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Research article

Seeing women as objects: The sexual body part recognition bias

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Abstract

Objectification theory suggests that the bodies of women are sometimes reduced to their sexual body parts. As well, an extensive literature in cognitive psychology suggests that global processing underlies person recognition, whereas local processing underlies object recognition. Integrating these literatures, we introduced and tested the sexual body part recognition bias hypothesis that women's (versus men's) bodies would be reduced to their sexual body parts in the minds of perceivers. Specifically, we adopted the parts versus whole body recognition paradigm, which is a robust indicator of local versus global processing. The findings across two experiments showed that women's bodies were reduced to their sexual body parts in perceivers' minds. We also found that local processing contributed to the sexual body part recognition bias, whereas global processing tempered it. Implications for sexual objectification and its underlying processes and motives are discussed.

Scholars across disciplines have argued that people are sometimes seen and treated as objects. This process is called objectification and occurs when a person's body parts or functions are separated from the person, reduced to the status of instruments, or regarded as capable of representing the entire person (Bartky, 1990; Fredrickson & Roberts, 1997; Gruenfeld, Inesi, Magee, & Galinsky, 2008). For example, economists and philosophers have argued that in capitalism, employers objectify their employees, reducing their employees to their work qualities (Marx, 1964). To the employer, the sum of the employees corresponds to their work-related capabilities. Likewise, in medicine, physicians may objectify a patient, reducing their patients to their symptoms (Barnard, 2001; Foucault, 1989). Finally, psychologists have argued that women are sometimes objectified and reduced to their appearance attributes (Fredrickson & Roberts, 1997; Heflick & Goldenberg, 2009; Heflick, Goldenberg, Cooper, & Puvia, 2010; see also Langton, 2009).

Of greatest familiarity and empirical examination, scholars have noted that women are *sexually* objectified in many contexts resulting in significant consequences (Bartky, 1990; Code, 1995; Fredrickson & Roberts, 1997; LeMoncheck, 1985; MacKinnon, 1987, 1989, 2006; McKinley & Hyde, 1996; Nussbaum, 1999). Sexual objectification is a specific type of appearance focus concentrated on sexual body parts. According to objectification theory, when people sexually objectify women, they separate women's sexual body parts or functions from the entire person, reduce the sexual body parts to the status of mere instruments, or regard the sexual body parts as capable of representing the entire person. Sexual objectification represents a form of body reduction (Langton, 2009), which focuses on sexual body parts more than the entire body and face (e.g., Loughnan et al., 2010; Vaes, Paladino, & Puvia, 2011, see also Archer, Iritani, Kimes, & Barrios, 1983).

Importantly, findings from several lines of research suggest that focusing on the sexual body parts of women, rather than women's entire bodies (including their faces), may be associated with adverse psychological consequences for recipients and perceivers. When people focus on the sexual body parts of women (e.g., the objectifying gaze), women recipients report body image concerns (Kozee, Tylka, Augustus-Horvath, & Denchik, 2007) and show decrements in cognitive functioning (Gervais, Vescio, & Allen, 2011a). Additionally, sexualizing women triggers a focus on sexual body parts (Bernard, Gervais, Allen, Campomizzi, & Klein, 2012a), decreases mind attribution (Loughnan et al., 2010) and agency (Cikara, Eberhardt, & Fiske, 2010), and increases dehumanization (Vaes et al., 2011).

Despite its provocative nature and potentially adverse consequences, there is no direct empirical evidence, however, that women's bodies are reduced to their sexual body parts in the minds of perceivers in the first place and the processes that might underlie this effect. In the present research, we introduced and tested the *sexual body part recognition bias* hypothesis that

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states that women's (versus men's) bodies are reduced to their sexual body parts. To test this hypothesis, we adopted the parts versus whole body recognition paradigm from cognitive psychology (Seitz, 2002; Tanaka & Farah, 1993, see also Reed, Stone, Grubb, & McGoldrick, 2006) and asked two questions: (i) Are women's bodies reduced to their sexual body parts in the minds of perceivers through greater recognition of their sexual body parts (versus entire bodies)? and (ii) Does local (versus global) processing contribute to the reduction of women's bodies to their sexual body parts in perceivers' minds?

Are Women's Bodies Reduced to Their Sexual Body Parts in the Minds of Perceivers?

Generally speaking, people tend to focus on the entire, global aspects of a structure, rather than the parts or local details. The well-documented global precedence effect reflects the fact that people tend to focus on the Gestalt before focusing on the details. In his seminal work on this issue, Navon (1977) presented participants with large, global letters formed from small, local letters. People were faster to respond to a target that matched the global letter, than the local letter (see also Fiske & Taylor, 1991; Kimchi, 1992). Notably, the distinction between global and local processing has been important to understanding psychological processes in many domains (e.g., Derryberry & Reed, 1998; Förster & Higgins, 2005; Förster, Liberman, & Kuschel, 2008; Gasper & Clore, 2002; Mogg, Mathews, Bird, & Macgregor-Morris, 1990, see Förster, 2012). To illustrate, global processing, by priming participants to watch only the global letters in the Navon task, increases face recognition (Macrae & Lewis, 2002), a search for similarities between stimuli (Förster, 2010), and assimilation effects in social judgments (Förster et al., 2008).

