Associations Between Life Contexts and Early Sexual Initiation Among Young Women in France

CONTEXT: Early sexual initiation (before age 16) has been linked to an increased risk of teenage pregnancy and STDs. Most research on correlates of early sexual initiation is from the United States; no similar work has been conducted in France, where the sociocultural environment differs.

METHODS: Cross-sectional data from the 2010 Health Behaviour in School-Aged Children survey were used to examine the relationships of personal, family, peer, school and neighborhood characteristics with early sexual initiation among 1,094 French females in grades 8–10. Two-level logistic regressions were used to identify associations.

RESULTS: Twenty-five percent of respondents had had sex before age 16. Early sexual initiation was primarily associated with individual-level characteristics. Young women had an elevated likelihood of having initiated sex early if they went out after school at least four times a week (odds ratio, 2.0), had repeated a grade (1.8), lived with a single parent or in a stepfamily (1.8 and 1.5, respectively), perceived a low level of parental monitoring (1.6) or had two or more male friends (2.8). At the environmental level, respondents who attended school in areas with a high proportion of residents who were foreigners had a reduced likelihood of having initiated sex early (0.5–0.6).

CONCLUSIONS: Although early sexual initiation in France was essentially linked to individual-level variables, further research is needed to understand its relationship with neighborhood characteristics. Such studies should include additional environmental variables, test new hypotheses and employ a longitudinal approach.

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Although levels of condom and contraceptive use among French teenagers are high,[1] the prevalence of sexual risk behaviors in this age-group remains a concern. Such behaviors can result in STDs, unwanted pregnancies and abortions. For example, the rate of abortion among 15–17-year-olds in France increased from 7.0 per 1,000 in 1990 to 10 per 1,000 in 2008–2009, representing about 12,000 abortions each year in this age-group;[2] 6% of abortions in 2005–2007 were obtained by females younger than 18.[3]

Early sexual initiation can be defined as engaging in sexual intercourse before age 16.[4] Females who initiate sex early have an elevated likelihood of having a child before age 18;[5] moreover, they are less likely than other women to use condoms and other contraceptives at first sex, and thus have a greater risk of pregnancy and STDs.[6] Very early sexual initiation (before age 14) has been linked to sexual risk behaviors (e.g., having not used a condom at last intercourse) and related outcomes (experiencing or causing pregnancy).[7] Furthermore, young adolescents may not be prepared for the psychological consequences of sexual activity: Among females, the earlier their sexual debut, the more likely they are to experience regret[8] and develop depression during adolescence.[9]

The individual-level contexts in which teenagers develop are important for their sexual behaviors. A review of more than 400 studies found that some sexual behaviors and outcomes (sexual initiation, condom and contraceptive use, frequency of sexual intercourse, and pregnancy) were associated with community, family, peer and school characteristics.[10] The family is the primary context in which cultural values, ideas and norms are learned and shared. However, during adolescence, teenagers' values increasingly are shaped by peers, school and other environmental characteristics. This transition may be associated with adolescents' sexual behavior. Perceiving that a high proportion of one's peers are involved in sexual activity, for example, has been linked to an increased risk of early sexual initiation,[11] and having a high proportion of friends who are of the opposite sex is associated with engaging in very early sexual intercourse.[12] Variables related to school (where teenagers spend the majority of their time) have also been linked to sexual behavior. For example, academic achievement is associated with sexual abstinence among youth in fifth through eighth grades,[13] and school attachment is negatively associated with the likelihood of early sexual initiation.[4] Finally, neighborhood characteristics may be important; in North America, youth aged 15–17 living in poor environments have an elevated risk of sexual initiation.[14] Furthermore, young females with a history of conduct problems are more at risk for sexual initiation between ages 12 and 15 if they live in a poor neighborhood than in a nonpoor neighborhood.[15]

Most studies of teenagers' sexual behavior have been conducted in the United States. To date, no comparable analyses are available for France. However, France and

the United States differ culturally and demographically. Furthermore, studies of adolescent sexual behavior have generally focused on family context and neighborhood environments, while neglecting the potential contribution of the school context. In France, no research has been conducted on the relationship of individual-level contexts and the environment in which teenagers develop with early sexual initiation. Our objective is to address this gap in the literature and study the associations of individual-level (personal, family, peer and school) characteristics and neighborhood-level environmental characteristics with early sexual initiation among females in France.

