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Does Knowledge about Sexuality Prevent Adolescents from Developing Rape-Supportive Beliefs?

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Believing that rape is acceptable in some situations may account for adolescent boys' perpetration of forced sex on girls. This study was intended to examine two hypothesized cognitive factors of adolescents' rape-supportive beliefs: general knowledge, measured with grade point average (GPA); and specific knowledge about sexuality, measured with a newly devised questionnaire. Fourteen-year-old adolescents (N = 248) participated in a short-term longitudinal study. They completed questionnaires designed to assess sexual knowledge and rape-supportive beliefs, and six months later completed them again. Sexual knowledge increased sharply between Time 1 and Time 2, whereas rape-supportive beliefs decreased during the same time. Boys obtained higher rape-supportive belief scores than girls. Regression analyses showed that sexual knowledge significantly predicted the level of rape-supportive beliefs six months later, independent of GPA and sex of participants. GPA accounted for a greater part of the variance in rape-supportive beliefs. This article discusses the importance of paying attention to the level of academic achievement of adolescents, as well as to their sexuality-specific knowledge, as a way of improving the efficiency of programs specializing in the prevention of adolescent sexual violence.

Adolescent Boys' Forced Sex on Girls

Over the last two decades, numerous studies have highlighted the prevalence of forced sex on women. For example, Brener, McMahon, Warren, and Douglas (1999) found that 20% of U.S. female college students reported having experienced forced sexual intercourse, generally during adolescence. Adolescence is a particularly interesting time for the development of mutual respect in dating situations because most people have their first sexual experiences during adolescence. Several factors such as substance abuse (e.g., Ullman, Karabatsos, & Koss, 1999), pornography consumption (Vega & Malamuth, 2007), masculinity norms (Locke & Mahalik, 2005), and childhood exposure to violence against females (Hunter, Figueredo, Malamuth, & Becker, 2004) enable a better understanding of juvenile males' forced sexual behavior toward juvenile females. For decades, research has shown that low intelligence (especially verbal intelligence), as well as low school attainment, predicted juvenile offending independently of sociological variables, such as family income and family size (for a review, see Farrington, 1996). Specific cognitive deficits, such as in abstract reasoning and concept formation, predict juvenile offending (for a review, see Moffitt, 1990). In the research on forced sex among adolescents, intelligence and academic achievement have generally been neglected, either as independent variables or as covariates, although some studies found male adolescent sexual offenders to be characterized by low intelligence and low school attainment (e.g., Fehrenbach, Smith, Monastersky, & Deisher, 1986). Few studies have tried to identify specific cognitive factors that influence adolescents' forced sexual behavior. The main goal of this study was to test the hypothesis that knowledge about sexuality predicts adolescents' rape-supportive beliefs, independently of general academic level.

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Adolescents' Rape-Supportive Beliefs

One of the reasons some boys force sex on girls might lie in boys' and girls' beliefs regarding the extent to which it is acceptable for boys to force sex on girls in certain situations. For example, by focusing on a given

Table 1. *Percentage of Boys and Girls Who Indicated That it is Acceptable for a Boy to Force Sex on a Girl, for Each Situation, in the First (T1) and Second (T2) Assessment*

	T1		T2		U.S. Students[a]	
Item	**Boys**	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
1. She said yes at first, but then changed her mind and said no.	28	24	20	14	13	2
2. She gets him sexually excited.	66	57	59	48	37	23
3. They have dated for a really long time.	45	39	31	21	29	5
4. She lets him touch and kiss her above the waist.	52	43	32	24	31	7
5. She has had sex with some of his friends.	36	33	23	21	15	4
6. She agrees to go home with him.	31	25	22	11	30	12
7. She gets drunk or high and passes out.	17	15	11	7	20	8
8. They have had sex before.	56	52	48	37	39	12
9. He bought her dinner or paid for a movie.	14	11	13	2	12	3
10. She is wearing revealing/sexy clothing.	37	32	28	17	27	9

Note. At T1, *n*s = 136 and 153 for boys and girls, respectively; and at T2, *n*s = 113 and 135 for boys and girls, respectively.
[a]From Davis, Peck, and Storment (1993): *n*s = 100 for boys and 137 for girls.

