COMPARISON OF TEENAGERS' EARLY SAME-SEX AND HETEROSEXUAL BEHAVIOUR: UK DATA FROM THE SHARE AND RIPPLE STUDIES

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Abstract

Introduction

North American research has suggested that teenagers with same-sex sexual partners are vulnerable to sexual risk-taking, although there is limited understanding of underlying processes. This UK study compared early sexual experiences of teenagers with same-sex partners and teenagers with exclusively opposite-sex partners, taking account of attitudinal and behavioural differences.

Methods

Multivariate analyses combined self-reported questionnaire data from two randomized trials of school sex education programmes (N=10,250). Outcomes from sexually experienced teenagers (N=3,766) were partner pressure to have first sex and subsequent regret, and measures of sexual risk-taking including pregnancy. Covariates included self-esteem, future expectations, substance use and communication with mother.

Results

By follow-up (mean age 16), same-sex genital contact (touching, oral, anal) was reported by 2.3% of teenagers, with most (72%) also reporting heterosexual intercourse. 39% reported heterosexual

intercourse and no same-sex genital contact. Boys were more likely to report partner pressure (OR 2.56 95% CI 1.29 - 5.08) and regret (OR 2.32 95% CI 1.39 - 3.86) in relation to first same-sex genital contact than first heterosexual intercourse, but girls showed no differences according to partner type. Teenagers with bisexual behaviour reported greater sexual risk than teenagers with exclusively opposite-sex partners, partially mediated by attitudinal and behavioural differences.

Discussion

This UK study adds to a limited evidence base seeking to interpret differences in early sexual experience according to sexual orientation. Significant effects of partner type in fully adjusted models confirm the greater vulnerability of teenagers with same-sex partners, and suggest the need to incorporate gay-related stressors in future research.

Introduction

There is mounting evidence from large-scale population studies of higher levels of sexual risk-taking among teenagers with same-sex partners, compared to teenagers with exclusively heterosexual relationships.[1-6] To date, there has been limited exploration of underlying factors that might explain differences in early sexual risk-taking according to partner type. Apart from sexual risk, little is known about how experiences of early same-sex and opposite-sex sexual relationships compare. Moreover, comparative evidence is confined to North American studies, although recent work suggests between-country variation in homophobia-related stresses and health consequences.[7] Interventions to address sexual health needs of young people with same-sex attractions would benefit from a clearer understanding of how these differ from those of the wider adolescent population.

Attempts to understand sexual risk-taking among adolescent sexual minority groups have adopted three main approaches. The first focuses on sexual knowledge and skills deficits, but evidence is mixed and confined to non-representative samples.[8, 9] Such deficits could stem from limitations of school sex education programmes:[10, 11] less gay-sensitive sex education was associated with sexual risk in a representative US school-based sample, but this did not take account of possible confounders in school and family environment.[2] A second approach (minority stress theory) focuses on unique stressors experienced in developing a gay, lesbian or bisexual identity.[12, 13] This was the basis of a study finding associations between victimisation at school and sexual risk.[3] A later study (exclusively of gay and bisexual youth) took account of a wider range of gay-related stressors and aspects of 'coming-out', finding associations between negative attitudes to homosexuality and sexual risk-taking.[14] Like many studies of sexual minority youth it used a convenience, urban sample that may not be representative of the wider population. A more fundamental criticism is that research on sexual minority groups in isolation may mask risk factors that are common to all, regardless of sexual orientation.[15, 16] The third approach is grounded in general theories of adolescent risk behaviour suggesting multiple underlying psychosocial influences.[17] Here, evidence is limited to two studies of North American teenagers. One study (combining data from six school-based surveys) found that teenagers with same-sex attractions were disadvantaged with respect to school connectedness, liking for school, family connectedness and religious identity; but did not attempt to link these to risk behaviours.[18] A separate study failed to find clear differences in academic orientation, friendship quality and school climate according to sexual orientation, although teenagers with same-sex attraction were disadvantaged with respect to attitudes towards risk, psychosocial functioning, relationship with parents and neighbourhood quality.[19] A second phase of this study found that these factors acted as partial mediators for the

effect of sexual orientation on an index of risk behaviours (including sexual risk), although a significant effect of minority orientation on increased risk remained.[6]

The aim of this study is to compare early sexual experiences of teenagers who have same-sex partners and opposite-sex partners, and to explore reasons for differences in terms of psychosocial risk factors. We examine both sexual risk and unwanted first experience, in terms of reported partner pressure to have sex and regret afterwards. As associations between sexual orientation and risk may vary by gender, we look at effects for boys and girls separately.[20-23] There are currently no large-scale quantitative data on young UK teenagers who have same-sex relationships, and prevalence information for teenagers under 16 depends on retrospective reports by an older age group.[24, 25] This is the first UK study to compare the sexual experiences of teenagers according to whether they have opposite-sex or same-sex partners, combining two large representative school-based surveys.

Method

Data collection

The analysis used data from the SHARE and RIPPLE studies, details of which have been published elsewhere.[26, 27] Twenty-five schools participated in the SHARE randomized controlled trial of enhanced teacher-led sex education in Scotland. This trial was approved by Glasgow University's Ethical Committee for Non-Clinical Research Involving Human Subjects. Twenty-seven schools participated in the RIPPLE randomized control trial of peer-led school sex education in England. This trial was approved by the committee on the ethics of human research at University College London. We combined data gathered from the two cohorts in both studies at baseline (SHARE 1996-7, mean age 14 years, 2 months; RIPPLE 1998-9, mean age 13 years 8 months) and follow-up

(SHARE 1998-9, mean age 16 years, 1 month; RIPPLE 2000-2001 mean age 16 years 0 months). SHARE baseline data were representative of the 1991 census of people living in Scotland in terms of parental social class and family composition. RIPPLE baseline data were representative of 1991 census English population data in terms of privately owned accommodation, and of 1998 GCSE education qualifications, schools were located in central and southern England.

