

The Relation Between Mood and Sexuality in Gay Men

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Negative mood, such as depression and anxiety, is usually associated with a decrease in sexual interest and responsiveness. In a minority of individuals, the reverse applies, often with an associated tendency to use sex as a mood regulator. In homosexual men, the prevalence of depression and anxiety states is increased, and the relationship between negative mood and sexuality is, therefore, of particular interest. A new brief instrument, The Mood and Sexuality Questionnaire, was administered to a sample of 662 gay men, with other trait measures of depression and anxiety, propensity for sexual inhibition and sexual excitation, sensation seeking, and questions about sexual activity and response. Sixteen percent reported that, when depressed, they typically experienced increased sexual interest with 7% reporting increased capacity for erectile response; 47% and 37% reported a decrease, respectively; the remainder reported no change. When experiencing anxiety, 24% reported that they typically experienced increased sexual interest, with 14% reporting increased responsiveness, and 39% and 31% reporting a decrease. Forty-three men were interviewed in depth. The resulting qualitative data showed depression to have a more complex relationship to sexual interest than anxiety; other mediating mechanisms, such as need for intimacy and self-validation, were sometimes involved. Fourteen percent of those interviewed reported reduced concern about sexual risk when depressed. Paradoxical increases in sexual interest or activity during negative mood states are relevant to high risk sexual behavior among gay men, and deserve closer study.

KEY WORDS: mood; depression; anxiety; sexuality; homosexuality; men.

INTRODUCTION

It is widely assumed that negative mood states, such as depression and anxiety or stress, are associated with a decrease in sexual interest and, to a lesser extent, sexual responsiveness (Araujo, Durante, Feldman, Goldstein, & McKinlay, 1998; Beck, 1967; Cassidy, Flanagan, Spellman, & Cohen, 1957; Kennedy, Dickens, Eisfeld, & Bagby, 1999; Schreiner-Engel & Schiavi, 1986). However, recent evidence has indicated that this is not always the case; there have been some reports of increased sexual interest and responsiveness in affective disorders (Angst,

1998; Nofzinger et al., 1993) and an association between sexual “compulsivity” and negative mood has been reported (Black, Kehrberg, Flumerfelt, & Schlosser, 1997), with several studies finding this association in compulsive use of the Internet for sexual purposes (Cooper, Scherer, Boies, & Gordon, 1999; Shapira, Goldsmith, Keck, Khosla, & McElroy, 2000; Young & Rogers, 1998).

Recent studies have shown that homosexuality in men is associated with increased psychiatric morbidity, particularly in terms of depression, anxiety disorders, and suicidal behavior (Fergusson, Horwood, & Beautrais, 1999; Gilman et al., 2001; Herrell et al., 1999; Remafedi, French, Story, Resnick, & Blum, 1998; Sandfort, de Graaf, Bijl, & Schnabel, 2001). It is not yet clear to what extent this association results from the stigma, social stress, or threat of AIDS that many younger gay men have experienced from early adolescence, or from some vulnerability which is linked more directly to the determinants of sexual orientation (Bailey, 1999).

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In another study, we explored the relationship between mood and sexuality in heterosexual men (Bancroft et al., 2003). For those who were aware of a predictable pattern between mood and sexuality, 42% reported decreased sexual interest and 9% increased sexual interest when depressed, and 28% decreased and 21% increased sexual interest when anxious or stressed; the remainder reported no change. Qualitative data showed that the relationship between depression and sexuality was more complex than the relationship between anxiety and sexuality. With anxiety, the negative state of arousal resulted either in distraction from sexual stimuli and focus on the anxiety-provoking problem or in the use of sexual release as a method of reducing the negative arousal—a mood regulator. With depression, there were additional mediating mechanisms, such as the need for validation through intimate contact, or a need to avoid intimate contact, depending on the individual's personality.

We also found support for our theoretical explanation for this individual variability in the mood/sexuality relationships. According to our “dual control” model (Bancroft, 1999; Bancroft & Janssen, 2000), in which sexual response depends on a balance of excitatory and inhibitory mechanisms in the brain, we postulated that most men, with normal levels of excitation and inhibition proneness, would be unlikely to become sexual aroused in situations which induced negative mood, because in parallel with the negative mood would be increased inhibition of sexual responsiveness. However, men with high propensity for excitation and low propensity for inhibition of sexual response would be more likely to respond to sexual stimuli with arousal in situations which otherwise induce negative mood. Using our measures of sexual inhibition and excitation proneness (Janssen, Vorst, Finn, & Bancroft, 2002), our findings were consistent with that prediction.

In this study, we explore such relationships in gay men, using the same questionnaire method of measuring mood/sexuality relationships and other personality traits, and the same interview method for obtaining qualitative data as used in the study of heterosexual men.

METHOD

Participants

Data were obtained from 662 gay White men who participated in an ongoing study of personality traits relevant to sexual risk taking. They had all described themselves as “homosexual/gay,” rather than bisexual or of uncertain orientation. Although a small number of gay men

from other ethnic groups had been recruited, these were excluded from this analysis to provide an ethnically homogeneous sample. Recruitment sites were selected to obtain subjects with a range of sexual risk taking behaviors. They included gay bars, bathhouses and fitness centers, STD clinics, and various gay-related organizations. Each subject was paid \$10 for his participation.

The average age of participants was 35.7 years (*SD*, 10.8; range, 18–80). Ninety-three percent had attended college, 73% were in full-time employment, 13.5% part-time, 2% full-time students, and 11.3% unemployed. For income level, 16.9% were “lower” or poverty; 60.8% “lower middle” or “middle,” and 22.4% “upper middle” or “upper.” For self-reported relationship status, 26.7% were in an exclusive or monogamous relationship, 25% in a nonexclusive, “open” relationship and 48.3% were not currently in a relationship. Eighty-four percent reported having been HIV tested. Of those whose results were known, 15.2% ($n = 80$) were HIV+.

