

## RISK FACTORS DIFFER ACCORDING TO SAME-SEX AND OPPOSITE-SEX INTEREST

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**Summary.** Are risk behaviours in adolescence differentiated according to same-sex vs opposite-sex interest? For all respondents a five-point scale of interest in each sex used information from both of the first two in-home waves of the National Longitudinal Study of Adolescent Health (Add Health). Logistic regression predicted the probability of experiencing each risk behaviour from the same-sex and opposite-sex interest scores. Same-sex interests have more effect on emotional risk, and opposite-sex interests have more effect on substance use. Nevertheless, all risk variables except boys' depression are responsive to both same-sex and opposite-sex interest. The same-sex interest component of risk is attributed to the emotional strain of living with an anomalous sex interest in a heterosexual society.

### Introduction

Adolescence is an age group for which there is little good said about sex. Sex leads to premature and unwanted pregnancies which disorganize the rest of your life. Sex leads to sexually transmitted disease, including some incurable, and some that will kill. Sex is part of a problem behaviour complex that includes drinking alcohol, using marijuana and other drugs, smoking cigarettes, and delinquent behaviour (Donovan *et al.*, 1988).

What about same-sex behaviour? A separate literature examines the differences between the risk behaviour of adolescents and adults who have same-sex interests and/or behaviour, and those who show opposite-sex interests. This literature proposes that those who have same-sex interests are stigmatized by others, and that as a consequence they show not only more of the substance use behaviours than those with opposite-sex interests (Faulkner & Cranston, 1998; Fergusson *et al.*, 1999) but also more depression (Fergusson *et al.*, 1999; Safren & Heimberg, 1999), suicidal thoughts (DuRant *et al.*, 1998; Herrell *et al.*, 1999), and other mental health and psychiatric problems (Fergusson *et al.*, 1999; Sandfort *et al.*, 2001). Those with same-sex interests are found to be at high risk of being physically attacked (Hershberger & D'Augelli, 1995; Faulkner & Cranston, 1998). Two recent papers

have discovered that those with both-sex interests are at greater risk than those with opposite- or same-sex interest (Russell *et al.*, 2002; Udry & Chantala, 2002). Much of the same-sex risk literature relies on convenience samples (Hershberger & D'Augelli, 1995; Safren & Heimberg, 1999), but some studies have been conducted on population samples (Faulkner & Cranston, 1998; Herrell *et al.*, 1999). Analyses lead to inconsistent findings because of inconsistent comparison groups and small sample sizes. Sometimes males and females are combined. Groups with both-sex interests are combined with same-sex only interest groups. Adolescents without sex interests are often omitted or considered opposite-sex oriented. Sometimes no comparison group is offered.

From reading the literature on same-sex risk factors, the strong implication is that risk factors emerge from the experience of those with same-sex interests that are either different from factors associated with opposite-sex interest, or factors that are stronger for youth with same-sex interests, and that these risk factors emerge specifically on account of the social stigma received by those with same-sex interests, but not by those with opposite-sex interests.

The present study takes as its focus the health and behaviour risks adolescents experience associated with opposite-sex and same-sex romantic and sexual interests and relationships. It considers that adolescents may have tentative or ambivalent sexual orientation. Some may never have felt attraction to the opposite sex, to the same sex, or to either. Some may have had one or more romantic and/or sexual relationships, and these may have been with the opposite sex, or the same sex, or with both. How do these varieties of sexual and romantic experience become associated with different risk factors? Using a developmental perspective (Troiden, 1988), the inquiries of adolescents do not presuppose that they will have chosen or must choose between heterosexual and same-sex attractions and relationships.

In this paper, the notion is explored that for each sex, the risk factors are differentiated according to same-sex vs opposite-sex interests, with some risks more associated with same-sex interest, and others more associated with opposite-sex interest. Sexual behaviour is a part of a complex of problem behaviours associated with adolescence, as Jessor & Jessor (1977) have proposed, rather than thinking of same-sex vs opposite-sex sexual interests as the 'causes' of the other risk behaviours.

### *Types of risk factors*

There are several types of risk factors associated with sexual behaviour as well as with other aspects of adolescence. A risk factor is a behavioural or social attribute of an individual or his environment that is associated with increase or decrease in the probability of a health outcome. However, the risk mechanisms are diverse. These mechanisms need to be disaggregated.

1. *Problem behaviours.* The typical problem behaviours (drinking alcohol, smoking, drug use, minor delinquency, and early sexual behaviour) are thought to be collectively interrelated, and commonly associated with striving for adolescent independence and peer group membership. Beyond their inter-relationships, they are all associated with unconventionality and sensation-seeking. In the problem behaviour conceptualization, they are related to heterosexual behaviour. In same-sex risk theory,

they are thought of as more strongly related to same-sex interests than to opposite-sex interests.

2. *Non-behavioural risk attributes of the individual or his family that may be related to sexual behaviour or other problem behaviours for complex unexplained reasons.* Examples of this type of risk factor are father absence, verbal ability, poverty, and mental retardation. For example, poverty may be a risk factor for delinquency. Father absence is a risk factor for early sexual involvement (Ellis *et al.*, 2003). Verbal ability is associated with the timing of involvement in sex (Halpern *et al.*, 1999).

3. *Psychological stress associated with sexual relationships or other adolescent problems.* In the same-sex literature, seeking counselling, depression and suicidal thoughts are risks thought to be associated with the stigma of same-sex interests. But depression and suicidal thoughts are also associated with break up of romantic relationships with partners of either sex (Joyner & Udry, 2000).

