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ORIGINAL ARTICLE

Female Self-Sexualization Covaries with Mate Value but Not Mate Availability

Lindsie C. Arthur, et al. *[full author details at the end of the article]*

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Abstract

Objective An array of literature spanning economics, sociology, biology, and psychology suggests that the availability of romantic partners has profound consequences for individuals and the societies in which they live. Here we build on this growing body of research to understand how variation in mate availability—operationalized via experimental imbalances in the ratio of men to women (the sex ratio)—affect women's willingness to enhance their physical and sexual attractiveness to men.
Methods Using a series of three treatments, with four replicate stimuli nested within each treatment conditions, we experimentally manipulated the sex ratio of the dating environment for 334 women, giving them the impression that romantic partners were either abundant, scarce, or balanced relative to competitors. We measured women's satisfaction with their body image, their interest in enhancing their sexual attractiveness to men, their acceptance of cosmetic surgery, and their overall belief that they were a high-quality romantic partner (their mate value; a potential moderator of the sex ratio effect).
Results Contrary to expectations, we found no evidence that sex ratios affected women's enhancement of their physical and sexual attractiveness, but we did find that individual differences in mate value robustly covaried with all three outcome variables.
Conclusions Results raise the possibility that female self-sexualization does not covary with the relative availability of mates, but that it is reliably associated with individual differences in mate value.

Keywords Sex ratios · Mating competition · Mate vale · Self-sexualization

Introduction

The Western trend towards sexualized depictions of women—dubbed variously as the "pornification of society" or the "sexualization of culture"—encompasses both the

Open Source Framework – Data Repository Link https://osf.io/px9q2/

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tendency for women to be sexually objectified in mass media and a shift toward more progressive sexual attitudes (Attwood 2006). It also includes women's styling of their physical appearance in ways that aim to enhance their sexual attractiveness to men. These behaviors involve wearing hyper-sexualized clothing and undergoing cosmetic surgery to emphasize secondary sexual characteristics, and often covary with a psychological preoccupation with one's body (Smolak et al. 2014). Researchers refer to these behaviors as examples of self-sexualization, which is defined as the normalized adoption of overtly sexualized behaviors and a mindset intent on enhancing sexual attractiveness (Choi and DeLong 2019).

Much debate surrounds the psychological drivers of self-sexualization. Feminist perspectives propose that the occurrence of sexualization cannot be divorced from its cultural context, in which women are routinely objectified and disproportionately valued for their physical appearance (Gill 2012). Accordingly, women can self-sexualize for a multitude of reasons, including to boost their own confidence within a patriarchal world (Peterson 2010; Yost and McCarthy 2012), or to transcend socially sanctioned and sexless versions of femininity (Baumgardner and Richards 2004). Biological perspectives highlight that self-sexualization is context-dependent, yet they are more concerned with individual drivers of behavior than with broad societal factors like gendered power relations. Evolutionary thinkers consider self-sexualization's primary psychological motivation to be attracting potential romantic partners and outdoing romantic competitors (Barber 1999; Blake et al. 2018; Buss 1988a). Increasing physical and sexual attractiveness can be important for women, as these forms of attractiveness elevate individual women's social status among other women, and their value as romantic partners to men (Maestripieri et al. 2017).

Feminist and evolutionary perspectives need not be considered diametrically opposed, even though there is indeed a tendency for scholars to treat them as such (Campbell 2006). It is likely that both cultural and biological pressures influence self-sexualization. Nevertheless, in comparison to the body of work considering self-sexualization from a cultural perspective, biological approaches toward self-sexualization have been relatively neglected. To remedy this gap, here we examine the degree to which self-sexualization varies according to the degree of mating competition in the local environment.

Mating Competition and the Sex Ratio

We manipulate perceived mating competition using the sex ratio, a concept originally formulated in biology, that refers to the ratio of males to females in any given population (Emlen and Oring 1977). In biology researchers have mostly focused on the operational sex ratio (OSR), which is the number of reproductively available members of each sex (Emlen and Oring 1977; Mills and Reynolds 2003). A male-biased OSR occurs when there are more sexually available males, and equally, a female-biased OSR indicates more available females (Balshine-Earn 1996). The OSR in biology differs from the adult sex ratio usually measured among humans, which instead captures the ratio of reproductive-age men to women. It does so by considering sex differences in the time taken to reproduce and care for young: Although there may be more females present in a population, if a large proportion are pregnant or caring for young, they are not considered available for mating and are therefore not included in the OSR (Kokko and Jennions 2008; Pröhl 2005).