All men completing the survey were invited to participate in an interview study to obtain qualitative data mainly relevant to sexual risk taking, but also including questions relating to mood and sexuality. Of those who agreed to participate, 51 gay men were selected to give a reasonable age range and patterns of risk taking. Of these, 42 discussed to some extent the impact of mood on their sexuality. Their mean age was 30.7 years (*SD*, 10.0); 21.4% were in an exclusive, “monogamous” relationship, 33.3% in a nonexclusive, “open” relationship, and 45.2% not in a relationship. Sixteen (38%) were currently students. They were paid \$30 for participation in the interview study.

Approval for these studies was obtained from Indiana University Bloomington Human Subjects Committee and all subjects gave informed consent.

Measures

All subjects were asked to complete the following questionnaires:³

1. *The Mood and Sexuality Questionnaire (MSQ)*. This recently developed instrument is a trait measure, asking respondents to indicate what typically happens to (a) sexual interest and (b) erectile responsiveness when depressed (MS-1 and 2) and when anxious or stressed (MS-3 and 4; e.g., “When you have felt depressed, what typically happens to your sexual interest?”). A bipolar scale is used for each item, with 5 indicating *no change*,

³Not all questionnaires were completed satisfactorily by all subjects, so that *n*'s will vary depending on the measure being reported.

1 marked *reduction*, and 9 marked *increase*. For each mood state, there is a box to tick if the subject “has never been depressed (or anxious) enough to find out.” The range for each individual item is, therefore, 1–9, and for the sum score (MS-total) of the four scales, 4–36.

2. *Zemore Depression Proneness Ratings (ZDPR; Zemore, Fischer, Garratt, & Miller, 1990)*. This is a trait measure of propensity for depression in terms of frequency and severity. The 13-item version was used. All questions ask “Compared to most people you know . . .” Three questions ask (a) “How often do you get depressed?”; (b) “How long do your depressions last?”; and (c) “How deeply depressed do you become?” There are 10 further questions asking how often one experiences a variety of depressive symptoms (e.g., discouraged about the future, feeling guilty or unworthy). Each question is answered with a bipolar scale from 1 (e.g., *much less*) to 9 (e.g., *much more*), with 5 indicating the same *as others you know*. The range of scores on this measure is therefore 13–117.

Zemore et al. (1990) reported on the reliability and validity of the ZDPR. Factor analysis showed a single factor structure, accounting for 44% of the variance, with a Cronbach alpha coefficient of .90. Test-retest reliability, after 9 weeks, was shown in a correlation of .82 ($n = 98$), with substantially greater stability than a state measure, the Beck Depression Inventory (BDI; Beck, Steer, & Garbin, 1988), administered on the same two occasions. The ZDPR was also found to be a significantly better predictor of past history of depression than the BDI.

3. *Spielberger Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970)*. This is a widely used, long-established trait measure for anxiety, which has 20 items (e.g., “I worry too much over something that doesn’t matter”; “I am calm, cool and collected”), each with four response options from “strongly agree” to “strongly disagree.” The range of scores is therefore 20 (low anxiety) to 80 (high anxiety).
4. *Sexual Inhibition/Sexual Excitation Scale (SIS/SES; Janssen et al., 2002)*. This questionnaire, with 73 items, measures three factors: (1) propensity for sexual excitation (SES; range, 20–80); (2) propensity for sexual inhibition due to “the threat of performance failure” (SIS1; range, 14–56); and (3) propensity for sexual inhibition due to “the threat of performance consequences” (SIS2;

range, 11–44). It has good discriminant validity with only modest overlap with measures of global traits of behavioral inhibition, harm avoidance, and reward responsivity. Typical items include: for SES, “When an attractive person flirts with me, I easily become sexually aroused”; for SIS1, “When I have a distracting thought, I easily lose my erection”; for SIS2, “If I realize that there is a risk of catching a sexually transmitted disease, I am unlikely to stay aroused.” The response for each item ranges from 1 = *strongly agree* to 4 = *strongly disagree*.

5. *Sensation Seeking Scales (Form V; Zuckerman, 1971, 1994)*. This long established questionnaire has a total of 40 items, each having two possible choices. There are four subscales—Thrill and Adventure Seeking, Experience Seeking, Disinhibition, and Boredom Susceptibility—as well as a Total score. Each of the four subscales contains 10 items scored 0 or 1; hence, each subscale has a range of 0–10. The Total score is based on all 40 items, with a range of 0–40.
6. *Demographic and Sexual History Questionnaire*. This covers basic demographic information, current health problems and use of medications, sexual orientation, relationship status (“exclusive,” “non-exclusive,” or “no current relationship”), number of sexual partners in recent months and number of casual “one time” partners in a lifetime, frequency of sexual activity (anal intercourse, any type of sexual activity with partner, and masturbation, each one assessed for a “typical month” during last half year), and questions about erectile and ejaculatory problems in the past 3 months and “ever” (these were rated as “never,” “occasionally,” “less than half the time,” and “most of the time”).

Interview Method

The interviews typically lasted 45 min to an hour, were audiotaped, and then transcribed. The subject was first asked about his current sexual life and practices, his relationship status, and how satisfied he was with his sex life. He was then asked if there had been any sexual episode in his relatively recent past that he regretted, either at the time or subsequently. Such regret could take different forms (e.g., not using a condom, going further sexually than he wanted to, or regretting the entire episode). The subject was asked to provide a narrative account of that episode. The focus on a regretted episode was used because the primary purpose of the interview was to

explore sexual risk taking and the interviewer asked him to comment on the impact on the regretted episode of the principal factors being studied—sexual arousal, assertiveness/control, and mood

The remainder of the interview consisted of more general questions about the three factors. For mood, he was first asked to describe what kind of mood he is in usually, how often he gets depressed, anxious or “stressed out,” and what typically causes him to experience these negative moods. He was then asked what typically happens to his interest in sex when he is depressed or anxious/stressed. Is he more or less interested in sex when in a particular negative mood? How often, if ever, does he use either sex with a partner or masturbation to lift himself out of a negative mood or to relieve stress? More generally, does the way he interacts with his partner, his close friends, or people in general change when he’s in a negative mood? The interviewer’s approach was to get him to talk about these concepts within the context of his life experiences, rather than to present him with a series of specific questions with yes/no answers.

