

Body Image in Dyadic and Solitary Sexual Desire: The Role of Encoding Style and Distracting Thoughts

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ABSTRACT

This study explored the link between body image and desire to engage in sexual activity (dyadic and solitary desire) in adult women living in a long-term couple relationship. Moreover, it considered two psychological factors that may underlie such a link: the occurrence of body-related distracting thoughts during sexual activity and encoding style (i.e., the tendency to rely on preexisting internal schemata versus external information at encoding). A total of 53 women (29 to 47 years old) in heterosexual relationships completed questionnaires assessing sexual desire (dyadic, solitary), body image, body-related distracting thoughts during sexual activity, and encoding style. Results showed that poor body image was associated with low dyadic and solitary sexual desire. Body-related distracting thoughts during sexual activity mediated the link between body image and solitary (but not dyadic) sexual desire. Finally, the mediation of body-related distracting thoughts between body image and solitary sexual desire was moderated by encoding style. A negative body image promoted the occurrence of body-related distracting thoughts during sexual activity, especially in internal encoders. Our study highlights the importance of body image, distracting thoughts, and encoding style in women's solitary sexuality and suggests possible factors that may reduce the impact of those body-related factors in dyadic sexual desire.

Although body image concerns are so widespread that they are considered “normative” among women (Silberstein, Striegel-Moore, Timko, & Rodin, 1988), their impact on sexual desire remains unclear. In particular, little is known about the mechanisms that may underlie this association. In the present study, we considered two cognitive factors—the occurrence of body-related distracting thoughts during sexual activity and encoding style (i.e., the tendency to rely on preexisting internal schemata versus external information at encoding)—in the relation between body satisfaction and the desire to have sexual activity (with a partner or alone) among women living in a long-term couple relationship.

Body image is a multifaceted construct referring to the subjective perception of and attitudes about one's own body and represents an important aspect of an individual's well-being (Cash & Pruzinsky, 2002). Indeed, a negative body-image evaluation (i.e., body dissatisfaction) has been associated with various psychosocial dysfunctions, such as disordered eating (for a review, see Littleton & Ollendick, 2003), depression (e.g., Stice, Hayward, Cameron, Killen, & Taylor, 2000), anxiety, and poor self-esteem

(e.g., Kostanski & Gullone, 1998). Without being a uniquely feminine prerogative, body dissatisfaction has been shown to be more widespread among women than among men (e.g., Davison & McCabe, 2005). Objectification theory (Fredrickson & Roberts, 1997) offers a framework for understanding why negative body-image evaluation is so frequent among women. According to this theory, women are socialized, from an early age, to value their physical appearance as a central determinant of their personal worth. Repeated exposure to the visual scrutiny of others reinforces the pressure that women experience to fit physical ideals and leads them to monitor their body and how they appear to others. Thus, women tend to adopt the observer's perspective on their bodies (i.e., body-image self-consciousness; Wiederman, 2000) and regard themselves as merely objects, or a collection of parts, intended to be viewed, desired, and used by others. In addition, because Western society promotes an unrealistic ideal female body (e.g., being very thin), women often perceive that they fail to meet the physical ideals, thus leading to body dissatisfaction (Murnen & Smolak, 2009; Wiederman & Sarin, 2014).

As physical intimacy implies the unveiling of one's own body, attention has been paid to the link between body image and sexuality. Across numerous studies, mostly based on college samples, a poor body image has been related to different aspects of sexuality, such as sexual avoidance (e.g., Faith & Schare, 1993; La Rocque & Cioe, 2011), difficulty in reaching orgasm (e.g., Koch, Mansfield, Thureau, & Carey, 2005), low sexual esteem (e.g., Wiederman & Hurst, 1998), and low sexual satisfaction (e.g., Holt & Lyness, 2007; Pujols, Meston, & Seal, 2010). These relationships have been suggested to exist above and beyond the effects of one's actual body size (e.g., Weaver & Byers, 2006). However, other studies failed to find such a link between body image and sexuality (e.g., Davison & McCabe, 2005). For instance, in a study based on women aged 39 to 56 years, no significant relationship was found between body image and sexual satisfaction, suggesting that, for midlife women, sexual satisfaction may be less related to body image (Koch et al., 2005). It has also been suggested that such inconsistency in the link between body image and sexuality might be related to the insensitivity of many body-image measures to assess evaluation toward specific body parts (e.g., Schick, Calabrese, Rima, & Zucker, 2010). Indeed, discontent with particular body parts may not always be related to overall body dissatisfaction (e.g., Cash & Henry, 1995).

Some studies explored more specifically the link between body image and sexual desire. Although there is still no consensus about its definition, desire can generally be defined as "an affectively charged cognitive event where an object or activity that is associated with pleasure or relief of discomfort is in focal attention" (Kavanagh, Andrade, & May, 2005, p. 4). According to these authors, desire involves highly elaborated cognition—in terms of verbal thoughts and elaborated images that may involve the five senses—about the desired object or activity that competes with other processing in working memory. Consistent with this general definition of desire being underlain by cognitive processes, sexual desire has been defined in terms of thoughts that motivate an individual to seek out or to be receptive to sexual activity (Spector, Carey, & Steinberg, 1996). These authors also distinguish between dyadic sexual desire (i.e., the desire to engage in sexual activity with a sexual partner) and solitary sexual desire (i.e., the desire to masturbate). Existing studies indicate that a poor body image may lead women, regardless of age, to be less likely to desire to engage in sexual activity with a partner (e.g., Koch et al., 2005; La Rocque & Cioe, 2010). For instance, Seal, Bradford, and Meston (2009) found that higher body satisfaction was related, in a sample of college women, to higher sexual desire in response to erotic stimuli in a laboratory setting and higher desire to engage in sexual activity in their general life, as assessed by self-reported questionnaires (evaluating dyadic sexual desire). To the best of our

knowledge, no study has investigated the relationship between body satisfaction and solitary sexual desire. However, Shulman and Horne (2003) explored the relation between masturbation and body image. They found that a negative body image was associated with low masturbation frequency among both young women and adult women. Interestingly, this relationship between negative body image and low masturbation frequency was found among European American but not African American women, suggesting that cultural norms may play an important role, in particular regarding women's self-pleasuring. As previous research has been limited to dyadic sexual desire, the first objective of the present study was to investigate the link between body image and the desire to engage in sexual activity by considering both dyadic and solitary sexual desire.

Although a poor body image was suggested to be related to lower sexual desire (at least dyadic), little is known about the mechanisms that may underlie this association. It has been suggested that a poor body image may negatively influence sexual functioning by increasing body self-consciousness during sexual activity, which refers to a cognitive absorption with concerns about how one's body appears to a sexual partner during physical intimacy (e.g., Claudat & Warren, 2014; Sanchez & Kiefer, 2007). Such cognitive absorption may decrease attention to internal states such as sexual arousal and physical pleasure, thus negatively influencing sexual functioning.