Pupils completed questionnaires in their classrooms under examination conditions, administered by researchers only (SHARE) or teachers and researchers (RIPPLE). Early school leavers in the SHARE study completed postal questionnaires.

At follow-up, teenagers were asked whether they had experienced (and at what age) kissing with tongues and genital contact (two sets of questions, for opposite sex and same-sex partners) and vaginal intercourse (with opposite-sex partner). Genital contact with an opposite-sex partner combined information from two questions on touching genitals and oral sex. Genital contact with a same-sex partner combined information from questions on touching genitals and (RIPPLE) 'had sex (any other activity involving genitals /private parts)' or (SHARE) questions on oral sex and (boys) anal sex. Information on circumstances, pressure and regret was gathered in relation to first vaginal intercourse with an opposite sex partner and first genital contact with a same-sex partner (both defined here as "first sex", FS). A binary measure, "no expectation of sex", was derived from agreement with either of the circumstances "It just happened on the spur of the moment" or "It was completely unexpected", contrasted with agreement with any of "I expected it to happen soon, but was not sure when"/ "I planned it to happen beforehand/ "We planned it together beforehand". For pressure, respondents were asked whether any pressure had been exerted, using a scale from 'I put a lot of pressure on her/him' through 'there was no pressure either way' to 's/he put a lot of pressure

on me'. A binary variable was created contrasting any pressure from partner with no pressure/any pressure from respondent. Regret was derived from a question about current feelings about first sex. A binary measure contrasted the responses 'I wish I had waited longer' and 'it shouldn't have happened at all' (taken to express regret) with 'I wish I'd not waited so long' or 'it was at about the right time'.

There were five sexual risk measures for all teenagers reporting vaginal intercourse with an opposite-sex partner: age at FS, condom use at first and most recent intercourse; number of partners in the past year; and pregnancy or (for boys) partner pregnancy. There were no measures of risk-taking with a same-sex partner in the combined data set.

Socio-demographic information on ethnicity, family composition and housing was available in the joint data set, together with baseline attitudinal and behavioural measures described in Table 1.

Table 1 Sample socio-demographic composition and baseline attitudinal/behavioural information

Percentages are weighted values			Both sexes	Boys	Girls	SHARE	RIPPLE
		Base N	*10,250*	*5,077*	*5,173*	*3,594*	*6,656*
Sociodemographic information			**%**	**%**	**%**	**%**	**%**
	Family composition	Do not live with both biological parents	29	27	31	3	16
	Ethnicity	Minority	11	13	9	31	28
	Housing	Social rented	30	28	31	33	28

Attitudinal and behavioural measures collected at baseline, aged 13/14 years

Measure	Number of items		Scale	Direction of coding	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
		Item content							
Attitudes to school	4	Like school, truancy, teachers never trust us, teachers show pupils respect (Cronbach's alpha=0.63)	1 to 5	High=less positive attitudes	2.54 (0.71)	2.57 (0.74)	2.51 (0.67)	2.61(0.71)	2.50(0.70)
Expectation of tertiary education	1	Likely to be at college/university in four years' time (SHARE), by age 20 (RIPPLE)	1 to 5	High=greater expectation	3.69 (0.99)	3.58 (1.03)	3.80 (0.95)	3.79(0.99)	3.64(0.99)
Expectation of early parenthood	1	Likely to have one or more children in four years' time (SHARE), by age 20 (RIPPLE)	1 to 5	High=greater expectation	2.43 (1.11)	2.55 (1.11)	2.31 (1.09)	2.24(1.10)	2.53(1.10)
Ease of communication with mother	1	Comfortable talking to mother about sex (SHARE) about very private and personal things (RIPPLE):	1 to 5	High=greater comfort/ease	3.14 (1.33)	2.82 (1.34)	3.45 (1.25)	3.07(1.26)	3.18(1.36)
Ease of communication with father	1	Comfortable talking to father about sex (SHARE) about very private and personal things (RIPPLE)	1 to 5	High=greater comfort/ease	2.43 (1.34)	2.83 (1.38)	2.02 (1.17)	2.46(1.22)	2.41(1.40)
Self -esteem	3	I like myself, I am a failure, most of the time I am satisfied	1 to 5	High=greater self-esteem	3.45 (0.67)	3.59 (0.63)	3.31 (0.68)	3.51(0.70)	3.41(0.64)

