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Individual Differences in the Effects of Mood on Sexuality: The Revised Mood and Sexuality Questionnaire (MSQ-R)

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Abstract

Previous research using the Mood and Sexuality Questionnaire (MSQ) has revealed substantial variability in how negative mood impacts sexual response and behavior. However, the MSQ does not address differences between desire for solo or partnered sexual activity, examine the effects of sexual activity on mood, or assess the effects of positive mood. This paper presents the development and factor structure of the Revised Mood and Sexuality Questionnaire (MSQ-R). An exploratory factor analysis in a sample of heterosexual men, homosexual men, and heterosexual women ($N = 1983$) produced 8 factors. Considerable variability was found in how moods influence sexual desire and arousal, in the effects of mood on sexual behavior, and in the reciprocal effects of sexual activity on mood. Among other findings, heterosexual women were less likely than heterosexual and homosexual men to experience increased sexual desire and arousal when anxious or stressed, whereas homosexual men and heterosexual women were less likely than heterosexual men to experience increased desire when sad or depressed. Heterosexual men and women were more likely than homosexual men to report increased desire when in a positive mood. Intercorrelations and correlations with various sexual behaviors varied by group. Limitations and implications of the findings are discussed.

Keywords

Emotions; Sexual Desire; Sexual Arousal; Gender Differences; Orientation

Introduction

Although sexual desire and arousal can be considered to be emotions (e.g., Everaerd, 1989), and although sexual and other emotions have been implicated in risky sexual behavior (e.g., Kalichman & Weinhardt, 2001; Ross & Schoennesson, 2000), research on how sexual and nonsexual emotions interact and influence sexual behavior and decision making has only recently begun to emerge (e.g., Ariely & Loewenstein, 2006; George et al., 2009; Macapagal, Janssen, Fridberg, Finn, & Heiman, 2011; Mustanski, 2007). Thus far, most studies have tried to establish general effects of emotions and mood states on sexuality, with inconsistent and often complex results. The research described in this article focuses on a relatively neglected topic in this area: the role of individual differences in the association between sexual and nonsexual emotions and mood states and in how they may impact various aspects of sexual behavior.

Mood and sexual arousal

Most of what is known about the effects of nonsexual emotions and mood on sexual desire and arousal is based on psychophysiological studies, and findings have been mixed. In contrast to the approach used in the current study – in which individuals are asked to report on their own experiences – such studies either relied on mood inductions or ascertained the relationship between mood and sexuality in other ways (e.g., by calculating correlations between affective and sexual responses). For example, a number of studies have found that positive mood is associated with increased sexual arousal (Heiman, 1980; Koukounas & McCabe, 2001; Mitchell, DiBartolo, Brown, & Barlow, 1998). Yet, in other studies this association was not found (e.g., Laan, Everaerd, Van Berlo, & Rijs, 1995) or it was found only for subjective, and not physiological, sexual arousal (Laan, Everaerd, van Bellen, & Hanewald, 1994; Nobre et al., 2004). Studies have revealed an even more variable relationship between negative emotions¹ and sexual arousal. Some researchers have found no association between negative mood and subjective and genital arousal (e.g., Nobre et al., 2004; Rowland et al., 1996), while others found that negative emotional states, using musical mood inductions, were associated with smaller genital responses, but not subjective arousal, in men (Mitchell et al., 1998). Still other studies have found support for a *positive* relationship between negative emotions and sexual arousal. For example, anxiety has been found to facilitate genital responses in men and women (Barlow, 1986; Bradford & Meston, 2006; Hamilton et al., 2011; Koukounas & McCabe, 2001), and negative emotions such as aversion and disgust were associated, in some studies, with increased genital, but not subjective, sexual responses in women (Heiman, 1980; Laan & Everaerd, 1995).

Mood, emotions, and sexual risk taking

The relationship between nonsexual emotions and sexual behavior, which has mainly been explored in the context of sexual risk taking, leaves us with an equally intricate picture. Although positive emotions and mood states may increase sexual desire and arousal, especially if sexual arousal is assessed through subjective reports (Koukounas & McCabe, 2001; Mitchell, DiBartolo, Brown, & Barlow, 1998; Nobre et al., 2004; Rowland, Cooper, & Slob, 1996), this does not always translate into behavioral effects. In a study on day-to-day associations between mood and sexual activity in adolescent women, Fortenberry et al. (2005) found no significant association between positive mood and the occurrence of coitus on a given day. In a related study on men who have sex with men (MSM), Mustanski (2007) found that whereas sexual activation (i.e. the appetitive sexual affect dimension) increased sexual risk taking, days characterized by higher levels of positive mood were associated with a decrease in STI/HIV risk behaviors (e.g., failure to use condoms). Although in nonsexual contexts, negative mood is often associated with increased risk taking (e.g., Leith & Baumeister, 1996), studies on sex and negative mood have yielded mixed findings. For example, increased negative affect (e.g., feeling unhappy, angry, or irritable) has been associated with decreased sexual behavior (Fortenberry et al., 2005), whereas anxiety has been linked with increased sexual risk behaviors (Mustanski, 2007). Furthermore, a meta-analysis by Crepaz and Marks (2001) found no significant associations between depressive symptomatology, anxiety, anger, and sexual risk taking, however there was significant heterogeneity in effects across studies.

