



Patterns of cross-orientation friendships in high schools

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ABSTRACT

Previous studies indicate that school friendship networks of sexual minority students (students with non-heterosexual orientations) consist mostly of straight peers, but little is known about these straight friends. This paper examines what background characteristics predict straight students' chance of having sexual minority friends by analyzing friendship nomination data from two large high schools included in the National Longitudinal Study of Adolescent Health. Straight females are more likely than straight males to have cross-orientation friendships particularly with sexual minority males. Like friendships among straight students, cross-orientation friendships show a strong homophilous tendency—straight students choose sexual minority friends within their grade levels, racial groups, and academic aptitude levels. Beyond homophily, white race and high levels of academic aptitude and parent education increase straight students' chance of having sexual minority friends in some gender combinations, consistent with previous research showing the links between these backgrounds and positive attitudes toward sexual minorities.

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1. Introduction

Previous studies of sexual minority adolescents' friendships have largely focused on two questions. The first question is whether sexual minority adolescents are isolated due to the stigma attached to their sexual orientation (Chesir-Teran, 2003; Kosciw, 2004), but recent research has shown no difference between straights and sexual minorities in the average number of friends (Diamond and Lucas, 2004). The second question is to what extent sexual minority adolescents know each other as friends. Although many adolescent participants in community organizations have at least a few sexual minority friends (Herd and Boxer, 1993; Wright and Perry, 2006), sexual minority students seem to be largely disconnected from each other at schools partly because of the small number of sexual minority students at school and their efforts to reduce visibility and avoid discrimination (Lasser and Tharinger, 2003).

These studies thus indicate that at school, sexual minority youth's friendship networks consist mainly of straight peers. Little is known, however, about straight students who associate with sexual minority students. This paper analyses data from the National Longitudinal Study of Adolescent Health ("Add Health") to determine what background characteristics predict straight students' choice of sexual minority friends, and to assess how those predictors of cross-orientation friendships differ from predictors of same-orientation friendships (i.e., straight students' choice of straight friends). Two unique features of the Add Health data—school-wide interview of friendship nominations and friends' direct reporting of sexual orientation and other individual attributes—provide a rare opportunity to answer these questions.

Focusing on race and gender, previous studies of school friendships have demonstrated that student backgrounds strongly shape friendship patterns (Hallinan and Williams, 1989; Joyner and Kao, 2000; Milner, 2006; Moody, 2001; Mouw and Entwisle, 2006). These studies showed that school structures such as extracurricular activities and academic tracks contribute to race and gender patterns of friendships by determining the chance of contact with peers within and across social categories.

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The role of sexual orientation remains unknown, however. Sexual orientation is not linked to these organizational structures to the same extent as race and gender are. Further, students' sexual orientation is not necessarily visible to each other. Sexual minority students may not be aware of their sexual orientation when developing friendship networks, and they do not necessarily disclose to their existing or new friends after becoming aware (Lasser and Tharinger, 2003). These observations lead to an expectation that straight students' backgrounds predict their choice of sexual minority friends in ways similar to their choice of straight friends. At the same time, explicit and implicit norms of heterosexuality exist in schools (Chesir-Teran, 2003), and sexual minority students occupy lower positions in the status hierarchy (Payne, 2007; Smith and Smith, 1998). Straight students' backgrounds, which correlate with status at school (Milner, 2006) and attitudes toward sexual minorities (Horn, 2006; Loftus, 2001), may therefore exert unique effects on straight students' choice of sexual minority friends. Among various background variables, this paper focuses on gender, race, parent socioeconomic status, religiosity, and academic aptitude, which are closely linked to students' social status at school and their attitudes toward sexual minorities, as I explain below.

Identifying patterns of cross-orientation friendships will help determine how the benefits of those friendships are distributed. For many sexual minority students, friends serve as the first straight people to whom they disclose their sexual orientation (Beals and Peplau, 2006; Herdt and Boxer, 1993). Sexual minorities decide which friends to tell by carefully evaluating responses they might give (Herdt and Boxer, 1993; Lasser and Tharinger, 2003). Because attitudes toward sexual minorities vary across social groups (Herek and Glunt, 1993; Loftus, 2001), straight students' backgrounds may affect whether sexual minorities disclose their sexual orientation to their straight friends and what responses they receive from their straight friends following disclosure. Degrees of disclosure and types of responses in turn have important implications for sexual minority youth's identity development and mental health (Hershberger et al., 1997; Troiden, 1989; Ueno et al., 2009).

For straight people, cross-orientation friendships provide opportunities to learn about sexual diversity and help break down their stereotypes about sexual minorities (Castro-Convers et al., 2005; Galupo and St. John 2001; Weinstock and Bond, 2002). By identifying patterns of cross-orientation friendships, this study shows which straight students might learn about sexual diversity from which sexual minority students. At the school level, cross-orientation friendships serve as bridges between sexual minority and straight student populations (Goodenow et al., 2006; Lee, 2002; Uribe, 1993). The results from the present study will indicate where these bridges are built in relation to social group boundaries.

2. Processes of cross-orientation friendship development

2.1. Attitudes toward sexual minorities

The literature suggests three major processes that link straight students' backgrounds and their chance of having sexual minority friends: attitudes toward sexual minorities, positions in the status hierarchy at school, and homophily. Research on attitudes, most of which has focused on adult populations, indicates that females, whites, people with high education levels, and those with low levels of religiosity have more positive attitudes toward homosexuality (Herek and Glunt, 1993; Loftus, 2001). Horn (2006) has shown that females' greater acceptance also appears among adolescents. The Add Health data analyzed here do not include direct measures of students' attitudes toward sexual minorities, but these groups previously found to have positive attitudes should be more likely than others to have sexual minority friends. Additionally, this study includes academic aptitude (measured by a modified version of the Peabody Picture Vocabulary Test—Revised) as a predictor of cross-orientation friendships. Academic aptitude is associated with cognitive flexibility and sophistication in evaluation of new ideas and therefore contributes to tolerance for nonconformity such as same-sex sexuality (Ohlander et al., 2005). Academic aptitude may therefore increase straight students' chance for developing cross-orientation friendships, independent of parent education.

