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Original article

Macro-Level Age Norms for the Timing of Sexual Initiation and Adolescents' Early Sexual Initiation in 17 European Countries

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A B S T R A C T

Purpose: To examine the relationship between country-level age norms for sexual initiation timing and early sexual initiation (ESI) among adolescent boys and girls.
Methods: Nationally representative data from 17 countries that participated in the 2006/2007 European Social Survey (ESS-3, n = 33,092) and the 2005/2006 Health Behaviour in School-Aged Children Study (HBSC, n = 27,702) were analyzed. Age norms were measured as the average country-level response to an item asking the age at which ESS respondents believed someone is too young to have sexual intercourse. HBSC respondents (aged 14–16 years) self-reported age at sexual initiation, which we defined as early (<15 years) or not early (≥15 years or no initiation). Control variables included age, family affluence, perceived socioeconomic status, family living arrangement, substance use, school attachment, and country-level legal age of consent. Multivariable three-level logistic models with random intercepts were run separately by sex.
Results: In multivariable analyses, higher overall age norms were associated with reduced likelihood of ESI among girls (AOR .60, 95% CI .45–.79); associations with ESI were stronger for parent cohort (ages 31–65 years) norms (AOR .37, 95% CI .23–.58) than for peer cohort (ages 15–20 years) norms (AOR .60, 95% CI .49–.74). For boys, overall norms were also significantly negatively associated with ESI (AOR .68, 95% CI .46–.99), as were parent cohort norms (AOR .66, 95% CI .45–.96). Peer cohort norms were not significantly related to boys' ESI.
Conclusion: Macrolevel cultural norms may impact adolescents' sexual initiation timing. Research exploring the sexual health outcomes of early initiators in countries with contrasting age norms is warranted.

IMPLICATIONS AND CONTRIBUTION

Adolescents' likelihood of initiating sex early (<15 years) is lower in countries with higher age norms for sexual initiation timing, with parent cohort norms (ages 31–65 years) more strongly related than youth cohort (ages 15–20 years) norms. This study contributes knowledge of the relationship between macrolevel social environments and adolescents' sexual behavior.

Sexual initiation is a significant transitional point for adolescents [1], and its timing can impact their health and well-being. Earlier sexual initiation (ESI) has been linked with increased risk

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for sexually transmitted infections (STIs) and pregnancy during adolescence, short-term increases in depressive symptoms among girls, lower educational attainment by early adulthood, greater sex partner accumulation, and risky sexual practices in adulthood [2–7]. Younger initiators' increased STI and pregnancy risk is largely due to their more inconsistent use of condoms and other contraceptives [8]. Although many studies document individual, familial, and peer group risk factors for ESI, rates of ESI differ considerably across countries after accounting for these factors [9–11]. A 2005/2006 study revealed that among 14–16 year-olds in Europe, Canada, and Israel, prevalence of ever having sexual intercourse varied from a low of 12% in Slovakia to 61% in Greenland [12]. Research explaining this cross-national variation is scarce.

Researchers have speculated that differences in sociocultural norms may contribute to cross-national variation in adolescent sexual initiation timing [9,10,13]. Although studies have found that individual-level perceived sexual behavior norms (i.e., individual perceptions of peer sexual involvement and peer beliefs about appropriate timing for sexual initiation) are among the strongest predictors of ESI [14,15], no studies have examined norms at a macrosocial level. According to ecological systems theory [16], adolescent behavior is influenced by contextual factors at different levels, including macrosystem influences such as cultural values, customs, and laws. The macrosystem likely influences youths' sexual socialization through shaping cultural values expressed by socialization agents such as family and peers.

Two qualitative studies have examined the influence of country-level cultural norms on adolescent reproductive health, including ESI. Although substantive differences between the United States and other (primarily European) nations were found in the acceptability of adolescent sexual behavior, similarity across countries in the proportion of adolescents who were sexually active seemed to suggest cultural norms had little influence on adolescent sexual behavior [13,17]. However, these studies only included a small number of countries (two and five, respectively), and mainly focused on contrasting Western and Northern European nations with the United States.

As highlighted by Bronfenbrenner [16], sociocultural norms at the macrolevel may interact with individual factors, such as biological sex, in influencing behavior. Recent studies highlight a persistent sexual double standard—boys are permitted greater sexual freedom than girls [18]. Given this double-standard, societal norms may be more strongly related to sexual initiation timing for girls versus boys.

