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Eye Tracking of Men's Preferences for Female Breast Size and Areola Pigmentation

Barnaby J. Dixson · Gina M. Grimshaw · Wayne L. Linklater · Alan F. Dixson

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Abstract Sexual selection via male mate choice has often been implicated in the evolution of permanently enlarged breasts in women. While questionnaire studies have shown that men find female breasts visually attractive, there is very little information about how they make such visual judgments. In this study, we used eye-tracking technology to test two hypotheses: (1) that larger breasts should receive the greatest number of visual fixations and longest dwell times, as well as being rated as most attractive; (2) that lightly pigmented areolae, indicative of youth and nubility, should receive most visual attention and be rated as most attractive. Results showed that men rated images with medium-sized or large breasts as significantly more attractive than small breasts. Images with dark and medium areolar pigmentation were rated as more attractive than images with light areolae. However, variations in breast size had no significant effect on eye-tracking measures (initial visual fixations, number of fixations, and dwell times). The majority of initial fixations during eye-tracking tests were on the areolae. However, areolar pigmentation did not affect measures of visual attention. While these results demonstrate that cues indicative of female sexual maturity (large breasts and dark areolae) are more attractive to men, patterns of eye movements did not differ based on breast size or areolar pigmentation. We conclude that areolar pigmentation, as well as breast size, plays a significant role in men's judgments of female attractiveness. However, fine-grained measures of men's visual attention to these morphological traits do not correlate, in a simplistic way, with their attractiveness judgments.

B. J. Dixson (✉) · W. L. Linklater · A. F. Dixson
School of Biological Sciences, Victoria University of Wellington, Wellington, New Zealand
e-mail: Barnaby.Dixson@vuw.ac.nz

G. M. Grimshaw
School of Psychology, Victoria University of Wellington, Wellington, New Zealand

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Introduction

Women appear to be unique among mammals in developing enlarged breasts prior to pregnancy and lactation (Short, 1976). Breast size in women increases during puberty due to deposition of adipose tissue (Linzell, 1959). Mammary adiposity varies substantially between women independent of total body fat (Vandeweyer & Hertens, 2002). The morphology and pigmentation of the areolae and nipples also change during pubertal development in girls (Biro, Falkner, Khoury, Morrison, & Lucky, 1992; Garn, Selby, & Crawford, 1956). The areola is the area of pigmented skin that surrounds the nipple. The areolae acquire their coloration due to increased deposition of melanin. Indeed, the areolae contain twice the amount of melanin that occurs in the skin of the surrounding breast (Dean et al., 2005). The pigmentation of the areolae also changes with reproductive status in women. Thus, the areolae are often lighter in girls at the onset of menarche, darken somewhat during consecutive ovulatory cycles, and become much darker during pregnancy and lactation (Garn & French, 1963; Garn et al., 1956; Montagna & Macpherson, 1974; Muzaffar, Hussain, & Haroon, 1998). In a study of skin reflectance of the breast, the areola was darkest in pregnant women, and also in non-pregnant women during the final week of the menstrual cycle (Pawson & Petrakis, 1975).

It has been suggested that breast size may have undergone sexual selection via mate-choice (Barber, 1995). However, findings on the relationship between breast size and attractiveness are inconsistent; some studies have found that men rate line drawings of women with average-sized breasts as most attractive (Horvath, 1981; Wiggins, Wiggins, & Conger, 1968), while other studies have concluded that men prefer smaller breasts

(Furnham, Swami, & Shah, 2006) or larger breasts (Singh & Young, 1995).

Eye-tracking techniques can provide data on attention that may shed light on the relative importance of morphological traits when people make attractiveness judgments. In eye-tracking experiments, attentional capture may be an endogenous process, in which participants actively control how they allocate attention in order to achieve a goal (Ruz & Lupiáñez, 2002). Alternatively, attention may be exogenous, whereby participants allocate their attention to stimuli unintentionally (Ruz & Lupiáñez, 2002). Attention is influenced by the motivation of the individual. For example, stimuli that are associated with fear and reward have been shown to capture attention (Castellanos et al., 2009; De Martino, Kalisch, Rees, & Dolan, 2009; Raymond & O'Brien, 2009). There is growing evidence that facial attractiveness actively captures attention (Maner, DeWall, & Gailliot, 2008; Maner, Gailliot, & DeWall, 2007) and that participants purposefully use facial features when judging the attractiveness of female faces (Shimojo, Simion, Shimojo, & Scheier, 2003). Female faces with an even complexion are judged to be highly attractive and also receive the most visual attention during eye-tracking studies (Fink et al., 2008).

