

Preferences for facial and vocal masculinity in homosexual men: the role of partnership status, sexual restrictiveness, and self-perceived masculinity

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Abstract

Studies on mate preferences usually examine heterosexual attraction; comparatively little is known about preferences of individuals whose sexuality is aimed at the same sex. This study examined preferences of two groups of androphilic individuals - homosexual men and heterosexual women - for male facial and vocal level of masculinity. Facial images of 61 men and vocal recordings of 30 men were rated by 50 heterosexual women and 33 homosexual men for their attractiveness and masculinity-femininity. In both groups of raters, ratings of vocal attractiveness and masculinity were positively correlated, but there was no overall preference for facial masculinity. After splitting raters according to their relationship status, sexual restrictiveness, and self-rated masculinity, we found significant preferences for lower pitched male voices only in single homosexual men and coupled heterosexual women, while a preference for feminine male faces was found in coupled homosexual men. Furthermore, homosexual men describing themselves as relatively masculine significantly preferred lower-pitched male voices but also more feminine male faces. Our results demonstrate that conditional mate preferences are not restricted to heterosexual interactions, and homosexual men prefer a mixture of masculine and feminine traits in their potential male partners.

Keywords: attractiveness, face, voice, sexual orientation

1 Introduction

A large body of recent empirical research has focused on aspects of human physical attractiveness and its social and evolutionary implications. Although it is only part of the broader picture, physical appearance undoubtedly plays a key role in mate choice decisions, with significant sex differences in preferences for different traits which, more often than not, are robust across different cultures (Andersson and Iwasa 1996). In addition to characteristics such as symmetry, averageness and adiposity, sex-typical physical traits are perceived as attractive by individuals of the opposite sex (Perrett, Lee, Penton-Voak, Rowland, Yoshikawa, Burt, Henzi, Castles, Akamatsu 1998; Rhodes, Hickford, Jeffrey 2000). Expression of these physical sex-typical traits are thought to be mediated by sex hormone action during prenatal and early childhood, and/or at pubertal development (Johnston, Hagel, Franklin, Fink, Grammer 2001), and to reliably indicate an individual's health, genetic quality and immunocompetence (Folstad and Karter 1992, Gangestad and Thornhill 2003, Yeo, Thornhill, Gangestad 1994, review in Roberts and Little 2008).

1.1 The effect of male sex-typical vocal and facial traits in opposite-sex preferences

One of the sexually dimorphic traits which develops under the influence of pubertal testosterone is voice pitch (a perceptual correlate of fundamental frequency). On average, adult men produce lower-pitched voices than women and children (Hollien, Green, Massey 1994). The development of preferences for low voice pitch is linked to pubertal changes and only become fully developed as adulthood approaches and mate choice decisions become relevant (Saxton, Caryl, Roberts 2006, Saxton, DeBruine, Jones, Little, Roberts 2009). Lower-pitched male voices are rated as masculine and attractive by female raters (Berry 1992, Collins, 2000, Feinberg, Jones, Burt, Perrett 2005, Feinberg, Jones, Smith, Moore, DeBruine, Cornwell, Hillier, Perrett 2005, Hodges-Simeon et al., 2010, Oguchi, Kikuchi 1997, Puts, 2005, Riding, Lonsdale, Brown 2006, Zuckermann, Miyake, Elkin 1995), are associated with

perceived maturity of their owners (Childers, Wu 1991, Wu, Childers 1991), perceived muscularity, age and weight (Collins 2000), actual body size (Evans, Neave, & Wakelin, 2006, Evans, Neave, Wakelin, & Hamilton, 2008, Puts, Apicella, & Cárdenas, 2012, Zuckermann, Miyake, Elkin 1995), and actual level of testosterone (Dabbs, Mallinger 1999).

