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Sexual dysfunction in depression and anxiety: Conceptualizing sexual dysfunction as part of an internalizing dimension

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ABSTRACT

Sexual dysfunction is often implicated in depression and anxiety disorders, but the current nosology of sexual dysfunction, depression, and anxiety (i.e., DSM-IV) does not adequately address these relationships. Because recent papers (Krueger, R. F., & Markon, K. E. (2006). Reinterpreting comorbidity: A model-based approach to understanding and classifying psychopathology. *Annual Review of Clinical Psychology*, *2*, 111–133) have suggested and provided evidence for latent internalizing and externalizing dimensions that help explain high comorbidity between mental disorders, the current paper suggests that sexual dysfunction might conceptually belong to a latent internalizing factor. To address this, evidence is presented for the relationship among disorders of sexual desire, arousal, and orgasm comorbid with depression and anxiety. A review of sexual disorders is also presented along with a critical examination of the way the current DSM is organized with respect to sexual dysfunction, depression, and anxiety.

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Healthy sexual functioning is an important part of the human experience. Similarly, the ability to experience pleasurable, anxiety-free mood states is also vitally important for overall well-being. Although these constructs may seem distinct, a relationship between

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mental health, mental illness, and sexual functioning has been well documented in the literature (Ace, 2007), and the relationship between mood and sexual function was suggested as early as perhaps 100 BC (Bhishagrathna, 1968, as cited in Michael & O'Keane, 2000). In fact, one indicator of positively functioning mental health is a normal sexual expression (Ace, 2007), and rates of sexual dysfunction from 30% to 70% have been reported in depressed populations (Saks, 1999). Taken individually, sexual dysfunction and mental health disorders can each have a large impact on normative functioning in a person's life; in combination, they can have a profoundly negative impact.

1. The need for a dimensional approach to psychopathology

Recently, increasing support has been found in the literature for conceptualization of a dimensional rather than a categorical approach to understanding and classifying psychopathology (Krueger, Caspi, Moffitt, & Silva, 1998; Krueger, Markon, Patrick, & Iacono, 2005; Widiger & Samuel, 2005; Widiger & Trull, 2007). This implies that for mental disorders that have a high degree of co-incidence, a more parsimonious approach to nosology would be to classify these sets of disorders within broad dimensions rather than treating them as unique and distinct categories. One dimensional approach that has received considerable support (Krueger & Markon, 2006) conceives of a broad *internalizing* factor that encompasses different symptoms of psychopathology, such as depression and anxiety, and a broad *externalizing* factor that encompasses disorders, such as drug and alcohol abuse and conduct disorder (Krueger, 1999; Krueger & Markon, 2006; Krueger et al., 2005). Empirical support for a two-dimensional model has been shown in a set of large, cross-cultural samples from 14 countries (Krueger, Chentsova-Dutton, Markon, Goldberg, & Ormel, 2003). This study fitted data for depression, anxious worry, anxious arousal, neurasthenia, somatization, hypochondriasis, and hazardous use of alcohol to 1-factor, 2-factor, and two separate 3-factor models.[1] Overall, a 2-factor model provided the best fit to the data, and it was concluded that a broad internalizing factor that included depression, anxiety, and somatization was evident across diverse cultures, and that this factor was distinct from alcohol problems, which loaded on its own factor in this study and has loaded on an externalizing factor in other research (Krueger et al., 2003).

One quality of a dimensional approach is that broad, latent dimensions can account for the high levels of comorbidity often seen between disorders and can help explain the shared variance among them. Because of this, it has also been suggested that any dimensional model should encompass a wide range of psychopathology (Cuthbert, 2005). As the time draws closer for the 5th edition of the of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) to be written, consideration should be given to including disorders related to sexual desire, arousal, orgasm, and pain among the disorders that comprise part of any broad internalizing factor. Although symptoms relating to sexual disorders are currently implicated in somatization disorders (Diagnostic and Statistical Manual of Mental Disorders [DSM-IV-TR]; American Psychiatric Association, 2000) and somatization has been shown to be part of the broad internalizing dimension, no research to date has investigated whether dimensional scores of sexual function would load equally well as depression or anxiety scores on an internalizing factor (Krueger et al., 2003).

It is also worth noting here that although the current DSM-IV uses symptom lists and other criteria to specify a diagnosis, a dimensional approach is often used in non-diagnostic research examining depression or anxiety and sexual function. For example, severity of depression is often operationalized as scores above or below a cutoff on scales that measure depressive symptoms, such as the Center for Epidemiological Studies Depression Scale (Radloff, 1977) or the Beck Depression Inventory (Beck & Beamesderfer, 1974). Sexual function is often treated in the same way and measured with one of several instruments such as the Sexual Functioning Questionnaire (Kennedy, Ralevski, Dickens, & Bagby, 1998) that assess sexual functioning across several phases of the sexual response cycle. In other cases, rather than cutoff scores, the dimensions are thought of and treated as continuous scales. This dimensional, measurement-based approach to understanding the relationship between internalizing disorders and sexual function highlights that many researchers already conceptualize mental health and sexual functioning as continua that span from healthy functioning to dysfunction.

2. The current classification of sexual dysfunction in the DSM-IV

Sexual functioning includes phases related to desire, arousal, orgasm, and resolution. It can also be argued that satisfaction and pleasure with one's sexual experiences are important parts of healthy sexuality that might not be present in sexual dysfunction. At present, classification of sexual dysfunction in the DSM-IV includes disorders of desire, arousal, orgasm, and pain. No disorders related to resolution or lack of pleasure are noted (Clayton, 2001), although painful sex (among other categories of sexual dysfunction) would presumably preclude sexual enjoyment even if it does not directly reflect this aspect of sexuality. Each of the sexual disorders that are discussed can be classified as lifelong versus acquired, generalized versus situational, and due to psychological or combined factors. A last type of disorder, sexual dysfunction due to a general medical condition, is not discussed here, although a dysfunction of this nature might also be associated with an internalizing disorder.

In many cases, separate disorders are listed for women and men, although it is not always clear why this is so. An excellent paper by Tolman and Diamond (2001) highlights some of these issues and discusses in detail how sexual desire and arousal have been viewed differently in men and women at various times throughout history and how these views have varied by culture. Tolman and Diamond also provide a description of biological essentialist and social constructionist theories on sexual desire and function, concluding that an integrative approach is superior to either of the other two in isolation.

3. Is there a basis for including sexual dysfunction in an internalizing dimension?

A relationship between poorer mental health (i.e., depression and anxiety) and greater sexual dysfunction, particularly loss of libido, has been well documented in the literature (Ace, 2007; Angst, 1998; Baldwin, 1996; Kennedy, Dickens, Eisfeld, & Bagby, 1999; Lief, 1986; Saks, 1999; for reports of increased sexual interest in depression, Bancroft et al., 2004 or Lykins, Janssen, & Graham, 2006). This relationship holds equally true for women and men (Frohlich & Meston, 2002; Pesce, Seidman, & Roose, 2002), and has been found in all corners of the world (Borissova, Kovatcheva, Shinkov, & Vukov, 2001; Chakrabarti, Chopra, & Sinha, 2002; Escobar, Gomez, & Tuason, 1983; Laumann, Paik, & Rosen, 1999; Okulate, Olayinka, & Dogunro, 2003; Sugimori et al., 2005).

Although the link between sexual functioning and mental health is well documented, and it is often thought that mental illness has a large effect on sexual function and the expression of sexuality (Hammen, 2003), concerns over sexual functioning may also contribute to mental health problems such as anxiety and depression (Ace, 2007). For example, in high percentages of patients who present with sexual difficulties, depression is a common complaint (Donahey & Carroll, 1993; Michael & O'Keane, 2000). Other studies have shown that depression or anxiety can occur secondary to sexual disorders

[1] The first 3-factor model loaded depression, anxious worry, and anxious arousal on a depression-anxiety factor and somatization, hypochondriasis, and neurasthenia on a somatization factor, with hazardous use of alcohol on an alcohol problems factor. The second 3-factor model loaded depression, anxious worry, anxious arousal, and neurasthenia on a depression-anxiety factor, somatization and hypochondriasis on a somatization factor, and hazardous use of alcohol on an alcohol problems factor.

such as erectile dysfunction (Derogatis, Meyer, & King, 1981). It is evident then that the relationship between sexual dysfunction, depression, and anxiety is multifactorial, complex, and often bidirectional, implying that the causal path is not clear, with sexual and depressive or anxious symptoms often manifesting at the same time (Araujo, Durante, Feldman, Goldstein, & McKinlay, 1998; Balon, 2006; Barlow, Sakheim, & Beck, 1983; Bradford & Meston, 2006; Cyranowski, Bromberger et al., 2004; Cyranowski, Frank, Cherry, Houck, & Kupfer, 2004; Derogatis et al., 1981; Elliott & O'Donohue, 1997; Pesce et al., 2002; Roose, 2003; Seidman, 2002; Turkistani, 2004; van Minnen & Kampmen, 2000; Weiner & Rosen, 1999). Adding to the difficulty in understanding the relationship between internalizing disorders and sexual dysfunction are the different ways that sexual dysfunction is defined in different studies, which makes comparisons across studies difficult (American Psychiatric Association, 2000; Frohlich & Meston, 2002; Kuffel & Heiman, 2006; Michael & O'Keane, 2000).[2]

4. Depression, anxiety, and sexual dysfunction in the DSM-IV

With such a strong link between sexual dysfunction and depression or anxiety respectively, it is perhaps surprising that there are few direct diagnostic links between these disorders in the current version of the DSM-IV (American Psychiatric Association, 2000). Perhaps this is because the aim of the DSM is more to specify distinct disorders and less to identify the relationships that may exist between disorders. High rates of comorbidity between disorders, however, suggest a possible common etiological basis between disorders that should be taken into account in a diagnostic system.

In relation to mood disorders, sexual functioning is mentioned only briefly in two locations in the DSM-IV, with one statement claiming "In some individuals, there is a significant reduction from previous levels of sexual interest or desire" (p. 349), and another stating "There may be… difficulties in sexual functioning" (p. 352), going on to mention anorgasmia in women and erectile dysfunction in men. In another location that describes associated features of depression and other mental disorders associated with major depression, no link to sexual disorders is given despite the overwhelming support for a decrease in sexual functioning associated with depression. This is true despite the fact that sexual problems, particularly decreased sexual desire, can be one of the most distressing symptoms of depression (Casper et al., 1985).

In the sections on anxiety disorders, few references to sexuality can be found other than that specific phobia related to sexual contact should be classified as a sexual aversion disorder rather than a specific phobia, and that posttraumatic stress disorder may be accompanied by reduced ability to feel emotions related to intimacy or sexuality (American Psychiatric Association, 2000, p. 464). There also is discussion that a traumatic event such as rape might be associated with recurrent thoughts, dreams, or episodes related to the stressor. It is conceivable that when the posttraumatic stress disorder is caused by a sexual trauma, any subsequent intrusive thoughts, dreams, or episodes related to the traumatic event might have an impact on sexual functioning. As an example of this, reviews of the long-term consequences in adulthood related to child sexual abuse has shown that for men and women, sexual trauma in childhood is related to anxiety, depression, and sexual dysfunction (Beitchman et al., 1992; Meston, Rellini, & Heiman, 2006; Leonard & Follette, 2002).