Individual variability in the effects of sexual and nonsexual emotions on sexuality

One factor that may be relevant to explaining inconsistencies in the literature, and that has received little attention until recently, is the role of individual variability in the relationship

¹The assessment and operationalization of negative emotional states varies substantially across studies – involving the use of composite mood scales or individual emotion items that focus on anxiety, sadness, disgust, etc. – and this complicates generalization and the comparison of research findings.

between sexual and nonsexual emotions. In contrast to clinical populations, in which studies on individual variability in the effects of depression on sexual desire date back to the 1980s (e.g., Mathew & Weinman, 1982; Angst, 1998), variability in the effects of nonsexual emotions and mood states on sexuality in nonclinical samples has only recently been considered (Bancroft et al., 2003a, 2003b; Lykins et al., 2006). In an initial attempt to quantify the effects of specifically negative mood (stress/anxiety and sadness/depression) on sexuality, Bancroft and colleagues (2003a; 2003b) developed a brief measure, the Mood and Sexuality Questionnaire (MSQ). This 4-item questionnaire asks respondents about the general effects of stress/anxiety and sadness/depression on their sexual desire and sexual response. Thus, in contrast to research in which the association between mood states and some aspect of sexuality is being inferred by the investigators (e.g., by calculating correlations between mood and sexual variables, or by testing the effects of a mood induction on sexual arousal), this questionnaire asks individuals to report on their own, real-life experiences. In a series of studies using the MSQ, the majority of both heterosexual (Bancroft et al., 2003a) and homosexual men (Bancroft et al., 2003b) described a decrease (84–91%) in sexual desire when feeling sad or depressed, while a minority (9–16%) reported an increase. An even larger proportion of men (21–24%) reported an increase in sexual desire when feeling stressed or anxious. Similar patterns were found in heterosexual women (Lykins, Janssen, & Graham, 2006).

Individual differences in the effects of emotions and mood on sexual desire and arousal have also been found to be relevant to sexual behavior. Bancroft and colleagues (2003a) found that in heterosexual men, MSQ scores that reflected increased sexual desire and arousal with sadness or depression were a strong predictor of participants' number of sexual partners in the past year and their number of lifetime one-night stands. Similarly, in homosexual men (Bancroft et al., 2003b), MSQ scores were a strong predictor of number of casual sex partners and cruising (seeking partners for casual sex). Furthermore, Bancroft and Vukadinovic (2004) found that self-defined male 'sex addicts' were much more likely than a control group of men to describe a pattern of acting out sexually when feeling sad or depressed. Finally, qualitative data from in-depth interviews with heterosexual and homosexual men suggested that the link between sexual risk taking and negative affect may be more complex with depression than with anxiety (Bancroft et al., 2003a, 2003b). Specifically, analysis of the interviews indicated that risky sexual behavior may be more likely to occur with depression because of participants' need for intimacy, self-validation, sexual pleasure, or simply their desire to improve their mood. On the other hand, the motivation to engage in sexual activity when anxious seemed more simply related to the fact that participants felt calmer following orgasm.

Aims of the current study

Although this brief literature review illustrates that mood impacts sexuality, and that research is emerging on individual differences in the impact of nonsexual emotions and mood states on sexual desire and arousal, as yet, the measurement tools available are limited in scope and do not sufficiently explain the complexity of these relationships. For example, the MSQ does not differentiate between the effects of negative mood states on desire for masturbation versus desire for sex with a partner, nor does it assess possible reciprocal effects (e.g., how sexual activity impacts mood), or the effects of various mood states on behavior. Furthermore, it does not address possible individual differences in the effects of positive emotions or mood states on sexuality. In this article, we present a new questionnaire, the Revised Mood and Sexuality Questionnaire (MSQ-R), which was created with the goals of 1) assessing a wider range of positive and negative emotions and mood states, and 2) to evaluate the complexities in the relationships among emotional states, sexual desire, response, and behavior in more depth.

Method

Participants

A total of 632 heterosexual men (mean age = 25.6 years, SD = 10.6, range = 18–71), 422 homosexual men (mean age = 33.1 years, SD = 10.9, range = 18–70), and 929 heterosexual women (mean age = 24.0 years, SD = 9.1, range = 18–63) participated in this study. Participants included undergraduate psychology students, individuals visiting the Kinsey Institute's website or websites catering to men looking for male sex partners, men subscribing to gay and lesbian university listserves, faculty and staff that were randomly selected from the university's telephone directories and staff lists, and men and women recruited from the community through the use of flyers and newspaper advertisements. The majority of heterosexual men and women completed the questionnaires online, with a small number of individuals from the faculty and staff and community samples indicating that they preferred to complete paper and pencil versions. The homosexual sample completed all questionnaires online as part of a larger study (Mustanski, 2007). All study protocols were approved by Indiana University's Institutional Review Board.

