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Face and Body: Independent Predictors of Women's Attractiveness

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Abstract Women's faces and bodies are both thought to provide cues to women's age, health, fertility, and personality. To gain a stronger understanding of how these cues are utilized, we investigated the degree to which ratings of women's faces and bodies independently predicted ratings of women's full-body attractiveness. Women came into the lab not knowing they would be photographed. In Study 1 ($N = 84$), we photographed them in their street clothes; in Study 2 ($N = 74$), we photographed women in a solid-colored two-piece swimsuit that revealed their body shape, body size, and breast size. We cropped each woman's original photo into an additional face-only photo and body-only photo; then, independent sets of raters judged women's pictures. When dressed in their original clothes, women's face-only ratings were better independent predictors of full-body attractiveness ratings than were their body-only ratings. When cues displayed in women's bodies were made conspicuous by swimsuits, ratings of faces and bodies were similarly strong predictors of full-body attractiveness ratings. Moreover, women's body mass index and waist-to-hip ratio were tied to ratings of women's body attractiveness, with waist-to-hip ratio more important among women wearing swimsuits than among women wearing their original clothes. These results suggest that perceivers attend to cues of women's health, fertility, and personality to the extent that they are visible.

Keywords Body shape · Attractiveness ratings · Face · Body · Female attractiveness

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Introduction

Women's faces and bodies advertise socially-relevant information. Women's faces, for example, provide significant cues of their health, age, femininity, and personality traits (Boothroyd et al., 2008; Gray & Boothroyd, 2012; Gangestad & Scheyd, 2005; Kramer et al., 2012). Women's bodies, particularly their body shape as indexed by waist-to-hip ratio and their body size as indexed by body mass index, provide significant cues of their current fertility, pregnancy status, and ability to support fetal development (Jasienska et al., 2004; Lassek & Gaulin, 2008; Singh, 1993; Tovée et al., 1998; Zaadstra et al., 1993). Some information about women, such as their sexual attitudes, can be gleaned from both women's faces and bodies (Kramer et al., 2012). Observers tend to rate as attractive those women who display cues of being young, healthy, kind, and of high reproductive potential, whether the source of the cues is the face, body or both (Gangestad & Scheyd, 2005). Moreover, manipulating women's body shape and women's faces—to make them appear younger, for example—affects observers' judgments of their attractiveness, healthiness, fertility, and potential to be a good mother (Furnham et al., 2004).

Various lines of research suggest that women's faces and bodies provide somewhat overlapping but also uniquely valuable pieces of information. First, ratings of women's face-only

attractiveness are correlated with ratings of their body-only attractiveness, but the correlations are just moderate in magnitude (Peters et al., 2007; Thornhill & Grammer, 1999), which suggests that cues from the face and cues from the body are not entirely redundant. Second, findings from studies that ask men to evaluate women's faces and bodies imply that female faces and bodies provide non-redundant information. For example, in eye-tracking studies, men attend not just to women's faces but also to their breasts and waist-hip area (Dixson et al., 2011a); in fact, when men view nude images of women, their attention is biased away from the face and toward the chest and pelvic regions (Nummenmaa et al., 2012). Moreover, when men consider women in the context of short-term relationships, for which current fertility is of primary importance, they attend more to women's bodies than when they consider women in the context of a long-term relationship (Confer et al., 2010; Lu & Chang, 2012). Third, support for the premise that women's faces and bodies provide multiple pieces of essential information is indicated in research showing that ratings of women's overall (full-body) attractiveness are independently influenced by ratings of both their bodies and their faces (Currie & Little, 2009; Peters et al., 2007).

Although both face and body predict women's overall attractiveness, several studies suggest that women's faces are a better predictor of overall attractiveness than their bodies are (Alicke et al., 1986; Currie & Little, 2009; Furnham et al., 2001; Mueser et al., 1984; Peters et al., 2007). Mueser et al. (1984) obtained face, body, and full-body shots of 15 women in typical dress and asked independent sets of seven men to rate each set of target pictures; they found that targets' facial attractiveness ratings accounted for slightly more variance in overall attractiveness than targets' body attractiveness did. Peters et al. asked 12 men to rate the overall attractiveness of 80 women dressed in shorts and a t-shirt and the men's ratings were correlated with ratings from another set of judges who had previously rated the women's faces and bodies; the researchers found that women's faces accounted for more variance in overall attractiveness than women's bodies did. Currie and Little attempted to eliminate clothing as a confound by photographing 10 women in their bra and underwear, which they colored black electronically. Then, 127 men rated the 10 women three times: their faces, their bodies, and combined images of their face and body. Once again, ratings of women's faces accounted for more variance in combined face-and-body ratings than did ratings of women's bodies. In yet another design, Furnham et al. took a single woman's image and manipulated it to create eight different images, each with one of four levels of body shape (waist-to-hip ratio) and one of two levels of facial attractiveness; the facial attractiveness manipulation accounted for more variance in ratings of the woman's attractiveness than did the manipulation of her waist-to-hip ratio.