aspect of the situation, an individual may see his or her transgression as acceptable. Such rape-supportive beliefs can be seen as a tendency to think that a well-known prohibition can be ignored in certain circumstances. In an exploratory self-report study, Kershner (1996) observed that 14- to 19-year-old boys and girls adhere to adult-like rape myths (e.g., ''Some girls encourage rape just by the way they dress''). These misconceptions may account for the high level of adolescents' beliefs that a boy can force sex on a girl. Indeed, Davis, Peck, and Storment (1993) reported that 60% of U.S. middle adolescent males found it acceptable in one or more situations to force sex on a girl; fewer girls thought it was acceptable. Situations in which it was relatively acceptable were, for example, ''She has had sex with some of his friends'' and ''She is wearing revealing/sexy clothing'' (for more details on the results of Davis et al.'s, 1993, study, see Table 1). Accordingly, in this study, we expected adolescents' beliefs that boys can force sex on girls in some situations to be more frequent in boys than in girls because boys are the usual perpetrators, and girls are typically the victims.

Gender-Stereotyped Biases about Sexuality and Adolescent Sexual Knowledge

Adolescents in the early 21st century in Western societies are exposed to a pervasive flow of explicit sexual information, especially conveyed by television, magazines, and the Internet (Sutton, Brown, Wilson, & Klein, 2002). This flow of information is likely to reinforce adolescents' beliefs that boys can force sex on girls in certain circumstances because it is strongly biased by gender stereotypes. This was demonstrated by Kim et al. (2007), who analyzed the sexual content of television programs viewed most frequently by adolescents, and found that men are portrayed as being consumed by sexual urges, sometimes using forceful means to engage women in sexual activity. Overall, the authors captured ''depiction of boys/men and girls/women thinking, feeling, and behaving in relational and sexual encounters in ways that sustain power inequalities between men and women'' (Kim et al., 2007, p. 145), with male characters most often actively and aggressively pursuing sex. These gender stereotypes about heterosexuality, which promote inequality between the sexes, are not conveyed only by the media. School-age children and early adolescents learn them in their peer groups, especially in their same-sex peer groups (e.g., Thorne, 1993). Furthermore, other gender stereotypes, learned early in childhood by way of parents and peers, prepare children to view heterosexual relationships as characterized by power inequality between the sexes (for an overview, see Maccoby, 1998). As a result of the overall socialization process, children and adolescents are exposed to information about sexuality that is strongly biased, and one can suppose that many adolescents have little knowledge about sexuality. Although no one can think about sexuality without thinking of gender-stereotyped biases, there may be large individual differences in sexual knowledge among same-age adolescents. The underdevelopment of sexual knowledge could account for various discriminatory and other negative attitudes toward sexuality and, therefore, could explain sexual aggression.

Very few empirical studies have measured adolescent knowledge about sexuality. In general, research has focused on declarative knowledge about contraception (e.g., Nadeem, Romo, & Sigman, 2006), HIV and AIDS (e.g., Berten & Van Rossem, 2009), and sexually transmitted diseases and abstinence (e.g., Pinkleton, Austin, Cohen, Chen, & Fitzgerald, 2008). As far as we know, there has been no systematic research, to date, on the development of declarative knowledge about sexuality in general. Among the few authors who have tackled this topic are Whittaker, Brown, Beckett, and Gerhold (2006). They used a 24-item questionnaire

that was based on a questionnaire devised by Nichols and Molinder (1984). The 24 items focused on limited aspects of sexuality: male and female genitals, pregnancy, contraception, and sexual intercourse. The internal consistency was very low ($\alpha = .48$). This cross-sectional study did not provide developmental discriminant validity because the questionnaire failed to reveal any significant increase with age among the three age groups of U.S. boys (14-, 15-, and 16-year-olds). Similarly, Part, Rahu, Rahu, and Karro (2008) devised a 16-item questionnaire intended to assess declarative knowledge about sexuality in a sample of 14- to 16-year-old Finnish students. Four issues were addressed: (a) contraception and sexually transmitted infections, (b) sexual development and conception, (c) sexual intercourse and sexuality, and (d) age of consent. The authors did not analyze the internal consistency or factor structure of their instrument, and they did not mention any increase in knowledge with age.