Measures

Demographics and Sexual History Questionnaire (DSHQ)—This questionnaire covers demographic information including ethnicity and religion, health problems and use of medications, sexual orientation, relationship status, and questions about sexual problems as well as frequency of various types of sexual activity (e.g., sexual intercourse and masturbation, each one assessed for a “typical month” during the last half year; Bancroft et al., 2004, Bancroft et al., 2003; Janssen et al., 2009). Sexual orientation was assessed by asking men and women “which of these commonly used terms would you use to describe yourself?” and offering them the options of heterosexual (or straight), bisexual, homosexual (or gay/lesbian), uncertain, and other (with the option to provide more details). In addition to the questions described above, heterosexual men and women were asked how often, during the past 12 months, they had searched the Internet (e.g., chat rooms, match-making websites, instant messaging) with the intent of finding a sexual partner, and how often they had gone to bars, clubs or parties with the intent of finding a sexual partner for that evening (e.g., “hooking up”). Answer options for these two questions ranged from *never*, *once or twice*, *once a month or less*, *several times a month*, *several times a week*, to *at least once a day*. Homosexual men were asked how often during the past month they had visited adult or erotic websites or newsgroups, and how often during the past month they had had sex “offline” with someone they had contacted on the Internet. Answer options were: *Not at all in the past month and never before that*, *Not in the past month but I have before that*, *One or two times*, *Once a week*, *A few times a week*, *Once a day*, *Several times a day*. Also included were three questions taken from the Sociosexual Orientation Inventory (SOI, Simpson & Gangestad, 1991; Seal & Agostinelli, 1994): 1) With how many different partners have you had sex (sexual intercourse) in the past year?; 2) With how many different partners have you had sex on one and only one occasion in your lifetime (“one night stands”)?; and 3) With how many different partners have you had sex during the past three years with whom no condoms were used?

The Revised Mood and Sexuality Questionnaire (MSQ-R)—The MSQ-R was developed to assess the effects of three mood states (i.e., anxiety/stress, sadness/depression, and happiness/cheerfulness) on a number of sexuality dimensions (see Appendix). Ten questions were asked for each of the three mood states for a total of thirty questions. For each mood state, six items covered the effects of mood on sexual desire (i.e., thoughts about sex, overall desire for sex, and desire for sex specifically with one's own partner), the ability to become sexually aroused, masturbation frequency, and sexual behaviors one might regret

later. Items pertaining to sexual arousal were tailored for men and women such that questions for men referred to erections. For each question, participants were asked to indicate whether being in a certain mood state decreased, increased, or did not influence their desire or behavior (e.g., “When I feel anxious or stressed, I think about sex...”) Each item was rated on a 5-point Likert scale ranging from 1=*much less than usual*, 2=*less than usual*, 3=*same as usual*, 4=*more than usual*, and 5=*much more than usual*.

The remaining four questions for each mood state covered the effects of sexual activity on the mood state (i.e., sex increases/decreases the intensity of the mood, sex makes one feel closer to one’s partner, sex makes one feel better about oneself). Each item was rated on a 5-point scale ranging from 1=*never*, 2=*rarely*, 3=*sometimes*, 4=*usually*, and 5=*always*. For questions involving a partner, the following additional answer option is given: “I have not had a sexual partner in the past year.” Several introductory questions obtained respondents’ baseline sexual activity and mood states. Four questions covered how frequently respondents felt anxious/stressed, sad/depressed, angry/frustrated and happy/cheerful, and how strongly they experienced these feelings over the past year. Three questions covered the co-occurrence of depression and anxiety, as well as negative mood during the menstrual period (women). Six questions addressed respondents’ typical level of sexual activity and sexual functioning in the last year. This included a question about how often during a typical month one felt like having sex with somebody who was not necessarily one’s partner, with answer choices ranging from not once to several times a day. MSQ-R scores were obtained by calculating the mean of the items in a given subscale (see Appendix).

Results

Sample Characteristics

Most participants were White, attended or completed college or university, and were single or never married (see Table 1). The groups differed in several respects. Homosexual men reported more sexual partners, one-night stands, and sexual partners without a condom in the past three years compared to heterosexual men and women. Heterosexual men and women were more likely than homosexual men to report being in an exclusive or monogamous sexual relationship. Finally, women were somewhat more likely than heterosexual and homosexual men to report having had problems with sexual arousal in their lifetime.

Exploratory factor analysis

A factor analysis using principal axis factor extraction and varimax rotation produced a selection of 8 factors (see Appendix)². The factor loadings ranged between .5 and .8 and the eight factors together accounted for 70% of the variance. An identical structure was found after excluding people who indicated not having had a partner in past 12 months, which explained 69% of the variance. Details of the eight factors and how they were labeled are as follows (see also Appendix and Table 2, which presents the means, and Figure 1, which presents the distributions of the first three factors).

Effect of anxiety/stress on sexual desire (AnxDes)—This factor, which consists of 3 items, concerns the effects of anxiety and stress on sexuality (i.e., sexual thoughts and desire for sex with one’s own partner, and with someone but not necessarily one’s partner). Cronbach alphas were .87 for heterosexual men, .84 for heterosexual women, and .86 for homosexual men. Without the item about one’s partner, the alphas are .80, .71, and .85, respectively.

²An additional factor analysis with oblique rotation produced an identical 8-factor solution involving the same items and with low intercorrelations.

Effect of sadness/depression on sexual desire (DepDes)—This factor consists of 3 items parallel to the *AnxDes* factor and concerns the effects of sadness and depression on sexuality. Cronbach alphas were .87 for heterosexual men, .86 for heterosexual women, and .87 for homosexual men. Without the item about one's own partner, the alphas are .80, .80, and .82, respectively,

Effect of positive mood on sexuality (HapSex)—This factor, which consists of 6 items, concerns the effects of positive mood on sexuality. It includes items on sexual desire, sexual arousal, and on the positive effects of having sex on one's mood, self-esteem, and experience of closeness to one's partner. Cronbach alphas were .82 for heterosexual men, .88 for heterosexual women, and .62 for homosexual men. Without the items about one's own partner, the alphas are .74, .82, and .40, respectively. For homosexual men, removing the item about closeness to one's own partner increases the alpha to .68.

