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# The Impact of Body Awareness on Sexual Arousal in Women with Sexual Dysfunction

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## Abstract

**Introduction—**The impact of self-awareness during sexual activity has been widely discussed. However, research has been largely focused on the effects of performance anxiety in male erectile functioning. It has been suggested that physical appearance concerns may have a similar influence on sexual function in women as does men's self-awareness about erectile function. However, the role that physical appearance or awareness of one's body may play in female sexual response has received little empiric attention.

**Aim—**To examine the effects of body awareness and self-report levels of body esteem on sexual response in 21 sexually dysfunctional women.

**Methods—**Body awareness was induced in one of two counterbalanced sessions. A full-length mirror was placed in front of participants throughout the experimental session, and participants were instructed to use the mirror to place 10 electrodes on each side of their bodies to prepare for a possible electrocardiogram. This methodology was used to ensure that women looked at themselves in the mirror and became more aware of their bodies during the experimental session.

**Main Outcome Measures—**Self-reported mental arousal, perceptions of physical arousal, physiological sexual arousal, affect, anxiety, and cognitive distraction responses to erotica.

**Results—**Results showed that subjective mental sexual arousal and perceptions of physical sexual arousal increased in response to erotica in the Body Awareness condition compared to in the No Body Awareness condition. These results were not accounted for by level of body esteem. There were no changes in physiological sexual arousal, affect, anxiety, or level of cognitive distraction across the two conditions.

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**Conclusions—**Findings suggest that awareness of one's body is related to increased subjective sexual response in conditions where cognitive distraction does not occur. It is particularly noteworthy that the current sample was made up of sexually dysfunctional women, all of whom had relatively low body image.

### Keywords

Sexual Function; Self-Awareness; Spectatoring; Vaginal Photoplethysmograph; Cognitive Interference; Body Image

## Introduction

The impact of self-focus during sexual activity has been widely discussed in the literature since the introduction of *spectatoring* by Masters and Johnson [1], which refers to inspecting, monitoring, and evaluating oneself during sexual activity. Masters and Johnson speculated that focusing one's attention outward, as is characteristic of spectatoring, rather than inward on pleasurable sensations, increases performance fears and subsequently impairs sexual functioning. Barlow's model of sexual functioning suggests that spectatoring interrupts sexual performance through cognitive interference, with the mind being directed toward oneself and sexual performance rather than on sensory aspects of the sexual experience [2]. This model originally focused on the effects of performance anxiety in male erectile functioning, but has since been adapted to female sexual functioning [3] based on research showing that female sexual functioning can also be impaired by cognitive distractions of both sexual [4] and nonsexual natures [5,6]. It has recently been suggested that physical appearance concerns in particular may have a similar negative influence on sexual function in women as do men's concerns about erectile function [3,7]. Although Barlow's model [2] did not specifically delineate the type of distraction, it is reasonable to assume, based on literature linking body image and sexuality, that body image concerns play a role. However, the role that physical appearance or awareness of one's body may play in female sexual response and dysfunction has received little empiric attention.

Several correlational studies have revealed negative relationships between general body image variables and a number of sexuality variables (e.g., sexual esteem, sexual experience, sexual satisfaction) among young undergraduate women [8–11] and among women from middle to late adulthood [12–14]. Changes in the appearance of one's body have also been linked to changes in sexual response. For instance, female patients who have undergone treatments involving body-altering surgeries (e.g., for cancer) show decreased sexual arousal and interest following surgery [15–17], and women who have undergone psychological treatments for eating disorders that include body-altering components (e.g., weight loss) show enhanced sexual responses following treatment [18,19].