Low voice pitch is also linked to self-reported number of sexual partners (Puts 2005), and self-reported reproductive success (Apicella, Feinberg, Marlowe 2007). Moreover, attractiveness of male voices predicted sexual behavior in males, such as lower age of first sexual intercourse and higher number of extra-pair sexual relationships (Hughes, Dispenza, Gallup 2004). These relationships may arise as a result of selection pressures on male vocal display (Clutton-Brock and Albon 1979; Ohala 1982; Puts et al 2006; Puts et al. 2007), such that higher reproductive success of men with lower-pitched voices reflect female preferences for male dominance (Wells et al 2009).

Another extensively studied domain of physical attractiveness is facial appearance. As with voices, since human faces display sex-dimorphic morphological traits, such as larger jaws and prominent eyebrow ridges in men, it has been suggested that male facial masculinity is related to attractiveness and mating success (Johnston, Hagel, Franklin, Fink, Grammer 2001) and sociosexuality in men (Boothroyd, Jones, Burt, DeBruine, Perrett 2008).

Although preferences for sex-typical traits occur across cultures and are thus robust, there is nonetheless substantial individual variation in strength of preference for such traits, which have been particularly well-described in the face literature. Positive relationships have been found between rated facial masculinity in males and attractiveness (Perrett, Lee, Penton-Voak, Rowland, Yoshikawa, Burt, Henzil, Castles, Akamatsu 1998), their actual health (Rhodes, Chan, Zebrowitz, Simmons 2003), symmetry (Little, Jones, Waitt, Tiddeman, Feinberg, Perrett, Apicella, Marlowe 2008) and level of salivary testosterone (Penton-Voak, Chen 2004). Relative strength of women's preferences for male traits are context-dependent,

i.e., being influenced by perception of females' own attractiveness (Little, Burt, Penton-Voak, Perrett 2001), phase of menstrual cycle (Jones, DeBruine, Perrett, Little, Feinberg, Law Smith, 2008), relationship status (Little, Jones, Penton-Voak, Burt, Perrett 2002), or sexual restrictiveness (Burt, Kentridge, Good, Perrett, Tiddeman, Boothroyd, 2007). Overall, it has been shown that women who perceive themselves as more attractive, coupled women, those who seek short-term relationships, and those who are less sexually restricted, show stronger preferences for male facial masculinity.

1.2 Effect of male masculinity-femininity in same-sex preferences

In contrast with the extensive investigations of heterosexual partner preferences (Barber 1995, Enquist, Ghirlanda, Lundquist, Wachtmeister 2002, Penton-Voak, Perrett 2000, Rhodes 2006, Roberts, Little 2008, Steven, Glenn 2005), there is very limited research on partner preferences of homosexual individuals. It has been reported that homosexual men show male-typical mating psychology, including interest in casual sex and visual sexually explicit material (Bailey, Gaulin, Agyei, Gladue 1994); they also report male-typical mate retention behavior (Vanderlaan, Vasey 2008), prefer potential partners who are younger than themselves (Hayes 2001, Silverthorne, Quinsey 2000) and, again similarly to heterosexual men, value physical attractiveness in their potential partners more than heterosexual women (Howard, Blumstein, Schwartz 1987). On the other hand, homosexual men prefer as partners men who describe themselves as rather masculine, and this is dependent on their own level of masculinity (Bailey, Kim, Hills, Linsenmeier 1997, Muscarella 2002). This is further supported by a recent study that found that homosexual men prefer digitally masculinized male facial pictures over feminized pictures (Glassenberg, Feinberg, Jones, Little, DeBruine 2010). Except for the last-mentioned study, the previous research on partner preferences of homosexual men is methodologically limited to questionnaire data or data based on personal

advertisements. To investigate preferences for masculinity-femininity of homosexual men in more detail, in this study, we use non-manipulated male facial pictures and vocal recordings.

1.3 Aims of the current study

The main aim of the current study was to investigate preferences for male facial and vocal masculinity in androphilic individuals, i.e. men and women sexually attracted to men (thus, we intentionally did not include ratings of heterosexual men and lesbian women, since they are not sexually attracted to men), and to test effects of potentially modulating variables. In line with the aforementioned findings, we expect that lower-pitched male voices perceived as masculine will in general be rated as attractive by both homosexual male and heterosexual female raters, and because of individual condition-dependency, that there is no general overall preference for facial masculinity. Based on findings described above for heterosexual preferences, we test for possible influence of relationship status, sexual restrictiveness and self-perceived masculinity on preferences for both facial and vocal masculinity in homosexual males and heterosexual females.