2.2. Positions in the status hierarchy

Student backgrounds may influence the chance of having sexual minority friends by specifying positions in the status hierarchy. Students with high status enjoy attention, respect from other students, as well as spatial privileges (e.g., lunch tables) (Coleman, 1961; Eder et al., 1995; Milner, 2006). Male gender, white race, and high socioeconomic background generally increase student status, although status hierarchies vary across schools (Milner, 2006; Perry, 2001). Higher status individuals tend to block lower status individuals from joining their crowds to maintain their status and crowd cohesion (Eder et al., 1995; Hughes, 1945). Given the marginalized positions of sexual minorities at school (Chesir-Teran, 2003), high status students may be less likely than others to befriend sexual minority students. Consequently, sexual minority students may become associated with other low status students such as “punks” and “geeks” (Smith and Smith, 1998:327) and “outcasts” and “artists” (Payne, 2007:72), as described in qualitative studies.

2.3. Homophily

The third process that links straight students' backgrounds and their chance of having sexual minority friends is homophily. Homophily refers to the tendency for people sharing backgrounds to associate with each other. Previous studies have

shown that school friendships tend to be homophilous in gender, race, grade level, and parents' education level (Coleman, 1961; Hallinan and Williams, 1989; Kandel, 1978). Homophily results partly from activity foci within organizations, which promote social contacts among individuals who share backgrounds (Feld, 1982). An individual's attraction to or preference for similar others also seems to contribute to friendship homophily. Homophilous preference may be motivated by a need to feel approved as well as by an attempt to increase the chance of mutual liking (Huston and Levinger, 1978). By definition, friendships between straight and sexual minority students are heterophilous in sexual orientation, but they could be homophilous in other dimensions.

To distinguish homophily from other processes (attitude toward sexual minorities and social status), this study uses dyad-level analyses. A dyad consists of two students attending the same school. In a dyad from Student A to Student B, Student A is referred to as the sender, and Student B as the receiver. A friendship tie is said to be present when Student A nominates Student B as a friend. A dyad from Student B to Student A is treated as a separate observation and indicates whether Student B nominates Student A. Background similarity in the dyad from Student A to Student B is measured by whether the two students share a background characteristic in a given categorical dimension (e.g., race) or report similar values in a continuously measured variable (e.g., religiosity). To predict a friendship tie from Student A to Student B by race, for example, dyadic analyses allow one to simultaneously consider similarity in race between the two students and Student A's race. A positive effect of similarity would indicate the presence of a *homophily effect*, and a positive effect for Student A's race would indicate the presence of a *sender attribute effect*—that is, a preference for Student B attributable to Student A's race. Sender attribute effects are assumed to result from Student A's attitudes toward Student B and Student A's social status which influences her inclination to associate with Student B.

By comparing the effects of dyadic similarities in cross-orientation and same-orientation dyads, this study examines whether the strength of homophily differs between the two dyad groups. Except for studies of gender effects (see discussion below), very little research has directly addressed this issue. The literature on stigma suggests, however, that same-sex sexuality may moderate the strength of homophily in cross-orientation friendships. In general, a person who holds a stigmatized characteristic becomes discredited in social interaction (Goffman, 1963); non-heterosexuality triggers strong stereotypes about personality and behaviors, coloring the overall impression others hold of the non-heterosexual person (Duran et al., 2007; Herek, 2002). In the process of friendship development, straight students' heightened attention to their peers' non-heterosexual orientation may thus reduce the perceived benefits of shared backgrounds in other dimensions. Cross-orientation dyads may therefore show weaker homophily effects than same-orientation dyads.

2.4. Gender effects

In addition to the general mechanisms discussed above (attitude toward sexual minorities, status at school, and homophily), two factors may influence gender patterns of cross-orientation friendships. First, cross-orientation friendships may be more gender-heterogeneous than same-orientation friendships because some barriers to cross-gender friendships are reduced in cross-orientation friendships. Due to the social expectation of cross-gender relationships as a context for romance rather than friendship, straight students may be hesitant to develop friendships with opposite-gender students, which would increase the risk of unwanted romantic or sexual attention (Monsour, 2002; Werking, 1997). In cross-orientation dyads, however, this tension should be small, especially when the friendships include students with homosexual orientation as opposed to bisexual orientation.

Second, the formation of cross-orientation friendships may be specific to straight students' gender and sexual minority students' gender. Among all gender combinations in cross-friendships, those between straight females and sexual minority males have received a great amount of attention in previous research (e.g., Castro-Convers et al., 2005; Moon, 1995). The scholarly interests perhaps reflect the high rate of friendships with the gender combination. Diamond and Dube (2002), for example, showed that sexual minority males tend to have more female friends than straight males do, although sexual minority females do not necessarily have more male friends than straight females do. One explanation for this gender specificity is that motivations for cross-orientation friendships differ between straight females and straight males. For example, because females are socialized to defend themselves from males' sexual advances (Rose and Frieze, 1993), they may have stronger motivations to avoid sexual tension in cross-gender friendships by choosing sexual minority friends.

In the adult gay community, these straight females with gay male friends are sometimes called "fag hags" and negatively portrayed as unsuccessful in finding boyfriends or as attracted to unavailable men (Moon, 1995; Nardi, 1999). To investigate whether this stereotype applies to the adolescent population, this study tests the relationship between straight females' dating experience and their chance of having sexual minority males as friends. The analysis also examines the effect of dating experience on dyads of other gender combinations (e.g., between straight males and sexual minority females).

3. Hypotheses

Six hypotheses are proposed about the relationships between straight students' backgrounds and their chance of having sexual minority friends.

Hypothesis 1. Straight students will be more likely to associate with sexual minority students when the two parties are similar in race and parents' educational level, academic aptitude, and religiosity.

Hypothesis 2. Homophily will operate more weakly in cross-orientation dyads than in same-orientation dyads. This hypothesis is based on the arguments that sexual minority students' sexual orientation overrides other individual attributes in straight students' perceptions and weakens the overall level of homophily, and that reduced constraints to cross-gender friendships further weaken gender homophily in cross-orientation dyads.

Hypothesis 3A. Beyond homophily, females, whites, those with highly educated parents and high academic aptitude, and those who are less religious are more likely than other straight students to nominate sexual minority friends, based on the argument that they have more positive attitudes toward sexual minorities.

Hypothesis 3B. Beyond homophily, females, racial minorities, and those who have parents with low levels of education are more likely than other straight students to have sexual minority friends, based on the argument that their lower positions in the status hierarchy increase social proximity to sexual minority students. This hypothesis therefore competes with hypothesis 3A in terms of race and parent education effects.