An extensive literature in cognitive psychology also suggests that the global and local processing underlie person recognition (i.e., recognition of bodies and faces) and object recognition, respectively (Reed et al., 2006; Seitz, 2002; Tanaka & Farah, 1993). On the one hand, global processing (also called configural processing) underlies person recognition; to recognize faces and bodies, perceivers require information about the specific body parts (e.g., eyes and arms), as well as information about the relations and configurations among the body parts. Local processing (also called analytic processing) underlies object recognition; to recognize objects (e.g., houses), perceivers only require information about the object parts (e.g., doors and windows). Perceivers do not require information about the spatial relations among stimulus parts for object recognition (see Maurer, Le Grand, & Mondloch, 2002 for review). One robust indicator of person versus object processing is the parts versus whole recognition paradigm (Seitz, 2002; Tanaka & Farah, 1993). In this paradigm, entire bodies or entire objects are initially presented. Then, slightly modified body or object parts are presented in the context of the entire body or object allowing for global processing (i.e., whole recognition) or in isolation allowing for local processing only (i.e., parts recognition). Illustrating the difference between object and person recognition, Seitz (2002) found that a door from a house was recognized similarly regardless of whether it was presented in the context of the entire house (whole recognition) or in isolation (parts recognition), whereas an arm from a person was recognized better when it was presented in the context of the entire person (whole recognition with legs, a torso, and a face) than when it was presented in isolation (parts recognition).

By integrating this basic cognitive finding on person versus object recognition with the suggestion from objectification theory that perceivers may reduce women's bodies to their sexual body parts, we suggest that perceivers may recognize women's sexual body parts in ways that resemble object recognition. That is, perceivers may show a *sexual body part recognition bias*, in which they recognize women's (versus men's) sexual body parts in isolation without requiring the spatial information about relations among the sexual body parts provided by the context of the entire body (similar to object recognition, Seitz, 2002; Tanaka & Farah, 1993). By adopting the parts versus whole recognition paradigm from cognitive psychology (Seitz, 2002; Tanaka & Farah, 1993), we hypothesized that women's sexual body parts will be recognized similarly regardless of whether they are presented in the context of entire bodies or in isolation (whole body recognition = body part recognition, corresponding to object recognition), whereas men's sexual body parts will be recognized better when they are presented in the context of entire bodies, rather than in isolation (whole body recognition > body part recognition, corresponding to person recognition). This constituted the main hypothesis of the present work and was tested in Experiments 1 and 2.

Does Local (versus Global) Processing Underlie the Sexual Body Part Recognition Bias?

The idea that perceivers may adopt a local processing perspective toward women's (versus men's) bodies and reduce their bodies to their sexual body parts is consistent with objectification research across multiple areas. Sexually objectifying images that focus on the sexual body parts of women pervade American media more than sexually objectifying images of men (Goffman, 1979; Kilbourne & Pipher, 1999). Additionally, several studies show that sexualizing women leads to dehumanized perceptions of women but not men (e.g., Heflick et al., 2010; Vaes et al., 2011). Finally, women reduce themselves to their sexual body parts with greater consequences than men (Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998; Moradi & Huang, 2008).

If local processing underlies the sexual body part recognition bias for women's bodies, then supporting or interfering with local processing should affect the recognition of women's bodies. Consistent with this notion, processing shift theory suggests that processing styles activated in the course of engaging in a task remain active and are carried over or transferred to subsequent tasks (Schooler, 2002; Schooler, Fiore, & Brandimonte, 1997). "Transfer-appropriate" processing shifts result when the residually activated procedures facilitate subsequent processing, whereas "transfer-inappropriate" shifts result when the residually activated procedures impair subsequent processing. If local processing is involved with perceivers reducing women to their sexual body parts, then supporting (by introducing a local processing objective) or interfering (by introducing a global processing objective) with local processing should influence the recognition of women's sexual body parts. Although not tested specifically with

sexual *objectification*, research shows a link between sex more generally and local processing (Förster, 2010). Specifically, when participants imagined either a one-night stand with no love involved (sex prime) or a walk with a romantic partner with no lust involved (love prime), the sex prime enhanced local processing and the love prime enhanced global processing. Furthermore, the elicited processing supported or impaired subsequent task performance with sex primes impairing memory for faces (Förster, 2010), facilitating analytic thinking (and hindering creative thinking; Förster, Epstude, & Özelsel, 2010), and increasing the likelihood of participants differentiating dimensions about their partners (e.g., whether they were creative, intelligent, attractive; Förster, Özelsel, & Epstude, 2010).

Applied to the present work, if a local focus underlies the reduction of women's bodies to their sexual body parts in perceivers' minds, then local processing may support the sexual body part recognition bias, but global processing may serve as an antidote. By integrating these considerations, we predicted that perceivers will reduce women's bodies to their sexual body parts under conditions of local processing, but this effect should be tempered under conditions of global processing. As in previous research that shows that women are sexually objectified with greater consequences than men (e.g., Heflick et al., 2010; Vaes et al., 2011), we predicted that men's entire bodies would be recognized better than their sexual body parts, regardless of global or local processing. We considered these possibilities in Experiment 2.

Finally, we explored whether gender differences emerged on the sexual body part recognition bias. Most sexual objectification theories assume that men objectify and women are objectified (Bartky, 1990; Fredrickson & Roberts, 1997; Jackman, 1994; Kuhn, 1985) to create and maintain patriarchy. Consequently, we may find that only men show the sexual body part recognition bias. Yet, it is possible and potentially more plausible that the bias will emerge for both men and women as a result of living in a culture where women are objectified by the media, other people, and themselves. In fact, a basic premise of objectification theory is that objectification is unavoidable and even women internalize the objectifying gaze and reduce themselves and other women to their sexual body parts (Fredrickson & Roberts, 1997). This latter suggestion is consistent with existing sexual objectification studies (Bernard et al., 2012a; Gervais, Vescio, & Allen, 2011b; Grabe, Routledge, Cook, Andersen, & Arndt, 2005; Heflick & Goldenberg, 2009; Heflick et al., 2010; Strelan & Hargreaves, 2005, Vaes et al., 2011, see also Förster, 2010). Consequently, we expected the sexual body part recognition bias to hold for both male and female perceivers.