Two examples of items on the questionnaires mentioned earlier are as follows: ''AIDS can only be caught by having sex with many different people'' (false), from Whittaker et al. (2006); and ''What is the age of consent according to Estonian law?'' (14 years), from Part et al. (2008). Most of the items focused on contraception or biological issues related to contraception. In this study, we devised a new instrument to measure a broader scope of adolescent sexual knowledge. It was intended to assess knowledge that is theoretically relevant to behavioral adjustment to the physical and social requirements related to sexuality in middle adolescence. The questionnaire included knowledge about the biological (e.g., puberty, functioning of male and female genitals, and procreation), behavioral (e.g., contraception and erotic practices), and legal (e.g., age of consent according to French law and incest) dimensions of sexuality. We measured sexual knowledge twice over a six-month interval in 14- to 15-year-old students. We designed this instrument to test our main hypothesis: those adolescents who have little knowledge of sexuality are more likely to develop rape-supportive attitudes, independently of their general knowledge. However, before testing this hypothesis, we wanted to examine the extent to which sexual knowledge increases with age between the two testing times. We expected to find this increase because we assumed that fundamental knowledge about sexuality, like many other areas of knowledge, develops primarily during childhood and adolescence.

Adolescent Sexual Knowledge and Boys' Forced Sex on Girls

To the extent to which an adolescent is knowledgeable about sexuality, he or she can be expected to take distance from stereotyped views of sexuality and be reluctant to view boys' discriminatory attitudes toward girls as acceptable. Sexual knowledge might have a negative impact on the development of discriminatory attitudes, just as the rational process has in the classical dual process, which accounts for the effect of persuasion on attitude change (Wegener & Carlston, 2005). In line with this hypothesis, Whittaker et al. (2006) found that 14- to 16-year-old sex offenders had less sexual knowledge than non-offenders. The fact that adolescent sex offenders are less knowledgeable about sexuality is consistent with the hypothesis that a lack of sexual knowledge predicts sexually abusive attitudes.

Whittaker et al. (2006) did not control for the amount of participants' general knowledge. It may be that adolescent sex offenders are also less knowledgeable in other areas, including those measured by academic achievement. In fact, in Whittaker et al.'s study, only 7 of the 24 items about sexuality had a higher rate of correctly identified answers for sexual abusers than for participants in the control group. The effect of sexual knowledge on rape-supportive attitudes that we expected to find might be accounted for, instead, by the effect of general academic knowledge, which can give adolescents a cognitive framework that supports resistance to myths and stereotypes about sexuality. Specifically, the individual educational level, assessed by grade point average (GPA), might strengthen adolescents' resistance to the sterotyped biases and myths they are exposed to through media and peer pressures. This could result in a refusal to endorse rape-supportive beliefs. Nevertheless, we did view sexual knowledge as exerting a specific negative effect on these beliefs, after controlling for the GPA effect.

Overall, we hypothesized that (a) boys would display a higher level of rape-supportive beliefs than girls; (b) sexual knowledge would increase during middle adolescence; and (c) general academic knowledge would account for individual differences in the development of rape-supportive beliefs, and sexual knowledge would account for an additional part of the variance.

Method

Participants and Procedure

The participants were French students from two high schools in a big city. They were of middle to high socioeconomic status. The mean age of the participants at the beginning of the study was 14 years and 8 months, and the standard deviation was 9 months, with no significant sex difference (the age range varied from 12 years and 10 months–17 years and 9 months). Adolescents and their parents were given an information sheet describing the purpose and nature of the study. Parental consent was provided for each participant, and the Department of Student Health and the Chief Education Officer of the school district approved the study. The sample included

96% of the pupils asked to participate. Students completed a self-report questionnaire during school time. Conditions were the same as those used for exams: keeping participants from watching classmates' responses or speaking with them during the session. There was no opportunity for students in one class to talk about the survey to other students before they took the survey because all of the classes of a school participated in one single session. The participants were assured of the confidentiality of the questionnaire, and were informed that they could drop out of the study at any point, without penalty. No professor or member of the school staff was present during the data collection. The first session was in November (Time 1 [T1]), and the second six months later in June of the same school year (Time 2 [T2]). Out of the 289 participants (47% of whom were boys) in November, 248 (86%) answered the questionnaire in June. The dropout rate (which was due to a trip organized by one of the schools) was not statistically different across sexes, decreasing from 136 to 113 (16.91%) for the boys and from 153 to 135 (11.76%) for the girls. In the June session, a one-hour, in-depth debriefing was held at the end of the study as part of a prevention program. Members of the school staff provided the GPA of each participant for the first three months of the school year (September–November). The GPA was obtained only at T1 because we did not plan to test the hypothesis that the mean level of the sample would increase or decrease. GPA reflects the individual's position compared to other students in the same grade, and GPA has always been found to be highly stable over time (e.g., Reuchlin, 1991).