An influential model of sexual dysfunction, developed by Barlow (1986), suggests that both cognitive interference and anxiety may be responsible for sexual dysfunction. Indeed, Barlow argued that, in sexual contexts, sexually functional individuals have positive expectancies regarding their ability to perform sexually and evaluate sexual cues positively. They focus their attention on erotic cues, which will eventually lead them to perform functionally (i.e., being sexually aroused) and to have sexual approach behaviors. In contrast, sexually dysfunctional individuals, because of negative expectancies regarding their sexual performance, tend to evaluate sexual cues negatively. They become more focused on nonerotic issues (e.g., negative consequences of not performing well), which prevents the processing of sexual cues and impedes sexual functional performance and the experience of pleasure, eventually resulting in sexual avoidance behavior. More recently, it has been proposed that focusing on other nonerotic issues during sexual activity, such as negative body image, may also interfere with the quality of sexual experiences, in particular among women (Wiederman, 2001). Numerous laboratory studies have supported the role of attentional processes in sexuality and have shown associations between cognitive distractions and decreased sexual arousal, both in men and women (for a review, see de Jong, 2009). On the other hand, some questionnairebased studies have highlighted a negative relation between distracting thoughts and sexuality. In particular, cognitive distractions related to body concerns during sexual activities were associated, among women, with poorer sexual functioning and less sexual satisfaction (Purdon & Holdaway, 2006), as well as with low sexual esteem and difficulty reaching orgasm (Dove & Wiederman, 2000). Another study showed that body shame affected sexual arousal and that this link was mediated by greater sexual self-consciousness (i.e., cognitive preoccupation with the body in a sexual context; Sanchez & Kiefer, 2007). However, some studies failed to find links between body-related distracting thoughts during sexual activity and sexual functioning. For instance, Nobre and Pinto-Gouveia (2003) found that body-image-related thoughts were not associated with sexual dysfunction, although other cognitive distractions were (i.e., thoughts of being abused, thoughts of failure and disengagement, lack of erotic thoughts). It has been shown that participants in an exclusive relationship had significantly lower levels of body self-consciousness during sexual activity than did participants who were currently not in a relationship (e.g., Steer & Tiggemann,

2008; Wiederman, 2000), suggesting that women who are in a partnered relationship may become less concerned about their appearance during sexual activity by becoming more comfortable with body exposure with their partner over time.

Although Barlow's (1986) model was specifically developed to explain the functioning of sexual arousal, such a model may also account for individual variability in sexual desire. Indeed, according to the definition of desire provided by Kavanagh and colleagues (2005), one may desire to engage in sexual activity only if it is associated with some kind of pleasure. Thus, a lack of arousal during sexual activity (e.g., because of body-image concerns) may diminish the desire to have sexual activities in subsequent contexts. More precisely, it is conceivable that having a negative body image may lead a woman to experience negative affect and have negative expectancies regarding the sexual encounter, as it implies showing her naked body. During sexual activity, she may focus her attention on the negative consequences of showing her body to her partner, rather than on the erotic cues, which may eventually interfere with sexual arousal and pleasure. Moreover, such poor sexual functioning may reinforce initial negative expectancies and the association between sexuality and negative affect, which may eventually influence how the woman experiences sexuality in general, either with a partner or alone. Thus, body image and distracting thoughts during sexual activity not only may influence ongoing sexual arousal but may also influence the desire to engage in subsequent sexual activity (both alone and with a partner).

Interestingly, only a few studies have investigated the link between cognitive distraction during sexual activity and sexual desire. For example, Cash, Maikkula, and Yamamiya (2004) revealed that anxious self-focus on (and avoidance of exposing) one's body during sexual activity was negatively related to the frequency of sexual desire, sexual pleasure, arousal, and orgasm, on one hand, and positively related to poorer body satisfaction, on the other hand. Therefore, the present study aims to investigate whether body-related distracting thoughts during sexual activity underlie the link between body image and the desire to engage in sexual activity (both dyadic and solitary sexual desire).

In addition, it is conceivable that the link between poor body image and body-related distracting thoughts during sexual activity may be influenced by encoding style (Lewicki, 2005), a cognitive mechanism that permits one to convert stimuli from the outside world, which may be ambiguous, into meaningful events. According to Lewicki (2005), the encoding process implies taking into account information provided by both external stimuli and preexisting knowledge (i.e., internal interpretative schemata). However, individual differences exist for how internal schemata (versus external cues) affect encoding processes. Internal encoding style is characterized by a tendency to rely excessively on what is expected (i.e., internal schemata), which leads an individual to encode a situation quickly, though in an imperfect or incorrect way (e.g., thinking that people with dark eyes are dangerous may lead, in the absence of information regarding the level of danger, to encode behaviors of people with dark eyes in a way that is consistent with the preexisting schemata). Internal encoding style tends to reinforce the internal schemata through the process of "self-perpetuation" (Lewicki, 2005; Lewicki, Hill, & Czyzewska, 1992). Although both internal and external encoding styles have been shown to provide specific advantages (for a review, see Lewicki, 2005), a highly internal encoding style has been associated with psycho-pathological symptoms such as anxiety, depression, schizotypal traits, and obsessive-compulsive symptoms (e.g., Badoud, Billieux, Van der Linden, Eliez, & Debbané, 2013; Belayachi & Van der Linden, 2010; Billieux, D'Argembeau, Lewicki, & Van der Linden, 2009; Herndon, 2008). In particular,

relations between internal encoding style and the occurrence of psycho-pathological symptoms can be explained in terms of self-perpetuation of maladaptive schemata. In the context of sexuality, it is conceivable that highly internal encoders with a negative body image would tend to self-perpetuate their negative body-related internal schemata by interpreting external stimuli (e.g., their partner looking at them during the sexual encounter) as evidence that their body is unattractive. Therefore, the present study aimed to explore whether encoding style influences the link between body image and body-related distracting thoughts during sexual activity.

This study had three main objectives. First, we aimed to investigate the link between body image and the desire to engage in sexual activity by considering both dyadic and solitary sexual desire. We postulated that poor body image would be associated with both low dyadic and low solitary sexual desire. Second, we aimed to investigate whether the relation between body image and sexual desire (dyadic and solitary) is mediated by body-related distracting thoughts during sexual activity. Indeed, we posited that women with poor body image would experience more body-related distracting thoughts during sexual activity, which, in turn, would be related to lower desire to have sexual activity, both with a partner and alone. Third, we aimed to explore whether encoding style moderates the link between body image and body-related distracting thoughts during sexual activity. More precisely, we postulated that highly internal encoders with a negative body image would present more body-related distracting thoughts during sexual activity (and therefore lower sexual desire) than would external encoders.

