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## Original Article

## Men's preferences for women's breast size and shape in four cultures

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## ABSTRACT

The morphology of human female breasts appears to be unique among primates due to their permanent fat deposits. It has been previously suggested that female breast morphology arose as a result of sexual selection. This is supported by evidence showing that women with larger breasts tend to have higher estrogen levels; breast size may therefore serve as an indicator of potential fertility. However, breasts become less firm with age and parity, and breast shape could thus also serve as a marker of residual fertility. Therefore, cross-culturally, males are hypothesized to prefer breast morphology that indicates both high potential and residual fertility. To test this, we performed a survey on men's preferences for breast morphology in four different cultures (Brazil, Cameroon, the Czech Republic, Namibia). As stimuli, we used two sets of images varying in breast size (marker of potential fertility) and level of breast firmness (marker of residual fertility). Individual preferences for breast size were variable, but the majority of raters preferred medium sized, followed by large sized breasts. In contrast, we found systematic directional preferences for firm breasts across all four samples. This pattern supports the idea that breast morphology may serve as a residual fertility indicator, but offers more limited support for the potential fertility indicator hypothesis. Future studies should focus on a potential interaction between the two parameters, breast size and firmness, which, taken together, may help to explain the relatively large variation in women's breast sizes.

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## 1. Introduction

Women develop enlarged breasts during puberty, mainly due to the deposition of adipose tissue, and retain them through adulthood. This appears to be unique to humans, as in other primate species enlargement is restricted to periods of pregnancy and lactation. Although the proximate mechanisms involved in permanent breast development are relatively well understood (e.g., Anderson, 1983), the ultimate mechanisms involved in the evolution of permanent breasts are still debated. Hypotheses regarding their function can be classified into those that involve sexual selection and those that primarily rely on mechanisms of natural selection (Arieli, 2004; Barber, 1995). The latter suggests that adipose deposits may serve either as energy reserves for breast-fed infants during food scarcity or as thermo-insulation during cold nights (Pawlowski, 1999).

The sexual selection hypotheses propose that permanently enlarged breasts evolved via male choice. In this context, the specific morphology of women's breasts might be an honest signal of mate value if adipose deposits provide information on lactational capacity and/or fertility (Low, Alexander, & Noonan, 1987). This is supported by a study showing that breast size is positively associated with estrogen levels, which may, in turn, indicate higher potential fertility (Jasienska, Ziomkiewicz, Ellison, Lipson, & Thune, 2004). Consequently, men are expected to be attracted to women with relatively large breasts. Nevertheless, research on attractiveness of women's breast size is inconclusive. Some studies show that men prefer larger breasts (Furnham, Dias, & McClelland, 1998; Zelazniewicz & Pawlowski, 2011) while others indicate preferences for medium (or medium to large) size (Dixson, Duncan, & Dixson, 2015; Dixson, Grimshaw, Linklater, & Dixson, 2011b) or even for small breasts (Furnham & Swami, 2007), and still others report no effect of size on attractiveness judgments (Dixson, Grimshaw, Linklater, & Dixson, 2011a; Horvath, 1979). Apart from methodological differences between studies, this mixed set of findings could be partly attributed either to cultural variation in the tested individuals (Dixson et al., 2011c;

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Valentova, Bártová, Štěrbová, & Varella, 2017) or temporal variation in preferences, although a study testing several cohort samples across the 1990s did not support the latter suggestion (Tantleff-Dunn, 2001). Alternatively, the variation in preferences might be due to interactions with other parts of the body: large breasts are perceived to be more attractive in women with low waist-to-hip ratios (Furnham et al., 1998; Singh & Young, 1995). Furthermore, preferences for breast size may vary systematically across individuals. Zelazniewicz and Pawlowski (2011) found that Polish men with high sociosexuality (i.e., tendency for sexual variety) prefer larger breasts. Similarly, a study from Malaysia found that men of lower socio-economic status prefer larger breasts than their counterparts of higher socio-economic status (Swami & Tovée, 2013b).

It has been further argued that breast symmetry may serve as a marker of developmental stability. Indeed, there is some evidence showing that high breast asymmetry is associated with lower fecundity (Manning, Scutt, Whitehouse, & Leinster, 1997; Moller, Soler, & Thornhill, 1995; Scutt, Manning, Whitehouse, Leinster, & Massey, 1997) and with higher risk of breast cancer (Scutt et al., 1997). In line with this, perceptual studies show that symmetrical breasts are judged as more attractive (e.g., Dixon et al., 2011c).

Variation in breast morphology is, however, not restricted to size and symmetry—breasts also vary greatly in shape. In general, breast shape changes with age and parity, having a firmer appearance in younger adults (for brevity, we hereafter use the term “firm”, which is a tactile descriptor, even though we primarily refer to their visual appearance on which our participants' preferences were based). Later in life, due to declining firmness of the breasts' fibrous tissue, they become progressively more pendulous; this effect is amplified by many factors, such as age, breast size, parity, weight loss, or smoking (Rinker, Veneracion, & Walsh, 2010). The medical literature labels this phenomenon as breast ptosis, defined as a sagging process where the breast falls onto the chest, flattens, and nipples point downward (Rinker et al., 2010). Based on these changes, Marlowe (1998) proposed the nubility hypothesis, suggesting that breast shape could be used as a reliable marker of residual reproductive value, i.e., the expected future reproductive output of an individual, which is negatively related to age. According to this hypothesis, men's perception of breast attractiveness is expected to be primarily affected by their shape rather than size. Although this hypothesis was formulated more than 15 years ago, to date its predictions have not, to our knowledge, been directly tested.