Recent eye-tracking studies have shown that men spend a lot of time looking at the female body when viewing both erotic and non-erotic stimuli (Lykins, Meana, & Kambe, 2006; Lykins, Meana, & Strauss, 2008; Rupp & Wallen, 2007). The breasts in particular are the focus of male attention. A recent eye-tracking study (Dixson, Grimshaw, Linklater, & Dixson, 2009) presented men with individual front-posed nude images of women that had been manipulated to show small, medium or large breasts and either low (0.7) or high (0.9) waist-to-hip ratios (WHR). Although ratings of attractiveness were related primarily to WHR, men spent more time and looked more frequently at the breasts compared to other areas of the body. Indeed, eye-tracking studies of the female body have consistently shown that the breasts receive a lot of visual attention irrespective of whether the stimulus images are shown fully clothed (Hewig, Trippe, Hecht, Straube, & Milner, 2008), wearing dresses and bathing suits (Suschinsky, Elias, & Krupp, 2007) or nude (Dixson et al., 2009). In such experiments, men may be examining the breast as a whole or looking at specific features, such as the areolae, when making attractiveness judgments. However, it is difficult to obtain fine-grained measurements concerning eye-tracking and breast morphology when men view clothed images or images of the entire female body and face. Therefore, in the current study, eye-tracking procedures were employed to obtain such measurements by using images of nude female torsos as stimuli. Specifically, the first visual fixation, number of fixations, and the amount of time (dwell time) men spent looking at defined areas of the female breast and torso were measured. Men were also asked to rate the various images for sexual attractiveness.

The current study was undertaken to examine the relative importance of two features of breast morphology in attentional capture and male judgments of female attractiveness: breast size and areola pigmentation. Women with larger breasts and lower WHRs have been shown to have higher circulating estradiol and progesterone (Jasienska, Ziomkiewicz, Ellison, Lipson, & Thune, 2004). Women with higher circulating levels of estradiol and progesterone have higher rates of conception compared to women with lower levels of estradiol and progesterone (Lipson & Ellison, 1996). In the Jasienska et al. (2004) study, the relationship between breast size and estradiol was independent of WHR, so that women with larger breasts had higher levels of estradiol compared to women with smaller breasts. Therefore, the first hypothesis we examined was that men should direct most visual attention to larger breasts and rate them as being most sexually attractive. Turning to the question of areola pigmentation, this is lightest at the onset of menarche, darkens as women age and particularly during pregnancy and lactation (Garn & French, 1963; Garn et al., 1956; Montagna & Macpherson, 1974; Muzaffar et al., 1998). It has been suggested that morphological features of the breast that signal youth should be most attractive to men, as they seek to maximize their reproductive success by selecting mates who exhibit traits of youthfulness as well as sexual maturity (Symons, 1995). Areolar pigmentation may be a signal to men of female age and reproductive status (Goodhart, 1964; Grammer, Fink, Juette, Ronzal, & Thornhill, 2001; Guthrie, 1976). Since lighter areolae may signal youth and nubility to men, the second hypothesis we tested was that a lighter-colored areola should be most attractive to men and the focus of their visual attention.

Method

Participants

A total of 37 heterosexual men of European descent, ranging in age from 22 to 47 years ($M = 30.05$ years; $SD = 6.21$), were recruited opportunistically from the staff and post-graduate student body at Victoria University. Ten of these men were married. Participants were given individual verbal briefing before the start of data collection and allowed some time to familiarize themselves with the room and eye-tracking machine. The details of the study were not discussed with participants beforehand. However, when each participant had completed the experiments, they were provided with written details of the rationale for the research. Each participant was told of their right to withdraw themselves or their data from the study without prejudice. All participants had normal vision or correction by contact lenses. None wore glasses. The project was approved by the Human Ethics Committee of the School of Psychology at Victoria University.