Effect of negative mood on sexual arousal/response (Arousal)—This factor, which consists of 2 items, concerns the effects of negative mood (i.e., anxiety/stress and depression/sadness) on sexual arousal. Cronbach alphas were .72 for heterosexual men, .65 for heterosexual women, and .63 for homosexual men.

Effect of mood on regrettable behavior (Regret)—This factor consists of 4 items and concerns the effects of both positive (i.e., happy/cheerful) and negative mood on the likelihood of engaging in behaviors one regrets later. Cronbach alphas were .67 for heterosexual men, .70 for heterosexual women, and .60 for homosexual men.

Effect of mood on masturbation (Mastur)—This factor consists of 3 items and concerns the effects of both positive and negative mood on masturbation frequency. Cronbach alphas were .61 for heterosexual men, .75 for heterosexual women, and .61 for homosexual men.

Positive effects of sex (Improve)—This factor consists of 6 items and assesses the likelihood that sexual activity helps decrease negative mood states, increases feelings of closeness to one's partner, or helps one feel better about oneself. Cronbach alphas were .91 for heterosexual men, .91 for heterosexual women, and .83 for homosexual men. Without the items about one's own partner, the alphas are .88, .88, and .82, respectively.

Negative effects of sex on mood (Worse)—This factor, which consists of 3 items, assesses the likelihood that sexual activity will increase negative mood if the respondent is currently in a negative mood, and decrease positive mood if the respondent is currently in a positive mood. Cronbach alphas were .67 for heterosexual men, .64 for heterosexual women, and .61 for homosexual men.

Correlations among MSQ-R scales

Intercorrelations among the eight factors of the MSQ-R are presented in Table 3. For all three groups, there was a relatively strong positive correlation between the effects of anxiety on sexual desire (*AnxDes*) and depression on sexual desire (*DepDes*). In contrast, correlations between *AnxDes* and *DepDes* and the effects of happiness on sexuality (*HapSex*) were low. In heterosexual men and women, a positive relationship was found between the effects of depression and anxiety on sexual desire (*AnxDes* & *DepDes*) and the effects of these mood states on sexual arousal (*Arousal*) – in other words, if depressive or anxious feelings lead to a decrease or increase in desire, they tend to have the same effect on arousal. In homosexual men, however, there was a negative relationship between the effects of depression and anxiety on sexual desire (*AnxDes* & *DepDes*) and the *Arousal* factor,

indicating that sexual desire may increase with depressive or anxious feelings while at the same time decreasing the ability to get or maintain erections.

Furthermore, the analyses showed that in heterosexual men and women, and to a lesser degree in homosexual men, there was a positive association between the effects of anxiety and depression on sexual desire and arousal (*AnxDes*, *DepDes*, & *Arousal*) and the likelihood of doing things one regrets when in a certain mood state (*Regret*). This relationship suggests that the tendency to experience increased sexual desire and arousal during negative mood states is associated with a stronger tendency to engage in regrettable sexual behaviors when in certain mood states. Moreover, *AnxDes* and *DepDes* scores were also positively associated with the effects of mood on masturbation (*Mastur*), but more so in heterosexual men and women than in homosexual men. How positive mood influences one's sexuality (*HapSex*) did not correlate as strongly with the *Regret* and *Mastur* factors. In all sample groups, but particularly in homosexual men, as desire increased during negative or positive moods (*AnxDes*, *DepDes*, & *HapSex*), having sex was more likely to improve the mood (*Improve*). Finally, the tendency to engage in regrettable behaviors in any mood (*Regret*) was associated with an increased likelihood that one experiences more negative (or less positive) affect after sex (*Worse*).

Correlations between MSQ-R scales and various sexual behaviors

Correlations between MSQ-R scales and various sexual behaviors are presented in Table 4. Focusing on the strongest correlations ($r > .20$), in heterosexual men, the tendency to experience increased desire during anxious mood states (*AnxDes*) was associated with an increased frequency of searching for sex online. For homosexual men, the tendency to experience increased desire during anxious mood states was associated with higher frequencies of offline sex. For heterosexual women, the tendency to experience increased desire during depressed (*DepDes*) and anxious states (*AnxDes*) was associated with higher levels of desire for sex with any partner and with a higher frequency of searching for partners in bars, clubs, or at parties. The tendency to experience increased desire during anxious mood states was associated with higher masturbation frequencies, especially in women.

Correlations involving the *HapSex* scale revealed that greater effects of positive mood on sexuality were associated with increased frequency of masturbation and desire for sex in women. For all groups, greater effects of positive mood on sexuality were correlated with higher frequency of intercourse. The effect of negative mood on sexual desire/response (*Arousal*) scale did not reveal as strong an association with our sexual behavior variables.

In heterosexual men and women, the likelihood of doing things one regrets (*Regret*) was positively correlated with desire for sex with any partner. This question was not asked of homosexual men. For women, greater likelihood of doing things one regrets when in an emotional state was also linked with, among others, a greater frequency of searching for partners in bars, clubs, and at parties, and for homosexual men, with higher frequencies of visiting erotic websites.

In each of the samples, the tendency to masturbate more when in a certain mood state (*Mastur*) was associated with a generally higher frequency of masturbation. In women, greater effects of mood on masturbation were associated with higher frequency of sexual thoughts and desire for sex with any partner, whereas in homosexual men, higher *Mastur* scores were associated with greater frequency of looking at erotic websites.

