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Sexual arousal patterns of bisexual men revisited

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ABSTRACT

Men who identify themselves as bisexual report feeling sexually aroused by both men and women. However, past research has not demonstrated that such men exhibit substantial genital arousal to both male and female erotic stimuli, suggesting that they identify as bisexual for reasons other than their genital arousal pattern. The purpose of the present study was to examine arousal patterns among bisexual men who were recruited using stringent criteria involving sexual and romantic experience with both men and women in order to increase the likelihood of finding a bisexual arousal pattern. Bisexual men in the present study demonstrated bisexual patterns of both subjective and genital arousal. It remains unclear which pattern is most typical of contemporary bisexual men: the present results supporting a bisexual arousal pattern, or previous results not finding one. In either case, understanding men with bisexual arousal patterns could help illuminate the etiology and development of male sexual orientation.

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1. Introduction

Some men who have had sexual experiences with both men and women identify as bisexual. However, there is a long history of skepticism about whether these men also have substantial sexual attraction toward both sexes (Krafft-Ebing, 1886; Freund, 1974). In part, this uncertainty exists because it is common for self-identified homosexual men to have first identified as bisexual, despite later professing they were never genuinely attracted to women (Rosario et al., 2006). Similarly, some bisexual men appear to have exclusively homosexual attractions, but identify as bisexual for reasons of perceived social acceptability (Stokes et al., 1997). It is also possible that some bisexual men may engage in sexual activity with both men and women because they are especially sexually open-minded, even if they are strongly sexually attracted to members of only one sex.

If some men's bisexuality is motivated by sexual attraction to both sexes, this should be evident in their pattern of sexual arousal. A man's pattern of genital arousal, in particular, provides an objective and highly valid measure of his underlying sexual orientation (Bailey, 2009). Heterosexual men typically exhibit substantially greater genital responses to female sexual stimuli (i.e., sexual stimuli featuring only women) than to male sexual stimuli, whereas homosexual men show the opposite pattern (Chivers et al., 2004; Freund, 1963; Freund et al., 1989; Sakheim et al., 1985). In contrast, studies of genital arousal patterns in bisexual men have generally not demonstrated that such men are substantially

aroused by both male and female stimuli (Cerny and Janssen, 2011; Rieger et al., 2005; Tollison et al., 1979). For example, Rieger et al. (2005) had self-identified bisexual, homosexual and heterosexual men watch erotic videos featuring two male performers as well as videos featuring two female performers. Unlike the homosexual and heterosexual men in the experiment, bisexual men reported substantial subjective (i.e., self-reported) arousal to both kinds of stimuli. However, their genital arousal pattern was no more bisexual than that of homosexual and heterosexual men. Bailey (2009) has argued that male sexual orientation is best conceptualized as a pattern of sexual arousal toward a category or categories of person (e.g., adult males, adult females, or both male and female adults). Thus, uncertainty about bisexual men's arousal patterns raises uncertainty about their underlying sexual orientations as well as their motivations for identifying and behaving bisexually.

Past research not finding bisexual genital arousal patterns among bisexual men may have been affected by recruitment techniques. For example, bisexual men in those studies needed only to identify as bisexual and to self-report bisexual attractions (e.g., Rieger et al., 2005). Thus, the bisexual samples of previous studies may have been populated by men who had never or rarely behaved bisexually and perhaps identified as bisexual for reasons other than strong arousal to both sexes. More stringent criteria pertaining to sexual and romantic experience with members of both sexes may increase the likelihood that bisexual participants identify as such because they exhibit a true bisexual arousal pattern. Additionally, bisexual participants in past studies were partly or exclusively recruited from the gay community. For example, the bisexual sample of Tollison et al. (1979) was recruited from a university gay student union. Thus, past studies may have unintentionally oversampled bisexual-identified men with homosexual

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arousal patterns. In the current study, we revisited this issue by assessing a subpopulation of bisexual men who seemed especially likely to show bisexual arousal both because of a recruitment source likely to reach such men and because of stringent inclusion criteria.

We examined whether bisexual-identified men who are recruited from bisexual-specific sources and have had sexual and romantic experience with members of both sexes have a *distinct and bisexual* pattern of genital and subjective arousal compared with the arousal patterns of homosexual and heterosexual men.

