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Young people's perceptions of advice about sexual risk taking

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Young people's perceptions of advice about sexual risk taking

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ABSTRACT

Sexual and reproductive health indicators for young people in the USA have improved in recent decades, but teenage pregnancies remain high, and large differences between Whites and non-Whites persist in teenage births, abortions, and the acquisition of sexually transmitted infections. Prior research shows that young people are receptive to communication about sex from parents and friends, but peers have been found to be more influential on sexual risk taking. In this study of 617 young people aged 13–20 years in high-risk neighbourhoods for teenage pregnancy in New Jersey, we asked whether sexually inexperienced young people differed from sexually experienced young people in their level of receptivity to the recommendations from their parents, friends, and others about whether to have sex before marriage and whether to use a condom if sexually active. The results showed that the sexually inexperienced were more receptive to messages from figures of authority in their life than those sexually experienced. We also found that stronger message intensity from parents, friends, and others to delay sex until marriage and to use a condom if sexually active was associated with lower sexual intentions in the next six months and the use of a condom if sexually active in the last three months.

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Adolescents; young people; sexual risk taking; sexual communication; contraceptive use; USA

Introduction

Despite signs of improvement in sexual and reproductive health outcomes for young people, the USA lags behind all developed nations outside of the former Soviet bloc in teenage pregnancies (Sedgh et al. 2015), and large disparities persist between Whites and Non-Whites. Recent data show that African-Americans and Hispanics remain more likely to become pregnant, give birth, have an abortion, and acquire a sexually transmitted infection (STI) than Whites (Martin et al. 2013; Kost and Henshaw 2014). One means of reversing these trends is to educate young people about the consequences of sexual risk taking by promoting increased and higher quality communication with parents, peers, and other socialising agents. However, factors such as parental comfort and knowledge about safe sex, and varying recommendations from parents, teachers, and peers about when to have sex and whether to use contraceptives, make sexual attitude and behavioural change more difficult to accomplish.

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Communication between parents and young people about sex is an effective means of promoting the use of contraceptives and condoms, but its impact on sexual decision-making may be small (Secor-Turner and Sieving 2011; Widman and Choukas-Bradley 2016). Studies show that young people can be guided to improve their knowledge and change their attitudes as a result of enhanced parental communication, but not necessarily modify their behaviour (Huebner and Howell 2003; Parkes et al. 2011; Wight and Fullerton 2013). This can be explained in part by the differences in parental comfort and knowledge regarding the topic, which may impact on the frequency of their conversations about sex and the effectiveness of their messages (Walker et al. 2008; Jerman and Constantine 2010; Morawska et al. 2015).

Parental support may also be a factor in achieving cooperation and reciprocal sexual communication among young people themselves. This can be seen in data from the 2010 Minnesota Student Survey, in which Hicks, McRee, and Eisenberg (2013) found that young people aged 13–19 years who felt more comfortable talking to their parents about sex were more likely to engage in conversations about the risks of sexual intercourse with their partners, and in research on transgender female youth where parental support was linked to more consistent condom use (Wilson et al. 2012). However, it may not be enough for parents to convey sexual norms indirectly to their children without also communicating with them directly about the subject. Evidence suggests that indirect expressions of sexual norms and disapproval alone are ineffective in promoting condom use and delaying sexual intercourse (Hampton et al. 2005; Malcolm et al. 2013).

Young people are also influenced by other authoritative figures in their lives such as teachers and doctors. Experiences with these agents of socialisation can lead to differences in their sexual intentions, decision-making, and risk taking. The context and environment in which these interactions take place may be influential as well. In schools, negative interactions with teachers have been associated with increased sexual risk taking (Kobak, Herres, and Laurenceau 2012), and fewer unsafe sexual health behaviours have been observed in settings where teachers reported superior health and welfare services for young people. In clinical settings, primary care physician testing and counselling have been associated with taking precautions against STIs (Sanci et al. 2015), and increased condom use has been found among young people that participated in interventions led by mental health clinicians (Chen et al. 2011).