In the present study, we examined the influence of sociocultural norms on adolescents' likelihood of early sexual initiation. We conducted a test of macrolevel processes and influences on adolescent behavior, one that is rarely encountered in the empirical literature [19]. We addressed the following research questions:

(1) Do norms about the age at which it is acceptable for adolescents to become sexually active explain cross-national variability in ESI among adolescents?
(2) Does this association vary by biological sex?

Methods

Data

Data from the European Social Survey (ESS; 2006–2007) and the Health Behaviour in School-aged Children Study (HBSC; 2005–2006) were utilized. The ESS is a multicountry cross-sectional survey conducted biennially designed to track the attitudes, beliefs, and behavior of Europeans [20]. Twenty-five countries participated in 2006–2007. Probability samples of the resident national population aged 15 years or older living in private households were drawn in each country, and face-to-face interviews were conducted. Across the 17 countries included in this analysis, the median response rate was 64.5% (range 46%–73%).

The HBSC study was conducted in 41 primarily European nations in 2005–2006 in collaboration with the World Health Organization Regional Office for Europe. HBSC was designed to examine the health and health behaviors of adolescents across country contexts [12]. Cluster sampling, with classes as the primary sampling units, was used to select nationally representative samples (in most countries). Data collection was conducted during the 2005–2006 school year; students completed anonymous questionnaires within classrooms. All countries adhered to a strict international protocol for sampling and data collection. School response rates varied by country (from 47% to 100%, but >70% for 14 of 18 included countries). Student response rates also varied by country but were >70% for most of the countries included here [21]. The present analysis was deemed exempt from review by the Tulane University institutional review board.

Our sample is limited to the 17 European countries that participated in both HBSC 2005–2006 and ESS-3 (Table 1). The separate HBSC country surveys conducted in England, Scotland, and Wales were combined into Great Britain for the current analysis to align with the ESS, which was conducted in the United Kingdom as a whole. Sampled countries vary in culture, religion, economic systems, adolescent access to sexual health services, and adolescent sexual behavior [12,22].

Measures

Outcome—early sexual initiation. *Early sexual initiation* was defined as initiation before age 15 years. Comparative research suggests that adolescent girls under 15 years of age are physiologically unprepared for pregnancy; their cervixes are more vulnerable to STI infection; and they have "lower cognitive capacity for making safe, informed, and voluntary decisions" due to immaturity of the prefrontal cortex before age 15 years [23]. Defining initiation before age 15 years as early initiation is consistent with the United Nations Programme on HIV/AIDS (UNAIDS) definition [24]. This variable was constructed based on HBSC respondents' reports of ever having sexual intercourse and reported age at first intercourse.

Predictors—age norms. *Age norms for sexual initiation* were based on an ESS question: "At what age is someone too young to have sexual intercourse?" Participants responded with an age in years. We created three different age-norm variables: an *overall* measure (average of all responses to this question within each country), a *youth cohort* measure (average response among respondents ages 15–20 years), and a *parent cohort* measure (average response among respondents ages 31–65 years). Higher responses indicated less tolerance for ESI. Using formulae provided by Ludtke et al., we found acceptable levels of reliability within countries for age norms [25].[1]

[1] For age norms we calculated the ICC(2) to equal .99. Ludke, et al. (2006) suggest an ICC(2) greater than .70 indicates acceptable reliability.

Table 1
Adolescent individual characteristics in 17 European nations from the HBSC; n = 27,702