2. Method

2.1. Participants

Participants were 35 bisexual men, 31 homosexual men, and 34 heterosexual men from the greater Chicago area who were recruited from Internet personal advertisement lists for those respective populations. In particular, bisexual men were recruited from a list of advertisements where men sought to have sex with both members of heterosexual couples. To be eligible, bisexual participants were required to have had at least two sexual partners of each sex and a romantic relationship of at least three months' duration with at least one person of each sex. These inclusion criteria were employed to increase the probability of finding men with a bisexual genital arousal pattern (rather than those who identify as bisexual for other reasons). We used analogous criteria to select the homosexual and heterosexual samples. The sample was racially and ethnically diverse: 64% Caucasian, 13% African-American, 8% Latino, 8% Asian-American, and 7% multiracial. The average age was 34.3 ($SD = 7.3$). Table 1 provides more detailed demographic information.

2.2. Measures and materials

2.2.1. Demographic information

Each participant provided his age, race/ethnicity, relationship status, education level, and the numbers of his lifetime male and female sexual and romantic partners.

2.2.2. Sexual orientation

Each participant provided his sexual identity (bisexual, homosexual, or heterosexual) and two ratings of his relative sexual attraction to women versus men (fantasy in the last year and since age 18) using the Kinsey scale (Kinsey et al., 1948) with responses ranging from 0 (completely heterosexual) to 6 (completely homosexual).

2.2.3. Psychophysiological assessment

Genital arousal data were continuously recorded using an MP100 data acquisition unit (BIOPAC Systems Inc., Goleta, California) and AcqKnowledge software, Version 3.7.3 (BIOPAC Systems Inc., Goleta, California). Genital arousal was assessed with circumferential penile plethysmography using an indium/gallium strain gauge that measured changes in penile circumference, with increases in circumference indicating increased physiological arousal. The gauge was calibrated to a range of 30 mm, and raw data were filtered to reduce noise in the signal.

2.2.4. Subjective arousal

Subjective arousal was assessed via self-report using an 11-point rating scale (0—unaroused, 10—extremely sexually aroused). We designed this scale solely for the purpose of this study; however, this scale is similar to those used in other studies of sexual arousal (e.g., Cerny and Janssen, 2011; Chivers et al., 2007).

2.2.5. Stimuli

Stimuli consisted of 3-min videos, including two neutral videos and four sexual videos: two videos depicting two women having sex, and two videos depicting two men having sex. The sexual stimuli were high-definition, digital media excerpted from erotic videos we gathered on the Internet. The authors and several research assistants rated a large pool of potential sexual stimuli on overall sexual appeal; the highest rated videos were selected for inclusion in the study. Neutral videos featured soothing music and landscape scenes that were excerpted from nature documentaries. For both categories of sexual stimuli, participants viewed exemplars of oral and penetrative scenes. That is, each participant saw lesbian cunnilingus, lesbian vaginal penetration with fingers and a dildo, male homosexual fellatio, and male homosexual anal penetration. Sex scenes, as opposed to masturbation scenes, were employed because the former typically elicit greater arousal than the latter (Chivers et al., 2007).

2.3. Procedure

Participants provided written informed consent, and then viewed the stimuli in a private room while wearing the penile strain gauge. The first and final stimuli were always neutral videos; sexual stimuli were presented in random order. When no erectile response was detected, the interstimulus interval was 10 s. When

a stimulus elicited an erectile response greater than 2 mm, participants completed distraction tasks such as deep breathing and mentally alphabetizing the US state capitals until they had returned to baseline. At the end of every stimulus, participants were prompted to record a written rating of their subjective sexual arousal.

2.3.1. Data reduction

Using the same approach as earlier studies (Chivers et al., 2004; Rieger et al., 2005), we ipsatized (i.e., standardized within subjects) the data to account for individual differences in overall levels of arousal across all stimuli and subsequently excluded 15 men (5 bisexual, 4 homosexual, and 6 heterosexual) for genital non-responding. Analyses that included nonresponders did not affect the direction or significance of results. Whenever arousal to sexual stimuli was used in analyses, we first subtracted arousal to the neutral stimulus in order to facilitate interpretation.

3. Results

For both subjective and genital arousal, we calculated the dependent variable *Minimum Arousal*, defined as mean arousal to the less arousing sex. For example, if a man had a smaller mean genital arousal to videos of women than to videos of men, his genital Minimum Arousal score was his average genital arousal to videos of women. Following Rieger et al. (2005), we reasoned that if bisexual men tend to have bisexual arousal patterns, they should have higher arousal to their less arousing sex (whichever one that is) compared with heterosexual men (whose less arousing sex is usually men) and homosexual men (whose less arousing sex is usually women).

