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**Archives of Sexual Behavior**  
The Official Publication of the  
International Academy of Sex Research

ISSN 0004-0002

Volume 43

Number 5

Arch Sex Behav (2014) 43:983-988  
DOI 10.1007/s10508-013-0204-z

VOLUME 43, NUMBER 5

JULY 2014

43(5) 845-1022 (2014)  
ISSN 0004-0002

## Archives of **SEXUAL BEHAVIOR**

The Official Publication of the  
International Academy of Sex Research

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# Self-Reported Impulsivity, Rather than Sociosexuality, Predicts Women's Preferences for Masculine Features in Male Faces

Lynda G. Boothroyd · Gayle Brewer

Received: 14 April 2012 / Revised: 4 January 2013 / Accepted: 27 July 2013 / Published online: 18 December 2013  
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**Abstract** Previous research has suggested that an individual's sociosexual orientation (i.e., their willingness to engage in sexual behavior outside of long-term relationships) may influence the qualities they find attractive in a potential mate. Results, however, have not been consistent and, moreover, studies have tended to draw from specific social groups. Here, we tested the relationship between sociosexuality and female's preferences for masculinity in male faces, using a diverse population. We furthermore investigated impulsivity alongside sociosexuality, as this trait has been suggested as a "root" cause of variation in sexual behavior (Cross, 2010) and thus may better explain variation in mate choice. Results showed a significant association between increases in both sociosexuality and two subcomponents of impulsivity and greater preferences for masculine male features. Regression analysis suggested that a subcomponent of impulsivity, namely lack of planning, was the primary determinant of preferences. We discuss the implications these results have for our understanding of female attraction to masculine features.

**Keywords** Impulsivity · Sensation seeking · Sociosexual orientation · Facial attraction

## Introduction

The potentially high fitness costs to human females of random mating, and the action of past sexual selection, suggest that human mate choice may include an evolved component which biases individuals towards appropriate potential mates. In addition to the selection of a mate of the appropriate species and sex, different modes of relationship may be suited to different kinds of partners.

Women seeking a mate for a long-term pair bond may benefit from a preference for cues that a male will provide parental investment and commitment to a long-term relationship. Conversely, women seeking a short-term sexual encounter without the expectation of pair bonding may benefit from prioritizing the genetic quality of their mate. Note these strategies are not mutually exclusive and may be utilized simultaneously by the same individuals (for the seminal review, see Gangestad & Simpson, 2000); yet, there may be trait differences between individuals in the extent to which they favor one type of relationship over another. Differences in willingness to engage in uncommitted sexual relationships are often encapsulated in the concept of sociosexuality, which has been quantified in the Sociosexual Orientation Inventory (SOI) (Simpson & Gangestad, 1991).

As women primarily interested (at that moment or in general) in short-term sexual relationships may benefit from prioritizing the genetic quality of their mate, we can hypothesize that they would be more attracted to certain facial features. It has been proposed that male facial masculinity may indicate a superior immune system which would, in turn, benefit offspring and men with masculine faces report fewer incidents of certain illnesses (Thornhill & Gangestad, 2006; see also Rhodes, Chan, Zebrowitz & Simmons, 2003) and/or may tolerate oxidative stress better (Gangestad, Merriman, & Emery Thompson, 2010). Furthermore, masculinity is associated

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with greater male mating success (Boothroyd, Jones, Burt, DeBruine, & Perrett, 2008; Boothroyd, Cross, Gray, Coombes, & Gregson-Curtis, 2010; Rhodes, Simmons, & Peters, 2005) and thus may confer greater inclusive fitness on sons via multiple genetic routes. In contrast, males with masculine faces are perceived as being less trustworthy, poorer parents, and less desirable long-term partners; these men may also have less interest in long-term relationships (Boothroyd, Jones, Burt, & Perrett, 2007; Johnston, Hagel, Franklin, Fink & Grammer, 2001; Perrett et al., 1998; Smith et al., 2009a) and should thus be avoided by women interested in long-term relationships.