Because women are consistently found to be more concerned with negative body image than men are (e.g., Meana & Nunnink, 2006), this study focused on women only. Moreover, our study was based on adult women living in long-term couple relationships. Indeed, most of the existing research has considered college samples, and so the relationship between body image and sexuality among adult women in long-term relationships is seemingly less well defined.

Method

PARTICIPANTS

A total of 53 women from the general population living in Geneva, Switzerland, took part in this study. Participants were part of a subsample of a large psychosociological survey about sexuality (300 men and 300 women) that had been conducted one year earlier and was financed by the Fonds Universitaire Maurice Chalumeau in Geneva. To obtain the original sample of 600 participants, 10,000 contacts were randomly selected from a list of addresses of households in Geneva by investigators from an economic and social research institute (M.I.S. TREND). Among the people who were successfully contacted ($N = 7,201$), 26.3% refused to participate, 48.9% did not meet predefined criteria (i.e., being 25 to 46 years old and being a native or fluent French speaker), and 15.6% fell outside the predefined quotas (as the final sample had to be composed of 50% men and 50% women with comparable ages). Thus, 664 people who met predefined criteria and quotas agreed to participate in the study and 600 individuals did in fact participate.

For the current study, those included had expressed an interest in participating in the second phase of

the study,¹ had defined themselves as heterosexual, and had been in a heterosexual relationship for at least one year at the time of the psychosociological survey ($N = 126$). Moreover, to be eligible for the present study, participants had to be in a relationship with the same partner they had been with one year earlier. We made this choice because it has been shown that female sexual desire tends to decrease with the duration of a relationship (Klusmann, 2002) and that the degree and functioning of sexual desire in women living in stable couple relationships may be different as compared with the desire women feel at the beginning of a relationship (Basson, 2002). Among women who were successfully contacted by phone by the first author ($N = 85$), 19 refused to participate in the second phase and nine were no longer with the same partner; 57 women agreed to participate, and 53 did participate in the study. Participants received 50 Swiss francs in compensation for their participation.

All participants were native French speakers (75.5% of the sample) or fluent French speakers and were in a long-term heterosexual relationship. Their average age was 38.62 years ($SD = 5.22$, range = 29-47 years); 45% of the participants had a university degree. The mean duration of the couple relationship was 14.41 years ($SD = 6.42$, range = 3-29 years), and the duration of cohabitation was 12.67 years ($SD = 6.64$, range = 1.5-26 years). In addition, 88.7% of participants were married, and 92.4% had one or more children.

MEASURES

Sexual Desire.

The Sexual Desire Inventory (SDI; Spector et al., 1996) consists of 14 items assessing (a) the desire to have sexual activity with a partner, namely, dyadic sexual desire (Items 1-8; e.g., “How strong is your desire to engage in sexual activity with a partner?”) and (b) the desire to engage in sexual behavior by oneself, namely solitary sexual desire (Items 10-12; e.g., “During the past month, how often would you have liked to behave sexually by yourself [for example, masturbating, touching your genitals, etc.]?”). Participants were asked to rate each item on Likert scales for frequency (0 = *Not at all* to 7 = *More than once a day*) and intensity of sexual desire (0 = *No desire* to 8 = *Strong desire*), as well as the importance to fulfill such desire (0 = *Not at all important* to 8 = *Extremely important*). For each dimension, scores were added; higher scores indicate a higher level of desire. The internal consistency was good for the solitary dimension (Cronbach’s $\alpha = .82$) and acceptable for the dyadic dimension (Cronbach’s $\alpha = .72$).

Body Image Evaluation.

¹A total of 242 women (81%) had indicated a willingness to be contacted for the second phase of the study. Although these women did not differ from those who were not interested in pursuing the study on different sociodemographic and sexual variables (e.g., the length of couple relationship, number of children, frequency of sexual activity, dyadic sexual desire, sexual satisfaction), they nevertheless were younger (though the difference was marginal), showed more positive attitudes toward sexuality, and indicated higher solitary sexual desire. These differences are consistent with previous findings showing that people who volunteer for sex research hold more liberal and positive sexual attitudes than people who do not (e.g., Wolchik, Braver, & Jensen, 1985). Such sexual attitudes may be associated, at least in women of Western societies, with being young (because of progressive liberalization of sexual behavior) and with a high solitary sexual desire (Dosch, Belayachi, & Van der Linden, 2015).

The Multidimensional Body-Self Relations Questionnaire—Appearance Scale (MBSRQ-AS; Cash, 2000) consists of 34 items assessing five dimensions of body image (i.e., appearance evaluation, appearance orientation, overweight preoccupation, self-classified weight, and body areas satisfaction scale) on 5-point scales (1 = *Definitely disagree*, 5 = *Definitely agree*). Only the appearance evaluation subscale (e.g., “I like the way I look without clothes”) was used in subsequent analyses to assess participants’ general evaluation of their body image. A higher score indicates a more positive body image. The appearance evaluation dimension revealed good internal consistency (Cronbach’s alpha = .89).

Body-Related Distracting Thoughts During Sexual Activities.

The Cognitive Distraction Scale (Dove & Wiederman, 2000) is a 20-item questionnaire assessing distracting thoughts and worries during sexual activity. It comprises two subscales: (a) appearance-based distraction and (b) performance-based distraction. For the purpose of this study, only the appearance-based distraction subscale was included in subsequent analyses (e.g., “During sexual activity, I am worried about how my body looks to my partner”). Participants rate the frequency with which they have each of the thoughts on a 6-point scale (1 = *Always*, 6 = *Never*). All scores were reversed, so that higher scores indicated higher frequency of distracting thoughts during sexual activity. The appearance-based distraction dimension revealed excellent internal consistency (Cronbach’s alpha = .93).

Encoding Style.

The Encoding Style Questionnaire (ESQ; Lewicki, 2005; French version: Billieux et al., 2009) is a 21-item questionnaire assessing the frequency of experiencing “split-second illusions” in everyday life (e.g., “Sometimes when I’m driving, I see a piece of paper or a leaf being moved by the wind, and for a split of second think that it might be an animal [e.g., a squirrel or a cat]”), on 6-point scales (1 = *Strongly disagree*, 6 = *Strongly agree*). The questionnaire is based on the assumption that internal encoders, who are more prone to impose imperfect encoding schemata, are more likely to experience split-second illusions, as compared with external encoders. Only six items are critical items and are considered in the total score. A high score indicates an internal encoding style, while a low score indicates an external encoding style, with extremely internal and extremely external representing the two ends of a continuum. The questionnaire revealed acceptable internal consistency (Cronbach’s alpha = .70).

Social Desirability.