There have been only a few experimental investigations examining self-awareness and sexual response in women. In an investigation of sexually functional and dysfunctional women, Meston [20] found that implicitly inducing self-focused attention by having women view an erotic video on a television with a 50% reflective screen impaired vaginal arousal in response to erotic films in sexually functional women only. There was no impact of self-focused attention on subjective arousal in response to the films for either sexually functional or dysfunctional women. However, with the television screen having been focused on the face only, the author speculated that it may be awareness of one's body, rather than the face, that is important for subjective aspects of female sexual functioning. Laan et al. [21] found that performance demand, induced by instructing women to attain and maintain maximum sexual arousal possible within 2 minutes, enhanced genital and subjective sexual arousal among sexually functional, undergraduate women. In an earlier, but related study, Korff and

Geer [22] found that women who were instructed to attend to body or genital cues during sexual stimuli had higher correlations between subjective and physiological sexual arousal than control women. Whether the increases in arousal noted in these latter two studies were the result of increased overall self-awareness or of attention directed specifically toward bodily or genital sensations is unknown. Regardless, findings from this group of investigations suggest that focusing on oneself, or aspects of oneself, during sexual arousal may not necessarily be detrimental to sexual response. In fact, as noted by Trapnell et al. [10] research on sensate focus, in which one is directed to focus on and enjoy one's own pleasurable sensations [1], suggests that in some cases, self-awareness can benefit sexual responding. For example, the use of sensate focus in treatment of women with female orgasmic dysfunction (FOD) and/or female sexual arousal disorder (FSAD) was found to result in the percentage of women who experienced FOD and FSAD dropping from 66.7% and 33.3% pretreatment to 11.1% and 14.8%, respectively, posttreatment [23].

That spectatoring and sensate focus each involves self-awareness yet theoretically affects sexual functioning in opposite directions suggests that it may be the valence of self-focused attention, as opposed to the presence or absence of self-awareness, that impacts sexual functioning [24]. In other words, it may be both *where* one's attention is directed and how one evaluates the content upon which one's attention is directed that are important, with attention directed upon erotic sensations and pleasurable thoughts and feelings helping, and attention directed away from erotic thoughts or toward negative thoughts impairing sexual functioning. One mechanism by which self-awareness may impact sexual functioning is through the distracting effects of low body image.

The current study directly examined the impact of attending to one's body during a sexual scenario on the sexual response of sexually dysfunctional women. The following predictions were made: (i) Based on Barlow's model of sexual dysfunction and on literature suggesting that spectatoring causes distraction and is harmful to sexual functioning, we predicted that if inducing body awareness distracted women from attending to erotic cues, sexual arousal responses would be decreased. Moreover, if distraction did occur, we would investigate the extent to which it occurred via level of body esteem. (ii) Based on literature suggesting that sensate focus can enhance sexual arousal, we predicted that if inducing body awareness did not result in distraction from erotic cues, body awareness would have either no effect or a positive effect on sexual arousal responses. (iii) Based on research showing negative relationships between body image and sexuality variables, we predicted that self-reports of sexual functioning, as assessed by a validated questionnaire, would be inversely related to body esteem scores.

## Method

### Participants

Sexually dysfunctional women were recruited from newspaper advertisements posted in a large Southwestern U.S. city. All women were interviewed on the phone by a trained doctoral clinical psychology graduate student to determine whether they met the criteria for a Diagnostic and Statistical Manual of Mental Disorders-IV-Text Revision (DSM-IV-TR) [25] sexual disorder, including hypoactive sexual desire disorder (HSDD), FSAD, FOD, dyspareunia, and vaginismus, and whether they met DSM-IV-TR for another Axis I disorder. Based on suggestions from Basson et al. [26], we expanded the DSM-IV-TR definition of FSAD to include subjective sexual arousal disorder and combined genital and subjective sexual arousal disorder (for a review of the classifications of sexual dysfunctions, see Hatzimouratidis and Hatzichristou [27]). Women were first asked whether they were currently experiencing any sexual difficulties and, if so, to describe what they were and whether they were distressed by them. A series of structured questions following DSM-IV-

TR criteria for each sexual dysfunction was then asked (e.g., “Do you experience a persistent or recurrent lack of sexual fantasies and/or desires?”). Participants were excluded from participation if they were under the age of 18 or over the age of 70, if they did not experience sexual dysfunction, and if they were taking any medications known to affect sexual functioning, including antidepressant medications.