4. *Behaviours of others towards an individual elicited by his sexual behaviour that may put him at risk of misfortune through no act of his own.* An example is the risk of being victimized or physically attacked. This is frequently invoked as more likely to occur to those reporting same-sex preferences or showing behaviour thought to be associated with same-sex preferences, especially for boys. On the other hand, being physically attacked is also an occasional part of competition for sex partners of whatever sex.

Each type of risk can be associated with same-sex or opposite-sex interest. The purpose of this paper is to establish which types of risk are more associated with same-sex interest, and which more with opposite-sex interest.

## Methods

The data for analysis come from the National Longitudinal Study of Adolescent Health, hereafter Add Health, a panel study of a national representative sample of US adolescents initially in grades 7–12 in 1994. A stratified probability sample of 80 high schools (and where necessary feeder schools to those high schools to include grade levels 7–12) was selected from the Quality Education Database that lists all high schools in the 50 United States as the frame. Eighty per cent of the contacted schools agreed to participate by directing a self-administered questionnaire on adolescent health to all students. School refusals were replaced by schools from the same stratum. For each school, all students present on a particular day completed a one-period op-scan questionnaire. Information from the self-administered questionnaire was used to identify specific sub-groups for over-sampling in a second-stage sample for home interviews. About 100,000 students took the school questionnaire. Details of the sample design are provided at the Add Health website [www.cpc.unc.edu/addhealth](http://www.cpc.unc.edu/addhealth).

Respondents from the school rosters and school questionnaires of participating schools were selected for a stratified probability sample to be interviewed at home. In the first wave of home interviews, 80% of the selected students (about 20,750) completed home interviews with permission from parents. Computer-assisted interviews were conducted by an interviewer, but sensitive questions were self-administered on the computer by respondents with recorded questions heard through earphones.

School questionnaires were administered in 1994–95. The first wave of home interviews was conducted in 1995. A second wave of home interviews was administered in 1996 about a year later with the same respondents and a similar questionnaire. Omitted from follow-up at the second wave were those in grade 12 at the first wave. About 13,000 respondents were interviewed at both home interview waves, consisting of more than 90% of the targeted respondents from the first wave home interview. When weighted, the sample is representative of all US adolescents in grades 8–12 in the autumn of 1995. The 13,000 respondents to both home interviews constitute the analytic sample for the present study.

At each home interview, all respondents were asked to answer yes or no to each of two questions: ‘Have you ever had a romantic attraction to a male? Have you ever had a romantic attraction to a female?’

In another questionnaire section, respondents were asked if they had had a special romantic relationship with another person in the last 18 months. They could list up to three. For each relationship they indicated the sex of the partner.

They were then asked if during the same period, they had had sex with any other person not listed among their romantic relationships. For each person listed they were asked other questions about the relationship. This series of questions was asked in each wave of home interviews.

#### *Constructing sex interest scales*

A same-sex interest scale and an opposite-sex interest scale was constructed for each respondent. For each wave, one point was scored if the respondent indicated any romantic or sexual partner for each sex, and one point was scored for an attraction for each sex. Scores on each scale ran from zero (no partners of that sex and no attraction to that sex for either wave) to four (a partner of that sex at each wave and an attraction to each sex at each wave). Thus, for each sex interest, a score of four means that the respondent had indicated at each wave an attraction to that sex, and one or more romantic or sex partners of that sex. The two sex-interest scales are logically independent from one another.

In evaluating this scoring, each measurement was a snapshot of the respondents’ perceptions of their sex interests and romantic partners at that time point. While each wave of home interviews recorded up to six partners for each respondent, it was scored for each interview whether or not they had listed *any* same-sex partners and *any* opposite-sex partners. It makes no difference whether the same relationship(s) are listed at more than one interview. A respondent at the first wave may perceive that he has a romantic attraction for a same-sex individual, but at the second wave may subsequently perceive that upon reflection this had not really been a romantic attraction to that person. While this may lead to two reports that appear as contradictions in the data, they are not interpreted as contradictions, but as different interpretations of the relationships as the respondents’ perceptions mature.

These two sex-interest scores (same-sex interest score and opposite-sex interest score) were used as independent variables, together with age and an interaction of same-sex by opposite-sex interest, to study association with several risk variables.

A logistic regression (except for Verbal IQ, an OLS regression) was computed using Stata (Stata Corp, 2001) to adjust for sample weights and design effects. The equation was evaluated for age 16, and graphed for ease of interpretation. The selection of equations for presentation as graphs was for the purpose of revealing interactions between same-sex interest and opposite-sex interest, or for highlighting sex differences in the graphs. The graphs are presented in Figs 1–6. The slope of the lines between points in the graphs indicates the increase in risk for adding an opposite-sex interest. The distance between the lines indicates the increase in risk for adding a same-sex interest. For each symbol in the graphs, the same-sex score is read by the symbol on the legend, and the opposite-sex score is read on the  $x$ -axis. For example, if a hypothetical individual at age 16 has a same-sex score of 1 and an opposite-sex score of 4, the probability of risk for that behaviour is read from the line for same-sex=1 at the point where opposite-sex=4.

### *Measurement of risk variables*

Risk variables were measured at Wave II unless otherwise noted. These measures were created as follows.

*Father absent.* At Wave I respondent indicates not living with his biological father.

*Verbal ability.* Truncated version of the Peabody Picture Vocabulary Test (Revised) computer-adapted, and administered by the interviewer at Wave I. This version correlates 0.96 with the full test. This measure of verbal ability correlates 0.65 or higher with popular intelligence tests. In administration, the interviewer states a word, and shows four pictures. The respondent points to the picture that is most closely related to the word. No reading ability is required on the part of the respondent.