	Female %	Age mean	High family affluence%	High perceived SES %	Living with both biological parents %	Girls' early sexual initiation[a] %	Boys' early sexual initiation[a] %	Girl versus boy difference in ESI prevalence[b] %	Substance use mean	School attachment mean
TOTAL	53.1	15.1	37.9	49.1	71.3	13.5	15.4	−1.9	−.3	−.1
North	51.9	15.2	45.3	52.8	66.4	18.3	14.6	3.7	−.2	−.1
Denmark	52.0	15.2	51.1	21.4	54.4	36.0	31.8	4.2	0	.2
Estonia	50.0	15.3	24.0	55.6	64.0	8.5	10.9	−2.4	−.2	−.1
Finland	55.2	15.3	38.7	64.2	69.6	14.9	11.2	3.7	−.4	−.3
Great Britain	51.4	15.2	49.2	51.0	67.9	17.3	12.3	5.0	−.1	−.1
Sweden	51.6	15.0	58.5	73.7	72.0	19.2	13.2	6.0	−.9	.2
East	56.8	15.1	11.3	51.8	69.5	8.5	17.8	−9.3	−.1	−.5
Bulgaria	56.8	15.1	14.0	36.5	78.6	13.8	25.6	−11.8	0	−.8
Hungary	55.4	15.0	21.9	29.7	74.8	9.5	11.8	−2.3	.3	−.2
Russia	58.0	15.1	8.6	92.2	61.2	7.3	16.8	−9.5	−.3	−.6
Ukraine	56.3	15.3	5.7	28.8	68.7	4.9	16.2	−11.3	0	−.4
South	55.7	15.1	40.3	47.5	82.4	7.5	13.2	−5.7	−.6	.3
Portugal	58.0	15.1	34.9	40.6	80.9	9.2	16.1	−6.9	−.8	.3
Slovenia	53.7	15.1	45.0	54.0	83.7	5.7	10.8	−5.1	−.3	.2
West	51.2	15.0	46.4	44.3	74.3	13.9	15.6	−1.7	−.4	.1
Austria	55.3	14.7	40.1	57.5	76.8	19.7	22.0	−2.3	.1	.2
Belgium	48.5	15.0	44.7	30.8	71.2	11.6	13.2	−1.6	−.4	−.1
France	50.5	15.1	49.4	54.5	72.7	12.0	19.7	−7.7	−.5	−.2
Germany	50.8	14.9	46.9	51.0	73.0	15.1	13.8	1.3	−.5	.2
Netherlands	51.7	15.0	48.8	24.2	78.2	15.5	12.0	3.5	−.4	.2
Switzerland	52.3	15.0	47.8	42.1	77.3	10.2	12.9	−2.7	−.6	.3

[a] Sexual initiation before age 15 years.
[b] Negative numbers indicate greater prevalence of boys' early initiation, positive numbers indicate greater prevalence of girls' early initiation.

Individual-level controls. *Age* was included as a continuous variable, because likelihood of sexual initiation increases with age. The HBSC Family Affluence Scale (FAS), based on respondents' household asset reports, was used to capture *family affluence* [26]. Affluence has been inversely related to likelihood of adolescents' ESI [9]. Scores ranged from zero to seven, categorized as low, medium, and high affluence, based on published guidelines [26]. *Perceived socioeconomic status*, was based on respondents' reports of how well-off their family was on a 5-point scale (*very-well-off* to *not-at-all-well-off*), collapsed to create a three-level variable (better off, average, worse off). *Family living arrangements* (both biological parents, stepfamily, single parent, or other) was included because living with two biological parents, as opposed to other living arrangements, has been associated with decreased odds of ESI among adolescents [9]. *School attachment* was based on a polychoric principal components analysis of five items describing students' perceptions of classmates and the general school environment (4- to 5-point Likert scales for five items, Cronbach's $\alpha = .71$); higher scores indicate higher school attachment. *Substance use* was based on a polychoric principal components analysis of frequency of alcohol use (5-point Likert scale), frequency of tobacco use (5-point Likert scale), and frequency of getting drunk (5-point Likert scale, Cronbach's $\alpha = .65$); higher scores indicate greater substance use. School attachment has been linked with lower odds of ESI, while substance use has been linked with higher odds [9].

Country-level control. We included one country-level control variable, *legal age of consent*, coded based on a 2000 article [27], but updated for countries where laws changed between 1999 and 2006 [28]. The correlation between legal age of consent and age norms was moderate ($r = .45$, $p = .06$).

Analysis sample

We applied three inclusion criteria. First, we limited to students targeted for the 15-year-old sample, because those were the only students asked about sexual behavior (n = 67,872). Second, we limited to HBSC participants in the 17 countries where the ESS-3 was also conducted (n = 33,912). We then limited to students who had complete data on all analysis covariates (n = 27,702). Missingness varied across variables: ESI (12.3%); age (0%); family living arrangement (0%); family affluence (3.0%); perceived socioeconomic status (2.0%); substance use (1.6%); and school attachment (3.4%). Compared with those excluded, included respondents were significantly more likely to report living with both biological parents (71.3% vs. 61.1%) and high family affluence (37.9% vs. 34.1%), and were less likely to report high perceived socioeconomic status (49.1% vs. 53.7%) and ESI (14.4% vs. 19.7%). Included respondents also indicated higher school attachment (−.10 vs. −.15) and lower substance use (−.31 vs. −.09).