One potential inference from the previously described studies is that the face offers more information, or more important pieces of information, about a woman than does her body. Another non-mutually exclusive possibility, as noted by Peters et al. (2007), is that cues displayed in women's bodies may be masked, highlighted, or deemphasized by women's choice of clothing. For example, although Currie and Little (2009) photographed women in their undergarments, it is possible that the women wore undergarments (particularly bras) that accentuated or minimized their shape or size. Moreover, the three pictures of each woman in Currie and Little's (2009) study were judged by the same set of raters. In the current set of studies, we attempted to extend previous work by comparing the relative importance of face versus body for predicting overall attractiveness under conditions that differed in the degree to which bodies were masked. Specifically, we photographed one sample of women in their original clothing and hairstyle and we photographed a second sample of women with their hair pulled back and wearing a lab-supplied, solid-colored two-piece swimsuit. To minimize error, we acquired large samples of target women and had each of their three photos evaluated by a different set of raters. Our first hypothesis, in accord with previous research, was that ratings of women's face-only attractiveness and ratings of women's body-only attractiveness would both independently predict ratings of their full-body attractiveness. Our second hypothesis was that body-only attractiveness would predict full-body attractiveness more when women's body attributes were clearly visible (e.g., in swimsuits) than when their body attributes were potentially masked, accentuated or minimized (e.g., in women's chosen street clothes). Third, we hypothesized that waist-to-hip ratio and body mass index, which have been tied to women's attractiveness (Dixson et al., 2011a; Singh, 1993; Singh et al., 2010; Swami et al., 2007; Tovée et al., 1998), would be strong predictors of women's body attractiveness. Because observers also attend to women's breast size (Dixson et al., 2011a) and because men have systematic preferences about optimal breast size (Dixson et al., 2011b; Zelazniewicz & Pawlowski, 2011), we also investigated the degree to which women's breast size was related to ratings of women's body attractiveness.

Method

Participants

We recruited participants through lower-level and upper-level psychology courses at a public university in the U.S. We advertised our research as an investigation of female friendship dynamics. Each woman was instructed to bring a casual or close same-sex friend with them to the study. Study 1 women ($N = 86$; $M_{age} = 19.8$, range 18–24) were recruited during the fall of 2010. Study 2 women ($N = 74$; $M_{age} = 20.7$, range 19–24) were recruited during the fall of 2011. Although women came into the lab in dyads as part of a separate study on how similarities and

discrepancies in attractiveness are related to rivalry in women's friendships (Bleske-Rechek et al., 2014), the present analysis utilized each individual woman's data as the unit of analysis.

Measures and Procedure

Female dyads came into the lab knowing only that we were interested in studying female friendship dynamics. We recruited participants by going into large introductory level Psychology classes and offering the study to women in return for partial credit toward their course research participation requirement. Women were warned the study would be offered for a limited time. Interested women wrote down their name and email address and the researchers subsequently contacted them to schedule a time for them to visit the lab with a friend. We intentionally did not tell women that they would be measured and photographed (Study 1 in street clothes; Study 2 in swimsuits). First, we did not want women to select into the studies or select a friend into the studies based on their willingness to be measured and photographed. Second, we did not want women to dress differently from usual or engage in extra self-preparation in anticipation of a photo shoot. Participant recruitment for each study occurred over mid-October and November of successive fall semesters; because of the intervening spring semester and summer, women in Study 2 were unlikely to have heard about the first study and, due to the winter weather common to both recruitment periods, not a single woman in either study wore a skirt or shorts to the lab.

Upon their arrival to the lab, we told women that, as part of the study, we were interested in measuring their bodies and photographing them. We assured them that their photos would be used for research purposes only. One pair in Study 1 did not consent to having their pictures taken; all other women consented to photographs. Each woman was photographed from a set distance under constant lighting and was asked to retain a neutral expression. In Study 1, each woman was photographed in her original street clothes. In Study 2, each woman was photographed with her hair pulled back and wearing a lab-supplied two-piece, royal blue swimsuit (see Fig. 1). Very few women wore makeup other than mascara and lip gloss. We purchased multiple suits of varying sizes and sanitized them after each use. After the photographs, researchers took participants' height and weight and measured their waist, hip, and chest circumference. Chest circumference was taken at the point where breasts were fullest. To minimize participants' discomfort given that we had not forewarned them about the photographs and measurements, only one researcher (always one of two female researchers) took the measurements. Obtaining only one set of measurements inhibited us from establishing measurement reliability; however, we established inter-rater reliabilities of .98 in a previous study out of our lab that utilized two researchers' measurements of women's chest, waist, and hip circumference (Bleske-Rechek et al., 2011).