The Social Desirability Scale (DS-36; Tournois, Mesnil, & Kop, 2000) is a 36-item questionnaire designed to assess two facets of the construct: (1) autodeception, that is, the tendency to give, without being aware of it, favorable self-descriptions (e.g., “I fully control my own destiny”) and (2) heterodeception, that is, the tendency to knowingly give an excessively favorable self-description to others (e.g., “Sometimes I distort the truth”). Items are scored on a 7-point rating scale from 0 (*Totally false*) to 6 (*Totally true*). A higher score indicates higher social desirability. For the subsequent analyses, only the heterodeception subscale was used and revealed good internal consistency (Cronbach’s alpha = .84). We decided to use only the heterodeception subscale, as we held no study hypotheses for autodeception, and the tendency to manage impressions has been shown to influence self-report description of sexual behavior (e.g., Alexander & Fisher, 2003).

Sociodemographic Data.

The sociodemographic questionnaire included questions about age, the duration of the couple's relationship, the duration of cohabitation with the partner, having children or not, the highest level of education that was achieved, professional activity, the importance of religion, and physical and psychological health.

PROCEDURE

Participants were tested individually in a laboratory at the University of Geneva. The first author and a graduate student in psychology collected data alternately. All participants gave their written informed consent prior to their participation. They were informed that the study would involve measures related to sexuality, that they could withdraw from participation at any time without disadvantage, and that all data would be collected anonymously. Participants were asked to complete a battery of self-assessment questionnaires. They were randomly assigned to one of four fixed orders, in which the order of the presentation of the questionnaires was counterbalanced. To ensure complete confidentiality, we distributed an envelope to collect the completed questionnaires. At the end of the session, participants were asked to seal the envelope, to slip it into a large box through a small slot, and to shake the box to mix the contents. The anonymity of the participants was guaranteed, as informed consent forms were kept separate from the completed (and anonymous) questionnaires. The session lasted about one hour. This study was approved by the Ethics Committee of the Faculty of Psychology at the University of Geneva.

STATISTICAL ANALYSES

Statistical analyses were performed with SPSS 21. First, to test the hypothesis that body-related distracting thoughts operate as a mediator between body-image evaluation and sexual desire, we computed mediation analyses by using a bootstrapping procedure developed by Preacher and Hayes (2008). We chose this procedure because it is particularly indicated in the case of small samples, as it does not require the sampling distribution to be normally distributed (often unrealistic in small samples). In fact, the bootstrap is a particular kind of resampling method that allows one to greatly reduce sampling error by resampling and replacing observations from the original sample numerous times. Moreover, it has been shown to compensate for low power in small samples while controlling for Type I error rate, as compared with other methods, such as the Sobel test (Hayes, 2013). Using an SPSS macro (INDIRECT)² developed by the authors, the bootstrapping procedure generates thousands of subsamples (1,000 iterations in the current study) from the original sample and provides confidence intervals (CIs; 95% CIs in the current study) of the indirect effects. A significant mediation effect is found when CIs from the bootstrap analysis for indirect effects do not include zero. INDIRECT provides unstandardized coefficients for each path (a , b , c , and c' ; see Figures 1 and 2). Standardized coefficients were calculated by dividing the standard deviation of y by the standard deviation of x , and then multiplying the result by the unstandardized coefficient provided by INDIRECT (e.g., in path a , x is represented by "body image evaluation" and y refers to "appearance-based distractions").

²This macro is freely available on Hayes' webpage: <http://www.afhayes.com/spss-sas-and-mplus-macros-and-code.html>.

Furthermore, we computed a hierarchical multiple regression analysis to explore the impact of encoding style on the link between body-image evaluation and body-related distracting thoughts during sexual activity (moderation analysis). To test the moderator effect, we calculated the interaction between encoding style and body image evaluation by multiplying the two variables, after having standardized all of the predictors. In the first step of the hierarchical multiple regression analysis, we introduced encoding style and body-image evaluation to test the simple main effect of each predictor. In the second step, the interaction body image x encoding style was entered to assess the interaction effect. Multicollinearity problems were checked by means of tolerance values and variance inflation factor (VIF) values. VIF values higher than 2.5 and tolerance values lower than .40 are considered problematic (e.g., Allison, 1999). We also ensured that there were no extreme observations (standardized residual errors > 3) or influential cases (Cook's distance >1) that might have diminished the model accuracy. In the case of a significant interaction effect, a simple slope analysis allows us to determine whether the gradient of one or both of these lines differs from 0 (i.e., departs from the horizontal plane).

Finally, we computed moderated mediation analyses by using an SPSS macro (PROCESS)³ designed by Hayes (2013) to test whether the indirect effect of body image on sexual desire through body-related distracting thoughts depends on the participants' encoding style. This macro, indicated for small samples, enables the implementation of the recommended bootstrapping methods and provides a procedure to test more than 70 different models. In our study, we tested model number 7,⁴ as it seemed the most relevant for testing our assumption. Indeed, we assumed that a highly internal encoding style (which is associated with self-perpetuation of maladaptive schemata) may lead individuals with a negative body image to increase body-related distracting thoughts during sexual activity (as external stimuli are interpreted as evidence that their body is unattractive) which may, in turn, interfere with sexual desire. However, to ensure that such a model best fits the data, we also tested two alternative models: (a) the moderator modulates the relation between the mediator and the dependent variable (corresponding to the model 14 in PROCESS) and (b) the moderator modulates the relation between the independent and the dependent variable (corresponding to model 8 in PROCESS). The bootstrapping procedure we chose generated 1,000 subsamples from the original sample and provided 95% CIs. We also chose to explore the indirect effect at different percentiles (instead of ± 1 SD from mean) of the moderator to enable a more nuanced analysis of the encoding style, as it was shown to vary across individuals on a continuum from highly external to highly internal (Lewicki, 2005). Thus, the indirect effect of body-related distracting thought was evaluated at a very low value of encoding style (10th percentile), corresponding to a very high external encoding style; at a low value of encoding style (25th percentile); at a medium value of encoding style (50th percentile); at a high value of encoding style (75th percentile); and at a very high value of encoding style (90th percentile), corresponding to a very high internal encoding style.

³ The PROCESS macro is freely available on <http://www.processmacro.org/download.html>.

⁴ All templates for PROCESS are freely available on the website <http://www.afhayes.com/public/templates.pdf>. See Greenaway, Wright, Willingham, Reynolds, and Haslam (2015) for an example of use of the model number 7. In the present study, five participants were included at the 10th percentile, six at the 25th percentile, 14 at the 50th percentile, 11 at the 75th percentile, 12 at the 90th percentile, and finally, five at the 100th percentile.

RESULTS

Preliminary Analyses

Descriptive statistics for each scale are presented in [Table 1](#) (columns 1-3). The observed values for skewness (-0.85 to 1.34) and kurtosis (-1.12 to 1.70) show that the distributions of all the variables do not deviate strongly from a normal distribution (West, Finch, & Curran, 1995).