Overview of the Present Work

The aforementioned rationale formed the basis of two experiments that examined the *sexual body part recognition bias* hypothesis, specifically whether and why women's bodies are reduced to their sexual body parts in the minds of perceivers. To test our predictions, participants completed parts versus whole body recognition tests adapted from cognitive psychology (Seitz, 2002; Tanaka & Farah, 1993). Specifically, we presented images of men and women's bodies on a computer screen. Participants were then presented with two images. One was the original and the other was a version of the original in which a sexual body part (waist or chest) had been slightly modified. Participants were asked to indicate which one of the images matched the original. Half of the trials included a whole body recognition task; the original and modified sexual body parts appeared in the context of the entire body. The other half included a body parts recognition task; the original and modified sexual body parts appeared in isolation without the context of the entire body.

Waists and chests were chosen to represent *sexual* body parts in the present work for several related reasons. First, at the very least, waists and chests are sexual because they differentiate people on the basis of biological sex. For example, eye-tracker studies confirm that people focus on men and women's waists and chests when they engage in gender categorization (Hewig, Trippe, Hecht, Straube, & Miltner, 2008; Johnson, Lurye, & Tassinary, 2010; Johnson & Tassinary, 2005). Second, although genitalia may be regarded as more explicitly *sexual* than waists and chests, they are rarely revealed in interactions with other people, and thus, people use secondary (versus primary) sex characteristics, including waists and chests, as proxies for reproductive fitness (Singh, 1993). Finally, and perhaps most importantly, in sexual objectification studies that have focused on specific body parts, researchers have found that chests and waists are sexually objectified for both men and women. For example, the self-objectification questionnaire (Noll & Fredrickson, 1998) assesses the degree to which measurements (including chest and waist size) serve as the basis for sexual objectification for both men and women (Strelan & Hargreaves, 2005). Although the specific attractiveness ideals may differ for men (e.g., attractive men have broad, muscular pectorals and narrow muscular waists, Pope, Katz, & Hudson, 1993; Pope, Olivardia, Gruber, & Borowiecki, 1999) and women (e.g., attractive women have large breasts and slim waists), these body parts are sexually objectified and serve as the basis of evaluations of attractiveness for both women and men.

We hypothesized that women's sexual body parts would be recognized similarly regardless of whether they are presented in the context of the entire body or in isolation (corresponding to object recognition, Experiments 1 and 2). We also hypothesized that this effect would emerge when a local processing objective was introduced but tempered when a global processing objective was introduced (Experiment 2). Finally, we hypothesized that men's sexual body parts would be recognized better when they were presented in the context of the entire body, rather than in isolation (corresponding to person recognition, Experiments 1 and 2).

EXPERIMENT 1

Method

Participants, Design, and Predictions

Eighty-three undergraduates (45 females) from a Midwestern university participated for course credit. Participants worked at computers to complete the experiment, which used a Target Gender (male or female) × Recognition Task (body part or whole body) × Participant Gender (male or female) mixed

model experimental design. Target gender and recognition task were the within-participant factors.

Procedure

After providing informed consent, participants completed parts and whole body recognition tasks adapted from Tanaka and Farah (1993) and Seitz (2002). Participants saw 48 full body images of White college-aged men and women presented in random order (Gervais et al., 2011b provided their stimuli). Specifically, a person was shown from head to knee, in a standing position, with eyes focused on the camera. Clothing style and facial expression were controlled; each person wore dark pants and a white tank top and had a neutral facial expression. Men and women were equal in size and attractiveness.

Following the protocol of Tanaka and Farah (1993) and Seitz (2002), an image of a man or a woman appeared in the middle of the computer screen for 5000 ms on each trial. A blank screen then appeared for 1000 ms prior to the recognition task. In the recognition task, participants were presented with two images, one on the left of the screen and one on the right of the screen. As in previous research (Seitz, 2002; Tanaka & Farah, 1993), one of the images was unmodified and contained the original image, and the other was a slightly modified version of the original image that contained a modified sexual body part (see Appendix section for sample stimuli used in the parts and whole recognition tasks). By key press, participants indicated which of the two images they had previously seen. Half the trials included a whole body recognition task; participants indicated whether they had seen the sexual body part from the original image or a slightly modified image in the context of an entire body. The other half of the trials included a body parts recognition task; participants indicated whether they had seen the sexual body part from the original image or a slightly modified image of the same body part without the context of the entire body.

Participants completed 12 practice trials before completing experimental trials. Forty-eight experimental trials were created by crossing target gender body (24 males and 24 females) and recognition task (recognition of original or modified sexual body parts in context of entire body [whole body recognition] or in isolation [body part recognition]). Recognition scores were created by dividing the number of correct responses within each condition by the total number of trials within that condition (representing the mean proportion correct). Thus, participants received a separate recognition score for female whole body recognition, female body part recognition, male whole body recognition, and male body part recognition.

Results

To test the predictions, recognition scores were submitted to a Target Gender (male or female) × Recognition Task (body part or whole body) × Participant Gender (male or female) mixed model Analysis of Variance (ANOVA). Target gender and recognition task were the within-participant factors. Two significant effects emerged from this analysis. A main effect of participant gender, $F(1, 81) = 6.55$, $p < .02$, $\eta_p^2 = 0.08$, revealed better recognition for female participants ($M = 0.61$, $SD = 0.09$) than male participants ($M = 0.55$, $SD = 0.10$). Additionally, consistent with the notion that women's bodies are reduced to their sexual body parts in perceivers' minds, whereas men's bodies are not, the hypothesized Target Gender × Recognition Task interaction emerged, $F(1, 81) = 5.32$, $p < .04$, $\eta_p^2 = 0.05$. As Figure 1 shows, male whole body recognition ($M = 0.60$, $SD = 0.20$) was better than male body part recognition ($M = 0.55$, $SD = 0.21$), $F(1, 81) = 2.20$, $p < .06$, $\eta_p^2 = 0.03$. By contrast, however, female body part recognition ($M = 0.62$, $SD = 0.21$) was better than female whole body recognition ($M = 0.56$, $SD = 0.20$), $F(1, 81) = 2.68$, $p < .04$, $\eta_p^2 = 0.03$. Within type of task (part or whole recognition), we also compared the recognition of male and female targets. These analyses revealed that female body part recognition was better than male body part recognition, $F(1, 81) = 3.85$, $p < .05$, $\eta_p^2 = 0.05$, whereas whole body recognition did not vary as a function of target gender, $F < 1.48$.