		with the way I look (Cronbach's alpha=0.66)							
Religiosity	1	How religious are you (SHARE), how important is religion to you (RIPPLE)	1 to 5	High=greater religiosity	2.13 (1.17)	2.07 (1.19)	2.20 (1.16)	2.05(1.01)	2.18(1.25)
Substance use	3	Frequency of drunkenness, cigarette use, cannabis use (Cronbach's alpha=0.75)	1 to 4	High=greater substance use	1.64 (0.73)	1.58 (0.69)	1.69 (0.77)	1.86(0.86)	1.51(0.62)
Knowledge of sexual health	5	True or false items about whether having sex standing up can lead to pregnancy, first intercourse can lead to pregnancy, all sexually transmitted diseases can be cured, all sexually transmitted diseases have visible symptoms, doctors will respect confidentiality of a pregnant girl under 16	Count of correct responses	High=greater knowledge	3.04 (1.58)	2.86 (1.61)	3.23 (1.53)	3.27(1.56)	2.92(1.58)
Attitudes to condoms	3	Embarassing, interrupt sex, reduce enjoyment (Cronbach's alpha = 0.70)	1 to 5	High=more positive attitudes	3.65 (0.84)	3.50 (0.88)	3.79 (0.78)	3.76(0.81)	3.58(0.85)
Condom self-efficacy	3	Easy to get condoms, use condoms properly, suggest condoms to partner (Cronbach's alpha=0.69)	1 to 5	High= greater self-efficacy	3.69 (0.75)	3.82 (0.75)	3.55 (0.74)	3.81(0.71)	3.61(0.77)
					%	**%**	**%**	**%**	**%**
Close friendship	2	Friend of same sex to talk about very private and personal things	Yes/no	No close friend	23	39	8	22	27

Data analysis

From 12,500 teenagers who supplied information at follow-up, 10,250 were eligible for this analysis after excluding teenagers from the SHARE study who were not asked about same-sex relationships (2,109 from nine schools in one education authority, plus a further 151 school leavers who completed a shorter postal questionnaire).

In multivariate analyses, we first examined the effect of partner type on pressure and regret. This compared information from first same-sex genital contact with first heterosexual intercourse (for teenagers not reporting same-sex genital contact). These are not equivalent events, and we adjusted for age at the time and having no expectation of sex to increase the validity of the comparison. Secondly, we examined the effect of partner type on sexual risk. This compared teenagers reporting bisexual behaviour (heterosexual vaginal intercourse AND same-sex genital contact) with teenagers reporting heterosexual intercourse only.

Analysis combined cases from both arms of each RCT study. Neither study had found differences between intervention and control arms in prevalence of heterosexual intercourse or use of contraception. The RIPPLE study found a borderline effect of lower unintended pregnancy among girls in the intervention arm reported at age 16 (2·3% vs. 3·3%, p=0·07), although there was no corresponding between-arm difference in the SHARE study.[26, 27] All multivariate analyses allowed for clustering by school and initially adjusted for study, trial arm (intervention/control), age at follow-up and socio-demographic information, with addition of further baseline covariates in a second stage. Analyses also corrected for differential attrition from baseline to follow-up using a

weighting system, created separately for each study using inverse values from logistic models of baseline predictors of response.

First, we performed complete case analyses using Stata version 10. In all models, missing information was greater in teenagers reporting same-sex partners than for those with exclusively heterosexual partners. In order to decrease bias and increase the power of the analyses, we used multiple chained equations (ICE program, version 1.7.0) to impute missing values.[28] This reduction in bias is expected when the missing items to be imputed are 'missing at random', meaning that their values are comparable to those observed for each variable given the observed values of other variables used in the imputation model. The imputation excluded teenagers who provided no information on first heterosexual intercourse or first same-sex genital contact. Clustering of pupils by school was ignored in the imputation for simplicity. We generated twenty imputed data sets, and estimates were combined across these.[29, 30]

Results

Sample composition is shown in Table 1. There were significant ($p<0.001$) between-study differences in the proportion of minority ethnic groups and those in social rented housing.

Out of the eligible sample (N=10,250), 674 cases (7%) did not report on heterosexual intercourse, and 770 cases (8%) did not report on same-sex genital contact. 440 (4%) did not provide information on either behaviour, and were excluded from multivariate analyses.

Almost four in ten teenagers reported heterosexual intercourse without any same-sex behaviour, and 2.3% reported same-sex genital contact (Table 2). Most teenagers reporting same-sex genital contact had also experienced heterosexual intercourse (72%). Girls were more likely than boys to report same-sex kissing with tongues and heterosexual vaginal intercourse (both $p<0.001$), but there were no other gender differences in reporting of sexual behaviour. Although a slightly higher percentage of SHARE teenagers reported heterosexual intercourse than in the RIPPLE study ($p<0.01$), there were no other significant ($p<0.05$) between-study differences.

Table 2 (spread over 3 pages)

Sexual behaviour reported at follow-up in the RIPPLE and SHARE data sets, for teenagers aged 15/16 years

n=number reporting behaviour, N= teenagers responding to either or both questions about behaviour with same-sex or opposite-sex partner. n/N values are unweighted, percentages are weighted values.

Both sexes		**Combined data sets (N=10,250)**				**RIPPLE (N=6,656)**				**SHARE (N=3,594)**			
		Opposite-sex partner only	Any same-sex partner	Same-sex partner only	Partners of both sexes	Opposite-sex partner only	Any same-sex partner	Same-sex partner only	Partners of both sexes	Opposite-sex partner only	Any same-sex partner	Same-sex partner only	Partners of both sexes
Kissing with tongues	n/N	8379/9237	306/9237	18/9237	288/9237	5342/5683	218/5683	14/5683	204/5683	3037/3554	88/3554	4/3554	84/3554
	%	90.6	3.5	0.2	3.3	93.8	4.0	0.3	3.7	85.6	2.8	0.2	2.6
Genital contact	n/N	6698/9974	201/9974	25/9974	176/9974	4290/6458	128/6458	15/6458	113/6458	2408/3516	73/3516	10/3516	63/3516
	%	68.7	2.3	0.3	2.0	67.9	2.1	0.2	1.9	70.1	2.4	0.3	2.1
Oral sex [a]	n/N									1226/3374	38/3374	10/3374	28/3374
	%									38.4	1.4	0.4	1.0
"First sex" [b]	n/N	3565/9810	201/9810	64/9810	137/9810	2174/6364	128/6364	41/6364	87/6364	1391/3446	73/3446	23/3446	50/3446
	%	39.3	2.3	0.6	1.6	43.6	2.3	0.7	1.6	37.0	2.4	0.6	1.8