Figure 1. Mediation of the body image evaluation-dyadic sexual desire relationship by appearance-based distractions during sexual activity. CI = confidence interval.

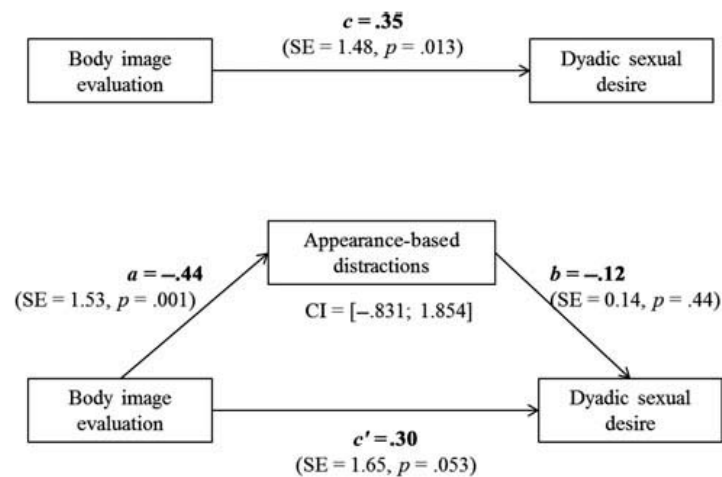
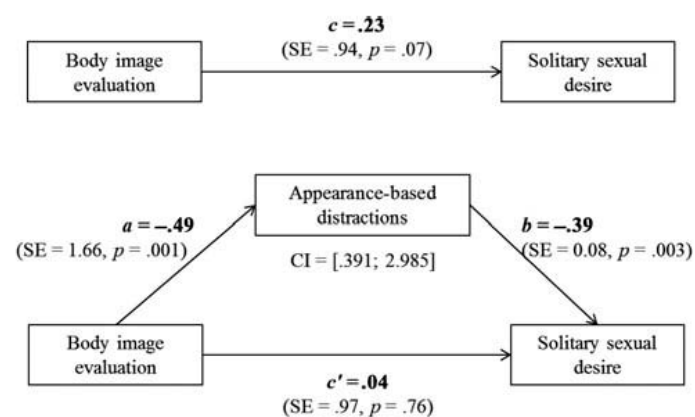


Figure 2. Mediation of the body image evaluation-solitary sexual desire relationship by appearance-based distractions during sexual activity, while controlling for social desirability and duration of the relationship. CI = confidence interval.



Correlation Analyses

Pearson's correlations were performed to explore the associations between body image evaluation, appearance-based distractions during sexual activity, encoding style, dyadic and solitary sexual desire, social desirability, and some sociodemographic variables (age, duration of relationship, and number of children) that may influence body- and sexuality- related variables. The results are shown in [Table 1](#) (columns 4-11).

These analyses revealed that a positive body image was related, on one hand, to higher dyadic and solitary sexual desire and, on the other hand, to fewer appearance-based distractions during sexual activity. In addition, having frequent body-related distracting thoughts during sexual activity was related to lower solitary sexual desire and, marginally, to lower dyadic sexual desire. Concerning encoding style, a highly internal encoding style was significantly related to higher solitary desire and, marginally, to positive body image. Social desirability was related to lower scores on solitary sexual desire. Finally, among the sociodemographic variables, only the duration of the relationship revealed significant correlations with some variables of interest. Indeed, a longer duration of relationship was related to lower solitary sexual desire and to higher social desirability.

Mediation Analyses

We computed two mediation analyses to test the hypothesis that body-related distracting thoughts operate as a mediator between body-image evaluation and sexual desire, both dyadic and solitary. Results concerning dyadic sexual desire are depicted in [Figure 1](#). This mediation analysis revealed that appearance-based distractions during sexual activity did not mediate the effect of body-image evaluation on dyadic sexual desire. Indeed, the 95% CI from the bootstrap analysis for indirect effects included zero, indicating that the mediation effect was not significant. In particular, path *b* was not significant, indicating that appearance-based distractions were not associated with dyadic sexual desire.

The second mediation analysis was computed with solitary sexual desire as the outcome. Because both social desirability and the duration of the relationship were significantly correlated to solitary sexual desire, they were entered as control variables in the analysis. Results are depicted in [Figure 2](#) and show that body-image evaluation was significantly related to appearance-based distractions (a); appearance-based distractions were significantly related to solitary sexual desire (b); and the marginal relationship between body-image evaluation and solitary sexual desire (c) was definitely reduced when appearance-based distractions were included in the regression equation (c'). The overall effect size was moderate (adjusted $R^2 = .44$). Finally, the 95% CI from the bootstrap analysis for indirect effects did not include zero, confirming the significant mediation effect.

Moderation Analysis

A hierarchical multiple regression analysis was conducted to explore the impact of encoding style on the link between body image evaluation and appearance-based distractions during sexual activity. In the first step, we entered body image and encoding style as predictors. We also included the duration of the relationship and the number of children as control variables because, although nonsignificant, they nevertheless showed a small correlation with the encoding style. In the second step, we added the interaction between body image and encoding style as a predictor. In both regression models, there were no extreme observations, influential cases, or multicollinearity problems (tolerance values = .74-.89; VIF = 1.12-1.34).

As can be seen in [Table 2](#), the results showed that body image was the only significant predictor in Step 1, indicating that a more negative body image was related to more frequent appearance-based distractions during sexual activity. The introduction of the interaction between body image and encoding style in the second step significantly improved the overall prediction (R^2 change = .14, $p = .004$), showing that the encoding style significantly moderated the relationship between body image and

appearance-based distractions.

Table 1. Mean Scores, Standard Deviations, Observed Range, and Correlations Between Sexual Desire, Body Image, Appearance-Based Distractions During Sexual Activity, Encoding Style, Social Desirability, and Sociodemographic Variables

Measure	M (SD)	Range	Correlations							
			1	2	3	4	5 Age	Duration of relationship	Number of children	
1. Dyadic sexual desire (SDI)	33.74 (8.33)	15-50	—					-.02	-.08	.15
2. Solitary sexual desire (SDI)	7.35 (5.72)	0-18	.41**	—				-.09	-.40**	.00
3. Body image evaluation (MBSRQ-AS)	3.41 (0.76)	1-4.43	.35*	.34*	—			-.05	-.17	.08
4. Appearance-based distractions during sexual activity (CDQ)	20.22 (8.89)	10-47	-.25 [†]	-.46**	-.44**	—		.07	.19	-.06
5. Encoding style (ESQ)	18.04 (5.26)	6-30	.11	.37**	.26 ^f	-.15	—	-.10	-.19	-.21
6. Social desirability (DS-36)	66.83 (14.79)	34-91	-.11	-.45**	-.11	.04	-.14	.15	.28*	.18

Note. $N = 53$; SDI = Sexual Desire Inventory; MBSRQ-AS = Multidimensional Body-Self Relations Questionnaire-Appearance Scale: Appearance evaluation scale; CDQ = Cognitive Distraction Scale: Appearance-based distraction scale; ESQ = Encoding Style Questionnaire; DS-36 = Social Desirability Scale: hetero-deception scale.

