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The Relation Between Mood and Sexuality in Heterosexual Men

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This paper reports on a study of individual variability in the relationship between negative mood and sexuality in men. Part 1 involves a questionnaire survey of 919 white heterosexual men, asking what typically happens to sexual interest and response when (a) depressed and (b) anxious/stressed, using the Mood and Sexuality Questionnaire (MSQ). Trait measures of sexual inhibition and excitation, depression, anxiety, and sensation seeking were also used. Relationships between trait measures and MSQ scores were tested using multiple linear and ordinal logistic regression. Of those reporting the experience of depression, 9.4% indicated increased and 42% decreased sexual interest when depressed; for anxiety/stress, the percentages were 20.6 and 28.3%, respectively. Increase in sexual interest during negative mood states was negatively related to age and trait measures of sexual inhibition and positively related to depression proneness and sexual excitation. In Part 2, the relationship between mood and sexuality was explored qualitatively, using in-depth interviews with 43 participants from Part 1. This supported the findings in Part 1, while finding more complex relations with depression than anxiety. Sex when depressed can serve needs for intimacy and self-validation as well as sexual pleasure. Sex when anxious appears to be more simply related to the calming effect of sexual release, plus a possible "excitation transfer" effect of anxious arousal. Further research is needed to explore these relationships in clinical mood disorders. Paradoxical increases of sexual interest with negative mood may help explain high risk as well as "out of control" patterns of sexual behavior.

KEY WORDS: sexual interest; erectile function; depression; anxiety; men.

INTRODUCTION

According to conventional psychiatric wisdom, sexual interest, and to some extent sexual response, declines in states of negative mood, such as depression, with a tendency for sexual interest to be increased in states of elevated mood, such as hypomania (Segraves, 1998). Although the recent upsurge of interest in the sexual side effects of antidepressant drugs has drawn attention to this topic, the relation between mood and sexuality has been researched to a very limited extent. In addition, there is recent evidence of comorbidity between compulsive sexual behavior or "sexual addictions" and mood disorders (Black, Kehrberg, Flumerfelt, & Schlosser, 1997), which suggests that the relation between negative mood and sexuality is not always in the same direction.

In this article, we will be considering depression and anxiety or stress as examples of negative mood. The earlier literature on sexuality and depression was largely restricted to studies of clinical depression. Thus, Beck (1967) reported that 61% of severe depressives experienced loss of sexual interest compared with 27% of a nondepressed control group. Beck also found this symptom to be associated with fatigability, loss of appetite, weight loss, and insomnia, suggesting that it was part of a biological syndrome. Similar findings had been reported by Cassidy, Flanagan, Spellman, and Cohen (1957). Schreiner-Engel and Schiavi (1986), in a study of men and women with primary loss of sexual interest, found

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that the large majority had suffered previous depressive illness with loss of sexual desire being established during and persisting after one of these earlier depressive episodes. In the Massachusetts Male Aging Study, a community study, Araujo, Durante, Feldman, Goldstein, and McKinlay (1998) reported an association between erectile dysfunction and depressive symptoms, after controlling for other potentially confounding factors, such as age and physical health. Although they found an association between erectile dysfunction and loss of sexual interest, there was, somewhat surprisingly, no association between depression and loss of sexual interest. In the Zurich Cohort Study, a longitudinal study of men and women between the ages of 20 and 35 years, an association between depression and loss of sexual interest was found in both men and women, though more marked in the women (Angst, 1998). In this study, "depression" included major depressive illness, dysthymia, and recurrent brief depression. Another recent clinical study showing an association between depression and sexual problems was reported by Kennedy, Dickens, Eisfeld, and Bagby (1999).

Regarding anxiety, the clinical evidence is much more limited. Ware et al. (1996), using the Sexual Function Questionnaire, found higher rates of sexual dysfunction in 61 male and 92 female patients with anxiety disorders, compared with 37 normal controls (13 males, 24 females). Angst (1998), in the Zurich Cohort Study, found that loss of sexual interest was associated with generalized anxiety disorder, but was not associated with panic disorder, agoraphobia, or social phobia. Figueira, Possidente, Marques, and Hayes (2001) found that panic disorder patients were more likely to report sexual problems, particularly sexual aversion, than social phobics, whereas premature ejaculation was the most common sexual problem in men with social phobias. Considerable attention has been paid to the idea that anxiety about the sexual situation, in particular anxiety about failure to respond sexually, may cause, or at least aggravate, sexual responsiveness, though this assumed relationship, which is central to much of sex therapy, has received remarkably little research attention (Norton & Jehu, 1984).

There have also been some indications in the literature that the relation between mood and sexuality is not always in the same direction. Thus, Mathew and Weinman (1982) found in a mixed gender group of 57 depressives that whereas 31% had loss of sexual interest, 22% reported increased sexual interest. Similarly, Angst (1998) found that among depressed males, 25.7% reported decreased and 23.3% increased sexual interest, compared with 11.1 and 6.9%, respectively, of their nondepressed group. In contrast, only 8.8% of their females reported increased interest when depressed compared with 35.3% decreased sexual interest (with 1.7 and 31.6%, respectively, of their nondepressed group). In a study of depressed men receiving cognitive–behavior therapy, Nofzinger et al. (1993) found that those who failed to respond to treatment had significantly higher levels of sexual interest than both those who remitted and their nondepressed control group. In addition, this high sexual interest, nonremitting group was more anxious as well as having more intermittent depression. On the basis of these findings, Nofzinger et al. wondered whether sexuality variables might be useful in categorizing different types of affective disorder. It is apparent that asking about *increased* sexual interest in negative mood states has been very unusual and if more studies had covered this possibility there may have been more consistency in the published evidence.