To test this, we regressed both subjective and genital Minimum Arousal onto participants' Kinsey scores. If bisexual men are more likely than heterosexual and homosexual men to have a bisexual pattern of arousal, there should be a negative quadratic relation between Minimum Arousal and participants' Kinsey scores, with higher Minimum Arousal for participants with Kinsey scores in the bisexual range (2–4) and lower Minimum Arousal scores for men with Kinsey scores in the heterosexual (0–1) and homosexual (5–6) ranges. This predicted pattern was found for both subjective arousal, $p < .0001$, $\beta = -.59$, $\Delta R^2 = .35$, and genital arousal, $p < .0001$, $\beta = -.41$, $\Delta R^2 = .17$ (see Fig. 1). Thus, the bisexual men had a distinct and bisexual pattern of genital as well as subjective arousal.

In contrast to Minimum Arousal, there was no curvilinear relation between Maximum Arousal (arousal to the more arousing sex) and Kinsey scores for either subjective arousal, $p = .98$, $\beta = -.00$, $\Delta R^2 = .00$, or genital arousal, $p = .85$, $\beta = .02$, $\Delta R^2 = .00$ (see Fig. 1). Thus, bisexual, homosexual, and heterosexual men did not differ in how aroused they were by their more arousing sex.

4. Discussion

On average, the bisexual men in our sample had distinctly bisexual patterns of both genital and subjective arousal. That is, their arousal responses to their less arousing sex tended to be higher than those of homosexual and heterosexual men. Even bisexual men's arousal patterns were not completely undifferentiated, however. Their genital Minimum Arousal averaged approximately half of their arousal to the more arousing sex, suggesting a marked preference for stimuli of one sex, even though the other sex was also arousing to them. It appears that some men may identify as bisexual because they are sexually aroused by both sexes, even if they experience considerably more arousal to one sex than the other. Alternatively, men with bisexual arousal patterns may experience temporal fluctuations in their attractions and arousal to men and to women. Thus, a bisexual man may be more aroused by male stimuli at one time point but by female stimuli at another time point. Further, his arousal to his less arousing sex may vary in magnitude depending on fluctuations in his attractions to that sex at any given time.

The current study establishes that some bisexual men have bisexual arousal patterns. Accepting the centrality of sexual arousal

Table 1
 Demographic information for all participants and grouped by sexual identity.

	Bisexual n = 30	Heterosexual n = 28	Homosexual n = 27	All participants n = 85
Kinsey score	3.10 (0.94)	0.34 (0.45)	5.67 (0.43)	–
Age	37.77 (8.05)	32.18 (6.18)	32.70 (6.35)	34.32 (7.33)
Sexual and romantic partners				
Female sexual	10.00 (26.81)	14.50 (27.45)	0.00 (1.81)	–
Female romantic	3.00 (5.60)	5.00 (9.20)	0.00 (1.24)	–
Male sexual	10.00 (201.02)	0.00 (2.78)	50.00 (162.19)	–
Male romantic	3.00 (2.05)	0.00 (0.38)	4.00 (2.33)	–
Race/ethnicity				
Caucasian/White	17 (57%)	18 (64%)	19 (63%)	54 (64%)
African-American	3 (10%)	3 (11%)	5 (17%)	11 (13%)
Latino	4 (13%)	3 (11%)	0 (0%)	7 (8%)
Asian American	3 (10%)	3 (11%)	1 (3%)	7 (8%)
Multiracial	3 (10%)	1 (4%)	2 (7%)	6 (7%)
Education				
Some college	7 (23%)	10 (36%)	3 (11%)	20 (24%)
Bachelor's degree	13 (43%)	12 (43%)	13 (48%)	38 (45%)
Some post-graduate school	3 (10%)	1 (4%)	2 (7%)	6 (7%)
Graduate degree	7 (23%)	5 (18%)	9 (33%)	21 (25%)
Relationship status				
Marriage/relationship with woman	9 (30%)	17 (60%)	0 (0%)	26 (31%)
Marriage/relationship with man	3 (10%)	0 (0%)	5 (19%)	8 (9%)
Single	18 (60%)	11 (39%)	22 (81%)	51 (60%)

Note. Demographic data are presented only for men classified as responders. For Kinsey score and age, values are means and standard deviations are in parentheses. For number of sexual and romantic partners, values are medians and standard deviations are in parentheses; medians are shown because of mean skew caused by outliers. For all other variables, values are counts for each category and percentages are in parentheses. Some percentages total more or less than 100% due to rounding error.

patterns in understanding male sexual orientation (Bailey, 2009), this suggests that indeed, some men have a bisexual orientation. It does not, however, establish whether all, or even most, bisexual-identified men have arousal patterns that correspond with their sexual identity. Our results contrast with those of previous studies (especially Rieger et al., 2005) that did not find evidence of a bisexual genital arousal pattern among bisexual men (key effect size of $\beta = -.41$ in the current study compared with $\beta = -.05$ in Rieger et al., 2005). This raises the question of why our results differ from the earlier ones, and which results are most applicable to the population of contemporary Western bisexual-identified men.