** $p < .01$; * $p < .05$; [†] $p < .10$.

Figure 3 illustrates this result. The slope of the relationship between body image and appearance-based distractions during sexual activity was stronger for internal encoders (simple slope = -7.75 , $t = -4.28$, $p < .001$) as compared with external encoders (i.e., low internal encoding style; simple slope = -2.27 , $t = -1.81$, $p = .08$). Among internal encoders, the tendency to have appearance-based distractions during sexual activity was highly influenced by their body image. Indeed, appearance-based distractions were the highest in internal encoders with a negative body image and the lowest in internal encoders with a positive body image. Among external encoders, body image played a less influential role in the tendency to have appearance-based distractions during sexual activity, although the negative relationship between body image and appearance-based distractions was marginal.

Moderated Mediation Analyses

We computed moderated mediation analyses to test whether the indirect effect of body image on sexual desire (both dyadic and solitary) through body-related distracting thoughts depends on the participant's encoding style (see Figure 4). Results are shown in Table 3.

Concerning dyadic sexual desire, and consistent with the result found in the hierarchical regression noted previously (see Table 2 and Figure 3), the effects of both body image and the cross-product term between body image evaluation and encoding style on appearance-based distractions were significant. The analysis also showed that the effect of body satisfaction on dyadic sexual desire was marginally significant, while the effect of appearance-based distraction on dyadic sexual desire was not significant. We then examined the conditional indirect effect of body-image evaluation on dyadic sexual desire

(through appearance-based distractions during sexual activity) at different values of encoding style: 10th, 25th, 50th, 75th, 90th percentiles, corresponding to a range from a very high external encoding style to a very high internal encoding style. At any value of the encoding style, the 95% CI from the bootstrap analysis included zero, indicating no indirect effect of body image on dyadic sexual desire through appearance-based distractions, independent of encoding style. This finding confirmed the result obtained in the simple mediation analysis discussed previously.

Concerning solitary sexual desire, we controlled for social desirability and the duration of the relationship, as such variables have been shown to be correlated with the desire to masturbate. Again, the effects of body image and the cross-product term between body image evaluation and encoding style on appearance-based distractions were significant. The analysis also shows that body satisfaction was not a significant predictor of solitary sexual desire when appearance-based distraction was controlled for (this latter remaining a significant predictor of solitary sexual desire). Moreover, social desirability and duration of relationship were both significant predictors of desire to masturbate. We then examined the conditional indirect effect of body-image evaluation on solitary sexual desire (through appearance-based distractions during sexual activity) at different values of encoding style. The bootstrap CIs indicated that the indirect effect of body image on solitary sexual desire through appearance-based distractions was observed when levels of the encoding style were low to very high (the 95% CI from the bootstrap analysis did not include zero for the values of the encoding style, corresponding to the 25th through 90th percentiles), but not when the level of encoding style was very low (at the 10th percentile, the 95% CI included zero).⁵ In other words, the indirect effect showing that participants who evaluated their body negatively had lower solitary sexual desire (through enhancement of appearance-based distractions during sexual activity) was not found when the encoding style was highly external. Finally, it is worth noting that none of the alternative models we tested (model 8 and model 14) was significant.

Discussion

The first objective of this study was to explore the relationship between body image and the desire to engage in sexual activity (both dyadic and solitary sexual desire) among adult heterosexual women in a long-term relationship. The second objective consisted of investigating whether the occurrence of body-related distracting thoughts during sexual activity underlies the relationship between body image and sexual desire. Finally, we aimed to explore whether this mediation is moderated by a cognitive mechanism, the encoding style.

Our results showed a link between body image and desire to engage in sexual activity in adult women in long-term couple relationships, suggesting that body image concerns extend beyond youth and beyond the initial stage of a romantic relationship, at least among Western women. More precisely, a poor body image was associated with lower dyadic sexual desire. This result, which is consistent with previous studies (e.g., Seal et al., 2009), suggests that negative body image may interfere with the desire to have sexual activity with a partner, as it implies showing one's own body.

⁵ *Post hoc power analyses indicated a high power for both path a (0.989) and path b (1.00).*

Table 2. Unstandardized (*B*) and Standardized (β) Regression Coefficients, Standard Errors (*SE*), and *t* Values Predicting Appearance-Based Distractions During Sexual Activity

Predictor	Appearance-Based Distractions			
	<i>B</i>	<i>SE</i>	β	<i>t</i>
Step 1				
(Intercept)	20.22	1.21		16.67
Duration of relationship	1.38	1.35	.16	1.02
Number of children	-0.98	1.34	-.11	-0.73
Body image evaluation	-3.58	1.28	-.40**	-2.79
Encoding style	-0.31	1.28	-.03	-0.24
Step 2				
(Intercept)	20.95	1.12		18.66
Duration of relationship	1.83	1.25	.21	1.47
Number of children	-2.00	1.27	-.22	-1.56
Body image evaluation	-5.01	1.27	-.56***	-3.96
Encoding style	-0.83	1.19	-.09	-0.70
Interaction body image evaluation x Encoding style	-2.74	0.91	-.44**	-3.03

Note. *N* = 53. Step 1: $R^2 = .22$; adjusted $R^2 = .15$. Step 2: $R^2 = .36$; adjusted $R^2 = .28$. All variables were standardized prior to analysis.

*** $p < .001$; ** $p < .01$.

Moreover, our results showed that a poor body image was also related to lower solitary sexual desire. This finding suggests that negative body image may not only interfere with the desire to have sexual activity with a partner but also be much more pervasive, reducing one's desire to feel, more generally, body-associated pleasure.