One cornerstone of the non-human animal literature is that as the OSR becomes increasingly biased, within-sex competition intensifies among members of the sex in oversupply (Emlen and Oring 1977). There are several ways that non-human animals compete for mates, but here we focus on courting behaviors due to their relevance to human self-sexualization. Animal courtship may include dances, visual displays, vocalizations, other acoustic signals, pheromones, or even the presentation of gifts. Given the abundance of potential mates, the sex in undersupply enjoys greater demand, and thus ceteris paribus more potential mates to choose from than when it is in oversupply. In extreme cases, changes in sex ratio can alter the mating market so dramatically that the choosier sex becomes the less choosy (Gwynne and Simmons 1990). Therefore, although there may be simultaneous competition within both sexes, competition intensifies within a sex that is abundant relative to the other, and decreases in a sex that is relatively rare (Weir et al. 2011).

Newer biological models consider how sex ratio imbalances interact with other factors to influence mating behaviour, within a framework that considers the benefits and costs of competition in a given environment. Using mathematical modelling, Kokko and Jennions (2008); see also Fromhage and Jennions 2016) demonstrate that when mating opportunities are rare, the investment of time and effort in parenting (rather than mating) may provide a more fruitful reproductive outcome. In such scenarios, increased investment in existing offspring will likely maximize survival, especially if future mating opportunities are uncertain. This new model, however, was designed to account for the origins of sex roles among species, and these kind of frequency-dependent costs and benefits may require generations upon which to act (Stone 2017). For these reasons, here we focus primarily on mating competition rather than parenting, though we note that opting out of mating competition can also be a strategic reproductive strategy.

A number of scholars have applied evolutionary ideas about the OSR or Adult Sex Ratio (ASR) to understand variation in mating behaviors among human populations (Schacht et al. 2017). Guttentag and Secord's (1983) sex ratio theory outlines a range of behavioral consequences of imbalanced sex ratios. They argue that the sex in oversupply suffers limited mating options and reduced bargaining power, thus motivating them to adhere to the preferences of the rarer sex. However, when the environment is disadvantageous and an individual's sex is oversupplied in the mating market, courting behaviours must be adapted to satisfy the needs of the opposite sex (Emlen and Oring 1977; Weir et al. 2011). For instance, research on humans suggests that under female-biased sex ratios, sex is less restricted (Schacht and Mulder 2015); thus, adhering to male mating preferences.

How Might the Sex Ratio Affect Competitive Mating Behaviors among Women?

Previous research shows that one of the ways that heterosexual women compete for romantic partners is by enhancing their physical and sexual attractiveness to men (Buss 1988b). The drivers of these behaviors are likely cultural and biological (Blake et al. 2018; Fredrickson and Roberts 1997), and they have been demonstrated reliably across cultures (Buss 1988b). Examples of self-sexualization include using cosmetics to enhance facial attractiveness, particular kinds of clothing to highlight one's physical features (Barber 1999), and sharing sexualized images online (Blake et al. 2018).

Wearing high heels, shaving genitals and purchasing special underwear are also strategies women engage in to enhance their attractiveness to men (Smolak et al. 2014).

To the extent that these behaviors are a manifestation of within-sex competition, we can extract predictions about how they may respond to experimental variation in the sex ratio. In a female-biased environment—where women are in oversupply, and hence experience greater competition and reduced bargaining power over the formation of intimate relationships—we predict that women will engage in more physical appearance enhancing activities in order to gain men's attention and to give the impression that they are open to unrestricted mating. In male-biased environments, however, where women are scarce and men are abundant, we would expect women to show reduced investment in these activities, as such behaviors are less often necessary to attract a mate. In the current work, we tested these hypotheses by measuring women's investment in self-sexualization in different sex ratio conditions.