The aim of this study was to test both preferences for breast size and breast shape. We based our predictions about size preferences on the potential fertility hypothesis (Jasienska et al., 2004) and about shape on the nubility hypothesis (Marlowe, 1998). As preferences may vary across tested populations (Dixon et al., 2011c), we collected attractiveness ratings across several populations varying in their cultural and socio-economic settings, including two African communities (Cameroon, Namibia) and two industrialized urban populations (the Czech Republic, Brazil). We expected to find preferences for firm breasts across the tested countries. In contrast, we expected men to prefer larger breasts in countries with relatively lower living standards and higher resource scarcity (here, Cameroon and Namibia) compared with men in countries with relatively higher living standards (here, the Czech Republic and Brazil). Resource scarcity is frequently associated with preferences for more corpulent bodies (e.g., Wetsman & Marlowe, 1999). As breast size is to some extent positively associated with body mass (Brown et al., 2012), preferences for larger breasts may simply reflect a generalized preference for more corpulent women in communities that experience resource scarcity.

To assess other factors that might be associated with breast preferences, we followed findings from previous research (Dixon et al., 2011c; Zelazniewicz & Pawlowski, 2011). Namely, we also tested effects of age, self-assessed attractiveness, relationship status, and sexual restrictiveness (here assessed in two ways, by self-reported number of sexual partners and by using the Sociosexual Orientation Inventory,

SOI-R: Penke & Asendorpf, 2008), each of which has been found to be positively associated with preferences for larger breasts.

## 2. Material and methods

### 2.1. Participants

The data were collected as part of several larger projects investigating cross-cultural predictors of physical attractiveness and intrasexual competition. The Brazilian sample consisted of 44 male students of the University of São Paulo (mean age = 23.4ys; SD = 3.89; range 18–34) approached on campus by local researchers (MACV and KJP). São Paulo is a large urban agglomeration with a prevailing economic reliance on industrial production, finance, and retail. Living standards range between moderate to rather high, with relatively large social inequality. The population is highly culturally diverse, with most people being of mixed descent, mainly of Amero-Indian, Portuguese, African, Japanese, and Middle Eastern origin.

The sample from Cameroon consisted of 94 men (mean age = 22.8ys; SD = 4.15; range 17–37); 49 students at the University of Buea (mean age = 22.9ys; SD = 3.69; range 17–37) and 45 young men from the Big Babanki rural community (mean age = 22.7ys; SD = 4.63; range 18–37), located in the South and North West Regions, respectively. Students were approached on campus by local (RA) and visiting (JV, KK and TK) researchers, while the men from Big Babanki were recruited with the help of a local research assistant (EV) using snowball sampling. The town Buea of the South West Region and the village Big Babanki of the North West Region lie within the English speaking portion of Cameroon. The subsistence is mainly agricultural, primarily based on production of yams, sweet potatoes, cassava, corn, plantains, and palm oil. The community has a complex traditional governance system headed by local chiefs, called ‘Fons’ in the north west region and simply ‘chiefs’ in the south west region, all operating underneath a central governmental system.

In the Czech Republic, we collected data from 48 male students at Charles University in Prague (mean age = 22.3ys; SD = 3.03; range 18–33), who were approached on campus or in student dormitories by local researchers (JF, ZŠ and VT). Prague is the capital of the country, which can be characterized by a market economy based mainly on industrial production and services. Living standards are relatively high, with low social inequality, and a relatively culturally homogenous population.

The sample from Namibia consisted of 81 men (mean age = 22.7ys; SD = 3.97; range 18–36) from suburban sites (townships) of the Tseiblaagte and Karasburg communities of the Karas region in southern Namibia. Both sites are characterized by a semi-arid environment based on goat and cattle farming. In contrast to Cameroon, farms are typically larger and commercially run; consequently, the majority of participants were landless and of low socio-economic status. Here, again, the participants were recruited by a local research assistant (RJ) using snowball sampling. The samples from individual countries did not differ in their age ( $F(3,260) = 1.1, p = 0.35$ ).

### 2.2. Stimuli and procedure

The stimuli on breast size were adopted from Dixon et al. (2011a) and consisted of 3 full frontal nude images (with the pubic area covered) digitally manipulated to vary only in breast size (small, medium, large). The stimuli on breast shape variation were redrawn from Rawson and Brooks (1984) and consisted of 4 profile drawings depicting gradually decreasing age-related firmness (high, moderate, rather low, and low). The stimuli on breast size are shown in the Fig. 1 and on breast shape in Fig. 2.

In both cases the stimuli were presented on laminated cards (4×9.5 cm) placed in random order in front of the seated participant, who was asked to order the images from the most to the least attractive.

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