Analysis

All analyses were performed in Stata version 10 (StataCorp LP, College Station, TX), with individuals (n = 27,702) as the units of analysis. Individuals were nested in schools (n = 2,177), which were nested in countries (n = 17). We began by examining univariate distributions of variables across countries (i.e., proportions and means). Stratifying by biological sex, we then examined crude bivariate relationships between ESI and covariates. For individual-level variables, we used single-level binary logistic models with standard error corrections for nonindependence within schools and countries. For country-level variables, we used multilevel models with random intercepts for schools and countries.

In the last step, we conducted multivariable multilevel logistic regression analyses separately for boys and girls. First, a null or empty model quantified the amount of variability in ESI at the individual, school, and country levels. Using an estimated level-one variance of $\pi^2/3$ [29], we calculated country-level intra-class correlations (ICC). We also calculated a Median Odds Ratio (MOR), which represents the increased risk that (in median) one would have if moving to another area with a higher risk when randomly picking two areas [30]. In the second model, we added individual-level controls. In the third model, we added overall age norms to assess their relationship with ESI after controlling for individual factors. We then repeated this step for peer cohort age norms and parent cohort age norms separately (models 4 and 5). Any controls not significantly associated with ESI in bivariate analyses for both boys and girls were not included in multivariable models.

Results

Descriptive results

Individual-level characteristics of HBSC study respondents and country characteristics are presented in Table 1. The sample was 53.1% female with an average age of 15.1 years. Nearly 40% were classified as high affluence, 49.1% reported high perceived socioeconomic status, and 71.3% lived with both biological parents. Across countries, 13.5% of girls and 15.4% of boys reported having experienced ESI. Prevalence of ESI ranged from 4.9% in Ukraine to 36% in Denmark for girls, and from 10.8% in Slovenia to 31.8% in Denmark for boys. Perceptions of when a person is too young to have sex varied from 15.2 years in Austria to 17.3 years in the Ukraine (Table 2). Across countries, norms among parent cohorts were more conservative than youth cohorts' norms. Legal age of consent varied from 13 to 16 years, with a mean of 14.8 years.

Table 2
Country-level characteristics in 17 European nations

	Age norms for sexual initiation timing[a] overall mean	Age norms for sexual initiation timing[b] youth cohort mean	Age norms for sexual initiation timing[c] parent cohort mean	Legal age of consent
TOTAL	16.3	15.5	16.3	14.8
North	16.4	15.5	16.4	15.2
Denmark	15.9	15.1	15.8	15
Estonia	16.7	15.8	16.7	14
Finland	16.7	15.6	16.7	16
Great Britain	16.6	15.9	16.6	16
Sweden	16.1	14.9	16.1	15
East	16.9	16.4	16.9	15.0
Bulgaria	16.6	15.9	16.6	14
Hungary	16.7	16.3	16.8	14
Russia	16.8	16.3	16.9	16[d]
Ukraine	17.3	17.0	17.1	16
South	16.2	15.3	16.1	15.0
Portugal	15.9	15.1	15.7	14
Slovenia	16.4	15.4	16.5	15[e]
West	15.9	15.2	15.9	15.0
Austria	15.2	14.5	15.4	14
Belgium	16.3	15.3	16.3	16
France	16.1	15.3	16.2	15
Germany	15.4	14.8	15.4	14
Netherlands	16.2	15.8	16.1	16
Switzerland	16.0	15.2	15.9	16

[a] Average within-country response to ESS question "At what age is someone is too young to have sexual intercourse?"
[b] Average within-country response to ESS question "At what age is someone is too young to have sexual intercourse?" among those age 15–19 years.
[c] Average within-country response to ESS question "At what age is someone is too young to have sexual intercourse?" among those age 31–65 years.
[d] In 2003, Russia changed the legal age of consent from 14 to 16 years.
[e] In 1999, Slovenia raised its legal age of consent from age 14 to age 15 years.

Bivariate results

Crude associations are presented in Table 3. For both boys and girls, increased odds of ESI were associated with younger age, family structures other than living with two biological parents, lower perceived socioeconomic status, and higher substance use. For boys, higher perceived socioeconomic status was associated with increased odds of ESI. For girls, both lower affluence and school attachment were associated with reduced odds of ESI. Girls living in countries with higher age norms had lower odds of ESI (OR .53, 95% CI .33–.83); parent cohort norms (OR .50, 95% CI .32–.78) were slightly more negatively related to girls' ESI than were youth cohort norms (OR .58, 95% CI .40–.83). None of the age norms variables were significantly associated with boys' odds of ESI in crude analyses. Country-level legal age of consent was also unrelated to ESI for both girls and boys.

