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Single-Sex Schooling: Friendships, Dating, and Sexual Orientation

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Abstract
Single-sex schooling has been controversial for decades. The current study investigated the differences in friendships, dating, and past, present, and ideal sexual orientation, between 207 college students who attended single-sex secondary schools and 249 college students who attended coeducational secondary schools in Hong Kong, controlling for personal characteristics such as socioeconomic status. We found that, compared to graduates of coeducational schools, graduates of single-sex schools reported a different gender composition in intimate friendships favoring the same sex, less romantic involvement with other-sex close friends, older age at first date, fewer boyfriends or girlfriends, and more past same-sex sexuality. In contrast, we found no significant differences in the interactions with same-sex versus other-sex friends, most aspects of past or present dating engagement, or self-reported present or ideal sexual orientation. These findings give insight into the interpersonal outcomes of single-sex schooling and fill a gap in previous research which has focused on academic achievement and gender role stereotypes.

Keywords Single-sex school · Sexual orientation · Friendship · Dating · Romantic love

Introduction

Single-sex schooling is currently one of the most controversial subjects in developmental and educational research. In the U.S., where most research and debates occur, single-sex schooling has been reviving, as more public schools were allowed to segregate boys and girls following the reinterpretation of Title IX of the U.S. Education Amendments in 2006 (reviewed in Halpern et al., 2011; Liben, 2015). In other parts of the world, too, single-sex schools represent a sizeable portion in the education system, and they appear to be on the rise (e.g., Chiu, 2008; Herr & Arms, 2004; Younger & Warrington, 2006). For example, in Hong Kong, single-sex schooling was common during the British colonial era in the 1900s, and approximately 16% of secondary schools remain single-sex today (Chiu, 2008; Ho, 2004).

The large number of students receiving single-sex schooling and the increasing popularity of single-sex schooling both call for more comprehensive, evidence-based evaluations of the developmental impacts of single-sex schooling. However, recent reviews pointed out a dearth of research on the interpersonal outcomes of single-sex schooling, including friendships and romantic and sexual relationships (Mael, Alonso, Gibson, Rogers, & Smith, 2005; Pahlke, Hyde, & Allison, 2014; Sullivan, Joshi, & Leonard, 2012). These outcomes are nevertheless important developmental phenomena and have been of concern to parents, teachers, and other stakeholders (Bigler, Hayes, & Liben, 2014; Fabes, Pahlke, Borders, & Galligan, 2015; Faraday, 1989; Gurian, Henley, & Trueman, 2001; Sax, 2005; Sullivan et al., 2012). Thus, to help fill the gap in the empirical literature, we compared same-sex friendships, dating experiences, and past, present, and ideal sexual orientation of graduates of single-sex schools and of coeducational schools.

Single-Sex Schooling and Interpersonal Development

Secondary schools provide a rich context for adolescents to socialize. Among all social interactions, at least three types are prominent to adolescents. First, same-sex friendships continue to dominate adolescents' social life (Clark & Ayers, 1992; Pelligrini & Long, 2003; Poulin & Pedersen, 2007), while other-sex interactions and friendships become more important in adolescence than in childhood (Mehta & Strough, 2009). Second, dating activities are increasingly common from early to late adolescence, although individual differences have been

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found in the age of first date and in dating involvement (Carver, Joyner, & Udry, 2003; Connolly & McIsaac, 2009; Laursen, & Williams, 1997; Smetana, Campione-Barr & Metzger, 2006). Third, adolescents engage in a variety of same-sex or other-sex sexual activities (Diamond, Bonner, & Dickenson, 2015; Udry, 1988; Udry & Billy, 1987), which are partly influenced by sexual orientation—a multidimensional construct describing sexual attraction, sexual fantasies, and sexual behavior, among others, to the same sex, to the other sex, to both sexes, or to neither sex (Savin-Williams, 2006).

It has been suggested that single-sex schooling may have a different impact than coeducational schooling on same-sex friendships, dating, and sexual orientation (Bigler et al., 2014; Fabes et al., 2015; Faraday, 1989; Gurian et al., 2001; Sax, 2005; Sullivan et al., 2012). The deprivation hypothesis proposes that sex segregation leads to increased same-sex interactions and reduced other-sex interactions, which fosters sex-typed play styles and social norms, and in turn further encourages sex segregation (Leaper, 1994; Maccoby, 1988). Partly supporting the deprivation hypothesis, one study reported that single-sex classrooms increased boys', although not girls', same-sex friendships (Barton & Cohen, 2004). Another study in Hong Kong found that students of single-sex schools were less satisfied with their other-sex friendships (Cheung & McBride-Chang, 2007). However, both studies were uncontrolled (see below) and had small samples, which may have undermined the reliability and validity of the conclusions.

The deprivation hypothesis also predicts that sex segregation contributes to reduced heterosexual dating involvement and satisfaction, due to limited opportunities in other-sex interactions and discomfort with other-sex interaction styles (Leaper & Anderson, 1997). To test this hypothesis, Bruce and Sanders (2001) asked university students to report romantic experience with the other sex in the past 3 years. In contrast to the deprivation hypothesis, in 6 of 8 comparisons, single-sex school graduates reported no significant differences than coeducational school graduates, suggesting that heterosexual romantic episodes among graduates from single-sex schools were not noticeably thwarted by the lack of other-sex interactions in the single-sex school system. However, this study focused on romantic involvement in a restricted time period (the 3 years preceding the study), thus overlooking lifetime experiences, such as age at first date or lifetime number of dating partners. It is possible that single-sex schooling would delay age at first date and reduce the lifetime number of dating partners because of sex segregation, which were not captured by Bruce and Sanders. On the other hand, sex segregation may increase same-sex dating, so when all types of romantic relationships are considered, few differences in past or present dating experiences may be found by school type.

Another social domain that may be influenced by sex segregation is sexual orientation. For example, previous studies have found that adults in single-sex environments were more likely to self-identify as a sexual minority or report more same-sex sexual behavior than adults in the general population, such as women in the military (Gates, 2005, 2010) and women and men in prison or correctional facilities (Bancroft, 2009; Halleck & Hersko, 1962; Kinsey, Pomeroy, & Martin, 1948; Kinsey, Pomeroy, Martin, & Gebhard, 1953; Meyer et al., 2017; Sagarin, 1976). While part of this increased same-sex sexuality may be attributed to sex segregation, it may also reflect gender nonconforming interests among sexual minority adults (e.g., sexual minority women may be more likely than heterosexual women to be interested in military service). Moreover, it remains unknown whether the increased same-sex sexuality lasts after leaving these single-sex contexts and having access to potential other-sex sexual partners.