Young people are also influenced by what they learn from their friends and siblings. Sexual socialisation of this kind is complex since young people may not be aware of whether or not their friends and siblings are exaggerating or telling them the truth about their real sexual experiences. Secor-Turner and Sieving (2011) found that most young people aged 13–20 identified peers and siblings as the source of most of their sexual information. A wealth of other evidence also suggests that both perceptions of peer behaviour (Diiorio et al. 2001; Hampton et al. 2005; Ali and Dwyer 2011) and peer approval (Goodson, Buhi, and Dunsmore 2006; Kapadia, Siconolfi, and Barton 2013) are reliable predictors of sexual risk taking.

Media outlets offer additional information about sexual behaviour and safe sex practices. In a recent study by Dunaev and Stevens (2016), African-American and Hispanic young people aged 13–24 ranked television and movies higher than all other sources of information about sex, and social media users were found more likely to use contraception. In other research, sexually active young people aged 11–21 have been found more likely than sexually inactive teens to use social media as a source of information about sex (Gebremeskel et al. 2014). Young people are consumers of this information and they may also be contributors

to it in open access forms of social media, such as Facebook and Twitter. Black, Schmiege, and Bull (2013) found that young people using online social networks were more likely to over-report sexual risk taking and under-report protective peer sexual behaviours; and in another study of online sexual behaviour, descriptive peer norms about what peers were doing were good predictors of the behaviour of young people, but injunctive peer norms about what they recommend were not (Baumgartner, Valkenburg, and Peter 2011).

It is clear in prior research that both parent and peer communication influence the attitudes of young people, but that young people are more likely to model their actions after their expectations of what their peers want and are perceived to be doing. However, since young people vary in their level of sexual experience, their interest level and receptivity to messages from parents and peers may vary in important ways as well. In this study, we compared young people aged 13–20 that were sexually experienced (with vaginal intercourse) to those that were sexually inexperienced on the level of importance they place upon messages about sex and the use of contraceptives when they come from parents, peers, doctors, religious leaders, teachers, other adults, and the media. We compared these two groups because we anticipated that young people that had already participated in coitus would use what that experience had taught them as a foundation for understanding the messages about sex that they hear from others in their lives.

In the analysis that follows, we tested the following hypotheses:

(H₁) Sexually inexperienced young people place greater importance than sexually experienced young people upon the messages about sex and contraceptives that come from authority figures such as parents, other adults, doctors, teachers, and religious leaders;

(H₂) Sexually inexperienced young people place lesser importance than sexually experienced young people on messages that come from friends;

(H₃) Sexually inexperienced young people perceive greater recommendations than sexually experienced young people, from all agents of socialisation (parents, other adults, doctors, teachers, religious leaders, friends and the media) to wait until marriage to have sex;

(H₄) Sexually inexperienced young people perceive weaker recommendations than sexually experienced young people to use a condom, from all agents of socialisation;

(H₅) Young people perceiving stronger messages to delay sexual intercourse until marriage have lower intentions to have sex; and

(H₆) Sexually experienced young people perceiving stronger messages to practise safe sex are more likely to have used a condom in their last three months of sexual activity.

Methods

Sample

Data for this study come from three high schools that participated in a teenage pregnancy prevention programme with funding from the New Jersey Personal Responsibility in Education Programme (NJPREP). Two cities in New Jersey were selected for the programme due to their high levels of teenage births relative to the rest of the state. Data were collected on teenage births by zip code in the two cities. High schools were invited to participate in the programme beginning with the school in the area with the highest teenage birth rate in the city, and then moving down the list until a school accepted. We continued this method until three schools had accepted, all of which were located in regions ranking in the top five in their city for teenage births. Over the course of this process, four schools opted not to

participate, three of which declined because they already had an existing teenage pregnancy prevention programme.