Table 2
continued

Boys		**Combined data sets (N=5,077)**				**RIPPLE (N=3,426)**				**SHARE (N=1,651)**			
		Opposite-sex partner only	Any same-sex partner	Same-sex partner only	Partners of both sexes	Opposite-sex partner only	Any same-sex partner	Same-sex partner only	Partners of both sexes	Opposite-sex partner only	Any same-sex partner	Same-sex partner only	Partners of both sexes
Kissing with tongues	n/N	4098/4498	100/4498	11/4498	89/4498	2718/2871	67/2871	9/2871	58/2871	1380/1627	33/1627	2/1627	31/1627
	%	90.9	2.3	0.3	2.0	94.5	2.4	0.4	2.0	84.9	2.2	0.2	2.0
Genital contact	n/N	3249/4901	101/4901	18/4901	83/4901	2189/3296	63/3296	12/3296	51/3296	1060/1605	38/1605	6/1605	32/1605
	%	67.7	2.3	0.4	1.9	67.8	2.0	0.4	1.6	67.7	2.7	0.4	2.3
Oral sex [a]	n/N			`						511/1554	24/1554	7/1554	17/1554
	%									34.5	1.9	0.6	1.3
Vaginal/anal intercourse [a]	n/N									568/1632	14/1632	1/1632	13/1632
	%									38.1	1.1	0.1	1.0
"First sex" [b]	n/N	1557/4807	101/4807	38/4807	63/4807	1002/3245	63/3245	26/3245	37/3245	555/1562	38/1562	12/1562	26/1562
		35.1	2.2	0.7	1.5	33.3	2.0	0.8	1.2	38.8	2.7	0.7	2.0

Table 2 continued

Girls		**Combined data sets (N=5,173)**				**RIPPLE (N=3,230)**				**SHARE (N=1,943)**			
		Opposite-sex partner only	All same-sex partner	Same-sex partner only	Partners of both sexes	Opposite-sex partner only	All same-sex partner	Same-sex partner only	Partners of both sexes	Opposite-sex partner only	All same-sex partner	Same-sex partner only	Partners of both sexes
Kissing with tongues	n/N	4281/4739	206/4739	7/4739	199/4739	2624/2812	151/2812	5/2812	146/2812	1657/1927	55/1927	2/1927	53/1927
	%	90.4	4.6	0.1	4.5	93.2	5.6	0.2	5.4	86.2	3.2	0.1	3.1
Genital contact	n/N	3449/5073	100/5073	7/5073	93/5073	2101/3162	65/3162	3/3162	62/3162	1348/1911	35/1911	4/1911	31/1911
	%	69.6	2.3	0.2	2.1	66.4	2.3	0.1	2.2	70.5	2.2	0.2	2.0
Oral sex [a]	n/N									715/1820	14/1820	3/1820	11/1820
	%									41.9	1.0	0.3	0.7
"First sex" [b]	n/N	2008/5003	100/5003	26/5003	74/5003	1172/3119	65/3119	15/3119	50/3119	836/1884	35/1884	11/1884	24/1884
	%	43.4	2.3	0.5	1.8	40.8	2.4	0.5	1.9	47.9	2.3	0.6	1.7

[a] Information on oral sex and (boys) anal intercourse with a same-sex partner was not collected in the RIPPLE study

[b] Defined as genital contact for same-sex partner, and as vaginal intercourse for opposite-sex partner. The division between those with 'same sex partner only' and those with 'partners of both sexes' differs from that shown for petting, since not all teenagers reporting petting with partners of both sexes also experienced heterosexual intercourse.

Baseline univariate comparisons (Table 3) indicated that the same-sex group contained higher proportions of teenagers ($p<0.05$ for boys) from ethnic minority groups and families without both biological parents. Since these were associated with risk outcomes, we adjusted multivariate analyses for ethnicity and family composition at stage 1. Comparison of attitudinal and behavioural measures indicates some significant ($p<0.05$) or borderline significant ($p<0.08$) differences in baseline protective and risk factors according to partner type. Teenagers with same-sex partners were more religious and more knowledgeable about sexual health, and (boys) were more likely to expect tertiary education than the exclusively heterosexual group. However boys with same-sex partners had lower self-esteem; and girls with partners of both sexes reported poorer communication with their mother, higher expectation of early parenthood and greater substance use. Boys and girls with same-sex partners were less likely to have a close same-sex friend than exclusively heterosexual teenagers. Stage 2 of multivariate analyses adjusted for baseline covariates associated with both partner type and risk outcomes.