Compared with earlier studies, ours employed more stringent inclusion criteria, requiring romantic and sexual experience with both sexes. Indeed, approximately two-thirds (67.9%) of the potential bisexual participants who did not meet our romantic and sexual relationship criteria would have been eligible for inclusion in Rieger et al. (2005). The most frequent source of ineligibility

among the bisexual men who approached us was not having had serious romantic relationships with at least one person of each sex. If bisexual-identified men commonly lack substantial romantic or sexual experience with both sexes, then Rieger et al.'s results may be more generalizable than ours. If they do not commonly lack such experience, then our results may be more generalizable.

Another important difference between our study and past studies is that ours recruited bisexual men from a source likely to be frequented by men with bisexual erotic interests. Despite our relatively stringent inclusion criteria, about half (53.2%) of the bisexual men who approached us were eligible for inclusion. Thus, the men we focused our recruiting efforts on frequently met our inclusion criteria. Rieger et al. (2005) and other past studies recruited their participants differently, using sources and advertisements in publications that did not specifically cater to men likely to have bisexual erotic interests. For example, Rieger et al. advertised in both gay-oriented publications and an urban alternative newspaper. It is

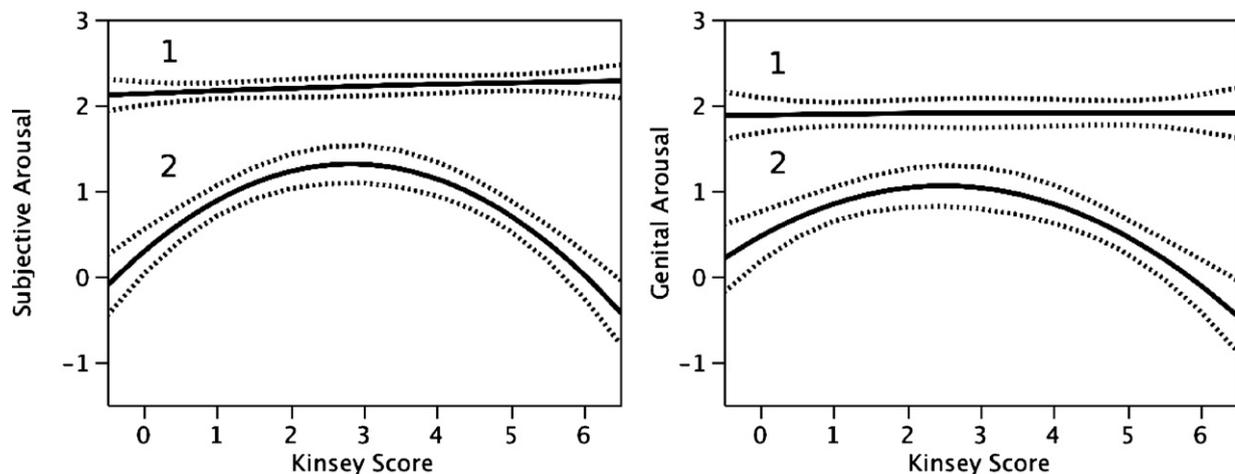


Fig. 1. Sexual arousal as a function of self-reported sexual orientation (Kinsey score). For both graphs, the curve labeled “1” represents arousal to the more arousing sex (Maximum Arousal), and the curve labeled “2” represents arousal to the less arousing sex (Minimum Arousal). Dashed lines in the panels represent 95% confidence intervals. Dependent variable units are within-subjects standard deviations.

impossible to know from available data which recruitment strategy led to the more representative sample of bisexual-identified men.

Survey data suggest that with respect to self-reported identity or attraction pattern, bisexual men are less common than homosexual men (Bailey et al., 2000; Diamond, 1993; Laumann et al., 1994). Given that bisexual arousal patterns have not previously been detected among even bisexual-identified men, an underlying bisexual orientation may be uncommon. Apparently, male development usually channels sexual arousal toward one sex (usually women) or the other, and less often toward both. Bisexual-identified men with bisexual arousal patterns do indeed exist, however, and they present an interesting opportunity to illuminate the development and expression of male sexual orientation.

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