To our knowledge, only one study directly examined the relation between sexual orientation and single-sex versus coeducational schooling. Wellings, Wadsworth, and Johnson (1994) analyzed data from the 1990 British National Survey of Sexual Attitudes and Lifestyles. It was found that for men only, those who had attended single-sex schools were more likely to report having a same-sex partner in the lifetime than participants who had attended coeducational schools, but there was no significant difference between graduates of the two types of schools in having a same-sex partner in the last 5 years for either men or women. Wellings et al. suggested that sex segregation at school increased same-sex sexual expressions but that this effect decayed after graduation. However, the conclusions from Wellings et al. were limited, because their analyses relied on a single item asking about only one aspect of sexual orientation (having a same-sex partner), which might involve more measurement error than assessing multiple aspects of sexual orientation (Savin-Williams, 2006).

Confounding Factors in Research on Single-Sex Schooling

Because random assignment into different types of schools is often not possible (for examples of experimental studies, see Pahlke, Hyde, & Mertz, 2013; Park, Behrman, & Choi, 2013), past studies have highlighted the importance of accounting for potentially confounding differences between single-sex and coeducational school students (Bigler et al., 2014; LePore & Warren, 1997; Pahlke et al., 2014; Signorella, Hayes, & Li, 2013). For example, prior studies have suggested that the advantages in single-sex schooling over coeducational schooling in academic outcomes and gender stereotyping may result from higher socioeconomic status (SES) and higher prior educational attainment of students admitted to single-sex schools, rather than the effect of single-sex schooling itself. A recent meta-analysis concluded that although single-sex schools showed modest advantages in academic achievement, these advantages were not due to single-sex schooling per se, as these advantages became

minimal or nonsignificant once the analyses were restricted to studies of higher quality (i.e., studies that controlled for at least one individual difference between single-sex and coeducation school students or used random sampling) (Pahlke et al., 2014). These confounding effects of individual differences may also affect other domains of development, including interpersonal relationships. For example, the distribution of self-reported sexual orientation has been found to relate to SES: Higher SES associated with more same-sex sexual experience (Mercer et al., 2013). Therefore, increased same-sex sexual experience among single-sex school graduates reported by Wellings et al. (1994) may reflect higher SES of single-sex students than coeducational school students, rather than differences in schooling. Hence, it is important to control for potential confounding factors when examining the relation between single-sex schooling and interpersonal outcomes.

This Study

In this first controlled study of single-sex schooling and sexual orientation, friendships, and dating, we asked graduates of single-sex and coeducational schools in Hong Kong to report their preference for same-sex friends, dating experience, and past, present, and ideal sexual orientation. We controlled for parental income and education as indicators of SES, because SES is on average higher in single-sex school students (Bigler et al., 2014). We additionally controlled for age, ethnicity, school's academic banding, year of study at university, and years of post-secondary (non-tertiary) education before university. Lastly, we controlled for the numbers of siblings, because sibling gender correlates with dating-related outcomes (Doughty, Lam, Stanik, & McHale, 2015), and because the number of older brothers correlates with sexual orientation in males (Blanchard, 1997; Blanchard & VanderLaan, 2015; Bogaert & Skorska, 2011).

Based on the deprivation hypothesis (Leaper, 1994; Maccoby, 1988) and prior studies, we hypothesize:

1. Single-sex school graduates would have a larger proportion of same-sex friends compared to coeducational school graduates and would have an increased preference for same-sex friends in various gender-neutral activities.
2. Past or current dating involvement and relationship commitment are similar among single-sex and coeducational school graduates, but single-sex school graduates may experience delayed dating activities and/or have a smaller number of dating partners than coeducational school graduates due to restrained availability of other-sex partners.
3. Compared to coeducational school graduates, single-sex school graduates would report increased same-sex sexuality in secondary schools, but not increased present or ideal same-sex sexuality.

Method

Participants

Participants were recruited from a large university in Hong Kong through advertisements posted in campus, halls, snowballing, and the participant pool of the undergraduate-level course Introduction to Psychology. Ethical approval was obtained from the Human Research Ethics Committee of a local university. Participants completed a questionnaire in the laboratory and received either HK$100 (~ US$13) or course credits as compensation for participating in a study on single-sex schooling and gender development. The number of participants was roughly balanced by secondary school type and by participant gender. Participants who switched between single-sex and coeducational schools were excluded from analysis ($n = 27$). The final sample consisted of 456 participants (239 females; 52.4%) who either attended single-sex schools ($n = 207$) or coeducational schools ($n = 249$) for secondary education. This sample size was adequate to detect effect sizes as small as $d = 0.26$, with power of 0.8 and an α of .05, two-tailed (Faul, Erdfelder, Lang, & Buchner, 2007).

Compared to the Hong Kong census data (Census and Statistics Department of the Government of the Hong Kong Special Administrative Region, 2012, 2016), the current sample closely represented the Chinese ethnic group (97.6% in the current sample versus 93.6% in the 2011 population census) but under-represented low-income households (10.5% of the participants reported monthly parental income less than HK$10,000 [~ US$1288] compared to 18.3% of all the HK domestic households in the third quarter of 2016). This latter difference is expected given that the sample involved college students and single-sex school attendees, who typically come from higher SES households (Bigler et al., 2014). The median household income of the sample was representative of undergraduate students from several local universities (e.g., Hong Kong Polytechnic University, 2016; Wong, 2017; Yuen, n.d.).

Table 1 shows detailed personal characteristics by secondary school type. Overall, only a few significant differences were found between graduates of single-sex schools and graduates of coeducational schools. Parents of participants who attended single-sex schools received higher levels of education than did parents of participants who attended coeducational schools. Participants from single-sex schools on average received secondary training from more academically competitive schools (i.e., higher mean school band) and were more likely to be admitted to university directly after graduation from secondary schools than did participants from coeducational schools.