Previous research offers partial support for these hypotheses. When explicitly asked to choose a short-term partner, women select a more masculine face than when choosing a long-term partner (Burt et al., 2007; Little, Jones, Penton-Voak, Burt, & Perrett, 2002; Penton-Voak et al., 1999; Scott, Swami, Josephson, & Penton-Voak, 2008) and there is some evidence that women with a less restricted sociosexual orientation also prefer more masculine faces (Burt et al., 2007; Waynforth, Delwadia, & Camm, 2005). Furthermore, variables associated with interest in short- or long-term relationships, including relationship status (Sacco, Jones, DeBruine, & Hugenberg, 2012), hormonal contraceptive use (Smith et al., 2009b), and age at menarche (Jones, Boothroyd, Feinberg, & DeBruine, 2010), each relate to face preference. Specifically, single women who reported a greater willingness for short-term relationships preferred sex-typical characteristics, women who do not use hormonal contraceptives preferred feminine male faces for long- compared to short-term partners and women experiencing menarche at an early age displayed a greater preference for masculinized men. However, other studies have failed to show any relationship between facial masculinity preferences and sociosexuality (Glassenberg, Feinberg, Jones, Little, & DeBruine, 2010; Provost, Kormos, Kosakowski, & Quinsey, 2006), although Provost et al. did find a relationship between sociosexuality and preferences for body masculinity. One possible reason for this variation in results may be that only one facet of sociosexual orientation is related to preferences. In their related analysis of facial symmetry preferences, Quist et al. (2012) found that within the revised SOI scale it was attitudes towards uncommitted sexual encounters that correlated best with preferences, possibly because behavioral measures are confounded with opportunity. Other studies may sometimes lose this effect among the broader measure of overall sociosexuality.

In a related issue, the inconsistency of results across studies may reflect differences in participant recruitment. Glassenberg et al. (2010), the null study with the largest sample size, used an online sample, while the two positive results were based on undergraduate samples. Provost et al. (2006), whose findings were mixed depending on whether one considered faces or bodies, also recruited an undergraduate sample but recruited

fewer participants than the significant facial masculinity studies. As has been discussed elsewhere (Boothroyd et al., 2008), undergraduate samples may be a peculiar population in terms of sexual behavior, consisting largely of unmarried, non-cohabiting young adults living in unmonitored mixed sex accommodation (halls or shared houses) and with a social scene that encourages regular intoxication. Thus, opportunities for sexual encounters may be heightened compared to those living in more traditional housing and/or older individuals and patterns may emerge among students that are not representative of the general population.

Alternatively, sociosexuality may be one facet of a larger construct that is driving these effects and may, therefore, be less reliable as a predictor than the underlying causal factor. Risky sexual behavior (which includes engaging in one-night stands and having a larger number of sexual partners, as per sociosexuality) is associated with sensation seeking and impulsivity (for a meta-analysis, see Hoyle, Fejfar, & Millar, 2000) and sociosexuality positively correlates with the tendency to engage impulsively in (non-sexual) risky activities (Boothroyd et al., 2010; Cross, 2010). Cross explicitly suggested that sex differences in impulsivity may mediate sex differences in sexual attitudes, i.e., that sociosexuality is one manifestation of individual and sex differences in broader cost-benefit trade offs in risk. Given that there is already evidence among males for higher levels of sensation seeking predicting stronger preferences for sexually dimorphic female faces (Jones et al., 2007), it is particularly important that the link between sociosexuality and face preferences should be considered alongside at least some measures of impulsivity, establishing the relative influence of sociosexuality and impulsivity.

In the current study, we investigated the influence of sociosexuality and impulsivity/sensation seeking on women's mate preferences. We employed a heterogeneous sample of both undergraduate students and those not traditionally included in attraction research. This approach placed the previous findings and the role of sociosexuality in the wider context of a more general population and the broader sweep of individual differences in personality.

## Method

### Participants

A total of 152 women were opportunistically sampled from local businesses, the university campus, and by email "word of mouth" in a northern English city with moderate rates of economic deprivation. Participants reported their sexual orientation on a 1–7 Likert scale where 1 indicated exclusively homosexual and 7 indicated exclusively heterosexual; women scoring 4 or below were excluded leaving a final sample of 124 women with

a mean age of 25.9 years ( $SD = 9.3$ ). Sexual orientation on this reduced sample did not correlate with our measures below and so was not analyzed further.

### Measures

Participants were presented with male and female face stimuli and a series of questionnaires (demographic information including socioeconomic status, sociosexuality, and impulsivity).