Statistical Analysis

For analysis of continuous variables across groups, analysis of variance or *t* tests (with Levene’s corrections for unequal variances) were used and for comparison of categorical data, χ^2 analyses were used. To explore the multivariate relationship between our various trait and behavioral measures and the measures of mood/sexuality, multiple linear regression was used with MS-total as the dependent variable. For the four individual MS items, since the outcomes are ordinal, the ordinal logit model was considered, but we found evidence of violation of this model’s assumption of proportional odds (Wolfe & Gould, 1998). Consequently, the multinomial logit model (MNL) was used to model the effects of independent or predictor variables on MS-1, 2, 3, or 4, categorizing subjects into “no change” in sexual interest or response (scores from 4 to 6 inclusive), “decrease” (<4.0), and “increase” (>6.0) groups (Hosmer & Lemeshow, 2000; Long, 1997).

RESULTS

Fifty-two (7.9%) men were taking antidepressants. They were compared with the 610 antidepressant nonusers on all of our trait measures (Table I). In particular, the antidepressant users scored lower on all MSQ items, more markedly on the two sexual response items (MS-2 and MS-4), and higher on the ZDPR and STAI. As antidepressant drugs may have a direct effect on sexuality while at

Table I. Comparison of Gay Antidepressant Users With Nonusers for Personality Trait Measures

	Antidepressant users				<i>t</i>	<i>df</i>	<i>p</i>
	Yes (<i>n</i> = 52)		No (<i>n</i> = 610)				
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Age	35.2	8.9	35.7	11.0	0.4	650	<i>ns</i>
MS-1	3.5	2.0	4.1	2.0	2.1	503	.03
MS-2	3.5	1.5	4.2	1.6	2.7	503	.01
MS-3	3.9	2.3	4.6	2.0	2.3	553	.02
MS-4	3.7	1.5	4.6	1.6	3.5	551	.001
MS-total	14.1	6.0	17.4	5.9	3.5	398	<.001
SES	58.6	8.2	57.1	8.2	1.3	645	<i>ns</i>
SIS 1	31.3	5.7	29.9	5.9	1.6	645	<i>ns</i>
SIS 2	29.6	4.9	27.8	4.8	2.5	645	.01
SSS-TAS	4.3	3.1	5.6	2.9	2.9	588	.004
SSS-ES	5.9	2.5	6.7	1.9	2.7	588	.01
SSS-DIS	5.0	2.5	5.4	2.3	1.1	586	<i>ns</i>
SIS-BS	3.2	2.3	3.5	2.0	1.0	589	<i>ns</i>
SSS-TOT	19.4	8.1	22.0	5.8	2.3	586	.02
STAI	49.6	10.4	45.0	9.7	3.2	631	.001
ZDPR	73.1	18.6	57.4	20.6	5.2	624	<.001

Note. MS-1, Sexual Interest/Depression; MS-2, Sexual Response/Depression; MS-3, Sexual Interest/Anxiety; MS-4, Sexual Response/Anxiety; MS-total, sum MS scores; SES, Sexual Excitation Scale; SIS1, Sexual Inhibition Scale 1; SIS 2, Sexual Inhibition Scale 2; SSS-TAS, Sensation Seeking-Thrill and Adventure Seeking; -ES, Excitement Seeking; -DIS, Disinhibition; -BS, Boredom Susceptibility; SSS-TOT, sum SSS scales; STAI, Spielberger Trait Anxiety Inventory; ZDPR, Zemore Depression Proneness Ratings.

the same time altering mood, it is likely that they would alter the usual relationship between sexuality and mood. It is not, therefore, possible to establish to what extent these group differences reflect basic differences in the individuals involved, or differences due to effects of antidepressant medication. Hence, antidepressant users were excluded from subsequent analyses of questionnaire data.

After excluding antidepressant users, there were 75 (15.5%) men known to be HIV+ left in the sample. These were compared with HIV– and untested men on the key variables reported in this article. The three groups did not differ on MSQ, SSS, SES, SIS2, or ZDPR. The “untested” group scored higher than the other two groups on STAI, $F(2, 564) = 4.23$, $p = .015$, and the HIV+ group scored higher on SIS1 than the other two groups, $F(2, 563) = 6.98$, $p = .001$, and this will be considered later. Otherwise, HIV+ subjects are included in the sample, and HIV status is not considered further.

The Mood and Sexuality Questionnaire (MSQ)

Subjects who ticked the box indicating that they had “never been depressed (or anxious) enough to find out”

Table II. Comparison of MSQ “Excluders”^a and “Includers” for Trait Measures

	Excluders (<i>n</i> = 136)		Includers (<i>n</i> = 474)		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Age	37.3	13.0	35.3	10.3	1.7	598	.098
SIS 1	29.0	6.0	30.2	5.9	2.0	593	.04
SSS-DIS	5.8	2.4	5.3	2.2	2.2	534	.03
STAI	39.3	10.4	46.8	8.8	8.3	579	<.001
ZDPR	40.6	17.5	62.6	18.7	12.1	573	<.001

Note. See Table I for description of trait measures.