Thirty-one women met the criteria for the sexually dysfunctional group. Ten women did not participate for the following reasons: two expressed that the study was too much of a time commitment, one stated she was not comfortable with the procedures, and seven did not show up for their scheduled sessions. The final sample consisted of 21 women. Participants ranged in age from 18 to 47 years old (mean = 24.43, SD = 7.12), and averaged 14.43 years of education (i.e., 2–3 years postsecondary education). The sample was composed of 15 women identifying as white (71.4 %), two Asians (9.5%), one black (4.8%), and three Hispanics (14.3%). Nineteen (90.5%) of the women were sexually active. One woman did not return for her second (control) session, and subjective arousal data in response to the audiotape because she did not complete her first (control) session. Data for one participant was eliminated from psychophysiological data analysis because of technical difficulties during psychophysiological testing that rendered the data unreliable. The final sample size was two women who experienced FSAD only (1 combined, 1 genital), three women who experienced HSDD only, 12 women who experienced both HSDD and FSAD (6 combined, 5 genital, 1 subjective), one woman who met the criteria for FOD only, and three women who met the criteria for HSDD and FOD. The latter four women all expressed distressing difficulties with arousal in addition to their other concerns (1 combined, 2 genital, 1 subjective).

## Procedures

Women who responded to the advertisements were told that the purpose of the study was to investigate the effects of erotica on women’s sexual arousal, and were informed of the study procedures. Those who met the criteria and chose to participate took part in two sessions for a total of 2 hours at the Female Sexual Psychophysiology Laboratory at the university. This laboratory consists of a computer/psychophysiological equipment room in which the experimenter is located during assessment, and an adjoining, private, internally locked participant room. An intercom system between the participant and experimenter rooms allows for communication with participants at all times. A cassette player was positioned in the participant room next to the participant at a distance that allowed the woman to sit comfortably in a recliner and hear the content of the cassette clearly.

During the first session, each participant signed the informed consent document and was given a chance to ask any questions. They were then left alone in privacy in the participant room, and completed a battery of questionnaires including the Female Sexual Function Index (FSFI) [28] and the Body Esteem Scale (BES) [29].

Following completion of the questionnaires, participants engaged in one of two counterbalanced experimental conditions: Body Awareness and No Body Awareness. During the No Body Awareness condition, participants were asked to take off their clothes, insert the vaginal photoplethysmograph, and to sit in the recliner. Depth and orientation of the probe insertion were standardized between women using a device developed by the Instrumentation Department of the Academic Medical Hospital in Amsterdam. This device is a 9 × 2-cm rubber plate with a hole in the center that allows for the photoplethysmograph to be pulled through and fixed to the cable at a distance 5 cm from the center of the probe. Participants were instructed to insert the photoplethysmograph such that the device would touch their labia. To minimize potential movement artifacts, participants were asked to remain as still as possible when the photoplethysmograph was inserted throughout the

session. When participants notified the experimenter, via the intercom system, that they had finished inserting the photoplethysmograph, they completed a subjective sexual arousal rating scale. This was followed by a 5-minute relax period. After the relax period, participants listened to one of two 8-minute audiotape sequences that consisted of a nonsexual travel segment (3 minutes) and an erotic story segment (5 minutes). The erotic story segments were derived in our laboratory, made specifically for female listeners, and consisted of a man and a woman engaging in foreplay and intercourse. The erotic segments used in the audio sequences were matched on the number and type of sexual activities and were shown to be sexually arousing to women in a pilot study conducted in our laboratory. Participants were told to keep their eyes open while listening to the tape and to imagine themselves in the erotic story. A full-length mirror was positioned across the room from the participant, directly in front of the participant's chair, facing backward, away from the participant. Immediately after the erotic tape, participants filled out a second subjective sexual arousal rating scale.

The Body Awareness condition was identical to the No Body Awareness condition with the following exceptions. At the beginning of the session participants were told that an electrocardiogram (EKG) might be conducted, using the following statement: "The photoplethysmograph measures heart rate, but sometimes it does not measure heart rate very accurately. If this happens, we will do a heart rate measurement immediately at the end of the session, after you have removed the photoplethysmograph. In order to prepare for this, you'll be asked to place these 10 electrodes on your body according to this diagram, before you start listening to the audiotape. This is to ensure that we can get a heart rate measurement as quickly as possible after the tape is finished." Participants were asked to position five pairs of electrodes on their unclothed bodies, including on both sides of their upper chest, upper arms, lower stomach, upper thighs, and lower thighs according to a diagram depicting a female body, immediately before the 5-minute relaxation period. They were told to use the mirror to help ensure that the pairs of electrodes were placed evenly on each side of their bodies. They were told that they would receive further instruction at the end of the session, after they had removed the photoplethysmograph, if an EKG needed to be conducted. The full-length mirror, which has been shown to induce self-awareness [30], was turned to face the participant, allowing for a full self-view while seated in the reclining chair throughout the entire session. At the end of the session, they were told that the photoplethysmograph had measured heart rate accurately, so they could remove the electrodes as we would not be conducting an EKG.