It is particularly surprising that sexual function is not mentioned more often in the DSM-IV in relation to the diagnosis of anxiety, given that anxiety was originally conceived of as one of the primary bases for sexual dysfunction (Masters & Johnson, 1970; Kaplan, 1974, as cited in Elliott & O'Donohue, 1997), and the prevalence of sexual dysfunction in people with anxiety disorders is high (Bodinger et al., 2002; Bradford & Meston, 2006; Seto, 1992). This may be because the relationship between anxiety and sexual dysfunction is not always clear, with sexual dysfunction primarily related to the cognitive rather than the physiological aspects of anxious arousal (Elliott & O'Donohue, 1997), or that anxiety is sometimes associated with an increase in sexual arousal rather than a decrease (Barlow et al., 1983). If sexual dysfunction proves to be related conclusively to anxiety, then a dimensional approach to understanding the link between them would most likely have implications for diagnosis and treatment of both anxiety and sexual dysfunction disorders.

In the diagnostic category of sexual dysfunctions, mention is only briefly made that "Sexual dysfunction may be associated with Mood Disorders and Anxiety Disorders" (American Psychiatric Association, 2000, p. 537), although the possibility of a comorbid mood disorder is also noted in a section on male erectile disorder. Further, in each of the disorders related to desire, arousal, orgasm, and pain, one of the criteria for diagnosis is that the disturbance should be associated with "marked distress or interpersonal difficulty" (e.g., p. 541), general symptoms that are common to depression and anxiety, but also to most other named diagnostic categories.

5. Internalizing disorders and sexual dysfunction: a selective review of the evidence

Although one of the principal aims of this paper is to review the literature linking sexual functioning to depression and anxiety disorders, and therefore to argue for inclusion of disorders related to sexual dysfunction in any internalizing dimension, the sheer volume of studies that have documented comorbid sexual dysfunction and internalizing disorders makes a comprehensive review of all extant literature beyond the scope of this paper. Therefore, the literature linking depression and anxiety spectrum disorders to sexual dysfunction will be selectively reviewed, with general estimates of comorbidity prevalence rates given along with discussion of the few experimental and longitudinal studies that have been conducted.

Research has shown clear links between sexual functioning, depression, and anxiety. At present though, very few longitudinal or experimental studies have been conducted that might help sort out the causal relationship between sexual dysfunction and internalizing disorders. Most research has instead been descriptive in nature, describing case studies or reporting percentages of people who present with elements of sexual dysfunction comorbid with an internalizing disorder. Furthermore, although some research does discuss comorbid diagnosis (Corretti, Pierucci, De Scisciolo, & Nisita, 2006; Strand, Wise, Fagan, & Schmidt, 2002; Tignol, Martin-Guehl, Aouizerate, Grabot, & Auriacombe, 2006), typically, scores from dimensional measures of sexual dysfunction are reported in people with internalizing disorders (Bodinger et al., 2002; Cyranowski, Frank et al., 2004) or scores on dimensional measures of depression or anxiety are reported in people with diagnosed sexual dysfunction (Hurlbert et al., 2005; Shabsigh et al., 1998). Other research uses dimensional measures for both internalizing disorders and sexual dysfunction or studies the relationship in normal populations (Angst, 1998). Some descriptive research has gone further and used logistic regression or latent class modeling to provide odds ratios along with associated tests of significance. In the next sections, selected evidence of the relationship between internalizing disorders and sexual dysfunction is reviewed, followed by specific suggestions about the next step researchers should take might consider in investigating sexual functioning and other internalizing disorders.

[2] The relationship between depression, anxiety, and sexual functioning is further complicated by the fact that most available first-line drug treatments for depression and anxiety (with the possible exceptions of bupropion and nefazodone; Ferguson, 2001) are believed to adversely affect sexual functioning in both women and men (e.g., Montgomery, 2006). It is beyond the scope of this paper to discuss this topic in any detail, but several quality studies and comprehensive reviews of sexual functioning during antidepressent medication treatment are available elsewhere (Cassano & Fava, 2004; Clayton et al., 2002; Ferguson, 2001; Kennedy et al., 2006; Margolese & Assalian, 1996; Montgomery, 2006; Montgomery, Baldwin, & Riley, 2002; Rosen & Marin, 2003; Werneke, Northey, & Bhugra, 2006).

5.1. Depression and sexual dysfunction

5.1.1. Sexual desire disorders

Loss of libido is perhaps the most common aspect of sexual functioning that is affected by depression or depressive symptoms. In fact, a change in libido "is an indicator of depression in all patient cohorts except in women older than 70 years" (Baldwin, 1996, p. 31). For example, in a study that measured depression in people diagnosed with low sexual desire or in a control population, the history of major depression was almost twice as high in those with low sexual desire (Schreiner-Engel & Schiavi, 1986). And in a large probability sample of 3004 people (60% women), Johnson, Phelps, and Cottler (2004) found that people with depression were 5.3 times more likely to have inhibited sexual desire. Another study compared 133 patients diagnosed with either unipolar or bipolar depression to a group of 80 healthy controls and found that loss of sexual interest was the second most reported somatic symptom behind sleep disturbance (Casper et al., 1985).

It should be noted, however, that loss of sexual desire is not always the case, at least in men. In samples of heterosexual and gay men, Bancroft, Janssen, Strong, & Vukadinovic (2003) and Bancroft, Janssen, Strong, Carnes et al. (2003), reported that 9.4% of heterosexual men and 16% of gay men had an *increase* in sexual interest when depressed, while 42% and 47% of the same samples reported a decrease in sexual interest, respectively. In another sample of 591 men and women, Angst (1998) found that twice as many men as women reported an increase in libido as a sexual problem (23% of men versus 9% of women) while 26% of men and 35% of women reported decreased libido. This somewhat puzzling increased interest in sex in depression, however, is thought to reflect a search for reassurance and comfort, rather than actual increased desire (Baldwin, 1996; Bancroft et al., 2004).

Although many studies relating depression to loss of libido do not take into account the use of antidepressant medication, some research has specifically focused on the connection between sexual functioning and depression in non-medicated populations, in order to rule out potential confounds. For example, using retrospective questionnaires and prospective daily logs, Howell et al. (1987) found that a sample of 26 drug-free outpatient men who were depressed were significantly less interested in and less satisfied with sex than an age-matched sample of control men. Similarly, Kennedy et al. (1999) assessed sexual dysfunction in a depressed sample of 67 men and 102 women who either had never taken antidepressant medication or had been antidepressant free for at least 2 weeks (5 weeks if they had been taking fluoxetine). They found that 42% of men and 50% of women reported a decrease in sexual drive, 36% of men and 38% of women had a decreased interest in sexually explicit material, and 42% of men and 35% of women had a reduction in fantasizing about sex. In addition, 40% of men and 30% of women reported a reduction in masturbation. This finding was contradicted by a later study by Frohlich and Meston (2002), who found that women with depressive symptoms reported a *greater* desire for solitary sexual activity than non-depressed women, and that these same women were significantly more likely to have masturbated in the last month. Similarly, Cyranowski, Bromberger et al. (2004) found a higher frequency of masturbation in women with single or recurrent episodes of depression compared to never depressed women. See Table 1 for a descriptive summary of the information presented in the section above, along with normative information from Laumann et al. (1999) on the prevalence of problems with sexual desire in a national probability sample of U.S. respondents.

Table 1
Summary of associations between sexual desire disorders and depression.

Source	Sample characteristics and primary findings
Angst (1998)	Total sample of 591 participants in a longitudinal study. Of the depressed males ($n=47$), 23% reported increased libido and 26% reported decreased libido, compared to only 9% of the depressed females ($n=79$) reporting increased libido and 35% reporting decreased libido
Bancroft, Janssen, Strong, and Vukadinovic et al. (2003), Bancroft, Janssen, Strong, Carnes et al. (2003)	662 gay males (2003a) and 919 heterosexual males (2003b) reported that while depressed, respectively, 7% and 9.4% had an increase in sexual desire, while 47% and 42% had a decrease in sexual desire
Casper et al. (1985)	133 patients diagnosed with either unipolar or bipolar depression reported that loss of sexual interest was most common symptom after sleep disturbances
Cyranowski, Bromberger et al. (2004)	292 women with single or recurrent episodes of depression had significantly higher reported frequency of depression than 622 never depressed women
Frohlich and Meston (2002)	47 depressed women reported significantly greater desire to engage in sexual activity alone and were significantly more likely to have masturbated in the past month than 47 matched controls
Howell et al. (1987)	26 drug-free outpatient depressed men were significantly less interested in and less satisfied with sex than an age-matched sample of control men
Johnson et al. (2004)	Community sample of 3004 respondents. Of the 7% of the total sample who reported inhibited sexual desire, the reported odds ratios for comorbid depression were 5.32 (95% CI 3.72–7.61)
Kennedy et al. (1999)	67 depressed men and 102 depressed women who had never taken antidepressants or were antidepressant free for at least 2 weeks. 42% of males and 50% of females reported decrease in sex drive, 36% of males and 38% of females reported decreased interest in sexually explicit material, 42% of males and 35% of females had reduced sexual fantasies, and 40% of males and 30% of females reported reductions in masturbation
Schreiner-Engel and Schiavi, (1986)	46 married couples diagnosed with global inhibited sexual desire (ISD) and 36 matched controls. Proportion of ISD subjects with history of major or intermittent depression nearly twice as high as controls

Note: Normative data are taken from Laumann et al. (1999), who found that in a nationally representative probability sample of 1486 women and 1249 men aged 18–59 who had at least one sexual partner in the last 12 months, between 27–32% of females and between 14–17% of males reported lacking interest in sex. These overall percentages, which were drawn from a nationally representative probability sample from the United States, likely represent a mix of depressed and/or anxious people, as well as individuals without a history of depression or anxiety.

5.1.2. Sexual arousal disorders

Sexual arousal disorders, particularly erectile dysfunction (ED) are common in men with depression. In women, there is also some evidence of decreased arousal in depression, although fewer studies have documented this. The evidence for ED and depression is presented first, with female arousal disorder reported next.

In one study, Dunn, Croft, and Hackett (1999) reported that problems in maintaining or achieving an erection were associated with between 1.9–2.3 greater likelihood of depression. A study by Shabsigh et al. (1998) compared depressive symptoms in 120 men with either ED, benign prostatic hyperplasia (BPH, a condition that affects the prostate in men), or both ED and BPH. Fifty-four percent of men with ED alone and 56% of men with ED and BPH reported depressive

symptoms compared to only 21% of men with BPH alone. This translated into a likelihood of depressive symptoms with ED that was 2.6 times greater than in men with BPH alone. In a series of studies (Thase, Reynolds, Glanz et al., 1987; Thase, Reynolds, Jennings, Berman et al., 1988; Thase, Reynolds, Jennings, Frank, Howell et al., 1988, Thase, Reynolds, Jennings, Frank, Garamoni et al., 1992), rather than asking about erectile function, nocturnal penile tumescence (NPT) recordings were taken from depressed or control populations. In an early study, Thase et al. (1987) recorded NPT in 10 men with major depression and 10 age-matched healthy controls. They found that depressed men had fewer minutes of tumescence time, and that this was not related to sleep efficiency or REM sleep time. In another study (Thase, Reynolds, Jennings, Berman et al., 1988), 17 men who had been diagnosed with organic ED were compared to 17 age-matched healthy controls and 17 depressed men. Measures of NPT classified 47% of depressives in the dysfunctional range. Another sample (Thase, Reynolds, Jennings, Frank, Howell et al., 1988) compared 34 male outpatients with major depression to 28 age-matched healthy controls. After controlling for age, diagnosis, REM time, and sleep time, depressed men had significantly diminished NPT time and diminished penile rigidity. In addition, the level of NPT time was comparable to a level seen in 14 non-depressed men who had been diagnosed with organic impotence. A later descriptive study (Thase, Reynolds, Jennings, Frank, Garamoni et al., 1992) measured NPT in 51 depressed men, and found that compared to earlier samples, there were significant abnormalities of NPT and penile rigidity.