^aFor this table, subjects excluded either for depression or anxiety or both were combined. Only those comparisons with $p < .10$ are shown.

were labeled as “excluders”; those who did not tick the box and completed the rating scales were labeled “includers.” One hundred twenty-one men (19.8%) were “excluders” for depression and 66 (10.8%) for anxiety. Excluders and includers were compared on all our trait measures and those showing significant difference are given in Table II. Excluders had significantly lower ZDPR and STAI scores as expected, and were lower on SIS1 and higher on Disinhibition (SSS).

Test-retest reliability. Twenty-nine gay men, includers on first completing the MSQ, were asked to repeat this questionnaire in order to assess test-retest reliability. The average interval between the two ratings was 12 weeks (range, 2–25). After removing outliers, based on visual judgment, reliability was assessed by computing Pearson’s correlations between the two ratings. For MS-1 (less 2 outliers), $r(27) = .66$; MS-2 (less 3 outliers), $r(26) = .79$; MS-3 (less 1 outlier), $r(28) = .68$; and MS-4 (less 2 outliers), $r(27) = .70$. For MS-total (less 4 outliers), the correlation was $r(25) = .91$. All correlations were significant at $p < .001$.

MSQ Scores

Distributions (and means \pm *SD*) of scores for each of the four MSQ items and the MS-total score (for those completing all four MSQ items) are shown in Fig. 1. Taking scores less than 4 to indicate “decrease” and greater than 6, “increase,” 16% of subjects reported that when depressed their sexual interest and 7.2% their capacity for erectile response were increased to some extent, with 46.8% and 37.1%, respectively, reporting a decrease. When anxious or stressed, 23.9% of subjects indicated that their sexual interest, and 14.1% their capacity for erectile response were increased to some extent, with 38.7% and 31.2% respectively reporting a decrease. The remainder indicated “no change” (4–6 on the scale).

Relationships Between MSQ Scores and Other Variables

Univariate correlations between the MSQ scores and other measures are shown in Table III. Age correlated negatively to all the MSQ scores except MS-1 (depression and sexual interest). SIS1 correlated negatively to the two “response” scores (MS-2 and 4). SIS2 correlated negatively to all items, whereas SES was positively correlated only to the two “anxiety” scores (MS-3 and 4). None of the SSS scales were significantly correlated, except Disinhibition, which positively correlated to MS-2.

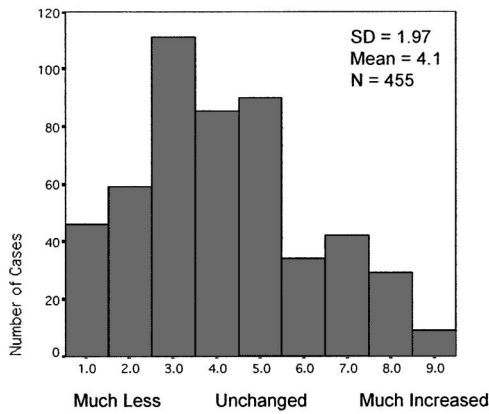
To test our theoretical model further, multiple regression was used with those trait variables which had been significantly correlated with one or more of the MSQ scores as predictor variables: age, SES, SIS1, SIS2, SSS-Disinhibition, and SSS-Total. First, multiple linear regression was carried out using MS-total as dependent variable. This accounted for 4.2% of the variance. Only SIS2 ($p = .003$) entered the model, with SIS1 showing a trend ($p = .088$; see Table IV).

Results of the multinomial logit used for each of the four MSQ scores are shown in Table V. Column 2 indicates the odds ratio for the effect of a one standard deviation (SD) increase in the predictor variable, on the odds of “no change” compared to “decreased,” with the corresponding significance level in column 3. Similarly, the remaining columns present the odds ratios for “no change” compared to “increased,” and “decreased” compared to “increased,” with column 8 giving the *SD*, and the final column, the overall significance level for that predictor variable.

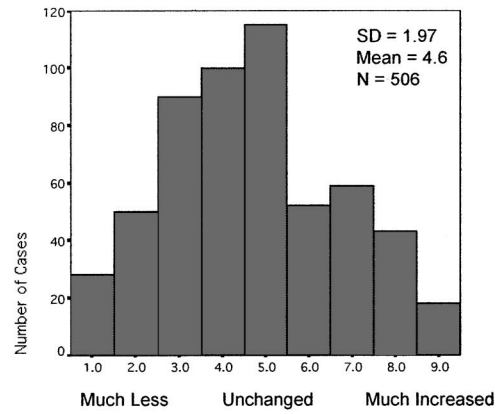
SIS2 had a significant and ordinal effect for each of the four MSQ scores, with an increase of one standard deviation increasing the likelihood of “decrease” compared with “increase” by 39% for MS-1, 59% for MS-2, 48% for MS-3, and 37% for MS-4, holding all other variables constant. SES had a borderline effect on MS-3, with increase of one standard deviation reducing the odds of “decrease” versus “increase” by 24% and reducing the odds of “no change” versus “increase” by 23%.