2 Materials and Methods

2.1 Participants

Facial photos and vocal recordings of 61 men (targets; mean age 23.3; SD 3.82; range 18 – 35) were obtained for this study; 28 men were identified as homosexual, and 34 as heterosexual. There were no significant differences between the two groups of target men in age, type and level of education, and religious belief, but homosexual men reported higher income ($t(64) = 4.46; p < 0.001$). Except for two participants who were of Slovak origin (both of them were homosexual and were excluded from the voice rating study), all of the targets were Czech, Caucasian. The target sample was mainly recruited by distribution of information flyers in various faculties of Charles University in Prague, on gay web pages, in bars, and by the snowball method; i.e. **through social networks of the first author who sent an information**

email about the research to her heterosexual and homosexual friends and colleagues, and asking them to spread the information further. Data collection was performed by the first author during two summer months of 2006 (i.e. within one season) in order to reduce possible seasonal effects (e.g. on skin color due to tanning).

2.2 Sampling procedure

All data were collected under standard conditions at the Laboratory of Human Ethology and each participant was reimbursed by 300 CZK (approximately 17 USD) in compensation for their time. All participants signed a consent form having been informed about the procedure and assured that data would be treated confidentially and for scientific purposes only. They further completed a battery of questionnaires collecting information on basic demographic data, sexual orientation, and self-reported attractiveness.

2.3 Facial photographs

All targets were dressed in white T-shirts of appropriate size (which we provided) when photos were taken in order to standardize dress and reduce shadows in faces caused by colored clothes. Each participant used a black hair band to remove hair from the forehead. Further, they were asked to remove earrings, facial jewelry and to adopt a neutral facial expression. The portraits were taken with a Canon 350D camera with the focus Canon EF 50/1.8 II from a distance of 1.5 m. A light blue background was used to optimize white balance, following digital adjustments. In order to eliminate possible influences of hairstyle, only faces with scalps covered were used for the ratings (procedure used in previous studies, eg Roberts et al., 2004). The scalps were covered using Photoshop 7.0 software and faces placed on a black background.

2.4 Vocal recordings

Vocal samples were recorded using a digital recorder Olympus WS310M with an external Sennheiser E845-S microphone. Seated targets were asked to read aloud a standard

paragraph of an emotionally neutral text describing various concepts of a rainbow (Jacobs, Smyth, Rogers 2006) which was translated into the Czech language. Each participant was familiarized with the text before recordings were taken. To avoid potential effects of stress or fatigue, we extracted an intermediate section (approximately 20 seconds out of 90 to 120 seconds) of the recording, similar to the research of Jacobs and colleagues. SoundForge 8.0 software was used for the extraction and the volume standardization. All 59 voice samples (two individuals of Slovak origin were excluded from the analyses and the voice of one participant was not recorded) were analyzed by Praat software (www.praat.org) for average fundamental frequency (F0) that ranged from 86.4 to 191.8 Hz. Fundamental frequency was measured using Praat's autocorrelation algorithm with parameters set to a pitch floor of 75 Hz and a pitch ceiling of 300 Hz, with all other values set to default. Fundamental frequencies were averaged across recordings for each speaker.

2.5 Raters

The sample consisted of 50 heterosexual female raters (mean age 24.8, $SD = 5.57$, range 17 – 42) and 33 homosexual male raters (mean age 28.7, $SD = 6.08$, range 19 – 48). Women were recruited in various public places in Prague (mostly open-air cafés) with access to sit at the computer. Ratings took place during afternoons and only individuals who had not been drinking alcoholic beverages were recruited, since there is some evidence that alcohol consumption may affect attractiveness ratings (Parker, Penton-Voak, Attwood, & Munafò, 2008). Before rating, raters completed a short questionnaire on basic demographic data including age, use of hormonal contraception, and sexual orientation as assessed on a 7-point Kinsey scale (0 = heterosexual; 6 = homosexual). Of 62 females who answered this question, 51 (82%) rated themselves as heterosexual (ie scores of 0 and 1 on the Kinsey scale), and 11 (18%) as bisexual (ie 2-4 on the Kinsey scale). For all analyses, we only included data from women identifying as heterosexual. The average number of reported male sexual partners was