METHODS
Data

We used French data from the 2010 Health Behaviour in School-Aged Children (HBSC) study. This cross-sectional, multinational survey, currently conducted every four years in 43 nations, asks students in grades 5–10 about their perceptions and feelings regarding key health behaviors, as well as about their well-being, life context and social conditions. After their parents provide consent, respondents anonymously complete questionnaires in school classrooms. The international[16,17] and French[1] survey methodologies have been described elsewhere.

The French Ministry of Education used a cluster design to obtain a nationally representative sample of youth. The primary sampling units were schools, from each of which two classes were randomly selected. Students aged 15 or older were the target population for questions about sexuality.

Measures

•*Early sexual initiation*. Teenagers were asked "Have you ever had sexual intercourse (sometimes this is called 'making love,' 'having sex' or 'going all the way')?" If they had, they were asked "At what age did you first have sexual intercourse?" Teenagers who had had sex before age 16 were considered to have initiated sex early.*[4]

•*Personal*. Age was measured as a continuous variable, and school grade as a categorical variable (eighth, ninth or 10th grade). Respondents were classified as having had early menarche if they reported having had their first period before age 12.†[18]

•*Family*. We included several parameters related to family context. Family structure was classified according to whether respondents lived with both biological parents, with a single parent or in a stepfamily. Adolescents' perceptions of their relationship with their parents were captured using measures of communication, bonding and monitoring. We

created two communication variables, using answers to the questions "How easy is it for you to talk to your mother?" and "How easy is it for you to talk to your father?" Response options were "very easy," "easy," "difficult," "very difficult" or "I haven't seen/don't see" the parent; the first two responses were recoded as "easy," and the second two as "difficult." Parental bonding was measured by asking respondents how often each parent gives them as much help as they need, is loving, understands their problems and worries, and makes them feel better when they are upset; response options for each question were "never," "sometimes" and "almost always." Parental monitoring was measured by asking respondents the extent to which each parent knows who their friends are, how they spend their money, where they go after school, where they go in the evening and how they spend their free time; response options were "does not know," "knows a little" and "knows a lot." For the parental bonding and monitoring measures, scores were calculated separately for mother and father using polychoric principal component analysis; the highest score obtained for either parent was used as the value. Scores were divided into tertiles for the purpose of analysis; higher scores indicate closer relationships between teenagers and their parents, and higher levels of parental monitoring.

We used three measures of family socioeconomic status. The first was the family affluence scale, which assesses material wealth using four items: "Does your family own a car, van or truck?" "Do you have your own bedroom for yourself?" "During the past 12 months, how many times did you travel away on holiday with your family?" and "How many computers does your family own?" Responses were used to classify family affluence as low, medium or high; details are available elsewhere.[19] The second measure, perceived wealth, was assessed by asking the teenager "How well off do you think your family is?" Response options were "very or quite well off," "average" or "not so or not at all well off." Finally, we created a measure that categorized respondents on the basis of their parents' occupations. Using categories specified by the French National Institute for Statistics and Economic Studies, we classified occupational status as high (e.g., managers, professionals, craftsmen, shopkeepers), intermediate (e.g., farmers, technicians, teachers, midlevel administrators, police officers), low (e.g., drivers, skilled and unskilled workers) or unclassified (retired people, individuals without an occupation and those for whom data were insufficient). If the occupations of a respondent's parents fell into different categories, we used the higher of the two.

•*Peer relationships*. We included measures of respondents' number of male friends (categorized as none, one, or two or more) and the quality of their communication with friends (good or bad). Other peer measures concerned how often respondents spent time with friends after school and went out in the evening; both were considered "frequent" if they happened at least four times a week.