The Importance of Mate Value

Before concluding our predictions regarding sex ratio effects on mate competition in women, however, it is worth briefly mentioning the suspected importance of mate value. Mate value is a measure of how desirable someone is to the opposite sex (Fisher et al. 2008), such that a woman with high mate value will possess highly desirable mate qualities, such as attractiveness, youthfulness or intelligence (Arnocky et al. 2016). Mate value is believed to be important because it influences how selective someone can be when trying to mate with someone (Arnocky 2018). For instance, individuals with high mate value are themselves highly desirable, meaning they can afford to be highly selective. In contrast, low mate value individuals must adopt a less discriminatory approach (Arnocky 2018). Critically, it is not enough for an individual to be valued highly within their mating market, they must also perceive themselves in this way; an important distinction when considering mate value in people.

As indicated above, research has shown that self-perceived mate value influences the dating preferences and behaviours of both men and women (Arnocky 2018; Arnocky et al. 2012). Buss and Schmitt (1993) argue that people who believe that they are a good mate are likely to adopt a mating strategy that suits their preferences and are unlikely to make sacrifices on what they want in a partner. Conversely, people who believe that they offer relatively little value as a mate are more likely to accept trade-offs in the dating game. These trade-offs can come from the characteristics of their new partner (for example, accept a partner who is less attractive than they would like) or though their willingness to adapt to new mating preference (for example, engage in a sexual strategy that is not their ideal preference).

Given that people with high mate value are less likely to feel threatened by members of the same sex (Fussell and Stollery 2012), and are less likely to make compromises when dating (Arnocky 2018), we predict that the effects of the sex ratio on self-sexualization may be moderated by individual differences in mate value. Specifically, we hypothesize that the positive effect of female-biased sex ratios on self-sexualization will be stronger among women with low self-perceived mate value. Our reasoning is that because women with low self-perceived mate value are more likely to adapt their dating strategy to compete with other women (Buss and Schmitt 1993), we suspect that they will feel increased pressure to self-sexualize when mates are scarce.

Method

Participants and Design

Four-hundred and thirty-four women ($M_{age} = 30.36$, $SD = 6.81$; 63.6% Caucasian/White, 15.7% African American/Black, 6.7% Hispanic) were recruited from Amazon Mechanical Turk and paid US$1.15 to participate in the study, advertised as a survey about comprehension and social attitudes. We aimed to recruit enough participants to provide roughly 20 participants within each nested prime, allowing for 80 participants in each experimental condition. A pre-screening questionnaire required participants to meet five key criteria: female, 18–45 years, heterosexual, single relationship status and fluent in English. Eighty people were excluded for failing an attention check, fourteen were eliminated for failing the manipulation check, five for exceeding a reasonable time limit (± 3-*SD* from the mean duration of 13.3 min, $SD = 23.5$ min) and one was removed following technical issues, leaving $N = 334$ females ($M_{age} = 30.7$, $SD = 6.98$; 65.9% Caucasian/White, 15% African American/Black, 6.6% Hispanic). Participants were randomly assigned into one of 12 groups, following a 4 (prime: newspaper article, dating profile photos, statistics, article titles) × 3 (condition: male-biased, female-biased, control) between participants design.

Procedure

After obtaining written consent, participants provided their demographic details, political orientation, and subjective social status. These confounders were selected because sexual behaviour has been shown to vary by political orientation (Berggren et al. 2017), socioeconomic class and age (Santelli et al. 2000). They were then presented with a series of questions related to self-perceived mate value, which included an attention check question (see below). Each participant was then presented with one of four primes (see Materials) which gave the impression that the sex ratio in their location was female-biased, male-biased, or neither (control condition). After priming, participants answered a manipulation check, and questions about their body image perception, enjoyment of self-sexualization and acceptance of cosmetic surgery. All participants were debriefed following the experiment.

Materials

Primes

The four primes composed a newspaper article, statistics, titles of articles, and dating profiles. Each participant received one of the four replicate primes within their experimentally assigned condition. When stimuli are used in an experiment, it is the independent application of the treatment that constitutes the unit of true replication. Many priming studies use only one prime per treatment condition, a form of pseudoreplication that could cause either Type I or Type II error, respectively, if something spurious in the prime elicits or dampens the treatment effect. Our "nested primes" approach (Blake and Brooks 2018) allows genuine replication of the priming stimulus, and thus more robust conclusions than typical single-prime studies.