Table 1 Participant characteristics by school type

Variable	Single-sex school	Coeducational school	Comparison	
	M (SD) or *n* (%)	*M* (SD) or *n* (%)	χ^2 (*df*) or *t*(*df*)	*p*
Age (years; range: 17–25)	19.45 (1.43)	19.59 (1.51)	1.02 (454)	.311
Gender			0.08 (1)	.777
Male	97 (46.9)	120 (48.2)		
Female	110 (53.1)	129 (51.8)		
Ethnicity			1.49 (1)	.222
Chinese	204 (98.6)	241 (96.8)		
Other	3 (1.4)	8 (3.2)		
Monthly parental income (HK$)[a]			8.61 (5)	.126
0–5999	14 (7.1)	28 (12.1)		
6000–9999	1 (0.5)	5 (2.2)		
10,000–25,999	60 (30.5)	76 (32.9)		
26,000–49,999	46 (23.4)	57 (24.7)		
50,000–79,999	39 (19.8)	33 (14.3)		
80,000 and above	37 (18.8)	32 (13.9)		
Highest parental education attainment[b]			15.70 (4)	.003
Primary or lower	4 (2.0)	15 (6.1)		
Junior secondary	11 (5.5)	34 (13.8)		
Senior secondary	73 (36.3)	90 (36.6)		
Post-secondary	68 (33.8)	65 (26.4)		
Postgraduate	45 (22.4)	42 (17.1)		
Number of elder brothers (range: 0–3)	0.15 (0.40)	0.20 (0.43)	1.08 (454)	.281
Number of elder sisters (range: 0–3)	0.27 (0.56)	0.32 (0.58)	0.97 (454)	.335
Number of younger brothers (range: 0–4)	0.20 (0.40)	0.22 (0.50)	0.63 (454)	.532
Number of younger sisters (range: 0–3)	0.20 (0.44)	0.24 (0.50)	0.95 (454)	.345
Years of study at current university (range: 1–5)	2.18 (1.22)	2.08 (1.14)	0.93 (454)	.354
Years of post-secondary education before current university (range: 0–3)	0.00 (0.00)	0.21 (0.57)	5.76 (248)[d]	<.001
Mean school banding for all secondary schools (range: 1–3)[c]	1.05 (0.23)	1.19 (0.45)	4.41 (358.92)[d]	<.001

Original data (before multiple imputation) are presented. For continuous variables, *M*, *SD*, *t*, and *df* are reported; for categorical variables, *n*, column percentage, χ^2, and *df* are reported

[a]Cutoff values roughly correspond to the 10th, 20th, 50th, 80th, and 90th percentiles of Hong Kong monthly domestic household income in the third quarter of 2016 (Census and Statistics Department of the Government of the Hong Kong Special Administrative Region, 2016)

[b]Controlled as a continuous variable in analyses reported in "Appendix B"

[c]School bandings represent academic standards for student admissions. Band 1 schools set the highest standards; Band 3 schools set the lowest standards

[d]Because group variances were not equal, adjusted *df* was used

Measures

Secondary School Type

Participants reported starting and ending dates for each secondary school they attended, as well as the name of the school, school type (single-sex or coeducational), and school banding ranked by academic quality (1 = highest standard, 3 = lowest standard). Research assistants searched school information online to verify self-reported school type and school banding.

Same-Sex Friendships

Based on research on peer gender preference (Leaper, 1994; Mehta & Strough, 2009), various characteristics were inquired regarding current relationships with friends (defined as someone whose name the participant knew and with whom the participant went out on activities in groups but not alone) and with close friends (defined as someone whose name the participant knew, with whom the participant went out on activities in groups or alone, with whom the participant shared emotional

feelings, and from who the participant received honest feedback). These characteristics included sex ratios of close friends and the sex of the best friend, weekly hours spent with same-sex friends, and preference for a same-sex friend in four different gender-neutral activities (to control for the confounding effect of the gender-typing of the activities; $\alpha = .72$). See Table 2 for specific items about same-sex friendships.

Dating Experiences

Past and current dating experiences were asked using the Dating Questionnaire, which has been validated extensively in studies on adolescent relationships (Kuttler & La Greca, 2004). Special attention was paid to the occurrence, age of first experiences, and level of involvement. See Table 3 for specific items about dating experiences.

Sexual Orientation

Participants reported their sexual orientation using an adapted version of the Klein Sexual Orientation Grid (KSOG; Klein, 1993). The KSOG is similar to the Kinsey scales (Kinsey et al., 1948) in that four aspects of sexual orientation are rated on continuous scales ranging from 0 (having exclusive other-sex sexual attraction, sexual behavior, or sexual fantasies, or self-identify as exclusively heterosexual) to 6 (having exclusive same-sex sexual attraction, sexual behavior, or sexual fantasies, or self-identify as exclusively gay/lesbian). Different from the Kinsey scales, the KSOG measures sexual orientation at three time periods: past, defined as during secondary school; present, defined as in the past 12 months; and ideal, defined as what one would be if given a choice. Because within each time period, sexual attraction, sexual behavior, sexual fantasies, and sexual identity were highly correlated (αs = .88–.90), three mean scores were calculated to represent past, present, and ideal sexual orientation. Large correlations were found between these three mean scores in women, rs (239) > .72 and in men, rs (217) > .81, suggesting high stability between past, present, and ideal sexual orientation.

Concerning recent debates regarding the validity of self-reported sexual orientation (Katz-Wise, Calzo, Li, & Pollitt, 2015; Li, Katz-Wise, & Calzo, 2014; Savin-Williams & Joyner, 2014a, b), the fraternal birth order effect (FBOE), a well-established phenomenon that conceiving sons may alter the sexual orientation of subsequent sons through affecting the maternal immune system (Blanchard, 1997; Blanchard & VanderLaan, 2015; Bogaert & Skorska, 2011), was examined in the current sample. Consistent with predictions of FBOE, male participants with same-sex sexuality reported more older brothers than male participants without same-sex sexuality, while there were no significant differences in the number of older sisters, younger brothers, or younger sisters; in girls, the number of older brothers significantly related only to ideal sexual orientation (see Table 5 in "Appendix A"). These findings suggest good validity of self-reported sexual orientation in this sample.

Missing Data

Most variables (86.4%) had no missing data. Among variables with missing data, the amount of missingness was small, with the largest amount to be 6.1%. Multiple imputation was conducted in IBM SPSS 24.0 to adjust for potential bias due to missing data. Considering the fraction of missing information, 20 imputations were conducted for a power falloff of less than 1% (Graham, Olchowski, & Gilreath, 2007) on all study variables. "Not applicable" responses were considered not to be missing and were therefore not imputed.