•*School*. Several measures assessed respondents' academic performance and feelings toward school. Measures of school achievement were whether the respondent had ever

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*Forced first sex seems to have been uncommon in the sample. The HBSC questionnaire includes a question asking teenagers whether, when they first had sexual intercourse, they "wanted it to happen at that moment (or earlier)," "would rather have had it later," "did not ask [themselves] that question" or "did not really want to have intercourse"; only six of the 272 females in our analysis who had experienced early sexual initiation reported that they "did not really want to have intercourse."

†All but 18 had reached menarche.

repeated a grade and whether her teachers considered her school performance to be below average. The latter measure was based on responses to a question on how the respondent felt her teachers rated her academic performance relative to that of her classmates; response options were "very good," "good," "average" or "below average." We created a dichotomous variable by reclassifying respondents' performance as "below average" or "average or higher." Another variable assessed respondents' feelings toward school, using their answers to the question "What do you think about your school?" Possible answers were "I like it a lot," "I like it a little," "I do not like it so much" and "I do not like it at all"; the first three were grouped to create a dichotomous variable indicating whether respondents liked school at least somewhat or did not like it at all. Students' perceptions of the demands that school made on them were measured using two items that asked the extent to which they agreed that schoolwork is "difficult" and "tiring." Response options were on a scale ranging from 0 ("strongly disagree") to 4 ("strongly agree"); scores for the two items were combined and classified as low (0–3), moderate (4–6) or high (7–8). Finally, we included a classmate support scale, which was based on respondents' level of agreement with three items: "The students in my class enjoy being together," "Most of the students in my class are kind and helpful" and "Other students accept me as I am." Responses options again ranged from 0 ("strongly disagree") to 4 ("strongly agree"); scores on individual items were summed to yield a total support score, categorized as low (0–5), moderate (6–9) or high (10–12).

•*Neighborhood.* For each school participating in the 2010 HBSC survey, the French Ministry of Education calculated the rate of grade repetition and the proportion of youth whose parents were in disadvantaged occupational categories, according to teenagers' reports.

In addition, we include several ecologic measures for each school. In France, cities and towns with more than 5,000 citizens are divided into small geographic areas called IRIS (regrouped statistical information areas). Precise environmental data at the IRIS level are available from the most recent (1999) full French census. These data include ecological deprivation index scores.[20] Higher scores indicate higher perceived deprivation in the area; we categorized scores into quintiles, which allows us to compare the situation of teenagers whose school is located in a deprived IRIS to the overall French situation.[20] In addition, we included IRIS-level measures of unemployment, foreigner status (defined as a person born in France or abroad who is not of French nationality), single-parent households, and people aged 15 or older who were not attending school and had not attained a national diploma.* For these measures, areas were grouped into quartiles.

Sample

A total of 1,456 females aged 15 or older in grades 8–10 took part in the survey. We excluded 58 females who did not indicate whether they had ever had sexual intercourse

or how old they were when they first had sex, 12 who reported same-sex first intercourse (because they were not at risk for pregnancy), 100 who responded inconsistently to questions about family, 87 who attended one of the nine schools that could not be geocoded and 105 who were attending a school with fewer than five respondents (after data cleaning).

Overall, 362 females (25%) were excluded. Compared with respondents who remained in the analytic sample, those who were excluded were slightly younger (median, 15.7 vs. 15.8 years), more likely to have repeated a class (55% vs. 33%) and more likely to be in eighth grade (16% vs. 1%) or ninth grade (52% vs. 34%). The final sample consisted of 1,094 young women from 79 schools.

Analyses

All analyses took into account the cluster design of the sample. We retained the 124 respondents who were missing data for at least one independent variable, and we created a "missing" category for each measure. To compare females who reported early sexual initiation with those who did not report this behavior, we used chi-square tests or (if the theoretical frequency was less than five) Fisher tests without weights.

Next, we studied the parameters associated with early sexual initiation. The intercluster variance was tested using an empty model to determine whether significant variability existed between schools. We then created models using multilevel logistic regressions by dividing the variance into student- and school-level variance. Variables were individually introduced into multilevel logistic regressions, and those that were significant at $p < .20$ were retained. These analyses were conducted to ensure that the significance reflected the modalities and not missing data. We conducted three stepwise procedures—one each for family, school and peers, again using $p < .20$ as the level of significance. The aim was to identify variables that were related to early sexual initiation in each context, as well as to determine whether the intercluster variance diminished after introduction of individual-level variables. Once these variables had been identified, all significant individual-level parameters characterizing family, peers and school were introduced into a final stepwise model at the threshold of $p < .05$. Finally, significant neighborhood variables were added at level two of the full individual-level model ($p < .05$).