Discussion

The results of Experiment 1 support the sexual body part recognition bias hypothesis. Specifically, the results suggest that women's bodies are reduced to their sexual body parts in perceivers' minds with their sexual body parts recognized better when presented in isolation (body part recognition) than when presented in the context of entire bodies (whole body recognition). Men's sexual body parts were recognized better when presented in the context of entire bodies (whole body recognition) than in isolation (body part recognition). In other words, the global information about spatial relations among the sexual body parts facilitated recognition for men's but not women's sexual body parts. The finding for male bodies replicated previous studies using this procedure, in which only male bodies have been examined (Seitz, 2002; Tanaka & Farah, 1993; see also Reed et al., 2006). To our knowledge, this is the first work to link the cognitive processes that underlie the recognition of people's bodies to the suggestion from objectification theory that perceivers reduce women's bodies to their sexual body parts. This research also extends sexual objectification research, providing the first empirical evidence that women's bodies are reduced to their sexual body parts (at least at a basic cognitive level) in perceivers' minds; in other words, perceivers can easily recognize women's sexual body parts without the context of their entire bodies.

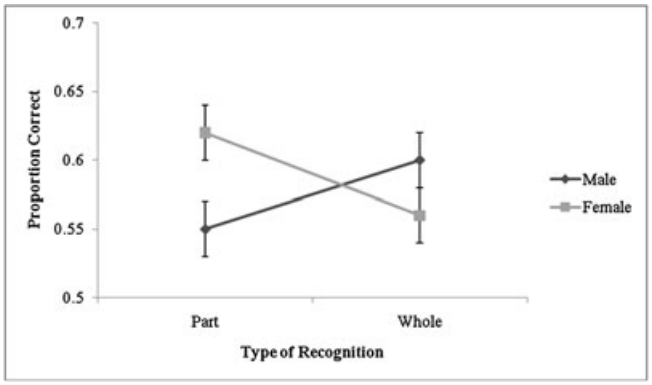

Figure 1. Proportion correct as a function of target gender and recognition task. Standard errors are represented in the figure with error bars

These effects were not qualified by participant gender. Both men and women reduced women's bodies to their sexual body parts. This finding is consistent with research and theory suggesting that sexually objectified representations of women are culturally shared by both men and women (Grabe et al., 2005). This finding is also consistent with existing empirical evidence on sexual objectification for men and women perceivers (e.g., Bernard et al., 2012a; Gervais et al., 2011a; Heflick et al., 2010; Vaes et al., 2011).

These results also provide preliminary support for our suggestion that local processing underlies the recognition of women's bodies. Following the logic of Förster and Dannenberg (2010; Förster, 2010, 2012) that local versus global processing can be proceduralized upon certain cues (here, a male or female body), objectification theory suggests that sexual objectification in the media and in interpersonal interactions may cause people to habitually reduce women's bodies to their sexual body parts. If this is indeed the case, then we would expect even ordinary, everyday women's bodies (rather than celebrities, Heflick & Goldenberg, 2009; women wearing provocative clothing, Gurung & Chrouser, 2007; or women with exaggerated sexual features, Bernard et al., 2012a; Cikara et al., 2010; Vaes et al., 2011) to be reduced to their sexual body parts. Indeed, the images in this work were nonsexualized college men and women, who were unknown to participants (see Appendix section). Furthermore, we predicted body part recognition would be similar to whole body recognition for female bodies, showing that the global features of the entire body were not required for recognition of sexual body parts. However, a close examination of the data shows that body part recognition was *better* than whole body recognition, suggesting that seeing women's sexual body parts in the context of the global, entire body interfered with recognition. To examine this proposed process further, we explicitly introduced local or global processing modes in Experiment 2.

EXPERIMENT 2

Method

Participants, Design, and Predictions

One hundred and forty-four undergraduates (72 females) from a Midwestern university participated for course credit. This experiment used a Target Gender (male or female) × Recognition Task (body part or whole body) Participant Gender (male or female) × Processing Objective (global or local) mixed model experimental design. Target gender and recognition task were the within-participant factors.

Procedure

The procedure was identical to that used in Experiment 1 with one exception. Prior to completing the computer task, participants completed an identification task in which either local or global processing objectives were introduced (Förster & Higgins, 2005). As in previous research, participants were presented with 16 trials in which a global letter (e.g., a large letter *H*) appeared on a computer screen. The horizontal or vertical lines making up the global letter were formed from five identical closely spaced local letters (e.g., several small letter *F*s). The targets included four global *H*s, *F*s, *L*s, and *T*s. Each global target was made up of local *H*s, *F*s, *L*s, or *T*s, (e.g., in one instance a global *H* included local *F*s, in another instance local *H*s). Participants in the *local processing objective* condition were asked to indicate the local letter across trials. Participants in the *global processing objective* condition were asked to indicate the global letter. We also asked participants to indicate their mood on a nine-point scale (1 = *very negative*; 9 = *very positive*) because mood has been linked to processing objective, and we wanted to rule out the possibility that mood effects could explain the sexual body part recognition bias. Finally, participants completed the same body recognition tasks as in Experiment 1. We compared the recognition of whole bodies and body parts for male and female targets.

Results

To examine the effectiveness of our manipulation, we examined whether participants in the local processing objective condition accurately identified the local letters and whether participants in the global processing objective condition accurately identified the global letters. We found 100% accuracy in both the local and global processing objective conditions.