9.4 (with median 6). Six women stated they had had at least one female sexual partner during their lifetime. Twenty women (39.2 %) reported being in a long-term relationship at the time of the study and 29 female raters (56.9 %) were using hormonal contraception at the time of the study. Five women stated they had at least one child.

Male raters were recruited in gay bars, by the snowball method and by distributing leaflets in gay internet sites. Three men did not complete the questionnaires. Thirty-three men (89 %) rated themselves as homosexual (5-6 on the Kinsey scale) and 4 (11 %) as bisexual (ie scores of 3-5). All the analyses are based on male raters who identified themselves as homosexual. The average number of reported male sexual partners was 68.1 (with median 20.0). Eleven men (29.7 %) reported having a long-term partner at the time of the study. Twenty men (54.1 %) stated they had had at least one female sexual partner during their lifetime. Raters also answered a question on how masculine or feminine they would rate themselves (answers on a 7 point scale, 1 = masculine, 7 = feminine).

Recruitment locations were chosen in order to minimize the between-location variability (for factors such as lighting or surrounding noise). We also asked participants to complete ratings while sitting at the researcher's table in order to reduce possible distraction by their friends. We note that differences across locations are more likely to reduce the chance of finding significant effects than to generate them.

None of the raters were paid for their participation.

2.6 Rating procedure

In this study we chose to use unmanipulated voices and faces to explore preferences instead of experimental manipulation (eg manipulation of vocal fundamental frequency, or masculine facial traits) of facial and vocal masculinity. By using this method, we can estimate the effect of perceived masculinity in faces and voices with other acoustic or visual parameters that are freely varying. It was shown that vocal fundamental frequency correlates with other acoustic

parameters (Hodges-Simeon, Gaulin, & Puts, 2010) but can be used as a proxy measure of overall vocal masculinity (Puts 2006). Furthermore, we were not only interested in objectively measured vocal or facial masculinity, which can be experimentally manipulated, but also in the relationship between perceptions of attractiveness and perceptions of facial and vocal masculinity.

We randomly chose only half of the vocal recordings because of time constraints for raters (the rating took approximately 20 minutes in total) and each rater rated only one parameter to avoid carry-over effects. Each rater judged firstly the vocal recordings and then the whole sample of facial images (each photo and vocal recording of a heterosexual individual was alternated by a photo or vocal recording of a homosexual individual) for attractiveness or masculinity on a 7 point scale (1 = attractive/masculine, 7 = not attractive/feminine). Of 65 female raters, 42 rated both facial and vocal stimuli and 23 rated only facial stimuli. All homosexual male raters rated both facial and vocal stimuli. Image ratings were carried out on a laptop screen with resolution of 1280 x 800 pixels using ImageRater 1.3 software specifically developed for our purposes. Vocal recordings were rated using same laptop with Koss headphones.

2.7 Statistical analyses

Analyses were carried out with SPSS v.16.0. Initially, data normality was tested by visual examination of histograms, and the assumptions of univariate normality for rating scores was checked with Shapiro-Wilks's W test. In several cases data violated the assumption of normality, we have thus used nonparametric correlations to test for relationships between the variables. Moreover, to compute possible differences between the two correlations, we used Fisher's Z. We then did some exploratory analyses to prepare for the planned inferential testing.

Firstly, using Mann-Whitney U tests, we tested for possible differences between homosexual and heterosexual targets in judged attractiveness and masculinity. The ratings of attractiveness and masculinity for both vocal and facial stimuli did not significantly differ between homosexual and heterosexual targets as rated either by male or female raters (all p 's $> .12$), therefore the ratings were further analysed for both groups of targets together.