Some significant correlations were found with the negative effects of sex (*Worse*) and, in particular, the positive effects of sex (*Improve*) scales. In all three samples, the tendency to

experience positive effects of sex when one is in a negative mood state was associated with, among others, a higher frequency of sexual intercourse.

Discussion

This article reports on the development and initial validation of the MSQ-R, a self-report measure assessing individual differences in the relationship between positive and negative mood and various aspects of sexual experience and behavior. The MSQ-R builds on a previously developed measure, the MSQ (e.g., Bancroft et al., 2003a, 2003b; Lykins et al., 2006), a 4-item questionnaire that asks about the effects of negative mood on sexual desire and arousal. The MSQ-R, which consists of 30 questions, focuses on positive as well as negative mood, on the effects of mood on sexual behaviors including masturbation, and includes questions about how sexual activity influences mood. The variability we found in men and women's scores on the MSQ-R is consistent with past research that shows different (and variable) effects of mood and affect on sexuality in different groups of individuals (e.g., Bancroft et al., 2003a, 2003b; Fortenberry et al., 2005; Lykins et al., 2006; Mustanski, 2007).

An exploratory factor analysis on the MSQ-R revealed a factor structure involving eight factors, with low to intermediate intercorrelations, explaining a total of 70% of the variance. Three of the factors were specific to either positive or negative mood. The other factors involved the effects of a combination of mood states on some aspect of sexual experience or behavioral dimension. Of the first three factors, one was specific to the effects of anxiety or stress on sexual desire (*AnxDes*) and one was specific to the effects of sadness or depression on sexual desire (*DepDes*). The third factor was specific to the effects of positive mood (happy or cheerful, *HapSex*); however, this factor included not only items relevant to desire but also ones that involve sexual arousal and that refer to how sexual activity may (further) strengthen positive mood and other feelings (e.g., towards one's partner). Interestingly, the positive effects of engaging in sexual activity when one is in a *negative* mood, combining the two negative mood states, loaded on a separate factor (*Improve*). These findings suggest that there is a strong connection between the effects of positive mood on desire and what happens when one engages in sex when in a positive mood: If a person reports that positive mood increases their desire, sexual activity during that mood state is also more likely to make one feel better about oneself, more connected, and even happier than before, at least compared to people for whom the effects of positive mood on desire are less strong. In contrast, for negative mood states, the effects on sexual desire and the effects of what happens when one engages in sex are, seemingly, more distinct processes—sexual desire may increase, but this seems independent of possible positive effects of engaging in sex when in a negative mood.

A total of three factors emerged that included a combination of negative and positive mood items. The first one (*Regret*) is about the tendency to do something sexual one may regret later. The second one (*Mastur*) is about the effects of positive and negative mood on masturbation. The third one (*Worse*) focuses on the tendency to feel more negative or less positive when engaging in sex while in a negative or positive mood state, respectively. These factors have in common that all of them involve some sexuality-related outcome of being in *any* mood. In other words, a high score on any of these factors implies that one is more likely to experience the described effects (e.g., engaging in behaviors one regrets, masturbating) when being in an affective state, regardless of whether that affective state is negative or positive in nature. This finding suggests that some effects of affect on sexuality may be the result of being in an emotional state, regardless of its valence. The degree to which this may involve individual variations in the effects of general, nonspecific arousal

(cf. excitation transfer; Zillmann, 1983) on sexuality is unclear, and this possibility could be explored further in future research.

Consistent with findings from studies using the 4-item MSQ (Bancroft et al., 2003a, 2003b; Lykins et al., 2006), our study revealed substantial variability in how different mood states impact men and women's sexuality. While many women and men reported being negatively affected by negative mood, and positively by positive mood, a considerable number of individuals experienced effects that are, perhaps, counterintuitive (e.g., positive mood being associated with decreased interest in sex). Our research shows that such variability not only exists in the effects of mood on sexual desire and sexual arousal, but also in the effects of mood on sexual behavior, and in how sexual activity influences mood. At the same time, while showing substantial individual variability in factor scores, our study also found that the relationships among mood, sexual desire and arousal, and behavior vary as a function of gender and sexual orientation. For example, heterosexual women were less likely than heterosexual and homosexual men to experience increased sexual desire and arousal when anxious or stressed, whereas homosexual men and heterosexual women were less likely than heterosexual men to experience increased desire when sad or depressed. Also, homosexual men were less likely to report increased desire and experience positive effects of engaging in sexual activity when in a positive mood as compared to heterosexual men and women, and they were also more likely to feel worse after engaging in sex when in a negative mood. Furthermore, heterosexual women were less likely than either group of men to masturbate more, or to engage in behaviors one may regret later, when in a positive or negative mood state.

Although generally low or intermediate, some of the intercorrelations among MSQ-R scales also showed interesting patterns. For example, although *AnxDes* and *DepDes* were strongly correlated, they were both only weakly correlated with *HapSex*, suggesting that the effects of positive and negative mood states on sexuality are not necessarily opposite in nature. Also, the analyses revealed several significant correlations among factors related to emotions and mood states and those more relevant to behavior. For example, for all groups a positive association was found between, on the one hand, the effects of anxiety and depression on sexual desire and arousal and, on the other hand, the likelihood of doing things one regrets when in a certain mood state. This suggests that the tendency to experience increased sexual desire and arousal during negative mood states is associated with a stronger tendency to engage in regrettable sexual behaviors when in certain (be it positive or negative) mood states.