Hypothesis 4. Straight females will be more likely than straight males to nominate sexual minorities of the opposite gender, based on the argument that they have stronger motivations to avoid sexual tension in friendships.

Hypothesis 5. Straight females without any dating experience will be more likely than other straight females to befriend sexual minority males, according to the negative characterization of straight women with gay friends in past qualitative studies.

The present paper overcomes major limitations of previous research. For instance, although studies based on sexual minorities' reports (e.g., Beals and Peplau, 2006; Galupo, 2007; Nardi, 1999) have contributed to an understanding of how sexual minorities perceive their friendships, these works did not address straight people's friendship choices. Moreover, in these studies, straight friends' background characteristics were based on sexual minority respondents' reporting. In addition to creating the risk of random measurement errors resulting from respondents' lack of knowledge, that approach may have increased a bias toward homophily effects because of respondents' overestimation of similarities between themselves and their friends (Kandel, 1996). There are studies that utilize data directly reported by straight respondents with sexual minority friends (Castro-Convers et al., 2005; Muraco, 2006; Weinstock and Bond, 2002), but the lack of negative cases (straight people with no sexual minority friends) precludes the possibility of determining what predicts the cross-orientation friendships. Finally, because most previous studies have been based on individual-level analyses, they were not able to distinguish between the effects of straight students' backgrounds and the effects of their similarities with sexual minority friends. The present study overcomes this limitation by conducting dyad-level analyses.

4. Methods

4.1. Data and sample

Data came from the National Longitudinal Study of Adolescent Health. In 1994, 80 high schools and 52 feeder schools (middle schools that sent their graduates to those high schools) were selected for a school-wide survey (In-School Survey). For a subsequent in-depth interview in 1995 (Wave 1 In-Home Interview), a subset of the initial respondents was selected at most of the sampled schools. To produce complete friendship network data, all students at two large schools and 14 small schools were asked to participate ("saturated sample").

To ensure the presence of several female and male sexual minority students in each school, the present study uses data from the two large schools in the saturated sample ($N = 2552$ students). School A, a public high school (grades nine through twelve) in the rural Midwest, had a predominately white student body. School B, also a public high school (grades 10 through 12), was located in the suburban West and had a racially diverse student body. The response rate at each school was about 82%. The two schools did not differ in the proportion of sexual minority students in the student body, but School A had a higher rate of friendship nominations overall and a lower rate of nominations to sexual minority males than School B. The multivariate models included a dichotomous variable to account for these school differences.¹ Dyad-level data were constructed to include all possible pairs between straight senders and sexual minority receivers (cross-orientation dyads) and those between straight senders and straight receivers (same-orientation dyads). Dyads between sexual minority senders and straight receivers and those between sexual minority senders and sexual minority receivers were not included in the analysis because the main study purpose is to examine what predicts straight students' choice of sexual minority friends. The question can be best answered by identifying the patterns of friendship nominations made by straight students.

¹ In an exploratory analysis, separate models were run for each school. The results from the separate samples were largely consistent with those based on the combined sample, although the size of coefficients differed to some extent between the two schools and race effects were not very clear in School A due to the small number of racial minorities.

4.2. Measures

The key variables are briefly described below. Measures came from Wave 1 data, except information from Wave 2 (1996) and Wave 3 (2001–2002) used to supplement Wave 1 measures.

4.2.1. Friendship nominations

In the Wave 1 interviews, respondents were asked to nominate up to five female friends and up to five male friends.²

For friends attending the same school, identification numbers were recorded. Although students were allowed to nominate friends outside their school, the analyses reported here focused on friendship ties within each school. Close to 70% of the friendship nominations involved relationships in which both respondents attend the same school.³

4.2.2. Sexual orientation

Add Health included three sets of sexual orientation indicators—attraction, dating relationships, and self-identity. In Waves 1, 2, and 3, respondents reported if they had been attracted to males/females; and if they had any romantic or sexual relationships in the previous 18 months (Wave 1), since the last interview (Wave 2), and since the summer of 1995 (Wave 3). For up to three romantic and three sexual relationships, the sex of each partner was recorded. In Wave 3 only, respondents reported their sexual identity by choosing among “100% heterosexual,” “mostly heterosexual but attracted to the same sex,” “bisexual,” “mostly homosexual but attracted to the opposite sex,” and “100% homosexual.”

In this paper, sexual minority status was defined somewhat narrowly, on the assumption that clear and stable signs of homosexuality and bisexuality are likely to influence friendship development. Respondents were classified as sexual minorities if they showed one of the following response patterns: (1) reported both same-sex attraction and same-sex dating in Wave 1 or 2; (2) reported same-sex attraction in both Waves 1 and 2; (3) reported same-sex dating in both Waves 1 and 2; or (4) reported same-sex attraction or dating in Wave 1 or 2 *and* reported same-sex attraction, dating, or non-heterosexual identity (“bisexual,” “mostly homosexual,” or “100% homosexual”) in Wave 3. All other students were classified as straight. About 4.7% of female respondents and 2.0% of male respondents were classified as sexual minorities in the operational sample.⁴

4.2.3. Student backgrounds

The following independent variables were constructed from Wave 1 data. *Grade level*, ranging from nine to twelve, was treated as a continuous variable. *Race* was a dichotomous variable distinguishing non-white (coded as 1) from white students (coded as 0). Specific racial minority groups were too small to be treated as separate categories in the analysis. Those who reported Hispanic ethnicity were treated as non-white, regardless of their racial backgrounds. *Parents' education level*, a proxy measure for family socioeconomic background, distinguished students with at least one college-educated parent (coded as 1) from other students (coded as 0). *Religiosity* was measured in a summed scale of four items (e.g., “how important is your religion”), ranging from 1 to 16 ($\alpha = .82$). *Academic aptitude* was based on scores from the Add Health Picture Vocabulary Test (AHPVT), a modified version of the Peabody Picture Vocabulary Test—Revised (PPVT—R). The instrument has good reliability and validity, as demonstrated in previous research (Carvajal et al., 1993; Dunn and Dunn, 1981).⁵ Age-standardized scores were trichotomized into top 10%, middle 80%, and bottom 10% categories based on ranks within each school in order to capture the non-linear relationship between cognitive ability and friendship choice. *Dating experience* was a dichotomous variable, differentiating students who reported previous or ongoing romantic relationships in Wave 1 (coded as 1) from those who did not (coded as 0). When respondents did not provide valid data for these predictors in Wave 1, corresponding information from other waves was used. For other cases lacking information in at least one variable (8.1%), data were imputed from other study variables in using the “ice” command in Stata 9.2 (Royston, 2004).