*Receiving counselling.* A yes answer to ‘During the past year did you receive psychological or emotional counselling?’

*Depression.* Measured as being in the top 10% of a nineteen-item version of the CESD depression scale, scored as a sum of item scores.

*Thinking about suicide.* A yes answer to ‘During the past 12 months, did you ever seriously think about committing suicide?’

*Delinquency.* A fifteen-item delinquency scale consisting of offences from trivial to serious. The score is a mean of responses, irrespective of the seriousness of the delinquency. Respondents scoring over the 50th percentile for their sex were classified as delinquent.

*Trying drugs.* A yes answer to any of the following questions: ‘ever trying marijuana’, ‘ever trying cocaine’, ‘every trying inhalants’, ‘ever trying any other type of illegal drug’, or ‘ever inject an illegal drug’.

*Drinking alcohol.* A yes answer to the question: ‘Do you ever drink beer, wine, or liquor when you are not with your parents or other adults in your family?’

*Smoking regularly.* A yes answer to ‘Have you ever smoked cigarettes regularly, that is at least one cigarette every day for 30 days?’

*Was attacked.* A yes response to any of the following questions about events occurring in the past year: ‘someone pulled a knife or gun on you’, ‘someone shot you’, or ‘you were jumped’.

**Table 1.** Distribution of sexual interest scores

Same-sex interest scores	Opposite-sex interest scores					Total
	0	1	2	3	4	
0	465	861	2308	3005	5149	11,788
1	17	88	218	421	515	1259
2	9	7	35	51	80	182
3	3	5	5	17	23	53
4	4	7	2	5	5	23
Total	498	968	2568	3499	5772	13,305

Frequency missing=265.

### Results

Table 1 shows the number of respondents in each of the 25 categories of same-sex by opposite-sex interest. For economy of space the breakdown by sex of respondent is omitted, but the proportions in each category were similar in each sex. Of the 13,305 respondents with non-missing answers, 465 (3.5%) reported no sex interest, 11,323 (85%) reported only opposite-sex interest, 33 (0.25%) reported only same-sex interest and 1484 (11%) reported both same-sex interest and opposite-sex interest. While these *n* values and percentages are unweighted, the percentages are only trivially different when weighted. Missing on one or more of the four sex-interest questions on Wave I and Wave II or missing on age were 265 (2% of those to whom the questions were posed). Some respondents may have inadvertently or deliberately answered incorrectly, in spite of the fact that they were answering questions only they could hear or read, and answering privately into a computer.

An important part of the findings of this study is contained in the marginal distributions of Table 1. For 85% of the adolescents, sex interests are unambiguously heterosexual. For them, there is little reason to be concerned about the difficulty of their struggling with the identity of their sexual orientation. There are a thousand times as many adolescents in the category of zero same-sex interest and high opposite-sex interest as there are in the category of zero opposite-sex interest and high same-sex interest.

Here is an illustration of the instability of same-sex attractions between waves. At Wave I, 69 boys indicated that yes, they had ever had a romantic attraction to the same sex, and no, they had never had an attraction to the opposite sex. At Wave II, how did these same 69 boys respond to the same questions? At Wave II, 35% said no attraction to either sex, 48% said yes to opposite sex only. About 11% said yes to same-sex only, and 6% said yes to both sexes. Thus only 11% gave the same response at Wave II that they had given at Wave I, while 89% gave a different response. Each response category has its own level of instability. Had Wave I responses been used to identify a group with 'minority sexual orientation' in need of group support, such use would be reading more meaning into the responses than they contain. Yet the responses are not 'invalid'; they are only unstable. Presumably combining responses

from two waves provides a broader foundation, although there is still no grounds for stating that combining two waves provides a good prediction for stable adult sexual orientation.

The general pattern revealed in the logistic regressions is as follows. For risks of type 1, 3 and 4, as opposite-sex interest increases, and as same-sex interest increases, the probability of the risk increases, at a greater or lesser rate of increase. Hence it follows that any sex interest is risky. Because the risk effects of same-sex interest and opposite-sex interest are usually additive, the highest risk is experienced by those with high scores on both sex interests. The lowest risk is always associated with zero-sex interest in both sexes. But several interactions of same-sex and opposite-sex interest were discovered. In the case of such interactions, the results have been presented in graphs. For type 2 risks (living in a father-absent family and verbal ability) diverse patterns are found, and these have all been presented in graphs for clarity. All graphs are straightforward plots of the equations when they are evaluated for age 16. All risk coefficients for same-sex interest and opposite-sex interest are significant at  $\alpha=0.05$ , except for boys' opposite-sex interest predicting depression, where there is no relationship.

#### *Effect size for risk*

The same-sex effect (SS effect) is defined as the difference in the probability of the outcome for adolescents with the highest same-sex only interest (same-sex interest score=4, opposite-sex interest score=0) and adolescents with no sex interest (same-sex interest score=0, opposite-sex interest score=0). Similarly, the opposite-sex effect (OS effect) is defined as the difference in the probability of the outcome for adolescents with the highest opposite-sex only interest (same-sex interest=0, opposite-sex interest=4) and adolescents with no sex interest (same-sex interest score=0, opposite-sex interest=0). The effect ratio is simply the ratio of the same-sex effect to the opposite-sex effect (SS effect/OS effect). The effect size was computed for each risk factor (not computed for verbal IQ). See Appendix for statistical detail. All main effects are significant for boys and girls except depression for boys. Table 2 gives the relative effect size for risk variables. Risk ratios above 1.0 indicate that opposite-sex effect is greater, and ratios below 1.0 indicate that same-sex effect is greater. There is a consistent pattern in both sexes that emotional risks are greater for same-sex interests than for opposite-sex interests. Generally, only boys' substance use risks are greater for opposite-sex interests than for same-sex interests. Nevertheless, all risk variables are responsive to both same-sex and opposite-sex interests to varying degrees. The exception is that boys' depression is impervious to sex interests.

