Personality and Individual Differences 87 (2015) 166–170

Contents lists available at ScienceDirect

Personality and Individual Differences

journal homepage: www.elsevier.com/locate/paid

Influence of conception risk and sociosexuality on female attraction to male red

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ARTICLE INFO

Article history:
Received 9 June 2015
Received in revised form 27 July 2015
Accepted 28 July 2015
Available online 14 August 2015

Keywords:
Color
Human
Ovulation
Red
Sociosexuality

ABSTRACT

An experiment was conducted to test the moderating roles of ovulatory status and sociosexuality on female attraction to male red. Female participants were shown a picture of a man surrounded by a red or gray border, and then reported their sexual desire toward the man and their perceptions of his general likeability. The results indicated that women at times of high conception probability reported stronger sexual desire for the man surrounded by a red, relative to gray, border; this pattern was not found for women at times of low conception probability. The effect was significant only when the categorical "fertile window" (days 9–14) was calculated using the forward counting method from last menstrual onset. Color did not influence ratings of general likeability, and sociosexuality did not moderate the influence of color on participants' reports of sexual desire or their perceptions of general likeability. The results suggest that women tend to have a stronger sensitivity to red stimuli when their likelihood of conception is greatest. The increased sexual desire for men in red may be due to preferences for healthy and dominant men with high status.

1. Introduction

A striking difference between human and non-human primates is the absence of conspicuous morphological changes during ovulation, such as the estrogen-dependent sexual skin swellings found in chimpanzees and some Old World monkeys (Dixson, 2009). Women at times of high conception probability, relative to those at times of low conception probability, report stronger sexual desire (Pillsworth, Haselton, & Buss, 2004), are more prone to interact with men other than their primary partner (Dawson, Suschinsky, & Lalumière, 2012; Gangestad, Thornhill, & Garver, 2002), dress more provocatively (Durante, Li, & Haselton, 2008; Haselton, Mortezaie, Pillsworth, Bleske-Rechek, & Frederick, 2007), engage in more flirtatious behavior (Cantú, Simpson, & Griskevicius, 2014; Haselton & Gangestad, 2006a,b), and are more receptive to men's courtship invitations (Guéguen, 2009).

Women's preference for men with good genes is also heightened during peak fertility, which may confer reproductive benefits (Gangestad & Thornhill, 2008; Thornhill & Gangestad, 2008). For example, ovulating women pay more attention to attractive men (Anderson et al., 2010; Cantú et al., 2014), particularly those who have more masculine and/or symmetrical faces (Koehler, Rhodes, & Simmons, 2002; Little, Jones, Burt, & Perrett, 2007b; Penton-Voak et al., 1999) and are tall in height (Pawlowski & Jasienska, 2005; Pawlowski & Koziel, 2002). These features – attractiveness, masculinity/symmetry, height – are indicators of good genes, which may convey information regarding disease resistance (Lie, Rhodes, & Simmons, 2008; Little, DeBruine, & Jones, 2011; Thornhill & Gangestad, 2006) and/or fertility (Pawlowski, Dunbar, & Lipowicz, 2000; Prokop & Fedor, 2011). Woman, especially ovulating women, are also more attracted to dominant men (Cantú et al., 2014; Gangestad, Simpson, Cousins, Garver-Apgar, & Christensen, 2004; Havlicek, Roberts, & Flegr, 2005). Dominant and high status men (Borgerhoff-Mulder, 1990; Waynforth & Dunbar, 1995) are favored by women due to their ability to provide physical security and material resources (Borgerhoff-Mulder, 1990; Kaplan & Hill, 1985).

Recent research suggests that women are more attracted to men displaying red relative to other chromatic and achromatic colors (Elliot et al., 2010; Roberts, Owen, & Havlíček, 2010; Stephen & McKeegan, 2010). This preference for men in or near red may be due, at least in part, to women's perception that men associated with red are healthier, more dominant, and higher in status (Elliot et al., 2010; Little, Jones, & Burriss, 2007a; Stephen, Coetzee, Law Smith, & Perrett, 2009a, Stephen, Oldham, Perrett, & Barton, 2012). Even extraneous red (i.e., red not on skin or clothing) can have an effect, as women rate black and white photographs of men framed in red as more attractive and sexually desirable (Elliot et al., 2010). Similar effects were found in non-human primates; female rhesus macaques looked longer at a male scrotum on a red background (compared with blue background) suggesting that extraneous color affects female mating preferences (Hughes, Higham, Allen, Elliot, & Hayden, 2015). As noted above,

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http://dx.doi.org/10.1016/j.paid.2015.07.042
0191-8869/

ovulating women appear to be particularly sensitive to cues of male quality, thus, women's ovulation status may influence their sexual response to male red. Specifically, at times of high relative to low conception probability, women may be more likely to be sexually attracted to a man wearing or near the color red (Hypothesis 1). Ovulation status would not be expected to moderate the relation between male red and women's perceptions of the male's general likeability.

Much as ovulating women are particularly sensitive to cues of male quality, women's sociosexuality, defined by Simpson and Gangestad (1991) as individual differences in willingness to engage in uncommitted sexual relations, appears to be especially responsive to such cues. Waynforth, Delwadia, and Camm (2005) and Quist et al. (2012), for example, found that sexually unrestricted women preferred masculine and symmetrical men to a greater degree than their sexually restricted counterparts. Similar results have been found regarding preference for vocal masculinity (Feinberg et al., 2006), particularly among sexually unrestricted women (O'Connor et al., 2014), and such women have also exhibited a stronger preference for males with greater material resources (Prokop & Fedor, 2013). Given the aforementioned association between the color red and male quality, sexually unrestricted women may be more attracted to a man displaying red than sexually restricted women (Hypothesis 2).