Instruments

Sexual knowledge. The questionnaire focused on the ability to name physical or social objects pertaining to human sexuality, as well as the ability to distinguish between true and false statements about sexuality. Given the lack of data in this domain, the first part of this study was qualitative, aiming at the construction of a questionnaire to assess the various areas of sexual knowledge as comprehensively as possible. We first established the general issues pertaining to sexual knowledge based on sex education books for adolescents (e.g., Zep & Bruller, 2001) and handbooks used by practitioners involved in adolescent sex education (e.g., Picod, 1994). Then, after consulting doctors acting as advisors for the French ministry of education, we chose six themes: (a) puberty, (b) biological reproduction, (c) sexual functions and organs, (d) sexually transmitted diseases and contraception, (e) legal rights and duties, and (f) sexual pleasure. The first three themes pertain more specifically to biophysical issues, and the next three to social issues. The third step included focus-group discussions with practitioners in charge of sex education and prevention for adolescents. The aim was to produce 10 items pertaining to each theme, giving a total of 60 items. More than 100 items were produced and, subsequently, items were eliminated or altered on the basis of consensus among practitioners.

In the first part of the Sexual Knowledge Questionnaire for Adolescents (SKQA), each theme is assessed using a set of five items that require participants to write one word or a sequence of words. The responses to this first part of the SKQA were coded by a trained doctoral student research assistant as correct or incorrect according to precise guidelines that specified the words or word sequences (including slang) that are correct. Thirty questionnaires chosen at random were rated by a second coder (Pascal Mallet) according to the same guidelines, providing a high level of interrater agreement ($\kappa = .94$). In the second part of the questionnaire, the six themes were assessed again, each one with five forced-choice items: Participants had to say if the statement was true, false, or they did not know (an "I don't know" response was used to reduce the probability of being correct by guessing). These two response styles (open-ended and closed-ended questions) are complementary. The first one assesses language, reading, and writing skills, as well as sexuality knowledge. The correct responses are unlikely to result from a random effect. The other response style measures language and reading skills, as well as sexuality knowledge. The correct responses are more likely to be selected at random. The appendix illustrates the two kinds of items for each area (the complete scale can be obtained on request from Pascal Mallet). There were an equal number of questions about male and female sexuality.

Rape-supportive beliefs. We used 10 hypothetical situations devised by Davis et al. (1993) to measure the beliefs that boys can force sex on female acquaintances. Each hypothetical situation described a boy and a girl between the ages of 15 and 18 years. The boy wants to have sexual intercourse with the girl, but she clearly tells him that she does not want to have sex with him. Each situation depicts a scenario in which certain circumstances can be viewed as "reasons" to find it acceptable to force sex on a girl. These contextual cues were used to make the situations somewhat ambiguous in order to accurately assess individual differences in rape-supportive beliefs. The participants had to answer with "yes," "no," or "I don't know" if "It's OK for a boy to force a girl to have sex with him if . . . ," for example, she lets him touch her above the waist. The participant's number of "yes" responses (range = 0–10) was used as a measure of the belief about the acceptability of rape in the 10 situations (the "I don't know" response was used to reduce the number of uncertain responses in the "yes" response category). Table 1 presents the 10 items. Although several tools measure adolescents' attitudes toward the acceptability

of various forms of teen dating aggression (e.g., Slep, Cascardi, Avery-Leaf, & O'Leary, 2001), none of them specifically assess the beliefs that an adolescent boy can force sexual intercourse on an adolescent girl in specific dating contexts.

Results

Attrition Analysis

As 289 adolescents completed the survey at T1 and only 248 at both T1 and T2, we tested whether the 41 participants who dropped out differed from the others on the T1 variables. Independent sample t tests showed that the two groups of participants did not differ on GPA, sexual knowledge, and rape-supportive beliefs.