Table 3 (spread over 3 pages)

Sexual outcomes, Sociodemographic composition and baseline attitudinal/behavioural information, according to sexual grouping at follow-up: univariate comparisons

Both sexes

		(1) Any genital contact with same-sex partner	(2) Any same-sex genital contact, and heterosexual intercourse	(3) Heterosexual intercourse only	1 vs.3	2 vs. 3
Base N		*201*	*137*	*3,565*		
Sexual outcomes		**%**	**%**	**%**	**p**	**p**
	Age FS under 13 yrs (column 2 shows age first heterosexual intercourse)	28	10	5	0.001	0.006
	Partner pressure FS	25	26	15	0.001	0.001
	Regretted FS	47	45	34	0.002	0.023
	No condom FS		41	29		0.002
	No condom LS		48	38		0.018
	3 or more opposite-sex partners in last yr		47	23		0.001
	Pregnancy/partner pregnancy		24	8		0.001
Sociodemographic information						
	Do not live with both biological parents	42	40	37	0.169	0.017
	Ethnic minority	14	11	10	0.030	0.726
	Social rented housing	34	37	36	0.553	0.770
Attitudinal and behavioural measures collected at baseline, aged 13/14 years						
Measure	**Direction of coding**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**p**	**p**
Attitudes to school	High=less positive attitudes	2.63 (0.76)	2.75 (0.77)	2.71 (0.74)	0.148	0.444
Expectation of tertiary education	High=greater expectation	3.78 (1.09)	3.63 (1.16)	3.57 (1.05)	0.005	0.067
Expectation of early parenthood	High=greater expectation	2.57 (1.20)	2.69 (1.23)	2.58 (1.17)	0.917	0.460
Ease of communication with mother	High=greater comfort/ease	2.96 (1.39)	2.99 (1.42)	3.15 (1.34)	0.055	0.181
Ease of communication with father	High=greater comfort/ease	2.39 (1.40)	2.45 (1.44)	2.40 (1.36)	0.974	0.642
Self -esteem	High=greater self-esteem	3.30 (0.79)	3.30 (0.83)	3.43 (0.69)	0.018	0.052
Religiosity	High=greater religiosity	2.32 (1.25)	2.30 (1.27)	1.95 (1.08)	0.001	0.001
Substance use	High=greater substance use	1.94 (0.84)	2.12 (0.87)	1.99 (0.83)	0.413	0.280
Knowledge of sexual health	High=greater knowledge	3.46 (1.52)	3.58 (1.54)	3.13 (1.58)	0.002	0.001
Attitudes to condoms	High=more positive attitudes	3.74 (0.92)	3.78 (0.95)	3.67 (0.88)	0.286	0.126
Condom self-efficacy	High= greater self-efficacy	3.91 (0.83)	4.02 (0.74)	3.92 (0.72)	0.848	0.098
		%	**%**	**%**	**p**	**p**
Close same-sex friend	No close friend	28	30	17	0.001	0.001

Table 3 continued
Boys

		(1) Any genital contact with same-sex partner	(2) Any same-sex genital contact, and heterosexual intercourse	(3) Heterosexual intercourse only	1 vs.3	2 vs. 3
Base N		*101*	*63*	*1,557*		
Sexual outcomes		**%**	**%**	**%**	**p**	**p**
	Age FS under 13 yrs (column 2 shows age first heterosexual intercourse)	28	16	6	0.001	0.073
	Partner pressure FS	26	29	9	0.001	0.001
	Regretted FS	44	41	23	0.001	0.003
	No condom FS		41	27		0.012
	No condom LS		33	30		0.587
	3 or more opposite-sex partners in last yr		58	23		0.001
	Pregnancy/partner pregnancy		24	7		0.001
Sociodemographic information						
	Do not live with both biological parents	44	48	34	0.046	0.023
	Ethnic minority	20	16	12	0.017	0.327
	Social rented housing	27	31	32	0.352	0.845
Attitudinal and behavioural measures collected at baseline, aged 13/14 years						
Measure	**Direction of coding**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**p**	**p**
Attitudes to school	High=less positive attitudes	2.60 (0.80)	2.72 (0.83)	2.74 (0.78)	0.091	0.845
Expectation of tertiary education	High=greater expectation	3.86 (1.05)	3.79 (1.18)	3.46 (1.11)	0.001	0.016
Expectation of early parenthood	High=greater expectation	2.58 (1.25)	2.66 (1.31)	2.71 (1.16)	0.278	0.700
Ease of communication with mother	High=greater comfort/ease	2.84 (1.33)	2.92 (1.36)	2.82 (1.37)	0.911	0.574
Ease of communication with father	High=greater comfort/ease	2.74 (1.41)	2.95 (1.43)	2.90 (1.43)	0.309	0.783
Self -esteem	High=greater self-esteem	3.47 (0.73)	3.51 (0.75)	3.64 (0.61)	0.024	0.167
Religiosity	High=greater religiosity	2.19 (1.31)	2.23 (1.39)	1.91 (1.11)	0.038	0.065
Substance use	High=greater substance use	1.83 (0.80)	1.98 (0.84)	1.90 (0.80)	0.445	0.394
Knowledge of sexual health	High=greater knowledge	3.34 (1.59)	3.56 (1.54)	2.90 (1.61)	0.006	0.001
Attitudes to condoms	High=more positive attitudes	3.57 (0.87)	3.64 (0.90)	3.48 (0.94)	0.377	0.204
Condom self-efficacy	High= greater self-efficacy	4.03 (0.75)	4.13 (0.65)	4.07 (0.71)	0.625	0.470
		%	**%**	**%**	**p**	**p**
Close same-sex friend	No close friend	45	51	31	0.014	0.001