Scores on the MSQ-R scales were associated with various aspects of sexual behavior. For example, in heterosexual men and women, the tendency to experience increased desire during negative mood states was associated with increased frequencies of searching for sex online or in bars, clubs, or at parties. In homosexual men, this tendency was associated with higher frequencies of offline sex. In all three groups, higher scores on the factor relevant to the effects of positive mood on sexuality were associated with increases in the frequency of intercourse. Also, in heterosexual men and women, scores on the *Regret* scale were positively associated with desire for sex with any partner. This question was not asked of homosexual men. For heterosexual men and women, a greater likelihood of doing things one regrets when in an emotional state was also linked with a greater frequency of searching for partners in bars, clubs, and at parties, and for homosexual men, with increased frequencies of visiting erotic websites, among other behaviors.

The newly developed MSQ-R has a number of advantages over the MSQ. Among others, it includes questions about the effects of mood on desire for sex with one's partner if one is in a relationship, and desire for sex in general, be it with one's partner or with someone else.

Also, it includes items about masturbation, items about the effects of mood on the tendency to engage in behaviors one might regret later, and items about possible reciprocal effects of sex on mood. Furthermore, in contrast to the MSQ, it assesses the effects of positive mood. However, despite these strengths, the MSQ-R has several limitations. Like the original questionnaire, the MSQ-R, does not differentiate between relatively normal mood changes and more severe or clinical states of anxiety and depression. Also, both the MSQ and MSQ-R rely on the ability and willingness of respondents to indicate how different mood states impact their sexuality, and both questionnaires were developed based on the assumption that these effects are relatively stable and independent from the intensity and duration of a specific emotion or mood state. Future research incorporating some combination of self-report, psychophysiological, and behavioral measures, and possibly using a longitudinal design, may further clarify the complex interactions between mood and sexuality. For example, future studies could evaluate psychophysiological and personality-related predictors of MSQ-R scores, use the MSQ-R to predict variability in the effects of mood inductions on sexual response, examine MSQ-R distributions in different samples (e.g., different age groups, clinical versus nonclinical groups), and explore the relationship between state and trait affect and MSQ-R scores over time. Given the relationship between affect and behavioral tendencies towards approach or avoidance, it would also be fruitful for future research to consider the moderating effects of the behavioral inhibition and activation systems (e.g., Carver & White, 1994). Furthermore, the homosexual and heterosexual groups were different in several ways (e.g., relationship status). Although this was not an objective of the current study, future research could examine in more depth the association between variables such as relationship status and responses on the MSQ-R. Also, future research is needed to establish other aspects of (e.g., test-retest) reliability and validity of the MSQ-R. In addition, future studies could explore the value of the MSQ-R in other sexual orientation groups (e.g., homosexual women, bisexual men and women), in older samples, and in samples with a more substantial racial and ethnic representation.

In conclusion, the newly developed MSQ-R revealed substantial variability in how positive and negative mood impacts various aspects of men and women's sexuality. This variability was found not only in the effects of mood on sexual desire and arousal, but also in the effects of mood on various behavioral domains, and in the effects of sexual activity on mood. Recent studies have begun to examine the value of the MSQ-R in the prediction of sexual infidelity (Mark, Janssen, & Milhausen, 2011) and in research on the role of couple similarity in sexual function and satisfaction (Lykins, Janssen, Newhouse, Heiman, & Rafaeli, 2012). In a sample of heterosexual men and women, Mark et al. (2011) found that the *Regret* scale was a significant predictor of self-reported infidelity. Moreover, in a sample of newlywed men and women, Lykins et al. (2012) found that couple similarity in the sexual effects of anxiety and stress was a significant predictor of women's problems with sexual arousal, and that similarity in how happiness impacts couples' sexuality was a significant predictor of men's sexual satisfaction. Although preliminary in nature, these findings underscore the value of examining individual differences in how mood influences sexuality and illustrate their relevance to our understanding of various aspects of sexual function and behavior, not only at the individual level, but also at the dyadic level.

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AppendixMSQ-R

MSQ-R questions are grouped by mood state (anxiety/stress, depression/sadness, happy/cheerful)

General instruction

“In this questionnaire you will find statements about what typically happens to your sexual desire and sexual response when you are in one of the following mood states: anxious or stressed, sad or depressed, angry or frustrated, or happy or cheerful. Please read each statement carefully and decide how you would **typically** react when you feel like that. The word ‘**sex**’ refers to sexual intercourse (entry of the penis in vagina or anus) as well as other

types of sexual behavior (e.g., oral or manual stimulation of penis or vagina). The word ‘**sexual partner**’ refers to a person with whom you currently are in a sexual relationship, or with whom you had a sexual relationship anytime in the past year. This relationship can be exclusive/monogamous (that is, you have or had sex only with each other) or non-exclusive/non-monogamous (that is, one or both of you has or had sex with other partners).

Instruction for questions about anxiety/stress

“The next questions are about the effect of being anxious/stressed/tense on your sexuality. When answering the questions, please try to think of times during the past year that you actually felt anxious or stressed or tense. For example, you may feel anxious or stressed when you are under pressure to perform or to get certain tasks done. Or you may be anxious or stressed when you’re under pressure to meet your financial responsibilities (e.g., paying bills). Or you may feel anxious or stressed because you feel uneasy about something and not be sure what it is. Try and think of what happens when you are in situations like this, when you feel anxious or stressed. In answering the questions, please ignore possible situations in which (the prospect of) sexual activity itself was a source of stress or anxiety.