Body-related distracting thoughts during sexual activity, which were related to poor body image, did not mediate the relationship between body satisfaction and dyadic sexual desire, in contrast with our hypotheses. Various explanations could account for this lack of relationship. First, as some previous studies have highlighted, being in a couple relationship and/or being satisfied with one's own couple relationship may reduce the influence of body image on sexual functioning (e.g., Milhausen, Buchholz, Opperman, & Benson, 2015). It is conceivable that a satisfying relationship may have a protective effect,

mitigating the negative influence of body dissatisfaction on female sexual experiences. According to Barlow's (1986) model, perceiving a partner's sexual arousal may invalidate negative expectancies regarding the consequences of showing one's own naked body, thus diminishing the impact of body concerns during sexual activity. In addition, it has been shown that women in exclusive relationships reported having lower body self-consciousness during sexual activity as compared with women without a romantic partner (e.g., Wiederman, 2000). It is conceivable that women who are in partnered relationships become more comfortable in exposing their bodies during sexual activity with their partners over time (Claudat & Warren, 2014). Second, perceiving the partner as sexually aroused during a sexual encounter might provide several erotic cues (e.g., visual, tactile) that may help women to stay more focused on the sexual experience (e.g., erotic sensations, genital arousal), thus reducing body-related distracting thoughts and favoring the emergence of sexual desire. Finally, the lack of mediation effect of cognitive distraction on dyadic sexual desire may be due to the measure of sexual desire used in the present study. Indeed, the questionnaire we used does not assess the level of sexual desire during sexual activity; rather, it evaluates the desire to have sexual activity, that is, the desire that precedes sexual activity. Therefore, as cognitive distraction during sexual activity tends to distract individuals from erotic cues, thus impeding the experience of sexual arousal and pleasure (e.g., Barlow, 1986), we cannot exclude the possibility that having body-related intrusive thoughts during sexual activity may interfere with sexual arousal and desire *during* such sexual intercourse, but not with the more general desire to have sexual activity with a partner (Satinsky, Reece, Dennis, Sanders, & Bardzell, 2012).

On the other hand, our results showed that body-related distracting thoughts during sexual activity mediated the relationship between body image and solitary sexual desire. Indeed, participants with a poor body image had lower solitary sexual desire through enhancement of body-related distracting thoughts during sexual activity; conversely, a positive body image was associated with higher solitary sexual desire, this relation being explained by a low frequency of distracting thoughts. These results suggest that although dyadic sexual desire may be associated with different factors (not only individual but also relational) body-related concerns may still have a negative impact on the way women experience sexuality as a physical experience (e.g., during masturbation).

Figure 3. Interaction between body image evaluation and encoding style and their impact on appearance-based distractions during sexual activity. High body-image evaluation corresponds to high body satisfaction (+1 SD). Low and high internal encoding styles represent, respectively, highly external (-1 SD) and highly internal encoding style (+1 SD).

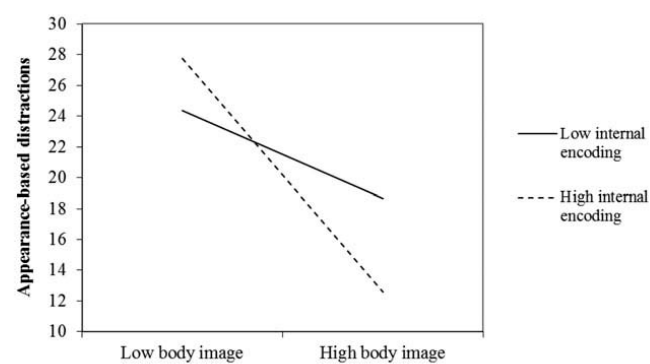
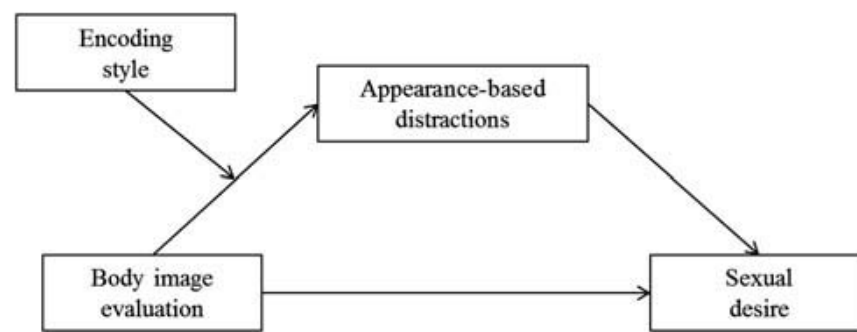


Figure 4. Conditional indirect effect of body image evaluation on sexual desire through appearance-based distractions during sexual activity, depending on the participants' encoding style.



Finally, our results suggest that encoding style moderates the relationship between body image and the frequency of body-related distracting thoughts during sexual activity. Indeed, the results showed that the frequency of distracting thoughts during sexual activity was only weakly related to body image among external encoders (who are more prone to interpret a situation on the basis of external environmental cues). In contrast, the association between body image and distracting thoughts was much stronger among internal encoders, who tend to impose preexisting interpretive schemata on external cues (Lewicki, 2005). In particular, having negative preexisting schemata, such as a negative body image, may lead highly internal encoders to encode and interpret stimuli (e.g., the look of the partner at one's naked body during sexual activity) on the basis of such schemata. This would support and reinforce, through the process of self-perpetuation, the negative evaluation of one's own body, contributing to the experience of more negative, body-related distracting thoughts during sexual activity.

On the other hand, having a positive body image may lead highly internal encoders to encode the partner's look during sex in a more positive way (e.g., "My partner likes my body"), thus drastically reducing the frequency of negative body-related distracting thoughts. Therefore, having an internal encoding style may favor, or limit, the occurrence of negative body-related distracting thoughts during sexual activity, depending on the preexisting internal schemata (i.e., positive versus negative body image, respectively).

In summary, the present study underscores that body image represents an important aspect of sexual desire, both dyadic and solitary, in adult women in a committed relationship. The results also highlight the interest in considering different cognitive factors, such as cognitive distraction and encoding style. In particular, the influence of those cognitive factors shows how individuals differ in the way that they process information concerning body image. Without denying the impact of external influences on body image, such as the mass media or judgment of others, our results suggest that there may be different trajectories, depending on individual psychological functioning, regarding the way that body image influences sexuality. Indeed, a negative body image may bias the way that women perceive and interpret information related to their body, thus promoting the occurrence of body-related distracting thoughts during sexual activity. However, this may be true only among women characterized by an internal encoding style (and not among those with a highly external encoding style). Moreover, the impact of these distracting thoughts seems to differ depending on the nature of desire (dyadic or

solitary). Indeed, having body-related distracting thoughts during sexual activity may interfere with the way that women experience sexuality as a physical experience, which may explain the negative impact on solitary sexual desire (as it may be essentially related to the experience of physical pleasure and/or relief). In contrast, dyadic sexual desire may also be influenced by factors not directly related to the physical experience of sexual pleasure, such as relational or emotional factors (e.g., the need to feel reassured or to feel closer to the partner; e.g., Meston & Buss, 2007).