In addition to studies of clinical cases, there is a certain amount of relevant experimental evidence that induction of depressed mood in the laboratory results in impaired physiological response to erotic stimuli (Mitchell, DiBartolo, Brown, & Barlow, 1998; Wolchik et al., 1980). There is rather more evidence suggesting that induction of anxiety can enhance sexual response in sexually functional men (for review, see Cranston-Cuebas & Barlow, 1990).

Apart from such experimental studies, we have no evidence of the effects of more normal variations in mood on sexuality. In this article, we report on an investigation of the relation between both depression and anxiety/stress on sexuality in nonclinical participants, using two methodological approaches: (a) a simple questionnaire to indicate what typically happens to sexual interest and response when depressed or anxious; and (b) a qualitative study involving in-depth interviews with men in which relations between mood and sexuality are explored.

In investigating individual variability in the relation between mood and sexuality, we were also interested in the extent to which we could explain such variability on the basis of our "Dual Control" model of sexual response (Bancroft, 1999; Bancroft & Janssen, 2000). This model postulates that individuals vary in their propensity for both sexual excitation and inhibition of sexual response. A questionnaire developed to measure these propensities (Janssen, Vorst, Finn, & Bancroft, 2002) involves three scales: (a) propensity for sexual excitation (SES); (b) propensity for sexual inhibition due to "fear of performance failure" (e.g., inability to maintain erectile response; SIS 1); and (c) propensity for sexual inhibition due to "fear of performance consequences" (e.g., threat of unwanted pregnancy, STIs; SIS 2). Scores on each of these scales are close to normally distributed in the substantial number of men we have so far tested. Our

theoretical model postulates that the "normal" range of inhibition of sexual response is adaptive, avoiding sexual response that is inappropriate or risky. Men with high propensity for sexual inhibition, on the other hand, particularly when combined with low sexual excitation, are expected to be prone to sexual dysfunction and men with low inhibition and high excitation more likely to engage in high risk sexual behavior or develop "out of control" patterns of sexual behavior. Circumstances that induce negative mood would typically be expected to elicit inhibition of sexual response, although this may depend on normal or higher propensity for inhibition.

We therefore embarked on this research predicting that respondents who typically experienced an increase in sexual interest or responsiveness, or both, when in a negative mood state would score low on inhibition (particularly SIS 2) and high on sexual excitation (SES). Our first task to enable us to test this hypothesis was to develop a simple trait measure of the relation between mood and sexuality. This paper reports the first use of this measure, the Mood and Sexuality Questionnaire (MSQ). The data presented are restricted to heterosexual white men; we do not have enough Black or non-White subjects to allow us to control adequately for racial and socioeconomic variables, which have been found in the literature to be important determinants of differences between Whites and Blacks in their experience of negative mood (Holzer & Copeland, 2000).There are also reasons to believe that the relation between negative mood and sexuality will be different in gay men, who tend to grow up, not only with a high prevalence of affective disorders, but often with a strong link between their sexuality and their mood problems. We have reported on these relations elsewhere (Bancroft, Janssen, Strong, & Vukadinovic, 2003). We are in the process of studying these relations in women.

STUDY 1: QUESTIONNAIRE STUDY

Method

The principal aim of this study was to collect data using the MSQ and relate this to other trait measures of potential explanatory relevance.

Participants

The participants were 919 White heterosexual men not currently taking antidepressant medication, who had participated in three other studies at The Kinsey Institute: (1) a study of male employees ($n = 223$) at Indiana University; participants were randomly selected from the university telephone directory; (2) a study of high risk sexual behavior involving men showing varying degrees of sexual risk taking ($n = 296$; Bancroft et al., in press); and (3) a study of undergraduate student sexuality ($n = 400$). Subsamples 1 and 2 were paid $10 for participation; subsample 3 earned course credits. All participants were fully informed about the study and those remaining anonymous indicated their consent by completing the survey. Those who expressed an interest in participating in other studies (e.g., Study 2) gave written consent.

Mean age was 28.1 years (*SD*, 13.8; range, 16–84); 24.1% were married, 67.0% single/never married, 5.3% separated/divorced, 3.5% cohabiting; 53.9% were in an exclusive, monogamous relationship, 36.6% were not currently in a sexual relationship, and 9.5% were in a nonexclusive relationship. Socioeconomic status was as follows: upper/upper middle income, 27.6%; middle/lower middle, 46.4%; lower income/poverty, 26%.

Forty participants from subsample 3 completed the questionnaires on two occasions to allow assessment of test-retest reliability of the MSQ. The mean interval between tests was seven weeks (*SD*, 2.4; range, 2.5–12).

Measures

1. The Mood and Sexuality Questionnaire (MSQ). This 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 and response?"). A bipolar scale is used, with 5 indicating no change, 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 scale 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 (i) "How often do you get depressed?"; (ii) "How long do your depressions last?"; (iii) "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 (*much less*) to 9 (*much more*) with 5 indicating the same as others. The range of scores on this measure is therefore 13 to 117.

Table I. Comparison of Excluded and Included Subjects for Depression and Anxiety

	Depression				Anxiety			
	Excluded ($n = 344$)		Included ($n = 574$)		Excluded ($n = 204$)		Included ($n = 714$)	
Measure	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Age	27.5	±14.1	28.4	±13.6	26.3*	±13.6	28.6	±13.8
ZDPR	41.6**	±14.5	58.1	±16.9	43.5***	±16.9	54.3	±17.5
STAI	38.1***	±7.8	43.2	±8.5	39.1***	±8.3	41.9	±8.6
SES	55.4	±8.3	55.4	±7.9	54.4*	±8.7	55.7	±7.8
SIS1	27.6*	±5.3	28.3	±5.2	27.6	±5.4	28.1	±5.2
SIS2	28.1	±4.5	27.8	±4.3	27.9	±4.4	28.0	±4.4

Note. ZDPR: Zemore Depression Proneness Ratings; STAI: Spielberger Trait Anxiety Inventory; SIS/SES: Sexual Inhibition/Sexual Excitation Scale

* $p < .10$. ** $p < .05$. *** $p < .01$.