Stimuli

A color photograph of an oblique-posed torso of a naked woman was scanned from Simblet (2001). This image was used to model overall breast size (three sizes) and areolar pigmentation (three levels) as detailed below. Thus, there were six stimulus images based on the same photograph.

Breast size was manipulated using Photoshop Version 7.0. Three sizes were created using anthropometric measurements taken from Brown et al. (1999). Images with small breasts (80% of the original image), medium (unchanged), and large (120% of the original size) were made. Each of these images had the same areolar pigmentation. In another set of images, areola pigmentation was altered in a step-wise fashion by adding or subtracting 10 units of brightness and 15 units of contrast to create two further images: one image that had lighter areolae and one with darker areolae. All three images had medium breast size.

The experiment was programmed using SR Research Experiment Builder (version 1.4.128 RC) and run on a 3-GHz Pentium D computer. Stimuli were presented on a 21 inch monitor at a resolution of 1024 × 768 pixels and with a refresh rate of 60 Hz.

Procedure

Participants were seated in a comfortable chair in a quiet room facing the monitor at eye level at a viewing distance of 57 cm, maintained by a forehead and chin-rest. They underwent eye-tracking trials in which each image was presented individually, in random order on the computer screen for five-seconds.

Measures

Attractiveness

At the end of each presentation, participants were instructed to rate the image for sexual attractiveness using a keyboard with a 6 point Likert scale in which 1 = unattractive, 2 = somewhat attractive, 3 = moderately attractive, 4 = attractive, 5 = very attractive, and 6 = extremely attractive.

Eye-tracking

Using the EyeLink® 1000 Tower Mount Head Supported System (SR Research Ltd., Ontario, Canada), eye position and eye movements were determined by measuring the corneal reflection and dark pupil with a video-based infrared camera and an infrared reflective mirror. The eye tracker had a spatial resolution of 0.01° of visual angle and the signal was sampled and stored at a rate of 1000 Hz. While viewing was binocular, recording was monocular, measuring right eye movements only as this is a standard procedure in eye-tracking studies (e.g., Lykins et al., 2006).

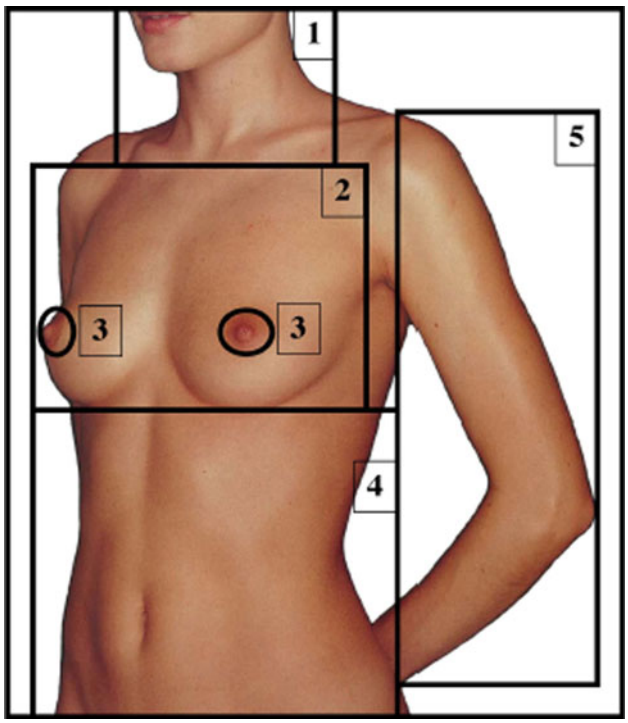

Fig. 1 Female stimulus images were divided into five anatomical regions in order to analyze male visual attention during eye-tracking. 1 = neck and jaw; 2 = breasts; 3 = nipples and areolae; 4 = midriff; 5 = arm

Calibration and validation of measurements were performed before each experimental session.