The experimental conditions, Body Awareness and No Body Awareness, were counterbalanced across sessions, and the two audiotape sequences were counterbalanced across conditions. After completing both sessions, participants were thoroughly debriefed. They were first asked if they had any guesses about the purpose of the study. No participant expressed a hypothesis about the study purpose beyond what she had previously been told by the researcher. They were then informed about the true purposes and goals of the study, and paid $25 for their participation. Because the true focus of the study was not described to participants prior to taking part in the study, a second informed consent was obtained from the participants following the debriefing. All participants allowed the researcher to use their data. All procedures were approved by the University Institutional Review Board.

### Manipulation Check

At the end of the study, all participants were asked if they had looked at themselves in the mirror while listening to the audiotape during the Body Awareness condition.

### Measures and Data Reduction—Assessment of Sexual Function

**FSFI—**The FSFI is a 19-item self-report measure of female sexual function that provides scores on six domains of sexual function as well as a total score [28]. The domains assessed have been confirmed using factor analyses and include desire (two items), arousal (four items), lubrication (four items), orgasm (three items), satisfaction (three items), and pain (three items). The FSFI was developed on a female sample of 131 controls (age range 21–68) and 128 age-matched subjects (age range 21–69) who met the DSM-IV criteria for FSAD. The FSFI has been shown to reliably discriminate FSAD and control patients on each of the six domains of sexual function as well as the Full Scale score [28], and to reliably discriminate between sexually functional women and women with FOD and/or HSDD [31] and women with FSAD [28]. Cronbach's alpha levels of internal consistency range between 0.82 and 0.98 [32], and test-retest reliabilities using a 4-week interval range between $r = 0.79$ and 0.86 [28].

### Measures and Data Reduction—Assessment of Trait Characteristics

**BES—**The BES [29] is a 35-item, three-factor, self-report measure of body esteem. Participants are asked to rate how they feel about a variety of parts and functions of their own bodies on a scale of 1–5, where 1 is "I have strong negative feelings" and 5 is "I have strong positive feelings." A principal component factor analysis using oblique rotation indicates three factors for women's body esteem, including sexual attractiveness, weight concern, and physical condition [29]. The sexual attractiveness subscale includes items or functions of the body that are associated with physical attractiveness and that cannot be changed through exercise (e.g., "body scent, sex organs, face"). The weight concern subscale includes physical appearance of body parts that can be altered through exercise (e.g., "appearance of stomach, thighs, weight"). The physical condition subscale includes qualities that are generally not under public scrutiny (e.g., "physical stamina, energy level, physical coordination"). For all three subscales, higher scores indicate higher body esteem. The BES has been shown to have acceptable levels of internal consistency (Cronbach's alpha = 0.78 for the attractiveness factor, 0.87 for the weight concern factor, and 0.82 for the physical condition factor), and high test-retest reliability ($r = 0.81$ for the attractiveness factor, 0.87 for the weight concern, and 0.75 for the physical condition) over a 3-month period [33]. The weight concern subscale has been shown to reliably discriminate between anorexic females from nonanorexic females [29]. For the purpose of this study, we were also interested in generating an overall body esteem score and therefore calculated a BES total score by taking the mean of items in all three subscales [34].

### Measures and Data Reduction—Assessment of Sexual Responding

**Subjective Responses to the Erotic Audiotape—**A self-report rating scale, adapted from Heiman and Rowland [35], was used to assess subjective sexual arousal, autonomic arousal, affect, and anxiety in response to the audiotapes. Participants rated each item, depending on the degree to which they experience the sensation, on a 7-point Likert scale, from 1 = "not at all" to 7 = "intensely." Sub-scales included subjective perceptions of physical sexual arousal (five items: *warmth in genitals*, *genital wetness or lubrication*, *genital pulsing or throbbing*, *genital tenseness or tightness*, *physical sexual arousal*), subjective mental sexual arousal (five items: *sexually aroused*, *sexual desire*, *mental sexual arousal*, *easy to arouse*, and the reverse score of *sexually turned off*), autonomic arousal (five items: *fast breathing*, *fast heart beat*, *perspiration*, *feelings of warmth*, *any physical reaction at all*), positive affect (10 items: e.g., *sensuous*, *interested*, *loving*), negative affect (10 items: e.g., *inhibited*, *offended*, *bored*), and anxiety (one item: *anxious*).