Descriptive Statistics and Preliminary Analyses

Rape-supportive beliefs. The frequency of participants who considered that boys can force sex on girl acquaintances varied across the 10 hypothetical situations, as shown in Table 1. Cross-situation variation was highly similar in boys and girls, as indicated by the correlation between the two series of percentages: rs = .99 and .98 at T1 and T2, respectively ($p < .001$ for both). Cross-situation variation was also similar at T1 and T2, with rs = .95 and .97 for boys and girls, respectively ($p < .001$ for both). The percentages obtained from French participants and those obtained from the U.S. students who participated in Davis et al.'s (1993) study were significantly correlated, with $r = .83$ ($p < .01$) for French boys at T1 and U.S. boys, and $r = .65$ ($p < .05$) for French girls at T1 and U.S. girls. The "yes" and "no" responses were scored as 1 and 0, respectively. An exploratory factor analysis with the 10 items and the complete sample of participants revealed the one-dimensional structure of the questionnaire. All of the items had a loading of .40 to .72 on the same factor, which accounted for 35% of the variance. Similarly, at T2, the loadings of the items were .44 to.73 on a unique factor that accounted for 38% of the variance. The 10-item scale showed high internal consistency ($\alpha = .79$ at T1 and $\alpha = .81$ at T2). An individual score ranging from 0 to 10 was computed by summing the 10 responses. The T1–T2 correlation coefficients were .48 and .53 for boys and girls, respectively ($p < .001$ for both).

Sexual knowledge. The percentage of participants answering correctly varied across the 60 items. The percentage ranged from 0% to 84% at T1 and from 0% to 87% at T2 across the 30 open-ended questions, and from 9% to 80% at T1 and 10% to 89% at T2 across the 30 closed-ended questions. Overall, among the 60 items, only two open-ended questions were incorrectly answered by the entire sample of participants at T1 and T2, and no one item was correctly answered by all participants. These results suggest that most of the items were appropriate to discriminate among individuals and across a six-month period in this age range. In accordance with this interpretation, for 24 of the 30 open-ended questions, the percentage of successful participants increased between T1 and T2, and a similar increase was found for 26 of the 30 closed-ended questions. Because the exploratory factor analyses did not validate the expected six-area structure or any other meaningful multidimensional structure (for T1 nor T2), a unique sexual knowledge score was computed, ranging from 0 to 60. The total scale had a moderate internal consistency, with a Cronbach's alpha of .73 in both November and June. This individual total score ranged from 9 to 40 at T1, and 10 to 47 at T2, revealing the high sensitivity of the scale. The skewness, mean, and median were 0.41, 21.87, and 22.00 at T1 and 0.10, 26.46, and 26.00 at T2, respectively. The SKQA score was significantly and positively correlated with GPA score: $r = .28$ for T1 and $r = .30$ for T2 ($p < .001$ for both); and was moderately stable between T1 and T2: rs = .65 and .72 for boys and girls, respectively ($p < .001$ for both).

Developmental Changes and Sex Differences in Sexual Knowledge and Rape-Supportive Beliefs

To test the hypotheses that boys display a higher level of rape-supportive beliefs than girls, and that sexual knowledge increases during middle adolescence, we computed 2 two-factor analyses of variance (ANOVAs), with sex of participants as a between-subject variable, time (T1 and T2) as a within-subjects factor repeated measure, and rape-supportive beliefs or SKQA scores as the dependent variables. We performed two-factor rather than one-way analyses in order to reveal possible interactions between sex of participant and time. Regarding sexual knowledge, as expected, the SKQA mean score was higher at the end of the school year ($M = 26.46$, $SD = 6.48$) than six months earlier ($M = 21.87$, $SD = 6.04$), $F(1, 246) = 217.06$, $p < .001$ (Cohen's $d = 0.12$; see Cohen, 1977). There was neither a sex of participant effect nor a Sex of Participant × Time Time interaction. With respect to rape-supportive beliefs, we observed that at T1, 80% of the 136 boys and 80% of the 153 girls agreed that the boy could force sex on the girl in at least one situation. At T2, the same was true for 73% of the 113 boys and 64% of the 135 girls. The ANOVA with beliefs as the dependent variable revealed that boys scored slightly higher than girls (Ms = 3.07 and 2.53, SDs = 2.17 and 1.93, respectively), $F(1, 246) = 4.25$, $p < .05$ ($d = 0.02$). The mean level of belief was significantly lower at the end of the school year ($M = 2.40$, $SD = 2.33$) than six months earlier ($M = 3.20$,

$SD = 2.41$), $F(1, 246) = 28.79$, $p < .001$ ($d = 0.03$). There was no Sex of Participant × Time interaction.