Although not much used in the literature, the ZDPR was the only psychometrically established trait measure of depression we found. Zemore et al. (1990) reported on the reliability and validity of this measure. Factor analysis showed a single factor structure accounting for 44% of the variance, with a Cronbach's 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). A widely used 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). As noted earlier, this questionnaire measures three factors: (a) propensity for sexual excitation (SES; range, 20–80); (b) propensity for sexual inhibition due to "fear of performance failure" (SIS 1; range, 14–56); and (c) propensity for sexual inhibition due to "fear of performance consequences" (SIS 2; range, 11 to 44). It has good discriminatory validity, with only modest overlap with measures of global traits of behavioral inhibition, harm avoidance, and reward responsivity.

5. Sensation Seeking Scales (Form V) (Zuckerman, 1994). A subset of participants ($n = 410$) completed this questionnaire,[4] which 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 has 10 items scored 0 or 1; hence, each subscale has a range 0–10. The Total score consists of all 40 items, with a range 0–40.

6. Demographic and Sexual History Questionnaire. This covers basic demographic information, current health problems and use of medications, sexual orientation, relationship status, number of sexual partners in recent months and number of casual "one time" partners in a lifetime, frequency of sexual activity (sexual 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.

Results

Mood and Sexuality Questionnaire (MSQ). Of the 919 participants, 37.4% indicated that they had never been depressed enough ("excluders") and 22.2% never anxious or stressed enough ("excluders") to have recognized any relationship between these negative moods and sexuality. Those excluded were compared with those who completed the MSQ on the variables measured in this study in Table I. For both depression and anxiety, the "excluded" scored significantly lower on both ZDPR and STAI than the "included," thus providing some validation of their MSQ classification.

Distributions of scores for each of the four scales (MS-1–4), and for the sum score for the four scales combined (MS-total), for those participants who were not excluded, are shown in Fig. 1. Whereas the distributions of the individual scales were not normal, the distribution of sum scores for the four scales combined (MS-total) approached normality. Correlations between these

[4]None of subsample 1, all of subsample 2, and a proportion of subsample 3 ($n = 114$) completed this questionnaire

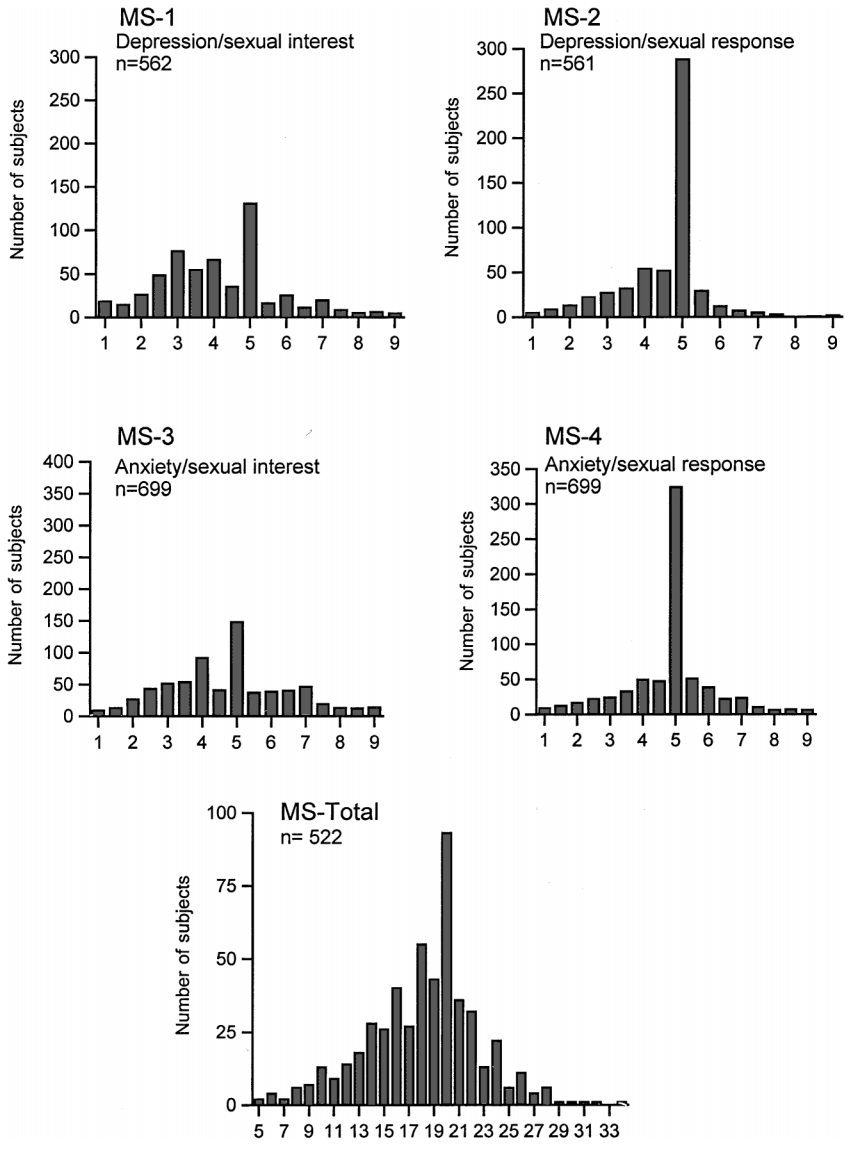

Fig. 1. Distributions of scores for each of the individual MS scales and the MS-total scale.

five scores are shown in Table II. The alpha coefficient for the internal consistency of MS-total was 0.78.