The protocol was approved by the Kean University Institutional Review Board. In each school, consent forms were sent home to parents/legal guardians in each of the health and physical education classes at the sophomore level. Students were offered a set of mini-headphones as an incentive for returning the forms, regardless of whether they actually participated in the study or not. The data were collected between September 2012 and December 2014. During that time, the programme was offered to 887 high school students in the three schools. A total of 694 students (or 78%) participated in the programme. The sample for this study is comprised of 617 of those programme participants aged 13–20 who also completed surveys about their sexual behaviours and intentions. This represents 70% of the original sample, and 89% of the programme participants. The other programme participants did not obtain parental consent to be surveyed or they were unavailable to be surveyed on the dates when data were collected.

Measures

Students were asked about their demographic characteristics, such as their age, gender, race, and Hispanic or Latino origin. We also asked if they received reduced price or free lunch. We then asked them to report the level of importance they place on messages about sexual intercourse and contraceptives when they come from parents, other adults, religious leaders, doctors, teachers, friends, and the media, where 1 = not at all important, 2 = slightly important, 3 = somewhat important, and 4 = very important. Separately, they were asked whether these sources recommended that they wait until marriage before engaging in sexual intercourse, where 1 = recommend it, 2 = neutral, and 3 = do not recommend it, and whether the sources recommended they use a condom if sexually active, where 1 = recommend it, 2 = neutral, and 3 = do not recommend it.

Four variables measuring message intensity were computed following Walsh's (2002) method for (a) the intensity of the message to wait for marriage to have sex, (b) the intensity of the message to not wait for marriage to have sex, (c) the intensity of the message to use a condom if sexually active, and (d) the intensity of the message to not use a condom if sexually active. For each of these measures, intensity was computed by multiplying the value of (1) for the recommendation by a value of (1–4) depending on the level of importance placed upon information from that source. For example, the intensity of the recommendation (1) to wait for marriage to have sex from a subject that rated a message from parents as a (4), was assigned a score of (4) for message intensity from parents to wait for marriage to have sex. The message intensity to have sex before marriage was then computed by summing the intensity of that message from each source. The same method was used to compute the intensity of each of the four messages.

Students also reported whether they had ever had sex (yes or no), and whether they planned to have sex in the next six months if they had the chance, where 1 = no definitely, 2 = no probably, 3 = yes probably, and 4 = yes definitely. On the questionnaire, sex was defined as vaginal intercourse or 'the act that makes babies.' Sexual experience was coded as a (1) for those who had engaged in vaginal intercourse, and a (0) for those who had not engaged in vaginal intercourse. Finally, we asked those that had sex in the last three months

how often they had used a condom, where 1 = all of the time and 0 = some of the time, most of the time, or all of the time.

Analytic strategy

Means were computed for the importance level placed upon messages about sex and the use of contraceptives when they come from parents, other adults, teachers, doctors, religious leaders, friends, and the media. The means for the subgroups of sexually inexperienced and sexually experienced young people were compared in an analysis of covariance (ANCOVA) with gender, age, race, ethnicity, and reduced price/free lunch as covariates. *F*-scores and *p* values were used to measure statistically significant differences by the subgroups. We also ran tests for effect sizes of the associations using Cohen's *d* and $r_{Y\lambda}$ using the following formulas:

$$\text{Cohen's } d = M_1 - M_2 / \sqrt{[(s_1^2 + s_2^2)/2]}$$

$$r_{Y\lambda} = \sqrt{t^2 / (t^2 + df)}$$

Logistic regression was used first in the full sample to predict intentions to have sex in the next six months, where 1 = probably yes or definitely yes and 0 = probably no or definitely no, and then in the sexually experienced sample, to predict the use of a condom, where 1 = all of the time and 0 = most, some, or none of the time in the last three months. The independent variables in the equations included message intensity and all of the demographic variables. Cox and Snell Pseudo R^2 statistics were used to measure the explained variation in the dependent variables.

Results

Demographic characteristics and data on sexual experience, sexual intentions in the next six months, and condom use can be found in Table 1. Results are shown for the full sample ($N = 617$) and the subsamples of those sexually inexperienced ($N = 310$) and those sexually experienced ($N = 291$). In the full sample, the average age was 15.74, 52% were female, 69.2% were Black or African-American, and 24.8% identified as Hispanic or Latino. The percentage of Black or African-American students in the sample is higher than that of the two school districts as a whole, which were approximately 35 and 51% Black or African-American, respectively, at the time. The percentage of Hispanics in the sample, on the other hand, was lower than that of the two school districts, which were about 36 and 40% Hispanic, respectively, at the time.