Table 3 continued
Girls

		(1) Any genital contact with same-sex partner	(2) Any same-sex genital contact, and heterosexual intercourse	(3) Heterosexual intercourse only	1 vs.3	2 vs. 3
Base N		*100*	*74*	*2,008*		
Sexual outcomes		**%**	**%**	**%**	**p**	**p**
	Age FS under 13 yrs (column 2 shows age first heterosexual intercourse)	27	8	3	0.001	0.028
	Partner pressure FS	25	25	19	0.221	0.260
	Regretted FS	50	48	42	0.186	0.362
	No condom FS		41	31		0.044
	No condom LS		62	43		0.002
	3 or more opposite-sex partners in last yr		38	22		0.002
	Pregnancy/partner pregnancy		34	9		0.001
Sociodemographic information						
	Do not live with both biological parents	41	42	39	0.900	0.578
	Ethnic minority	9	8	6	0.592	0.553
	Social rented housing	39	46	40	0.922	0.274
Attitudinal and behavioural measures collected at baseline, aged 13/14 years						
Measure	**Direction of coding**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**p**	**p**
Attitudes to school	High=less positive attitudes	2.66 (0.73)	2.78 (0.72)	2.68 (0.71)	0.758	0.208
Expectation of tertiary education	High=greater expectation	3.70 (1.12)	3.51 (1.13)	3.66 (0.99)	0.664	0.176
Expectation of early parenthood	High=greater expectation	2.57 (1.16)	2.71 (1.17)	2.48 (1.16)	0.449	0.073
Ease of communication with mother	High=greater comfort/ease	3.08 (1.43)	3.06 (1.47)	3.39 (1.26)	0.028	0.047
Ease of communication with father	High=greater comfort/ease	2.05 (1.30)	2.03 (1.32)	1.99 (1.16)	0.629	0.795
Self -esteem	High=greater self-esteem	3.14 (0.82)	3.13 (0.86)	3.27 (0.70)	0.106	0.127
Religiosity	High=greater religiosity	2.44 (1.19)	2.36 (1.16)	1.97 (1.05)	0.001	0.004
Substance use	High=greater substance use	2.04 (0.88)	2.24 (0.88)	2.06 (0.84)	0.795	0.064
Knowledge of sexual health	High=greater knowledge	3.58 (1.46)	3.59 (1.55)	3.31 (1.54)	0.071	0.100
Attitudes to condoms	High=more positive attitudes	3.88 (0.95)	3.89 (0.97)	3.81 (0.80)	0.391	0.457
Condom self-efficacy	High= greater self-efficacy	3.80 (0.89)	3.93 (0.80)	3.80 (0.70)	0.962	0.165
		%	**%**	**%**	**p**	**p**
Close same-sex friend	No close friend	13	14	6	0.007	0.007

Results are provided for stage 1 multivariate analysis using both complete case information and the imputed data set. Coefficients/odds ratios are similar, although for pressure and regret outcomes the imputed data set shows a greater risk associated with same-sex partner for boys. This is consistent with a reduction in bias due to lower disclosure of negative experiences by teenagers with same-sex partners. Here, we describe results using the imputed data set.

Pressure and regret were compared for first same-sex genital contact and opposite-sex intercourse (amongst teenagers NOT reporting same-sex genital contact). The latter group were older than the same-sex group (mean ages respectively 14.4 yrs, SD 1.15 and 13.4 yrs, SD 2.9, $p<0.001$), and were more likely to have expected sex (55% vs. 25%, $p<0.001$). Age and expectation of sex were strongly associated with the two outcomes, and were included at stage 1 (Table 4). There was a strong gender difference in the effect of partner type. Boys with a same-sex partner were more likely to report partner pressure and regret, although there was no effect of partner type among girls. There was only a small effect of adjusting for self-esteem in stage 2. Dividing up the same-sex partner group and comparing again to boys reporting opposite-sex partners only, the effect of partner type was similar for boys reporting same-sex genital contact only (pressure OR 2.11 95% CI 0.75 - 5.91; regret OR 3.73 95% CI 1.51 - 9.25) and boys who reported bisexual behaviour (pressure OR 2.80 95% CI 1.23 - 6.35); regret OR 1.79 95% CI 1.00 - 3.22).

Table 4

Partner pressure and regret according to partner type, comparing first genital contact with same-sex partner with first heterosexual vaginal intercourse