In contrast to the clear ordinal effect of SIS2, SIS1 showed a strong, nonordinal effect. This was evident for all four items, though most markedly for the two response items, MS-2 and 4. Thus, for MS-2, a standard deviation increase in SIS1 reduced the odds of “no change” versus “decrease” by 37%, but also reduced the odds of “no change” versus “increase” by 40%. It had no effect in distinguishing between “decrease” and “increase.” Similarly, with MS-4, the comparable odds were reduced by 51% and 33% respectively. In this case, there was a trend towards SIS1 distinguishing between “decrease” and “increase,” raising the likelihood of the former by 37%. This

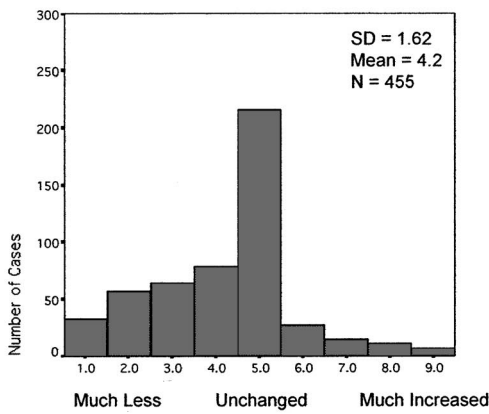
Depression & Sexual Interest (MS-1)



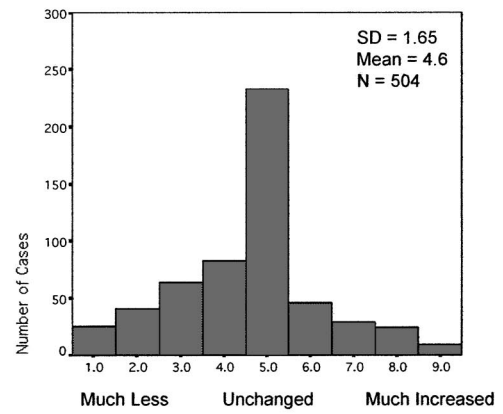
Anxiety & Sexual Interest (MS-3)



Depression & Sexual Response (MS-2)



Anxiety & Sexual Response (MS-4)



Composite Score (MS-total)

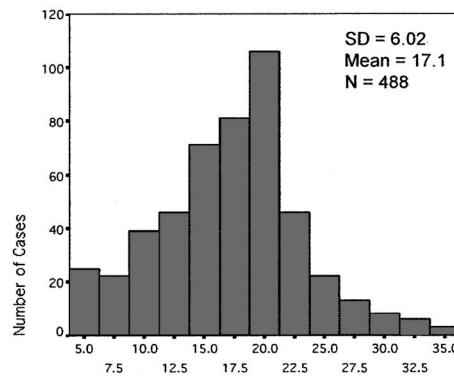


Fig. 1. Distribution of scores on the four MSQ scales and MS-total.

Table III. Correlations Between MSQ Scores and Other Trait Measures

	Depression and interest (MS-1)	Depression and response (MS-2)	Anxiety and interest (MS-3)	Anxiety and response (MS-4)	MS-total
<i>N</i>	455	455	506	504	411
Age		-.125**	-.117**	-.183**	-.125**
SES			.127**	.125**	
SIS1		-.148**		-.205**	-.130**
SIS2	-.119*	-.177**	-.148**	-.199**	-.198**
SSSDIS		.124*			
SSSTOT		.120*			
MS-1		.719**	.504**	.441**	.815**
MS-2			.462**	.576**	.822**
MS-3				.773**	.838**
MS-4					.836**

Note. See Table I for description of trait measures.
* *p* < .05. ** *p* < .01.

nonordinal pattern was also apparent for the two “interest” scales, MS-1 and 3.

Age had a borderline effect for MS-4 only, with a standard deviation increase in age reducing the odds for “no change” versus “decrease” by 21%. Neither ZDPR nor STAI had any significant effect.

Relationship Between SIS1 and MSQ Scores

To investigate further the nonordinal relationship between SIS1 and MSQ, the top 30% of SIS1 scorers were looked at separately (*n* = 178; mean SIS1 score, 36.8; *SD*, 3.6) to see if we could explain the difference among those with high SIS1 between those who reported “increase” and those who reported “decrease” in MSQ scores. The high SIS1 subjects were, therefore, divided into three groups on each MSQ item—“decreased,” “no change,” and “increased”—which were then compared for the following variables: age, ZDPR, SES, SIS2, SSS-Disinhibition, SSS-Boredom susceptibility, ED in last 3 months, ED “ever,” and number of alcoholic drinks per week, using ANOVA. Results are given in Table VI. For MS-1, only age and ZDPR scores differentiated; the “increased” group was significantly younger and had significantly higher ZDPR scores than the other two groups. For

MS-2, age and SES discriminated, with the “increased” group being significantly younger and with higher SES scores than the other two groups. For MS-3, none of the variables differentiated the groups, and for MS-4, only one, the frequency of ED in past 3 months, with the “decreased” group having significantly higher frequency of ED than the “no change” group, and a trend towards higher frequency than the “increased” group.

In view of the higher SIS1 among HIV+ men, we assessed the distribution of HIV+ men across the three categories for each MSQ variable, using chi-square, and found no difference in each case.

Relationships Between MSQ Scores and Sexual Behavior

Correlations between the MSQ scores and measures of frequency during the past 6 months of anal intercourse, any sexual activity with a partner, and masturbation, are shown in Table VII. MS-2 (depression and response) correlated with frequency of anal intercourse and “any sexual activity with partner,” whereas both anxiety scales (MS-3 and 4) correlated with masturbation frequency. Also shown in Table VII are correlations between MSQ scores and frequency of erectile problems and premature ejaculation. Both measures of mood/erectile responsiveness (MS-2 and 4) correlated negatively with frequency of erectile problems but not premature ejaculation.

Relationship Between MSQ Scores and Relationship Status

The association between MSQ scores and relationship status was examined comparing the three relationship categories of “exclusive,” “nonexclusive,” and “no

Table IV. Results of Stepwise Multiple Regression With MS-Total as Dependent Variable (*n* = 401)

Predictor	Beta	<i>t</i>	<i>p</i>
SIS 2	-.159	-2.997	.003
SIS 1	-.090	-1.709	.088

Note. See Table I for description of trait measures. Adjusted *R*² = .042.