Table 2 Same-sex friendships by secondary school type

Variable	Single-sex school *M* (SE) or *n* (%)	Coeducational school *M* (SE) or *n* (%)	Comparison *t* or χ^2	*p*
Percentage of same-sex close friends	79.09 (1.48)	67.30 (1.69)	5.24	<.001
Average number of hours spent with same-sex friends per week	20.00 (1.78)	18.31 (1.18)	0.81	.419
Preference for a same-sex friend to an other-sex friend in activities[a]	2.83 (0.04)	2.77 (0.03)	1.33	.186
Gender of the best friend			7.99	.005
Same sex	188 (90.8)	203 (81.5)		
Other sex	19 (9.2)	46 (18.5)		

For gender of the best friend, *n*, column percentage, and χ^2 are reported; for other items, *M*, *SE*, and *t* are reported

[a]Mean of preference scores in activities including going to a concert, going to a house party, going hiking, having afternoon tea, and doing group project ($\alpha = .72$); 1 = very unlikely to invite a same-sex friend than an other-sex friend; 4 = very likely to invite a same-sex friend than an other-sex friend

Table 3 Dating experiences by secondary school type

Variable	Single-sex school *M* (SE) or *n* (%)	Coeducational school *M* (SE) or *n* (%)	Comparison *t* or χ^2	*p*
Have you engaged in the following dating activities… ("yes" responses)				
Became romantically interested in men/women	176 (85.0)	215 (86.3)	0.16	.688
Had a "crush" on someone	170 (82.1)	205 (82.3)	0.00	.955
Felt at the time that you were "in love" with someone you were dating	122 (58.9)	152 (61.0)	0.21	.647
Hung around with both men and women	159 (76.8)	180 (72.3)	1.21	.271
Went to movies, concerts, sports, activities, and places with both men and women (but not as a date)	184 (88.9)	233 (93.6)	3.17	.075
Met with a group of men and women at night	173 (83.6)	216 (86.7)	0.91	.341
Went to dances or parties where there were both men and women	122 (58.9)	139 (55.8)	0.45	.503
Had close friends of the other sex with whom you were not romantically involved	139 (67.1)	187 (75.1)	3.51	.061
Dated someone, but with a group of friends	122 (58.9)	146 (58.6)	0.00	.948
Dated someone, just the two of you	142 (68.6)	175 (70.3)	0.15	.698
Dated a few different people over the year	64 (30.9)	84 (33.7)	0.41	.522
Dated one person on a fairly regular basis for at least one month	100 (48.3)	123 (49.4)	0.05	.817
Had a boyfriend/girlfriend	101 (51.2)	116 (46.6)	0.97	.326
Had a serious relationship	87 (42.0)	111 (44.6)	0.30	.584
Had a committed relationship in which you were planning to get engaged, married, or live together	39 (18.8)	53 (21.3)	0.42	.517
Got engaged, married, or lived with someone	3 (1.4)	5 (2.0)	0.73[e]	.467[e]
Age at first date (years)[a]	16.97 (0.19)	16.25 (0.18)	2.74	.006
Total number of boyfriends/girlfriends[a]	1.39 (0.11)	1.86 (0.11)	3.00	.003
Current level of dating involvement[b]	2.47 (0.14)	2.55 (0.13)	0.40	.687
Number of months of the current dating experience[c]	14.55 (1.62)	13.49 (1.21)	0.54	.592
Intention to marry the current dating partner[c,d]	3.43 (0.11)	3.57 (0.10)	0.94	.349

For the 16 dating activities, *n* and percentage of a "yes" response and χ^2 are reported; for other items, *M*, SE, and *t* are reported

[a]Only participants who reported any dating experiences were included in analyses; no imputation was conducted for participants who did not report any dating experiences

[b]1 = not dating now; 2 = dating or seeing one person casually; 3 = dating or seeing more than one person casually; 4 = dating a few persons but mostly going out with one person; 5 = having an exclusive relationship with someone (only seeing each other, but not yet planning to get engaged, married, or live together); 6 = having a very serious relationship with one person (planning to get engaged, married, or live together); 7 = being engaged or living with someone; 8 = being married

[c]Only participants who reported current dating experiences were included in analyses; no imputation was conducted for participants who did not report current dating experiences

[d]1 = definitely not; 5 = definitely yes

[e]Fisher's exact test is reported because of small cell sizes

Results

Unless otherwise stated, all results reported here and in Appendices are pooled estimates aggregating analyses from 20 imputed datasets. There were no significant interactions between school type and participant gender for all but one dependent variables, $ps > .05$ ("Appendix B"). The only significant interaction predicting the dating experience of hanging around with both men and women became nonsignificant after controlling for demographic characteristics, $B = -0.75$, SE = 0.46, $p = .101$. Therefore, data from males and females were combined in subsequent analyses. We first compared differences in interpersonal outcomes by school type in *t* tests (for continuous outcomes) and in Chi-squared tests (for dichotomous outcomes), and then examined these differences after controlling for personal characteristics in ordinary least squares regression models (for continuous outcomes) and in logistic regression models (for dichotomous outcomes).

Same-Sex Friendships

Table 2 shows comparisons on same-sex friendships between graduates of single-sex schools and graduates of coeducational schools. Participants who attended single-sex schools were more likely than the participants who attended coeducational schools to have a higher proportion of same-sex close friends

($M = 79.09$, SE = 1.48 vs. $M = 67.30$, $SE = 1.69$), $t(455) = 5.24$, $p < .001$, $d = 0.49$, and to have a same-sex best friend (90.8 vs. 81.5%), $\chi^2(1, N = 456) = 7.99$, $p = .005$. However, no significant differences by school type were found in weekly hours spent with same-sex friends or in preference for a same-sex friend in activities, $ps > .05$. Controlling for personal characteristics did not alter the findings about same-sex friendships (Table 4).

Dating

Table 3 shows comparisons on dating experiences between graduates of single-sex schools and graduates of coeducational schools. No significant differences were found by school type in past and current engagement in 16 dating activities, in the level of involvement in or the duration of current dating experiences, or in the intention to marry the current dating partner, $ps > .05$. However, participants who attended single-sex schools reported a significantly later onset of first date than participants who attended coeducational schools ($M = 16.97$, SE = 0.19 vs. $M = 16.25$, SE = 0.18), $t(455) = 2.74$, $p = .006$, $d = 0.26$, and a significantly smaller number of boyfriends or girlfriends ($M = 1.39$, SE = 0.11 vs. $M = 1.86$, SE = 0.18), $t(455) = 3.00$, $p = .003$, $d = 0.28$.