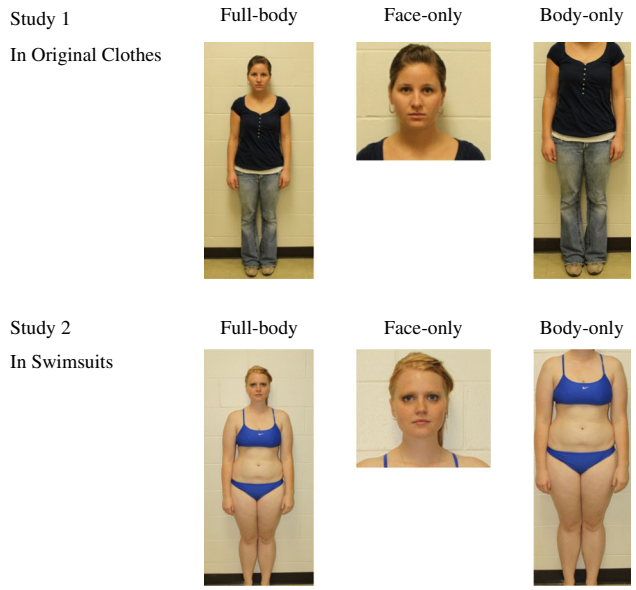

Fig. 1 Preparation of women's photos in Study 1 and Study 2

After the pictures and anthropometric measurements, friends were led to different rooms to complete a larger questionnaire that included demographic information, various anthropometrics such as their height, weight, and bra cup size (AA, A, B, C, D, DD, >DD), a number of filler items, and a variety of self-assessment scales and friendship measures that did not pertain to the current analysis. One specific self-assessment item on the questionnaire was important for the current analysis: "Compared with other women your age, how physically attractive are you?" Women indicated their response using a 9-point rating scale ranging from 1 (*Much Less Attractive*) to 9 (*Much More Attractive*). When women had completed their questionnaire, we offered them a written debriefing form and a coupon for a free sandwich at a local sandwich shop and we asked that they not talk about the study to others.

When all women had been recruited and photographed, we prepared their photos. As displayed in Fig. 1, each woman's full-body photograph was cropped into a face shot and a body shot. In Study 1, researchers constructed three separate slideshows of all the women (one slideshow of full-body pictures, one slideshow of face-only pictures, and one slideshow of body-only pictures). Women were placed into the slideshow in a random, unpaired order that was the same for each slideshow.

Students at a large public university in the western United States served as raters of the pictures in Study 1. These students were primarily first- and second-year students (M age = 19.31 - years) who judged the photos in return for research participation credits offered in their Psychology classes. Photo rating sessions were conducted in medium-sized classrooms (seating for 40 students), with four to 10 raters at each session. Raters were told it was a study of naïve observers' judgments of others' attractiveness.

Table 1 Descriptive statistics for variables of interest

Study 1: In original clothes	*N*	*M*	*SD*	Range
WHR	86	0.85	0.09	0.69–1.03
BMI	86	24.07	4.23	17.75–40.60
Chest circumference (inches)	86	35.96	3.41	30.50–45.50
Cup size[a]	84	3.5	1.13	2.00–6.00
Judges' ratings of attractiveness[b]				
Full-body (12 M, 16 F raters, $\alpha = .95$)	84	4.25	1.15	1.86–6.61
Face-only (15 M, 15 F raters, $\alpha = .97$)	84	3.90	1.20	1.50–6.53
Body-only (15 M, 15 F raters, $\alpha = .97$)	84	4.54	1.13	1.79–7.24
Study 2: In swimsuits	***N***	***M***	***SD***	**Range**
WHR	74	0.80	0.06	0.69–0.93
BMI	74	24.39	3.67	17.03–37.27
Chest circumference (inches)	74	37.28	3.16	31.00–46.00
Cup size	73	3.59	1.07	2.00–7.00
Judges' ratings of attractiveness				
Full-body (12 M, 19 F raters, $\alpha = .96$)	72	4.51	1.10	2.26–6.97
Face-only (12 M, 22 F raters, $\alpha = .97$)	71	4.07	1.22	1.91–6.32
Body-only (14 M, 26 F raters, $\alpha = .98$)	72	4.71	1.47	2.05–7.15

[a] Absolute range in cup size was 1–7, where each integer increase corresponded to a stepwise increase in cup size, from AA (1) to >DD (7)

[b] Absolute range in attractiveness ratings was 1–9

The raters were instructed to sit toward the front of the room, where the PowerPoint slideshow was projected on a large screen. Raters viewed each picture for five seconds and for each woman they responded to the question, "Compared to other women her age, how physically attractive is this woman (this woman's face, this woman's body)?" Students recorded their responses on paper sheets using a 9-point scale ranging from 1 (*Much Less Attractive*) to 9 (*Much More Attractive*).[1] Raters were asked to refrain from talking during the 15-min session. A different set of raters viewed each slideshow—that is, we gathered three independent sets of raters (see Table 1). Raters did not know that some of the women in the slideshow were friends of one another.

For Study 2, in which the target women wore swimsuits, researchers again constructed three separate slideshows of the women (one slideshow of full-body pictures, one slideshow of face-only pictures, and one slideshow of body-only pictures). Researchers generated a new random order and placed the women, unpaired, into each slideshow. Students at a large public university in the southeastern United States served as raters of these pictures. Again, students were told it was a study of naïve observers' impressions of others' attractiveness and they rated the photos in return for research participation credits offered in their lower level Psychology classes. The rating sessions were conducted in small and medium sized classrooms with groups of four to eight student raters per session. In Study 2, students rated both the physical attractiveness and sexiness of each picture they viewed, again using 9-point scales (coded as 1–9). Attractiveness and sexiness ratings were redundant ($rs = .99$), but because Study 1 included physical attractiveness ratings only, we chose to not combine ratings of physical attractiveness and sexiness in Study 2; we report results for physical attractiveness only. As in Study 1, the raters were asked to refrain from talking during the 15-min session and a different set of raters viewed each slideshow (see Table 1). Raters did not know they were looking at pairs of friends.

Male raters and female raters both showed high inter-rater reliability ($\alpha s > .90$) but even higher inter-rater reliabilities when combined (see Table 1). Moreover, the pattern of correlations among face, body, and full-body attractiveness ratings was consistent by sex of judge; thus, we combined male and female judges' ratings for all analyses reported below.