### Stimuli

Each participant viewed six pairs of male and six pairs of female faces manipulated in masculinity. Stimuli were drawn from previously published research (Penton-Voak et al., 1999; Perrett et al., 1998) and were objectively manipulated to be either more androgynous or masculinized in their facial proportions; color cues remained constant. Reducing dependence on one ethnic group, stimuli were based on composites of Scottish Caucasian (4 pairs per sex), Japanese (1 pair per sex), and Jamaican (1 pair per sex) faces.

### Socioeconomic Status

Participants were asked to report both their current occupation (free-response) and level of education (highest level qualifications completed). Those without degrees and working in non-skilled jobs (predominantly retail) were classified as “non-skilled,” those with degrees or professional qualifications and/or working in managerial posts were classified as “professional,” and those currently studying were classified as “students.”

### Sociosexuality

Participants completed the most widely adopted measure of sociosexuality, the 7-item Sociosexual Orientation Inventory (SOI). To address criticisms of sociosexual orientation as a unitary behavioral tendency, scores were calculated both on the full formula reported by Simpson and Gangestad (1991) and based on the three attitude questions to give both overall SOI and Attitude SOI. Items relating to attitudes were answered on a 9-point Likert scale. Higher scores indicate more interest in, and/or history of, sex outside committed relationships.

### Impulsivity

Consistent with most research investigating sexual behavior and impulsivity/sensation-seeking (Hoyle et al., 2000), participants completed the Impulsive Sensation Seeking (ImpSS) subscale from the Zuckerman-Kuhlman Personality

Questionnaire. Participants responded “yes” or “no” to statements such as “I sometimes like to do things that are a little frightening” and “I would like to take off on a trip with no preplanned or definite routes or timetables.”

Principal components analysis was conducted to determine the structure of impulsivity in our population, which showed that the scale yielded three principal components among our participants (correlations below .4 suppressed), as shown in Table 1. These components were conceptualized as behavioral impulsivity, planning, and sensation seeking.

### Procedure

Participants completing the pen-and-paper version of the questionnaire responded to the demographic and personality measures in the order described above. Women were then shown each pair of faces, three pairs to a page, and asked to indicate which face they found most attractive and how much so on an 8 point scale from 0 (*strongly prefer feminized face*) to 7 (*strongly prefer masculinized face*). Left–right position of the faces was counterbalanced between pairs and all participants viewed male faces first, followed by female face pairs.

Participants completing the questionnaire online responded to demographic and personality measures in the same order as those completing the pen-and-paper version. Women were then presented with the face pairs, one pair at a time, and asked to indicate their preference in an identical manner to the paper test. Left–right position of faces and pair order were randomized. Again, male face pairs were viewed before the female faces.

### Statistical Analysis

Data were analyzed using zero-order and partial correlations. Where multiple predictor variables all correlated with an outcome variable, these were then subjected to simple multiple regression.

### Results

Comparisons between socioeconomic groups revealed that students were significantly younger than the other two groups,  $F(2, 122) = 16.45, p < .001$ ; students:  $M = 20.4$  years, unskilled  $M = 28.6$  years, professional  $M = 29.7$  years, and had significantly higher sensation-seeking scores,  $F(2, 122) = 5.02, p < .01$ ; students:  $M = .34$ , professional  $M = -.11$ , unskilled  $M = -.31$ . When controlling for age, the difference in sensation seeking became non-significant,  $F(2, 120) = 2.02$ , and there were no other significant differences between groups on any measure, with or without controlling for age (all  $F$ s  $< 2.2$ ). All socioeconomic groups were therefore analyzed together.



**Table 1** Rotated factor solution for Impulsive-Sensation Seeking questionnaire

	Sensation seeking	Behavioral impulsivity	Planning (lack of)
I enjoy getting into new situations where you can't predict how things will turn out	.48		
I like wild, uninhibited parties	.51		
I sometimes do "crazy" things just for fun	.59		
I'll try anything once	.67		
I like to have new and exciting experiences and sensations even if they are a little frightening	.68		
I like doing things just for the thrill of it	.72		
I sometimes like to do things that are a little frightening	.78		
I like to explore a strange city or section of town by myself, even if it means getting lost		.49	
I prefer friends who are excitingly unpredictable		.50	
I would like to take off on a trip with no preplanned or definite routes or timetables		.52	
I often get so carried away by new and exciting things and ideas that I never think of possible complications		.53	.44
I would like the kind of life where one is on the move and travelling a lot, with lots of change and excitement		.61	
I often do things on impulse		.76	
I am an impulsive person		.79	
Before I begin a complicated job, I make careful plans			-.77
I usually think about what I am going to do before doing it			-.63
I tend to change interests frequently			.62
I very seldom spend much time on details of planning ahead			.64
I tend to begin a new job without much planning on how I will do it			.75
Eigenvalue	3.27	3.17	2.93
Variance explained (%)	17.20	16.67	15.42