Multivariable results—girls

Multivariable results for girls are presented in Table 4. In the null model, the ICC indicates that approximately 9% of the variability in girls' ESI is due to differences across country contexts. The MOR indicates that a girl's odds of ESI would, on median, increase by 71% if moving from a lower risk to a higher risk country picked randomly. In the second model, we added individual-level covariates. Living in a stepfamily, with a single parent, or in another living situation were all associated with increased odds of ESI versus living with both biological parents. Lower perceived socioeconomic status and substance use were significantly positively related to girls' odds of ESI, while school attachment was significantly negatively related to ESI. After incorporating these variables, unexplained between-country variance in ESI increased by 40.6%. In the third model, overall country-level age norms were negatively associated with girls' ESI (AOR .60, 95% CI .45–.79). Overall norms explained the between-country variance gained from adding the individual-level variables in Model 2. Parent cohort norms (AOR .37, 95% CI .23–.58) were more strongly negatively related to girls' ESI than were peer cohort norms (AOR .60, 95% CI .49–.74) (models 4 and 5), with parent cohort norms also explaining more between country variance in ESI (38.0% vs. 18.8%).

Multivariable results—boys

Results for boys are presented in Table 5. In the null model, the ICC indicates that approximately 4% of the variability in ESI is due to differences across country contexts. The MOR indicates that a boy's odds of ESI would, on median, increase by 43% if moving from a lower risk to a higher risk country picked randomly. In the second model, age was significantly negatively related to ESI. Living with a single parent, compared with living with both biological parents, was associated with increased odds. Lower and higher than average perceived socioeconomic status

Table 3
Bivariate analysis: Individual and country-level features predicting early sexual initiation by respondent sex

	Adolescent girls (n = 14,697)		Adolescent boys (n = 13,005)	
	N ESI/N Total Sample (% ESI)	Crude OR (95% CI)	N ESI/N Total Sample (% ESI)	Crude OR (95%CI)
Individual covariates[a]				
Age				
14 years	102/601 (17.0)	1.30(1.03–1.64)*	110/537 (20.5)	1.41 (1.12–1.78)**
15 years	1,643/12,078 (13.6)	Ref.	1,618/10,494 (15.4)	Ref.
16 years	245/2,018 (12.1)	.88 (.76–1.02)	280/1,947 (14.2)	.91 (.79–1.05)
Family affluence				
Low	342/3,293 (10.4)	.70 (.62–.80)***	328/2,277 (14.4)	.91 (.79–1.05)
Medium	896/6,330 (14.2)	Ref.	825/5,304 (15.6)	Ref.
High	752/5,074 (14.8)	1.06 (.94–1.18)	855/5,424 (15.8)	1.02 (.91–1.14)
Perceived socioeconomic status				
Lower than average	243/1,265 (19.4)	1.55 (1.32–1.83)***	168/892 (18.8)	1.42 (1.18–1.71)***
Average	881/6,639 (12.6)	Ref.	743/5,293 (14.0)	Ref.
Better off than average	866/6,793 (12.9)	.95 (.92–1.15)	1,097/6,820 (16.1)	1.17 (1.05–1.31)**
Family living structure				
With both biological parents	1,106/10,325 (10.7)	Ref.	1,308/9,413 (13.9)	Ref.
Stepfamily	355/1,535 (23.1)	2.50 (2.21–2.84)***	203/1,066 (19.0)	1.46 (1.23–1.72)***
Single parent	412/2,319 (17.8)	1.80 (1.60–2.03)***	394/2,043 (19.3)	1.48 (1.31–1.67)***
Other	117/518 (22.6)	2.43 (1.92–3.09)***	103/483 (21.3)	1.68 (1.36–2.08)***
Substance use *(Mean (SD))*				
ESI	.67 (1.01)	3.07 (2.90–3.25)***	.59 (1.14)	2.22 (2.12–2.34)***
Not ESI	−.53 (.95)	Ref.	−.41 (1.03)	
School attachment *(Mean (SD))*				
ESI	−.31 (1.34)	.88 (.85–.92)***	−.10 (1.32)	.97 (.93–1.01)
Not ESI	−.10 (1.29)	Ref.	−.05 (1.21)	
County-level predictors[b]				
Overall age norms *(Mean (SD))*				
ESI	16.22 (.49)	.53 (.33–.83)**	16.26 (.51)	.80 (.56–1.14)
Not ESI	16.34 (.50)	Ref.	16.32 (.49)	Ref.
Youth cohort age norms *(Mean (SD))*				
ESI	15.45(.55)	.58 (.40–.83)**	15.53(.61)	.90 (.66–1.21)
Not ESI	15.61(.62)	Ref.	15.57(.59)	Ref.
Parent cohort age norms *(Mean (SD))*				
ESI	16.22(.49)	.50 (.32–.78)**	16.28(.51)	.79 (.55–1.13)
Not ESI	16.36(.50)	Ref.	16.33(.49)	Ref.
Legal age of consent				
13/14 years	592/4,559 (13.0)	Ref.	637/3,899 (16.3)	Ref.
15 years	510/2,949 (17.3)	1.34 (.66–2.70)	520/2,748 (18.9)	1.13 (.71–1.80)
16 years	888/7,189 (12.4)	.86 (.47–1.57)	851/6,358 (13.4)	.79 (.53–1.17)