The stimulus image was divided into five anatomical regions for subsequent analyses of eye-tracking data (Fig. 1). The five regions were defined as follows: (1) the jaw and neck, from the jaw to the bottom of the clavicle; (2) breasts (excluding the areolae and nipples), from the bottom of the clavicle to the lower border of each breast; (3) the nipple and areola, the area of pigmented skin surrounding the nipple; (4) midriff, including the waist; beginning from below the breasts extending to the widest part of the hips, and (5) the arm, from the top of the shoulder to the wrist.

From the eye-tracking data, three dependent variables, first fixation, number of fixations, and dwell time (total time spent looking), were recorded for each of the five body regions. The first region of the body to be examined, starting 200 ms after the start of the trial, was defined as the first fixation. The lag time of 200 ms was allowed in order to give sufficient time for the eye to move from its initial fixation point in the center of the screen. Each time the eye moved, the eye-tracking machine recorded a new fixation. Total fixations which occurred in each area were summed during the analysis. Likewise, the machine measured individual fixation times, so that it was possible to calculate the total time spent examining each of the five regions.

Results

Attractiveness

Figure 2 shows the mean attractiveness ratings as a function of breast size. A single factor (Breast size: small, medium, large) repeated measures analysis of variance (ANOVA) yielded a significant main effect for breast size on attractiveness ratings, $F(2, 72) = 25.20, p < .001$. Post-hoc Scheffé tests revealed that large and medium-sized breasts were significantly more attractive than small breasts ($p < .001$). There was no statistical difference in attractiveness ratings between the images with medium and large breasts.

Figure 3 shows the mean attractiveness ratings as a function of areola pigmentation. A single factor (Areola Pigmentation: light, medium, dark) repeated measures ANOVA yielded a significant main effect for pigmentation on attractiveness ratings, $F(2, 72) = 5.75, p < .01$. Post hoc Scheffé tests showed that that the light areolae were significantly less attractive than the dark ($p < .01$) and the medium ($p < .05$) areolae. There was no statistical difference in the attractiveness ratings between medium and darkly-pigmented areolae.

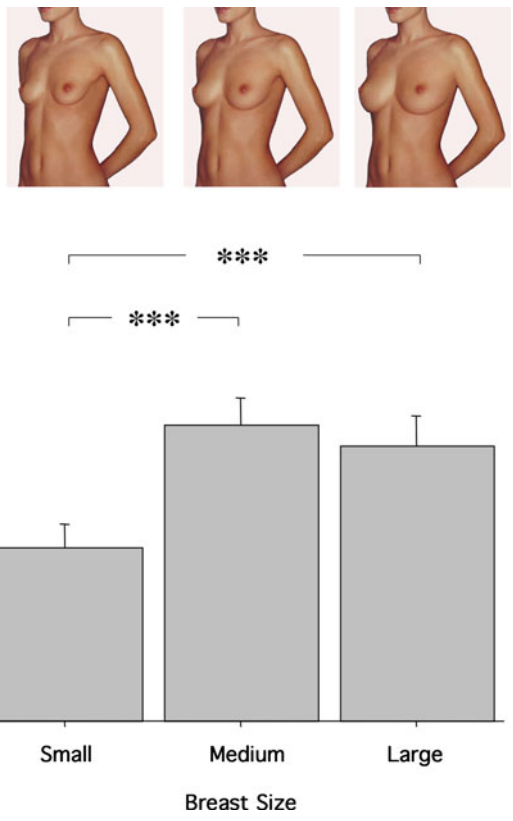

Fig. 2 Mean ratings (+SD) of sexual attractiveness for three female torsos varying in breast size (small, medium or large). *** $p < .001$