Results

Table 1 shows descriptive statistics for the two samples of women. As we expected on the basis of previous research (Peters et al., 2007; Thornhill & Grammer, 1999), ratings of women's face-only attractiveness and body-only attractiveness were positively correlated (Study 1: $r = .62$, $p < .001$; Study 2: $r = .45, p < .001$). In further support of the validity of the datasets, women's perceptions of their own attractiveness (relative to other women of their age) correlated significantly with outside judges' perceptions of their face-only, body-only, and overall attractiveness (mean $r = .32$, $ps < .01$), which again is consistent with past research (Bleske-Rechek & Lighthall, 2010).

Hypothesis 1 Face and Body as Independent Predictors of Full-Body Attractiveness

Our first hypothesis was that ratings of face-only attractiveness and ratings of body-only attractiveness would serve as independent predictors of full-body attractiveness. To test this hypothesis, we conducted standard multiple regression analyses with full-body attractiveness ratings regressed on face-only ratings and body-only ratings. Table 2 shows the zero-order correlations and regression coefficients. Both face ratings and body ratings had statistically significant zero-order correlations with ratings of full-body attractiveness, as displayed in Figs. 2 and 3. In support of Hypothesis 1, both face and body also had statistically significant partial (independent) effects in the full model. In Study 1, face and body ratings combined accounted for 82 % of the variance in full-body ratings and in Study 2 they accounted for 84 % of the variance in full-body ratings: Study 1: $F(2,$

[1] To check on our request to women that they maintain a neutral expression, outside judges also rated the degree to which each woman was smiling; mean scores were 3.1 on a scale that ranged from 1 to 9. Controlling for ratings of women's smiling did not alter the findings we reported in the text.

Table 2 Predicting full-body attractiveness from face and body attractiveness ratings

Study 1: In original clothes					
	Zero-order *r*			*β*	*b*
	Face	Body	Full-body		
Face		.62***	.89***	.75***	.71
Body			.69***	.23***	.23
$R^2 = .82$					
Study 2: In swimsuits					
	Zero-order *r*			*β*	*b*
	Face	Body	Full-body		
Face		.45***	.74***	.47***	.42
Body			.82***	.61***	.45
$R^2 = .84$					

β standardized regression coefficient, *b* unstandardized regression coefficient

*** $p < .001$

81) = 186.44, $p < .001$, $R^2 = .82$; Study 2: $F(2, 68) = 178.46$, $p < .001$, $R^2 = .84$.

Hypothesis 2 Contribution of Body-Only Ratings to Overall Attractiveness in Original Clothes Versus Swimsuits

Our second hypothesis was that body attractiveness would better predict full-body attractiveness when women's body attributes were clearly visible (e.g., in swimsuits) than when their body attributes could be masked, accentuated, or minimized (e.g., in street clothes). To test this hypothesis, we conducted sequential regression analyses. In the first step of each model, we entered face attractiveness ratings; on the second step, we entered body attractiveness ratings. The results of these analyses are shown in Table 3 and provide support for Hypothesis 2. In Study 1, when women were in their original street clothes, ratings of body attractiveness accounted for an additional 3 % of the variance in full-body ratings (face ratings having already accounted for 79 % of the variance). In Study 2, when women were in the swimsuit, ratings of body attractiveness accounted for an additional 29 % of the variance in full-body ratings (face ratings having already accounted for 55 % of the variance). Face ratings accounted for more variance than body ratings did in both samples of women, but body ratings had more incremental utility for predicting full-body attractiveness ratings of women wearing swimsuits than of women wearing their street clothes.

Hypothesis 3 Body Shape and Size as Predictors of Body Attractiveness Ratings

Hypothesis 3 was that waist-to-hip ratio (WHR) and body mass index (BMI) would be correlated with ratings of women's body attractiveness. We also were interested in whether women's breast size would be associated with body attractiveness ratings. We used standard multiple regression to predict women's body attractiveness ratings from the four body measurements: WHR, BMI, chest circumference, and bra cup size (Fig. 4). Table 4 shows the zero-order correlations and regression coefficients. In both studies, WHR and BMI had statistically significant zero-order associations with ratings of body attractiveness; among women wearing their own clothes, only BMI had a statistically significant independent effect, but among women wearing swimsuits, both BMI and WHR retained their statistical significance as independent predictors of women's body attractiveness rating. Although women's chest circumference and bra cup size had significant zero-order associations with women's body attractiveness in Study 2, women with higher WHR and BMI also tended to have larger breasts; controlling for WHR and BMI rendered breast size insignificant. Thus, Hypothesis 3 was supported, in that WHR and BMI predicted women's body attractiveness ratings, particularly when the women's bodies were relatively visible in swimsuits. In Study 1, body measurements accounted for 44 % of the variance in ratings of women's body attractiveness and in Study 2 they accounted for 64 % of the variance: Study 1: $F(4, 77) = 15.06$, $p < .001$, $R^2 = .44$; Study 2: $F(4, 66) = 28.80$, $p < .001$, $R^2 = .64$. Thus, body attributes—specifically, BMI and WHR—accounted for more variance in ratings of women's bodies among women in swimsuits than among women in their street clothes.