4.2.4. Dyad similarities

Dyad similarity between nomination sender and receiver was computed for each background variable. For example, if both students had at least one college-educated parent or if neither of them did, the dyad was considered concordant (coded as 1), and other dyads were classified as discordant (coded as 0). For race, dyads were considered concordant only if both students belonged to the same racial category (non-Hispanic white, non-Hispanic black, Hispanic, Asian, or Native American). Unlike other variables, dating experience was not expected to operate as a dimension of homophily. Therefore, receiver dating experience was entered as a control variable, instead of concordance in dating experience status. For continuous

² Due to an error in administration in the survey, in 5% of the cases, respondents' nominations were limited to one male friend and one female friend. To control for this questionnaire discrepancy, a dichotomous variable was used initially, but it was dropped later due to its non-significant effect in the multivariate analyses.

³ The questionnaire asked students to list their boyfriends and girlfriends first, if they had any. Dyads with romantic nominations were treated as non-friend cases because the present paper focuses on platonic friendships. The identification numbers of romantic partners were not available in this version of Add Health. Therefore, the impact of romantic nominations on the present findings could not be investigated.

⁴ This coding strategy was intended to address the large number of students who reported same-sex attraction in Wave 1 or 2 but reported no other same-sex experience in any wave. Alternative coding schemes for sexual orientation were used in exploratory analyses, but they did not change the overall results.

⁵ The AHPVT involved an interviewer reading a word aloud and the respondent selecting from four pictures the one that best reflected the meaning of the word. The test included 87 items (half the items in the PPVT—R).

dimensions (religiosity and academic aptitude), an absolute difference between the two students' scores was computed for each dyad.

4.2.5. Network structure variables

The dyad-level analysis also included three control variables to take into account the correlations between substantive variables and network structure (discussed in the next subsection). *Sender out-degree* was the total number of nominations the sender gave. *Receiver in-degree* was the total number of nominations given to the receiver. *Absolute difference in in-degree* was computed from the numbers of nominations the two students received.

4.3. Analytic strategy

For the student-level data, *t* and chi-square tests were conducted to detect differences in backgrounds between straight students with and without sexual minority friends. For the dyad-level data, logistic regression models were used to predict friendship ties (1 = presence; 0 = absence) by sender backgrounds and dyadic similarities. These models are similar to p^* models (Anderson et al., 1999; Wasserman and Pattison, 1996), except that here only a limited number of structural variables (sender out-degree, receiver in-degree, and difference in in-degree) were included, in order to reduce the risk of over-controlling homophily effects (Quillian and Campbell, 2003). The dyad data structure implicitly controls for unequal opportunities for contact with groups of different sizes (straights vs. sexual minorities, whites vs. racial minorities).

The first set of models examined the effects of gender combinations by using dummy variables (female-to-male, male-to-female, male-to-male, with female-to-female dyads as the reference category). The model was run separately for same-orientation dyads (i.e., straight-to-straight dyads) and cross-orientation dyads (i.e., straight-to-sexual minority dyads). Due to the difference in sample size, same-orientation dyads were substantially more likely to show significant relationships than cross-orientation dyads. For this reason, I also considered the effect size differences to interpret differences between the two groups of dyads, instead of exclusively relying on *p* values. In order to test interaction between receiver sexual orientation and gender combinations, the combined sample of same-orientation and cross-orientation dyads was used. The interaction model included receiver orientation, all predictors from the stratified models, and all multiplicative terms between receiver orientation and each predictor.⁶ To help interpret the results from the interaction models, predicted probabilities were computed for each gender combination of same-orientation and cross-orientation dyads while holding control variables constant. The second set of logistic regression models examined the effects of other student background variables and was conducted separately for each gender combination because friendship formation processes may be specific to the sender's and receiver's gender, as explained earlier. Interactions between receiver sexual orientation and sender backgrounds were tested using a strategy similar to the first set of models. Although Add Health provided sampling weights, they were not used here because findings based on only two schools were not intended to be generalized to other schools in the US.

5. Results

5.1. Student-level analyses

Table 1 presents results from student-level bivariate analyses which compared key background characteristics of straight students with and without sexual minority friends. Among straight females, those with sexual minority friends were more likely than those without to be white and to place in the top 10% of academic aptitude and less likely to be in the bottom 10% of academic aptitude. Among straight males, those who had sexual minority friends were in slightly lower grade levels than those without sexual minority friends. For both straight females and males, students with sexual minority friends sent and received greater numbers of friendship nominations (i.e., high out-degree and in-degree), indicating that they were more integrated into the school friendship networks. Another way to interpret this finding is that having more friends increased the chance that these friends would include sexual minorities.

Table 1 highlights similarities between straight females who had sexual minority friends and sexual minority females in racial and academic backgrounds. That is, both groups were more likely to be white and to place in the top 10% of academic aptitude than straight females without sexual minority friends. The major difference between these two female groups was that the former group sent and received more friendship nominations. These differences in numbers of sent and received nominations also appeared between straight males with sexual minority friends and sexual minority males.

The findings from the student-level analyses were intuitively appealing, but they were limited for two reasons. First, the analyses did not help determine whether straight students' nominations of sexual minority friends resulted from their backgrounds or from their similarities to sexual minority friends. Second, the analyses did not take into account sexual minority friends' gender. The dyad-level analyses addressed these issues.

⁶ Although commonly used (Jaccard, 2001), these traditional tests of interactions in logistic regression models may be biased because the effects of independent variables are confounded with residual variation for each group (Allison, 1999). Alternative methods have been proposed, but none of them is widely accepted at this time. Allison's approach, for example, has received criticisms regarding problematic assumptions and limited practicality (Williams, 2009). Therefore, this paper presents results based on traditional tests.

Table 1

Student characteristics by gender, sexual orientation, and presence of sexual minority friends (student-level analysis).