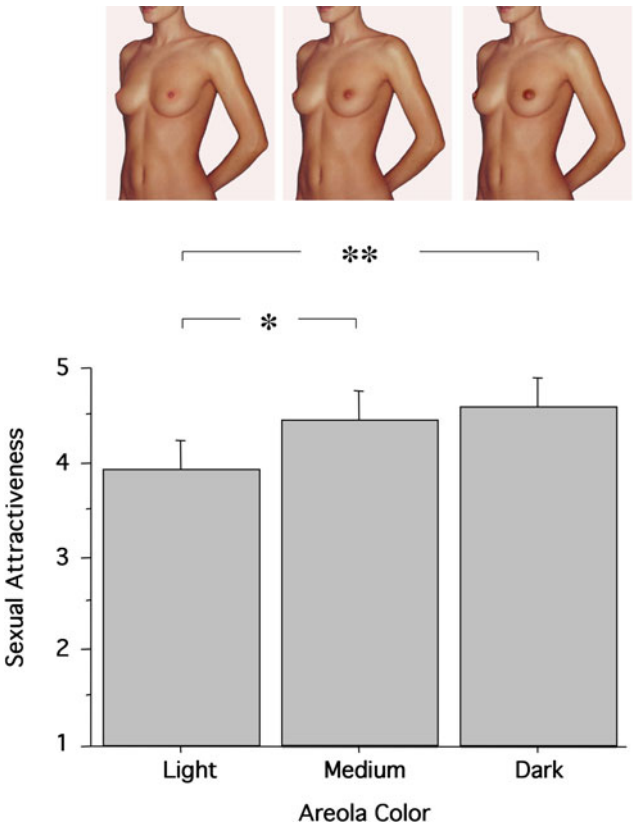

Fig. 3 Mean ratings (+SD) of sexual attractiveness for three female torsos varying in areola color (light, medium or dark). * $p < .05$, ** $p < .01$

Eye-tracking

First Fixations

Observations were made on the frequencies of first fixations on each body region for each of the six images. The areolae and nipples received the most first fixations, followed by the breast region, in all images irrespective of overall breast size or degree of areolar pigmentation (Table 1).

Breast Size

Numbers of Fixations

For number of fixations, a 3 (Breast Size) × 5 (Body Region) repeated measures ANOVA yielded a significant Breast Size × Body Region interaction, $F(8, 288) = 3.57, p < .001$. As can be seen in Fig. 4, the pattern of fixations was very similar irrespective of breast size. The breast as a whole was fixated on significantly more frequently than the areolae and nipples, $t(36) = 17.15$, $p < .001$, the jaw and neck, $t(36) = 21.92$, $p < .001$, the arm, $t(36) = 26.24$, $p < .001$, and the midriff, $t(36) = 20.47$, $p < .001$. The nipples and areolae were looked at significantly more often than the jaw and neck, $t(36) = 2.96$, $p < .01$, and the arm,

Table 1 Number of men (N = 37) who made their first visual fixations on each of the five body regions

Image	Jaw/Neck %	Breast %	Nipple/Areola %	Midriff %	Arm %
Small	1	9	5	2	0
Breast	3%	24%	68%	5%	0%
Medium	1	10	23	2	1
Breast	3%	27%	62%	5%	3%
Large	2	11	22	1	1
Breast	5%	30%	59%	3%	3%
Light	1	7	26	1	2
Areola	3%	19%	70%	3%	5%
Medium	1	10	23	1	2
Areola	3%	27%	62%	3%	5%
Dark	3	10	23	1	0
Areola	8%	27%	62%	3%	0%

Note: Data are shown for all six female images

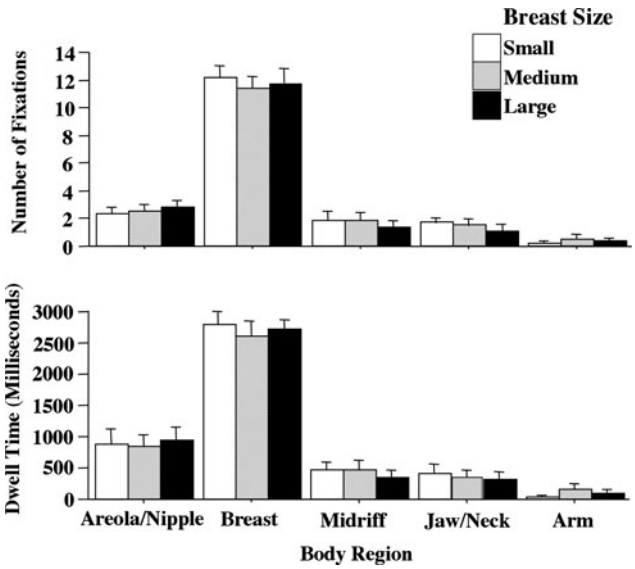

Fig. 4 Data are the means (+SD) of numbers of fixations (*upper panel*) and dwell times (*lower panel*) on the various body regions for the three images varying in breast size (small, medium, or large)

$t(36) = 6.50$, $p < .001$. The image depicting small breasts attracted slightly more fixations to the jaw and neck area than when looking at the same area on images with large breasts, $t(36) = 2.72$, $p < .01$. Likewise, when viewing images with smaller breasts, men looked more often at the breast region than when they looked at this region of the images with medium-sized breasts, $t(36) = 2.75$, $p < .01$ (Fig. 4).