Furthermore, both female and male raters showed high consistency in their facial attractiveness judgments (Cronbach's alpha = .965 and .940, respectively) and vocal attractiveness judgments (Cronbach's alpha = .627 and .763, respectively); they also showed high consistency in their facial masculinity judgments (Cronbach's alpha = .938 and .942, respectively) and vocal masculinity judgments (Cronbach's alpha = .897 and .620, respectively). Ratings of vocal ($r = .646$, $N = 30$, $p < .001$) and facial ($r = .752$, $N = 61$, $p < .001$) attractiveness among heterosexual females and homosexual males were highly correlated. Similarly, ratings of vocal ($r = .891$, $N = 30$, $p < .001$) and facial ($r = .775$, $N = 61$, $p < .001$) masculinity were highly correlated among heterosexual females and homosexual males.

The preferences for facial and vocal masculinity were analysed by Spearman's correlations, with mean ratings for each target as the unit of analysis. In order to test for a possible effect of relationship status, we split the raters into two groups based on their self-report. Similarly, to test for possible influence of sexual restrictiveness, we split the raters by the median of their number of reported sexual partners (we describe the group below the median as restricted and those above the median as unrestricted). There was no significant difference in age between coupled and single heterosexual women (Mann Whitney U = 296, $N = 51$, $p = .786$), nor in age or self-ascribed masculinity-femininity between coupled and single homosexual men (Mann Whitney U = 79.5, $N = 32$, $p = .715$; Mann Whitney U = 75, $N = 32$, $p = .552$, respectively). However, in both women and men, those with a higher number

of sexual partners were significantly older than more restricted individuals (Mann Whitney U = 160.5, N= 51, p = .002; Mann Whitney U = 38.5, N= 29, p = .004, respectively).

Male raters were also categorized according to their self-rated masculinity (also using a median split), with those below the median being described as feminine and those above as masculine. To adjust for multiple comparisons, Bonferroni corrections were applied.

Finally, to test for the possible influence of voice pitch on general vocal attractiveness and masculinity ratings, we used simple linear regression with rated parameters (attractiveness or masculinity) as dependent variables, and age and voice pitch as predictors.

3 Results

3.1 General preferences

To test our main hypothesis, we ran a series of non-parametric correlations between rated masculinity and attractiveness. In homosexual male raters, rated vocal masculinity was strongly and positively correlated with vocal attractiveness (Spearman's rho = .745, N = 30, p < .001), and the same effect was found in heterosexual female raters (Spearman's rho = .536, N = 30, p = .002). There was no significant difference between the correlation coefficients (Fisher's r-to-z test, Z; p = .18). Concerning facial ratings, we found a non-significant trend towards a negative correlation between rated facial masculinity and attractiveness in homosexual male raters (Spearman's rho = -.246, N=61, p = .056), but no evidence of a significant relationship between these variables in heterosexual female raters (Spearman's rho = .064, N=61, p = .625). These correlations did not differ significantly (p = .08).

3.2 The effect of relationship status

We then split the raters according to their relationship status (for all subsequent analyses we applied Bonferroni correction, $\alpha = .0125$). The positive relationship between vocal attractiveness and masculinity remained significant only in single homosexual male raters (Spearman's rho = .594, N = 30, p = .001), but no significant results were found in

coupled homosexual males and heterosexual females (p 's > .06). There was a significantly higher correlation between vocal attractiveness and masculinity in single homosexual male raters than in coupled homosexual males ($Z = 2.49$, $p = .012$), and in coupled heterosexual females than in single females ($Z = 2.36$, $p = .018$).

Concerning facial ratings, we found a significant negative relationship between rated facial masculinity and attractiveness only in coupled homosexual men (Spearman's $\rho = -.371$, $N = 61$, $p = .003$), while it remained non-significant in other groups of raters (p 's > .21). Fisher's r -to- z test revealed that this relationship was significantly stronger in single than coupled homosexual male raters ($Z = 2.98$, $p = .002$), but there was no significant difference in female ratings ($p = .36$).