Fifty-four per cent received reduced price or free lunch. Forty-seven per cent of respondents reported that they have ever had vaginal sexual intercourse. Less than half of the students, or 40.9%, reported that they would probably or definitely have sex if they had the chance in the next six months. Among the sexually inexperienced (those that had never had vaginal sexual intercourse), only 16.4% said probably or definitely yes, and among the sexually experienced sample (those that had vaginal sexual intercourse), 68.7% reported probably or definitely yes. In the sexually experienced sample, we also found that among

Table 1. Demographic characteristics, sexual experience, and condom use.

	Mean (SD)	Total sample (N = 617)	Sexually inexperienced (N = 310)	Sexually experienced (N = 291)
Age		15.74 (.97)	15.51 (.93)	15.98 (.94)
Gender				
Female		52.0%	59.0%	44.3%
Male		47.2%	40.3%	55.3%
Race				
Black/African-American		69.2%	64.5%	73.9%
White		7.0%	7.7%	6.5%
American-Indian		6.2%	5.2%	7.6%
Asian		5.0%	8.4%	1.7%
Hawaiian/Pacific Islander		3.9%	4.8%	3.1%
Hispanic or Latino				
No		70.7%	70.3%	71.8%
Yes		24.8%	25.5%	24.4%
Reduced price or free lunch				
Yes		54.6%	55.8%	53.6%
No		17.5%	16.5%	18.9%
Unsure		24.8%	25.2%	24.7%
Have you ever had sexual intercourse?				
No		50.2%		
Yes		47.2%		
If you have the chance, do you intend to have sex in the next six months?				
No, definitely not		32.9%	52.3%	12.7%
No, probably not		23.5%	29.4%	17.5%
Yes, probably		23.7%	13.2%	36.1%
Yes, definitely		17.2%	3.2%	32.6%
When you had sex in the last three months, how often did you or a partner use a condom? (asked only to those that reported having sex in the last three months, N = 219)				
All of the time				58.0%
Most of the time				12.8%
Some of the time				8.2%
None of the time				19.2%

those that had vaginal sexual intercourse in the last three months ($N = 219$) 58% reported using a condom all of the time in the last three months.

In Table 2, sexually inexperienced students are compared to sexually experienced students in the mean level of importance placed on messages about sex and the use of contraceptives when they come from the various agents of socialisation. The results of the ANCOVA, with gender, age, race, ethnicity, and reduced price/free lunch as covariates, show that the sexually inexperienced students placed greater importance than the sexually experienced students on messages from teachers ($F = 5.731, p = .017$) and religious leaders ($F = 7.927, p = .005$), but not for parents, other adults, or doctors, indicating only partial support for H_1 . Support was found for H_2 as the sexually inexperienced students placed lesser importance on messages about sex and contraceptives than the sexually experienced when the messages came from friends ($F = 6.337, p = .012$). Applying Cohen's (1988) standard, in which effect sizes are rated as 'small' when $r_{Y\lambda}$ is less than .059, 'medium' when $r_{Y\lambda}$ is between .059 and .138, and 'large' when $r_{Y\lambda}$ is above .138, all of the effects were classified as small.

In H_3 , we predicted that sexually inexperienced young people would perceive greater recommendations than sexually experienced young people from all socialising agents to wait until marriage to have sex. As shown in Table 3, partial support of this hypothesis was

Table 2. Perceptions of the importance of messages about sex and the use of contraceptives.