Table V. Odds Ratios From Multinomial Logit Analysis for Standard Deviation Increase in Each Predictor Variable for Each of the Four MSQ Scores

	No change vs. decreased		No change vs. increased		Decreased vs. increased		SD	Overall significance level
	OR	p	OR	p	OR	p		
<i>MS-1</i>								
Age	0.99	0.90	0.95	0.73	0.96	0.79	10.11	<i>ns</i>
STAI	1.15	0.32	1.31	0.19	1.13	0.54	8.81	<i>ns</i>
ZDPR	0.94	0.66	0.84	0.39	1.11	0.57	18.91	<i>ns</i>
SES	0.96	0.67	0.88	0.36	0.92	0.54	7.92	<i>ns</i>
SIS1	0.78	0.04	0.75	0.07	0.96	0.79	5.86	0.06
SIS2	0.74	0.01	1.03	0.84	1.39	0.03	4.70	0.01
<i>MS-2</i>								
Age	0.84	0.11	0.96	0.83	1.14	0.55	10.11	<i>ns</i>
STAI	0.98	0.91	0.89	0.66	0.90	0.71	8.81	<i>ns</i>
ZDPR	1.17	0.27	1.14	0.63	0.97	0.91	18.91	<i>ns</i>
SES	0.94	0.59	0.73	0.11	0.77	0.20	7.92	<i>ns</i>
SIS1	0.63	0.00	0.60	0.01	0.96	0.84	5.86	<.01
SIS2	0.76	0.02	1.21	0.38	1.59	0.04	4.70	0.02
<i>MS-3</i>								
Age	0.87	0.22	1.01	0.95	1.15	0.29	10.58	<i>ns</i>
STAI	1.03	0.83	1.03	0.88	0.99	0.98	9.36	<i>ns</i>
ZDPR	1.26	0.10	1.04	0.79	0.83	0.27	19.65	<i>ns</i>
SES	1.02	0.80	0.77	0.04	0.76	0.03	8.00	0.06
SIS1	0.68	0.001	0.68	0.004	1.01	0.97	5.73	0.001
SIS2	0.88	0.26	1.31	0.04	1.48	0.004	4.70	0.01
<i>MS-4</i>								
Age	0.79	0.04	1.11	0.51	1.40	0.06	10.57	0.07
STAI	1.23	0.18	1.07	0.74	0.87	0.55	9.37	<i>ns</i>
ZDPR	1.05	0.74	0.95	0.81	0.91	0.66	19.68	<i>ns</i>
SES	1.06	0.64	0.84	0.23	0.80	0.17	8.00	<i>ns</i>
SIS1	0.49	0.000	0.67	0.01	1.37	0.07	5.74	0.000
SIS2	0.82	0.10	1.54	0.006	1.88	0.000	4.71	0.001

Note. See Table I for description of trait measures. Subjects are categorized as (1) "decreased," (2) "no change," and (3) "increased" in their interest and response during negative mood, as shown below.

	Decreased	No change	Increased
MS-1	207	166	70
MS-2	152	261	30
MS-3	173	213	107
MS-4	128	33	60

relationship." Only MS-3 discriminated between categories, with the "nonexclusive" category scoring higher (5.0 ± 2.1) than both "exclusive" (4.3 ± 2.0 ; $p < .001$) and "no relationship" (4.5 ± 1.9 ; $p = .02$) categories. Subjects in the "no relationship" category also scored higher on ZDPR than those in the "exclusive" category (59.6 ± 20.8 vs. 53.8 ± 19.6 ; $p = .005$). Subjects in the "nonexclusive" category scored higher on SES (59.0 ± 8.2) than both the "exclusive" category (56.4 ± 8.0 ; $p = .005$) and the "no relationship" category (56.5 ± 8.1 ; $p = .003$). A similar pattern was found for the Disinhibition subscale of the SSS, with the mean for "nonexclusive" (5.8 ± 2.1) significantly higher than for "exclusive" (5.1 ± 2.3 ; $p = .008$) and "no relationship" (5.3 ± 2.3 ; $p = .02$).

Interview Data From Gay Men

For the purpose of this article, those parts of the transcript which referred to the effect of mood on sexuality were extracted and coded by two or three researchers. Codings indicated whether there was evidence of (a) increased or (b) decreased sexual interest in states of either depression or anxiety/stress or (c) no clear pattern, including those cases indicating that they rarely experienced depression or anxiety. Of the 42 interviews, 15 were coded by three and 27 by two researchers. In no case did one researcher code "increased" and another "decreased" interest. Where there were disagreements, it was between indicating a clear pattern or not. Of the 15 triple coded

Table VI. Top 30% of SIS1 Scores: Comparison of the Decreased, No Change, and Increased Sexual Interest/Response Categories From MSQ for Other Possible Explanatory Variables

	Effect of mood on sexual interest or response									ANOVA
	Decrease (1)			No change (2)			Increase (3)			
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	
<i>MS-1</i>										
Age	83	39.7	10.6	25	41.0	9.3	31	32.4	9.3	$F(2,136) = 6.4, p = .002; 1 \text{ vs. } 3 < .01; 2 \text{ vs. } 3 < .01$
ZDPR	86	63.5	17.7	25	62.0	20.5	32	74.3	18.3	$F(2,140) = 4.7, p = .01; 1 \text{ vs. } 3 < .05; 2 \text{ vs. } 3 < .05$
<i>MS-2</i>										
Age	80	39.7	11.4	49	37.9	9.6	10	29.3	7.3	$F(2,136) = 4.3, p = .015; 1 \text{ vs. } 3 < .01$
SES	83	55.8	7.4	51	56.6	7.0	10	63.2	7.8	$F(2,138) = 4.6, p = .011; 1 \text{ vs. } 3, p < .01; 2 \text{ vs. } 3, p < .05$
<i>MS-4</i>										
Erectile problems past 3 months ^a	77	2.4	0.9	55	1.9	0.8	22	2.0	0.7	$F(2,152) = 6.9, p = .001; 1 \text{ vs. } 2, p < .01$

Note. See Table I for description of trait measures. MS-3 not included, as no variables discriminated.