**Physiological Sexual Responses to Erotica—**A vaginal photoplethysmograph [36] was used to measure vaginal pulse amplitude (VPA) responses. VPA was sampled at a rate of 60 samples per second throughout the entire 180 seconds of neutral audiotape segment and 300 seconds of erotic audiotape segment, band-pass filtered (0.5–30 Hz), and recorded on a Dell Pentium computer using the software program AcqKnowledge III, Version 3.2 (BIOPAC Systems, Inc., Santa Barbara, CA, USA) and a Model MP100WS data acquisition unit (BIOPAC Systems, Inc.) for analog/digital conversion. Data were analyzed in 10-second segments and then averaged over the neutral and erotic segments separately, resulting in one data point for neutral and one data point for erotic segments per subject per session. In accordance with previous studies of this nature [37,38], artifacts caused by movement or contractions of the pelvic muscles were deleted using the computer software program following visual inspection of the data. This method is considered a reliable method of artifact detection [39]. We replaced each 10-second epoch containing an artifact with the average VPA of the intervals immediately preceding and following. VPA scores were computed for both the nonsexual and erotic tape segments by averaging across the entire 3 minutes of the neutral and 5 minutes of the erotic audio-tape stimuli. In order to control for potential variations in baseline levels of VPA to the neutral tapes between sessions, difference scores were calculated by subtracting the mean of the nonsexual tape segment from the mean of the sexual tape segment within each experimental condition.

### Measures and Data Reduction—Cognitive Distraction

Immediately following the subjective self-report measures to the erotic audiotapes, participants were given 10 questions to assess their attention to the content of the audiotapes. Five items pertained to the neutral content (e.g., *What is another name for the Bay of Vladivostok?*) and five to the erotic content of the tapes (e.g., *What did he whisper into her ear as they entered her apartment?*). Each question had three multiple choice responses, from which participants were instructed to choose the best answer.

## Results

### Participant Characteristics

FSFI full scale scores were similar to those previously found among patients with FSAD [28]. Participants in the current study scored within one SD of the mean of FSAD patients and of patients with multiple sexual diagnoses for all subscale scores. Participants experienced body esteem scores within one SD below the mean for nonanorexic females for the sexual attractiveness and weight concern subscales, and within two SDs below the mean for the physical condition subscale (See Table 1).

### The Effects of Body Awareness on Sexual Arousal

**Subjective Sexual Arousal, Autonomic Arousal, Affect, and Anxiety—**We generated difference scores for each participant for subscales of subjective sexual response, autonomic arousal, affect, and anxiety by subtracting the subjective ratings at pretest from ratings given immediately following exposure to the erotic material (*erotic subjective score—pretest subjective score*). Women's self-reported mental sexual arousal to the erotic audiotapes significantly increased in both the No Body Awareness condition, $t(19) = 5.40$, $P < 0.001$, and the Body Awareness condition, $t(19) = 8.44$, $P < 0.001$, as did perception of physical sexual arousal, $t(19) = 5.07$, $P < 0.001$ (No Body Awareness), $t(19) = 5.04$, $P < 0.001$ (Body Awareness), autonomic arousal, $t(19) = 3.98$, $P = 0.001$ (No Body Awareness), $t(19) = 4.78$, $P < 0.001$ (Body Awareness), and positive affect, $t(19) = 3.08$, $P < 0.01$ (No Body Awareness), $t(19) = 5.80$, $P < 0.001$ (Body Awareness). There were significant decreases in negative affect in both the No Body Awareness, $t(19) = 2.32$, $P < 0.05$, and Body Awareness conditions, $t(19) = 3.18$, $P < 0.01$, and no changes in anxiety in either the

No Body Awareness, $t(19) = 0.33$, $P > 0.05$, or Body Awareness condition $t(19) = 1.23$, $P > 0.01$.