Test-retest reliability. Of the 40 participants who completed two sets of questionnaires, 4 were "depression excluders" on both occasions and 2 only in the second test. One participants was an "anxiety excluder" on both occasions; 3 chose this option only on the first occasion, and a further 3 only on the second occasion.

Table II. Inter-Item Correlations on the MSQ

	MS-2	MS-3	MS-4	MS-total
MS-1	.600***	.438***	.342***	.769***
MS-2	—	.408***	.481***	.757***
MS-3		—	.652***	.830***
MS-4			—	.785***

*** $p < .01$.

Of the remainder, test-retest reliability was assessed by computing Pearson's correlations between the two ratings. For MS-1, $r = .53$, $n = 34$, $p < .01$; MS-2, $r = .03$, $n = 34$, *ns*; MS-3, $r = .33$, $n = 33$, $p < .10$ and MS-4, $r = .41$, $n = 33$. $p < .05$. For MS-total ($n = 28$) the correlation r was equal to .43, $p < .05$.

The percentage of included participants reporting increased, unchanged or reduced sexual interest and response, for depression and anxiety, are shown in Table III.

Table III. Sexual Interest and Response When Depressed or Anxious/Stressed

	Depression					Anxiety/Stress				
	N	% Decrease	% No change	% Increase	χ^2	*N*	% Decrease	% No change	% Increase	χ^2
Sexual interest	562	42.0	48.6	9.4	$p < .001$	699	28.3	51.1	20.6	$p < .001$
Sexual response	561	19.3	77.5	3.2	$p < .001$	699	16.6	72.8	10.6	$p < .001$

For this purpose, scores from 4 to 6 inclusive were categorized as *no change*. In this way, we have identified those who clearly indicated *increase* or *decrease*.

Relationship between MSQ scores and other variables. Univariate correlations between the five MSQ scales and the other measures are shown in Table IV. The strongest and most negative relationship was with age; SIS 2 showed a negative correlation with all five MSQ scores, consistent with our prediction. However, SIS 1 also showed comparable, if weaker negative correlations. Our prediction of a positive correlation with SES was evident, but more weakly, and not with MS-1. Weak but significant correlations were found with ZDPR (positive) and STAI (negative).

To test our hypothesis further, we used multiple regression to assess the extent to which we could predict the MSQ scores with our other variables, in particular the SIS 1 and 2 and SES scores. Predictor variables were age, SES, SIS 1, SIS 2, ZDPR, and STAI.

Multiple linear regression was used taking the sum score of the four variables (MS-total) as the criterion variable. The results are shown in Table V. This accounted for 19% of the variance and all independent variables entered the model apart from STAI. Age was the strongest predictor, followed by SIS 2, SIS 1, ZDPR, and SES.

Table VI contains the results from the ordinal logit models estimating the effects of age, SES, SIS 1, SIS 2, STAI, and ZDPR on each of the four MSQ variables. The proportional odds assumption (Hosmer & Lemeshow, 2000; Long, 1997), necessary for proper use of ordinal regression, was tested with an approximate likelihood ratio test (Hosmer & Lemeshow, 2000; Wolfe & Gould, 1998) and was not found to be violated.

MS-1: Sexual Interest When Depressed. A standard deviation increase in age, 12.9 years, decreased the odds of increased interest by 25.0%. SIS 2 also had a strong effect, with a standard deviation increase in SIS 2 (4.2 units) decreasing the odds of increased sexual interest by 30.8%, holding all other variables constant. SIS 1 had a smaller effect, with an expected decrease of 16.1% for a standard deviation increase (5.0 units). A standard deviation increase in ZDPR, 18.8 points, raised the odds of increased sexual interest by 23.1%, which was marginally significant, whereas SES and STAI had no effect.

MS-2: Sexual Response When Depressed. The overall pattern of effects and statistical significance was similar to the regression for sexual interest, with some differences in relative magnitude. After age, SIS 1 had the strongest effect, with a standard deviation increase reducing the odds of increased sexual response by 31.9%, compared with a 24.6% reduction with SIS 2. The magnitude of the effect of ZDPR was larger with respect to sexual response than interest, with a standard deviation increase leading to a 31.2% rise in the odds of increased sexual response. Age had the largest effect, with a standard deviation increase being associated with a 42.1% reduction in the odds of increased sexual response.

MS-3: Sexual Interest When Anxious. For SIS 1, a standard deviation increase (5.0 units) reduced odds of increased sexual interest by 16.1%; for SIS 2, a standard deviation increase (4.2 units) reduced odds by 22.2%. A standard deviation increase in age (13.4 years), reduced odds of increased interest by 35.8%. ZDPR had no effect.

Table IV. Correlations Between Mood and Sexuality Scales and Other Measures[a]

	MS-1	MS-2	MS-3	MS-4	MS-total
Age	−.218***	−.288***	−.261***	−.267***	−.345***
ZDPR	.084**	.148***	.070	.059	.147***
STAI	−1.520	−.111	−.167***	−.082	−.168***
SES	.053	.125***	.108***	.120***	.150***
SIS 1	−.129***	−.174***	−.139***	−.164***	−.186***
SIS 2	−.242***	−.211***	−.193***	−.187***	−.268***

[a] See Table I for description of other measures.
** $p < .05$. *** $p < .01$.