To examine potential mood effects, we submitted mood ratings to a Target Gender (male or female) × Recognition Task (body part or whole body) × Participant Gender (male or female) × Processing Objective (global or local) mixed model ANOVA. Target gender and recognition task were the within-participant factors in this analysis. An unexpected effect of participant gender emerged, $F(1, 140) = 8.64$, $p < .01$, $\eta_p^2 = 0.10$, indicating that men ($M = 7.65$, $SD = 1.25$) were in more positive moods than women ($M = 6.65$, $SD = 1.73$). The main effect for processing objective and the interaction between processing objective and participant gender, however, did not approach significance, $Fs < 1$, indicating that mood is not a likely explanation for the sexual body part recognition bias.

To test predictions, recognition scores were submitted to a Target Gender (male or female) × Recognition Task (body part or whole body) × Participant Gender (male or female) × Processing Objective (global or local) mixed model ANOVA. Replicating the findings of Experiment 1, a significant Target Gender × Recognition Task interaction emerged, $F(1, 140) = 8.01$, $p < .01$, $\eta_p^2 = 0.05$. Again, male whole body recognition ($M = 0.61$, $SD = 0.21$) was better than male body part recognition ($M = 0.54$, $SD = 0.21$), $F(1, 140) = 10.34$, $p < .0001$, $\eta_p^2 = 0.07$, whereas female body part recognition ($M = 0.62$, $SD = 0.21$) was equal to female whole body recognition ($M = 0.59$, $SD = 0.21$), $F(1, 140) = 1.57$, $p = .21$, $\eta_p^2 = 0.01$. Furthermore, female body part recognition was better than male body part recognition $F(1, 143) = 9.97$, $p < .01$, $\eta_p^2 = .07$. For whole body recognition, there was not a significant difference between recognition for male targets and female targets, $F < 1.05$.

Consistent with predictions, this effect was qualified by processing goal as evidenced by a significant Target Gender × Recognition Task × Processing Objective interaction,

$F(1, 140) = 3.98$, $p < .05$, $\eta_p^2 = 0.03$. As the right half of Figure 2 shows, in the local condition, male whole body recognition ($M = 0.61$, $SD = 0.20$) was better than male body part recognition ($M = 0.51$, $SD = 0.20$), $F(1, 140) = 8.16$, $p < .01$, $\eta_p^2 = 0.10$, whereas female body part recognition ($M = 0.65$, $SD = 0.22$) was better than female whole body recognition ($M = 0.57$, $SD = 0.21$), $F(1, 140) = 4.89$, $p < .03$, $\eta_p^2 = 0.06$. Additionally, female body part recognition was better than male body part recognition, $F(1, 140) = 15.40$, $p < .001$, $\eta_p^2 = 0.17$. Whole body recognition, however, was the same for male and female targets, $F < 1.16$.

As the left half of Figure 2 shows, in the global condition, male whole body recognition ($M = 0.62$, $SD = 0.22$) was better than male body part recognition ($M = 0.57$, $SD = 0.22$), $F(1, 140) = 2.49$, $p < .05$, $\eta_p^2 = 0.03$, and female whole body recognition ($M = 0.61$, $SD = 0.20$) was better than female body part recognition ($M = 0.58$, $SD = 0.20$), but this did not reach conventional levels of significance, $F < 1$. Importantly, even though global processing did not completely reverse participants' biased recognition of sexual body parts it effectively counteracted the sexual body part recognition bias.

Discussion

The results from Experiment 2 were consistent with hypotheses. They offered additional support for the hypothesis that women's bodies are reduced to their sexual body parts in perceivers' minds. Women's sexual body parts were recognized similarly in the context of entire bodies (whole body recognition) and in isolation (body part recognition), whereas men's sexual body parts were recognized better in the context of entire bodies (whole body recognition) than in isolation (body part recognition). By extending and elaborating Experiment 1, the findings from Experiment 2 were qualified by processing objective. Specifically, in the local processing condition, for women's sexual body parts, there was better body part recognition than whole body recognition, whereas for men's sexual body parts, there was better whole body recognition than body part recognition. In the global processing condition, however, no significant effects emerged for women, although the means were in the expected direction. Moreover, replicating Experiment 1, we found no evidence of gender differences in Experiment 2, which is consistent with the idea that both men and women reduce women's bodies to their sexual body parts.

To our knowledge, this is the first research to investigate the cognitive process behind reducing women to their sexual body parts or sexual objectification more generally. Specifically, Experiment 2 revealed that recognizing women's sexual body parts in isolation or in the context of entire bodies is systematically linked to local processing. Notably, the results from Experiment 2 also suggest a possible antidote for perceivers reducing women's bodies to their sexual body parts. When global processing objectives were salient, the sexual body part recognition bias was alleviated, even though it did not completely produce a processing style in favor of the entire body.

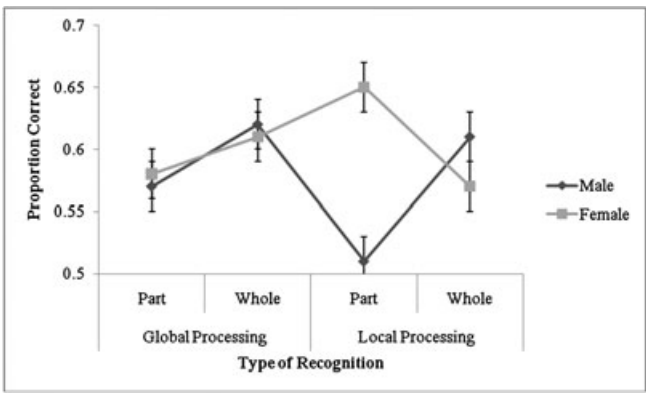

Figure 2. Proportion correct as a function of target gender, recognition task, and processing objective. Standard errors are represented in the figure with error bars