Controlling for personal characteristics listed in Table 1 did not alter the findings regarding dating experiences, except for one comparison (Table 4). All significant findings held after considering control variables, $ps < .05$. Among the findings that were previously nonsignificant, there was a new significant effect of school type after controlling for the personal characteristics: With all other conditions held constant, attendees of single-sex schools were less likely to have had close friends of the other sex with whom they were not romantically involved than were attendees of coeducational schools, $B = -0.67$, $SE = 0.24$, $p = .005$.

Sexual Orientation

Participants who attended single-sex schools reported significantly higher levels of past same-sex sexuality ($M = 1.46$, SE = 0.11) than did participants who attended coeducational schools ($M = 1.02$, SE = 0.09), $t(455) = 3.10$, $p = .002$, $d = 0.29$. However, participants who attended single-sex schools reported similar levels of present same-sex sexuality ($M = 1.13$, SE = 0.10) or ideal same-sex sexuality ($M = 0.92$, SE = 0.09) to participants who attended coeducational schools ($M = 1.08$, SE = 0.10 for present same-sex sexuality and $M = 0.94$, SE = 0.09 for ideal same-sex sexuality), $t(455) = 0.38$, $p = .708$ for present same-sex sexuality and $t(455) = 0.15$, $p = .879$ for ideal same-sex sexuality. Controlling for personal characteristics listed in Table 1 did not alter the findings about sexual orientation; graduates of single-sex schools reported significantly higher levels of past same-sex sexuality than graduates of coeducational schools, but did not differ from the latter group in the levels of present or ideal same-sex sexuality (Table 4).

Discussion

This study presents the first data examining single-sex schooling and friendships, dating, and sexual orientation, while controlling for personal characteristics of graduates of single-sex schools and of coeducational schools. It has been recognized that students attending single-sex schools are more likely to come from families of higher SES and/or to have higher prior educational attainment than students attending coeducational schools (Bigler et al., 2014; Pahlke et al., 2014; Signorella et al., 2013; see also Table 1). Because SES and education level have been shown to relate to interpersonal outcomes such as self-reported sexual orientation (Mercer et al., 2013), it is important to account for these personal characteristics to reveal the impact of school environment. While studies on academic performance found differences between single-sex and coeducational schools to diminish after controlling for individual differences (Pahlke et al., 2014), we found the differences in interpersonal outcomes to be unaffected by these confounds. Specifically, the current results suggested that with and without control variables, there were no significant differences between graduates of the two school types in many aspects of interpersonal outcomes. However, we did find significant differences in some other aspects, especially in the gender composition in intimate friendships and past sexual orientation, which may have policy implications regarding single-sex schooling.

Same-Sex Friendships

In the current study, there was no significant difference between graduates of different schools in the time spent with same-sex friends per week or in preference for same-sex friends in gender-neutral activities. However, college students who attended single-sex secondary schools reported a larger proportion of same-sex close friends and were more likely to have a same-sex best friend than college students who attended coeducational secondary schools. These differences converged with the uncontrolled studies by Barton and Cohen (2004) and Cheung and McBride-Chang (2007), and further suggested that these significant differences in the gender composition of current intimate friendships were above and beyond the differences in personal characteristics between graduates of the two types of schools. The increased number of same-sex intimate friends among graduates of single-sex school was likely due to continuity in close friendships formed in secondary school (Bowker, 2004; Degirmencioglu, Urberg, Tolson, & Richard, 1998) more than preference, because single-sex school graduates reported more same-sex intimate friends but did not report spending

Table 4 Replication of findings using ordinary linear regression models or logistic regression models controlling for personal characteristics

Variable	School type	
	B (SE)	*p*
Same-sex friendships		
Percentage of same-sex close friends	12.31 (2.41)	<.001
Average number of hours spent with same-sex friends per week	2.13 (2.21)	.337
Preference for a same-sex friend to an other-sex friend in activities[a]	0.05 (0.05)	.334
Gender of the best friend	0.89 (0.32)	.005
Dating experiences		
Have you engaged in the following dating activities…[b]		
Became romantically interested in men/women	−0.19 (0.29)	.508
Had a "crush" on someone	−0.13 (0.27)	.628
Felt at the time that you were "in love" with someone you were dating	−0.13 (0.21)	.558
Hung around with both men and women	0.10 (0.24)	.681
Went to movies, concerts, sports, activities, and places with both men and women (but not as a date)	−0.63 (0.38)	.093
Met with a group of men and women at night	−0.28 (0.29)	.327
Went to dances or parties where there were both men and women	0.16 (0.21)	.451
Had close friends of the other sex with whom you were not romantically involved	−0.67 (0.24)	.005
Dated someone, but with a group of friends	0.05 (0.21)	.811
Dated someone, just the two of you	0.12 (0.23)	.956
Dated a few different people over the year	−0.01 (0.22)	.964
Dated one person on a fairly regular basis for at least one month	−0.14 (0.21)	.501
Had a boyfriend/girlfriend	−0.26 (0.21)	.206
Had a serious relationship	−0.14 (0.21)	.505
Had a committed relationship in which you were planning to get engaged, married, or live together	−0.11 (0.27)	.669
Got engaged, married, or lived with someone	−0.35 (0.85)	.680
Age at first date (years)[c]	0.60 (0.27)	.025
Total number of boyfriends/girlfriends[c]	−0.47 (0.16)	.005
Current level of dating involvement[d]	−0.01 (0.20)	.956
Number of months of the current dating experience[e]	−0.43 (2.14)	.839
Intention to marry the current dating partner[e,f]	−0.19 (0.15)	.192
Sexual orientation		
Past sexual orientation[g]	0.47 (0.15)	.002
Present sexual orientation[g]	0.12 (0.15)	.414
Ideal sexual orientation[g]	0.73 (0.13)	.588

Each row presents a separate model. For continuous dependent variables, ordinary linear regression models were performed; for dichotomous dependent variables, logistic regression models were performed. School type was coded as 0 = coeducational school, 1 = single-sex school. All models controlled for personal characteristics including gender (0 = male, 1 = female), age, ethnicity (0 = other, 1 = Chinese), monthly parental income, highest parental education attainment, number of elder brothers, number of elder sisters, number of younger brothers, number of younger sisters, years of study at current university, years of post-secondary education before current university, and mean school banding for all secondary schools. No interactions were included in the models. For simplicity, only parameter estimates for school type are reported

[a]Mean of preference scores in activities including going to a concert, going to a house party, going hiking, having afternoon tea, and doing group project (α = .72); 1 = very unlikely to invite a same-sex friend than an other-sex friend; 4 = very likely to invite a same-sex friend than an other-sex friend