^a 1 = none to 4 = majority of occasions.

interviews, 10 had all three codes the same for depression and 9 for anxiety/stress. For the remainder, there were always two codes the same and these were taken as the majority code. For the 25 double coded interviews, 18 were coded the same for depression and 21 for anxiety stress. The remainder were recoded after revisiting the transcripts and negotiating.

Four of the interviews were considered uncodable for the effects of depression. Of the remaining 38, eight (21%) were coded as increased sexual interest when depressed, 18 (47%) as decreased interest when depressed, and 12 (32%) as having no clear pattern. There were six (14%) men who were either coded as showing decreased sexual interest or no clear pattern, who described how they would be more likely to engage in sexual activity, either masturbation or with a partner, when in a depressed mood. They either felt the need to be validated or appreciated by someone when depressed and this led them to seek a sexual partner, or they found that the pro-

cess of having sex or masturbating improved their negative mood. Six (14%) men indicated that they were more likely to take sexual risks when depressed. This was not a matter of needing to do something risky nor did they forget about the potential consequences of such behavior; rather, it seemed to be a case of not caring about the consequences, what one man described as “What the heck.”

Thirteen of the interviews were uncodable for the effects of anxiety or stress. Of the remaining 29, five (17%) reported increased and 14 (48%) decreased sexual interest when anxious/stressed, with 10 (35%) showing “no clear pattern.” The comments on this topic were more straightforward. Those who reported increased interest typically used masturbation as a “stress reliever,” whereas those coded as “decrease in sexual interest,” typically described how their attention is focused on dealing with the cause of the anxiety or stress and, hence, not on sex.

Table VII. Correlations Between MSQ Scores and Frequencies of Sexual Behavior During the Past 6 Months, Plus Frequency of Problems^a With Erection and Premature Ejaculation

Frequency	Depression and interest (MS-1)	Depression and response (MS-2)	Anxiety and interest (MS-3)	Anxiety and response (MS-4)	Sum score (MS-total)
Anal intercourse		.153**			
Any sexual activity with partner		.111*	.096*		.110*
Masturbation			.126**	.115*	
Lifetime erectile problems	-.101*	-.219**		-.237**	-.200**
Erectile problems in past 3 months		-.189**		-.261**	-.201**
Lifetime premature ejaculation					

Note. See Table I for description of trait measures. Only those with $p < .05$ shown.

^aFrequencies rated as 1 = never to 4 = most of the time.

* $p < .05$. ** $p < .01$.

DISCUSSION

Variability of Relationship Between Mood and Sexuality

Our results indicate that gay men vary in the relationship that they typically experience between negative mood and sexuality. Of those aware of a recurring pattern, 16% reported an increase in sexual interest when depressed, with 47% reporting a decrease. With anxiety, 24% reported an increase, and 39% a decrease. This variability was also apparent from our interview data, where 21% indicated an increase in sexual interest when depressed and 47% a decrease, the figures for anxiety being 17% and 48% respectively. The interviews also revealed a greater complexity in the relation between depression and sexual interest/response than was found with anxiety. Increased sexual activity when depressed was not only reported as a consequence of increased sexual interest, but in some cases explained as a need for contact with or validation from another person, and in other cases because sex improved the depressed mood if only transiently. Some subjects described how when depressed they were more likely to take risks because in that mood state they didn't care as much as usual about the consequences. With anxiety a simpler distinction was apparent. Those reporting an increase in sexual interest found that anxiety increased their focus on sex, typically with an increased likelihood of masturbating to obtain reduction of the anxious state. Those who reported a decrease in sexual interest described how, when anxious or stressed, they focused on dealing with, or at least worrying about whatever it was that was making them anxious. The first pattern was to some extent evident from the survey data, where we found a correlation between MS-3 scores (sexual interest when anxious) and frequency of masturbation.

To What Extent Can We Explain the Variability in MSQ Scores in Terms of Our Theoretical Model?

We had predicted that a paradoxical increase in sexual interest (or response) during negative mood states would be more likely in men with high propensity for sexual excitation (high SES) and low propensity for inhibition of sexual response due to fear of performance consequences (low SIS2). Using multiple linear regression with our combined MS-total scores as dependent variable, we were only able to account for 4% of the variance, and only SIS2 was a significant predictor. This in part may reflect that our very simple MSQ had not captured sufficiently the complexity of these mood/sexuality relations. Because of the various ways in which depressed mood may lead to sex-

ual behavior, not all of which reflect a simple increase in sexual interest or responsiveness, we are currently developing a more sophisticated instrument aimed to capture this complexity more adequately. With this new questionnaire, subjects are able to distinguish between increased sexual interest per se and increased need for intimacy or validation by another person, as well as an altered attitude to risk.

In examining predictors of our four individual MSQ scores, with multinomial logit modeling, we found SIS2 to be predictive in each case. SES was only predictive, and weakly, of MS-3, that is, higher SES was associated with a likelihood of increased sexual interest in states of anxiety, but not depression. This is, however, consistent with the "excitation transfer" concept (Zillman, 1983), whereby individuals with high excitation proneness and low inhibition proneness are more likely to transfer the arousal associated with anxiety, to augment the arousal to a sexual stimulus.