GENERAL DISCUSSION

The present work tested the sexual body part recognition bias hypothesis or the suggestion that women's bodies may be reduced to their sexual body parts in perceivers' minds. By adopting research on parts versus whole body recognition from cognitive psychology (e.g., Seitz, 2002; Tanaka & Farah, 1993), we predicted and found that women's sexual body parts presented in isolation were recognized similarly to and in some cases better than women's sexual body parts presented in the context of the entire body. This pattern of findings is strikingly similar to research on object recognition, showing that entire objects are not required for the recognition of object parts. As well, perceivers did not reduce men's bodies to their sexual body parts. Corresponding with previous research that has only examined the recognition of men's bodies (Seitz, 2002; Tanaka & Farah, 1993), men's sexual body parts were recognized better in the context of an entire body than in isolation. By extending previous research that has focused on facial recognition (Tanaka & Farah, 1993) or nonsexual body part recognition (e.g., legs, Seitz, 2002), men's sexual body (versus nonsexual or facial) parts were recognized better when presented in the context of an entire body than in isolation.

By extending and elaborating both object and person recognition and sexual objectification research, we also provided evidence of a potential mechanism for the sexual body part recognition bias effect. We suggested that one consequence of seeing sexually objectified women in the media and in interpersonal interactions is that perceivers adopt a local focus for women's bodies, focusing on their sexual body parts, rather than their entire bodies. Consistent with this notion, global information, which is spatial information about relations among the parts provided by recognizing body parts within the context of the entire body, was not required to accurately recognize women's sexual body parts. In fact, in Experiment 1, people recognized women's sexual body parts better (rather than simply equal to) in isolation than in the context of the entire body. In some respects, then the global aspects of the entire body appear to interfere with the recognition of women's sexual body parts.

We directly examined whether local processing modes contributed to and global processes modes interfered with the sexual body part recognition bias in Experiment 2. Consistent with the idea that local processing underlies the bias, we found that under local processing modes, women's sexual body parts were recognized better in isolation than in the context of the entire body. Global processing objectives, however, tempered this effect.

It is also important to note that men's bodies were not reduced to their sexual body parts by perceivers in either experiment. Even when situations may have elicited a focus on the parts of men, men's sexual body parts were recognized better in the context of entire bodies than in isolation. This suggests that men's bodies are particularly resistant to being reduced to their sexual body parts possibly because of the fact that, in general, global processing has precedence over local processing (Navon, 1977). This argument is based on the idea that global processing not only represents the preferred mode (see Navon's global precedence hypothesis) but also is more robust with respect to interference effects (such as mental fatigue, see van der Linden & Eling, 2006). Given that the default option for women's bodies is local processing, it may therefore be relatively easy to induce a change toward global (entire body) processing. To the contrary, the default option for men's bodies is global processing, which also happens to be the preferred processing mode in most tasks. It may be more difficult to persuade observers to use the alternative (local) mode of processing for men's bodies. In other words, given the overall preference for global processing, it may be easier to shift the processing mode for female bodies toward the global pole than to shift the processing mode for male bodies toward the local pole. Furthermore, this finding is also consistent with research showing that men are objectified to a much lesser degree (Fredrickson & Roberts, 1997; Gervais et al., 2011b) and with less adverse consequences (Bernard et al., 2012a; Heflick et al., 2010; Vaes et al., 2011) than women. However, if the physical features of men change, for example, if men were depicted in an extremely sexy manner, it is possible that the sexual body part recognition bias would emerge for men similarly to women.

Although we revealed evidence for a common mechanism—local processing—for both men and women, we are not arguing that the mechanisms of sexual objectification are always identical for the different genders. There may be situations when sexual objectification is driven by somewhat different mechanisms. For example, heterosexual men may focus on the sexual body parts of women because of sexual attraction motives, whereas women may focus on the sexual body parts of other women because of social comparison motives. Future research could manipulate attraction or comparison motives and measure sexual body parts recognition.

In summary, this research showed a sexual body part recognition bias with perceivers reducing women's bodies to their sexual body parts. In addition, the results of these experiments converge on the idea that women's bodies are reduced to their sexual body parts in perceivers' minds because of local processing. That is, local processing contributed to the sexual body part recognition bias, whereas global processing somewhat tempered the effects. Finally, consistent with previous research, both male and female perceivers showed the sexual body part recognition bias toward female bodies.

IMPLICATION AND FUTURE DIRECTIONS

Focusing on the processes underlying the sexual body part recognition bias extends sexual objectification theory in important ways. These experiments suggest that perceivers see women in a manner consistent with objectification theory by reducing women's bodies to their sexual body parts. Although this may seem self-evident, most research has focused on the causes and consequences of sexual objectification for recipients (Moradi & Huang, 2008) and the *consequences of* rather than *whether* and *why* people reduce women's bodies to their sexual body parts in the first place (e.g., Bernard et al., 2012a; Cikara et al., 2010; Vaes et al., 2011).

The present research provides empirical evidence for a suggestion originally proposed by objectification theory that women are reduced to their sexual body parts or functions (Fredrickson & Roberts, 1997) and shows that this occurs for the recognition of women's bodies at a basic cognitive level. Building on these initial findings, future research may consider whether the sexual body part recognition bias is driven by processes that occur at perception, encoding, retrieval, or recognition. Signal detection theory could be used to tease these potential contributors apart.