*Father absent* (Figs 1 and 2). There is a significant interaction of same-sex and opposite-sex interest by 'father absent' for boys (Fig. 1). At zero opposite-sex interest, about 25% of boys with same-sex interest=0 have absent fathers, while about 90% of boys with same-sex interest=4 have absent fathers. This is a very strong relationship. But as opposite-sex interest increases towards 4, this relationship completely disappears. This could be interpreted that presence of fathers suppresses same-sex interests. Girls with high same-sex interest scores are less likely to live with fathers, and girls with high opposite-sex interest scores are also less likely to live with fathers

**Table 2.** The effect of opposite-sex interest compared with same-sex interest

Outcome	Sex	Effect Ratio ( <i>p</i> value) <sup>a</sup>	Same-sex effect	Opposite-sex effect
Father absent	Boys	0.21 ( <i>p</i> =0.001) <sup>b</sup>	-0.64	-0.13
Father absent	Girls	0.57 ( <i>p</i> =0.37)	-0.16	-0.10
Counsel	Boys	0.23 ( <i>p</i> =0.01)	0.22	0.05
Counsel	Girls	0.37 ( <i>p</i> =0.03)	0.23	0.09
Depression	Boys	0.04 ( <i>p</i> <0.001)	0.33	0.01
Depression	Girls	0.29 ( <i>p</i> =0.02)	0.20	0.06
Suicide	Boys	0.10 ( <i>p</i> =0.001) <sup>b</sup>	0.59	0.06
Suicide	Girls	0.21 ( <i>p</i> <0.001)	0.49	0.10
Delinquency	Boys	0.79 ( <i>p</i> =0.47) <sup>b</sup>	0.51	0.41
Delinquency	Girls	1.00 ( <i>p</i> =0.99)	0.34	0.34
Any drugs	Boys	1.72 ( <i>p</i> =0.048)	0.23	0.39
Any drugs	Girls	0.71 ( <i>p</i> =0.10)	0.59	0.41
Alcohol	Boys	2.13 ( <i>p</i> =0.01)	0.21	0.44
Alcohol	Girls	1.21 ( <i>p</i> =0.17)	0.51	0.62
Smoke	Boys	2.55 ( <i>p</i> =0.050)	0.09	0.23
Smoke	Girls	2.11 ( <i>p</i> =0.023)	0.14	0.30
Attacked	Boys	1.22 ( <i>p</i> =0.59)	0.16	0.19
Attacked	Girls	0.20 ( <i>p</i> =0.002)	0.26	0.05

<sup>a</sup>*p* value for (two-sided) test that Effect Ratio=1.

<sup>b</sup>Interaction model.

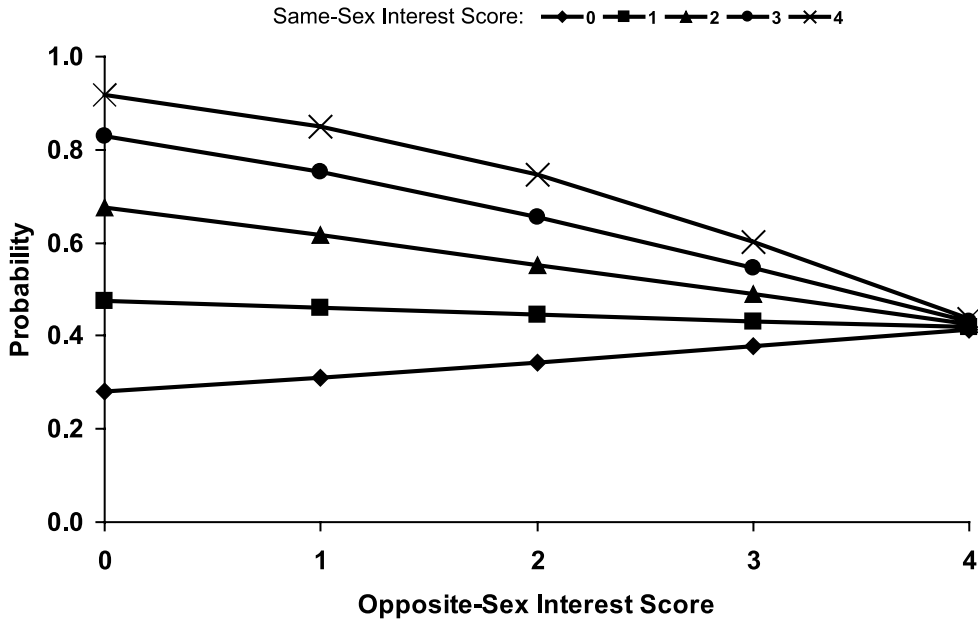
(Fig. 2). This is consistent with previous findings that adolescent girls with fathers absent have early sexual activity (Ellis *et al.*, 2003) but it applies to both same-sex and opposite-sex interest.