In the female-biased condition, primes gave the impression that the sex ratio was female dominated in the participant's home location (i.e., more females per male). In the male-biased condition, primes gave the impression that the sex ratio was male dominated in the participant's home state or county (i.e., more males per female). In the control condition, primes were unrelated to the sex ratio. Manipulation checks were used to confirm comprehension of all four primes and are explained below.

Newspaper Article Primes Newspaper article primes were written for a popular general audience. These articles emphasized that women had few (female-biased ratio) or many (male-biased ratio) options for finding a partner. The control newspaper article was unrelated to dating and concerned skylights. To increase engagement and comprehension, after the prime participants wrote open ended responses to summarize what they learnt from their article. In the sex biased conditions, participants then completed two additional manipulation checks, indicating whether their article provided evidence that men outnumbered women or that women outnumbered men, and whether this information indicated that it should be easier or harder for someone of their sex to find a partner in their county. We provided feedback on responses to these manipulation checks, correcting incorrect answers and highlighting correct responses on participants' screens.

Dating Profile Primes Participants saw 60 fictitious tinder profile pictures, of generally attractive people ostensibly from their US county. In the male-biased condition, male profiles outnumbered female profiles by a ratio of 3:1, the reverse was true in the female-biased condition. The control dating profiles were evenly sex-balanced. After the prime, the manipulation check required participants to summarize the profiles they saw and indicated how many men there were in comparison to women.

Statistics Primes In the sex-biased conditions, participants chose four popular dating websites in the US from a list of 20, under the guise of seeing real dating profiles of single people in their county listed on these websites. They were then presented with a ratio ostensibly determined by number of profiles on that website, indicating that for each single woman there was approximately 10 single men in their county (male-biased ratio), or vice versa for the female-biased ratio. To confirm manipulation, they then answered the same two comprehension questions from the newspaper article primes. We provided feedback on responses as per the newspaper article prime. In the control condition, participants answered four questions unrelated to dating (here, about the average rain and humidity conditions in their county).

Article Title Primes We told participants that psychologists had shown that individuals can quickly and easily comprehend reading material if the material's title was well-written, succinct, and explanatory. We then showed participants a mixture of seven fictitious newspaper, book, or academic journal article citations (including titles), and asked them to infer the themes of the articles from their titles. Titles emphasized that women outnumber men in the USA, especially in the dating market (female-biased ratio) or that men outnumber women (male-biased ratio). The control article titles were unrelated to dating and included topics such as recycling, cleaning and budgeting. After reading the articles participants wrote four sentences summarizing the themes of the articles, used as a manipulation check.

Mate Value

4 items measured self-perceived mate value on a 7-point scale, with high score indicating higher mater value (e.g., "Overall, how would you rate your own level of desirability as a partner?"; Cronbach's alpha = .93, M = 4.80, SD = 1.15; [Edlund and Sagarin 2014]).

Attention Check

Two questions within the survey instructed participants to select a specific option from a choice of seven. The questions were, 'Overall, if your comprehension skills are adequate for this study, select the average option?', and, 'I am reading each question so will select the middle option to prove this'. Following recommendations from Chmielewski and Kucker (2019), we also screened the data from all comprehension check questions (see primes above) for unusual comments (e.g., all capital letters, nonsense sentences and single word responses). Zero participants were excluded for failing the comprehension checks.

Body Image Satisfaction

Six items measured body image satisfaction on a 7-point self-assessed scale (e.g., "Which option best describes how you feel about your appearance?"; 1-extremely dissatisfied, 7-extremely satisfied; $\alpha = .93$, M = 4.19, SD = 1.42; [Cash et al. 2002]).

Enjoyment of Sexualization

Eight items measured enjoyment of sexualization on a 7-point scale (e.g., "I feel complimented when men whistle at me"; 1-strongly disagree, 7-strongly agree; $\alpha = .88$, M = 4.61, SD = 1.10; [Liss et al. 2011]).