Prediction of the Development of Rape-Supportive Beliefs from GPA and SKQA Scores

The aim was to examine whether the scores of the two cognitive variables (GPA and SKQA) measured at T1 differentially predicted the individual development of beliefs between T1 and T2. Both GPA and SKQA scores at T1 were significantly and negatively correlated with the belief scores at T2: rs = −.42 and −.29, respectively (for both, $p < .0001$). These Pearson correlations did not significantly differ across sexes. Two hierarchical linear regressions were computed in order to account for beliefs at T2. For each regression, belief score at T1 was entered on the first step, and sex of participant was entered on the second step, both as control variables. In one regression, SKQA was entered on the third step in order to examine its sole contribution. In the other regression, GPA was entered on the third step and SKQA at T1 on the fourth step. This order was intended to assess the weight of academic performance on belief development and to test whether sexual knowledge accounted for an additional part of the variance after GPA.

The results are presented in Table 2. Consistent with the aforementioned T1–T2 Pearson correlation, beliefs at T1 accounted for 25% of the variance in beliefs at T2 ($p < .0001$). The sex of the participants (girls = 0, boys = 1) negatively predicted 2% of the variance in beliefs at T2 ($p < .01$). This result is consistent with the sex of participant effect on beliefs reported earlier, wherein boys obtained a higher level of beliefs than girls. After controlling for beliefs at T1 and sex of participant, the contribution of SKQA was 4% ($p < .001$). When GPA was entered before SKQA, GPA explained 8% of the variance in beliefs at T2 ($p < .0001$), and SKQA significantly contributed to an additional 2% of the variance ($p < .01$)—that is, although the longitudinal effect of sexual knowledge was smaller compared to the effect of academic performance, it was significant even when entered in addition to academic performance.

Table 2. *Summary of Two Hierarchical Regressions to Predict the Adolescents' Rape-Supportive Beliefs*

Variable	β	R^2	R^2 Change	*t* Value
Step 1				
Belief at T1	.51	.25		9.18***
Step 2				
Sex of participant[a]	−.14	.27	.02	−2.57*
Analysis 1				
Step 3				
Sexual knowledge at T1	−.20	.31	.04	−3.66**
Analysis 2				
Step 3				
Grade point average	−.29	.35	.08	−5.47***
Step 4				
Sexual knowledge at T1	−.14	.37	.02	−2.58*

Note. $N = 248$. Beta values are derived from the step at which each predictor was added to the equation. T1 = Time 1.
[a]Boys coded as 1, and girls coded as 0.
*$p < .01$. **$p < .001$. ***$p < .0001$.

Discussion

The percentage of adolescents who believed that a boy could force sexual intercourse on a girl varied across the 10 situations. This finding underlines the importance of the dyadic interaction context in forced sexual behavior. The situational variation was highly similar at T1 and T2, for boys and girls, and for U.S. (Davis et al., 1993) and French adolescents, suggesting that both U.S. and French male and female adolescents interpret dyadic interaction cues in dating situations in the same way. French adolescents displayed a higher level of beliefs than did U.S. adolescents in the Davis et al. study. This difference may be due to the fact that the U.S. adolescents' mean age was about two years older than that of French participants, since these longitudinal data suggest that these beliefs decrease during middle adolescence. Given the paucity of intercultural research on Western adolescents' sexuality, it would be unwise to draw further conclusions about this difference.

Some situations are particularly high-risk situations. At T1, for one half of the hypothetical situations (Items 2, 3, 4, 5, and 8), more than one third of the boys and girls (not exactly the same individuals for the five situations) believed that it was okay for a boy to force sex on a girl acquaintance. One could presume that these beliefs would be dismissed by additional cues perceived only in real situations, but cross-sectional (Maxwell, Robinson, & Post, 2003) and longitudinal research (Foshee, Linder, MacDougall, & Bangdiwala, 2001) found that holding this kind of belief predicts dating violence in boys. Although further research should address the association between the belief that boys can force sexual intercourse on girls in certain circumstances and adolescents' actual perpetration of forced sex, the high level of beliefs for both boys and girls highlights the relevance of sex education programs focused on decreasing adolescents' acceptance of sexual aggression (on the issue of attitude–behavior consistency, see Crano & Prislin, 2006).