Our final analysis aimed to determine whether WHR and BMI were the main contributors to ratings of body attractiveness and hence whether they could account for the link between ratings of body attractiveness and full-body attractiveness. To do this, we conducted sequential regression analyses with the final outcome variable being full-body attractiveness. The results of these regression models are shown in Table 5. In Step 1, we entered ratings of women's face attractiveness; in Step 2, we entered the body measurements; in Step 3, we entered ratings of body attractiveness. We reasoned that if body measurements were responsible for the association between ratings of body attractiveness and full-body attractiveness, then body attractiveness ratings would not account for additional variance in ratings of full-body attractiveness once the body measurements were included in the model. What we found, instead, was that even after including face ratings and body measurements in the models, ratings of women's bodies continued to account for additional variance in ratings of women's full-body attractiveness. In Study 1, ratings of women's bodies accounted for an additional 2 % of the variance in the final step of the model; in Study 2, ratings of women's bodies accounted for an additional 15 % of the variance. Thus, although women's body measurements were linked to ratings of their bodily attractiveness, there appear to be additional attributes in women's bodies that are influencing assessments of their attractiveness.

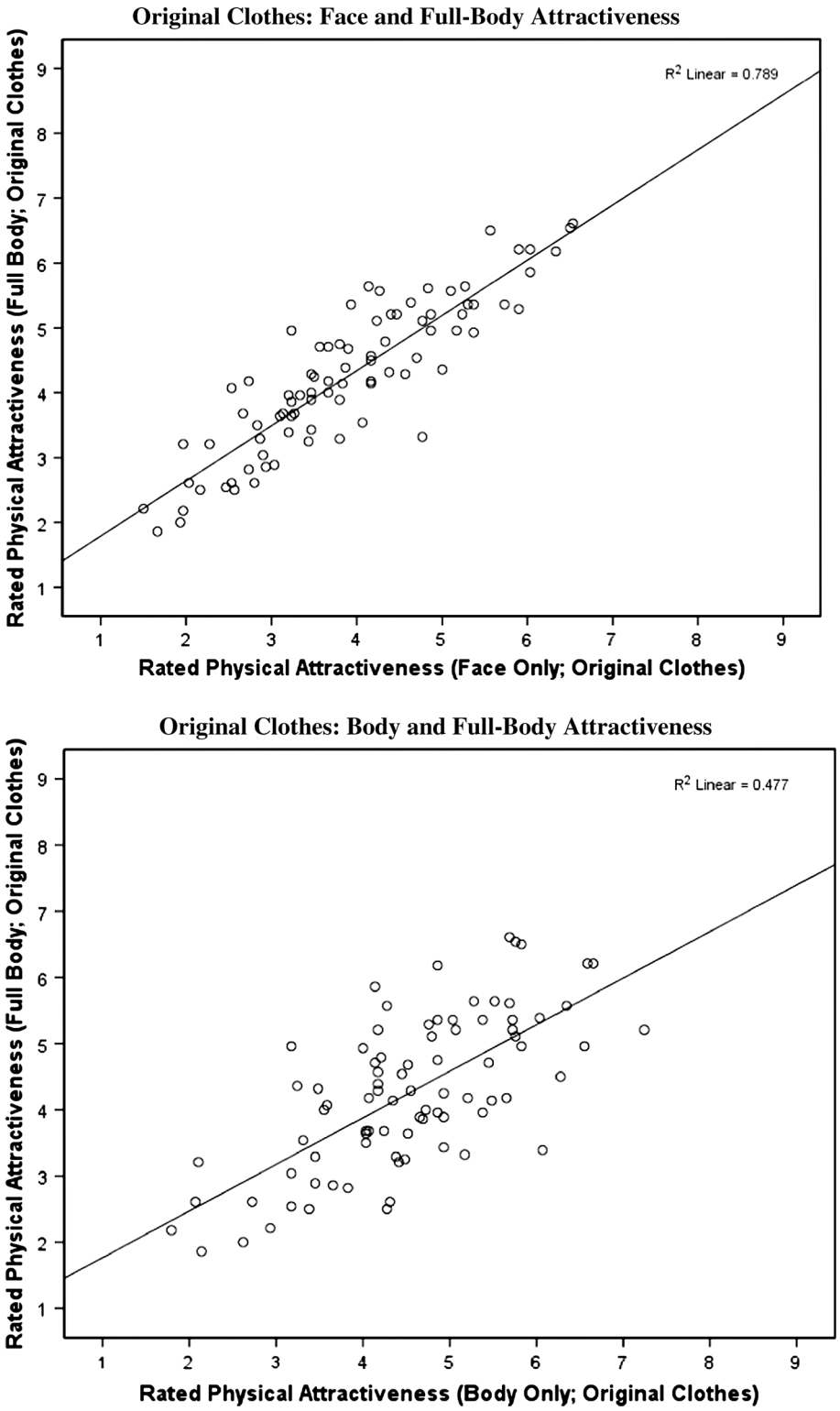

Fig. 2 Study 1 associations between face-only attractiveness and full-body attractiveness (*upper panel*) and between body-only attractiveness and full-body attractiveness (*lower panel*)

Discussion

Previous studies suggest that both body and face influence judgments of women's overall attractiveness (Currie & Little, 2009; Peters et al., 2007). We replicated those findings: In two independent samples, ratings of women's body attractiveness and ratings of women's facial attractiveness independently predicted ratings of their full-body attractiveness. Previous studies have also documented that face ratings tend to be better independent predictors than body ratings (Alicke et al., 1986;