3.3 The effect of sexual restrictiveness

After dividing the sample according to the median number of sexual partners, significant positive relationships between vocal attractiveness and masculinity were found in both restricted (Spearman's $\rho = .724$, $N = 30$, $p < .001$) and unrestricted (Spearman's $\rho = .603$, $N = 30$, $p < .001$) homosexual male raters. There was also a trend in restricted (Spearman's $\rho = .404$, $N = 30$, $p = .027$), and a significant relationship in unrestricted, female raters (Spearman's $\rho = .542$, $N = 30$, $p < .002$). There was no significant difference between correlation coefficients among any of the groups of raters (all p 's > .07).

In facial ratings, less restricted homosexual men tended ($\alpha = .0125$) to prefer less masculine faces (Spearman's $\rho = -.294$, $N = 61$, $p = .022$), while there was a trend towards a positive correlation in women, with unrestricted women tending to prefer more masculine faces (Spearman's $\rho = .284$, $N = 61$, $p = .027$). The relationship was not significant in the other groups of raters ($p > .112$). Sexually unrestricted homosexual men preferred significantly more feminine male faces than unrestricted heterosexual women ($Z = 3.2$, $p = .001$).

3.4 Effect of self-rated masculinity in male raters

Correlations between vocal masculinity and attractiveness were positive and significant in both masculine and feminine homosexual men (Spearman's $\rho = .750$, $N = 30$, $p < .001$; Spearman's $\rho = .496$, $N = 30$, $p = .005$, respectively), and these coefficients did not differ significantly. Furthermore, rated facial masculinity was negatively associated with attractiveness in homosexual raters who described themselves as masculine (Spearman's $\rho = -.364$, $N = 61$, $p = .004$), while this relationship remained non-significant in feminine homosexual raters (Spearman's $\rho = .067$, $N=61$, $p = .608$). Fisher's r-to-z test revealed that this relationship was significantly different in feminine homosexual men than in masculine men ($Z = 2.42$, $p = .015$).

3.5 Voice pitch as a predictor of rated vocal attractiveness and masculinity

To test for an effect of voice pitch of the rated individuals on rated attractiveness and masculinity, we ran linear regressions with voice pitch of the target individuals entered as independent variable, and rated attractiveness and masculinity as separate dependent variables. Because voice pitch was positively correlated with age, age of the target participants also entered as another independent variable. Rated vocal attractiveness was significantly predicted by voice pitch in both male and female ratings (men: $t = 2.623$, $\text{Beta} = .476$, $p = .014$; women: $t = 3.990$, $\text{Beta} = .649$, $p < .001$). Similarly, rated vocal masculinity was significantly predicted by voice pitch in both male and female ratings ($t = 3.955$, $\text{Beta} = .650$, $p < .001$; $t = 5.078$, $\text{Beta} = .746$, $p < .001$).

3.6 Additional analyzes

We also tested the relationship between ratings of attractiveness and masculinity between the two studied modalities (ie vocal and visual). We found no significant correlation

between facial and vocal stimuli either in ratings of attractiveness or masculinity, in either group of raters (all p 's > 0.3).

Finally, to test whether other-rated attractiveness from facial and vocal stimuli predicts self-rated attractiveness of the targets, we ran a linear regression with self-rated attractiveness as the dependent variable and facial and vocal attractiveness (as rated by both groups of raters) entered as independent variables. This model explained 27% of the variance, and we found that self-rated attractiveness was significantly predicted only by facial attractiveness as rated by homosexual male raters ($t = 2.130$, Beta = .597, $p = .043$).

4 Discussion

In this study, we aimed to test whether vocal and facial preferences of androphilic men and women are linked to male sex-typicality in targets. As predicted, we found that both homosexual men and heterosexual women prefer male voices which are perceived masculine, and which are low in pitch. In contrast, there was no general preference for masculinity in facial stimuli. Next, we investigated the possible influences of relationship status, sexual restrictiveness, and self-perceived masculinity on preference for masculinity. We found a significant effect of relationship status on preferences for masculinity in voices which, however, showed opposite patterns in homosexual male and heterosexual female raters. In facial ratings, we also found this opposing direction in preference among sexually unrestricted women and men. Finally, the results suggest that homosexual men describing themselves as relatively masculine prefer masculine male voices but more feminine male faces.