2. Method

2.1. Participants

401 Caucasian women attending a midsized Jesuit university in Slovakia participated in the study. After excluding women who reported having a homosexual or bisexual orientation, being pregnant, using hormonal contraceptives, having a color vision deficiency, or providing incomplete data, the sample was 249 women with the mean age of 22 years (SD = 6.14). All data were collected before any analyses were conducted; all data exclusions, manipulations, and variables analyzed are reported. Data exclusions were determined prior to any analysis.

Participants arrived at the laboratory for a study about first impressions; they participated in groups of up to 5 persons. Demographic and sociosexuality data were acquired first. Then, participants were given a folder containing a black and white picture of a young man (Fig. 1), framed by either a red or gray border. The picture was obtained from a standardized photo set (Corneille, Monin, & Pleyers, 2005). Other than the border color, the pictures were identical. Participants were instructed to open the folder, look at the picture (no time limit was given), and then complete a questionnaire; the questionnaire contained items assessing participants' sexual desire toward the man in the picture and their perceptions of his general likeability. The picture was 4″ wide by 6″ long, printed on archival quality paper with an Epson Stylus Photo printer. A GretagMacBeth spectrophotometer was used to select the color parameters from the spectral data (red LCh[42.7/49.0/21.4]; gray LCh[42.9/–/21.1]); this represents extremely rigorous color matching on the lightness dimension (Stokes, Fairchild, & Berns, 1992).

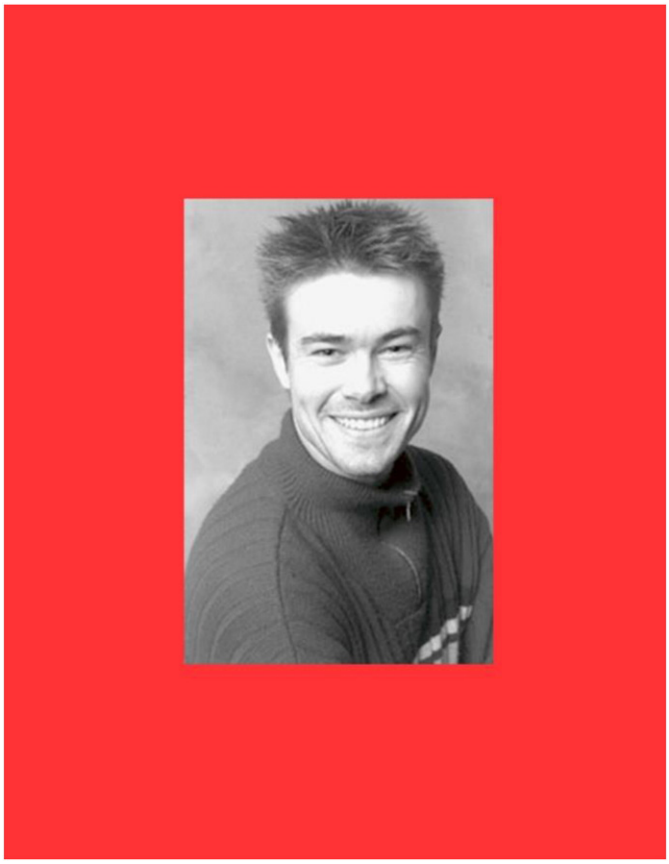

Fig. 1. The male target used in the study. The picture border was either red or gray.

2.2. Measures

2.2.1. Conception risk

Two methods were used for calculation of conception risk. The forward method for calculation of the "fertile window" is one of most common methods used for calculations of conception risk (Gildersleeve, Haselton, & Fales, 2014). Participants who reported having a 28 day menstrual cycle were divided into high days (9–14) or low days (0–8 and 15–28) of conception risk based on their self-report of the previous onset of menstruation. These groups correspond to the follicular phase, menstruation, and luteal phase, respectively (e.g., Regan, 1996), and have been categorized accordingly in previous research (e.g., Prokop, Rantala, Usak, & Senay, 2013). Our sample contained 50 women categorized as having a high risk of conception and 199 women categorized as low risk. Color condition was the between subjects manipulation with n = 120 in the red condition and n = 129 in the gray condition. The second method was based on probabilities of conception risk using the backward method (Gangestad et al., in press). Woman's current day of the cycle was firstly placed on a standard 29-day cycle based on cycle length, then assigned probability values from Wilcox, Duncan, Weinberg, Trussell, and Baird (2001) for regular cycles (see Gangestad, Garver-Apgar, Simpson, & Cousins, 2007; Garver-Apgar, Gangestad, & Thornhill, 2008, for a similar procedure).

2.2.2. Sociosexuality

Sociosexuality was assessed with the Revised Sociosexual Orientation Inventory (SOI-R; Penke & Asendorpf, 2008). The 9-item SOI-R provides an overall assessment of sociosexual orientation. A high SOI-R score indicates unrestricted sociosexual orientation — a propensity to engage in more short-term sexual relationships. We summed the scores from the SOI-R to create an overall sociosexuality index (mean = 21.03, SD = 9.58) with acceptable reliability ($\alpha = 0.74$).

2.2.3. Sexual desire and general likeability

Sexual desire was assessed with 5 face-valid items (e.g., "To what degree would you like to have sex with this man?") on a scale ranging from 1 (*not at all*) to 7 (*very much*). *General likeability* was assessed with 4 face-valid items (e.g., "To what degree do you think this man is friendly?") on a scale from 1 (*not at all*) to 7 (*very much*). A principal components factor analysis with varimax rotation conducted on the set of nine items revealed a clear two factor solution (eigenvalues > 1.0) that accounted for 67% of the total variance; each item loaded on its