The proportional change in variance was used to capture each step's contribution to the variance.[21] All analyses were performed using Stata version 11.

RESULTS

Respondents' age ranged from 15.0 to 18.3 years (median, 15.8). Thirty percent of young women reported having had sexual intercourse; of these, 84% stated that they first had

*In France, a national diploma is awarded at the end of ninth grade to students whose test scores indicate that they are proficient in core subjects.

TABLE 1. Percentage distribution of females in grades 8–10, by selected individual-level characteristics, according to whether they had initiated sex early, Health Behaviours in School-Aged Children survey, France, 2010

Characteristic	All (N=1,094)	Initiated sex early Yes (N=272)	Initiated sex early No (N=822)	Characteristic	All (N=1,094)	Initiated sex early Yes (N=272)	Initiated sex early No (N=822)
PERSONAL				**FAMILY**			
Grade‡				**Highest parental occupational category**			
8	1.4	1.1	1.4	Low	7.3	7.7	7.2
9	33.4	34.9	33.0	Intermediate	53.8	52.9	54.0
10	65.2	64.0	65.6	High	29.5	27.6	30.2
				Unclassifiable	9.4	11.8	8.6
Early menarche							
No	79.1	75.7	80.3	**PEERS**			
Yes	18.3	22.1	17.0	**No. of male friends***			
Missing	2.6	2.2	2.7	0	9.4	4.4	11.1
				1	17.0	12.1	18.6
FAMILY				≥2	71.8	82.7	68.1
Family structure, ‡**				Missing	1.8	0.8	2.2
Both biological parents	73.8	65.4	76.6				
Single parent	13.7	18.1	12.3	**Quality of communication with friends‡**			
Stepfamily	11.9	15.8	10.6	Bad	5.5	5.5	5.5
Missing	0.6	0.7	0.5	Good	92.8	94.1	92.3
				Missing	1.7	0.4	2.2
Ease of communication with father							
Difficult	65.2	68.0	64.2	**Goes out after school ≥4 times/wk.***,‡**			
Easy	25.5	22.1	26.7	No	64.9	50.4	69.7
Haven't seen/don't see father	6.6	7.3	6.3	Yes	33.9	49.2	28.8
Missing	2.7	2.6	2.8	Missing	1.2	0.4	1.5
Ease of communication with mother‡				**Goes out evenings ≥4 times/wk.***, ‡**			
Difficult	34.9	40.1	33.2	No	92.0	87.5	93.5
Easy	62.3	57.0	64.1	Yes	6.7	12.1	4.9
Haven't seen/don't see mother	1.1	1.8	0.9	Missing	1.3	0.4	1.6
Missing	1.7	1.1	1.8				
				SCHOOL			
Perceived parental monitoring, ‡**				**Ever repeated a grade***			
Low	33.7	42.3	31.0	No	66.9	55.5	70.7
Moderate	34.3	31.6	35.1	Yes	33.1	44.5	29.3
High	30.6	25.4	32.3				
Missing	1.4	0.7	1.6	**School performance§**			
				≥average	83.6	80.9	84.6
Perceived parental bonding‡				<average	16.4	19.1	15.4
Low	33.7	35.7	33.1				
Moderate	32.6	29.4	33.6	**Classmate support‡**			
High	32.7	33.8	32.3	Low	14.3	16.2	13.6
Missing	1.0	1.1	1.0	Moderate	54.8	56.2	54.4
				High	29.6	26.5	30.7
Family affluence scale score*,‡				Missing	1.3	1.1	1.3
Low	7.6	8.1	7.4				
Intermediate	31.8	32.7	31.5	**Feelings toward school***			
High	58.9	59.2	58.8	Likes it a lot/a little/not much	90.9	87.1	92.1
Missing	1.7	0.0	2.3	Does not like it at all	9.1	12.9	7.9
Perceived wealth‡				**Perceived school demands‡**			
Very/quite well off	53.2	47.8	55.0	Low	14.2	14.0	14.2
Average	35.5	39.3	34.2	Moderate	64.2	59.9	65.6
Not so/not at all well off	10.0	11.8	9.5	High	21.0	25.4	19.6
Missing	1.3	1.1	1.3	Missing	0.6	0.7	0.6
				Total	100.0	100.0	100.0