*Verbal ability* (Figs 3 and 4). Boys with lower same-sex interest scores have higher verbal ability and boys with higher opposite-sex interest scores have higher verbal ability (Fig. 3). This finding is not consistent with the commonly accepted view that homosexuals have higher IQs. Tuttle & Pillard (1991) compared adult heterosexual with homosexual males and females (recruited from newspaper advertisements) on verbal ability, and found no significant differences by sex preference within sex. However, see Willmott & Brierley (1984) and McCormick & Witelson (1991) for further exploration of sexual orientation and cognitive ability. Because of 'mainstreaming' of individuals with marginal and low intelligence in regular schools, plus the fact that the school sample contained some special education schools, Add Health has a representative sample of adolescents at all verbal ability levels. Girls in Add Health with high same-sex interest scores have higher verbal ability, while girls with high opposite-sex interest scores also have high verbal ability (Fig. 4). Put another way, girls with low sex interest for either sex have lower verbal ability.

*Received counselling.* For both boys and girls, the probability of receiving psychological counselling increases as the same-sex interest score increases and as the



## Boys with fathers absent



**Fig. 1.** Boys with fathers absent. Slope (increase for adding an opposite-sex interest) is statistically different from 0 ( $p < 0.001$ ). Distance between lines (increase for adding a same-sex interest) is statistically different from 0 ( $p < 0.001$ ). Interaction between same-sex and opposite-sex interest score is statistically different from 0 ( $p = 0.001$ ).

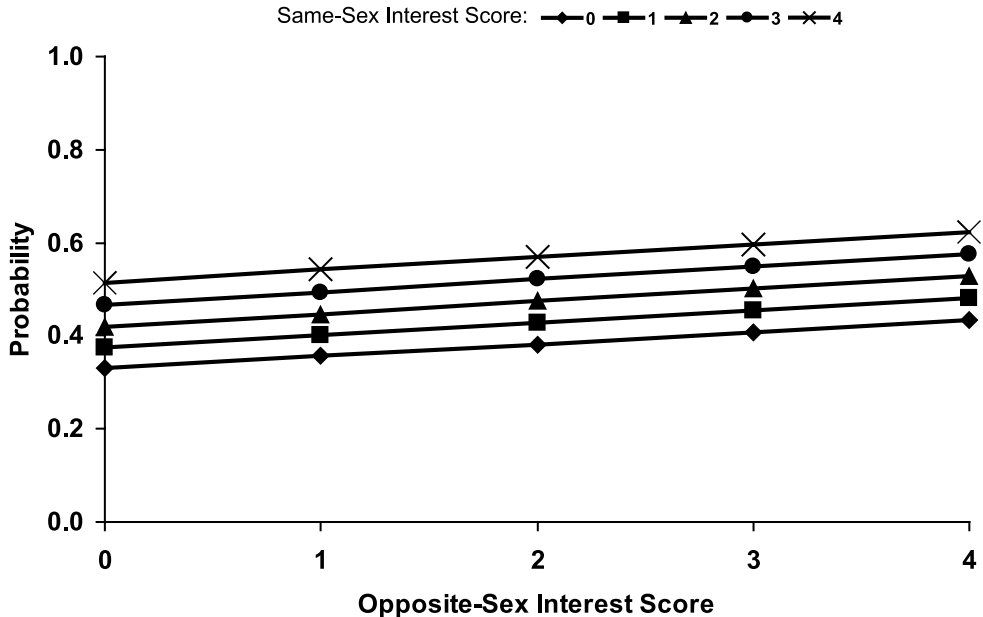
opposite-sex interest score increases. The effect of same-sex interest is stronger than the effect of opposite-sex interest.

*Depression.* Boys do not get depressed in association with opposite-sex interest, but they do get depressed in association with same-sex interest. Girls experience depression in association with each sex interest, but the same-sex effect is stronger than the opposite-sex effect for girls.

*Suicidal thoughts.* Girls think about suicide associated with both opposite-sex and same-sex interest, but the effect of same-sex interest is much stronger. For boys there is a significant interaction effect (Fig. 5). For boys at zero opposite-sex interest the effects of same-sex interest on suicidal thought is strong. But as boys increase in opposite-sex interest, the effect of same-sex interest on suicidal thoughts shrinks to negligible. Few boys with strong interest in both sexes have suicidal thoughts. Put another way, having strong opposite-sex interests suppresses the suicidal thoughts associated with same-sex interest for boys.

*Delinquency.* Girls have significant delinquency effects equally from same-sex and opposite-sex interests. For boys there is an interaction (Fig. 6). At zero opposite-sex interest, boys show a strong effect of same-sex interest on delinquency. But as boys' opposite-sex interest increases, their same-sex interest effect on delinquency vanishes.

## Girls with fathers absent



**Fig. 2.** Girls with fathers absent. Slope (increase for adding an opposite-sex interest) is statistically different from 0 ( $p < 0.001$ ). Distance between lines (increase for adding a same-sex interest) is statistically different from 0 ( $p = 0.016$ ). Interaction between same-sex and opposite-sex interest score is non-significant and was omitted from the model.