These findings have been replicated cross-culturally. A large sample of Japanese men aged 40-64 ($N = 1419$) were assessed for erectile dysfunction and depression. Controlling for age, body mass index, smoking, and alcohol consumption, ED was associated with 3.4 times and 2.4 times the likelihood of having depressive symptoms in 45–49 year old and 50–54 year old men, respectively (Sugimori et al., 2005). In a Malaysian study (Low, Khoo, Tan, Hew, & Teoh et al., 2006) ED was significantly associated with depression, although testosterone levels were not. A large sample of 1709 men in Brazil, Italy, Japan, and Malaysia also found that depression was 2.3 times more likely in men with ED than in men with no ED (Nicolosi, Moreira, Villa, & Glasser, 2004). Together, these studies show that up to 50% of men who have ED are depressed or show depressive symptoms and that depression is 2-3 times more likely in men with ED than men with no sexual arousal disorder.

Disorders of sexual arousal have not been as thoroughly investigated in women as in men, although it is generally thought that depression in women leads to difficulty in sexual arousal (Graziottin, 1998). One study that provided odds ratios (Dunn et al., 1999) found that in a community sample of 615 depressed women, self-reported problems with arousal were 6 times more likely than in women without depression, and that vaginal dryness was 2.3 times more likely. Frohlich and Meston (2002) compared self-reported arousal in 2159 college women who were classified as depressed or not according to their scores on a dimensional depression index. They found that women who were classified as depressed reported less arousal than women who were classified as not depressed. Cyranowski, Bromberger et al. (2004) measured self-reported arousal in 914 women and found that arousal was significantly lower in women with recurrent major depressive disorder compared to women with no history of depressive disorder, even when controlling for current depression scores, psychotropic medication use, and comorbid anxiety or substance abuse. Women who had only a single episode of major depression did not show this effect. Another study by Cyranowski, Frank et al. (2004) showed that of 68 women who were in at least their 2nd episode of major depression and free from psychotropic medication at study entry, 41% reported that in the past 30 days had they not had normal lubrication throughout sexual relations. Even after treatment with interpersonal therapy, a 12 month assessment showed that 38% of women still reported disturbances in arousal, suggesting that sexual symptoms comorbid with depression do not easily disappear, even when the depression is in remission. A study by Kennedy et al. (1999) showed similar rates of dysfunction with arousal in 102 depressed women. Fifty percent reported less sexual arousal overall, with 40% reporting difficulty in obtaining adequate vaginal lubrication. Laumann et al. (1999) also found problems with arousal in a sample of 1749 women. In these women, a latent class analysis showed that emotional problems or stress predicted a 4.6 times greater likelihood of arousal disorder.

The above studies provide useful information about the connection between depression and arousal problems in men and women but, being descriptive, do not bear directly on causality. A few researchers have therefore tried to understand the causal links between depression and sexual arousal by using experimental designs, showing that changes in mood affect sexual arousal. Meisler and Carey (1991) induced either elated or depressed affect in 15 sexually functional males. Following affect induction, participants watched a brief erotic film. Penile tumescence and subjective sexual arousal measures were recorded continuously. Following the depression induction there was a trend toward diminished subjective sexual arousal in the early part of the erotic exposure and maximum subjective arousal was temporally delayed. There was no effect, however on penile tumescence. A more recent study by Mitchell, DiBartolo, Brown, and Barlow (1998) found that in 24 sexually functional men a negative musical mood induction led to objectively less sexual arousal compared to baseline and a neutral control condition.

In women, only one experimental study could be located (Kuffel & Heiman, 2006). In this repeated measures experiment, 56 women with normal sexual function were classified as either depressive or not and asked to adopt negative and positive sexual schemata (i.e., imagining that they enjoyed their sexuality and viewed it as an important part of their lives, or that they did not enjoy sex and did not respond physically to sexual stimuli). Vaginal photoplethysmography was taken as an objective measure of sexual arousal and self-report measures of arousal were also taken. Following a baseline period, participants were exposed to either neutral or erotic films. Although there were no significant differences between women classified as depressed or not on objective or subjective measures of arousal, main effects for schema type emerged, with women in the negative schema condition showing significantly lower subjective and objective sexual arousal. In addition, a significant interaction between schema type (negative or positive) and schema order (negative first or second) emerged. Women who adopted a positive schema first showed no differences in objective sexual response across schemata, but women who adopted a negative schema first showed significantly lower vaginal sexual response after the negative schema induction. This suggests that negative thoughts or affect that are experienced before sexual activity commences can decrease sexual responding, even when positive affect is introduced later. Conversely, positive affect may increase sexual responding, providing resilience against later negative thoughts. See Table 2 for a descriptive summary of the information presented in the section above, along with normative information from Laumann et al. (1999) on the prevalence of problems with sexual arousal in a national probability sample of U.S. respondents.

5.1.3. Orgasm and pain disorders

Very little systematic research has linked orgasm and pain disorders to depression, although this may reflect a lack of research interest rather than a lack of a connection. Perhaps as a reflection of this, most of the studies that have examined comorbidity between orgasm or pain disorders and depression have been part of large epidemiological studies where the general purpose was not to describe sexual problems in depressed samples, but where data were collected on sexuality and depression along with other variables.

Laumann et al. (1999) found that a latent class factor related to sexual pain was almost twice as likely in women who experienced

Table 2
Summary of associations between sexual arousal disorders and depression.

Source	Sample characteristics and primary findings
Cyranowski, Bromberger et al. (2004)	914 women with recurrent major depressive disorder had significantly lower self-reported arousal than women with no history of depressive disorder, controlling for current depression, medication, substance use, and comorbid anxiety
Cyranowski, Frank et al. (2004)	68 women in a 2nd episode of major depression. 41% reported a recent lack of normal lubrication. At a 12 month assessment, 38% of this sample still reported disturbances in arousal
Dunn et al. (1999)	Community samples of 638 men and between 615–646 women. An odds ratio (OR) of 2.3 was reported for comorbid depression associated with problems in achieving an erection for men, an OR of 6.0 was reported for depression associated with problems in arousal for women, and an OR of 2.3 was reported for depression associated with vaginal dryness
Frohlich and Meston (2002)	In a sample of 2159 college women, women classified as depressed reported significantly less arousal than non-depressed women
Kennedy et al. (1999)	In a sample of 102 depressed women, 50% reported less sexual arousal overall, with 40% reporting difficulty in obtaining adequate vaginal lubrication
Kuffel and Heiman (2006)	56 women with normal sexual function. After a counterbalanced within-subject induction of positive or negative sexual schemata, women who adopted a negative schema before a positive schema had significantly lowered vaginal sexual response (measured with vaginal photoplethysmography) after the negative schema induction
Laumann et al. (1999)	In a sample of 1749 women and 1202 men, emotional problems or stress predicted 4.6 times greater likelihood of arousal disorder for women and 3.6 times greater likelihood of erectile dysfunction in men
Low et al. (2006)	A significant association between depression and erectile dysfunction (ED) was found in 351 males
Meisler and Carey (1991)	Experimental induction of depressed or elated affect in 15 sexually functional males. Subjective arousal was somewhat lower in the depression condition, with delay of maximum subjective arousal
Mitchell et al. (1998)	24 sexually functional men exposed to a negative musical mood induction had objectively less sexual arousal compared to baseline and neutral control condition
Nicolosi et al. (2004)	In a sample of 1709 men from several countries, depression was 2.3 times more likely in men with ED than in men with no ED
Shabsigh et al. (1998)	120 men with either ED, benign prostatic hyperplasia (BPH), or both ED and BPH were sampled. 26 of 48 men with ED only (54%) and 10 of 18 men with ED and BPH (56%) reported depressive symptoms, compared with only 7 of 34 men (21%) with BPH alone
Sugimori et al. (2005)	In 1419 males aged 40–64 years, ED was significantly associated with depression in the 45–54 age group, with odds ratios ranging from 2.43 to 3.42
Thase, Reynolds, Glanz et al., (1987)	10 men with major depression had significantly fewer minutes of nocturnal penile tumescence (NPT) compared with 10 age-matched healthy controls
Thase, Reynolds, Jennings, Berman et al. (1988)	17 men with organic ED, 17 depressed men, and 17 age-matched healthy controls. Analyses successfully discriminated 74% of dysfunctional and control subjects, but classified 47% of depressed subjects as dysfunctional
Thase, Reynolds, Jennings, Frank, Howell et al. (1988)	34 depressed male outpatients and 28 age-matched healthy controls. Depressed men had significantly less NPT and penile rigidity, with level of NPT in depression similar to 14 non-depressed males diagnosed with organic impotence
Thase, Reynolds, Jennings, Frank, Garamoni et al. (1992)	51 depressed men were compared to age-equated ($n=34$) and normal control ($n=28$), and found to have significantly reduced NPT in comparison

emotional problems or stress, and that premature ejaculation was 2.25 times more likely in men who experienced emotional problems or stress. Johnson et al. (2004) found that inhibited orgasm was 4.6 times more likely in depressed persons than in non-depressed persons and that women were 3.5 times more likely than men to report inhibited orgasm. In the same sample, functional dyspareunia was 4.4 times more likely in depressed women than in non-depressed women. Kennedy et al. (1999) found that 22% of depressed men reported delayed ejaculation and 12% had difficulty with premature ejaculation while 15% of depressed women reported difficulty in attaining orgasm. No information was given about sexual pain. Cyranowski, Frank et al. (2004) reported that 38% of depressed women were not at all satisfied with their ability to have an orgasm. This percentage did not change from baseline assessment to a 2nd assessment 12 months later. Frohlich and Meston (2002) also reported that depressed women had significantly more problems with sexual pain and orgasm than control women. A trend for premature ejaculation in depressed men with an associated odds ratio of 1.9 has also reported, although the finding was not significant, while dyspareunia was 4.5 times more likely in depressed women than control women (Dunn et al., 1999). See Table 3 for a descriptive summary of the information presented in the section above, along with normative information taken from Laumann et al. (1999) on the prevalence of problems with orgasm and pain in a national probability sample of U.S. respondents.

5.1.4. Sexual pleasure and satisfaction

Because there are no disorders associated with reduced enjoyment of sexual activities, no specific statistics are reported here. It is worth noting that several of the studies listed above (Cyranowski, Bromberger et al., 2004; Frohlich & Meston, 2002; Laumann et al., 1999) report rates of sexual satisfaction or pleasure in depressed and control populations. Rates of satisfaction and enjoyment are, in almost all cases, lower in depressed populations than in control populations. Because satisfaction and pleasure with one's sexual relationships are an important part of overall well-being and presumably contribute to normal sexual function, this is an important topic to be addressed in any future research.

One recent study (Laumann et al., 2006) highlights this. This study sampled over 27,000 men and women in 29 countries across multiple cultures. Data were collected on both cognitive and emotional aspects of sexual well-being. Laumann et al. found that the mean rates of sexual well-being were much lower in women than in men, mirroring somewhat the higher rates of depression generally found among women as compared to men (Marcus et al., 2005). This study also documented how lower sexual well-being suppressed overall happiness and demonstrated that lifetime diagnosis with depression was modestly associated with lower satisfaction with sexual functioning. Therefore, sexual pleasure or satisfaction should be another aspect of overall sexual function to be tested as belonging to an internalizing dimension of psychopathology.

5.1.5. Conclusion

All phases of the sexual response cycle, with the possible exception of resolution, are associated with depression. In addition, pain disorders are also found often in depressed people, although this finding applies more often to women than to men, and is an aspect of sexuality that is not as often researched in the context of depression. Sexual desire disorders are common in up to 50% of people who are depressed, with

Notes to Table 2
Note: Normative data are taken from Laumann et al. (1999), who found that in a nationally representative probability sample of 1486 women and 1249 men aged 18–59 who had at least one sexual partner in the last 12 months, between 19–27% of females experienced trouble lubricating, and between 7–18% of men experienced trouble maintaining or achieving an erection. These overall percentages, which were drawn from a nationally representative probability sample from the United States, likely represent a mix of depressed and/or anxious people, as well as individuals without a history of depression or anxiety.