[b]0 = no; 1 = yes

[c]Only participants who reported any dating experiences were included in analyses; no imputation was conducted for participants who did not report any dating experiences

[d]1 = not dating now; 2 = dating or seeing one person casually; 3 = dating or seeing more than one person casually; 4 = dating a few persons but mostly going out with one person; 5 = having an exclusive relationship with someone (only seeing each other, but not yet planning to get engaged, married, or live together); 6 = having a very serious relationship with one person (planning to get engaged, married, or live together); 7 = being engaged or living with someone; 8 = being married. [e]Only participants who reported current dating experiences were included in analyses; no imputation was conducted for participants who did not report current dating experiences

[f]1 = definitely not; 5 = definitely yes

[g]Summarized from self-reported sexual attraction, sexual behavior, sexual fantasies, and self-identity (αs = .88–.90); absolute range, 0–6, larger scores represent more same-sex sexuality

more time with same-sex friends or greater preference for same-sex over other-sex friends in various activities.

The finding that graduates of single-sex schools continue to have more same-sex social circles after graduation may have important social implications. Mixed-sex friendships are known to benefit development, including introducing a smooth transition into adulthood (Furman & Shaffer, 2003; Grover, Nangle, Serwik, & Zeff, 2007), providing a platform to practice the skills needed to communicate with the other sex effectively (Mehta & Strough, 2009), and increasing happiness (Procsal, Demir, Dogan, Ozen, & Sumer, 2015). Our findings thus call for consideration of the possible intervention strategies that may help address the disadvantage of students from single-sex schools in forming mixed-sex friendships, such as increasing the amount of mixed-sex joint-school activities early in the school years.

Dating

The current study found very few significant or marginally significant differences between school types in dating activities, which is in line with an uncontrolled study (Bruce & Sanders, 2001). Previously, proponents and principals of single-sex schooling have argued that it can reduce heterosexual dating experience (Fabes et al., 2015; Gurian et al., 2001; Sax, 2005). However, this argument overlooks the possibility that dating experiences can occur with both other-sex and same-sex peers (Bigler et al., 2014; Diamond et al., 2015). The findings from our study suggested that when all types of dating experiences were considered, there were no significant differences in most dating experiences between the two school types.

The only aspects of dating that seemed to be consistently influenced were age at first date and total number of romantic partners. These differences are perhaps caused by reduced opportunities for heterosexual dating in single-sex schools and the greater difficulty in forming same-sex dating relationships in spite of increased accessibility to potential same-sex partners in single-sex schools, considering the stigma associated with same-sex relationships (Chorney & Morris, 2008). However, it is important to note that the differences in the age of first date and the number of dating partners of students from single-sex and coeducational schools were small ($d = 0.26$, 16.97 vs. 16.25 years and $d = 0.28$, 1.39 vs. 1.86 partners). In conjunction with the finding that single-sex schooling per se is not associated with any major advantage in academic achievement (Pahlke et al., 2014), there is little evidence to suggest that single-sex schools may curb romantic distraction in favor of academic achievement.

Sexual Orientation

This study found that there were no significant differences in present or ideal sexual orientation between participants who attended single-sex secondary schools and those who attended coeducational secondary schools. These findings are consistent with the other study on the same topic, which reported no significant relation between school type and the number of same-sex sexual partners (an aspect of sexual orientation) in the recent 5 years (Wellings et al., 1994). The current study expanded Wellings et al.'s study to suggest that the nonsignificant associations also held when other domains of sexual orientation were considered, including sexual attraction, sexual fantasies, and sexual identity, and that these nonsignificant associations held after controlling for personal characteristics.

However, single-sex schooling appears to have a transient effect on sexual orientation during secondary school. For example, Wellings et al. (1994) found that in males only, participants who attended single-sex schools reported more same-sex sexual partners in the lifetime, but not in the recent 5 years, than participants who attended coeducational schools, suggesting that single-sex schools may influence male graduates' same-sex sexual behavior only in the early years. The current study further suggested that female graduates of single-sex schools might also have increased same-sex sexuality during secondary schooling. In addition, these differences appeared not to result from differences in personal characteristics, such as family SES, years of education after secondary school, or school banding (Table 4).

This "situational same-sex sexuality" may be explained by sex segregation, the salient institutional difference between single-sex and coeducational schools. From a developmental perspective, sex segregation often prevails in childhood, but in general becomes less pronounced starting from adolescence, without external interventions (Mehta & Strough, 2009). Engagement in mixed-sex friend groups and other-sex dyads in adolescence is a reliable predictor of the formation of other-sex romantic and sexual relationships (Mehta & Strough, 2009). This developmental process is more likely to occur in coeducational schools, where other-sex peers are readily available. In single-sex schools, however, without accessible other-sex peers, same-sex sexual explorations, as well as passionate same-sex friendships that involve intimate physical contact and intense affections (Diamond, 2000; McClelland, Rubin, & Bauermeister, 2016; Way, 2011), are likely to increase. Deprivation of other-sex interactions may have a similar effect on same-sex sexuality in other sex-segregated institutions, including for women in the military (Gates, 2005, 2010) and for women and men in prison or correctional facilities (Bancroft, 2009; Halleck & Hersko, 1962; Kinsey et al., 1948, 1953; Meyer et al., 2017; Sagarin, 1976). Together, these studies suggest that in extreme environments such as single-sex institutions, both females and males may engage in increased temporal same-sex sexual behaviors but may experience limited changes to their future sexual orientation when they leave single-sex environments.

Previously, opponents of single-sex schooling argued that single-sex schooling might increase same-sex sexuality (Dale, 1974; Dyhouse, 1985; Lambert & Millham, 1968; reviewed

in Bigler et al., 2014 and Sullivan et al., 2012). Findings from this study as well as from Wellings et al. (1994) suggest that any potential effect of single-sex schooling on sexual orientation is limited to adolescence. Our study further found that this transient effect was small, $d = 0.29$, meaning that single-sex schools may only affect some attendees' sexual orientation, and not to a large extent. Although acceptance of same-sex sexuality has increased over time across the globe, current attitude still leans toward being negative (Smith, Son, & Kim, 2014). Thus, the finding that there was even a small and temporary increase in same-sex sexuality in single-sex school graduates may alert parents and educators. However, caution should be taken in this interpretation: First, same-sex sexuality has been viewed by contemporary mental health professionals as a normal variation in human sexuality (Herek & Garnets, 2007); Second, the temporary increase may reflect an active exploration of emerging sexuality during adolescence as part of a normal process leading up to sexual maturity in adulthood (Diamond et al., 2015; Fortenberry, 2013). Therefore, our findings should not be used to support or oppose single-sex schooling.