Table V. Multiple Regression With MS-total as Criterion Variable[a]

Predictor variable	Beta	*t*	*p*
Age	−0.09	−6.4	<.001
SIS2	−0.16	−3.5	0.001
SIS1	−0.13	−3.2	0.002
ZDPR	0.03	2.1	0.033
SES	0.05	2.1	0.040

Note. Adjusted $R^2 = .19$.
[a] See Table I for description of other measures.

Table VI. Ordinal Logistic Regression With the Four Individual MSQ Scales as Criterion Variables[a,b]

Predictor variables	MS-1: Depression on sexual interest	MS-2: Depression on sexual response	MS-3: Anxiety on sexual interest	MS-4: Anxiety on sexual response
Age				
b	−0.027	−0.042	−0.033	−0.041
std %	−29.9	−42.1	−35.8	−42.6
z	−4.40****	−6.38****	−6.14****	−7.20****
STAI				
b	−0.007	−0.002	0.009	0.020
std %	−5.4	2.1	8.3	18.5
z	−0.48	0.16	0.75	1.53
ZDPR				
b	0.012	0.016	0.002	−0.003
std %	23.1	31.2	4.2	−4.5
z	1.83*	2.15**	0.40	−0.42
SES				
b	0.001	0.010	0.015	0.015
std %	0.5	7.9	12.0	12.0
z	0.07	0.85	1.57	1.49
SIS 1				
b	−0.035	−0.076	−0.035	−0.055
std %	−16.1	−31.9	−16.1	−24.2
z	−2.10**	−4.10****	−2.29*	−3.36**
SIS 2				
b	−0.089	−0.068	−0.059	−0.052
std %	−30.8	−24.6	−22.2	−19.7
z	−4.27***	−2.97***	−3.35**	−2.72**
Observations	545	544	682	682

Note. b is the estimated slope coefficient; std % is the percent age change in the odds of a higher (more positive) response, compared wih a lower (more negative) response for a standard deviation increase in the predictor variable, holding all other variables constant; *z* is the *z*-test score for the hypothesis that the slope coefficient is 0.

[a] Owing to small number of cases in some outcome categories, values above 7 were collapsed for MS-1; above 6 for MS-2; above 7 for MS-4.

[b] See Table I for description of other measures.

* $p < .10$. ** $p < .05$. *** $p < .01$. **** $p < .001$.

MS-4: Sexual Response When Anxious. The effects of SIS 1 and 2 were similar, with reduction of odds of 24.2 and 19.7%, respectively. Age had the largest effect in this equation, with a standard deviation increase in age reducing the odds of increased response by 42.6%.

The relationship between MSQ scores and Sensation Seeking was examined in the subset of subjects who also completed the Sensation Seeking scales. Significant correlations were found between Disinhibition subscale score and MS-3 ($r = .149$), MS-4 ($r = .130$) and MS-total ($r = .156$), and between SSS Total score and MS-3 ($r = .130$), all significant at the .05 level. However, when multiple regression was carried out taking the MS-total score as the criterion variable, and adding the Sensation Seeking Scale and subscales to the predictor variables shown in Table IV, none of them entered the equation.

Discussion

The questionnaire used in this study is clearly a simple, crude measure. Test-retest reliability was only modest. Those "excluded" differed from the "included" on trait measures for depression and anxiety, validating their exclusion to some extent. Exclusion may have been on the basis of simply not being aware of any predictable association rather than because of inadequate experience of the mood state. In either case, providing this option probably improved the validity of the measure. This aspect needs to be developed in future versions of the questionnaire.

Using a fairly broad range of scores to indicate "no change" (4–6), the results showed that the largest proportion to be in the "no change" category in both mood states, particularly with effects on erectile response. However, there was also clear evidence of individual variability, with

increased sexual interest being reported by 9.4% when depressed and 20.6% when anxious or stressed, and a substantial proportion reporting a decrease, 42% in the case of depression.

Although distributions were different for sexual interest and erectile response scales, Table II showed reasonable correlations between them for each mood state ($r = 0.60$ and 0.65). The combined score (MS Total) had satisfactory internal consistency and hence is a useful addition. However, it was important to maintain use of the individual scales, partly because the number of excluders was substantially higher for the depression scales, and there are some potentially important differences between the two mood states.

Although multiple regression showed age, SIS 2, SIS 1, ZDPR, and SES to be related, in that order of importance, to the combined score (MS-total), we found some differences in predictor variables for depression and anxiety when we considered the ordinal regression of the individual scales. Age had a strong negative effect across all four scales. Similarly, SIS 1 and SIS 2 have strong negative effects on all four scales, with SIS 1 having a stronger effect on the "response" scales (MS-2 and MS-4) and SIS 2 on the interest scales, which is not surprising, given the relationship between SIS 1 and erectile function. On the other hand, ZDPR only related to the two depression scales, particularly MS 2. SES showed more effects on the two anxiety scales but not to a significant extent.

The relationship between ZDPR and MS-1, MS-2 and MS Total, although not strong, was both noteworthy and surprising**.** It indicates that the more depression prone an individual is, the more likely he is to report an increase in sexual interest or response when depressed. This was not expected and is in some respects counterintuitive. We have, as yet, no adequate explanation for this finding, though it might indicate that the person who has more experience of depression will have a more accurate perception of these relationships, and hence will be more likely to report an increase in these aspects of sexuality *when they have occurred*; in other words, this may reflect accuracy of recall, and a tendency to underreporting of the positive mood–sexuality relationship in those with less experience of depression.

STUDY 2: INTERVIEW STUDY

To explore the relation between mood and sexuality using qualitative methods, data were used from an interview study, which was part of a larger project on sexual risk taking, and the impact of sexual arousal and assertiveness or control in interaction with the partner, as well as mood, was explored. Participants were selected from those who completed a questionnaire survey and agreed to participate in additional studies on sexual risk taking.