As well, only a handful of studies have considered the motives and processes that underlie objectification. Of these studies, many have examined appearance-focused objectification (e.g., Heflick & Goldenberg, 2009; Heflick et al., 2010), for example, regarding physical appearance attributes as more important than other person attributes (e.g., physical fitness, Strelan & Hargreaves, 2005; Gurung & Chrouser, 2007). However, recent research suggests that objectification—treating someone as an object—is a complex phenomenon that may have multiple indicators. For example, Gruenfeld et al. (2008) found that low power individuals were generally instrumentalized, and low power women were sexually instrumentalized and viewed as means toward high power men's sexual ends. In a related vein, Gervais et al. (2011b) found that women's bodies were seen as fungible (i.e., interchangeable) with other similar bodies. Future research should examine other ways that women may be seen and treated as sexual objects (Nussbaum, 1999).

Finally, the idea that target and perceiver features that contribute to a focus on local details may exacerbate objectification, whereas features that contribute to a focus on global wholes may attenuate objectification, may be tested in additional ways for future research. For example, another way to examine whether local processing mediates the sexual body part recognition bias would be to present participants with bodies of men and women and then measure (instead of manipulate) global and local processing using a Navon (1977) task. This global versus local focus may also provide a theoretical framework for existing and future objectification research. Target features that trigger a focus on the local parts of a situation may enhance

sexual objectification compared with target features that prompt a focus on the global entire situation. For example, provocative clothing may naturally narrow people's attention to women's sexual body parts. Consistently, Gurung and Chrouser (2007) found that women were more sexually objectified when they wore provocative clothing that accentuated their sexual body parts. Similarly, Gervais et al. (2011b) found that people had difficulty matching the bodies and faces of women with exaggerated sexual body parts. Future research should consider additional target features that may cause a focus on the sexual body parts, causing women to be sexually objectified. As an example, particular body movements could draw attention to the body parts of women, laying the foundation for sexual objectification.

Existing research that focuses on the perceiver features that moderate sexual objectification also can be interpreted as evidence for the idea that a focus on the local parts, rather than global entire women causes sexual objectification. Self-objectification, for example, may narrow people's attention to sexual body parts, causing them to focus on their own, as well as other people's sexual body parts. Consistently, Strelan and Hargreaves (2005) found that when perceivers self-objectified, they not only considered their own appearance as more important than other attributes but also did the same for other people (see also Bernard, Gervais, Allen, Campomizzi, & Klein, 2012b). Additionally, priming sex goals may cause people to focus on the sexual aspects and ignore other aspects of their subordinates. Gruenfeld et al. (2008) found that powerful people wanted to work with sexually attractive subordinates more than unattractive subordinates but only when sex was primed beforehand. This is consistent with other considerations of power that suggest that power leads people to more actively pursue their goals and ignore irrelevant aspects of the situation (Guinote, 2007a, 2007b). Finally, when people are explicitly asked to focus on the appearance of others, traits that are related to being a person may not even come to mind. Heflick and Goldenberg (2009) found that celebrities (e.g., Sarah Palin and Angelina Jolie) were objectified when participants focused on their appearance, rather than the entire person (see also Heflick et al., 2010). Although these studies differ in several regards, they are consistent with the idea that situations that initiate a focus on local parts, rather than the global whole should lead women to be objectified.

Additionally, scholars have long noted that people from many different social groups may be recognized as objects or reduced to their parts (e.g., Foucault, 1989; Gruenfeld et al., 2008; Haslam, 2006; Marx, 1964). This work may be extended to consider the objectification of people from other low status groups, such as racial minorities, people with disabilities, gay men and lesbians, the elderly, homeless, and medical patients. People from these groups may be objectified when features of the perceiver or target cause people to focus on their body parts (or other defining parts), rather than the entire person. This objectification may also be an important correlate of infrahumanization (Vaes, Paladino, Castelli, Levens, & Giovanazzi, 2003) and dehumanization (Haslam, 2006; Vaes et al., 2011). When people reduce others to their parts (e.g., sexual body parts, disability parts, symptoms), for example, they also may be less likely to attribute secondary emotions to them and more likely to view them as interchangeable with similar people.

LIMITATIONS

An unanswered question is whether people would recognize women's body parts, regardless of whether the body parts were sexual (e.g., chests and waists, as they were in the main experiments) or nonsexual (arms and feet). We cannot definitely answer this question with the current data because the purpose of this paper was to compare the recognition for sexual body parts for women and men. Specifically, considering sexual body parts was most relevant to our examination of sexual objectification theory. To fully consider this possibility, future research should examine recognition of sexual and nonsexual body parts. The potential implications to this finding are intriguing. If the sexual body part recognition bias emerges for sexual and nonsexual body parts, then a general global versus local processing mechanism may explain the effects. However, if the sexual body part recognition bias only emerges for sexual body parts, then a more motivated sex-focused process may be at work. Importantly, regardless of whether women's bodies are reduced to their body parts in general or sexual body parts in particular, this would still be akin to object recognition in which women's body parts can be recognized without the global context of the entire body. Future experiments should further disentangle these competing possibilities.

CONCLUSION

Scholars have long proposed that women are often represented as sexual objects, particularly in the media. This scholarship has been extended beyond the academy to the public, and consequently, the "objectifying, male gaze" and "sexual object" are terms that are often heard in everyday conversation. This knowledge has led to some important advances for women. Fifty years ago, for example, it was common for women to be blatantly sexualized in the work place. Since then, however, individuals and policy makers have identified the problematic nature of sexual objectifying behaviors and have adopted policies that limit overt sexual objectification.

Yet, society still condones less overt forms of sexual objectification. This acceptance of objectification is implicit in adages that "You can look as long as you don't touch," and a common response to objectifying behaviors, such as sexual gazes or cat calls, is that "boys will be boys." Furthermore, these maxims primarily focus on men, without considering the possibility that women may sexually objectify other women and the consequences of such perceptions of women. These beliefs may lay the foundation for people reducing women's bodies to their sexual body parts, and in a sense, seeing women in ways that strikingly resemble the

ways in which ordinary, everyday objects are seen. These representations may set the stage for seeing (e.g., through the objectifying gaze) and treating women as sex objects in interactions.