CI = Confidence Interval; ESI = Early sexual initiation; OR = Odds Ratio.
[a] OR estimates derived using single-level logistic regression analyses.
[b] OR estimates derived using three-level logistic regression analyses.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

were both associated with increased odds of ESI, while low, compared with medium, affluence was negatively related. After accounting for these individual-level differences, estimated between-country variability in boys' ESI increased by 28.6%. In the third model, overall country-level age norms were negatively related to boys' ESI (AOR .68, 95% CI .46–.99), and explained the between-country variance gained from adding the individual-level variables in Model 2. When differentiating between effects of youth versus parent cohort norms (Models 4 and 5), only parent cohort norms were negatively related to boys' ESI (AOR .66, 95% CI .45–.96). Parent cohort norms did not explain additional between-country variance in ESI above and beyond that explained by overall age norms.

Discussion

Similar to past findings, we found significant differences between European countries in the prevalence of ESI [9,10,31]. Particularly noteworthy was the high rate of ESI observed in Denmark (34.1%), which is consistent with past HBSC studies of adolescent sexual activity [12]. Although age norms for sexual initiation timing explained part of the between-country differences, substantial between-country variability remained after adjustment. It is possible that age norms are part of a larger cultural system that influences the timing of adolescents' sexual initiation. It is also possible that health system and demographic factors that vary across countries impact sexual initiation timing. Research exploring possible determinants of age norms, such as country-level religiosity and country GDP and/or income inequality, is warranted.

After controlling for multiple individual-level characteristics, higher overall age norms were associated with reduced odds of ESI, and explained substantial between-country variability in ESI. The impact of such norms on specific health outcomes, however, is unclear. More culturally conservative contexts may constrain some precocious sexual behavior, but also restrict adolescents' access to sexual health education and clinical services that could prevent negative sexual health outcomes. In a recent analysis of

Table 4
Multilevel logistic regression models: Age norms and early sexual initiation for adolescent girls (n = 14,697)

	Model 1: Null	Model 2: Individual controls	Model 3: Individual controls + overall age norms	Model 4: Individual controls + youth cohort age norms	Model 5: Individual controls + parent cohort age norms
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Individual predictors					
Age	–	.75 (.64–.86)***	.76 (.65–.88)***	.76 (.65–.88)***	.76 (.65–.88)***
Family affluence	–				
Low		.92 (.78–1.09)	.92 (.78–1.09)	.93 (.78–1.09)	.92 (.78–1.09)
Medium		Ref.	Ref.	Ref.	Ref.
High		.99 (.87–1.13)	.99 (.87–1.13)	.99 (.87–1.13)	.99 (.87–1.13)
Perceived SES	–				
Lower than average		1.28 (1.06–1.56)*	1.28 (1.05–1.56)*	1.28 (1.05–1.56)*	1.28 (1.05–1.56)*
Average		Ref.	Ref.	Ref.	Ref.
Better off than average		1.11 (.97–1.26)	1.11 (.97–1.26)	1.11 (.97–1.26)	1.11 (.97–1.26)
Living arrangement					
Both biological parents	–	Ref.	Ref.	Ref.	Ref.
Stepfamily		1.69 (1.44–1.99)***	1.70 (1.44–2)***	1.70 (1.44–2)***	1.69 (1.44–1.99)***
Single parent		1.48 (1.27–1.73)***	1.48 (1.27–1.73)***	1.48 (1.27–1.73)***	1.48 (1.28–1.73)***
Other		1.87 (1.41–2.48)***	1.87 (1.41–2.49)***	1.88 (1.42–2.49)***	1.87 (1.41–2.48)***
School attachment	–	.89 (.85–.93)***	.89 (.85–.93)***	.89 (.85–.93)***	.89 (.85–.93)***
Substance use	–	3.32 (3.12–3.53)***	3.32 (3.12–3.52)***	3.32 (3.12–3.52)***	3.32 (3.12–3.53)***
Country predictors					
Overall age norms		–	.60 (.45–.79)***	–	–
Youth cohort age norms		–	–	.60 (.49–.74)***	–
Parent cohort age norms		–	–	–	.37 (.23–.58)***
Variance estimates					
School intercept (*SE*)	.40 (.06)	.31 (.06)	.31 (.06)	.31 (.06)	.31 (.06)
Country intercept (*SE*)	.32 (.12)	.45 (.15)	.32 (.11)	.26 (.09)	.20 (.07)
Statistics					
ICC (Country)	.09	.12	.09	.07	.05
% change in country intercept variance[a]	–	+ 40.6%	0%	−18.8%	−38%
Median Odds Ratio (MOR)	1.71	1.89	1.71	1.62	1.53