These adolescent beliefs are characterized by high individual consistency, as revealed by the one-factor structure and the high alpha coefficient. We hypothesized that boys would obtain higher scores than girls. In fact, only a small proportion of individual differences was accounted for by the sex of adolescents, with the beliefs being only slightly higher in boys than girls. Beliefs in girls are likely to implicitly encourage boys to force sex on girls. According to Bourdieu's (1998) masculine domination theory, the adherence of girls to these beliefs can

be viewed as a nonconscious symbolic outcome of the socialization process that prepares males to endorse dominant social roles and females to be attracted by those males who endorse most dominant social roles.

In addition to the sex of participant effect, the mean belief level decreased slighly between the two testing times. Such developmental change in an attitudinal construct during a brief period in adolescence has been found in previous short-term longitudinal studies—for example, during an eight-month interval for adolescents' homophobic attitudes (Poteat, 2007). The average decreasing tendency of rape-supportive beliefs can be viewed as a consequence of sex education during the school year. This study was not intended to test such a hypothesis, which is nevertheless consistent with the sexual knowledge increase we hypothesized.

In accordance with this hypothesis, we found that for a vast majority of the SKQA questions (50 out of 60), participants obtained more correct responses at T2 than at T1, and there was a sharp increase (more than 10%) in the total average score during the six-month interval. This study did not shed light on the causes of this dramatic increase. One cause could be the adolescents' increasing interest in sexual issues. As Sutton et al. (2002) wrote, ''adolescents are hungry for sexual information. This is a time in their lives when the formation of a healthy sexual identity is vital to their mental health'' (p. 49). They may be motivated to actively seek knowledge about sexuality, for socially they are expected to show interest in dating and in romantic and sexual experiences (Miller & Simon, 1980). When they turn 15, French adolescents are no longer sexual minors, and the proportion of adolescents who experience sexual intercourse sharply increases between the ages of 15 and 18 (from 20.1%–66.8% in France; Lagrange & Lhomond, 1997). Other causes could be general adolescent cognitive development (e.g., Moshman, 2005); sex education courses in the school curriculum of 14-year-olds in France; and other sources like family members, peers, and media, although these sources provide more or less biased information about sexuality. The sexual knowledge increase could also be a consequence of the epistemic stimulation induced by the T1 assessment, which may have acted as a formative assessment (Johnston & Costello, 2005). This stimulation may have elicited cognitive exploration through discussions with professionals, such as the adults in charge of sex education.

Regardless of its causes, this dramatic increase supports the view of sexual knowledge as a cognitive-developmental construct, which is especially dynamic in middle adolescence. Given this developmental discriminant validity, the high individual stability of the sexual knowledge score between T1 and T2, and the higher internal consistency of this questionnaire than the one used by Whittaker et al. (2006), the SKQA can be viewed as a reliable tool for assessing adolescent sexual knowledge. Unfortunately, the exploratory factor analyses revealed that this instrument assesses only a general dimension and, hence, requires further development in order to be able to measure specific sexual knowledge components.

Our main hypothesis was that sexual knowledge accounts for the development of rape-supportive beliefs, independently of general knowledge level. The beliefs exhibited moderate individual stability between T1 and T2, revealing the relative plasticity of this kind of attitude in middle adolescence and, hence, its receptiveness to the influence of education. As hypothesized, one of the factors that account for individual differences in the development of these beliefs is sexual knowledge. The contribution of sexual knowledge observed during the six-month period, after controlling for GPA, was only 2%, but this effect is likely to be cumulative over several years. Most prevention programs focus directly on adolescent attitudes toward dating violence (e.g., Avery-Leaf, Cascardi, O'Leary, & Cano, 1997). Such programs have long-term efficacy in preventing various forms of dating violence (e.g., Foshee et al., 2004). Teaching adolescents sexual knowledge is likely to make students more receptive to prevention programs that focus on their attitudes and aim to change them. Such effort in sexual health and education policy could try to compensate for the paucity of knowledge about sexuality conveyed by the media in Western countries. As Ross (2002) observed, ''Where sexuality is discussed, it is largely by the entertainment industry, through scandal reported in the media, and by commercial sources'' (p. 7).