Table 3
Summary of associations between orgasm and pain disorders and depression.

Source	Sample characteristics and primary findings
Cyranowski, Frank et al. (2004)	68 women in a 2nd episode of major depression. 38% reported a lack of satisfaction with ability to have an orgasm. This did not change from baseline to a 2nd assessment 12 months later
Dunn et al. (1999)	Community samples of 610 men and 613–650 woman. An odds ratio (OR) of 1.9 (nonsignificant trend after controlling for age) was reported for comorbid depression associated with problems with premature ejaculation in men, and ORs of 4.3 and 4.5 were reported for depression associated with orgasmic dysfunction and dyspareunia in women, respectively
Frohlich and Meston (2002)	In a sample of 2159 college women, women classified as depressed reported significantly greater problems with sexual pain and orgasm than non-depressed women
Johnson et al. (2004)	In a sample of 3004 women and men, inhibited orgasm was 4.6 times more likely in depressed compared to non-depressed individuals, and functional dyspareunia was 4.3 times more likely in depressed than in non-depressed women
Kennedy et al. (1999)	67 depressed men and 102 depressed women who had never taken antidepressants or were antidepressant free for at least 2 weeks. 22% of depressed men reported delayed ejaculation and 12% reported difficulty with premature ejaculation. 15% of depressed women reported difficulty in reaching orgasm
Laumann et al. (1999)	In a sample of 1749 women and 1202 men, emotional problems or stress predicted 1.8 times greater likelihood of sexual pain for women and 2.3 times greater likelihood of premature ejaculation in men

Note: Normative data are taken from Laumann et al. (1999), who found that in a nationally representative probability sample of 1486 women and 1249 men aged 18–59 who had at least one sexual partner in the last 12 months, between 23–28% of females and 7–9% of males were unable to achieve orgasm, 8–21% of females experienced pain during sex, and between 28–32% of males experienced problems with climaxing too quickly. These overall percentages, which were drawn from a nationally representative probability sample from the United States, likely represent a mix of depressed and/or anxious people, as well as individuals without a history of depression or anxiety.

the likelihood of a sexual desire disorder sometimes more than 5 times as likely in depressed than non-depressed people. Disorders of arousal are also common in women and men. This has been assessed by both subjective self-report measures and by objective measures such as nocturnal penile tumescence, vaginal photoplethysmography, and experimental mood induction. None of this work has clearly established whether sexual dysfunction is caused by depression or if depression is caused by sexual dysfunction. Rather than one causing the other, it seems likely that there are reciprocal and bidirectional effects of each type of dysfunction upon the other, or that they often appear together and are not easily separable. A systematic investigation of whether there are shared genetic predispositions or etiologies for depression and sexual dysfunction is called for, as no available research was found that addressed this question.

High rates of comorbidity, coupled with the lack of a clear causal link between sexual dysfunction and depression (Balon, 2006), suggest that each might be a symptom of the other, with depressive symptoms one of the main problems found in those with sexual dysfunction, and sexual dysfunction found in those who are depressed. This suggests that any approach to classifying a dimensional factor of internalizing psychopathology should take into account the high rate of co-occurrence between sexual dysfunction and depression, and explicitly test whether sexual dysfunction would load clearly on an internalizing factor.

5.2. Anxiety and sexual dysfunction

Although presence or absence of sexual dysfunction has been used to differentiate depression from anxiety, with depressed but not anxious patients showing decreased libido (Steer, Beck, Riskind, & Brown, 1986), anxiety has nonetheless been associated with sexual dysfunction in several studies, including studies that experimentally manipulated anxiety. The following sections describe some of the evidence linking anxiety to decreased sexual functioning. Because of a lack of systematic research that has linked anxiety disorders to sexual functioning and also because anxiety disorders are made up of several discrete categories, sections will be labeled by anxiety disorders rather than by sexual disorders.

5.2.1. Generalized anxiety disorder and dimensional measures of anxiety

An early review of the literature of anxiety and sexual arousal (Norton & Jehu, 1984) suggested that anxiety is common in people with sexual dysfunction, but that the nature and level of the anxiety might show large individual differences. Norton and Jehu concluded that more research was needed to fully understand the link between anxiety and sexual functioning. Another paper written in the same period (Kaplan, 1988) concluded that anxiety is a major factor in the etiology of sexual dysfunction, and went on to discuss how because of this, panic disorder often goes untreated in those who seek sexual therapy. A later review (Seto, 1992), however, suggested that no matter how anxiety is operationalized, it has no effect on genital responding. A recent review (Hartmann, Heiser, Ruffer-Hesse, & Kloth, 2002) detailed evidence that women with sexual desire disorders are more worried and anxious than sexually functional women. A recent study (Kaya et al., 2006) conducted in Turkey corroborated this, finding that in women with chronic pelvic pain, scores on the Spielberger Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970) and the Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988) were positively correlated with an overall measure of sexual dysfunction from the Golombok Rust Inventory of Sexual Satisfaction (Rust & Golombok, 1986) and with a measure of vaginismus created by Kaya et al. In other recent work, Katz and Jardine (1999) found that measures of worry showed small but significant correlations with both sexual aversion and hypoactive sexual desire. By explicating the relationship between worry and anxiety, Katz and Jardine concluded that anxiety was related to a lack of sexual desire and to sexual disgust.

Finally, in two large samples that were described in more detail in the sections on depression, significant associations were found between anxiety and measures of sexual dysfunction. Dunn et al. (1999) found that in more than 600 men there was a marginally increased risk of erection problems with anxiety, and that inhibited enjoyment and premature ejaculation were respectively associated with 1.6 and 2.5 greater likelihood of anxiety. Dunn et al. also found that in over 600 women, anxiety was associated with a greater risk (odds ratio, OR) for an arousal problem (OR = 3.5), an orgasmic dysfunction (OR = 2.0), inhibited enjoyment (OR = 2.3), vaginal dryness (OR = 1.8), and dyspareunia (OR = 4.5). Johnson et al. (2004) also reported that generalized anxiety disorder was associated in men and women with a 2.6 times greater risk for inhibited orgasm, a 2.1 times greater risk for inhibited sexual excitement, a 3.3 times greater risk for inhibited sexual desire, and a 2.5 times greater risk for dyspareunia in women. With the exception of inhibited sexual desire women were more at risk than men for each of these disorders. Although separate odds ratios were not reported for women and men separately and women had a higher incidence of all disorders except for inhibited sexual desire, between 1–8% of men out of 1203 reported lifetime prevalence of these sexual disorders.

Experimental work has shown conflicting results of the effect that anxiety has on sexual arousal in the laboratory. Barlow et al. (1983) found that men with normal sexual functioning had increased penile response while watching an erotic film when in two shock threat conditions as compared to a no-shock threat control condition. In fact, shock threat that was contingent on producing an erection of a certain size produced more arousal than a noncontingent shock threat condition. A different study by Hale and Strassberg (1990), however, found that men who received feedback indicating that they would be receiving a painful shock or that their level of sexual arousal during baseline measurement was below normal had significantly diminished arousal. Differences such as these were discussed by Barlow (1986), who concluded that certain types of cognitive interference can reduce arousal

in sexually functional men, but can actually increase arousal in men with secondary erectile dysfunction, presumably by distracting them from worries about their sexual functioning. It was also concluded that in healthy men, anxiety that is not cognitively distracting can have an enhancing effect on sexual arousal.

Similar mixed results have been found in women. For example, Palace and Gorzalka (1990) found that an anxiety-evoking film enhanced physiological arousal in women when they viewed an erotic film, but other studies (Elliott & O'Donohue, 1997) have found that in women, non-sexual cognitive distractions reduce both subjective and physiological arousal to erotic stimuli. Bradford and Meston (2006) measured state anxiety, trait anxiety, anxiety sensitivity, sexual functioning, and vaginal pulse amplitude in 38 women with no reported sexual difficulties. After watching an erotic film, subjective reactions to the film were also taken. Bradford and Meston found that women with moderate state anxiety had significantly elevated vaginal pulse amplitude compared to low and high state anxiety groups. They also found that state anxiety and anxiety sensitivity measures were positively correlated with negative affect in response to the film, although trait anxiety was not. In addition, state and trait anxiety and anxiety sensitivity were negatively correlated with self-reported arousal and sexual satisfaction, state and trait anxiety were negatively related to orgasm, and only state anxiety was related to sexual pain. Bradford and Meston concluded that because moderate but not high or low state anxiety was associated with higher physiological arousal, some studies might find that state anxiety has no effect while others find that it does. In other words, the inverted U-shaped results might explain the discrepancies found in other research. See Table 4 for a descriptive summary of the information presented in the section above.

Table 4
Summary of associations between generalized anxiety disorder, dimensional measures of anxiety, and sexual dysfunction.

Source	Sample characteristics and primary findings
Barlow et al. (1983)	12 males with normal sexual functioning showed increased penile response under shock threat compared to a control condition, and when shock threat was contingent on producing an erection, more arousal was noted than in a noncontingent shock threat condition
Bradford and Meston (2006)	38 women with no reported sexual difficulties. In women with moderate (compared with high or low) state anxiety, increases in vaginal pulse amplitude were found relative to baseline during viewing of an erotic film clip. State anxiety and anxiety sensitivity were positively correlated with negative affect in response to the film. State and trait anxiety, and anxiety sensitivity were also negatively correlated with self-report arousal, state and trait anxiety with sexual satisfaction and satisfaction with orgasm, and state anxiety with sexual pain
Dunn et al. (1999)	In samples of between 525–640 males and 613–696 females, elevated anxiety was associated with the following: for males, reported odds ratios (ORs) linking anxiety and sexual problems were 1.3 for problems getting an erection, 2.5 for premature ejaculation, and 1.6 for inhibited enjoyment. For women, ORs were 3.5 and 1.8 for problems with arousal and vaginal dryness, 3.0 for orgasmic dysfunction, 2.8 for dyspareunia, and 2.3 for inhibited enjoyment
Elliott and O'Donohue (1997)	In a sample of 48 women, cognitive distraction reduced subjective and physiological arousal to erotic stimuli
Hale and Strassberg (1990)	54 men receiving either shock threat or feedback that their sexual response was below normal showed significantly diminished plethysmographic arousal while subsequently watching erotic films compared to a neutral control condition
Johnson et al. (2004)	In a sample of 3004 women and men, generalized anxiety disorder was associated with a 2.6 greater likelihood of inhibited orgasm, a 2.1 greater likelihood of inhibited sexual excitement, a 3.3 greater likelihood for inhibited sexual desire, and a 2.5 greater likelihood of dyspareunia in women
Katz and Jardine (1999)	In a sample of 138 young adults (54% female), dimensional measures of worry were positively correlated with sexual aversion and hypoactive sexual desire
Kaya et al. (2006)	In 19 women with chronic pelvic pain, elevated scores on dimensional measures of anxiety were associated with sexual dissatisfaction and vaginismus
Palace and Gorzalka (1990)	32 sexually functional and dysfunctional women showed similar rates of increased physiological sexual arousal with concurrent decreased subjective arousal after an anxiety-provoking stimulus

5.2.2. Obsessive compulsive disorder (OCD)

Controlled studies of sexual dysfunction in obsessive compulsive disorder are rare (Vulink, Denys, Bus, & Westenberg, 2006). The few available studies also demonstrate conflicting reports. For example, Fruend and Steketee (1989) studied the retrospective life history reports of 44 obsessive compulsive outpatients and concluded that overall, there was no relationship between this disorder and an abnormal sexual history, attitudes, or functioning. Aksaray, Yelken, Kaptanoğlu, Oflu, and Özaltin (2001), however, found that 23 women with OCD had significantly higher means on measures of anorgasmia, avoidance, and non-sensuality than a control group with generalized anxiety disorder. In addition, there was a trend for the women with OCD to score higher on vaginismus, sexual non-communication, and dissatisfaction subscales. Unfortunately, there was no control group in this study to which both groups could have been compared. Vulink et al. (2006) also showed that 101 women with OCD scored higher than a control group on measures of sexual disgust, and scored lower on measures of sexual desire, arousal, and satisfaction with orgasm. van Minnen and Kampmen (2000) reported a similar finding, that women with OCD had significantly lower sexual desire than controls, although there was no difference between the groups in sexual aversion.