	Sexually inexperienced (<i>N</i> = 310)		Sexually experienced (<i>N</i> = 291)		ANCOVA ^a		Effect sizes	
	Mean	SD	Mean	SD	<i>F</i>	<i>p</i>	Cohen's <i>d</i>	<i>r</i> _{<i>Yλ</i>}
Importance of message from ^b :								
Parents	3.41	.86	3.35	.85	.115	.735	.072	.036
Other adults	2.87	.88	2.85	.87	.057	.812	.015	.007
Doctors	3.39	.86	3.42	.84	.084	.773	.034	.017
Teachers	2.83	.92	2.59	1.02	5.731	.017	.243	.121
Religious leaders	2.56	1.13	2.27	1.09	7.927	.005	.267	.133
Friends	2.28	.94	2.50	.92	6.337	.012	.236	.117
Media	2.08	.96	2.11	.96	.133	.715	.039	.020

^aAnalysis of Covariance (ANCOVA) with female, age, Black, Hispanic, and reduced price/free lunch as covariates.

^b1 = Not at all important, 2 = somewhat important, 3 = important, 4 = very important.

Table 3. Perceptions of the recommendations about whether to have sex before marriage.

	Sexually inexperienced (<i>N</i> = 310)		Sexually experienced (<i>N</i> = 291)		ANCOVA ^a		Effect sizes	
	Mean	SD	Mean	SD	<i>F</i>	<i>p</i>	Cohen's <i>d</i>	<i>r</i> _{<i>Yλ</i>}
Recommendation to wait for marriage to have sex ^b :								
Parents	2.36	.71	2.16	.67	9.640	.002	.283	.140
Other adults	2.35	.64	2.17	.65	4.831	.028	.271	.134
Doctors	2.27	.68	2.10	.63	10.63	.001	.259	.128
Teachers	2.32	.68	2.21	.68	3.042	.082	.173	.086
Religious leaders	2.46	.76	2.23	.81	14.516	.0002	.301	.149
Friends	1.96	.65	1.96	.74	.086	.770	.004	.002
Media	2.04	.65	2.10	.69	.577	.448	.083	.042

^aAnalysis of variance (ANCOVA) with female, age, Black, Hispanic, and reduced price/free lunch as covariates.

^b1 = They recommend it, 2 = neutral, 3 = they do not recommend it.

found as the sexually inexperienced sample ranked parents ($F = 9.640, p = .002$), other adults ($F = 4.831, p = .028$), doctors ($F = 10.63, p = .001$), and religious leaders ($F = 14.516, p = .0002$) significantly higher than the sexually experienced sample in their recommendation to wait for marriage before having sex. In H_4 , we predicted that the sexually inexperienced young people would perceive weaker recommendations than the sexually experienced young people to use a condom if sexually active. As shown in Table 4, partial support of this hypothesis was found as the sexually inexperienced young people perceived weaker recommendations than the sexually experienced young people to use a condom if they have sex, from parents ($F = 11.057, p = .001$), other adults ($F = 11.125, p = .001$), and friends ($F = 12.34, p = .0004$). As in the previous case, all of the effect sizes are classified as small.

Table 5 contains two logistic regression models with results for the final two hypotheses. In H_5 , we predicted that total message intensity from all sources to delay sexual intercourse until marriage would be associated with lesser intentions to have sex in the next six months; and in H_6 , we predicted that in the sexually experienced sample, those perceiving more intensive messages to practise safe sex would be more likely to have used a condom when they had sex in the last three months. As in Walsh (2002), we included both the intensity of the message to delay intercourse and not delay intercourse, and to use a condom and not

Table 4. Perceptions of the recommendations about whether to use a condom if sexually active.

	Sexually inexperienced (<i>N</i> = 310)		Sexually experienced (<i>N</i> = 291)		ANCOVA ^a		Effect sizes	
	Mean	SD	Mean	SD	<i>F</i>	<i>p</i>	Cohen's <i>d</i>	<i>r</i> _{<i>V</i>λ}
Recommendation to use a condom if sexually active from ^b :								
Parents	1.26	.57	1.11	.39	11.057	.001	.311	.154
Other adults	1.31	.61	1.16	.42	11.125	.001	.299	.148
Doctors	1.21	.52	1.16	.46	1.031	.310	.100	.045
Teachers	1.26	.57	1.19	.47	2.036	.154	.137	.068
Religious leaders	1.43	.71	1.32	.63	2.62	.106	.157	.078
Friends	1.48	.65	1.29	.52	12.34	.0004	.316	.156
Media	1.55	.67	1.46	.66	1.376	.241	.139	.069

^aAnalysis of variance (ANCOVA) with female, age, Black, Hispanic, and reduced price/free lunch as covariates.