Table 2 shows the zero-order correlations between age, personality, and preference scores, and partial correlations controlling for age. Even after controlling for age, SOI scores correlated in the predicted direction with sensation seeking,  $r(121) = .24$ ,  $p < .05$ , behavioral impulsivity,  $r(121) = .16$ ,  $p = .08$ , and planning,  $r(121) = .29$ ,  $p < .01$ .

**Table 2** Correlations between age, personality variables, and preferences for masculinity in male and female faces

		2	3	4	5	6	7	8
1. Age	<i>r</i>	-.28	-.12	-.08	-.27**	-.19*	-.06	-.01
	<i>p</i>	<.01	ns	ns	<.01	.04	ns	ns
2. Sensation seeking	<i>r</i>		.00	.00	.30**	.24**	.09	-.03
	<i>p</i>		ns	ns	<.01	.01	ns	ns
3. Behavioral impulsivity	<i>r</i>	-.05		.00	.19*	.05	.15	-.06
	<i>p</i>	ns		ns	.04	ns	<.1	ns
4. Planning (lack of)	<i>r</i>	-.03	-.01		.30**	.28**	.27**	.06
	<i>p</i>	ns	ns		<.01	<.01	<.01	ns
5. SOI	<i>r</i>	.24**	.16	.29**		.62**	.22*	.04
	<i>p</i>	.01	ns	<.01		<.001	.02	ns
6. SOI (attitudes)	<i>r</i>	.20*	.03	.27**	.60***		.15	.00
	<i>p</i>	.03	ns	<.01	<.01		ns	ns
7. Male masculinity preference	<i>r</i>	-.10	.15	.27**	.22*	.14		-.11
	<i>p</i>	ns	ns	<.01	.02	ns		ns
8. Female masculinity preference	<i>r</i>	-.04	-.06	.06	.04	-.00	-.11	
	<i>p</i>	ns	ns	ns	ns	ns	ns	

Note: Zero order Pearson's correlations ( $N = 124$ ) are shown above the diagonal; partial correlations controlling for age ( $df = 121$ ) are shown below the diagonal

Zero-order correlations with facial preferences showed that masculinity preferences in male faces were correlated with overall SOI,  $r(122) = .22$ ,  $p < .05$ , and planning,  $r(122) = .27$ ,  $p < .01$ , and showed a trend in the predicted direction with behavioral impulsivity,  $r(122) = .14$ ,  $p = .096$ . This latter trend was non-significant once age was controlled for,  $r(122) = .14$ ,  $p = .103$ ; the other relationships remained significant when age was controlled. Attitude SOI correlated with sensation seeking,  $r(122) = .24$ ,  $p < .01$ , and planning,  $r(122) = .28$ ,  $p < .01$ , but did not relate to masculinity preferences. Likewise, masculinity preferences in female faces did not correlate with any other measure (all  $rs < .10$ ) (for details, see Table 2).

Given that the behavioral measures correlated with each other as well as with preferences for masculinity in male faces, all significant and borderline correlates of male facial masculinity preferences were entered into a regression model. As shown in Table 3, planning was the only significant predictor of masculinity preferences ( $t = 2.60$ ,  $p < .05$ ) such

**Table 3** Regression model for SOI, impulsivity and planning as predictors of masculinity preferences in male faces

	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	<i>p</i>
SOI	.00	.00	.12	1.33	ns
Behavioral impulsivity	.16	.11	.13	1.45	ns
Planning (lack of)	.30	.12	.23	2.60	.01

Note:  $R^2 = .11$ ;  $F(3, 121) = 4.92$ ,  $p < .01$

that those who engaged in less planning preferred more masculine male faces. Neither SOI nor behavioral impulsivity were significant predictors in the model.