GPA and, hence, general cognitive skills and school motivation associated with GPA, accounted for a bigger part of the belief variance than sexual knowledge did (8% vs. 4%). This suggests that academic knowledge and skills contribute to decreasing the tendency to accept boys forcing sex on girls. The effect of general academic knowledge on beliefs about forced sex might be accounted for by the well-documented effect of low intelligence or low school attainment on juvenile offending (e.g., Lynam, Moffitt, & Stouthamer-Loeber, 1993). The GPA effect we found on the development of adolescent rape attitudes calls for academic and intellectual enrichment programs as a way to prevent sex offending, as well as other types of offending.

Aside from such general programs, which require a long and expensive social and educational process, the GPA effect also calls for specific prevention programs targeting a sexual knowledge construct broader than the one we have considered here. Indeed, as Farrington (1996) suggested, the effect of low intelligence and school attainment on the tendency to commit offenses can be explained by the poor ability to foresee the consequences of one's offending and to appreciate the feelings of the victims. An adolescent sexual knowledge construct that includes more social and emotional content is likely to

yield a stronger prediction of beliefs supporting forced sex. An empathy deficit, and especially an empathy for girls, has been found in adolescent sex offenders (Farr, Brown, & Beckett, 2004). The SKQA should be enriched with knowledge about the typical feelings and emotions experienced by a sexual partner, especially a person who is a victim of forced sex, both during the assault and afterward. A prevention program that teaches such a broader sexual knowledge construct could enhance adolescents' empathy toward hypothetical sexual partners and thereby decrease their propensity for forced sex. Future research should try to demonstrate that this kind of prevention program increases adolescents' knowledge while decreasing their beliefs justifying boys' forcing sex on girls and their perpetration of these offenses.

Another way to improve prevention programs would be to include a literacy component focused on sexuality. Knowledge about sexuality can be learned through exposure to specific academic curricula, but it may also result from adolescents' active cognitive constructions when exposed to various information sources. A prevention program centered on "sexual literacy" could improve adolescents' ability to identify myths about sexuality as false and, more generally, to critically "read," understand, and evaluate sexual messages from a variety of sources, including mass media, peers, and adults. Sexual literacy could be considered a part of health literacy. Literacy in other areas has been found to protect against maladjustment. For example, the promotion of "mental health literacy," defined as the ability to label various mental illnesses and to identify their symptoms, is effective in reducing adolescents' psychiatric discrimination attitudes (Pinfold et al., 2003). Similarly, Primack, Gold, Land, and Fine (2006) demonstrated that a lack of "media literacy" about smoking was associated with current smoking and susceptibility to smoking in adolescents. There is a strong association between exposure to the highly stereotyped, unrealistic, and glamorized sexual content found in the mass media and adolescents' self-reported sexual experiences two years later (Brown et al., 2006). Pinkleton et al. (2008) reported that a literacy curriculum focused on sexual portrayals in the media increased 14-year-old adolescents' awareness of sex-related myths in the media. Sexual literacy could be viewed as a sociocognitive tool aimed at increasing adolescents' knowledge about sexuality.

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Appendix. *Examples of Items for the Six Themes Covered by the Sexual Knowledge Questionnaire for Adolescents*

Themes	Items
Items with written answers	
Puberty	What is the name of the spots that frequently appear on one's face during puberty? (Acne)
Biological reproduction	What is the name of the female gamete? (Ovum)
Genital organs and functions	What is the name of the female external genitals? (Vulva)
Sexually transmitted diseases and contraception	What is the name of the care center in which a minor may consult a physician anonymously and free of charge and obtain contraception? (Family Planning Centers)
Rights and duties	What is the name of a sexual relationship among members of the same family? (Incest)
Sexual pleasure	What is the name of the peak of sexual pleasure, which is characterized in men by an emission of sperm? (Orgasm)
Items with "true," "false," and "I don't know" answers	
Puberty	Puberty necessarily involves the emergence of sexual behavior. (False)
Biological reproduction	A period delay always means that a women is pregnant. (False)
Genital organs and functions	A muscle contraction causes an erection. (False)
Sexually transmitted diseases and contraception	Some sexually transmitted diseases can result in infertility. (True)
Rights and duties	A physician may prescribe contraception to a minor girl without informing her parents and without their authorization. (True)
Sexual pleasure	In general, boys get more pleasure than girls out of heterosexual intercourse. (False)