^b1 = They recommend it.

use a condom in the models, but in a separate analysis (not shown) we found the results were unchanged when the opposite recommendations were excluded from the models.

The first model in Table 5 predicts the probability of intentions to have sex in the next six months. The predictors in the equation include demographic variables, sexual experience, and the intensity of the messages to wait or not wait for marriage to engage in sexual intercourse. In the full model, the intensity of the message to wait until marriage for sex was negatively associated with intentions to have sex ($B = -.04, p < .05$). Gender, prior sexual experience, and message intensity to wait until marriage were all found to be significant factors, as females ($B = -1.16, p < .001$) and those who were sexually inexperienced ($B = 2.31, p < .001$) were significantly less likely to report having positive sexual intentions. Cox and Snell Pseudo R^2 showed that the model explained .32 of the variance in the dependent variable. The second model in Table 5 predicts the probability of using a condom 'all of the time' in the last three months among the sexually experienced sample. In the full model, a higher message intensity to use a condom ($B = .07, p < .01$) was associated with a greater likelihood of using a condom all the time in the last three months, and girls ($B = -1.20, p < .001$) were less likely to report that their partner used a condom than boys. Together the variables in the model explained .12 of the variance in the dependent variable.

Discussion

Previous studies have found that young people who receive information from their parents and other authority figures about sex (Chen et al. 2011; Sanci et al. 2015; Widman and Choukas-Bradley 2016) have somewhat greater odds of using contraceptives, but little is known about which young people are more receptive to these messages when they come from parents. When asked about who they turn to the most for questions about sex, young people are more likely to report that they rely upon their peers and siblings (Hampton et al. 2005; Wisnieski 2013), and evidence suggests they are more likely to engage in risk taking if they expect their peers are doing the same (Ali and Dwyer 2011).

The results of this study indicate that sexually inexperienced young people place greater importance than sexually experienced young people on messages about sex and contraceptives when they come from religious leaders and teachers, and less importance when they come from peers. We also found that the sexually inexperienced were more likely than

Table 5. Logistic regression coefficients predicting sexual intentions and condom use.

Variable	Intend sex in next six months ^a		Used condom in last three months ^b	
	Full sample (N = 564) ^c		Sexually Active Sample (N = 207) ^d	
	B (SE)	Odds ratio (95% CI) ^e	B (SE)	Odds ratio (95% CI)
Age	.14 (.11)	1.15 (0.92–1.43)	.11 (.17)	1.12 (0.80–1.57)
Female (0 = Male)	–1.16 (.21)	.32*** (0.21–0.48)	–1.20 (.31)	.30*** (0.16–0.55)
Black (0 = Non-Black)	.02 (.28)	1.02 (0.59–1.74)	–.02 (.45)	1.02 (0.43–2.46)
Hispanic (0 = Non-Hispanic)	–.54 (.29)	.48 (0.33–1.03)	.19 (.45)	1.21 (0.50–2.90)
Free/reduced price lunch (0 = No or unsure)	–.19 (.21)	.83 (0.54–1.26)	.28 (.31)	1.33 (0.72–2.43)
Ever had sex (0 = No)	2.31 (.22)	10.11*** (6.54–15.56)		
MI wait for marriage	–.04 (.02)	.96* (0.92–0.99)		
MI don't wait for marriage	–.02 (.02)	.98 (0.94–1.03)		
MI use a condom			.07 (.02)	1.07** (1.02–1.12)
MI use a condom			.07 (.02)	1.07** (1.02–1.12)
MI do not use a condom			–.01 (.06)	.99 (0.88–1.12)
Constant	–2.52		–2.02	
–2LL	555.80		251.39	
Pseudo R ²	.32		.12	

Notes: SE – standard error. MI – message intensity.

^aProbably yes or definitely yes.

^bAll of the time.

^cExcludes 53 cases with missing data.