Dwell Times

For dwell times, a 3 (Breast Size) × 5 (Body Region) repeated measures ANOVA also yielded a significant Breast Size × Body Region interaction, $F(8, 288) = 2.07$, $p = .039$. Similarly to data for numbers of fixations, the breast region was looked at for significantly longer than the areolae and nipples, $t(36) = 14.01$, $p < .001$, the neck and jaw, $t(36) = 22.33$, $p < .001$, the arm, $t(36) = 27.17$, $p < .001$, and the midriff, $t(36) = 21.00$, $p < .001$. The nipples and areolae were looked at for significantly longer than the jaw and neck, $t(36) = 3.23$, $p < .001$, the midriff, $t(36) = 2.83$, $p < .001$, and the arm, $t(36) = 5.33$, $p < .001$. When men looked at images with smaller breasts, they dwelt for longer on the neck and jaw than when looking at images with large breasts, $t(36) = 3.48$, $p < .001$. Dwell times on the breasts were significantly longer when men viewed images of smaller breasts compared to medium sized breasts, $t(36) = 2.71$, $p < .01$ (Fig. 4).

Areola Pigmentation

Numbers of Fixations

For number of fixations, a 3 (Areola Pigmentation) × 5 (Body Region) repeated measures ANOVA yielded a significant Areola Pigmentation × Body Region interaction, $F(8, 288) = 2.83$, $p < .01$. The breast as a whole was fixated on significantly more frequently than the areolae and nipples, $t(36) = -16.61$, $p < .001$, the jaw and neck, $t(36) = -21.19$, $p < .001$, the arm, $t(36) = -25.45$, $p < .001$, and the midriff, $t(36) = 20.51$, $p < .001$. The nipples and areolae were looked at significantly more often than the jaw and neck, $t(36) = 3.18$, $p < .01$, the midriff, $t(36) = 2.83$, $p < .01$, and the arm, $t(36) = 6.55$, $p < .001$. Fixations were greater on the midriff of images with lightly pigmented areolae compared to images with medium, $t(36) = -2.70$, $p < .01$, and darkly-pigmented areolae, $t(36) = -2.74$, $p < .001$ (Fig. 5).

Dwell Times

For dwell times, a 3 (Areola Pigmentation) × 5 (Body Region) repeated measures ANOVA yielded a significant Areola Pigmentation × Body Region interaction, $F(8, 288) = 4.80$, $p < .001$. These interactions reflect that the breast region was looked at for significantly longer than the areola and nipples, $t(36) = 13.02$, $p < .001$, the neck and jaw, $t(36) = 21.70$, $p < .001$, the arm, $t(36) = 26.88$, $p < .001$, and the midriff, $t(36) = 23.98$, $p < .001$. The nipples and areolae were looked at for significantly longer than the jaw and neck, $t(36) = 3.39$, $p < .01$, the midriff, $t(36) = 3.06$, $p < .01$, and the arm, $t(36) = 5.50$, $p < .001$. When men looked at images with darkly-pigmented areolae, dwell times were significantly longer on the breast region compared to images with medium, $t(36) = 2.98$, $p < .01$, and lightly-pigmented areolae, $t(36) = 3.48$, $p < .001$ (Fig. 5).