*p≤.05. **p≤.01. ***p≤.001. ‡As conditions of application were not met for a chi-square test, Fisher tests that took into account missing data (but not the cluster effect) were used to determine statistical significance. §Respondent's perception of how her teachers rate her work. *Notes:* Unless otherwise noted, chi-square tests that took into account cluster effect and missing data were used to determine statistical significance.

intercourse before age 16. Overall, 25% of respondents initiated sex early.

The majority of young women in the sample were in 10th grade (65%), lived with both parents (74%) and had a high level of family affluence (59%—Table 1). Most had at least two male friends (72%) and characterized the quality of their communication with friends as good (93%). Only

34% of participants went out after school four or more times per week, and an even smaller proportion went out that frequently during the evening (7%). Although one-third had repeated a grade, only 16% reported that their teachers considered their school performance to be below average. Levels of classmate support and perceived school demands were both generally moderate (55% and 64%, respectively).

TABLE 2. Percentage distribution of females in grades 8–10, by selected characteristics of school neighborhood, according to whether they had initiated sex early

Characteristic	All	Initiated sex early	
		Yes	No
Ecological deprivation index			
Lowest quintile	12.3	12.5	12.3
Second quintile	8.1	8.0	8.2
Third quintile	12.2	12.5	12.0
Fourth quintile	31.4	33.5	30.7
Highest quintile	36.0	33.5	36.8
Unemployment rate			
Lowest quartile	26.6	22.8	27.9
Second quartile	24.7	29.4	23.1
Third quartile	24.4	20.6	25.7
Highest quartile	24.3	27.2	23.3
% of residents who are foreigners[**]			
Lowest quartile	25.9	34.9	22.9
Second quartile	27.0	24.3	28.0
Third quartile	22.5	21.7	22.7
Highest quartile	24.6	19.1	26.4
% of households headed by single parent			
Lowest quartile	25.6	23.5	26.3
Second quartile	25.7	25.0	25.9
Third quartile	27.3	32.7	25.5
Highest quartile	21.4	18.8	22.3
% of residents 15 or older without a diploma and not in school			
Lowest quartile	25.3	24.3	25.7
Second quartile	25.0	27.6	24.2
Third quartile	25.8	26.8	25.4
Highest quartile	23.9	21.3	24.7
% of students who have repeated a grade			
Lowest quartile	27.0	25.7	27.5
Second quartile	25.4	25.4	25.4
Third quartile	22.6	21.0	23.1
Highest quartile	25.0	27.9	24.0
% of students from disadvantaged families			
Lowest quartile	26.4	22.4	27.7
Second quartile	23.6	24.6	23.3
Third quartile	25.4	23.5	26.0
Highest quartile	24.6	29.5	23.0
Total	100.0	100.0	100.0

[**]p≤.01. *Notes:* Chi-square tests that took cluster effect into account were used to determine statistical significance. The range of values for each quintile and quartile are available from the authors upon request.

Young women who reported early sexual initiation did not differ from others with regard to school grade or to whether they had reached menarche early. However, in bivariate analyses, early sexual initiation was associated with not living with both biological parents and with low levels of perceived parental monitoring. Having at least two male friends, going out frequently with friends after school or in the evening, having repeated a grade and not liking school at all were also linked to early sexual initiation.

A disproportionate number of young women attended schools in areas whose residents felt disadvantaged (36% were in the quintile with the highest ecological deprivation index scores—Table 2). Distributions of respondents according to most other environmental measures were more uniform. The only environmental characteristic associated with early sexual initiation was the proportion of residents who were foreigners; the higher this proportion, the lower the proportion of females who had initiated sex early.