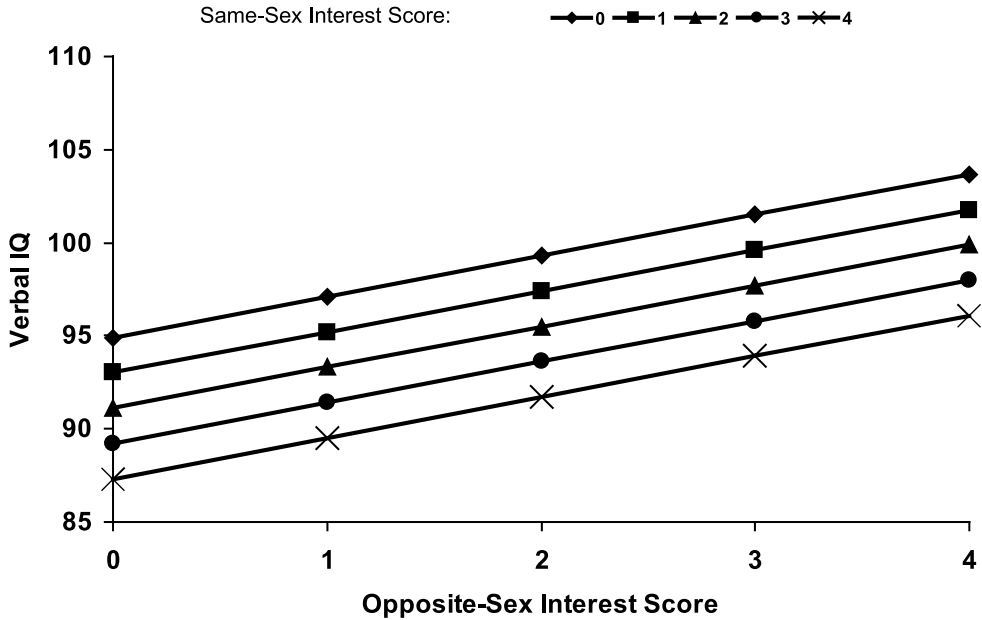
*Trying drugs, alcohol and smoking.* For boys and girls, same-sex and both-sex interests are associated with trying drugs, drinking alcohol outside the family, and regular smoking. For boys, all these risk factors are associated more with opposite-sex interest than same-sex interest. For girls, opposite-sex interest has a stronger association with smoking than does same-sex interest, but alcohol and drug use are not significantly more associated with one sex interest than the other.

*Being attacked.* Boys being attacked is associated with same-sex and opposite-sex interest with no significant difference. This is contrary to the commonly perceived strong association of victimization with young homosexual males. Surprisingly, for girls, being attacked is more associated with same-sex interest than with opposite-sex interest. Victimization is not a behaviour, but a happening, and is defined as the action of someone else.

### Discussion

Why are behaviour risks responsive to both same-sex and opposite-sex interest? The problem behaviour-type risks of Jessor & Jessor (1977) (type 1 risks: delinquency and

## Boys' verbal IQ



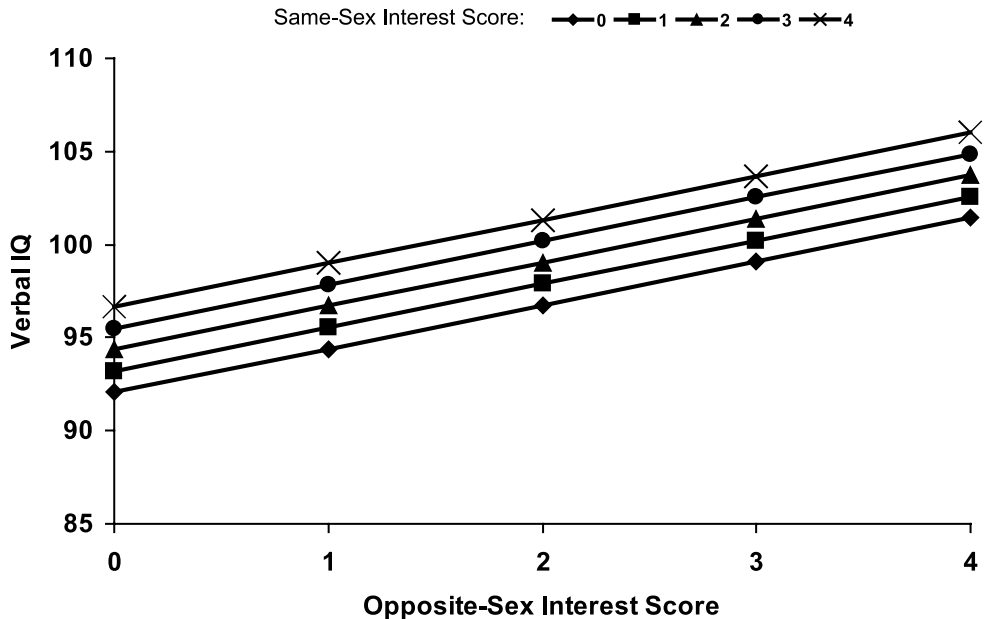
**Fig. 3.** Boys' verbal IQ. Slope (increase for adding an opposite-sex interest) is statistically different from 0 ( $p < 0.001$ ). Distance between lines (increase for adding a same-sex interest) is statistically different from 0 ( $p = 0.001$ ). Interaction between same-sex and opposite-sex interest score is non-significant and was omitted from the model.

substance use) are associated with the personality traits of sensation-seeking and unconventionality. They are also associated with adolescent androgen levels (Udry, 1990). Adolescent sexual behaviour displayed by either sex is an integral part of the problem behaviour syndrome, and shares the syndrome relationship to sensation-seeking, unconventionality and adolescent androgen levels (Halpern & Udry, 1999). Therefore adolescent circulating androgens generate generic sex interests and problem behaviour type risks simultaneously, while risky behaviours may stimulate androgens.

Why are certain risks associated with same-sex interests or opposite-sex interests more than the other? Type 2 risks (non-sexual attributes of the individual) such as father absence and verbal ability may be related to sex interests. The reasons for this are not clear. Higher same-sex interests were observed in adolescents who are not living with fathers. For boys, this only holds when opposite-sex interests are low while same-sex interests are high. For girls, not living with fathers is associated with high sex interest, directed at either sex. Girls' interest in sex, whether same or opposite sex, is suppressed by father presence, or encouraged by absence of fathers.