Multinomial logit was required because the results were not ordinal. This was almost entirely due to the intriguing relationship between SIS1 and each of the MSQ scores, with high SIS1 increasing the likelihood of both decreased and increased sexual interest and response in negative mood states. We conceptualize SIS1 as a measure of the propensity for inhibition due to fear of performance failure, and it is clearly related to erectile failure (correlations between these two variables in this gay sample are substantial; $r = .48$ for lifetime ED; $r = .49$ for ED in the last 3 months). Intuitively, one would expect that high SIS1 would be associated with reduced sexuality in negative mood states, particularly in terms of erectile response; and that is what we found in the heterosexual men (Bancroft et al., 2003). In this sample of gay men, there is a subgroup where the reverse applies. This paradox was explored further by comparing the "decreased," "no change," and "increased" MSQ scorers among the high SIS1 subsample. With the MS-1 and 2 items, dealing with depression, the younger high SIS1 scorers with high ZDPR or high sexual excitation (SES) scores were more likely to be in the more paradoxical "increased" MSQ group. This may partly explain this paradoxical pattern; the high SES counteracting the inhibition reflected in the SIS1 score. But, this paradoxical pattern may be further evidence of the complex relationship between depression and sexuality that was apparent in our qualitative data. Thus, some gay men may be in the "increased" group because the depressed mood reduces their concern about risk or erectile failure, rather than actually increasing their sexual interest. However, this paradoxical pattern was also evident in relation to anxiety and sexuality, and this so far defies explanation. Given the clear correlation between

SIS1 and frequency of erectile problems, a closer examination of erectile function and its importance to gay men is warranted. These issues have been explored further elsewhere, where we report on sexual risk taking in gay men (Bancroft et al., 2002).

Comparison of Gay and Heterosexual Subjects

In drawing comparisons between the results reported here and those from our study of heterosexual men (Bancroft et al., 2003), we should be cautious. In various respects, the two samples differed on potentially relevant variables that were not simply related to sexual orientation. The heterosexual sample, for example, was younger than our gay sample, and was not only recruited from our study of sexual risk taking; a substantial proportion of the heterosexual men were students and overall, their level of sexual risk taking was less than in this sample of gay men. So, we should keep in mind that the apparent differences may reflect sampling differences rather than sexual orientation differences. With that proviso, we can, however, say that both the quantitative and qualitative results from this study show that gay men, like heterosexual men, vary in the relationships they typically experience between mood and sexuality. Our measure of the propensity for inhibition of sexual response due to the threat of performance consequences (SIS2) played a similar role in both the linear and nonlinear multiple regressions in both studies: the higher the SIS2 score, the less likelihood of experiencing an increased sexual interest or response in negative mood states. However, with multiple linear regression we accounted for more of the variance (19%) in the heterosexual men. Our measure of propensity for sexual excitation (SES) entered the multiple regression model in the straight sample, but for the gay men featured only in the multinomial logit for MS-3, and then weakly.

The qualitative data from interviews in both studies indicated that the relationship with anxiety/stress was relatively straightforward and with depression was more complex. However, the “what the heck” phenomenon, being more likely to take sexual risks in states of depression because in such a mood one doesn’t care, was only described by subjects in our gay study.

Other differences between the gay and heterosexual men were the lack of effect of either age or the propensity for depression (ZDPR) on the MSQ scores of the gay men, both of which had a substantial effect in heterosexual men. Increased sexuality in states of negative mood was more apparent in younger heterosexual men. In some way, either the effects of aging on sexual interest and response or a process of learning over time reduced this paradoxical mood/sexuality relationship. In gay men, this did not

seem to happen, suggesting that a learning explanation might be more relevant, as there is no reason to expect heterosexual and gay men to age differently in terms of sexual response. A positive relationship between ZDPR and mood/sexuality puzzled us in our analysis of the heterosexual men; we had predicted the opposite, and our best explanation was that men with a tendency to feel more sexual when depressed might be more aware of it if they experienced more depression. The gay men showed no such relationship, either positive or negative. This sexual orientation difference needs to be replicated and further studied.

What might be the explanation for the differences between the findings in these two studies? We have already commented on a possible sampling explanation. The differences in relation to age and to ZDPR may reflect a different developmental pattern in a proportion of gay men. Given the stigma that still prevails in their development and, in many cases, the consequent tendency to feel depressed about one’s emerging homosexual identity, it is conceivable that the association between negative mood and sexuality may be more common in the early developmental histories of gay men. The origin of the paradoxical increase in sexual interest in negative mood states in a minority of individuals, and whether this derives from an early association between sexual response and negative mood, requires study in both heterosexual and gay men.

The impression that the “what the heck” phenomenon is more common among gay men may reflect a sense of fatalism in relation to sexual risk taking that has been reported in gay men (Kalichman, Kelly, Morgan, & Rompa, 1997). It may also reflect that it is simply easier for most gay men to find a casual sexual partner when they are depressed than it is for heterosexual men. As yet, we do not know what effect these complexities might have had on how the gay men responded to the MSQ. Nevertheless, this impact of depressed mood, however complex, is likely to be of considerable importance to understanding sexual risk taking in gay men.

This study raises more questions than it answers, but the questions are of potential importance. To what extent does the variability in the relation between mood and sexuality apply to clinical states of depression or anxiety? The results presented here are probably more relevant to more reactive states of negative mood. However, the literature reviewed in the Introduction indicates that those studies that have looked for paradoxical increases in sexual interest or response in clinical affective disorders have found them in a substantial minority. To what extent is the paradoxical increase in sexual interest in states of depression dependent on the coexistence of anxiety? Our current questionnaire does not address that question; our

new questionnaire does so. More research, asking such questions, is required with clinical samples.

The impact of erectile dysfunction on the sexuality of gay men requires further study. The relevance of this and of the mood and sexuality relationship to sexual risk taking has been reported elsewhere (Bancroft et al., in press). In general, our results suggest that the relationship between negative mood and sexuality needs closer study in gay men, taking into account the potentially important developmental impact of growing up feeling negatively about one's sexuality, an experience that has obviously affected some gay men. Such study may help to explain the individual variability in mood/sexuality relationships; those who show increased sexual interest or response in negative mood may have had a different developmental history to those who show the more common negative relationship. This should be regarded as a new area of research.

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