In the multivariate analysis, model 1, which included only family variables, revealed that only two of these measures were associated with early sexual initiation (Table 3). The likelihood of early sexual debut was elevated among young women who lived with a single parent (odds ratio, 1.8) or in a stepfamily (1.7) rather than with both biological parents, and among those who perceived low rather than moderate or high levels of parental monitoring (1.7). Model 2, which examined peer variables, revealed that the odds of early sexual initiation were higher among females who went out at least four times a week after school (2.0) or in the evening (2.0) than among those who went out less frequently, and higher among young women with two or more male friends than among those with no male friends (2.6). Model 3 examined school-related variables and indicated that one—grade repetition—was associated with early initiation (1.8).

When we combined all of the individual-level variables and adjusted for early menarche (model 4), all parameters that were significant in models 1–3, except for the frequency of evenings out with friends, were associated with early sexual initiation.

The final regression adjusted for the only environmental variable that had shown a significant association in the bivariate analysis: the proportion of residents of the school area who were foreigners (model 5). Young women in the two quartiles with the highest proportions of residents who were foreigners were less likely than those in the lowest quartile to have experienced early sexual initiation (odds ratios, 0.5–0.6). The proportional change in school-level variance was 73%, indicating that almost three-quarters of the variance among schools was explained by this model. In comparison, the proportional change in the other models ranged from a 30% increase in variance to a reduction of 27%.

The magnitudes of other associations were similar to those of earlier models. Young women were more likely to have initiated sex early if they lived with a single parent or in a stepfamily rather than with both biological parents (odds ratios, 1.8 and 1.5, respectively); if they perceived a low rather than moderate or high level of parental monitoring (1.6); if they went out after school at least four times a week rather than less frequently (2.0); if they had two or more male friends rather than none (2.8); or if they had ever repeated a grade (1.8).

Intercluster (school) variance was significant in the empty model and in the models consisting of individual-level variables (except for model 3, where the variance was marginally significant). These results indicate that differences among schools in the odds of early sexual initiation among females are not explained by individual parameters. After adjustment for the proportion of residents who are foreigners, intercluster variance was no longer significant.

TABLE 3. Odds ratios (and 95% confidence intervals) from multilevel logistic regression models assessing relationship between selected characteristics and early sexual initiation

Characteristic	Empty model	Model 1	Model 2	Model 3	Model 4‡	Model 5‡
FAMILY						
Family structure						
Both biological parents (ref)	na	1.0	na	na	1.0	1.0
Single parent	na	1.8 (1.2–2.6)**	na	na	1.7 (1.2–2.6)**	1.8 (1.2–2.7)**
Stepfamily	na	1.7 (1.1–2.6)*	na	na	1.6 (1.0–2.4)*	1.5 (1.0–2.4)*
Missing	na	3.8 (0.4–31.8)	na	na	4.5 (0.5–38.5)†	3.8 (0.5–31.7)
Perceived parental monitoring						
High/moderate (ref)§	na	1.0	na	na	1.0	1.0
Low	na	1.7 (1.2–2.3)***	na	na	1.6 (1.2–2.1)**	1.6 (1.2–2.2)**
Missing	na	0.3 (0.0–1.9)	na	na	0.3 (0.0–2.1)	0.3 (0.0–2.1)
PEERS						
Goes out after school ≥4 times/wk.						
No (ref)	na	na	1.0	na	1.0	1.0
Yes	na	na	2.0 (1.5–2.8)***	na	2.0 (1.5–2.8)***	2.0 (1.5–2.7)***
Missing	na	na	0.7 (0.0–10.3)	na	0.4 (0.0–3.3)	0.4 (0.0–3.0)
Goes out evenings ≥4 times/wk.						
No (ref)	na	na	1.0	na	ns	na
Yes	na	na	2.0 (1.2–3.3)*	na	ns	na
Missing	na	na	0.4 (0.0–6.2)	na	ns	na
No. of male friends						
0 (ref)	na	na	1.0	na	1.0	1.0
1	na	na	1.6 (0.8–3.3)†	na	1.5 (0.7–3.3)	1.5 (0.7–3.2)
≥2	na	na	2.6 (1.4–5.0)**	na	2.8 (1.5–5.5)**	2.8 (1.5–5.3)**
Missing	na	na	1.2 (0.2–6.1)	na	1.5 (0.3–7.7)	1.5 (0.3–7.7)
SCHOOL						
Ever repeated a grade						
No (ref)	na	na	na	1.0	1.0	1.0
Yes	na	na	na	1.8 (1.3–2.4)***	1.8 (1.3–2.5)***	1.8 (1.3–2.4)***
Feelings toward school						
Likes it a lot/a little/not much (ref)	na	na	na	1.0	ns	na
Does not like it at all	na	na	na	1.5 (1.0–2.4)†	ns	na
NEIGHBORHOOD						
% of residents who are foreigners						
Lowest quartile (ref)	na	na	na	na	na	1.0
Second quartile	na	na	na	na	na	0.7 (0.4–1.0)†
Third quartile	na	na	na	na	na	0.6 (0.4–0.9)*
Highest quartile	na	na	na	na	na	0.5 (0.3–0.7)***
Level 2 variance (standard error)	0.135 (0.08)	0.176 (0.09)	0.126 (0.08)	0.098 (0.08)	0.124 (0.09)	0.037 (0.07)
p value for cluster effect	.014	.004	.025	.053	.032	.270
Proportional change in variance		−30.4	6.7	27.4	8.1	72.6