Verbal ability is related to same-sex interest for unknown reasons. As boys' verbal ability increases, their same-sex interest decreases, and their opposite-sex interest

## Girls' verbal IQ



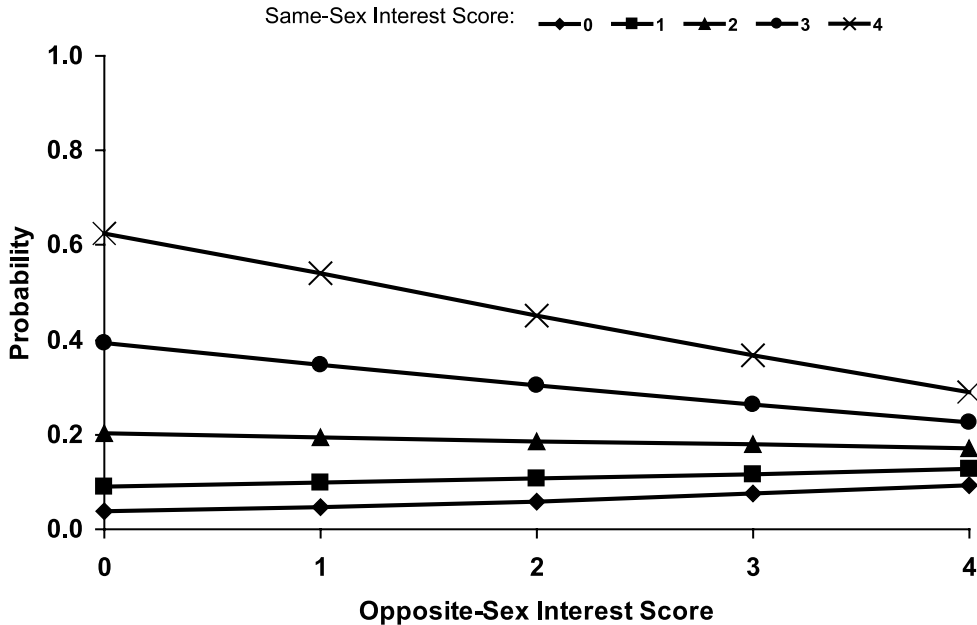
**Fig. 4.** Girls' verbal IQ. Slope (increase for adding an opposite-sex interest) is statistically different from 0 ( $p < 0.001$ ). Distance between lines (increase for adding a same-sex interest) is statistically different from 0 ( $p = 0.046$ ). Interaction between same-sex and opposite-sex interest score is non-significant and was omitted from the model.

increases, contrary to expectation. As girls' verbal ability increases, their opposite-sex interest increases, but their same-sex interest also increases. The smarter girls have high interest in both sexes, and the less smart girls have low interest in both sexes. However, this does not mean that the smartest girls are more sexually active: they are not (Halpern *et al.*, 1999).

The easiest risk to understand is emotional/psychological distress. It is best considered as a direct emotional response to the circumstances of living with same-sex interest in a heterosexual society. It is not clear that the psychological distress is caused by social stigma associated with same-sex behaviour or attractions. Perhaps some other condition causes both emotional risk and same-sex interest, and as a consequence, they co-vary. Nevertheless, receiving counselling, depression and thinking of suicide are distinctly related to same-sex interests for both boys and girls, and are only slightly related to opposite-sex interest.

The physical attack of others upon individuals on account of their perceived sexual interests is easy to understand as an expression of hostility towards their perceived homosexuality. While physical attack on those thought to have homosexual interests is often highlighted in the literature on same-sex risks, these data show no

## Boys thinking about suicide

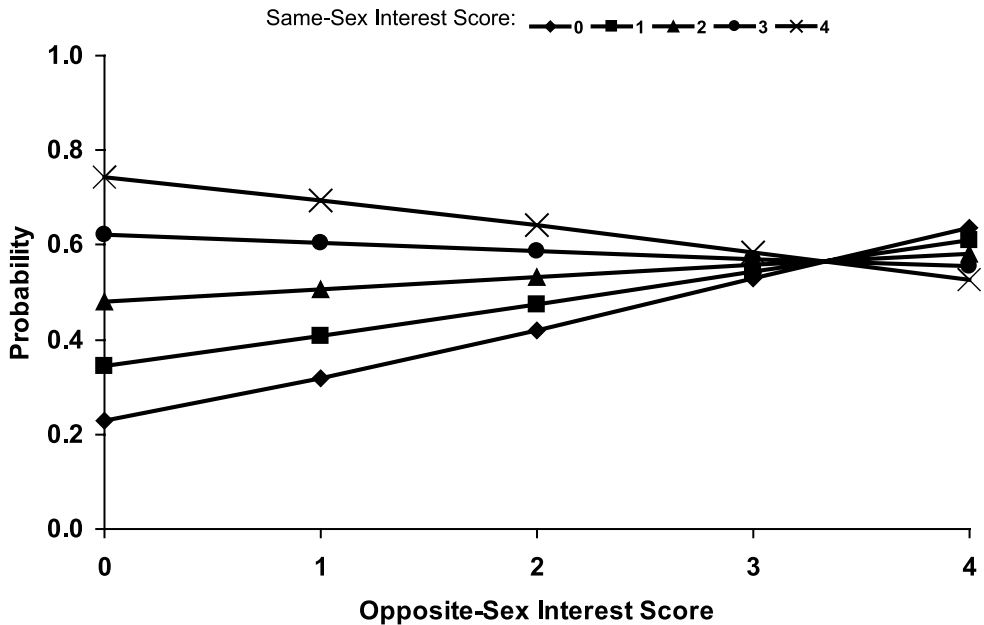


**Fig. 5.** Boys thinking about suicide. Slope (increase for adding an opposite-sex interest) is statistically different from 0 ( $p < 0.001$ ). Distance between lines (increase for adding a same-sex interest) is statistically different from 0 ( $p < 0.001$ ). Interaction term between same-sex interest and opposite-sex interest score is significant ( $p = 0.038$ ).

relationship between boys having same-sex interests and probability of being physically attacked. On the other hand, girls' probability of being attacked is higher the stronger their same-sex interest, and this relationship is highly significant. This is surprising because there is a general perception that same-sex interest is less visible but more tolerated and less stigmatized in girls than in boys. It is unfortunate that the data do not identify the sex of the attacker.