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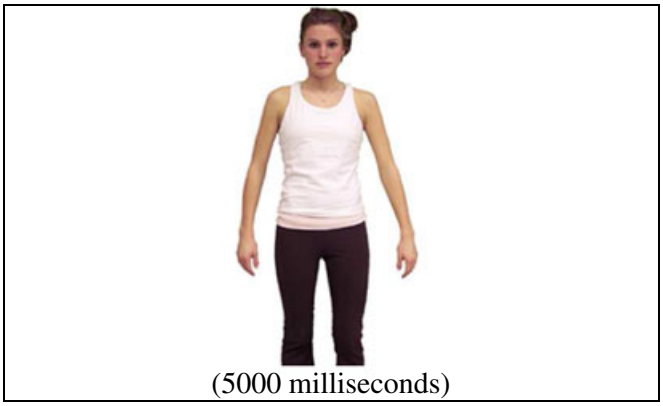
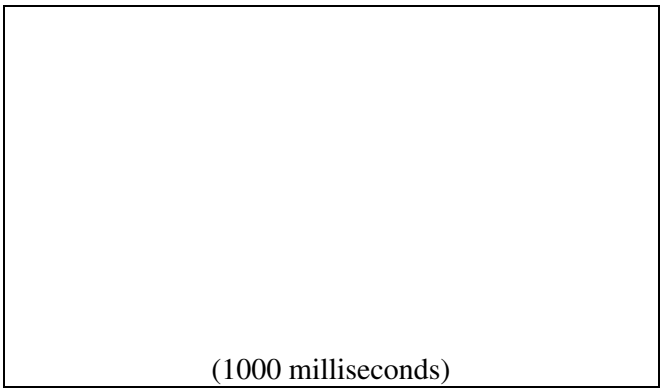
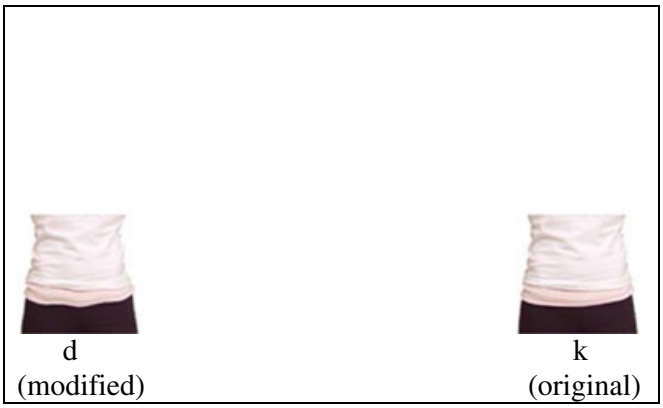
APPENDIX
SCREENS FROM AN EXAMPLE TRIAL







[1]This rationale assumes that sexual (versus nonsexual) body parts are initially attended to similarly for male and female bodies for both male and female perceivers. By utilizing a dot-probe task (MacLeod, Mathews, & Tata, 1986) with a separate sample of 76 undergraduates (45 females) from a Midwestern university, we presented 24 experimental trials with a subset of the stimuli from our experiments. On each trial, a black fixation cross was presented in the middle of a white screen for 1500 ms. Then, a male or female target appeared in the upper left, upper right, lower left, or lower right quadrant of the screen. Each target remained on the screen for 200 ms. When the target was removed, the participant's task was to indicate whether or not a dot appeared on the screen. In two-thirds of the trials, the dot appeared in a location previously occupied by a target's sexual body part (i.e., waist or chest) or nonsexual body part (i.e., arm or leg). In the other third of the trials, a dot did not appear. The participants were

instructed to press the space bar key if they saw the dot. If participants directed their attention to sexual body parts, then they should be quicker to press the space bar when the dot appeared where the sexual body parts were than when the dot appeared where the nonsexual body parts were. Reaction times were submitted to a Target Gender (male or female) × Type of Body Part (sexual or nonsexual) × Participant Gender (male or female) mixed model Analysis of Variance. Target gender and type of body part were the within-participant factors. The only significant effect to emerge from this analysis was an effect of type of body part. Replicating previous research (Johnson & Tassinary, 2005) with the stimuli used in our experiments, $F(1, 73) = 7.84$, $p < .0066$, $\eta_p^2 = 0.11$, sexual body parts ($M = 333.11$, $SD = 52.19$) were attended to more quickly (as indicated by the lower reaction time) than nonsexual body parts ($M = 344.97$, $SD = 61.42$). Importantly, supporting the notion that waists and chests are attended to similarly (at least initially at 200 ms) for male and female bodies and for male and female participants, no significant effects emerged for target gender, participant gender, or the two-way or three-way interactions, Fs < 2.69.

[2]To examine whether recognition scores differed from chance (0.50), we submitted the mean scores for female body part recognition, female whole body recognition, male body part recognition, and male whole body recognition to separate independent *t*-tests. We found that female body part recognition ($t(1, 82) = 4.97$, $p < .0001$), male body part recognition ($t(1, 82) = 2.29$, $p < .03$), female whole body recognition ($t(1, 82) = 2.82$, $p < .01$), and male whole body recognition ($t(1, 82) = 4.50$, $p < .0001$) were significantly above chance.

[3]Again, to examine whether recognition scores differed from chance (0.50), we submitted the mean scores for female body part recognition, female whole body recognition, male body part recognition, and male whole body recognition to separate independent *t*-tests. As in Experiment 1, we found that female body part recognition ($t(1, 143) = 6.66$, $p < .0001$), male body part recognition ($t(1, 143) = 2.16$, $p < .04$), female whole body recognition ($t(1, 143) = 5.06$, $p < .0001$), and male whole body recognition ($t(1, 143) = 6.54$, $p < .0001$) were significantly above chance.