5.2.3. Panic disorder

Similar to other anxiety disorders, there are mixed reports about sexual dysfunction in panic disorder. For example, van Minnen and Kampmen (2000) found that women with panic disorder had significantly lower sexual desire than controls. In Mercan et al. (2006), however, sexual desire did not differ between women with panic disorder and controls, although women diagnosed with panic disorder comorbid with depression had lower sexual desire and greater sexual aversion. Mercan et al. concluded that sexual symptoms might be presenting symptoms of depression rather than of panic disorder. A study by Figueira, Possidente, Marques, and Hayes (2001) also found relatively low rates of vaginismus, dyspareunia, orgasmic, and arousal disorder in 14 women with panic disorder, although 50% of this sample had a comorbid diagnosis of sexual aversion disorder and 21% of the sample was diagnosed with hypoactive sexual desire disorder, which suggests that hypoactive sexuality might actually be related to panic disorder even without comorbid depression. In the same study, 21% of 14 men with panic disorder were diagnosed with premature ejaculation, 36% with sexual aversion disorder, and 14% with hypoactive sexual desire disorder. Only 7% of men were diagnosed with erectile disorder and none of these men were diagnosed with orgasmic disorder. These last findings are in contrast to a case study by Sbrocco, Weisberg, Barlow, and Carter (1997), where 3 men with panic disorder presented for erectile problems. Sbrocco et al. suggested that more research needs to be conducted to examine the relationship of panic to sexual dysfunction.

5.2.4. Social phobia

Few studies have explored comorbidity between social phobia and sexual dysfunction. In one study, premature ejaculation was associated with a 2.5 times higher chance of also having comorbid social phobia (Corretti et al., 2006). Another study found that the odds of a person having premature ejaculation were over 10 times higher if the person also had social phobia (Tignol et al., 2006). Bodinger et al. (2002), however, found that while 33% of the 24 men in their sample who were diagnosed with social phobia also had premature ejaculation, this number was not significantly different from a control group, which leaves the relationship between social phobia and premature ejaculation unclear. Men in this study did have more orgasmic disorder (i.e., inhibited orgasm) than controls, and they found it

significantly harder to become aroused, had a lower frequency of orgasm during sex, enjoyed sex with their partner less, and were less satisfied with their own sexual functioning. In this same study, 16 women with social phobia were compared to a control group with no disorder. Social phobic women had a lower frequency of sexual thoughts and desire for sex, less coital lubrication, more difficulty with arousal, less frequent sex, less sexual satisfaction, more painful sex, and higher loss of desire during sex.

5.2.5. Posttraumatic stress disorder

Although sexual function is thought to be related to posttraumatic stress syndrome (Kotler et al., 2000), very little systematic research has linked these disorders, and at least one article (Evren, Can, Evren, Saatcioglu, & Cakmak, 2006) demonstrated a lack of association between postraumatic stress disorder and arousal in men. Other studies have found the opposite. For example, Solursh and Solursh (1994) reported that 63% of combat veterans receiving treatment for PTSD had erectile difficulties. Letourneau, Schewe, and Frueh (1997) also found that in an ethnically diverse sample of 90 combat veterans who had been diagnosed with PTSD, 69% had erectile difficulties, 50% had problems with premature ejaculation, 44% were sexually disinterested, 48% were sexually avoidant, 33% were sexually dissatisfied, and 73% had elevated scores on a sexual infrequency subscale. Kotler et al. (2000) also found that 42 males with PTSD who were either treated with selective seretonin reuptake inhibitors or received no medication had significantly poorer scores across all aspects of sexual functioning that were measured (desire, arousal, orgasm, activity and satisfaction). They concluded that PTSD is associated with pervasive sexual dysfunction. In a study that compared 40 women who had experienced rape (95% of whom were diagnosed with PTSD) but who weren't sexually abused in childhood with 32 women who had experienced severe non-sexual trauma, Faravelli, Giugni, Salvatori, and Ricca (2004) found that the women who were raped had significantly more sexual aversion and genital pain. Other studies also suggest that a relationship between PTSD and sexual dysfunction may present in people who have experienced sexual trauma, although rates for co-occurrence of these disorders is not always described (Roesler & McKenzie, 1994; van Berlow & Ensink, 2000). For example, an excellent review by Leonard and Follette (2002) of sexual functioning related to child sexual abuse used a PTSD framework to show how sexual dysfunction relates to various types of sexual abuse, and how this abuse is in turn related to both depression and anxiety. See Table 5 for a descriptive summary of the information presented in the sections above on obsessive compulsive disorder, panic disorder, social phobia, and posttraumatic stress disorder.

5.2.6. Conclusion

A strong relationship exists between anxiety and sexual dysfunction, although this relationship is not as clear as in depression. Generalized anxiety disorder appears to be associated with all phases of the sexual response cycle, although there are conflicting reports. Bradford and Meston (2006) used their finding that women who scored in the moderate range on state anxiety were higher in physiological arousal than those who scored low or high in state anxiety to explain why some studies find experimentally induced anxiety increases arousal while others find arousal decreased. They also pointed out the generally weak correlations between objective and subjective measures of arousal in the literature, concluding that different methodologies can return different findings depending on the focus of the research.

Obsessive compulsive disorder and panic disorder seem to be primarily associated with lowered sexual desire and sexual aversion, although lower arousal, pain, and reduced satisfaction have also been noted. Social phobia also appears to be related to lower sexual desire, but in one study (Bodinger et al., 2002), it was also related to most phases of the sexual response cycle in men and women. This disorder also seems to be strongly related to premature ejaculation, although the findings are somewhat mixed. Posttraumatic stress disorder has been related to sexual aversion as well, but also to pain, erectile difficulties, and problems with premature ejaculation. In addition,

Table 5
Summary of associations linking obsessive compulsive disorder (OCD), panic disorder, social phobia, and posttraumatic stress disorder (PTSD) to sexual dysfunction.

Source	Sample characteristics and primary findings
Obsessive compulsive disorder	
Aksaray et al. (2001)	23 women with OCD had significantly higher means on measures of anorgasmia, sexual avoidance, and non-sensuality, and a trend for higher vaginismus, sexual non-communication, and sexual dissatisfaction than a control group with generalized anxiety disorder
Fruend and Steketee (1989)	44 obsessive compulsive outpatients retrospectively reported life histories, and no evidence of sexual dysfunction noted by the authors
van Minnen and Kampmen (2000)	17 women with OCD had significantly lower sexual desire than a control group
Vulink et al. (2006)	101 women with OCD scored significantly higher than a control group on a measure of sexual disgust, and significantly lower on measures of sexual desire, arousal, and satisfaction with orgasm
Panic disorder	
Figueira et al. (2001)	14 women and 14 men with panic disorder. 50% of the female sample had comorbid diagnosis of sexual aversion disorder and 21% were diagnosed with hypoactive sexual desire disorder. Rates of vaginismus, dyspareunia, and orgasmic and arousal disorders were low. For the male sample, 21% were diagnosed with premature ejaculation, 36% with sexual aversion disorder, 14% with hypoactive sexual desire disorder, and 7% with orgasmic disorder
Mercan et al. (2006)	12 female patients with panic disorder and 28 female patients with panic disorder comorbid with depression. Panic disorder patients did not differ from a control group on sexual desire or sexual aversion, while the comorbid group showed lower sexual desire and greater sexual aversion compared to both panic disorder alone or control
Sbrocco et al. (1997)	3 men with panic disorder presented with erectile problems
van Minnen and Kampmen (2000)	27 women with panic disorder had significantly lower sexual desire than a control group
Social phobia	
Bodinger et al. (2002)	24 men and 16 women with social phobia. 33% of males had comorbid premature ejaculation, although this number was not significantly different from a control group. Males also found it significantly harder to become aroused, had lower frequency of orgasm during sex, enjoyed sex less, and were less satisfied with their sexual functioning. Females had a lower frequency of sexual thoughts and desire for sex, less vaginal lubrication, more difficulty with arousal, less frequent sex, less sexual satisfaction, higher loss of desire during sex, and more painful sex
Corretti et al. (2006)	In a sample of 242 males referred to a sex clinic, likelihood of social phobia was 2.6 times greater in those with premature ejaculation disorder
Tignol et al. (2006)	85 subjects with premature ejaculation were compared to a group of controls without any sexual disorder. 47% of the premature ejaculation group were diagnosed with social phobia versus only 8% of the control group. This was associated with an odds ratio of 11.0
Posttraumatic stress disorder	
Faravelli et al. (2004)	40 women who had experienced rape (95% diagnosed with PTSD) but were free of childhood sexual abuse history had significantly more sexual aversion and genital pain compared with a group of women who had experienced severe non-sexual trauma
Kotler et al. (2000)	42 males with PTSD had significantly lower sexual desire, arousal, orgasm, activity, and satisfaction compared with a control group
Letourneau et al. (1997)	In a sample of 90 combat veterans diagnosed with PTSD, 69% had erectile problems, 50% had problems with premature ejaculation, 44% were sexually disinterested, 48% were sexually avoidant, 33% were sexually dissatisfied, and 73% had elevated scores on a sexual infrequency subscale
Solursh and Solursh (1994)	In a sample of 100 combat veterans receiving treatment for PTSD, 63% reported erectile difficulties

sexual abuse viewed within a posttraumatic stress disorder framework has linked posttraumatic stress to depression, anxiety, and sexual dysfunction (Leonard & Follette, 2002).

The strongest conclusion that can be drawn overall is that more research needs to be done. There is a lack of any programmatic research linking sexual functioning to anxiety disorders, and while results often appear mixed, the preponderance of evidence seems to show that there are substantial links between sexual dysfunction and multiple aspects of anxiety.

6. An integrative model of internalizing psychopathology that includes sexual dysfunction

Any model of psychopathology should be informed not only by data alone, but should have a theoretical basis. It is beyond the scope of this paper, however, to review in detail the many theories of depression and anxiety that include problems with sexual functioning. Concerning sexual dysfunction alone, there is little agreement about its causes, except that it is multiply determined (Wincze & Carey, 2001), and that the relationships between sexual dysfunction and mood are "complex and multidirectional" (Weiner & Rosen, 1999, p. 412). Still, there is a rich tradition of theorizing about the likely causes of sexual problems, and there is a striking similarity between the majority of these theories and the theories that have been offered to explain the development and maintenance of depression and anxiety. In fact, many of the theories explaining depression and anxiety include a focus on sexuality.

For example, in classic psychoanalytic theory (Freud, 1940/1964, as cited in Firestone, Firestone, & Catlett, 2006), disturbances in mental health are conceptualized as relating to unresolved conflicts about sexuality, including oedipal complexes, penis envy, or castration fears that lead to repression and denial. Modern psychoanalytic theory treats sexual dysfunction as a defense mechanism arising from conflicts about body shame transmitted from parents' attitudes about nudity, imitations of parents' distorted views about sexuality, or modeling of dysfunctional or inappropriate sexual behavior between parents (Firestone et al., 2006).