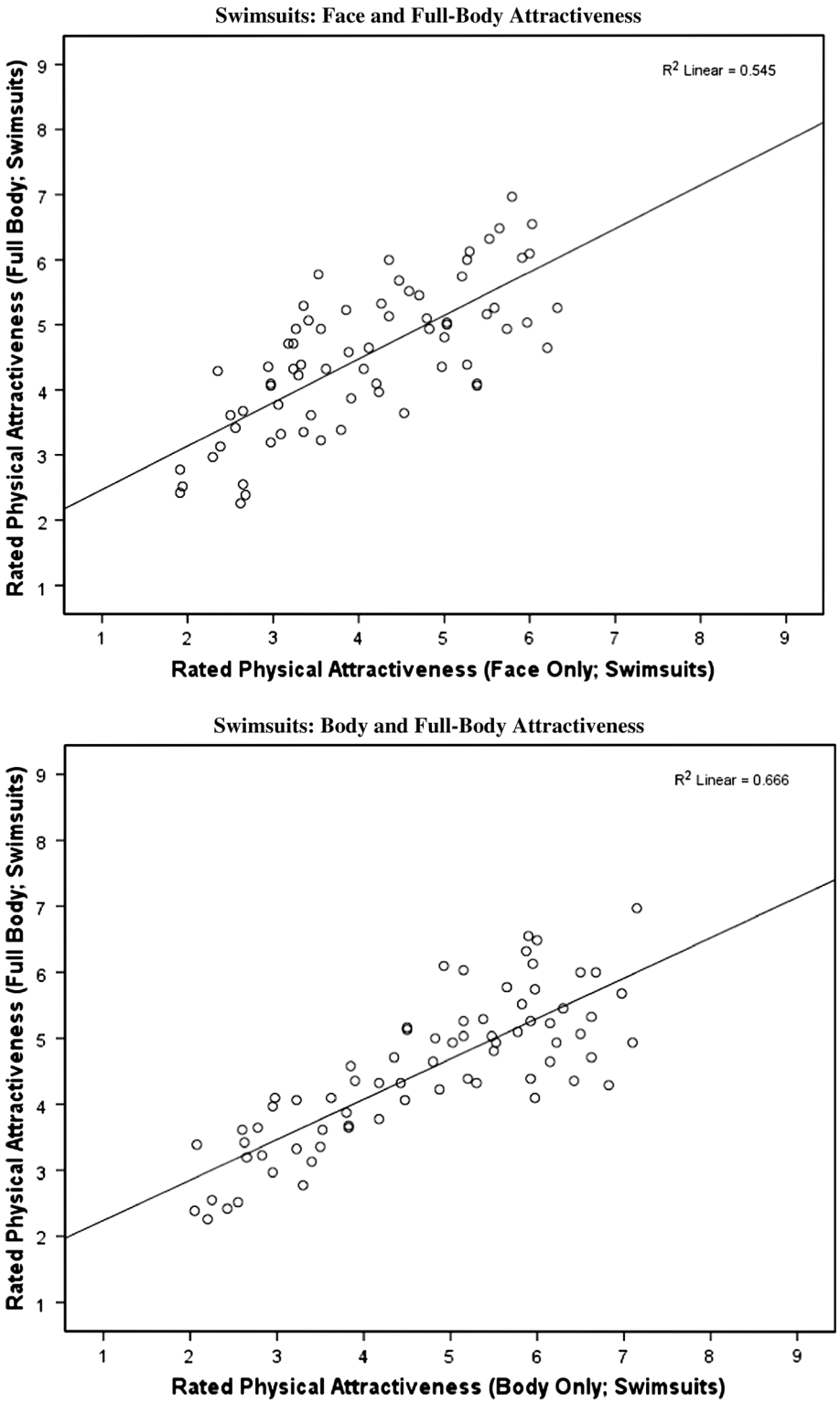

Fig. 3 Study 2 associations between face-only attractiveness and full-body attractiveness (*upper panel*) and between body-only attractiveness and full-body attractiveness (*lower panel*)

Currie & Little, 2009; Mueser et al., 1984; Peters et al., 2007). In Study 1, when we measured, photographed, and rated women in their own clothes, we replicated that finding: women's face ratings were a better independent predictor of full-body attractiveness than were body ratings. Study 2 was designed to determine whether women's bodies would predict full-body attractiveness more when they were more fully revealed compared to when their bodies were not revealed.

Table 3 Incremental utility of body attractiveness ratings, after accounting for face attractiveness ratings, in the prediction of full-body attractiveness

Predictor	Study 1: Original clothes		
	β	Model R^2	ΔR^2
Step 1: Face attractiveness	.89***	.79	–
Step 2: Body attractiveness	.23***	.82	.03***
Predictor	Study 2: Swimsuits		
	β	Model R^2	ΔR^2
Step 1: Face attractiveness	.74***	.55	–
Step 2: Body attractiveness	.61***	.84	.29***

β standardized regression coefficient

*** $p < .001$

Women wore their hair pulled back and they all wore the same two-piece swimsuit (in a size that corresponded to their body). The swimsuit was a high-cut bikini, it did not have bra cup pads, and it did not have under-wires for lift; as a result, women's torso, waist-to-hip ratio, actual breast size, and breast firmness were more conspicuous than under the typically clothed conditions of Study 1. Indeed, faces and bodies were similarly strong independent predictors of full-body attractiveness for the women in swimsuits (see Table 2) and ratings of body attractiveness accounted for more variance in ratings of women's full-body attractiveness among the women in swimsuits than among the women who wore typical clothing. Our findings thus imply that outside viewers attend to both women's faces and bodies to the extent that the cues are accessible. It is possible that humans have evolved to attend to many cues of women's value, because in any given perspective some cues may have been hidden from the receiver or manipulated by the sender.