Our results, in general, indicate that androphilic individuals, irrespective of their sex, prefer sex-typical male voices over high-pitched, feminine voices. This result is in agreement with previous studies reporting similar preferences in English-speaking female raters (Collins 2000, Feinberg, Jones, Burt, Perrett 2005, Riding, Lonsdale, Brown 2006), and suggests that this preference is not specific to a particular language, sex or sexual orientation.

Nevertheless, this preference is modulated by the raters' relationship status. It is suggested that masculinity in men provides a cue to underlying genetic quality, and is thus preferred by women. However, the faces of masculine men are associated with perceived traits that indicate lower investment in potential offspring, and masculinity might be thus relatively preferred by women who already have a long-term relationship with a man willing to invest in their offspring. However, it should be noted that the evidence supporting this assumption is mixed (eg Gangestad and Simpson 2000, Pawlowski and Zelazniewicz 2012). Furthermore, this effect could also be due to an exposure effect, as coupled women are exposed on a daily basis to their male partner, which might shift their preference towards more masculine faces (eg Saxton, Little, DeBruine, Jones, Roberts, 2009). In contrast, we found an opposite pattern in homosexual male raters: single homosexual men preferred more masculine male voices and faces than coupled men, which would be inconsistent with an exposure effect. Previous research has shown general preferences in homosexual men for potential sexual partners who describe themselves as relatively masculine (Bailey, Kim, Hills, Linsenmeier 1997) and also preferences for masculinized over feminized male faces (Glassenberg et al 2010). However, none of the previous studies tested possible effects of relationship status on these preferences, and we show that these preferences might be more pronounced in single homosexual men.

Furthermore, we also found an effect of self-perceived masculinity on facial and vocal preferences, showing that homosexual men who describe themselves as relatively masculine prefer more masculine male voices, but also more feminine male faces. To our knowledge, only one other study has investigated this, in personal advertisements, where more masculine homosexual men preferred men describing themselves as masculine (Bailey et al., 1997). Here we show that self-perceived masculinity also influences preferences of homosexual men, but rather than seeking either sex-typical or atypical traits in their potential partners, it seems

they prefer a mosaic of masculine and feminine traits. This is consistent with our result showing that there was no correlation between judged attractiveness across the two modalities. Several previous studies have claimed that different cues in one individual signal the same underlying quality, particularly in men (eg Feinberg, DeBruine, Jones, Little 2008, Saxton, Caryl, Roberts 2006). However, in our study, facial attractiveness was not associated with vocal attractiveness, and facial masculinity did not correlate with vocal masculinity. Thus, our targets were rated differently in the two modalities by both groups of raters. This finding is consistent with Collins (2000), who found no correlations between male voice pitch and either measured or estimated bodily characteristics. In her study, voices with low frequency were rated as attractive, and their owners as heavier, older and more likely to be hairy-chested. Nevertheless, these estimations did not relate to the measured or self-reported qualities of the rated individuals. Thus, facial and vocal masculinity-femininity in men might be associated with different qualities – while vocal masculinity might signal positively valued social dominance or maturity (Wells et al., 2009), masculine faces might be rather associated with aggressiveness or impulsivity (Perrett et al., 1998).

It is also worth noting that our results show that, with increasing age, male faces were rated as more masculine but not as more attractive, which is in agreement with a previous study (Boothroyd, Jones, Burt, Cornwell, Little, Tiddeman, Perrett 2005). Consequently, masculine physiognomy in faces (and not low voice pitch) might evoke perceptions of higher age or dominance, rather than attractiveness.

The current study has also several limitations. For example, although raters were asked about their relationship status, other details such as their relationship length, general and sexual satisfaction within the relationship, and extra-pair sexual activities might have explained additional variation in raters' responses.

In summary, our results show that conditional mate preferences are not restricted to heterosexual interactions. Circumstances such as relationship status or self-perceived masculinity influence preferences for male sex-typical traits in both females and homosexual males.

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