Cognitive-behavioral theories have also related psychological functioning to sexual functioning, with depression, anxiety, and sexual dysfunction all tied to the distorted ways people can learn to think about themselves (Barlow, 1986; Beck & Emery, 1985; Beck, Rush, Shaw, & Emery, 1979). Specifically, negative early sexual experiences can condition an anxiety or fear response in future sexual encounters, leading to avoidance of sex, erectile difficulties, or vaginismus (Leiblum & Rosen, 2000). Anxiety that is associated with sex can also interfere with sexual functioning on many levels (Barlow, 1986), with maladaptive thoughts such as worries about performance or pain interfering with arousal or orgasm by either distracting or focusing a person's thoughts too greatly on sex related cues (Cranston-Cuebas & Barlow, 1990).

Social learning theory also connects sexuality with mental health by describing how children learn about sexuality through identification and imitation of parents. If negative beliefs about life or sexuality are transmitted to children, fear or guilt about experiencing pleasure can be created and contribute to an inability to find fulfillment in an intimate relationship. In turn, this can lead to sexual dysfunction, depression, or anxiety (Kaplan, 1995).

Among others, these theories have evolved to describe the etiology and maintenance of not only mood disorders, but sexual dysfunction. While some theories directly implicate sexual functioning in anxiety and depression, other theories only imply that there is an association between mental health and sexual dysfunction. Common to each theory is either a direct or indirect implication of depression or anxiety as a cause or consequence of sexual dysfunction.

Because all of the models discussed in earlier sections have received at least some empirical support, the model proposed here does not take any particular theoretical stance. Instead, as the circle at the center of Fig. 1 shows, depression, anxiety, and sexual dysfunction are treated as conceptually linked to each other, with causality flowing in all directions from each disorder to each other disorder. This addresses the high comorbidity observed between the three types of disorder. In addition, it mirrors the empirical findings and theoretical stance of many researchers who agree that there is a lack of clear directionality from one disorder to another, and instead think of the set of disorders as mutually influencing each other or simply co-occurring.

Outside of the circle, various factors are presented that may each present a vulnerability or diathesis for an internalizing problem. These possible causal factors represent the complex, multifactorial, multiple determinants of all three internalizing syndromes, and do not favor one set of causes over another. In addition, with the exception of causality only flowing in one direction from developmental theories

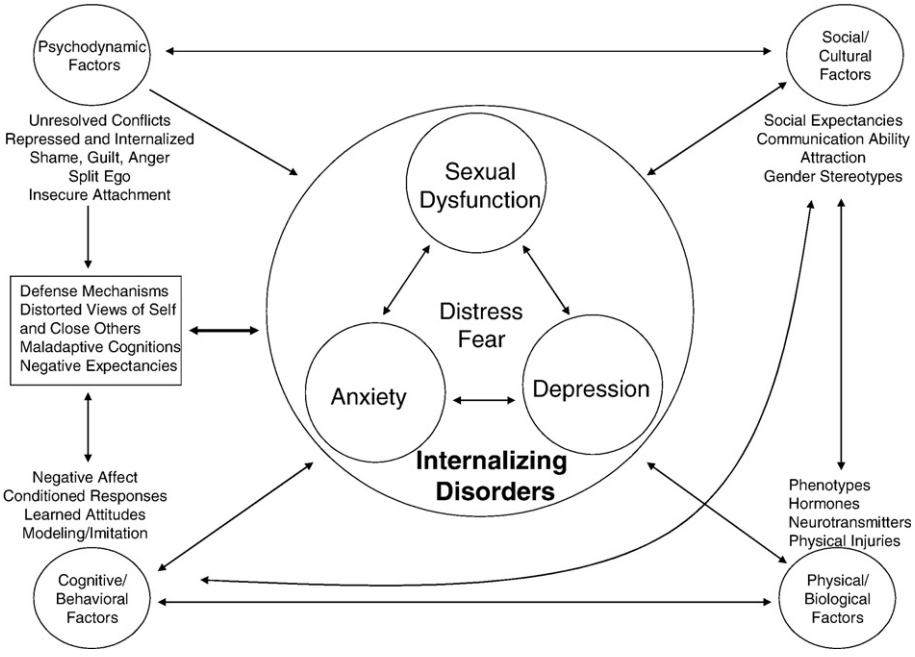

Fig. 1. Model of Internalizing Psychopathology. Arrows indicate the direction of causality or the interaction of factors.

(i.e., psychoanalytically derived theories) to internalizing disorders, connections between the internalizing disorders and causal factors indicate how causality can flow in multiple directions. For example, maladaptive cognitions might cause anxiety and sexual dysfunction, which might reinforce the negative cognitions or lead to operant conditioning.

Because of the multiple causes and interactions of causes that can potentially lead to an internalizing disorder, elements relating broadly to biological and physical factors such as hormones or physical trauma, psychological factors such as guilt, shame, or learned behaviors, and cultural, social, or interpersonal factors such as cultural or gender role expectations or relationship problems are all included. This model is not meant to be exhaustive or complete; instead, it is an attempt to show how multiple determinants might cause or maintain an internalizing disorder, and how sexual dysfunction relates to depression and anxiety in a way that places each syndrome as part of a larger internalizing dimension.

7. General discussion

Our review has suggested that as the time to write a new version of the DSM grows near, a dimensional approach to classification of psychopathology might be indicated (Krueger et al., 2005). Accordingly, a brief review of evidence has been provided that shows a 2-factor model provides a satisfactory fit to available data across multiple samples and a wide range of cultures (Krueger et al., 2003). Examining the research literature linking sexual dysfunction with depression and anxiety disorders, it becomes evident that may be a basis for the inclusion of sexual dysfunction as part of an internalizing dimension. The link between sexual dysfunction and mental health has been demonstrated in populations from most cultures around the world, and discussion has focused on the bidirectional and reciprocal causality of sexual functioning on mental health and vice versa. Because of the high rates of sexual dysfunction found in people with depressive and anxiety disorders (Baldwin, 1996; Norton & Jehu, 1984), the probable bidirectional nature of causality (Balon, 2006), and the lack of research concerning shared versus distinct etiologies, any conceptualization of a broad latent internalizing dimension should consider the inclusion of sexual dysfunction as part of the dimension.

Current meta-analytically derived models of an internalizing dimension (Krueger & Markon, 2006) show that internalizing disorders can be further broken into two subsets (i.e., distress and fear) that each load highly on the internalizing factor and are correlated with each other. In fact, depression and anxiety are often found to be so highly correlated with one another that empirically differentiating the constructs has been difficult (Clark & Watson, 1991). This raises the question of why the associations of depression and anxiety, respectively, with sexual dysfunction might be lower than those between depression and anxiety.

Answers to this question might lie in the ways that depression and anxiety are measured and in the differential bases of depression, anxiety, and sexual dysfunction. For example, Watson et al. (1995) note that there are several symptoms that are found in criteria for both depression and anxiety, and that these symptoms are found in assessment instruments measuring both depression and anxiety. To the extent that the same or similar items are used to measure different constructs, this will tend to exaggerate the correlation between those constructs. Therefore, some of the observed correlation between depression and anxiety may be due to this measurement issue. Because instruments that measure sexual dysfunction do not tend to use the same types of symptom criteria in their measurement, sexual dysfunction may be more clearly differentiated from depression and anxiety at the measurement level than depression and anxiety are from one another.

Still, depression – theoretically involving despair or distress and connected with feelings of sadness – is clearly distinct from anxiety, which is related to fear and connected to feelings of dread or worry, so measurement is only part of why sexual dysfunction might correlate less strongly with depression and anxiety than depression and anxiety correlate with each other. Speculatively, a further reason might be found in the tripartite model of depression and anxiety tested by Watson et al. (1995). They found that while both depression and anxiety are characterized by high negative affect, depression alone was strongly associated with anhedonia or low positive affect, while anxiety was uniquely associated with somatic arousal. Extending this idea to the present question, it may be that sexual dysfunction to some extent shares the same basis of high negative affect that characterizes both depression and anxiety. Still, in some cases, a specific disorder – such as low sexual desire – may also share the elemental lack of pleasure-seeking seen in depression, while in other cases, disorders such as diminished arousal or dyspareunia may share the element of physiological arousal seen in anxiety. Furthermore, anxious arousal may not always have a consistent effect on sexuality, sometimes diminishing sexual desire or performance, but other times increasing it. This might help explain the stronger overall association between depression and sexual dysfunction than between anxiety and sexual dysfunction. In addition, if a particular sexual dysfunction had as a basis, for example, low positive affect *blended* with somatic arousal, this might tend to diminish the correlation with both depression and anxiety, yet this disorder would strongly load on a general internalizing dimension.

Without further explicit model-testing, it is difficult to tell if within such a hierarchical internalizing dimension as posited by Krueger and Markon (2006), different aspects of sexual functioning (e.g., sexual desire versus sexual pain) would load clearly on fear or distress facets (i.e., subsets), or whether there might be a third subset related to sexual functioning that hasn't yet been identified. It seems possible that a sexual sub-factor related to arousal and pain might fit in with the fear facet, while sexual desire and orgasm disorders might load more clearly on a distress facet. There may also be a third facet with multiple sexual disorders that are all related to sexual distress, that in turn would be highly correlated with distress and fear facets. To resolve these questions, additional research will be needed, but in any case, the way that researchers often use a dimensional approach to psychopathology, treating depressive, anxiety, and sexual dysfunction symptoms as continuous variables, suggests that it would not be a quantum leap for a diagnostic system to follow a dimensional model.

The current nosology of sexual dysfunction in the DSM-IV-TR (American Psychiatric Association, 2000), which separates sexual dysfunction conceptually from depression and anxiety, does not adequately account for the high comorbidity between depression, anxiety, and sexual dysfunction. In addition, sexual disorders are conceptualized as distinct for women and men. This should be empirically examined in order to see when and where this model fits better than a model that assumes the etiology and course of sexual dysfunction is similar across the sexes. The next DSM should take both of these issues into consideration.

In closing, evidence clearly shows that all sexual disorders have been linked to depression and depressive symptoms. The evidence also suggests that anxiety spectrum disorders are related to most aspects of sexual functioning, particularly low sexual desire and sexual aversion, although all classes of sexual disorders have been implicated in anxiety.

The following recommendations are therefore submitted. One, that further systematic research needs to be conducted on the nature of sexual dysfunction in anxiety, to more definitively show a relationship between anxiety and sexual dysfunction. Two, that more longitudinal and experimental work is needed to address whether sexual dysfunction causes depression and anxiety, whether depression and anxiety cause sexual dysfunction, or whether the relationship is truly bidirectional and reciprocating. This research should also attempt to uncover whether there are shared genetic risk factors or common etiologies in depression, anxiety, and sexual dysfunction. Three, that the next version of the DSM should consider using a dimensional rather than or in addition to a categorical approach to classification of mental disorders. This approach would address the high rates of comorbidity between mental disorders with possibly shared social and genetic bases that are

currently thought of as distinct, and would do so by describing them in terms of broad internalizing and externalizing dimensions. As part of this, any internalizing dimension should potentially include disorders related to sexual functioning as well as disorders related to depression and anxiety. A dimensional approach also implies the use of current and valid measurement tools to aid in assessment as well as the development of new tools that can more precisely demarcate the boundaries between healthy functioning and dysfunction. Last, empirical models of an internalizing dimension of psychopathology that include sexual dysfunction should be fit to available data, and new research should be also be commenced that explicitly tests these models and the theories that describe them. These quantitative models should replace the mostly qualitative and descriptive research that has been done to date, in order to test whether sexual dysfunction should be considered part of an internalizing dimension, and if so, what the structure of this internalizing dimension would be.

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References

Ace, K. J. (2007). Mental health, mental illness, and sexuality. In: M. S. Tepper & A. F. Owens (Eds.), Sexual health volume 1: Psychological foundations (pp. 301-329). Westport, CT: Praeger Publishers/Greenwood Publishing Group.