Method

Subjects

The sample consisted of 43 White heterosexual men. They were all included in subsample 2 of Study 1. They were paid $30 for participating in the interview. Their mean age was 21.1 years (*SD*, .3.7). One was married, with 52% ($n = 22$) currently in an exclusive or monogamous relationship, 22% ($n = 9$) in a nonexclusive relationship, and 26% ($n = 11$) not currently in a relationship. Forty (93%) of the 43 were currently students.

Procedure

The interview typically lasted 45 min to an hour and was audiotaped. The participant 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 participant was asked to provide a narrative account of that episode, in the course of which the interviewer asked him to comment on the impact of our three factors—arousal, assertiveness/control, and mood. (The focus on a regretted episode was used because of the primary purpose of exploring sexual risk taking.)

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 is in a negative mood? The interviewers' 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.

Table VII. Relationship Between Mood and Sexuality Based on Content Analysis of the Interviews

	n (%)			
	Decreases	No change	Increases	Uncodable
Sexual interest when depressed	22 (51)	10 (23)	5 (12)	6 (14)
Sexual interest when anxious/stressed	23 (54)	9 (21)	10 (23)	1 (2)

Most of the interviews ($n = 37$) were carried out by a male team member (DS), aged 32, four by a female graduate student (aged 30), and two by the first author (JB). For the purpose of this article, extracts from each transcript, that covered issues relating to mood and sexuality were coded by three researchers as indicating that sexual interest typically (a) increased, (b) decreased, or (c) was unchanged in states of depression or anxiety/stress. In some cases, either the subject indicated that they had not experienced the mood state sufficiently to recognize a pattern or their answers did not clearly fit one of the three response categories. These interviews are shown in Table VII as "uncodable." As questions about the effects of mood on erectile response were not consistently asked, these responses have not been reported. Other aspects of the mood/sexuality interaction were also coded (e.g., whether sex was used as a way of improving mood).

Results

Results of the content analysis of answers to questions about mood and sexual interest, coded as "decreased," "increased," "no change," and "uncodable" are given in Table VII. In 62% of interviews, all three coders were in agreement. In 33%, two agreed, and their codes were taken. The remaining 5% were included under "uncodable." In no case did one coder indicate "increase" while another indicated "decrease."

To compare these coded mood/sexual interest relationships taken from the interview with the participant's responses to the MSQ, the MS 1 and MS 3 scores were converted into the same three categories. These two sets of ratings were then compared using Cohen's weighted kappa. The weighted kappa values were, for (a) sexual interest when depressed, .42 ($p = .001$), and, (b) sexual interest when anxious/stressed, .52 ($p = .001$).

In the course of the interviews, it became apparent that while the concept of "stress" was usually understood, "depression" meant different things to different people. For some, it meant "feeling down," whereas for others it had a more clinical meaning. Not surprisingly, those who had experienced depression or stress, or both, had a much easier time answering the questions about the interaction between mood and sexuality. Some participants gave very clear, definite answers, whereas others seemed to be speculating. Answers might also have been influenced by the values they implied; some participants seemed reluctant to acknowledge that their behavior might be influenced by their mood.

a) *Men who report a decrease in sexual interest when depressed*

Table VII shows that a majority, 51%, reported a decrease, whereas only 12% reported an increase. Statements such as this were typical:

> When I'm in that kind of mood, I just feel like nothing will make me happy, which includes like sexual type things. I just feel like nothing is going to take me out of this mood type thing, which is why I'm depressed. (Subject A)

> There's really no thought in my mind really about having sex when I'm depressed . . . that usually doesn't even cross my mind. Usually I'm worried about trying to deal with the problems that, you know, are causing the (depression). (Subject B)

Both of these statements are representative of a large proportion of subjects who equated depressed mood with wanting to be alone, or trying to deal with and understand what is making them depressed – and further, do not see sex as something that will make them feel better.

b) *Men whose sexual interest increases when depressed, or who acknowledge using sex as something to regulate a bad mood*

The figures in Table VII may underestimate the number of people who use sex as a mood regulator. Only 12% reported an increase in sexual interest when depressed, when asked if they ever used sex to lift themselves out of a bad mood, whereas 38% acknowledged doing so at least "on occasion." Obviously, precisely how these questions are asked will have an impact on the answers obtained. It is probably the case that for sex to be used as a mood regulator, there should at least be no decrease in sexual interest or responsiveness in the negative mood state.

Two discernible patterns were apparent for those subjects who reported either an increase in sexual interest when depressed or the use of sex to improve mood—those who wanted to connect with another person or feel close to their partner,

feeling validated in the process, and those who wanted to have sex for its own sake.

(i) Connecting with someone and feeling validated:

> When I'm moody I feel like I need a woman. When I'm moody and down . . . then I . . . if I'm not with somebody I think about being with somebody . . . I wish I had a girl, not really sex, because I don't think about sex that way. (Subject C)

This sentiment was expressed by a number of participants—they want to be around someone in a somewhat sexual context (whether it be someone new or their partner), and although sex might not be explicitly what they are looking for, situations like this often lead to sex. The same participant quoted above, when asked about his regretted episode (he had recently broken up with a girlfriend, and was feeling a bit down about other things in his life) talked of picking someone up on campus, taking her to a fraternity party and eventually having intercourse with her. He explained it this way:

> I needed to have a good night. I needed to have a night like that, to be honest. I just needed to go out and find a woman, and intercourse didn't need to be involved, but I just had to go out and find somebody. My relationship ended so I wasn't with anybody for a while and I just felt the need to go out and find a girl. (Subject C)

For some, this validation takes the form of being able to sexually please their partner. One participant, in a long-term committed relationship, said that in general his sexual interest does not change much when he's feeling down; however, when asked if he ever uses sex to lift himself out of a bad mood, answered:

> I would say yes because I know that I will get happier if I make her happy. I do that all the time actually, now that I think about it. It'll definitely be more of an approach of "This is your night. I'm going to make you happy," and do everything that she likes and not even concentrate on me . . . I don't even have to orgasm. (Subject D)

(ii). Wanting sex to improve one's mood.