## Discussion

The aim of this study was to examine whether a relationship between sociosexuality and face preferences could be replicated in a heterogeneous sample and whether impulsivity/sensation seeking might better explain such relationships. Results showed that there were relationships between impulsivity, sociosexuality, and preferences for male facial masculinity. Moreover, when entered into a multiple regression, one component of impulsivity, namely planning behavior, emerged as the only significant predictor of masculinity preferences, with both behavioral impulsivity and SOI becoming non-significant. This suggests that, as hypothesized, sample differences in impulsivity (or variance therein) might explain different results across studies in the SOI-preferences relationship.

Our initial significant correlation between SOI and masculinity preferences concurred with the results of Waynforth et al. (2005) and demonstrated the link in a heterogeneous sample of both students and non-students, including those of low socioeconomic status who may be less likely to engage in online university research (see, Ross, Mansson, Daneback, Cooper, & Tikkanen, 2005). Moreover, the fact that the behavioral components of SOI may be confounded with opportunity does not appear to preclude significant results and, indeed, attitude SOI failed to produce significant results in our sample. We used the original SOI rather the SOI-R (Penke & Asendorpf, 2008), which Quist et al. (2012) used in their symmetry preference study, but even so the attitude questions are the same between the two scales. Furthermore, similar relationships between sociosexuality and sensation seeking were reported when administering the original SOI and SOI-R (Penke & Asendorpf, 2008). Taken together, these points suggest that rather than sample recruitment or SOI measure used, it may be some other factor which differentiates the significant and non-significant results (such as impulsivity as discussed above).

Importantly, our significant results were limited to male stimuli, i.e., the faces of potential mates. This would suggest that the nature of the shifting preferences does not relate to impulsivity with regard to social partners in general. Instead, impulsivity appears to be linked with sexual behavior/attitudes and the type of partner selected for an intimate relationship. Given that some indices of sexual dimorphism are related to physical aggression (for a summary, see Lassek & Gaulin, 2009) and to perceptions of aggressiveness (Geniole et al., 2012), this could be partially regarded as an element of risk taking: whether one is willing to enter an intimate encounter with a “riskier” individual. Future research may

investigate this element of risk taking and the perception of behavioral aggression.

Alternatively, impulsivity, SOI, and mate choice could be seen as part of a general suite of behaviors relating to “time horizons,” such that those with a short-time horizon engage in less planning (i.e., give less thought to the future and their actions), have a less restricted sociosexuality, and select sexual partners with features that indicate a similar bias towards short-term relationships or select partners without regard to the consequences of desertion. In this sense, mate choice could be regarded as just one expression of a broad underlying trait, rather than necessarily a distinct functional process. This preliminary hypothesis could be tested by examining whether preferences for other traits unrelated to risk co-vary with impulsivity as well; Quist et al. (2012) found that preferences for symmetry were positively correlated with sociosexuality (for discussion of the potential costs of symmetric partners, see Boothroyd et al., 2009). It could be argued that traits and health cues such as averageness and skin yellowness, may better test whether observers are maximizing the genetic quality of short-term partners or are simply acting without consideration of the costs of masculine (or indeed symmetric) partners.

Our data were, however, limited in being derived from hypothetical preferences between static facial images. Although 2D image preferences have some validity, they do not contain as much information as moving images (Rhodes et al., 2011). Furthermore, as suggested by Scott (2010), forced choice tasks (even very extended forced-ranking tasks such as Burt et al.’s Q-sort design) may elicit variations in behavior which do not reflect behavior under free choice. Indeed, it must be acknowledged that the effects sizes demonstrated here were modest with correlation coefficients typically below .3. With regard to the validity of static forced choice tests, Provost et al. (2006) found that sociosexuality predicted hypothetical preferences for a highly masculinized versus a less masculinized male confederate in a speed dating paradigm (masculinity being assessed across face and body together), but the direction was different depending on whether the participants were asked to rate the males for a short- or long-term relationship. As such, it is important that the extant research into impulsivity/sensation seeking, sociosexual orientation, and mate preferences be extended further into ecologically valid scenarios, such as speed dating and longitudinal analyses of real relationships.

In summary, we have simultaneously examined, for the first time, the roles of both impulsivity and sociosexuality in physical attraction, and the potential dominance therein of impulsivity over sociosexuality. Furthermore, we demonstrated that these relationships exist in heterogeneous samples as well as in student samples. Future research is required to replicate these preliminary findings and should consider the combined influence of these traits on preferences for other

features in a partner and examine more ecologically valid indices of preference.

**Acknowledgment** The authors thank Rachel Stokes for assistance with data collection.

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