Aksaray, G., Yelken, B., Kaptanoğlu, C., Oflu, S., & Özaltin, M. (2001). Sexuality in women with obsessive compulsive disorder. *Journal of Sex and Marital Therapy*, *27*, 273—277.

American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Wasington, DC: Author text revision.

Angst, J. (1998). Sexual problems in healthy and depressed persons. *International Clinical Psychopharmacology*, *13*, S1—S4.

Araujo, A. B., Durante, R., Feldman, H. A., Goldstein, I., & McKinlay, J. B. (1998). The relationship between depressive symptoms and male erectile dysfunction: Cross-sectional results from the Massachusetts male aging study. *Psychosomatic Medicine*, *60*, 458—465.

Baldwin, D. S. (1996). Depression and sexual function. *Journal of Psychopharmacology*, *10*, 30—34.

Balon, R. (2006). Mood, anxiety, and physical illness: Body and mind, or mind and body? *Depression and Anxiety*, *23*, 377—387.

Bancroft, J., Janssen, E., Carnes, L., Goodrich, D., Strong, D., & Long, J. S. (2004). Sexual activity and risk taking in young heterosexual men: The relevance of sexual arousability, mood, and sensation seeking. *Journal of Sex Research*, *41*, 181—192.

Bancroft, J., Janssen, E., Strong, D., Carnes, L., Vukadinovic, Z., & Long, J. S. (2003). The relation between mood and sexuality in heterosexual men. *Archives of Sexual Behavior*, *32*, 217—230.

Bancroft, J., Janssen, E., Strong, D., & Vukadinovic, Z. (2003). The relation between mood and sexuality in gay men. *Archives of Sexual Behavior*, *32*, 231—242.

Barlow, D. H. (1986). Causes of sexual dysfunction: The role of anxiety and cognitive interference. *Journal of Consulting and Clinical Psychology*, *54*, 140—148.

Barlow, D. H., Sakheim, D. K., & Beck, J. G. (1983). Anxiety increases sexual arousal. *Journal of Abnormal Psychology*, *92*, 49—54.

Beck, A. T., & Beamesderfer, A. (1974). Assessment of depression: the depression inventory. *Modern Problems of Pharmacopsychiatry*, *7*, 151—169.

Beck, A. T., & Emery, G. (1985). *Anxiety disorders and phobias: A cognitive perspective.* New York: Basic Books.

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, *56*, 893—897.

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression.* New York: The Guilford Press.

Beitchman, J. H., Zucker, K. J., Hood, J. E., DaCosta, G. A., Akman, D., & Cassavia, E. (1992). A review of the long-term effects of child sexual abuse. *Child Abuse and Neglect*, *16*, 101—118.

Bodinger, L., Hermesh, H., Aizenberg, D., Valevski, A., Marom, S., & Shiloh, R. (2002). Sexual function and behavior in social phobia. *Journal of Clinical Psychiatry*, *63*, 874—879.

Borissova, A. M., Kovatcheva, R., Shinkov, A., & Vukov, M. (2001). A study of the psychological status and sexuality in middle-aged Bulgarian women: significance of the hormone replacement therapy (HRT). *Maturitas*, *39*, 177—183.

Bradford, A., & Meston, C. M. (2006). The impact of anxiety on sexual arousal in women. *Behavior Research and Therapy*, *44*, 1067—1077.

Casper, R. C., Redmond, D. E., Jr., Katz, M. M., Schaffer, C. B., Davis, J. M., & Koslow, S. H. (1985). Somatic symptoms in primary affective disorder: Presence and relationship to the classification of depression. *Archives of General Psychiatry*, *42*, 1098—1104.

Cassano, P., & Fava, M. (2004). Tolerability issues during long-term treatment with antidepressants. *Annals of Clinical Psychiatry*, *16*, 15—25.

Chakrabarti, N., Chopra, V. K., & Sinha, V. K. (2002). Masturbatory guilt leading to severe depression and erectile dysfunction. *Journal of Sex and Marital Therapy*, *28*, 285—287.

Clark, L. A., & Watson, D. (1991). Tripartite model of anxiety and depression: Psychometric evidence and taxonomic implications. *Journal of Abnormal Psychology*, *100*, 316—336.

Clayton, A. H. (2001). Recognition and assessment of sexual dysfunction associated with depression. *Journal of Clinical Psychaitry*, *62*(Supp. 3), 5—9.

Clayton, A. H., Pradko, J. F., Croft, H. A., Montano, C. B., Leadbetter, R. A., & Bolden-Watson, C. (2002). Prevalence of sexual dysfunction among newer antidepressants. *Journal of Clinical Psychiatry*, *63*, 357—366.

Corretti, G., Pierucci, S., De Scisciolo, M., & Nisita, C. (2006). Comorbidity between social phobia and premature ejaculation: Study on 242 males affected by sexual disorders. *Journal of Sex & Marital Therapy*, *32*, 183—187.

Cranston-Cuebas, M. A., & Barlow, D. H. (1990). Cognitive and affective contributions to sexual functioning. *Annual Review of Sex Research*, *1*, 119—161.

Cuthbert, C. M. (2005). Dimensional models of psychopathology: research agenda and clinical utility. *Journal of Abnormal Psychology*, *114*, 565—569.

Cyranowski, J. M., Bromberger, J., Youk, A., Matthews, K., Kravitz, D. O., & Powell, L. H. (2004). Lifetime depression history and sexual function in women at midlife. *Archives of Sexual Behavior*, *33*, 539—548.

Cyranowski, J. M., Frank, E., Cherry, C., Houck, P., & Kupfer, D. J. (2004). Prospective assessment of sexual function in women treated for recurrent major depression. *Journal of Psychiatric Research*, *38*, 267—273.

Derogatis, L. R., Meyer, J. K., & King, K. M. (1981). Psychopathology in individuals with sexual dysfunction. *American Journal of Psychiatry*, *138*, 757—763.

Donahey, K. M., & Carroll, R. A. (1993). Gender differences in factors associated with hypoactive sexual desire. *Journal of Sex and Marital Therapy*, *19*, 25—40.

Dunn, K. M., Croft, P. R., & Hackett, G. I. (1999). Association of sexual problems with social, psychological, and physical problems in men and women: A cross sectional population survey. *Journal of Epidemiology and Community Health*, *53*, 144—148.

Elliott, A. N., & O'Donohue, W. T. (1997). The effects of anxiety and distraction on sexual arousal in a nonclinical sample of heterosexual women. *Archives of Sexual Behavior*, *26*, 607—624.

Escobar, J. I., Gomez, J., & Tuason, V. B. (1983). Depressive phenomenology in North and South American patients. *American Journal of Psychiatry*, *140*, 47—51.

Evren, C., Can, S., Evren, B., Saatcioglu, O., & Cakmak, D. (2006). Lifetime posttraumatic stress disorder in Turkish alcohol-dependent inpatients: Relationship with depression, anxiety and erectile dysfunction. *Psychiatry and Clinical Neurosciences*, *60*, 77—84.

Faravelli, C., Giugni, A., Salvatori, S., & Ricca, V. (2004). Psychopathology after rape. *American Journal of Psychiatry*, *161*, 1483—1485.

Ferguson, J. M. (2001). The effects of antidepressants on sexual functioning in depressed patients: A review. *Journal of Clinical Psychiatry*, *62*, 22—34.

Figueira, I., Possidente, E., Marques, C., & Hayes, K. (2001). Sexual dysfunction: A neglected complication of panic disorder and social phobia. *Archives of Sexual Behavior*, *30*, 369—377.

Firestone, R. W., Firestone, L. A., & Catlett, J. (2006). *Sex and love in intimate relationships.* Washington, DC: American Psychological Association.

Frohlich, P., & Meston, C. M. (2002). Sexual functioning and self-reported depressive symptoms among college women. *Journal of Sex Research*, *39*, 321—325.

Fruend, B., & Steketee, G. (1989). Sexual history, attitudes and functioning of obsessive–compulsive patients. *Journal of Sex and Marital Therapy*, *15*, 31—41.

Graziottin, A. (1998). The biological basis of female sexuality. *International Clinical Psychopharmacology*, *13*, S15—S22.

Hale, V. E., & Strassberg, D. S. (1990). The role of anxiety on sexual arousal. *Archives of Sexual Behavior*, *19*, 569—581.

Hammen, C. (2003). Interpersonal stress and depression in women. *Journal of Affective Disorders*, *74*, 49—57.

Hartmann, U., Heiser, K., Ruffer-Hesse, C., & Kloth, G. (2002). Female sexual desire disorders: subtypes, classification, personality factors and new directions for treatment. *World Journal of Urology*, *20*, 79—88.

Howell, J. R., Reynolds, C. F., Thase, M. E., Frank, E., Jennings, J. R., Houck, P. R., et al. (1987). Assessment of sexual function, interest and activity in depressed men. *Journal of Affective Disorders*, *13*, 61—66.

Hurlbert, D. F., Fertel, E. R., Singh, D., Fernandez, F., Menendez, D. A., & Salgado, C. (2005). The role of sexual functioning in the sexual desire adjustment and psychosocial adaptation of women with hypoactive sexual desire. *Canadian Journal of Human Sexuality*, *14*, 15—30.

Johnson, S. D., Phelps, D. L., & Cottler, L. B. (2004). The association of sexual dysfunction and substance use among a community epidemiological sample. *Archives of Sexual Behavior*, *33*, 55—63.

Kaplan, H. S. (1988). Anxiety and sexual dysfunction. *Journal of Clinical Psychiatry*, *49*, 21—25.

Kaplan, H. S. (1995). The sexual desire disorders: Dysfunctional regulation of sexual motivation. Levittown, PA: Brunner/Mazel.

Katz, R. C., & Jardine, D. (1999). The relationship between worry, sexual aversion, and low sexual desire. *Journal of Sex & Marital Therapy*, *25*, 293—296.

Kaya, B., Unal, S., Ozenli, Y., Gursoy, N., Tekiner, S., & Kafkasli, A. (2006). anxiety, depression and sexual dysfunction in women with chronic pelvic pain. *Sexual and Relationship Therapy*, *21*, 187—196.

Kennedy, S. H., Dickens, S. E., Eisfeld, B. S., & Bagby, R. M. (1999). Sexual dysfunction before antidepressant therapy in major depression. *Journal of affective disorders*, *56*, 201—208.

Kennedy, S. H., Fulton, K. A., Bagby, R. M., Greene, A. L., Cohen, N. L., & Rafi-Tari, S. (2006). Sexual function during bupropion or paroxetine treatment of major depressive disorder. *Canadian Journal of Psychiatry*, *51*, 234—242.

Kennedy, S. H., Ralevski, E., Dickens, S., & Bagby, R. M. (1998). *Distinct areas of sexual dysfunction in men and women with major depression.* Halifax: Canadian Psychiatric Association.

Kotler, M., Cohen, H., Aizenberg, D., Matar, M., Loewenthal, U., Kaplan, Z., et al. (2000). Sexual dysfunction in male posttraumatic stress disorder patients. *Psychotherapy and Psychosomatics*, *69*, 309—315.

Krueger, R. F. (1999). The structure of common mental disorders. *Archives of General Psychiatry*, *56*, 921—926.

Krueger, R. F., Caspi, A., Moffitt, T. E., & Silva, P. A. (1998). The structure and stability of common mental disorders (DSM-III-R): A longitudinal-epidemiological study. *Journal of Abnormal Psychology*, *107*, 216—227.

Krueger, R. F., Chentsova-Dutton, Y. E., Markon, K. F., Goldberg, D., & Ormel, J. (2003). A cross-cultural study of the structure of comorbidity among common psychopathological syndromes in the general health care setting. *Journal of Abnormal Psychology*, *112*, 437—447.