Nevertheless, the temporary increase in same-sex sexuality in single-sex schools may have policy implications for single-school educators. Specifically, open and science-based discussions about relationships may help students explore and understand their emerging sexuality. Moreover, sexual minority adolescents have been suggested to experience higher risks for mental health problems than heterosexual peers (Institute of Medicine, 2011; Russell & Fish, 2016). These health disparities have been partly attributed to minority stress—prejudice, discrimination, and victimization toward individuals possessing a minority social status, including same-sex sexuality (Meyer, 2003). Considering the higher occurrence of same-sex sexuality in single-sex schools, these schools are especially encouraged to create a safe school environment for sexual minority students by, for example, implementing anti-homophobic bullying policy and establishing gay-straight alliances, which have been found to relate to reduced health problems and promote resilience among sexual minority students (Poteat et al., 2015; Poteat, Sinclair, DiGiovanni, Koenig, & Russell, 2013; Russell, Kosciw, Horn, & Saewyc, 2010).

Limitations

The findings of the current study should be interpreted with some limitations in mind. First, all the interpersonal outcomes were self-reported, which may be subject to self-report bias. For example, participants who attended single-sex schools may be familiar with the assumption that single-sex schooling promotes same-sex sexuality, and therefore selectively recall same-sex sexual experiences. However, we attempted to reduce this bias in two ways: (1) we blurred the study hypotheses in the study advertisements and the survey materials, and (2) we embedded the question about school type among other demographic questions.

Second, the sample in this study was only representative of college students, who are from families of higher SES, so our conclusions may be difficult to be generalized to families of lower SES. Nevertheless, one advantage of the recruitment method is that it allowed us to recruit students from many different secondary schools instead of from only one or two secondary schools or classes, which has been a limitation in many prior studies (Sax, Riggers, & Eagan, 2013).

Third, it may be argued that the findings from our Hong Kong sample may not generalize to other cultures. However, there is reason to believe that our findings are not specific to Hong Kong. Cross-cultural research shows that the principles of gender development tend to apply across cultures (Gibbons, 2000), with many gender differences and stereotypes in Hong Kong resembling those in the West (Li & Wong, 2016). Also, both this study and a prior study (Wong, Lam, & Ho, 2002) found that students in single-sex schools in Hong Kong are more academically excellent and/or are from families of higher SES, just like studies conducted in other parts of the world (Liben, 2015; Mael et al., 2005; Pahlke et al., 2014).

Lastly, the use of retrospective report for past sexual orientation may raise concern for the accuracy of reporting due to memory erosion or distortion. However, for the topic of sexual-orientation development, a retrospective design perhaps offers a better benefit–cost ratio than a longitudinal design, in which one needs to trace a large cohort of students to retain a few sexual minority adults. In addition, research has demonstrated relative reliability in the recall of past sexual orientation (Calzo, Antonucci, & Cochran, 2011; Rivers, 2001; Schrimshaw, Rosario, Meyer-Bahlburg, & Sharf-Matlick, 2006). Nevertheless, longitudinal studies would offer stronger conclusions about the developmental change in sexual orientation associated with schooling. Relatedly, the high stability we found in self-reported past, present, and ideal sexual orientation might result partly from common method bias (e.g., reporting on the same scale using similarly worded items and reporting at the same time; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). However, despite the tendency to provide similar answers, past, present, and ideal sexual orientation was found to relate differently to single-sex schooling.

Conclusion

In conclusion, there is little to no evidence suggesting significant differences between graduates of single-sex schools and graduates of coeducational schools in most aspects of friendships, dating experience, and present and ideal sexual orientation. However, single-sex schools may have a short-term impact on interpersonal development, such as in past sexual orientation, age at first date, and total number of romantic partners; these

differences were small and rarely extended beyond secondary schools. Single-sex schooling appears to have a relatively larger impact on the sex composition of current intimate friendships, in that graduates of single-sex schools may have fewer opportunities to reap the benefits of mixed-sex friendships. Given that single-sex schools also appear to have no significant effects on gender role development or academic performance, after accounting for differences in personal characteristics between the two types of schools (Bigler et al., 2014; Halpern et al., 2011; Liben, 2015; Pahlke et al., 2014), there seems to be no ground favoring single-sex schooling in the contemporary education system, at least with regard to academic outcomes and the specific interpersonal outcomes addressed in this study. Nevertheless, single-sex schools may usefully take measures to promote the well-being of sexual minority students and to increase mixed-sex interactions.

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Appendix A

Validity of Self-Reported Sexual Orientation

The validity of self-reported sexual orientation is examined using correlations with the number of older brothers in male participants. Consistent with predictions in the fraternal birth order effect (Blanchard, 1997; Blanchard & VanderLaan, 2015), male participants with same-sex sexuality reported significantly or marginally significantly more older brothers (and not older sisters or younger brothers or younger sisters) than male participants without same-sex sexuality (Table 5). In contrast, also consistent with predictions in the fraternal birth order effect, number of older brothers did not significantly relate to past or ideal sexual orientation in females (Table 5). These findings suggest good validity of self-reported sexual orientation in this sample.

Unless otherwise stated, all results reported here are pooled estimates aggregating analyses from 20 imputed datasets, using "mice" and "miceadds" packages in R (Robitzsch, Grund, & Henke, 2017; van Buuren & Groothuis-Oudshoorn, 2011).

Appendix B

Replication of Findings with Interactions

Table 6 presents replication analyses including the interaction between school type and gender. There were no significant interactions between school type and participant gender for all but one dependent variable, $ps > .05$ (Table 6). The only significant interaction predicting the dating experience of hanging around with both men and women became nonsignificant after controlling for demographic characteristics, $B = -0.75$, $SE = 0.46$, $p = .101$.

Unless otherwise stated, all results reported here are pooled estimates aggregating analyses from 20 imputed datasets, using "mice" and "miceadds" packages in R (Robitzsch et al., 2017; van Buuren & Groothuis-Oudshoorn, 2011).