Instruction for questions about depression/sadness

“The next questions are about the effect of sadness/depression/feeling low or down on your sexuality. When answering the questions, please try to think of times during the past year that you actually felt sad or depressed. You can think of situations or events that can make or have made you feel sad. For example, you may have felt sad or depressed when unpleasant things happened in your relationships with others (e.g., a break-up, a disagreement), or when someone you cared about moved or passed away. But you can also feel sad when you read or watch upsetting things (e.g., movies). Or you may have just felt sad or depressed, not knowing exactly why.”

Instruction for questions about feeling happy/cheerful

“The next questions are about the effect of feeling happy or cheerful on your sexuality. For example, during the past year you may have felt happy or cheerful when you did something you felt proud about, when you won something, when someone did or said something nice to or for you, or when something happened you had hoped for. Or you may have just felt happy or cheerful, for no apparent reason. Try and think of what happens when you are in one of those situations, when you feel happy or cheerful.”

Answer options

For all questions except the ones that ask about the reciprocal effects of sex on mood the answer options are: 1. Much less than usual, 2. Less than usual, 3. Same as usual, 4. More than usual, 5. Much more than usual. For the questions about the effects of sex on mood, the answer options are: 1. Never, 2. Rarely, 3. Sometimes, 4., Usually, 5. Always. For the questions involving one’s partner, the following additional answer option is given: “I have not had a sexual partner in the past year.”

MSQ-R – Factors (factor loadings in parentheses)

AnxDes (Effect of anxiety/stress on sexual desire)

When I feel anxious or stressed, I think about sex... (.81)

When I feel anxious or stressed, I feel like initiating sex with my partner... (.77)

When I feel anxious or stressed, I feel like having sex with somebody (not necessarily with my partner)... (.76)

DepDes (Effect of sadness/depression on sexual desire)

When I feel sad or depressed, I think about sex... (.83)

When I feel sad or depressed, I feel like initiating sex with my partner... (.82)

When I feel sad or depressed, I feel like having sex with somebody (not necessarily with my partner)... (.71)

HapSex (Effect of positive mood on sexuality)

When I feel happy or cheerful, I think about sex (.82)

When I feel happy or cheerful, I feel like initiating sex with my partner (.81)

When I feel happy or cheerful, my ability to get or stay sexually aroused is (.59)

When I feel happy or cheerful, sexual activity makes me feel closer to my partner (.59)

When I feel happy or cheerful, sexual activity makes me feel better about myself (.58)

When I feel happy or cheerful, sexual activity makes me feel more happy or cheerful (.65)

Arousal (Effect of negative mood on sexual arousal/response)

When I feel anxious or stressed, my ability to get or stay sexually aroused/get or keep an erection is... (.82)

When I feel sad or depressed, my ability to get or stay sexually aroused/get or keep an erection is... (.78)

Regret (Effect of mood on regrettable behavior)

When I feel anxious or stressed, I am likely to do something sexual that I regret later (.68)

When I feel sad or depressed, I am likely to do something sexual that I regret later (.65)

When I feel happy or cheerful, I am likely to do something sexual that I regret later (.53)

When I feel happy or cheerful, I feel like having sex with somebody (not necessarily with my partner) (.75)

Mastur (Effect of mood on masturbation)

When I feel anxious or stressed, I masturbate on my own (.64)

When I feel sad or depressed, I masturbate on my own (.60)

When I feel happy or cheerful, I masturbate on my own (.79)

Improve (Positive effects of sex)

When I feel anxious or stressed, sexual activity makes me feel closer to my partner (.65)

When I feel anxious or stressed, sexual activity makes me feel better about myself (.77)

When I feel anxious or stressed, sexual activity makes me feel less anxious/stressed (.79)

When I feel sad or depressed, sexual activity makes me feel closer to my partner (.75)

When I feel sad or depressed, sexual activity makes me feel better about myself (.82)

When I feel sad or depressed, sexual activity makes me feel less sad/depressed (.81)

Worse (Negative effects of sex on mood)

When I feel anxious or stressed, sexual activity makes me feel more anxious/stressed (.84)

When I feel sad or depressed, sexual activity makes me feel more sad/depressed (.82)

When I feel happy or cheerful, sexual activity makes me feel less happy/cheerful (.54)

Figure 1. Distribution of Scores (Possible Range 1–5) on Three MSQ-R Scales (AnxDes, DepDes, and HapSex) in Heterosexual Men (N=632), Heterosexual Women (N=929), and Homosexual Men (N=422)

