure and academic achievement) and the sexual activity variable is another limitation. However, self-reported assessment is typical in this field of research and few alternative valid methods are currently available. This paper adds to a growing number of longitudinal studies (Alexander et al., 1993; Capaldi et al., 1996) in reminding to scholars studying adolescent sexuality to use repeated measures in order to enhance the validity of the findings. Using a three-wave design for assessing age at intercourse was already a step further. Further research in this direction is needed.

This study has integrated risk and protective factors across three different domains of the adolescent functioning to increase our knowledge of the antecedents of early sexual intercourse. It would have been almost impossible to try to cover in one study every factor involved in early sexual activity given the variety of predictors enlightened in the literature. For examples, personality traits like autonomy (Raffaelli & Crockett, 2003), impulsivity (Noar, Zimmerman, Palmgreen, Lustria, & Horosewski, 2006) and sensation-seeking (Stanton, Li, Cottrell, & Kaljee, 2001; Zuckerman, 2007, biological variables such as early pubertal maturation (Miller et al., 1997) and some features of the relationship between the sexual partners (Manlove, Franzetta, Ryan, & Moore, 2006), have been linked with early sexual intercourse, just to report a few.

This paper adds to a growing amount of research aiming to identify the personal and interpersonal determinants of early heterosexual activity (Friedlander et al., 2007; Miller et al., 1997; Price & Hyde, 2008). It should be noted that given the small proportions of adolescents in both samples reporting same-sex sexual experiences and the particularities in the sexual development trajectories of gay and bisexual teenagers (Savin-Williams, 2003), our results cannot be generalized to this population. We believe that future research should specifically address the predictors of same-sex sexual experiences, since homosexual adolescents are likely to be confounded with virgins in studies focusing exclusively on heterosexual intercourse.

This study focused on early onset of sexual activity as an indicator of a potential problematic trajectory in adolescence. The perspective of risk claims that the earlier the first sexual intercourse, the greater the chances to experiment the problematic consequences of intercourse in teenage years, such as exposition to STIs and AIDS as well as unwanted pregnancies. As Jessor et al. (1983) have pointed out, sexual intercourse, like most youths' problem behaviors, is age graded, which means it is becoming a problem only if it occurs earlier than permitted or prescribed by the relevant norms. Sexual intercourse among early adolescents can then be considered as a departure from prevailing norms about the appropriate age to have such intimate other-sex experience whereas sexual activity is fairly widespread, even normative, among older adolescents. Therefore, researchers should keep in mind that age in itself is not the only predictor of risky or safe sex in adolescence (Ciarrano et al., 2006; Coleman & Roker, 1998). For instance, by the end of adolescence, which is legally defined as 18 years old in Quebec, Canada, a majority of teenagers will have become sexually active (Rotermann, 2008). Thus from a more normative

point of view, sexual development is a key issue in adolescence because teenagers must learn how to accurately interact with other-sex peers in order to eventually fulfill their needs of intimacy, emotional and sexual closeness.

Clinical implications

Notwithstanding these limitations, the present study provides longitudinal data on two samples from two contexts, including both males and females. These findings have shown that programs aiming at delaying sexual intercourse among teenagers should target both the friendship networks and the youths themselves. Youths living in non-intact families and those exhibiting high levels of antisocial behaviors have higher probabilities of engaging in early sexual activity. The presence of plural other-sex friends in one's network is another factor precursor of sexual encounters because potential romantic and sexual partners can then be reached through their network.

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