Krueger, R. F., & Markon, K. E. (2006). Reinterpreting comorbidity: A model-based approach to understanding and classifying psychopathology. *Annual Review of Clinical Psychology*, *2*, 111—133.

Krueger, R. F., Markon, K. E., Patrick, C. J., & Iacono, W. G. (2005). Externalizing psychopathology in adulthood: A dimensional-spectrum conceptualization and its implications for DSM-V. *Journal of Abnormal Psychology*, *114*, 537—550.

Kuffel, S. W., & Heiman, J. R. (2006). Effects of depressive symptoms and experimentally adopted schemas on sexual arousal and affect in sexually healthy women. *Archives of Sexual Behavior*, *35*, 163—177.

Laumann, E. O., Paik, A., Glasser, D. B., Kang, J. H., Wang, T., Levinson, B., et al. (2006). A cross-national study of subjective sexual well-being among older women and men: Findings from the global study of sexual attitudes and behaviors. *Archives of Sexual Behavior*, *35*, 145—161.

Laumann, E. O., Paik, A., & Rosen, R. C. (1999). Sexual function in the United States: Prevalence and predictors. *Journal of the American Medical Association*, *281*, 537—544.

Leiblum, S. R., & Rosen, R. C. (Eds.). (2000). *Principles and practice of sex therapy* (3rd ed.). New York: The Guilford Press.

Leonard, L. M., & Follette, V. M. (2002). Sexual functioning in women reporting a history of child sexual abuse: Review of the empirical literature and clinical implications. *Annual Review of Sex Research*, *13*, 346—388.

Letourneau, E. J., Schewe, P. A., & Frueh, B. C. (1997). Preliminary evaluation of sexual problems in combat veterans with PTSD. *Journal of Traumatic Stress*, *10*, 125—132.

Lief, H. I. (1986). Sex and depression. *Medical Aspects of Human Sexuality*, *20*, 38—53.

Low, W. Y., Khoo, E. M., Tan, H. M., Hew, F. L., & Teoh, S. H. (2006). Depression, hormonal status and erectile dysfunction in the aging male: Results from a community study in Malaysia. *Journal of Men's Health and Gender*, *3*, 263—270.

Lykins, A. D., Janssen, E., & Graham, C. A. (2006). The relationship between negative mood and sexuality in heterosexual college women and men. *Journal of Sex Research*, *2*, 136—143.

Marcus, S. M., Young, E. A., Kerber, K. B., Kornstein, S., Farabaugh, A. H., Mitchell, J., et al. (2005). Gender differences in depression: Findings from the STAR*D study. *Journal of Affective Disorders*, *87*, 141—150.

Margolese, H. C., & Assalian, P. (1996). Sexual side effects of antidepressants: a review. *Journal of Sex and Marital Therapy*, *22*, 209—217.

Masters, W. H., & Johnson, V. E. (1970). *Human sexual inadequacy*. Toronto: Bantam Books.

Meisler, A. W., & Carey, M. P. (1991). Depressed affect and male sexual arousal. *Archives of Sexual Behavior*, *20*, 541—554.

Mercan, S., Karamustafalioglu, O., Ayaydin, E. B., Akpinar, A., Goksan, B., Gonenli, S., et al. (2006). Sexual dysfunction in female patients with panic disorder alone or with accompanying depression. *International Journal of Psychiatry in Clinical Practice*, *10*, 235—240.

Meston, C. M., Rellini, A. H., & Heiman, J. R. (2006). Women's history of sexual abuse, their sexuality, and sexual self-schemas. *Journal of Consulting and Clinical Psychology*, *74*, 229—236.

Michael, A., & O'Keane, V. (2000). Sexual dysfunction in depression. *Human Psychopharmacology: Clinical and Experimental*, *15*, 337—345.

Mitchell, W. B., DiBartolo, P. M., Brown, T. A., & Barlow, D. H. (1998). *Archives of Sexual Behavior*, *27*, 197—207.

Montgomery, S. A. (2006). Major depressive disorders: Clinical efficacy and tolerability of agomelatine, a new melatonergic agonist. *European Neuropsychopharmacology*, *16*, 5633—5638.

Montgomery, S. A., Baldwin, D. S., & Riley, A. U. (2002). Antidepressant medications: A review of the evidence for drug-induced sexual dysfunction. *Journal of Affective Disorders*, *69*, 119—140.

Nicolosi, A., Moreira, Jr., E. D., Villa, M., & Glasser, D. (2004). A population study of the association between sexual function, sexual satisfaction and depressive symptoms in men. *Journal of Affective Disorders*, *82*, 235—243.

Norton, G. R., & Jehu, D. (1984). The role of anxiety in sexual dysfunctions: A review. *Archives of Sexual Behavior*, *13*, 165—183.

Okulate, G., Olayinka, O., & Dogunro, A. S. (2003). Erectile dysfunction: Prevalence and relationship to depression, alcohol abuse and panic disorder. *General Hospital Psychiatry*, *25*, 209—213.

Palace, E. M., & Gorzalka, B. B. (1990). The enhancing effects of anxiety on arousal in sexually dysfunctional and functional women. *Journal of Abnormal Psychology*, *99*, 403—411.

Pesce, V., Seidman, S. N., & Roose, S. P. (2002). Depression, antidepressants and sexual functioning in men. *Sexual and Relationship Therapy*, *17*, 281—287.

Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, *1*, 385—401.

Roesler, T. A., & McKenzie, N. (1994). Effects of childhood trauma on psychological functioning in adults sexually abused as children. *Journal of Nervous and Mental Disease*, *182*, 145—150.

Roose, S. P. (2003). Depression: Links with ischemic heart disease and erectile dysfunction. *Sexual and Relationship Therapy*, *17*, 281—287.

Rosen, R. C., & Marin, H. (2003). Prevalence of antidepressant-associated erectile dysfunction. *Journal of Clinical Psychiatry*, *64*, 5—10.

Rust, J., & Golombok, S. (1986). *The Golombok-Rust Inventory of Sexual Satisfaction*. Odessa, FL: Psychological Assessment Resources.

Saks, B. R. (1999). Identifying and discussing sexual dysfunction. *Journal of Clinical Psychiatry Monograph Series*, *17*, 4—8.

Sbrocco, T., Weisberg, R. B., Barlow, D. H., & Carter, M. M. (1997). *The conceptual relationship between panic disorder and male erectile dysfunction.*

Schreiner-Engel, P., & Schiavi, R. C. (1986). Lifetime psychopathology in individuals with low sexual desire. *Journal of Nervous and Mental Disease*, *174*, 646—651. *Journal of Sex and Marital Therapy*, *23*, 212-220.

Seidman, S. N. (2002). Exploring the relationship between depression and erectile dysfunction in aging men. *Journal of Clinical Psychiatry*, *63*, 5—12.

Seto, M. C. (1992). A review of anxiety and sexual arousal in human sexual dysfunction. *Annals of Sex Research*, *5*, 33—43.

Shabsigh, R., Klein, L. T., Seidman, S., Kaplan, S. A., Lehrhoff, B. J., & Ritter, J. S. (1998). Increased incidence of depressive symptoms in men with erectile dysfunction. *Urology*, *52*, 848—852.

Solursh, L. P., & Solursh, D. S. (1994). Male erectile disorders in Vietnam combat veterans with chronic post-traumatic stress disorder. *International Journal of Adolescent Medicine and Health*, *7*, 119—124.

Spielberger, C. D., Gorsuch, R. C., & Lushene, R. E. (1970). *Manual for the State Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press.

Steer, R. A., Beck, A. T., Riskind, J. H., & Brown, G. (1986). Differentiation of depressive disorders from generalized anxiety by the beck depression inventory. *Journal of Clinical Psychology*, *42*, 475—478.

Strand, J., Wise, T. N., Fagan, P. J., & Schmidt, C. W., Jr. (2002). Erectile dysfunction and depression: Category or dimension? *Journal of Sex and Marital Therapy*, *28*, 175—181.

Sugimori, H., Yoshida, K., Tanaka, T., Baba, K., Nishida, T., Nakazawa, R., et al. (2005). Relationships between Erectile Dysfunction, Depression, and Anxiety in Japanese Subjects. *Journal of Sexual Medicine*, *2*, 390—396.

Thase, M. E., Reynolds, C. F., Glanz, L. M., Jennings, J. R., Sewitch, D. E., Kupfer, D. J., et al. (1987). Nocturnal penile tumescence in depressed men. *American Journal of Psychiatry*, *144*, 89—92.

Thase, M. E., Reynolds, C. F., Jennings, J. R., Berman, S. R., Houck, P. R., Howell, J. R., et al. (1988). Diagnostic performance of nocturnal penile tumescence studies in healthy, dysfunctional (impotent), and depressed men. *Psychiatry Research*, *26*, 79—87.

Thase, M. E., Reynolds, C. F., Jennings, J. R., Frank, E., Garamoni, G. L., Nofzinger, E. A., et al. (1992). Diminished nocturnal penile tumescence in depression: A replication study. *Biological Psychiatry*, *31*, 1136—1142.

Thase, M. E., Reynolds, C. F., Jennings, J. R., Frank, E., Howell, J. R., Houck, P. R., et al. (1988). Nocturnal penile tumescence is diminished in depressed men. *Biological Psychiatry*, *24*, 33—46.

Tignol, J., Martin-Guehl, C., Aouizerate, B., Grabot, Denis, & Auriacombe, M. (2006). Social phobia and premature ejaculation: A case-control study. *Depression and Anxiety*, *23*, 153—157.

Tolman, D. L., & Diamond, L. M. (2001). Desegregating sexuality research: Cultural and biological perspectives on gender and desire. *Annual Review of Sex Research*, *12*, 33—74.

Turkistani, I. Y. A. (2004). Sexual dysfunction in Saudi depressed male patients. *International Journal of Psychiatry in Clinical Practice*, *8*, 101—107.

van Berlow, W., & Ensink, B. (2000). Problems with sexuality after sexual assault. *Annual Review of Sex Research*, *11*, 235—257.

van Minnen, A., & Kampmen, M. (2000). The interaction between anxiety and sexual functioning: A controlled study of sexual functioning in women with anxiety disorders. *Sexual and Relationship Therapy*, *15*, 47—57.

Vulink, N. C., Denys, D., Bus, L., & Westenberg, H. G. (2006). Sexual pleasure in women with obsessive–compulsive disorder? *Journal of Affective Disorders*, *91*, 19—25.

Watson, D., Weber, K., Assenheimer, J. S., Clark, L. A., Strauss, M. E., & McCormick, R. A. (1995). Testing a tripartite model: I. Evaluating the convergent and discriminant validity of anxiety and depression symptom scales. *Journal of Abnormal Psychology*, *104*, 2—14.

Weiner, D. N., & Rosen, R. C. (1999). Sexual dysfunctions and disorders. In T. Millon, P. H. Blaney, & R. D. Davis (Eds.), *Oxford textbook of psychopathology* (pp. 410—443). New York: Oxford University Press.

Werneke, U., Northey, S., & Bhugra, D. (2006). Antidepressants and sexual dysfunction. *Acta Psychiatrica Scandinavica*, *114*, 384—397.

Widiger, A. W., & Samuel, D. B. (2005). Diagnostic categories or dimensions? A question for the diagnostic and statistical manual of mental disorders–Fifth edition. *Journal of Abnormal Psychology*, *114*, 494—504.

Widiger, T. A., & Trull, T. J. (2007). Plate tectonics in the classification of personality disorder: shifting to a dimensional model. *American Psychologist*, *62*, 71—83.

Wincze, J. P., & Carey, M. P. (2001). *Sexual dysfunction: A guide for assessment and treatment* (2nd ed.). New York: The Guilford Press.