Boys		**Partner pressure**						**Regret**					
		Complete case (N=1010)		**Imputed data set (N=1,658)**				**Complete case (N=1,018)**		**Imputed data set (N=1,658)**			
		Stage 1 [a]		Stage 1 [a]		Stage 2 [b]		Stage 1 [a]		Stage 1 [a]		Stage 2 [b]	
		OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Partner type	Opposite-sex partner only (vaginal intercourse)	1.00		1.00		1.00		1.00		1.00		1.00	
	Same-sex partner (genital contact)	2.21 (0.87 , 5.63)	0.097	2.56 (1.29 , 5.08)	0.008	2.52 (1.26 , 5.04)	0.009	1.97 (1.06 , 3.68)	0.033	2.32 (1.39 , 3.86)	0.001	2.28 (1.37 , 3.79)	0.002
Age at time of sex	years	0.87 (0.74 , 1.03)	0.099	0.87 (0.76 , 0.99)	0.034	0.87 (0.76 , 0.99)	0.034	0.90 (0.79 , 1.02)	0.098	0.87 (0.77 , 0.98)	0.022	0.87 (0.77 , 0.98)	0.022
Circumstances	Sex expected/planned	1.00		1.00		1.00		1.00		1.00		1.00	
	Sex not expected	2.08 (1.23 , 3.53)	0.006	1.79 (1.20 , 2.69)	0.005	1.78 (1.19 , 2.67)	0.005	2.00 (1.46 , 2.74)	0.001	2.00 (1.54 , 2.59)	0.001	1.98 (1.53 , 2.58)	0.001
Girls		**Complete case (N=1548)**		**Imputed data set (N=2,108)**				**Complete case (N=1,539)**		**Imputed data set (N=2,108)**			
		Stage 1 [a]		Stage 1 [a]		Stage 2 [b]		Stage 1 [a]		Stage 1 [a]		Stage 2 [b]	
		OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Partner type	Opposite-sex partner only (vaginal intercourse)	1.00		1.00		1.00		1.00		1.00		1.00	
	Same-sex partner (genital contact)	0.58 (0.20 , 1.67)	0.317	0.69 (0.28 , 1.68)	0.412	0.68 (0.28 , 1.66)	0.399	0.48 (0.21 , 1.09)	0.080	0.81 (0.36 , 1.79)	0.592	0.80 (0.36 , 1.77)	0.580
Age at time of sex	years	0.73 (0.64 , 0.84)	0.000	0.72 (0.64 , 0.82)	0.001	0.73 (0.64 , 0.82)	0.001	0.56 (0.49 , 0.64)	0.001	0.62 (0.54 , 0.71)	0.001	0.62 (0.54 , 0.71)	0.001
Circumstances	Sex expected/planned	1.00		1.00		1.00		1.00		1.00		1.00	
	Sex not expected	2.67 (2.00 , 3.57)	0.000	2.77 (2.10 , 3.65)	0.001	2.74 (2.08 , 3.63)	0.001	3.23 (2.72 , 3.84)	0.001	3.20 (2.71 , 3.76)	0.001	3.18 (2.69 , 3.75)	0.001

[a] Adjusted for study, intervention/control group, sociodemograhics and age in months at follow-up. [b] Further adjusted for baseline self esteem.

Sexual risk was compared for teenagers reporting bisexual behaviour and those reporting heterosexual intercourse only (Table 5). Among boys, bisexual behaviour had significant associations with three outcomes (no condom at FS, number of partners and partner pregnancy), which remained after allowing for baseline covariates (communication with mother, future expectations and substance use) in stage 2. Among girls, bisexual behaviour was significantly associated with greater risk on four measures at both stages, although there was a greater downward adjustment of risk at stage 2 than for boys. Further adjusting the pregnancy models for characteristics of sexual behaviour (age and partner pressure at first heterosexual intercourse, number of partners) attenuated the risk associated with bisexual behaviour to non-significance among girls (OR 1.85 95% CI 0.98 , 3.51), but not among boys (OR 3.53 95% CI 1.86 - 6.67).

Table 5

Sexual risk according to partner type, comparing outcomes for teenagers with both same- and opposite-sex partners and teenagers with opposite-sex partners only

		Effect for bisexual behaviour						
Boys		**Complete case analysis**			**Analysis using imputed data set (N=1,620)**			
Sexual risk outcomes reported at follow-up		***N***	**Stage 1 [a]**	**p**	**Stage 1 [a]**	**p**	**Stage 2 [b]**	**p**
Age at first heterosexual intercourse	Coefficient (95% CI)	*1078*	-0.25 (-0.68 , 0.18)	0.242	-0.33 (-0.74 , 0.07)	0.102	-0.33 (-0.74 , 0.07)	0.103
No condom at first heterosexual intercourse	OR (95% CI)	*1307*	1.96 (1.12 , 3.44)	0.018	1.96 (1.13 , 3.40)	0.017	2.02 (1.13 , 3.61)	0.017
No condom at most recent heterosexual intercourse	OR (95% CI)	*944*	1.11 (0.61 , 2.02)	0.724	1.11 (0.60 , 2.05)	0.747	1.10 (0.57 , 2.12)	0.770
Number of partners in last 12 months	Coefficient (95% CI)	*801*	0.51 (0.02 , 1.00)	0.041	0.59 (0.05 , 1.13)	0.034	0.59 (0.05 , 1.13)	0.034
Pregnancy/partner pregnancy	OR (95% CI)	*1237*	4.21 (2.25 , 7.86)	0.001	4.43 (2.41 , 8.14)	0.000	3.09 (1.67 , 5.73)	0.001
Girls		**Complete case analysis**			**Analysis using imputed data set (N=2,108)**			
Sexual risk outcomes reported at follow-up		***N***	**Stage 1 [a]**	p	**Stage 1 [a]**	**p**	**Stage 2 [b]**	**p**
Age at first heterosexual intercourse	Coefficient (95% CI)	*1658*	-0.57 (-0.90 , -0.24)	0.001	-0.52 (-0.81 , -0.22)	0.001	-0.41 (-0.66 , -0.15)	0.003
No condom at first heterosexual intercourse	OR (95% CI)	*1774*	1.56 (0.97 , 2.51)	0.069	1.58 (1.00 , 2.51)	0.051	1.38 (0.87 , 2.20)	0.169
No condom at most recent heterosexual intercourse	OR (95% CI)	*1472*	2.02 (1.07 , 3.83)	0.031	2.12 (1.20 , 3.73)	0.010	1.90 (1.06 , 3.39)	0.031
Number of partners in last 12 months	Coefficient (95% CI)	*1293*	0.98 (0.11 , 1.86)	0.029	0.92 (0.21 , 1.63)	0.013	0.85 (0.14 , 1.56)	0.021
Pregnancy/partner pregnancy	OR (95% CI)	*1810*	3.13 (1.72 , 5.72)	0.001	4.51 (2.35 , 8.64)	0.000	2.66 (1.47 , 4.82)	0.001

[a] Adjusted for study, intervention/control group, gender, sociodemograhics and age in months at follow-up. [b] Further adjusted for parenthood expectations, ease of communication with mother and substance use.