Body Attributes and Body Attractiveness

Although face and body ratings were independent predictors of overall attractiveness, it was notable that face and body ratings were positively correlated in both studies. As others have suggested, attributes of the face and body may share some underlying factor of genetic quality that is perceived as attractive (Thornhill & Grammer, 1999). Moreover, the various body attributes we measured were correlated with each other as well as with ratings of women's body attractiveness. That is, women with higher WHRs also had higher BMIs, larger chest circumference, and larger bra cup sizes; and women with higher WHR, higher BMI, and larger breasts were rated as less attractive. These correlations were particularly strong in Study 2, in which both body measurements and body ratings may have been more valid because of the standardized clothing.

Although we observed negative zero-order correlations between breast size and ratings of women's attractiveness, such that women with larger breasts were rated as less attractive (see Table 4), some researchers have documented that men rate medium and large breasts as more attractive than small breasts (Dixson et al., 2011b; Furnham et al., 1990; Zelazniewicz & Pawlowski, 2011). Perhaps that preference for larger breasts is linked to female fertility: Women with large breasts (relative to under breast), particularly in combination with a low WHR, have higher reproductive potential in comparison to other women (Jasieńska et al., 2004). We speculate that the discrepancy between our results and the results of previous studies was related to the nature of the stimuli used in studies involving breast size. Previous studies have primarily been experiments in which the researchers have manipulated breast size and held other aspects of the body, such as stomach fat or breast shape, constant. In the current sample of typical women, however, breast size co-varied with other body attributes, including body fat and body shape. Specifically, the women in our sample with large breasts tended also to have higher WHRs and higher BMIs, which are tied to lower fecundity (Zaadstra et al., 1993). As expected given the importance of BMI and WHR (Singh et al., 2010; Swami et al., 2007), the relationship between breast size and ratings of women's attractiveness was diminished after accounting for women's body size and shape.

Women's body attributes correlated with ratings of women's body attractiveness, but controlling for those measurements did not nullify the association between ratings of body attractiveness and full-body attractiveness. For example, when women's bodies were conspicuous (Study 2), the body attractiveness ratings accounted for 15 % of the variance in full-body attractiveness ratings even after controlling for body attributes and face-only ratings of attractiveness. Thus, ratings of women's bodies seem to be influenced by much more than what we were able to measure in the current samples. We speculate that observers respond to a variety of cues to women's reproductive value and health that have not been studied in combination, including breast shape (e.g., round and firm versus saggy) (Symons, 1979), body posture, skin tone (Fink et al., 2001), symmetry (Dixson et al., 2011b; Perrett et al., 1999), and averageness (Langlois & Roggman, 1990). In particular, future researchers could investigate how breast size and shape interact with body weight, in natural populations, to predict ratings of attractiveness.

Limitations

Future research that aims to replicate and extend our findings could improve upon our design in a number of ways. First, due to our own lack of proficiency with experimental software, the order in which the target women's pictures were viewed was not randomized for each individual rater. However, it is possible that the use of many targets minimized order effects for raters. Second, although we view the use of two samples of many