AOR = Adjusted Odds Ratio; CI = Confidence Interval; ESI = Early sexual initiation; ICC = Intraclass correlations; *SE* = Standard error; SES = Socioeconomic status.
[a] Relative to Null model.
* $p < .05$.
*** $p < .001$.

U.S. states, those with higher religiosity and political conservatism evidenced higher teen birth rates [32]. Although research is mixed in terms of the effect of individual-level religiosity on contraceptive or condom use [33,34], interventions that promote religiosity to influence sexual behavior may have negative effects on condom and contraceptive use at the macrolevel [35]. Further research examining the implications of macrolevel cultural norms on other adolescent sexual health outcomes, such as contraceptive use, teen pregnancy, and STI is warranted.

We found sex differences in the influence of norms on ESI: all three norms measures were more strongly negatively related to girls' ESI than to boys'. This finding offers further support for differences in sexual standards for adolescent girls and boys identified in past studies [18]. Such a double-standard could lead to the negative sequelae of ESI observed for girls but not boys in some contexts, most notably negative psychological symptoms [5,31], as well as peer judgment and rejection [3]. These double-standards also may lessen young women's power in sexual encounters, including their ability to request male partners to use condoms and to refuse unwanted sexual contact [36]. Further research should explore the role of sexual norms in producing sex-disparate outcomes of ESI, and their implications for young women's sexual health.

For both boys and girls, parental cohort norms were more strongly negatively related to adolescents' ESI than were peer cohort norms. These results are consistent with studies that found adolescents' perceptions of maternal values for abstinence predict delayed sexual onset, and that relationships and communication with parents about sexual matters can buffer peer influences on adolescents' sexual initiation [37,38]. Our results also extend these findings given that we are measuring the general normative context within which parents operate, which may or may not concur with parents' own values. Future studies that examine the interactive influence of both individual parents' values and general normative context could further elucidate how and under what conditions social norms at various contextual levels influence adolescent sexual behavior.

Sex differences in associations between peer cohort norms and ESI are consistent with a number of studies that find that group membership is more important for girls than for boys, and that girls are more susceptible than boys to peer norms and peer pressure in other risk behaviors [39,40]. However, the association between peer cohort norms and ESI for boys is trending in the expected direction; therefore, lack of statistical significance may merely reflect lack of power at the country level. Future analyses including more countries could further test these sex differences.

Table 5
Multilevel logistic regression models: Age norms and early sexual initiation for adolescent boys (n = 13,005)