Table 1

Participant Characteristics

Variable	Heterosexual Men	Heterosexual Women	Homosexual Men
Age	25.6 (10.6) ^{b,c}	24.0 (9.1) ^{a,c}	33.1 (10.9) ^{a,b}
Sexual partners (past year)	1.6 (2.5) ^{b,c}	1.3 (1.7) ^{a,c}	16.0 (32.4) ^{a,b}
One-night stands (lifetime)	4.1 (14.7) ^{b,c}	2.0 (4.2) ^{a,c}	89.5 (215.7) ^{a,b}
Sexual partners w/o condom (past 3 yrs)	1.3 (2.8) ^c	1.1 (1.7) ^c	9.3 (36.8) ^{a,b}
Relationship status			
Exclusive/monogamous	52.0%	55.4%	24.9%
Nonexclusive/nonmonogamous	9.1%	7.0%	28.9%
Not in a sexual relationship	39.0%	37.6%	46.0%
Religion			
Protestant	25.2%	22.0%	20.3%
Catholic	28.7%	28.8%	22.2%
Jewish	6.3%	7.9%	3.8%
Muslim	0.6%	0.4%	0.2%
Other	15.4%	24.4%	20.0%
None	23.8%	16.5%	33.4%
Ethnicity			
Hispanic/Latino	3.8%	3.6%	4.0%
Asian	4.0%	3.9%	2.6%
African American	3.8%	3.6%	1.9%
White	86.0%	85.5%	88.6%
Other	2.3%	3.3%	2.9%
Erectile/Arousal Problems			
Never	56.2%	29.0%	43.6%
Occasionally	33.1%	50.8%	42.1%
Less than half the time	2.2%	6.6%	8.7%
Most of the time	1.3%	4.6%	3.9%
Not Applicable	7.2%	8.7%	1.7%

Note. Superscripts:

^a significantly different from heterosexual men ($p < .001$),

^b significantly different from heterosexual women ($p < .001$),

^c significantly different from homosexual men ($p < .001$).

Table 2

Mean Scores on MSQr Scales (SD between parentheses)

	Heterosexual Men	Heterosexual Women	Homosexual Men
AnxDes	2.49 (0.92) ^b	2.08 (0.90) ^{a,c}	2.53 (1.02) ^b
DepDes	2.48 (0.89) ^{b,c}	2.05 (0.90) ^a	2.18 (0.95) ^a
HapSex	3.60 (0.69) ^c	3.66 (0.78) ^c	3.19 (0.69) ^{a,b}
Arousal	2.68 (0.63) ^{b,c}	2.29 (0.78) ^{a,c}	3.04 (0.85) ^{a,b}
Regret	2.64 (0.75) ^b	2.31 (0.79) ^{a,c}	2.56 (0.64) ^b
Mastur	2.82 (0.74) ^{b,c}	2.25 (0.91) ^{a,c}	3.34 (0.66) ^{a,b}
Improve	3.08 (0.93) ^{b,c}	2.87 (0.96) ^a	2.85 (0.79) ^a
Worse	1.93 (0.78) ^c	1.90 (0.70) ^c	2.06 (0.66) ^{a,b}

Note. Scores are averages, with a possible range of 1–5. Superscripts:

^a significantly different from heterosexual men ($p < .001$),

^b significantly different from heterosexual women ($p < .001$),

^c significantly different from homosexual men ($p < .001$).

Table 3

Intercorrelations – Heterosexual Men/Homosexual Men/Heterosexual Women

	DepDes	HapSex	Arousal	Regret	Mastur	Improve	Worse
AnxDes	.55/.58/.62	.10/.14/.11	.35/-.26/.54	.34/.23/.42	.43/.26/.40	.33/.47/.40	.19/-./.09
DepDes		-./.17/.09	.36/-.21/.53	.37/.21/.44	.47/.27/.40	.37/.48/.40	.24/-./.11
HapSex			-./-./.12	.12/-./.12	.13/.13/.14	.51/.57/.52	-./-./-.11
Arousal				.27/-./.28	.27/-.14/.32	.23/-.16/.38	.11/.13/-.11
Regret					.42/.28/.44	.17/-./.23	.28/.35/.25
Mastur						.29/.32/.27	.16/-./.14
Improve							-./-.18/-.18
Worse							

Note. Only correlations significant at $p < .05$ are presented.

Table 4

Correlations between MSQ-R Scales and Other Variables

Heterosexual Men									
	AnxDes	DepDes	HapSex	Arousal	Regret	Mastur	Improve	Worse	
Age	--	--	.13	--	-.14	--	.15	-.12	
Frequency Masturbation	.11	--	.12	--	.12	.38	.15	--	
Frequency Sexual Intercourse	--	--	.24	--	--	--	.23	--	
Desire for Sex (Any Partner)	.13	.15	.15	.10	.27	.12	.11	--	
Frequency Searching Online	.22	.17	--	--	--	.20	.12	--	
Frequency Searching in Bars	.16	.17	--	--	.15	--	--	.13	
Heterosexual Women									
	AnxDes	DepDes	HapSex	Arousal	Regret	Mastur	Improve	Worse	
Age	--	--	--	-.11	--	.17	--	--	
Frequency Masturbation	.24	.14	.22	.11	.13	.56	.26	--	
Frequency Sexual Intercourse	--	--	.36	--	--	--	.32	--	
Desire for Sex (Any Partner)	.30	.26	.22	.16	.28	.21	.28	--	
Frequency Searching Online	.11	--	--	--	.15	.18	--	--	
Frequency Searching in Bars	.30	.30	--	.18	.20	--	--	--	
Homosexual Men									
	AnxDes	DepDes	HapSex	Arousal	Regret	Mastur	Improve	Worse	
Age	.17	.14	--	--	--	--	.11	--	
Frequency Masturbation	--	--	--	--	.18	.41	--	--	
Frequency Sexual Intercourse	.16	.15	.31	--	.12	--	.25	--	
Frequency Erotic Websites	--	--	--	--	.22	.25	--	--	
Frequency 'Offline' Sex	.22	.12	--	--	.18	--	.11	--	

Note. Only correlations significant at $p < .05$ are presented.