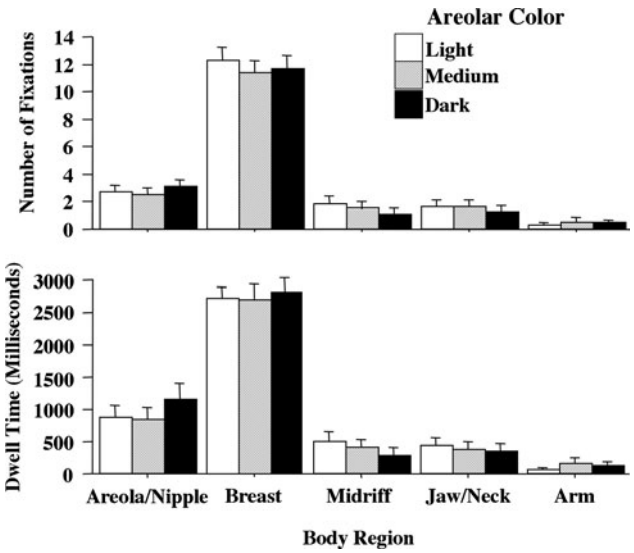

Fig. 5 Data are the means (+SD) of numbers of fixations (*upper panel*) and dwell times (*lower panel*) on the various body regions for the three images varying in areola pigmentation (light, medium, or dark)

Discussion

The eye-tracking results showed that men attend to the overall shape of the breasts and also to the morphology of the areolae and nipples when making attractiveness judgments. Medium and large-sized breasts were rated as more attractive than small breasts. Medium and darkly-pigmented areolae were more attractive that lightly-pigmented areolae. However, patterns of eye movements did not differ based on breast size or areolar pigmentation. We conclude that areolar pigmentation, as well as breast size, plays a significant role in men's judgments of female attractiveness. However, fine-grained measures of men's visual attention to these morphological traits do not correlate, in a simplistic way, with their attractiveness judgments.

Our first hypothesis that large breasts should be the focus of male attention and the most sexually attractive compared to smaller breasts was not supported. While medium and large breasts were rated as significantly more attractive than smaller breasts, frequencies of men's visual fixations and dwell times were highest for the breast area, irrespective of overall breast size. However, this finding should be evaluated in the light of previous research on eye-tracking and breast size. Thus, in previous work (Dixson et al., 2009) using full-length images of women, there was no significant effect for breast size on male ratings of female attractiveness. These differing results may be due to the use of images of oblique-posed female torsos in the current study. Men may be more discerning in their preference for female breast size when viewing torsos because breast morphology is more prominently displayed than is the case when viewing full-length images of the female body. Numbers of fixations and dwell times were greater on the head and neck and breast region of images with small breasts compared to images with medium and large breasts. This may reflect an aversion to the breast region of the image that was judged to be less attractive. After their eye-tracking sessions, several participants commented that images depicting smaller breasts appeared more immature. Marlowe (1998) has suggested that firmer and fuller breasts are more attractive to men because they signal sexual maturity. Thus, male preferences for medium and larger breasts in the current study might have been influenced by their more adult and sexually mature appearance.

Areola pigmentation was also a significant determinant of female sexual attractiveness in the current study. However, our second hypothesis concerning putative preferences for lighter areola pigmentation, such as occurs in young adulthood, was not upheld. Medium and darkly-pigmented areolae were rated as significantly more attractive than lightly pigmented areolae. The pigmentation of the areolae in women is lightest at the onset of menarche, and darkens somewhat with age, after repeated ovulatory cycles, pregnancies and lactation (Garn & French, 1963; Garn et al., 1956; Montagna & Macpherson, 1974; Muzaffar et al., 1998; Pawson & Petrakis, 1975). Grammer et al. (2001) have suggested that lighter pigmentation may be attractive to men as a signal of nubility in a potential female partner. However, that hypothesis was not supported in the current study. It is important to note that, irrespective of attractiveness judgments or degree of areolar pigmentation, men directed their first visual fixations most frequently to the areolae and nipples. However, as these are morphologically prominent traits at the center of the breast and the left breast was centrally positioned in our stimuli, it may be that attention is rapidly drawn to this feature as a passive response. As with effects of breast size discussed above, it is possible that male preferences for darker areolae were due to their significance as visual signals of female sexual maturity. Lighter areolae, by contrast, may be indicative of adolescence and of hormonal changes occurring during the period of adolescent sterility.