One participant who has had multiple partners/one-night stands has one particular friend he calls for sex whenever he's feeling down.

> It definitely makes me feel better . . . because she's really cool about being interesting and everything and its always, it's never boring with her . . . but yeah, (sex) definitely brings me out of a bummed state. I definitely look forward to it more when I'm depressed. (Subject E)

When asked what he would do if he didn't have his regular partner and he was depressed, he said "(Find) a random girl. It's easy. It's terrible to say that, but it really is." (Subject E)

(iii). A mixture of need for validation and using sex to improve a bad mood.

One participant, who has had multiple "one-night stands" but is currently in a monogamous relationship, said that although he prefers to have sex when in a positive mood, acknowledged that "I've had sex a lot when I was depressed, just to get my mind off things." Now that he is in a committed relationship, he is clear that he prefers sex with his girlfriend when he's in a positive mood because with her he is not seeking validation through sex.

Another participant reported an increased sexual interest when depressed, stemming from a combination of wanting to connect with someone, and using the physical act of sex to improve his mood, even though he acknowledged this is not a good long-term solution. He said:

> I think when I am depressed I am more willing to get into a physical situation because I know that the source of emotion is what I'm looking for . . . I'm looking for energy, and I feel (it is a) short-term solution because afterwards I feel like I have less than I had when I started. (Subject F)

He differs from the previous participant, however, in that later in the interview he said he is more likely to use sex as a mood regulator with a girlfriend than a random partner. He gave an example of having sex with his partner when he was very depressed over some problems in his friendship circle.

> I was really upset, and I was like "Can we have sex, will you make love to

> me?" She was actually kind of touched by that and we did and it was good and I got the energy out and I felt better afterwards. (Subject F)

Like the previous participant, he clearly wants to feel validated, and in this case comforted, when in a negative mood, but unlike the examples cited in (b) (i) above, there also is a more physical component here, comprised in the sexual act itself.

c) *Anxiety/stress and sexual interest*

The impact of stress/anxiety on sexual interest differs from that of depression in a number of ways. First, more participants report an increased interest in sex when anxious/stressed than when depressed. Further, a majority of participants acknowledge using sex (53%) or masturbation (54%) to relieve stress at least "on occasion." Second, increased sexual interest, or using sex or masturbation (or both) for stress relief does not seem to be an attempt to connect with someone or feel validated, but rather a need for sexual release/orgasm.

The majority of men for whom anxiety or stress has a negative effect on their sexuality described how, when they feel overwhelmed about something, they want to take care of that rather than focus on something else like sex.

> If I have a lot of stuff to get done, it's [sex] one of the last things on my mind. If I have, you know, a lot of stuff to do, I don't even think about it. I got to get my stuff done then I'm going to bed. (Subject G)

Nevertheless, over half the participants report using sex as a form of stress relief, and as stated above, unlike depression and the need to connect with someone, the goal of sex in this context is sexual release. Many participants talked about it having a physically calming effect on them, giving them release and clarity. The following two quotes are representative.

> I was going crazy with midterms and everything and I don't know, I usually wouldn't use sex as a regulator like that, but I did and it really did kind of like level me out and made me think about what I had to do and it kind of gave me a clear mind. (Subject H)

> I've always had a huge joke with my friends that it was the best stress reliever was sex. Usually, if I do end up getting myself stressed out to some point, I actually end up looking, I try to pick up my arousal and my girlfriend, I try to get her to do something, especially when we're both stressed because it usually picks up my interest because I know something like that will relax me anyway and kind of help me . . . and kind of calm me back down again and think about everything clearly again. (Subject I)

d) *Masturbation and mood regulation*

The observation that increased sexual interest when depressed was more related to connecting with another person/feeling validated, whereas increased interest when stressed was more associated with sexual release was further supported by looking at the impact of mood on masturbation. Obviously, masturbation is associated with sexual release and not with feeling validated/connecting with another person. To that end, whereas only 24% of respondents acknowledged occasionally using masturbation as a mood regulator when depressed, 52% acknowledged occasionally using it to relieve stress. The reason that masturbation does not have a mood-enhancing effect when depressed, for many participants, is connected to some form of depression-related loneliness, and masturbation seems to reinforce that loneliness.

> Usually if I'm just feeling shitty, the thought of that (masturbation) would almost make me feel shittier, you know. It's like I'm here by myself alone, yeah, it would almost feel like I was digging myself deeper. (Subject J)

> Actually I think masturbation actually makes you more depressed. For me actually makes me more depressed because it just reminds me that I don't have anyone, because I usually don't masturbate when I do have a girlfriend, so it actually makes me depressed. (Subject K)

The more common pattern of using masturbation as a stress reliever is exemplified by the following:

> I masturbate more because I think masturbation for me calms me down and relaxes me . . . to get me out of this stressful mode. (Subject L)

Discussion

The qualitative data presented here further confirms the variable relationship between mood and sexuality reported in Study 1, both in terms of the content of the interviews and the weighted kappas to assess agreement between interview assessment and the original questionnaire. However, these data also help to explain the limitations of the MSQ and its relatively low test-retest reliability.

These relationships between mood and sexuality are clearly more complex than can be captured by the simple scales of the MSQ. The interviews also reinforce the point that some people are much more clearly aware of the mood/sexuality relationship than others. The agreement between interview and MSQ rating might well have been greater if the MSQ had been completed after the interview. This reinforces the need for a method of assessment that takes this into account.