Discussion

The study suggests that boys with a same-sex partner were more vulnerable to unwanted first sex, reporting greater partner pressure and regret than their exclusively heterosexual counterparts. Bisexual behaviour in both boys and girls was associated with greater sexual risk-taking than exclusively heterosexual behaviour, including a more than three-fold increase in pregnancy/partner pregnancy risk.

In comparing first same-sex genital contact and heterosexual intercourse, we took account of the likely non-equivalent setting of these two behaviours by adjusting for age and not expecting sex. Further exploration using more detailed RIPPLE measures confirmed boys' greater likelihood of negative feelings after first same-sex genital contact, taking account of additional circumstantial information (use of alcohol/drugs, no prior relationship with partner). The findings mirror gender differences in approval of same-sex relationships, reported elsewhere among UK teenagers.[31] Boys' greater disapproval of gay male relationships suggests an explanation for regret. Reported pressure appears in line with low relationship control reported by sexual minority boys in a US study,[32] and could signal denial of responsibility. Sexual minority boys were more likely than girls to report sexual coercion in seven North American population-based surveys,[33] but the extent of physical coercion, victimisation or sexual abuse in our pressure measure is unknown.

Greater risk taking among teenagers with bisexual behaviour accords with previous studies of teenagers[4, 5, 34] and older populations.[25] Part of pregnancy risk associated with bisexual behaviour was mediated by difficult communication with mother, future expectations of early parenthood and substance use; and among girls the remainder was attributable to sexual lifestyle.

Low statistical power prevented us from excluding cases where baseline covariates post-dated first sex, so there may have been an element of reverse causation. More research is needed on sexual risk-taking among teenagers with exclusively same-sex partners.

The study suffers from several limitations, notably its use of self-reported measures of sensitive behaviour.[35] In general, inclusion of questions regarding same-sex behaviour appeared acceptable to both schools and young people. However, one education authority in the SHARE study refused to allow teenagers certain sensitive questions. Comments at the end of the questionnaire suggest that some teenagers welcomed the opportunity to report on such behaviour. However, although young people were asked to complete the questionnaire without talking to friends, researchers frequently observed young people, particularly boys, making homophobic comments. Rates of missing responses for detailed questions about same-sex experiences were greater than for equivalent opposite-sex experiences, suggesting a reluctance to divulge more sensitive information despite reassurances of confidentiality. Imputation of missing items using predictors (including partner type) helped to overcome risk of bias and loss of power inherent in complete case analyses. The risk of bias in both studies due to differential attrition from baseline to follow-up was addressed through the use of weights, which make it more likely that the results generalise to a wider population of teenagers. Rates of same-sex sexual behaviours found were comparable with rates of under 16 behaviour reported retrospectively by older UK respondents.[24, 25]

Our study is confined to the early sexual experiences of a young age group. More research is needed to establish whether our findings extend to subsequent sexual experiences; as well as to those who initiate sexual relationships at an older age. We use a behavioural classification of sexual orientation rather than a measure of sexual attraction or identity: discordance between such measures during

adolescence is well known, and future research should use multiple measures of orientation.[5, 36] A further limitation is the age of our data set, since over the last decade the UK has seen greater social tolerance and legitimisation of same-sex relationships.[37] Nevertheless, recent evidence suggests that homophobic bullying and victimisation among school-age teenagers are still commonplace in the UK and US.[38, 39]

Overall, there was little support for the notion that sexual knowledge and skills deficits were associated with partner type, although two other studies had more mixed findings.[8, 9] The findings also indicate limitations to the interpretation of differences using psychosocial risk factors common to all adolescents, echoing a North American study,[6] while extending the evidence base to a UK setting, and focusing on unwanted sex in addition to risk-taking. The results confirm the unique vulnerability of teenagers with same-sex partners, and suggest that greater understanding in future research might come from the application of measures designed to capture gay-related stressors, such as bullying and fear of stigmatisation.

What this paper adds

Although research indicates greater sexual risk-taking among teenagers with same-sex partners, compared to those with exclusively opposite-sex partners, our understanding of this is limited. Apart from sexual risk, little is known about how experiences of early same-sex and opposite-sex sexual relationships compare.

This paper extends the North American evidence base to a UK setting, focusing on unwanted sex in addition to risk-taking. It combines two large school-based surveys to compare early sexual experiences of teenagers who have same-sex partners and opposite-sex partners.

Boys with a same-sex partner were more vulnerable to unwanted first sex than their exclusively heterosexual counterparts. Bisexual behaviour in both boys and girls was associated with greater sexual risk-taking than exclusively heterosexual behaviour, and this was only partially explained by underlying psychosocial factors.

The findings suggest limitations to the interpretation of differences using psychosocial risk factors common to all adolescents, and confirm the unique vulnerability of teenagers with same-sex partners. Greater understanding of the impact of gay-related stressors is required in future work.

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