A unique feature of this research design is the creation of separate and independent measures of same-sex interest and opposite-sex interest, instead of a more usual bipolar measure with 100% homosexual at one pole and 100% heterosexual at the other, with bisexual in between. The creation of two sex-interest scales allows the inclusion of the two separate measures in equations simultaneously. Of special interest to the results is the inclusion of an interaction term: same-sex interest  $\times$  opposite-sex interest. Inclusion of these interactions in boys predicts three risk variables: father absence, delinquency and suicidal thoughts. In each case, for boys with low opposite-sex interest, there is a strong relationship between the level of same-sex interest and the risk variable, with increasing same-sex interest associated with high risk. But as boys' opposite-sex interest increases, the relationship between the level of same-sex interest and the level of risk diminishes until it vanishes at high levels of opposite-sex interest. A compelling interpretation is that high opposite-sex interest in

## High delinquency in boys



**Fig. 6.** High delinquency in boys. Slope (increase for adding an opposite-sex interest) is statistically different from 0 ( $p < 0.001$ ). Distance between lines (increase for adding a same-sex interest) is statistically different from 0 ( $p = 0.002$ ). Interaction term between same-sex interest and opposite-sex interest score is statistically different from 0 ( $p = 0.004$ ).

boys provides protection (or immunization) against the parallel risks associated with same-sex interest. As an example, same-sex interest is associated with thoughts of suicide for boys. But assume that a boy with high same-sex interest also has high opposite-sex interest. If the boy has a firmly established opposite-sex interest, his same-sex interest may not be experienced by him or his acquaintances as of much emotional importance. But if he has little or no opposite-sex interest, his same-sex interest can come to overwhelm him and loom large in his negative emotional evaluation of himself.

As a second example, a boy from a father-absent household is more likely to have higher same-sex interest than a boy living with a father. Which is a direction of causation? It may be that boys not living with fathers do not learn typical opposite-sex interests because they have no father present from whom to learn typical opposite-sex interests. Alternatively, boys may for reasons unrelated to father-presence develop same-sex interests. Fathers may have such negative reactions to sons who display same-sex interests that they abandon their families. Neither of these explanations accounts for the interaction of same-sex and opposite-sex interest associated with risks of father absence. A possible explanation that satisfactorily

accounts for the interaction goes like this. Boys develop or do not develop opposite-sex interest for biological (although not necessarily genetic) reasons. Independently a few boys also develop or do not develop same-sex interests depending on whether they live with a father or do not live with a father. If their opposite-sex interest is strong enough, it overcomes the same-sex risk effects of father absence. Note that this explanation is based on the assumption that same-sex interest and opposite-sex interest are generated by independent mechanisms. This is a novel theory, but one that is congruent with the independent measures of same-sex and opposite-sex interest used in this paper.

### *Perspective on the development of sex interest*

For 90% of individuals, the outcome of adolescent experience is interest in the opposite sex only. For those individuals, sex preference is not a discovery process and not a learning process. It is given, taken for granted, and they never deviate from it. For another small group, same-sex preference is the outcome. Since the learning process is so overwhelmingly heterosexual, such individuals must discover, some by introspection and some by exploration, that their partner preference is for the same sex. Their task is not one of choice, but of discovery.

For the remainder, life does not present a *fait accompli* of sex preference. In adolescence, they are attracted to both sexes to a greater or lesser extent. Since society is heterosexual, it is more comfortable to be heterosexual. Most of those who are presented with a choice will choose a life that is predominantly heterosexual. The more adventuresome will choose partners of both sexes because they can.

Adolescence is a period during which the sexual minorities explore their options. While the majority explores the joys and frustrations of heterosexuality, those few who are destined to discover a same-sex preference may try opposite-sex partnerships because of normative expectations. Girls whose inclination is same-sex will often try opposite-sex relationships because they are invited. How will they identify their sexual orientation when they are grown up? Many respondents who as adults will identify themselves as heterosexual will have previously reported attractions to same-sex individuals.

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## Appendix

### *Computation and derivation of effect sizes*

The same-sex effect (SS effect) is defined as the difference in the probability of the outcome for adolescents with the highest same-sex only interest (same-sex score=4, opposite-sex score=0) and adolescents with no sex interest (same-sex score=0, opposite-sex score=0). Similarly, the opposite-sex effect (OS effect) is defined as the difference in the probability of the outcome for adolescents with the highest opposite-sex only interest (same-sex score=0, opposite-sex score=4) and adolescents with no sex interest (same-sex score=0, opposite-sex score=0). The Effect Ratio is simply the ratio of the same-sex effect to the opposite-sex effect.

Let:

- $p_1$  = probability of outcome for adolescents with highest same-sex only interest;  
 $p_2$  = probability of outcome for adolescents with highest opposite-sex only interest;  
 $p_3$  = probability of outcome for adolescents with no sex interest.

Then:

$$\text{SS effect} = p_1 - p_3;$$

$$\text{OS effect} = p_2 - p_3;$$

$$\text{Effect Ratio} = p_1 - p_3 / p_2 - p_3.$$