To compare scores across conditions, we then compared the mean difference scores for the No Body Awareness and Body Awareness conditions using *t*-tests. Results showed that self-reported mental sexual arousal, $t(18) = 2.23$, $P < 0.05$, perceptions of physical sexual arousal, $t(18) = 2.48$, $P < 0.05$, and autonomic arousal, $t(18) = 2.36$, $P < 0.05$, were all significantly higher in the Body Awareness condition than in the No Body Awareness condition. There were no differences in positive affect, $t(18) = 2.05$, $P > 0.05$, negative affect, $t(18) = -0.64$, $P > 0.05$, or anxiety $t(18) = -0.65$, $P > 0.05$ between the conditions (Table 2).

In addition to investigating anxiety difference scores, we investigated individual anxiety scores from immediately prior to and immediately following the erotica in both sessions in order to have a better understanding of women's general anxiety levels throughout the study. Results showed that mean levels ranged from 1.65 to 1.95 on the Likert scale from 1 to 7, indicating that women experienced no anxiety to low anxiety levels in both sessions of the study.

**Physiological Sexual Arousal—**Difference scores were obtained for each subject for the physiological response to the audiotapes (*erotic VPA score—pretest VPA score*). The difference scores for the No Body Awareness and Body Awareness conditions were compared using a *t*-test, and indicated that there was no difference in VPA difference scores between the conditions, $t(19) = 1.46$, $P > 0.05$.

**The Role of Body Esteem in Sexual Response to Erotica—**To investigate the possible role that level of body esteem played in the relationships between condition and sexual response to erotica, we conducted exploratory analyses by grouping women according to their average response on the BES. Women who had an average response less than 3, indicating negative feelings for one's body, were labeled Low Body Esteem (N = 11, mean = 2.7), while women who had an average response of 3 or above, indicating neutral to high feelings for one's body, were labeled Average Body Esteem (N = 10, mean = 3.3). Comparing groups on measures of physiological and subjective arousal responses to erotic audiotapes revealed no significant differences, indicating that both Low and Average BES women responded equally in both the Body Awareness and the No Body Awareness conditions.

## The Effects of Body Awareness on Cognitive Distraction

Each participant received a score out of 10 points for how many questions from the distraction task they received correct. The mean numbers of correct responses in the two conditions were then compared using a *t*-test, which revealed no difference in cognitive distraction, $t(16) = -0.08$, $P > 0.05$, between the Body Awareness and No Body Awareness conditions (see Table 2).

## Manipulation Check

All but one participant reported that they had looked at themselves in the mirror throughout the session.

## The Relationships Between BES and FSFI Scores

We limited our analyses of FSFI score to women who reported being currently sexually active, thereby excluding two women from this analysis. Pearson's product moment correlation coefficients were conducted to investigate the relationships between body esteem

and sexual functioning. Results revealed significant positive relationships between the sexual attractiveness subscale of the BES and FSFI total score, $r(19) = 0.62$, $P < 0.01$, sexual arousal, $r(19) = 0.67$, $P < 0.01$, orgasm, $r(19) = 0.44$, $P = 0.05$, and satisfaction $r(19) = 0.51$, $P < 0.05$. There was also a trend such that the BES sexual attractiveness was positively related to FSFI lubrication, $r(19) = 0.43$, $P = 0.07$. The weight concern subscale of the BES was positively related to the FSFI total score, $r(19) < 0.50$, $P = 0.05$ and to lubrication, $r(19) = 0.47$, $P < 0.05$, and marginally related to arousal, $r(19) = 0.44$, $P = 0.06$. BES total score was significantly positively correlated with the FSFI total score, $r(19) = 0.53$, $P < 0.05$, arousal, $r(19) = 0.56$, $P < 0.01$, and orgasm, $r(19) = 0.48$, $P < 0.05$ (see Table 3).