^dIncludes only those that reported sex in the last three months, and excludes 12 cases with missing data.

^eRange of odds ratios at the 95% confidence level.

* $p < .05$; ** $p < .01$; *** $p < .001$.

the sexually experienced to perceive that doctors, parents, religious leaders, other adults, and teachers were recommending that they wait until marriage to have sex, but less likely than the sexually experienced young people to perceive that parents, other adults, and peers were recommending that they use a condom if sexually active. Thus, despite reporting more recommendations from others to wait for marriage to have sex, sexually inexperienced young people do not seem to receive the same strong advice to use a condom if they do become sexually active. One possible explanation is that parents, other adults, and friends who recommend waiting until marriage to have sex, may be less inclined to advise that if they do not follow their guidance, they should use protection to lower the risk of an unintended

pregnancy and/or an STI. This lends support to the need to educate young people on the value of both abstinence and the use of contraceptives (Greslé-Favier 2013; Lee 2015) since informal forms of advice may be less likely to prepare teenagers for multiple contingencies. Finally, we found that more intense messages to delay sexual intercourse until marriage were associated with lower sexual intentions in the full sample, and that in the sexually experienced sample, more intense messages to practise safe sex were associated with greater condom use in the last three months.

In the USA in recent years there has been a renewed political focus on the elimination of ethnic and racial disparities in health through broad public messaging and the wide dissemination of information about healthy lifestyles on the Internet and in social media, and some positive results have been documented. A recent report on tobacco use, for example, shows that the percentage of US adults who smoke declined between 2005 and 2012, and the percentage of those who have ever smoked that quit has risen (Agaku, King, and Dube 2014). Other goals are being achieved as well according to Leading Health Indicators data, such as greater air quality, lessened second-hand smoke exposure to children, increased aerobic physical and muscle-strength activity, and greater levels of colorectal cancer screening (Koh, Carter, and Roper 2014). Nevertheless, young people in this study rated 'the media' lowest in importance among the agents of socialisation for messages about sex and contraceptives. This finding may stem from the popular perception that the media offers mixed messages about sex, but young people may also be unaware of the indirect effects that public health messages have on them through the advice they receive from parents, religious leaders, doctors, and other agents of socialisation that are close to them.

Finally, the evidence we found that sexually inexperienced young people have lower sexual intentions and that sexually experienced young people report higher condom use when they perceive stronger recommendations to do so (or greater message intensity), suggests that young people are more receptive to advice when it comes from multiple agents of socialisation that they find important. This finding demonstrates the potential for key agents of socialisation in the lives of young people to impact their sexual behaviour. It also lends credence to the call for formal sex education programmes that engage parents and peers in the process of disseminating information and influencing decision-making (Walker 2004; Secor-Turner and Sieving 2011; Eisenberg et al. 2012; Wight and Fullerton 2013).

Limitations and indications for future research

Important limitations to these findings should be noted. Although the sample is composed of a high percentage of African-Americans and Hispanics, two groups with high rates of teenage pregnancy and STIs, their schools were selected for this study depending on their zip code and rate of teenage births, and cannot be assumed to represent all young people. In addition, although we found statistically significant differences between sexually inexperienced and sexually experienced young people, all of the effect sizes for those differences were small. Another limitation is found in the cross-sectional design, which makes it unclear whether the attitudes and recommendations we measured are antecedent to the sexual behaviours. We also noted the possibility that some respondents did not draw a clear distinction between a recommendation to have sex before marriage or use a condom, and a neutral recommendation, since some recommendations to have sex before marriage (e.g. from religious leaders) were higher than expected. Finally, we asked about vaginal

intercourse only and this makes it impossible to know whether the results would be different for any other forms of sexual behaviour such as oral sex or anal sex.

A strength of this study is that it combines information about the nature of recommendations about sexual risk taking with the relative weight assigned to it. This enables a better understanding of the competing pressures that young people deal with and allows for an assessment of the relative intensity of positive and negative messages. In future research, we plan to use longitudinal data to determine if formal sexual education is more effective on young people that place greater importance on the messages about sex that they receive from parents and teachers, compared to friends.

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