The complexity appears to be greater where depression is concerned, with involvement in sexual activity serving a variety of functions, including establishing intimacy and self-validation in addition to simple use of sex to improve mood. The role of masturbation is also more complex in relation to depression. In some instances, the solitariness of masturbation reinforces the depressed sense of isolation and worthlessness; in others, it allows sexual expression without having to cope with the feelings of low self-esteem that might be amplified by a dyadic experience. With anxiety and stress, the relationship seems more straightforward. Participants, most of whom were students, were consistent in their use of the concept "stress" to describe being under pressure, feeling overwhelmed, or anxious or worried about what needed to be done. For those who reported an increase in sexual interest when anxious or stressed, it appeared to be principally a matter of benefiting from the arousal reducing and calming effects of the postorgasmic state.

The participants in the subsample of Part 2 are younger than our main sample. We may find a different picture with older men, but given the clear negative correlation between MSQ scores and age, we are more likely to encounter positive as well as negative effects in a younger sample.

SUMMARY AND CONCLUSION

The results from these two studies demonstrate individual variability in the relationship between mood and sexuality, which could be of considerable importance, and which has been largely ignored or overlooked in the psychiatric literature. It is important to emphasize, however, that the methods used in this study did not allow distinction between relatively normal reactive mood changes and states of clinical depression. In addition, the samples used were not representative of the general population of White heterosexual men.

Our MSQ questionnaire, while having the advantage of brevity, making it attractive for use in more general inquiries, is too simple to capture the complexity of the relationship. Assessment needs to take into account that these relationships are more likely to be correctly and consistently reported in individuals who have experienced significant or recurrent mood changes. We also need to consider the extent to which depression and anxiety coexist. Some types of depression are relatively devoid of anxiety and are characterized by low arousal; in others, there is an accompanying agitation or anxiety. This needs to be considered in future research.

It is noteworthy that, although our two measures of sexuality, interest and response (i.e., capacity for erectile response) were correlated ($r = 0.60$ and 0.65), there was considerably more variance in the "interest" than the "erectile response" measure, for which the clear majority of subjects reported no effect on erectile capacity in either direction.

To what extent have our original theoretical predictions been supported? Given the limitations of the MSQ, and the consequent "noise" generated in the data, we should not expect to account for large amounts of the variance. In the circumstances, the extent to which we could explain mood/sexuality relationships with our other measures is encouraging. However, the overall strongest predictor is age. The paradoxical increase in sexual interest during negative mood states, particularly anxiety, is less likely in older men, and as yet we have no adequate explanation for that finding. It raises the important possibility, however, that this pattern may be established early, even during childhood, and this could readily be researched by assessing developmental histories in individuals with different patterns.

Whereas our measures of inhibition (SIS 1 and 2) were relevant to both mood states in the ordinal regression, SES, our measure of excitation, was only marginally related to anxiety. The most likely explanation of this pattern is that with depressed mood *per se*, the key issue is the extent to which perception of the threats or negative circumstances, that induce the depressed mood also invokes inhibition of sexual response. In a substantial proportion, this apparently happens, and in those cases we see the decline in sexual interest, and to a lesser extent response. However, in those individuals where less inhibition is invoked, those with low SIS 1 and 2 scores, the capacity for sexual interest and response remains and may therefore be employed to serve the various purposes identified in this study. With anxiety, we not only have the same relevance of inhibition, but we see a tendency for high excitation to interact with low inhibition to produce increased sexual interest and responsiveness in these high arousal negative mood states. This raises the possibility of "excitation transfer" (Zillmann, 1983), in which arousal from one type of stimulus is recruited to enhance arousal to another type of stimulus. Thus, when the propensity for inhibiting sexual response in the face of threat is low,

the arousal, already existing as part of the negative mood state, becomes recruited in the arousal response to a sexual stimulus. Hence, we see these two sources of arousal combining to drive the sexual response to orgasm, resulting in the postorgasmic lowering of arousal or calming. We are left with a need to explain the relatively small proportion of men who report an increase in sexual interest and arousability in depressed states, rather than just the use of sex for self-esteem or intimacy-enhancing purposes. This may be because in those individuals, the depressed mood is associated with anxiety and increased arousal. That remains to be demonstrated.

We also need to keep in mind that our theoretical model postulates two types of mechanism in the brain: one a reaction to the perception of threat which, on a day-to-day basis, might be the main determinant of the negative mood state as well as an active inhibition of sexual response, and the other a more generalized change in neurophysiological responsiveness that impacts on various response patterns as may be found in states of "chronic stress" or more endogenous clinical depression (Bancroft, 1999; Bancroft & Janssen, 2000). In such circumstances, the modulating mechanism may be a metabolically based lowering of excitation rather than specific inhibition. Studies of clinical populations are needed to assess the appropriateness of our theoretical model.

The importance of these paradoxical relations between mood and sexuality lies in the possibility that they may lead to inappropriate or high risk sexual behavior or the establishment of "out of control" patterns of sexual behavior. We have already shown sexual risk taking to be greater in gay men who report increased sexual interest in negative mood states (Bancroft et al., in press), and we are currently studying men with "out of control" patterns of sexual behavior, in which this paradoxical pattern is usually present (unpublished data). Its relevance to the interesting finding by Nofzinger et al. (1993) that men with increased sexual interest when depressed and anxious respond poorly to cognitive–behavior therapy also deserves further consideration, because this may have implications for the cognitive–behavioral treatment of depression. This new aspect of the relationship between mood and sexuality warrants closer attention in clinical as well as nonclinical samples, and in general, studies of mood and affective disorders should inquire about increased as well as reduced sexual interest as potential symptoms.

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