	Females						
	Straight students						Sexual minority students (n = 58)
	No sexual minority friends (n = 1074)		Have sexual minority friends (n = 92)		Group difference		
	Mean	SD	Mean	SD		Mean	SD
Grade level	10.75	1.00	10.55	.99		10.60	.95
White	.33		.49		**	.41	
College ed. parent	.29		.32			.31	
Religiosity	11.10	3.56	10.70	3.75		10.53	3.97
Academic aptitude					***		
Top 10%	.08		.18			.12	
Middle 80%	.80		.76			.78	
Bottom 10%	.12		.05			.10	
Had romantic relation	.73		.70			.79	
Out-degree	3.13	2.68	5.13	2.21	***	2.95	2.85
In-degree	2.91	2.88	3.57	2.74	*	2.17	2.10
	Males						
	Straight students						Sexual minority students (n = 26)
	No sexual minority friends (n = 1235)		Have sexual minority friends (n = 67)		Group difference		
	Mean	SD	Mean	SD		Mean	SD
Grade level	10.75	.97	10.66	.98	*	10.77	1.18
White	.35		.40			.38	
College ed. parent	.31		.39			.31	
Religiosity	10.47	3.73	9.78	4.08		10.27	3.69
Academic aptitude							
Top 10%	.11		.10			.19	
Middle 80%	.81		.84			.69	
Bottom 10%	.09		.06			.12	
Had romantic relation	.66		.66			.85	
Out-degree	3.22	2.70	5.40	2.36	***	2.85	2.65
In-degree	2.60	2.65	3.27	2.96	*	2.58	2.96

Notes: For categorical variables, proportions are presented, instead of means.

Asterisks indicate significant differences between straight students with and without sexual minority friends based on two-tailed *t* tests for continuous variables and chi-square tests for categorical variables (**p* < .05; ***p* < .01; ****p* < .001).

5.2. Dyad-level analyses

Controlling for group size, cross-orientation (straight-to-sexual minority) dyads had a lower chance of friendship nominations than same-orientation (straight-to-straight) dyads. Out of 114,888 cross-orientation dyads, friendship ties were present in 175 dyads (.15%), whereas among 3,416,292 same-orientation dyads, friendship ties were present in 6697 dyads (.20%).

5.2.1. Gender patterns

The first set of dyad-level analyses identified gender patterns of friendship ties. Table 2 presents the results of logistic regression models run separately for same-orientation and cross-orientation dyads. In the model for same-orientation dyads, male-to-male dyads showed an odds ratio of .93, indicating that straight males were slightly less likely than straight females to nominate same-gender friends. Cross-gender dyads (female-to-male and male-to-female) had odds ratios much smaller than 1, suggesting lower chances of friendship nominations than same-gender dyads. Fig. 1 visually demonstrates these patterns using predicted probabilities.

The model for cross-orientation dyads showed different gender patterns of friendship nominations. Compared to female-to-female dyads, female-to-male dyads had about the same chance of friendship nominations (odds ratio of 1.10), whereas male-to-female and male-to-male dyads had much lower chances (odds ratios of .61 and .57 respectively). Thus, straight females were overall more likely than straight males to nominate sexual minority friends, consistent with Hypothesis 3A based on females' more positive attitudes toward sexual minorities (Horn, 2006; Loftus, 2001) and with Hypothesis 3B based on females' lower positions in the status hierarchy (Eder et al., 1995; Milner, 2006). As shown in Fig. 1, this gender difference mainly resulted from straight females' increased chance and straight males' reduced chance of nominating sexual minority male friends, compared to their nomination patterns in same-orientation dyads. Further, in cross-orientation dyads, the chance of friendship nominations was significantly higher in female-to-male dyads than in male-to-female dyads ($\chi^2 = 6.74$, $df = 1$, $p < .01$). This pattern was consistent with Hypothesis 4 that straight females are more likely than straight

Table 2

Logistic regression models predicting presence of friendship ties by gender and sexual orientation (dyad-level analysis).

	Same orientation (Receiver straight)	Cross orientation (Receiver sex. min.)
Female to female (reference)		
Female to male	0.52***	1.10 ^a
Male to female	0.59***	0.61*
Male to male	0.93*	0.57*
School A (vs. B)	2.03***	1.83***
Sender out-degree	1.14***	1.14***
Receiver in-degree	1.19***	1.22***
Difference in in-degree	0.94***	0.90**
<i>n</i>	3,416,292	114,888
Dyads with friendship ties	6697	175

Notes: Odds ratios are presented.

* $p < .05$; ** $p < .01$; *** $p < .001$.Superscripts indicate significant interactions between receiver sexual orientation and each predictor in a combined sample. ^a $p < .001$.

The interaction model included receiver orientation, all predictors from the stratified models, and all multiplicative terms between receiver orientation and each predictor.

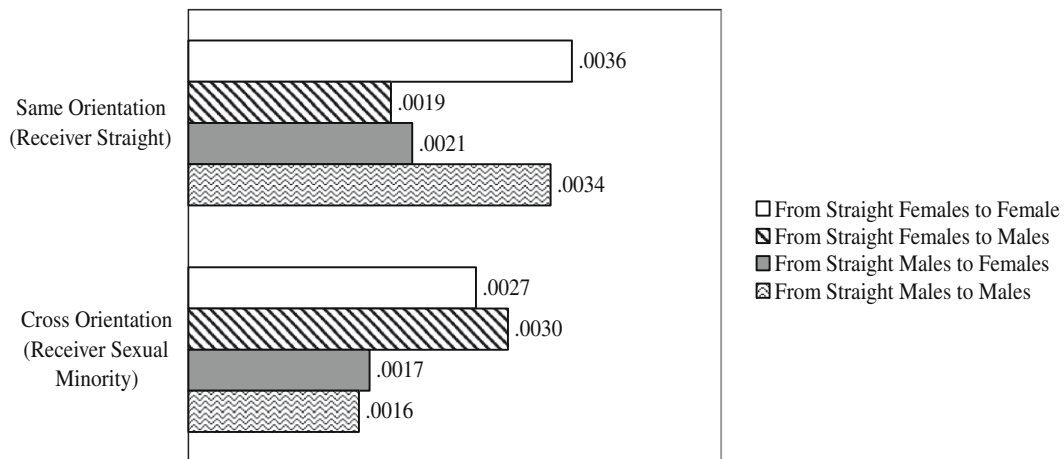


Fig. 1. Predicted probabilities of friendship nominations by receiver sexual orientation and sender–receiver gender combination. Notes: Predicted probabilities are based on logistic regression models stratified by receiver sexual orientation (see Table 2). Control variables are held constant at the following values: School A = 1; sender out-degree = 3; receiver in-degree = 3; absolute difference in in-degree = 2.52.

males to choose sexual minority friends of the opposite gender, based on the argument that females are more strongly motivated to avoid sexual tension in cross-gender friendships.