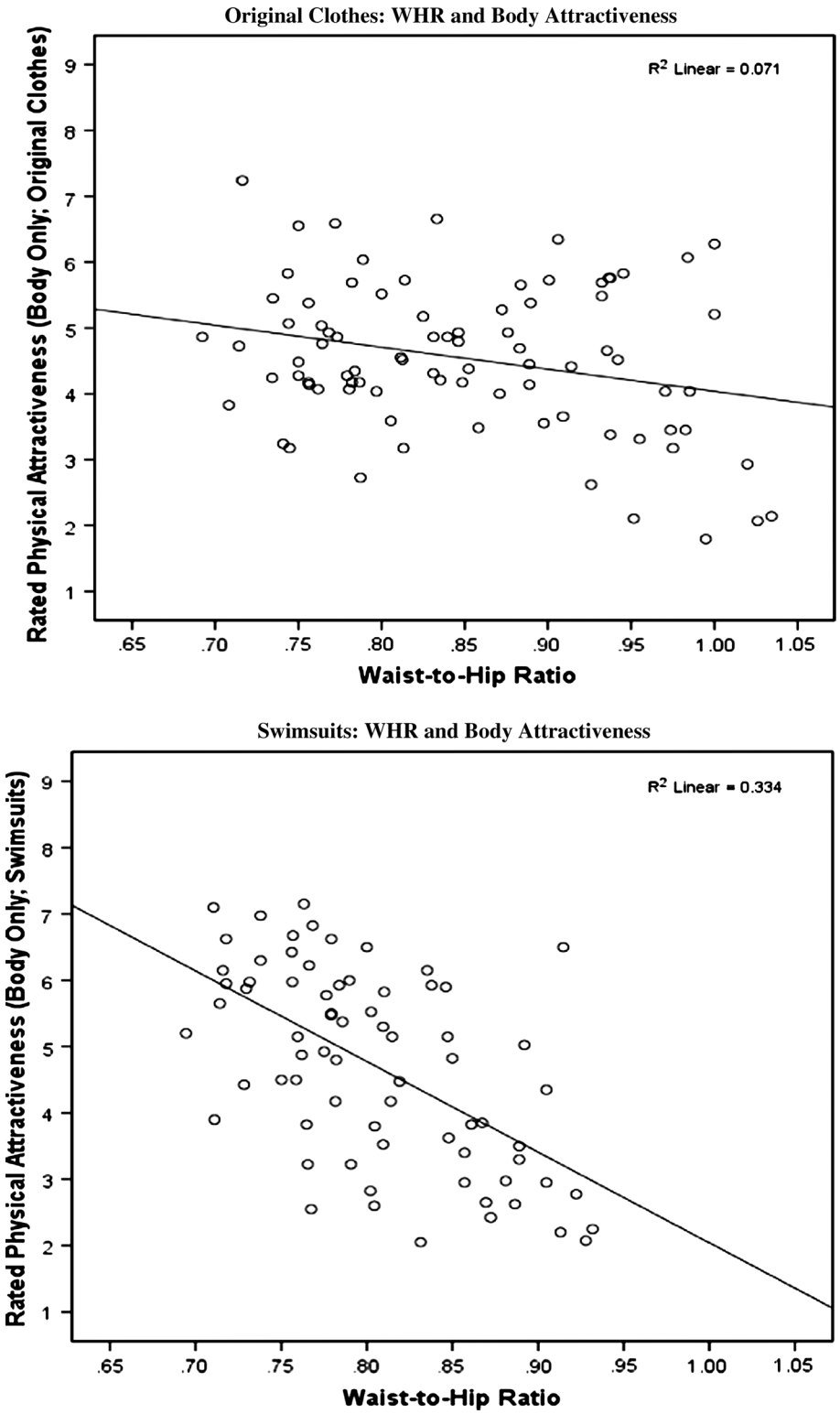

Fig. 4 Zero-order associations between WHR and ratings of body attractiveness in Study 1, when women were in their original street clothes (*upper panel*), and in Study 2, when women were in a two-piece swimsuit (*lower panel*)

women as a strength of our study, we could draw cleaner conclusions if we had used the same women for each study. That is, the different pattern of findings in the two studies could simply reflect differences in the two samples of women. That said, the women were similar in age distribution, body measurements, and attractiveness ratings, so we view it unlikely that sampling differences are responsible for our results. Third, a related concern is that our results might not reflect the effect of revealing body cues so much as the effect of wearing unstandardized clothing (Study 1) as opposed to standardized clothing (Study 2).

Table 4 Predicting body attractiveness ratings from body measurements

Study 1: In original clothes							
	Zero-order *r*					*β*	*b*
	WHR	BMI	Chest	Cup size	Body		
WHR		.43***	.27**	.40***	−.25*	−.01	−.07
BMI			.18	.33**	−.65***	−.69***	−.18
Chest				.17	−.04	.07	.02
Cup Size					−.12	.09	.09
$R^2 = .44$							
Study 2: In swimsuits							
	Zero-order *r*					*β*	*b*
	WHR	BMI	Chest	Cup size	Body		
WHR		.47***	.50***	.41***	−.58***	−.27**	−6.23
BMI			.81***	.34**	−.75***	−.50***	−.20
Chest				.32**	−.69***	−.16	−.07
Cup size					−.32**	.02	.03
$R^2 = .64$							

β standardized regression coefficient; *b* unstandardized regression coefficient

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 5 Incremental utility of body attractiveness, after accounting for face attractiveness ratings and body measurements, in the prediction of full-body attractiveness ratings

Predictor	Study 1: Original clothes		
	β	Model R^2	ΔR^2
Step 1: Face attractiveness	.89***	.78	–
Step 2: Body measurements		.81	.034*
WHR	−.05		
BMI	−.14*		
Chest circumference	−.06		
Cup size	−.03		
Step 3: Body attractiveness	.22**	.83	.021**
Predictor	**Study 2: Swimsuits**		
	β	Model R^2	ΔR^2
Step 1: Face attractiveness	.75***	.55	–
Step 2: Body measurements		.70	.153***
WHR	−.20*		
BMI	−.34**		
Chest circumference	.07		
Cup size	−.05		
Step 3: Body attractiveness	.65***	.85	.147***

β standardized regression coefficient

* $p < .05$, ** $p < .01$, *** $p < .001$

One option may have been to photograph women in the same set of relatively masking clothes, such as jeans and a t-shirt, and then again in the same two-piece swimsuit. That standardization would have decreased women's ability to mask weaknesses and enhance strengths of their body, although even then women would have been able to wear bras that accentuated or masked their breast size and shape. Finally, because in each study a different set of raters judged only one image type of each woman (e.g., body only, in a swimsuit) rather than all image types of each woman, it is possible that subtle individual differences in judges' attractiveness ratings could have influenced the relationships among ratings between the studies.

Conclusion

Numerous studies now support the proposal that women's faces and bodies are not entirely redundant in their provision of cues to women's health, reproductive value, sexual receptivity, and personality (Confer et al., 2010; Currie & Little, 2009; Gray & Boothroyd, 2012; Kramer et al., 2012; Peters et al., 2007). In two studies, we have demonstrated that the degree to which faces or bodies influence attractiveness ratings may depend on the extent to which the cues they provide are conspicuous as opposed to masked, downplayed, or accentuated. Future research utilizing both experimentally manipulated and naturally occurring faces and bodies will further our understanding of the many cues underlying human mate choice.

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