## Discussion

This study examined the effects of increased body awareness on subjective and physiological sexual responses to erotica. According to Barlow's model of sexual functioning [2], and based on literature showing that spectatoring causes distraction, it was predicted that if body awareness was distracting, it would impair women's sexual responses. Based on literature showing that, in some cases, self-awareness induced through sensate focus can enhance sexual response, it was predicted that if body awareness was not distracting, there would be either no change or an increase in women's sexual responses. Results showed that cognitive distraction did not occur, and that subjective mental sexual arousal and perceptions of physical sexual arousal increased in response to erotica in the Body Awareness condition. Results showing no change in cognitive distraction in the Body Awareness condition are particularly interesting, given that this group of women had relatively low body esteem scores. It may be that in the absence of a partner, women with sexual dysfunction do not fall into a state of anxious apprehension that they typically experience in sexual situations, and are not likely to experience the characteristics of narrowed attentional focus to nonerotic thoughts, including self-consciousness about one's body [3]. This is consistent with findings of no difference in anxiety across the two conditions. It would be valuable to extend this research by comparing the effects of performance-related focus and appearance-related focus on sexual response in sexually dysfunctional women with their partners present to better determine the effects of focusing on one's appearance in real-life sexual situations.

There are several possible explanations for the finding of enhanced sexual response in the Body Awareness condition. It may be that these women, who self-report being sexually dysfunctional and who have relatively low body esteem scores, tend to avoid viewing themselves as being sexual. This would be consistent with Masters and Johnson's concept of spectatoring, during which women focus on themselves from a third-person perspective [1], resulting in decreased participation in the sexual situation. Although speculative, it may be that having to look at themselves being sexual, as in the current study, women enhanced their level of sexual arousal by enhancing their participation in or their image of themselves as an actor in the erotic scenario. Unfortunately, we did not assess this. However, if these findings are replicated, and if women acknowledged that their increase in arousal was related to an enhanced self-view as a participant in an erotic situation, then findings could have treatment implications. For instance, similar to moving through a hierarchy of anxiety-provoking stimuli in systematic desensitization, women could practice pairing their naked bodies with the idea of being erotic in a laboratory setting, and gradually move to involving a partner in real-life settings.

Findings may also be related to the additional visual component of the Body Awareness condition, in which seeing one's naked body enhanced subjective sexual response in a general way synonymous to viewing sexually explicit scenes which promote sexual arousal.

Consistent with Masters and Johnson's literature on sensate focus [1], in which focusing on bodily sensations enhances sexual arousal, it may also be that women in the current study focused on their bodily sensations more during the Body Awareness condition. Unfortunately, we did not measure whether or not women were actually attending to bodily sensations in the current study.

Regarding physiological sexual arousal, there was no significant difference in VPA change scores between neutral and erotic segments across conditions. While women perceived an increase in arousal in a condition of greater body awareness (i.e., experienced increased subjective arousal), they did not experience a similar increase in physiological genital response. This is consistent with findings from Meston [20] and van Lankveld et al. [40] in which self-focused attention resulted in inconsistent subjective and physiological arousal responses in females and males, respectively. It is also consistent with findings from Beck et al. [41] in which dysfunctional men's subjective sexual responses in response to three levels of partner arousal in the self-focus condition were different from their physiological arousal responses to the three levels, and with findings from Rellini and Meston [42], in which self-report, but not physiological, measures of sexual arousal significantly predicted improvement in sexual dysfunction following treatment. It may be that, compared with cognitive arousal, genital arousal is a more immediate, primed response that is less sensitive to subtle cognitive changes such as those which occurred during the Body Awareness condition [21].

Consistent with the hypotheses, relationships between body esteem and sexual functioning, as assessed by validated questionnaires, showed that body esteem was positively related to sexual functioning, with the weight concern subscale, the sexual attractiveness subscale, and BES total scores being related to the overall FSFI scores. Among sexually dysfunctional women, the better one feels about her body parts that can be physically altered (e.g., thighs, appearance of stomach, weight) and about her physical features of appearance that cannot be changed easily through exercise (e.g., face, chest, breasts), the higher her overall sexual functioning. In addition, sexual attractiveness scores were positively related to the FSFI components of sexual arousal, lubrication, orgasm, and satisfaction, and weight concern scores were positively related to the FSFI components of arousal and lubrication. This is the first study to link different aspects of body esteem to sexual functioning among sexually dysfunctional women using validated measures.