Comparisons between same-orientation and cross-orientation dyads showed mixed results for **Hypothesis 2** that homophily operates more weakly in cross-orientation dyads than in same-orientation dyads. Consistent with the hypothesis, straight females were more likely to nominate male friends in cross-orientation dyads than in same-orientation dyads (i.e., weaker gender homophily in cross-orientation dyads). Contrary to the hypothesis, however, straight males were no more likely to nominate female friends in cross-orientation dyads than in same-orientation dyads. In a follow-up analysis (not shown here), these unique gender patterns of cross-orientation dyads persisted after introducing other variables (race, parent education, religiosity, academic aptitude, and dating experience).

5.2.2. Homophily effects

The second set of logistic regression models predicted presence of friendship ties by other sender attributes and dyadic similarities for each gender combination of same-orientation and cross-orientation dyads. Table 3 summarizes the results.

Some student background characteristics showed strong homophily effects, in line with **Hypothesis 1** and with previous studies (e.g., Hallinan and Williams, 1989; Kandel, 1978; Moody, 2001). Concordance in grade level was a consistent predictor of friendship ties; regardless of gender combination and receiver's sexual orientation, the chance of friendship nominations was higher when students were in the same grade level. Similarly, racial homophily shaped friendship ties across all gender combinations of same-orientation and cross-orientation dyads. As indicated by negative coefficients for sender–receiver absolute difference, academic aptitude and religion showed homophily tendencies, although the effects were weaker and less consistent across dyad groups than the race and grade-level homophily.

Table 3

Logistic regression models predicting presence of friendship ties by sender attributes and dyadic similarities (dyad-level analysis).

	Nominations from straight females to:				Nominations from straight males to:			
	Straight females	Sex. min. females	Straight males	Sex. min. males	Straight females	Sex. min. females	Straight males	Sex. min. males
Sender grade level	1.06*	0.97	0.98	0.97	1.08**	1.17	1.01	0.82
S–R same grade level	8.03***	4.78***	3.80***	4.35***	4.47***	3.72***	5.80***	17.28***
Sender white	1.65*	2.48	0.45*	10.52***c	0.71	0.32	1.53**	3.22
S–R same race	10.24***	2.97***c	4.73***	16.18***	5.77***	4.00***	6.50***	4.63*
Sender col. ed. parent	1.27***	1.09	1.15*	3.14***a	1.14*	2.08*	1.10*	1.58
S–R same parent ed.	1.19***	1.34	1.25***	2.54*	1.25***	2.01*	1.15**	1.52
Sender religiosity	1.00	0.99	1.02	0.99	1.00	0.97	1.00	0.92
S–R absolute difference in religiosity	0.96***	1.03 ^a	0.96***	1.07	0.97***	1.05	0.94***	0.87
<i>Sender academic aptitude</i>								
Top 10%	1.32***	2.03*	1.11	4.41***c	1.35***	1.07	1.26**	1.09
Bottom 10%	1.15	0.52	0.92	0.41	0.85	0.34	1.01	2.74
S–R absolute difference	0.98***	0.99	0.99***	0.97	0.98***	0.97*	0.98***	0.98
Sender had dated	1.01	0.91	1.01	0.86	1.05	0.83	0.94	1.44
Receiver had dated	0.90*	0.65	1.23**	1.46	1.40***	0.57 ^b	1.04	0.75
Sender out-degree	1.09***	1.03	1.21***	1.25***	1.21***	1.14*	1.08***	1.20*
Receiver in-degree	1.15***	1.20**	1.23***	1.28***	1.22***	1.24**	1.15***	1.06
S–R absolute difference	0.92***	0.90	0.96**	0.97	0.97**	0.96	0.95***	0.85
School A (vs B)	0.70	0.86	2.18*	0.04***c	1.20	2.27	0.86	0.34
<i>n</i>	765,140	37,558	852,250	16,822	852,250	41,790	946,652	18,718
Dyads with friendship ties	1999	68	1107	37	1354	48	2237	22

Notes: Odds ratios are presented.

"S–R" refers to sender–receiver attributes.

* $p < .05$; ** $p < .01$; *** $p < .001$.Superscripts indicate significant interactions between receiver sexual orientation and each predictor in a combined sample (e.g., Nominations from Straight Females to Straight Females combined with Nominations from Straight Females to Sexual Minority Females). ^a $p < .05$; ^b $p < .01$; ^c $p < .001$. The interaction models included receiver orientation, all predictors from the stratified models, and all multiplicative terms between receiver orientation and each predictor.

Comparisons between same-orientation and cross-orientation dyads showed little support for [Hypothesis 2](#) that the difference in sexual orientation reduces the strength of homophily in other dimensions. Same-orientation and cross-orientation dyads revealed no significant differences in the homophily effects in grade level, race, and academic aptitude. The only exception to this pattern was that straight females were less likely to choose friends who had different racial background and different religiosity levels when nominating sexual minority female friends than straight female friends, although the homophily effect in racial background was still present in these cross-orientation dyads.

5.2.3. Sender background effects

Beyond homophily, cross-orientation dyads showed five significant sender attribute effects. Three of these effects appeared in dyads from straight females to sexual minority males. In these dyads, whites and those with college-educated parents and high academic aptitude were more likely than other straight females to nominate sexual minority males as friends. These sender attribute effects were significantly stronger in cross-orientation dyads than same-orientation dyads as shown by significant interactions in [Table 3](#). [Fig. 2a](#) graphically demonstrates the effect of parent education. Straight females with college-educated parents were more likely to nominate straight male friends than sexual minority male friends. In contrast, straight females who had parents without college degrees were less likely to nominate male friends when potential friends were sexual minorities as opposed to straight. As shown in [Fig. 1b](#), the pattern for academic aptitude was somewhat different: Straight females with high aptitude were much more likely to nominate sexual minority males than straight males, whereas potential male friends' sexual orientation did not seem to have strong impact on nominations from straight females with average and low aptitude.

Sender attribute effects also appeared in cross-orientation dyads of other gender-combinations. Straight females with high academic aptitude were more likely than those with average aptitude to nominate sexual minority females. Straight males with college-educated parents were more likely than other straight males to choose sexual minority female friends. These sender attribute effects were not significantly stronger in cross-orientation dyads than in same-orientation dyads, however.