*p≤.05. **p≤.01. ***p≤.001. †p<.20. ‡Adjusted for early menarche. §These categories are combined because they had the same odds ratios in multivariate models. *Notes:* ref = reference group. na = not applicable, because the characteristic was not included in the model. ns = not significant.

DISCUSSION

We found that early sexual initiation, defined as first sexual intercourse before age 16, occurred among one-quarter of females. A variety of family-, peer- and school-related measures were associated with early sexual initiation; however, at the neighborhood level, only the proportion of residents in the school area who were foreigners was associated with early sexual initiation.

The results of this research are consistent with those of previous analyses, including those of HBSC data from other European countries, which showed that early sexual initiation was negatively associated with intact family structure and levels of parental monitoring.[22–24] Moreover, French research has found that teenagers living in single-parent households or stepfamilies were more likely than other youth to engage in early sexual intercourse.[25] In other studies, maternal responsiveness during discussions about sex appeared to buffer peer influences by delaying the intention to have intercourse among 14–16-year-olds who perceived that a high proportion of their friends were sexually active,[26] and teenagers who thought that their mother disapproved of their having sex or who were highly satisfied with their maternal relationship were less likely than other youth to initiate sexual activity.[27,28]

In our analysis, no familial socioeconomic parameters were independently associated with early sexual initiation. Santelli and colleagues found no association between family income and sexual initiation among 14–17-year-olds,

although parents' educational attainment was negatively associated with this behavior.[29] Education provides parents with intellectual and cultural experiences,[30] which may be linked to the way they live and educate their children. We did not observe an association between parents' occupational categories and early sexual initiation, perhaps because the classification system combines different professions into the same categories.[30] Furthermore, teenagers' reports of their parents' professions may have been inaccurate. Another possible explanation for the absence of an association is that any relationship between socioeconomic characteristics and sexual debut is mediated by other variables, such as familial relations.

Our analysis linked going out after school to an increased likelihood of having initiated sex early. In a previous study, youth aged 12–15 who were at home with an adult after school had a lower risk of sexual initiation than did their counterparts who were not at home after school or were home on their own.[31] In a mainly white sample of inner-city youth in two U.S. cities, the significant relationships between "positive" characteristics (such as having aspirations for the future) and never having had sexual intercourse were more numerous and stronger among those who were supervised by an adult during the day than among those who were home on their own two or more hours per day.[32] A study of urban ninth and 10th graders, most of whom were white, found that negotiated unsupervised time was associated with an increased risk of having had sex and with intentions to have sex.[33] The absence in the final model of our analysis of an association between frequently going out in the evening and early sexual initiation may be due to the small number of respondents in that category (73).