Table 5 Ordinary least squares regression models using number of siblings to predict sexual orientation

	Past sexual orientation			Present sexual orientation			Ideal sexual orientation		
	B	SE	*p*	*B*	SE	*p*	*B*	SE	*p*
Males (n = 217)									
Number of older brothers	0.53	0.28	.059	0.61	0.29	.034	0.58	0.25	.020
Number of older sisters	−0.14	0.18	.456	−0.13	0.18	.489	−0.24	0.16	.141
Number of younger brothers	0.21	0.22	.353	0.30	0.22	.189	0.04	0.20	.854
Number of younger sisters	0.30	0.29	.301	0.07	0.30	.823	0.03	0.26	.911
R^2	.026			.171			.191		
Females (n = 238)									
Number of older brothers	−0.14	0.23	.539	0.15	0.23	.500	0.47	0.21	.024
Number of older sisters	−0.24	0.18	.195	0.01	0.18	.945	−0.08	0.17	.641
Number of younger brothers	−0.62	0.25	.012	−0.25	0.24	.297	−0.21	0.22	.348
Number of younger sisters	0.15	0.18	.430	0.14	0.18	.444	0.16	0.17	.346
R^2	.038			.013			.193		

Past, present, and ideal sexual orientation was calculated from mean scores of self-reported sexual attraction, sexual behavior, sexual fantasies, and self-identity (αs = .88–.90); absolute range, 0–6, larger scores represent more same-sex sexuality

Table 6 Replication of Findings using ANOVAs or logistic regression models with the interaction between school type and gender

	School type		Gender		School type × Gender	
	F or *B* (SE)	*p*	*F* or *B* (SE)	*p*	*F* or *B* (SE)	*p*
Same-sex friendships						
Percentage of same-sex close friends	26.08	<.001	9.31	.002	0.24	.625
Average number of hours spent with same-sex friends per week	0.70	.404	0.06	.812	0.41	.521
Preference for a same-sex friend to an other-sex friend in activities[a]	1.45	.229	34.85	<.001	3.44	.064
Gender of the best friend	0.90 (0.37)	.015	0.97 (0.34)	.005	−0.24 (0.61)	.689
Dating experiences						
Have you engaged in the following dating activities…[b]						
Became romantically interested in men/women	−0.09 (0.39)	.816	−0.05 (0.37)	.887	−0.03 (0.54)	.959
Had a "crush" on someone	0.17 (0.38)	.653	−0.13 (0.33)	.689	−0.32 (0.50)	.527
Felt at the time that you were "in love" with someone you were dating	0.20 (0.29)	.504	−0.39 (0.26)	.136	−0.50 (0.39)	.205
Hung around with both men and women	0.69 (0.32)	.029	0.63 (0.29)	.029	−0.90 (0.44)	.041
Went to movies, concerts, sports, activities, and places with both men and women (but not as a date)	−0.48 (0.50)	.337	0.08 (0.52)	.881	−0.23 (0.68)	.735
Met with a group of men and women at night	0.13 (0.39)	.738	0.29 (0.38)	.434	−0.72 (0.54)	.183
Went to dances or parties where there were both men and women	0.55 (0.29)	.057	−0.13 (0.26)	.607	−0.76 (0.39)	.051
Had close friends of the other sex with whom you were not romantically involved	−0.26 (0.30)	.394	0.18 (0.29)	.534	−0.26 (0.42)	.536
Dated someone, but with a group of friends	−0.08 (0.28)	.779	−0.24 (0.26)	.349	0.18 (0.38)	.648
Dated someone, just the two of you	0.14 (0.31)	.646	-0.21 (0.28)	.460	−0.39 (0.41)	.351
Dated a few different people over the year	−0.32 (0.29)	.272	−0.47 (0.27)	.081	0.38 (0.40)	.349
Dated one person on a fairly regular basis for at least 1 month	0.08 (0.27)	.776	−0.18 (0.25)	.490	−0.23 (0.38)	.551
Had a boyfriend/girlfriend	−0.01 (0.27)	.981	−0.19 (0.25)	.461	−0.33 (0.38)	.380
Had a serious relationship	−0.06 (0.27)	.821	−0.42 (0.26)	.098	−0.07 (0.38)	.849
Had a committed relationship in which you were planning to get engaged, married, or live together	0.02 (0.32)	.948	−0.24 (0.31)	.447	−0.37 (0.48)	.441
Got engaged, married, or lived with someone	−0.90 (1.16)	.439	−0.49 (0.92)	.597	1.06 (1.54)	.490
Age at first date (years)[c]	7.04	.008	0.39	.531	0.91	.339
Total number of boyfriends/girlfriends[c]	8.54	.003	0.27	.603	2.10	.148
Current level of dating involvement[d]	0.18	.670	0.90	.343	0.54	.461
Number of months of the current dating experience[e]	0.31	.576	0.56	.456	0.03	.871
Intention to marry the current dating partner[e,f]	0.79	.375	10.46	.001	3.59	.058
Sexual orientation						
Past sexual orientation[g]	3.56	.002	0.31	.577	0.70	.403
Present sexual orientation[g]	0.13	.716	0.14	.707	0.01	.933
Ideal sexual orientation[g]	0.03	.858	2.82	.093	0.01	.939

Each row presents a separate model. For continuous dependent variables, 2 (school type: coeducational versus single-sex) × 2 (gender: male versus female) ANOVAs were performed; for dichotomous dependent variables, logistic regression models were performed, with school type coded as 0 = coeducational school, 1 = single-sex school, and gender coded as 0 = male, 1 = female. [a]Mean of preference scores in activities including going to a concert, going to a house party, going hiking, having afternoon tea, and doing group project (α = .72); 1 = very unlikely to invite a same-sex friend than an other-sex friend; 4 = very likely to invite a same-sex friend than an other-sex friend

[b]0 = no; 1 = yes

[c]Only participants who reported any dating experiences were included in analyses; no imputation was conducted for participants who did not report any dating experiences

[d]1 = not dating now; 2 = dating or seeing one person casually; 3 = dating or seeing more than one person casually; 4 = dating a few persons but mostly going out with one person; 5 = having an exclusive relationship with someone (only seeing each other, but not yet planning to get engaged, married, or live together); 6 = having a very serious relationship with one person (planning to get engaged, married, or live together); 7 = being engaged or living with someone; 8 = being married

[e]Only participants who reported current dating experiences were included in analyses; no imputation was conducted for participants who did not report current dating experiences

[f]1 = definitely not; 5 = definitely yes

[g]Summarized from self-reported sexual attraction, sexual behavior, sexual fantasies, and self-identity (αs = .88–.90); absolute range, 0–6, larger scores represent more same-sex sexuality

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