These five sender attribute effects are consistent with [Hypotheses 3A](#) that background characteristics linked to positive attitudes toward sexual minorities increase the chance of befriending sexual minority students, although these effects were limited to certain gender combinations. At the same time, the sender effect of white race in dyads from straight females to sexual minority males was contrary to [Hypothesis 3B](#) that background characteristics linked to low positions in the status hierarchy increase the chance of nominating sexual minority friends.

Both as a sender attribute and a dimension of homophily, religiosity showed very little impact on friendship nominations. In response, religious affiliation was used as an alternative measure. The follow-up analysis did not reveal any stronger relationships with friendship nominations, however.⁷ The overall small effects of religion might be due to the unique student composition of the two schools in the subsample. Compared to other schools in Add Health, School A had somewhat higher proportions of mainline Protestant students and those with no religion, and School B included a higher proportion of Catholic students, many of whom were from Hispanic background.

5.2.4. Dating status

Drawing from the literature on friendships between straight women and gay men ([Moon, 1995](#); [Nardi, 1999](#)), [Hypothesis 5](#) proposed that straight females with no dating experience would be more likely than other straight females to nominate sexual minority males. The analysis showed no effect of dating status in these dyads, however.⁸ Further, dating experience did not predict friendship ties in the other gender-combination of cross-orientation dyads. In same-orientation dyads, both females and males were *more* likely to nominate opposite-gender students with dating experience than those without dating experience. This finding might reflect that these students nominated datable students or those whom they had previously dated.

6. Discussion

Consistent with [Hypothesis 1](#), straight students are more likely to befriend sexual minorities who share their backgrounds than those who do not. Homophily operates strongly in race and grade level and only moderately in parent education, religiosity, and academic aptitude. Contrary to [Hypothesis 2](#), these homophily effects are not necessarily weaker in cross-orientation dyads than same-orientation dyads. Beyond homophily, some background characteristics (white race, parent college education, and high academic aptitude) increase straight students' chance of having sexual minority friends in certain gender

⁷ The follow-up analysis used the classification of five religious affiliations (mainline Protestants, conservative Protestants, Catholics, other religions, and no religion) presented in [Adamczyk and Felson \(2006\)](#).

⁸ The failure to find the expected relationship between dating experience and friendship choice prompted an exploratory analysis using alternative measures of dating experience. One alternative variable, for example, measured students' current dating status, instead of combining current and previous involvement. Another variable measured the total number of previous and current romantic partners, as opposed to dichotomized status. A third focused on presence and absence of boyfriends or girlfriends at school. Another set of variables included non-romantic sexual partners. These variables showed no or only very weak relationships with friendship nominations in dyads between straight females and sexual minority males, and showed similarly weak relationships in other dyads.



Fig. 2. Predicted probabilities of friendship ties by sender parent education and academic aptitude (dyads from straight females to straight males and sexual minority males). *Notes:* Predicted probabilities are based on logistic regression models stratified by receiver sexual orientation (see Table 3). Control variables are held constant at the following values: sender grade = 10; same grade = 1; sender white = 1; same race = 1; sender college educated parents = 1 for (b); same parent education = 1; sender religiosity = 10.73; absolute difference in religiosity = 0; academic aptitude top 10% = 0 for (a); bottom 10% = 0 for (a); absolute difference in academic aptitude = 0; sender dated = 1; receiver dated = 1; School A = 1; sender out-degree = 3; receiver in-degree = 3; absolute difference in in-degree = 2.52.

combinations of cross-orientation dyads. These sender background effects indicate that straight students' nominations of sexual minority friends are driven by positive attitudes toward sexual minorities linked to these background characteristics (Hypothesis 3A) rather than low social status at school (Hypothesis 3B). Consistent with Hypothesis 4, straight females are more likely than straight males to befriend sexual minorities of the opposite gender, but in these dyads, a lack of dating experience does not necessarily increase the chance of friendship nominations, contrary to Hypothesis 5.

6.1. Homophily

Although cross-orientation friendships are transformative in the sense that they transcend the group boundary between sexual minorities and straight people (Muraco, 2006), they have limits. The present results show that cross-orientation friendships are no less constrained than same-orientation friendships by other group boundaries such as race, grade level, and academic aptitude, consistent with previous studies that emphasized the persistence of homophily effects (e.g., Hallinan and Williams, 1989; Kandel, 1978; Joyner and Kao, 2000). The strong homophily tendency implies that the benefits of cross-orientation friendships are not widely distributed. For example, although straight students with cross-orientation relationships have opportunities to learn about sexual diversity (Goodenow et al., 2006; Lee, 2002; Uribe, 1993), they are exposed only to sexual minorities who share their backgrounds and may not necessarily learn about the diversity that exists within the sexual minority population. Similarly, although sexual minorities can rely on their straight friends for social support

(Beals and Peplau, 2006; Ueno et al., 2009), their support networks do not necessarily extend across social boundaries, thereby limiting the range of available resources.

The constraining aspect of homophily should not be overemphasized, however, because homophily also provides opportunities for the development of cross-orientation friendships. Some straight and sexual minority students become friends *because* they share those backgrounds. The development of cross-orientation friendships is further enhanced by the fact that sexual orientation is only moderately correlated with other background characteristics (i.e., “intersecting” condition, Blau, 1977). The condition allows straight students, regardless of the configuration of their backgrounds, to befriend sexual minority students. From sexual minorities’ perspective, their sexual orientation does not strongly reduce the chance of finding straight friends who share backgrounds. This enabling aspect of homophily in cross-orientation friendships may thus partly explain previous findings that sexual minority students are not necessarily isolated at school or pushed into sexual minority enclaves (Diamond and Lucas, 2004; Ueno, 2005).

The enabling aspect of homophily has positive implications. The ability of cross-orientation friendships to promote straight students’ tolerance (Castro-Convers et al., 2005; Galupo and St. John, 2001; Weinstock and Bond, 2002) may be enhanced by the fact that straight students learn about sexual diversity from sexual minority friends with whom they can identify in some respects. Further, even if cross-orientation friendships within existing social boundaries do not create bridges that reach a diverse body of straight and sexual minority students, they may promote solidarity within those social groups. Although these advantages of homophily in cross-orientation friendships depend on sexual minority students’ decisions to disclose their orientation to straight friends, the greater closeness in homophilous friendships (Schneider et al., 2007; Kao and Joyner, 2004) may contribute to sexual minorities’ willingness of orientation disclosure.