Table 3. Regression Results for Conditional Indirect Effect on Dyadic Sexual Desire and Solitary Sexual Desire

Predictor	Dyadic Sexual Desire				Solitary Sexual Desire			
	<i>B</i>	SE	<i>t</i>	<i>p</i>	<i>B</i>	SE	<i>t</i>	<i>p</i>
	Appearance-Based Distractions During Sexual Activity				Appearance-Based Distractions During Sexual Activity			
Constant	21.21	1.12	18.94	.000	18.66	5.58	3.34	.002
Body satisfaction	-6.84	1.63	-4.18	.000	-7.05	1.71	-4.13	.000
Encoding style	-0.12	0.21	0.54	.590	-0.12	0.23	-0.52	.608
Body satisfaction × Encoding style	-0.59	0.22	-2.75	.008	-0.57	0.24	-2.37	.023
Social desirability					0.00	0.08	-0.03	.974
Duration of relationship					0.19	0.19	0.97	.339
	Dyadic Sexual Desire				Solitary Sexual Desire			
Predictor								
Constant	35.85	3.10	11.57	.000	24.42	5.41	4.51	.000
Appearance-based distractions	-0.11	0.14	-0.78	.441	-0.25	0.08	-3.14	.003
Body satisfaction	3.27	1.65	1.98	.053	0.30	0.97	0.31	.759
Social desirability					-0.14	0.04	-3.28	.002
Duration of relationship					-0.21	0.10	-2.03	.049
	Conditional Indirect Effect at Different Values of the Encoding Style				Conditional Indirect Effect at Different Values of the Encoding Style			
Encoding Style (ESQ)	BIE	BSE	BCI		BIE	BSE	BCI	
ESQ = -9 (10th percentile)	0.16	0.59	-0.22-3.25		0.44	1.63	-0.51-5.76	
ESQ = -3 (25th percentile)	0.55	0.69	-0.77-1.95		1.30	0.85	0.26-3.38	
ESQ = 0 (50th percentile)	0.81	0.91	-1.11-2.57		1.73	0.63	0.59-3.01	
ESQ = 3 (75th percentile)	0.94	1.04	-1.23-3.02		2.15	0.69	0.94-3.77	
ESQ = 6 (90th percentile)	1.14	1.25	-1.35-3.61		2.58	0.99	0.63-4.75	

Note. *N* = 53. Unstandardized regression coefficients are reported. Variables used for the product (body satisfaction and encoding style) were mean centered prior to analysis. Bias corrected; 1,000 bootstrap samples; 95% CIs. BIE = bootstrapping indirect effect; BSE = bootstrapping standard error; BCI = bootstrapped confidence interval; ESQ = Encoding Style Questionnaire.

It is conceivable that such factors play an important role in reducing the impact of body-related distracting thoughts during sexual activity in dyadic sexual desire. This suggestion is in concordance with previous studies, indicating the importance of interpersonal factors in female dyadic sexual desire (e.g., Donahey & Carroll, 1993). Thus, a better understanding of the psychological factors that are implicated in the relation between body image and sexual desire may provide an interesting and helpful way to improve the quality of women's sexual experiences.

From a clinical perspective, our results suggest the importance of assessing body satisfaction and the presence of body-related distracting thoughts during sexual activity in the context of women with a sexual desire disorder. In addition, though further studies are needed to confirm the results, we can consider some clinical interventions that may be relevant in the treatment of sexual desire disorder among women with body dissatisfaction. For instance, interventions aimed at reducing attentional bias toward body-related negative cues (attentional bias modification training; e.g., Schoenmakers et al., 2010) or aimed at decreasing negative interpretation bias regarding stimuli encountered in the sexual

context (for a review on cognitive bias modification training techniques, see Menne-Lothmann et al., 2014) may help diminish body-related distracting thoughts during sexual activity, especially among women characterized by an internal encoding style. In addition, interventions that are focused on the content of body concerns and related negative expectancies regarding sexuality (e.g., cognitive restructuring) may also help women diminish body self-consciousness during sexual activity. Finally, results concerning dyadic sexual desire suggest that the presence of a steady partner may play a role in the way that body image influences women's sexual experiences. Thus, although speculative, this interpretation suggests that the quality of the relationship should systematically be assessed in the case of sexual desire concerns and/or body dissatisfaction.

Some limitations of the study should be noted. First, our results were based on a relatively small and homogeneous sample with regard to cultural characteristics, sexual orientation, and the couple situation. Moreover, women who agreed to participate to this study (which represented the second phase of a larger research started one year earlier) presented some differences (they were younger, had more positive sexual attitudes, and had higher solitary sexual desire) as compared to the women who did not agree to take part in the study, therefore limiting the generalizability of the findings. Second, our study explored only negative body-related distracting thoughts during sexual activity. Therefore, we cannot exclude the possibility that it was the negative valence of the thoughts, and not the distracting nature of the thoughts (regardless of their valence), that interfered with sexual desire. Third, it is worth noting that the relation between body image and the desire to engage in sexual activity (both with a partner and alone) was moderate, suggesting that other factors might be important to consider when exploring sexual desire. It may be that women, when assessing their global body satisfaction, have referred to parts that are less relevant to their sexual experience, thus explaining such a moderate link. Furthermore, it is noteworthy that this study assessed only the desire to have sexual activity (with a partner or alone) and did not evaluate sexual desire during sexual activities. Finally, this study was cross-sectional in nature and, although the results indicate associations and influences among variables, causation cannot be implied.

Thus, future research should apply a longitudinal design to clarify the direction of the relationships highlighted in this study. Moreover, it seems important to reproduce such a study in a larger sample so that the different levels of encoding style are better represented. Future studies should also consider the relation between both positive and negative body-related distracting thoughts during sexual activity and sexual desire. Although women are generally found to report higher levels of body dissatisfaction and appearance-based distraction during sexual activity than men do (Meana & Nunnink, 2006), men in Western cultures have become more concerned about their appearance in recent decades (e.g., Leit, Pope, & Gray, 2001). According to objectification theory, such an increase of concerns related to body image among men may be explained by the fact that men are increasingly becoming the object of the female gaze (Blashill, 2011). For instance, it has been shown that the naked male body is displayed more and more frequently in women's magazines (Pope, Olivardia, Borowiecki, & Cohane, 2001). Therefore, future studies should explore the relationships between body image and sexual desire in both genders. Moreover, as our study was based on heterosexual participants only, future research should be conducted to clarify how body image, distractive thoughts, and encoding style are related to dyadic and solitary sexual desire among homosexual men and women. Further studies should also include relationship satisfaction as a predictor when testing the relation between body image, body-related cognitive distraction, and sexual desire, as it may play a central role. In addition, in light of the moderate

relationship between general body image and sexual desire, future studies should allow a more individualized assessment of the body parts that are unsatisfactory for a woman during a sexual encounter to explore their impact on sexual functioning. Future research may also assess both the desire to have sexual activity and sexual desire during sexual activity, as these measures may be differently related to body image and cognitive distractions during sex. Finally, as representations regarding sexuality and ideal body are strongly related to social norms and expectations (Woertman & van den Brink, 2012), future research should explore whether the relations found in the present study can be generalized to other cultures and other social classes.

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