We found an association between having two or more male friends and early sexual initiation. Cooksey and colleagues found that having a preponderance of older friends at ages 11–12 was associated with having had sex between ages 13–14 and 15–16, but having mostly opposite-sex friends at the younger age was not.[34] The difference between those findings and ours may be due to a disparity in measures. Cooksey et al. considered whether most or all of a teenager's friends were of the opposite sex, whereas our research considered the number of male friends. Similarly, Cooksey and colleagues measured friendship at ages 11–12, whereas we measured it at age 15 and older. Furthermore, their study, unlike ours, focused on youth born to young mothers.

The proportion of foreigners in the school neighborhood was the only environmental variable in the final model that was associated with early sexual initiation. Results of previous studies suggest that this association may be attributable to cultural differences. For example, in the United States, Hispanic teenagers living in neighborhoods with a low-to-medium density of Hispanic residents were more likely to initiate sex than were similar youth in neighborhoods with a medium-to-high density of Hispanic residents.[35] Other work has developed a concept known as "collective efficacy," which measures the social cohesion (mutual trust, solidarity), intergenerational closure (whether parents know the parents of their children's friends) and informal social control in a neighborhood. Collective efficacy has been linked to delay of sexual onset between ages 11 and 16 among youth with low parental place monitoring (those allowed to wander in public places without an adult for more than two hours).[36] Similarly, teenagers who lived in a neighborhood with permissive sexual norms were more likely than other youth to have sexual intercourse.[37] In analyses not reported here, we found that the association we observed between the proportion of a neighborhood's residents who were foreigners and early sexual initiation among females was not apparent among males, suggesting that in France this association may differ by gender.

Although U.S. studies have linked living in a disadvantaged area to risky behavior, including early sexual initiation, we did not find such a relationship in our study. This disparity may reflect differences between the United States and France in levels of disadvantage. For example, highly disadvantaged areas in France may not be comparable to those in the United States, given the differing levels of social welfare provision. Furthermore, to promote social diversity, students in France are assigned to a school according to the area in which they live, regardless of their parents' social status; therefore, segregation between advantaged and disadvantaged young people is probably less prevalent in France than in the United States.

Limitations and Strengths

The main limitation of the current research is the cross-sectional nature of the data, which precludes any assumptions of causality. Another limitation is the constraint imposed by the structure of data. Early sexual initiation was defined as first intercourse before age 16; however, 15-year-olds were the target population for questions about sexuality in the HBSC study, and some members of this age-group may have begun having sex after being surveyed but before their 16th birthday. In addition, females who were excluded from the analysis were younger than those in the analytic sample, and they were more likely to have repeated a grade, a characteristic associated with early sexual initiation. Consequently, we may have underestimated the proportion of females who experienced early sexual initiation.

Future research on early sexual initiation may benefit from the inclusion of variables that were not available in the HBSC study, such as religiosity, educational aspirations, parents' educational attainment and maternal-child discussions about sex. Other parameters that may contribute to such analyses include sexual coercion and partner age. Finally, no information was available concerning respondents' nationality, ethnicity or immigrant status. This information might have shed light on the association between the proportion of residents who were foreigners and early sexual initiation. It is important to acknowledge that ethnicity is a particularly sensitive subject in France, which makes it difficult to collect information about this characteristic, especially in schools.

Despite these limitations, the HBSC study remains a valuable source of data on the sexual behavior of a nationally representative sample of teenagers in France. The study relies on self-reported questionnaires that use previously validated questions; this approach may yield more accurate information on adolescents' sexual behaviors than do surveys administered verbally by an investigator. The HBSC study also enables the simultaneous consideration of numerous variables related to teenagers' behaviors while avoiding recall bias.

Conclusion

In our results, family structure and grade repetition were associated with early sexual initiation. If these links are confirmed by a future longitudinal study, they may be entry points for intervention. Indeed, collaboration between parents and schools can promote positive sexual health from adolescence to adulthood.[38]

Further longitudinal research is also required to deepen our understanding of cultural and religious characteristics that may underlie the negative association between the proportion of foreigners in the school neighborhood and early sexual initiation, and to determinate the direction of any causal links that may exist. Our findings support the inclusion of neighborhood environment in future analyses of adolescents' sexual behaviors and suggest that this environment may need to be taken into account in prevention programs.

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