6.2. Sender attribute effects

Some straight students’ background characteristics are associated with an increased chance of choosing sexual minority friends beyond homophily. Specifically, among straight females, those who are white and have college-educated parents and high academic aptitude are more likely than others to nominate sexual minority males as friends. These results are consistent with previous studies of adults, which demonstrated that people from white and high socioeconomic backgrounds hold more positive attitudes toward sexual minorities (Herek and Glunt, 1993; Loftus, 2001). The effect of academic aptitude may indicate the impact of family socioeconomic background which is not fully captured by the dichotomous measure of parents’ education level. It is also possible that high academic aptitude contributes to greater acceptance of sexual minorities, independent of family socioeconomic status, by increasing cognitive sophistication necessary to evaluate complex and new ideas and thus promoting tolerance for nonconformity (Ohlander et al., 2005). Related to the effect of academic aptitude, when GPA was used as an alternative measure in an exploratory analysis, it did not show a significant sender effect. Perhaps GPA reflects student effort and commitment as well as aptitude, and those elements do not increase straight students’ chance of becoming friends with sexual minority students. These three sender attribute effects are specific to dyads from straight females to sexual minority males. One possible explanation is that straight females’ greater acceptance of sexual diversity (Herek, 2002; Horn, 2006) and lower positions in the status hierarchy at school (Eder et al., 1995; Milner, 2006) allow these sender attribute effects to appear, whereas straight males’ overall negative attitudes and higher status suppress these effects.

These sender attribute effects are contrary to the hypothesis that student backgrounds linked to low positions in the status hierarchy increase the chance of having sexual minority friends. Status hierarchies and friendship patterns vary across schools with different student composition (Moody, 2001; Mouw and Entwisle, 2006; Perry, 2001; Milner, 2006), and further examinations of the hypothesis require data from a large number of schools with various student composition.

6.3. Gender effects

Straight females and sexual minority males have a greater chance of developing friendships than any other gender combination of cross-orientation dyads. This pattern is in line with a previous student-level finding that sexual minority males have more cross-gender friendships than do straight males and sexual minority females (Diamond and Dube, 2002). By using dyad-level data and by shifting the focus to straight students’ friendship choice, however, the current study demonstrated that straight females are more likely than straight males to nominate sexual minority males, and that straight females are more likely to nominate sexual minority males than to nominate straight males, controlling for group size.

One possible explanation for the higher rate of friendships in this gender combination is that the difference in sexual orientation between the two parties reduces barriers to cross-gender friendships. Straight females may be less concerned about receiving unwanted romantic and sexual overture when interacting with sexual minority male friends. The reduced tension might be more important for straight females than straight males because of their role as the defender in romantic and sexual relations (Rose and Frieze, 1993).

The analysis did not support the hypothesis that straight females lacking dating experience become friends with sexual minority males. Further, using alternative measures of dating experience did not reveal the expected patterns. The existing literature on friendships between straight women and gay men focuses on adulthood (Moon, 1995; Nardi, 1999). Possibly, the phenomenon is dependent on an individual’s stage in the life course. For example, a lack of dating experience in adoles-

cence may not be as stigmatizing as in adulthood. It is also possible that a long history of non-dating status exerts a unique effect on straight females' friendship choice in adulthood.

The lack of dating experience effect across dyad groups raises a question as to why a negative stereotype exists only for straight females who have sexual minority male friends and not for other straight people with sexual minority friends. As the analysis showed, this gender combination is more common than others. Thus, these straight females may be more visible than other straight people who have sexual minority friends.

6.4. Limitations

The study has some limitations. First, in order to reduce complexity and maintain the size of the sexual minority group, the present analysis did not distinguish between students who reported same-sex experience only and those who reported both same-sex and opposite-sex experience. It is possible, however, that straight students' friendship choice may be affected by their potential sexual minority friends' opposite-sex experience (Galupo, 2007). Second, Add Health provided no information about students' knowledge about their friends' sexual orientation and did not include direct measures of students' attitudes toward sexual minorities. Third, the analysis was based on data from students at only two schools. Future studies are necessary to determine the extent to which the current findings apply to other schools and to identify any school characteristics that influence the presence of cross-orientation friendships (e.g., presence of gay-straight alliances, Goodenow et al., 2006).

Fourth, Add Health is a longitudinal survey, but the current analysis used only Wave 1 data to maximize the number of sexual minority respondents in the operational sample. The cross-sectional design limited the ability to establish causal order. For example, the homophilous tendency in cross-orientation friendships indicates at least two possible causal processes: (1) straight students befriend sexual minority students who have similar backgrounds; or (2) friendships develop among students who share backgrounds, and emerging awareness of friends' same-sex orientation does not undermine the stability of these homophilous friendships.

7. Conclusions

Extending the literature on cross-group friendships, this study shed light on the role of sexual orientation as a dimension of intergroup friendship formation. Cross-orientation friendships seem to differ from other cross-group friendships (e.g., cross-gender and cross-race friendships) in that the group boundary exerts only weak effects on friendship formation. Controlling for group size, straight students are only slightly less likely to have sexual minority friends than to have straight friends, and potential friends' sexual orientation does not have a strong influence on the strength of homophily in other dimensions except gender. Beyond homophily, some backgrounds of straight students influence their chances of having sexual minority friends, but those effects are specific to straight students' and sexual minority students' gender. The subtle impact of sexual orientation as a group boundary could mean that sexual orientation does not negatively impact sexual minority students' social experience. On the other hand, the overall small effect on friendship patterns may reflect sexual minority students' invisibility and efforts to hide their sexual orientation. Interpreted this way, the present findings raise a concern about stigma attached to same-sex sexuality.

These patterns of cross-orientation friendships may be unique to the school context and to the adolescent life stage. Some cross-orientation friendships dissolve after high school graduation. With age, straight people's attitudes toward sexual minorities may change, and sexual minorities may develop strong sexual identities and become more open about their orientation. Also, sexual orientation may influence life stage transitions that provide the contexts for new friendships, including relocations, career trajectories, marriage, and parenting. Diverging lifestyles between sexual minorities and straight people may therefore create different patterns of cross-orientation friendships in adulthood.

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