	Model 1: Null	Model 2: Individual controls	Model 3: Individual controls + overall age norms	Model 4: Individual controls + youth cohort age norms	Model 5: Individual controls + parent cohort age norms
	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Individual predictors					
Age	–	.74 (.64–.84)***	.74 (.65–.84)***	.74 (.65–.85)***	.74 (.65–.85)***
Family affluence	–				
Low		.80 (.68–.95)*	.81 (.69–.96)*	.81 (.69–.96)*	.81 (.69–.96)*
Medium		Ref.	Ref.	Ref.	Ref.
High		.98 (.86–1.11)	.97 (.86–1.11)	.98 (.86–1.11)	.97 (.86–1.10)
Perceived SES	–				
Lower than average		1.45 (1.17–1.79)**	1.44 (1.16–1.78)**	1.45 (1.16–1.78)**	1.44 (1.16–1.78)**
Average		Ref.	Ref.	Ref.	Ref.
Better off than average		1.29 (1.14–1.46)***	1.29 (1.14–1.46)***	1.29 (1.14–1.46)***	1.29 (1.14–1.47)***
Living arrangement					
Both biological parents	–	Ref.	Ref.	Ref.	Ref.
Stepfamily		1.18 (.97–1.42)	1.18 (.97–1.42)	1.17 (.97–1.42)	1.18 (.97–1.42)
Single parent		1.41 (1.21–1.63)***	1.41 (1.21–1.63)***	1.41 (1.21–1.63)*	1.41 (1.21–1.63)*
Other		1.30 (.99–1.71)	1.31 (.99–1.72)	1.31 (.99–1.72)	1.31 (.99–1.72)
School attachment	–	1 (.96–1.05)	1 (.96–1.05)	1 (.96–1.05)	1 (.96–1.05)
Substance use	–	2.42 (2.29–2.55)***	2.42 (2.30–2.55)***	2.42 (2.30–2.56)***	2.42 (2.30–2.56)***
Country predictors					
Overall age norms		–	.68 (.46–.99)*	–	–
Youth cohort age norms		–	–	.76 (.55–1.04)	–
Parent cohort age norms		–	–	–	.66 (.45–.96)*
Variance estimates					
School intercept (*SE*)	.40 (.06)	.43 (.07)	.42 (.07)	.42 (.07)	.42 (.07)
Country intercept (*SE*)	.14 (.05)	.18 (.07)	.14 (.06)	.15 (.06)	.14 (.05)
Statistics					
ICC (Country)	.04	.05	.04	.04	.04
% change in country intercept variance[a]	–	+ 28.6%	0%	+ 7.1%	0%
Median Odds Ratio (MOR)	1.43	1.50	1.43	1.44	1.43

AOR = Adjusted Odds Ratio; CI = Confidence Interval; ESI = Early sexual initiation; ICC = Intraclass correlations; *SE* = Standard error; SES = Socioeconomic status.
[a] Relative to Null model.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Legal age of consent was only borderline correlated with country-level age norms, and was unassociated with ESI for both boys and girls. It is possible that the narrow range of legal ages of consent (13–16 years) contributed to this. However, this may also indicate that laws are not consistent with popular opinion. Findings emphasize the importance of measuring both structural and social aspects of norms, which may differentially impact health outcomes.

Despite the study's strengths, such as the use of large, nationally representative data sets, inclusion of more countries compared with past qualitative studies, and the use of multilevel analyses to quantitatively estimate the effects of age norms on ESI, the study's findings should be interpreted with awareness of its limitations. First, although we incorporated data from a much larger set of countries than previously studied [13,17], our country sample size may result in an under-estimate of between-country variance, and an overestimate of the standard errors for age norms. Second, our study is cross-sectional, and, therefore, causal inference should be made with caution. However, given that we measure norms reported by respondents other than the adolescents reporting sexual behavior, we do avoid some potential problems of endogeneity (i.e., ESI influencing adolescents' perceptions of norms). Third, age at sexual initiation is self-reported and subject to reporting biases potentially related to cultural norms. If ESI is under-reported in countries with higher age norms, then the association between age norms and ESI may be overestimated. Fourth, we focus on a simple measure of sexual initiation timing, without exploring subsequent sexual behavior or the couple context of initiation. Future studies that examine whether sociocultural norms are related to postinitiation sexual behavior trajectories and/or whether first sex is voluntary are warranted. Fifth, although the question was meant to capture vaginal penetrative sex acts, it is possible some adolescents interpreted this question differently. Sixth, use of a complete case analysis may result in selectivity biases. Seventh, the age norms measure did not distinguish between boys and girls, for whom norms may be different. Also the norms question is negatively worded (i.e., when someone is "too young to have sex"), which may result in different responses than a positively worded question would (i.e., when someone is "old enough to have sex"). Finally, we were unable to control for some potentially important individual confounders, such as childhood sexual abuse or whether the respondent's mother was a teen mother. If future data sets become available that include such measures, replications of our analyses including these factors would be warranted.

In conclusion, likelihood of ESI was lower among adolescents living in countries with older age norms for sexual initiation timing

compared with adolescents living in countries with younger age norms. Additionally, norms among parent-aged adults seem especially influential for teens, compared with teen norms. Results support the influence of macrolevel cultural norms on the sexual behavior of adolescents. Future research should examine whether such norms increase the risk associated with earlier sexual initiation through, for example, reduced condom and contraceptive use. Further, studying interactions between macrolevel norms and more proximal determinants of adolescent sexual behavior (e.g., parent-reported norms) may inform intervention opportunities across a variety of sociocultural contexts.

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