Studies of human physique and sexual attractiveness most often employ questionnaire surveys containing images, which are then rated by participants. The presumption is that participants will attend to the morphological cues that drive the attractiveness judgment. Eye-tracking can provide behavioral data on attention. The prediction is that those morphological cues that drive an attractiveness judgment will be the focus of attention during eye-tracking experiments. Indeed, attractiveness in women appears to capture male attention (Maner et al., 2007) and men bias their attention towards more attractive female faces (Fink et al., 2008; Maner et al., 2008; Shimojo et al., 2003). Given the relationship between attentional capture and facial attractiveness, attention and attractiveness may be correlated as men view other traits indicative of female health and fecundity such as female WHR and breast morphology. However, in studies using full body images, men look at the

breasts most frequently, but the breasts are not necessarily the principle determinants of female attractiveness, as WHR is crucial in this context (Dixson et al., 2009). A recent eye-tracking study found that men did not attend to the same morphological cues when judging female WHR as when they judged female attractiveness (Cornellissen, Hancock, Kiviniemi, George, & Tovée, 2009). While the findings of the current study show male preferences for medium and large breasts, as well as darkly-pigmented areolae, behavioral measures of attention did not differ significantly based on breast size or areolae pigmentation. Eye-tracking studies have shown that novel, unique, attractive, and unattractive traits capture attention (Sütterlin, Brunner, & Opwis, 2008). Thus, it is interesting that such a dissociation in attention and attractiveness judgments occurred even when employing as stimuli a female torso, which one might argue displays the experimentally manipulated trait quite obviously. It may be that the assumption that eye-tracking provides some implicit and bias-free measure of attractiveness is too simplistic. However, participants may be more attentive to the features they find more or less attractive when viewing pairs of stimulus images, as this would allow for a visual comparison. Future studies using paired images should investigate this question.

The current study has implications for future research on human physique and sexual attractiveness using eye-tracking techniques. A challenge in any study of human morphology and mate preference is to isolate a variable and test its role in mate choice. However, this method has its drawbacks. For example, if one attempted to model the appearance of female breasts in regard to age or reproductive status (i.e., adolescent, adult, lactating), it would be necessary to alter multiple associated traits, such as skin tone and body fat. This is because changes in breast morphology with reproductive status do not occur in isolation from other traits indicative of the ageing process. Others have stressed the possible importance of changes in breast morphology with age and reproductive status for male judgments of female attractiveness (Gallup, 1982; Marlowe, 1998; Symons, 1995). However, relatively few studies have been conducted to test these ideas and future work should aim to collect quantitative data on how men assess these aspects of female breast morphology.

Some researchers have criticized the use of computer-generated stimuli and suggest that the use of sexually explicit stimuli is more ecologically valid when conducting studies investigating the possible effects of sexual selection on the evolution of human morphology (Voracek & Fisher, 2006, 2009). However, eye-tracking studies have shown that erotic pictures depicting female nudes with direct gaze elicit a startle effect in men (as measured by the magnitude of eye blinks), the face then becomes the focus of attention, and the body receives less attention (Lass-Hennemann, Schulz, Nees, Blumenthal, & Schachinger, 2009). While other eye-tracking studies have confirmed the importance of the female body as a region that captures male attention in both erotic and non-erotic scenes (Lykins et al., 2006, 2008; Rupp & Wallen, 2007; Tsujimura et al., 2009), these scenes are complex and may not allow for fine-grained analyses of attention on specific morphological traits. We suggest that, if the goal of the study is to test for attentional capture on traits that may be under sexual selection, a reasonable starting point is the use of stimuli in which the anatomical features can be standardized.

On a final note, it will be important to conduct cross-cultural studies concerning effects of breast size and areola pigmentation upon men's judgments of female attractiveness. Cross-cultural studies have shown discordance in male preference for female breast size. For example, Brazilian men prefer small breasts and large buttocks, whereas men from the U.S. and Russia prefer large breasts and smaller buttocks in women (Jones, 1996). The current eye-tracking study included only men of European descent, living in New Zealand. Clearly, men in other cultures may differ in their eye-tracking responses and attractiveness judgments. Thus, for the moment, it would be unwise to draw firm conclusions about human preferences for female breast morphology, as distinct from preferences within a single culture.

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