While body esteem was related to self-reported sexual functioning scores, it was unrelated to subjective and physiological sexual arousal response in the laboratory setting, and could not explain the changes in subjective response across the two conditions. This may suggest that general body esteem, as measured by questionnaires, has more of an impact on sexual functioning as measured over time in real-life situations, as the FSFI measures, as opposed to an acute sexual response to nonpartner-related stimuli, in which there is no obvious external evaluation present. On the other hand, analyses comparing women's responses to erotica based on their levels of body esteem were based on small groups only, thus lacking the power to potentially find group differences. Moreover, all the women in the current study had relatively low body esteem scores. It would be valuable to compare the impact of body awareness on sexual response across women with low vs. high body esteem scores.

Overall, findings from the current study suggest that awareness of one's body is related to increased sexual response among women diagnosed with sexual dysfunction, in conditions where cognitive distraction does not occur. Given the heterogeneity of sexual dysfunctions that women from the current sample experienced, including arousal, desire, and/or orgasm difficulties, conclusions cannot necessarily be made for specific dysfunctions. However, that all women experienced relatively low body image suggests that findings may apply to any

woman who experiences body image concerns that impact her sexuality, rather than to specific type of sexual dysfunction. Future research should aim to better understand the possible opposing roles of body awareness on sexual functioning in real-life settings.

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## Table 1

Participant characteristics

| | Mean (SD) |
|---|---|
| Age | 24.4 (7.1) |
| Female sexual function index | |
| Full scale score | 19.9 (5.7) |
| Desire* | 2.8 (1.1) |
| Arousal* | 3.1 (1.2) |
| Lubrication* | 3.6 (1.7) |
| Orgasm* | 2.9 (1.7) |
| Satisfaction* | 3.1 (1.3) |
| Pain (lack of)* | 4.4 (1.7) |
| Body esteem scale | |
| Sexual attractiveness subscale† | 42.3 (5.1) |
| Body esteem scale | |
| Weight concern subscale‡ | 26.5 (6.2) |
| Body esteem scale | |
| Physical attractiveness subscale§ | 26.0 (5.6) |

N = 19–21.

*Domain scores; items summed and multiplied by domain factor for each subscale.

†Possible range from 13 to 65, with higher indicating more esteem.

‡Possible range from 10 to 50, with higher indicating more esteem.

§Possible range from 8 to 40, with higher indicating more esteem.

## Table 2

Response to erotica by condition

| | No Body Awareness condition mean (SD) | Body Awareness condition mean (SD) |
|---|---|---|
| Subjective mental sexual arousal† | 5.63 (4.87) | 7.95 (4.03)* |
| Subjective perceptions of genital sexual arousal† | 5.05 (4.77) | 8.89 (7.70)* |
| Autonomic arousal† | 3.32 (4.11) | 5.37 (5.81)* |
| Positive affect† | 4.95 (7.31) | 8.42 (6.03) |
| Negative affect† | −2.00 (4.20) | −2.79 (4.24) |
| Anxiety† | −0.05 (0.71) | −0.37 (1.30) |
| Cognitive interference‡ | 7.53 (1.59) | 7.59 (2.09) |

*Significant difference between conditions at $P < 0.05$.

†Means are based on change scores from pretest to erotic/post-test.

‡Number of correct answers about content of audiotapes based on a range from 0 to 10.

**Table 3**

Correlations between body esteem and sexual functioning

| Subscale | BES Sexual | BES Weight | BES Physical | BES Total |
|---|---|---|---|---|
| FSFI total | 0.62** | 0.50* | 0.03 | 0.53* |
| Desire | 0.36 | 0.37 | 0.09 | 0.38 |
| Arousal | 0.67** | 0.44*** | −0.13 | 0.56** |
| Lubrication | 0.43*** | 0.47* | −0.10 | 0.37 |
| Orgasm | 0.44* | 0.26 | 0.38 | 0.48* |
| Satisfaction | 0.51* | 0.24 | −0.16 | 0.26 |
| Pain (lack of) | 0.11 | 0.24 | −0.23 | −0.07 |

* $P \leq 0.05$, two-tailed.

** $P \leq 0.01$, two-tailed.

*** $P \leq 0.10$.

N = 18–19.

FSFI = Female Sexual Function Index.

BES = Body Esteem Scale.