Acceptance of Cosmetic Surgery

Fourteen items measured acceptance of cosmetic surgery on a 7-point scale (e.g., "Cosmetic surgery is a good thing, because it can help people feel better about themselves"; 1-strongly disagree, 7-strongly agree; $\alpha = .96$, M = 3.96, SD = 1.41; [Henderson-King and Henderson-King 2005]).

Data Analysis

Analyses were conducted using generalized linear models in SPSS Statistics version 25. All models also corrected for the effect of manipulation, nested within condition, and cases with Cook's distances exceeding 1.0 were flagged for exclusion, though all Cook's scores were below 1.0 so none were excluded. We first tested for main effects of sex ratio condition and mate value, and the interaction term, on the three measures of self-sexualization – body image satisfaction, enjoyment of sexualization, and support for cosmetic surgery. Then we tested the robustness of effects by seeing if they were robust to the inclusion of subjective social status, political orientation and age.

Results

The effects of sex ratio condition on body image satisfaction, enjoyment of sexualization, and cosmetic surgery were not significant, nor was the condition × mate value interaction, see Table 1. There were also no significant differences according to manipulation prime type (see outcome variable *Manipulation within SR,* in Table 1).

Notably, however, the main analysis revealed that mate value was a significant predictor of scores across all dependent variables, also in Table 1. The effect was positive and large for body image satisfaction, $R(333) = .60$, $p < .001$, and positive and medium for enjoyment of sexualization, $R(333) = .33$, $p < .001$, such that women high on mate value were more likely to be preoccupied with their bodies and enjoy self-sexualizing. In contrast, the effect size was negative and small for acceptance of cosmetic surgery, $R(333) = -.14$, $p = .008$. Further exploration of the cosmetic surgery scale revealed that women with low mate value were more accepting of cosmetic surgery if that surgery was for themselves, $R(333) = -.15$, $p = .005$, but not if it were for others ($p = .052$), see the Supplementary Materials (Online Resource 1) for details.

Sensitivity analyses in Model 2 show that mate value remained a significant predictor of all dependent variables after controlling for subjective social status, political orientation and age, see Table 1. Using correlation analyses, we also found that women who reported high subjective social status recorded higher measures body satisfaction, $R(333) = .35$, $p < .001$, whereas participants with conservative personal values recorded significantly lower scores on enjoyment of sexualization, $R(333) =$. -15, $p = .015$.

Discussion

Replicate primes of the availability of mates did not affect any of the three measures of openness to self-sexualization: women's interest in cosmetic surgery, their enjoyment of self-sexualization, or their satisfaction with their body image. We did, however, find that individual differences in mate value covaried with all three measures of sexualization. Below, we house these findings within the context of past literature, examine limitations of our work, and make suggestions for future directions.

On Sex Ratios and Female Sexualization

The robust null effects of sex ratios on female sexualization suggests that sexualization is not influenced by mate availability, in the absence of other contextual factors. This finding is inconsistent with previous work suggesting that female intrasexual competition increases in female-biased sex ratio environments (Arnocky et al. 2014; Schacht et al. 2017; Uecker and Regnerus 2010). We note, however, that many studies investigating sex ratio effects use aggregate level data to describe correlation between variables, and only a few studies experimentally manipulate sex ratios (i.e., Arnocky et al. 2014; Durante et al. 2012). Geographic analyses are limited in terms of what they can tell us about individual processes (Pollet et al. 2014) and aggregate data can be error prone (Wolff et al. 2011). Likewise, there is no guarantee that aggregate-level relationships will hold at the individual levels of analysis (Ostroff 1993). Future

Table 1 Generalized linear models for self-sexualization outcome variables, testing sex ratios and mate value (Model 1), plus relevant confounds for sensitivity (Model 2)

Outcome variable	**Model**					
A. Body satisfaction	Model 1			Model 2		
	Walds χ^2	*df*	*p*	Walds χ^2	*df*	*p*
Intercept	<.01	1319	.933	0.01	1316	.911
Sex ratio	1.60	2319	.450	1.34	2316	.511
Mate value	183.11	1319	<.001	126.60	1316	<.001
Sex ratio × mate value	1.00	2319	.607	0.93	2316	.627
Manipulation within SR	6.85	9319	.653	5.25	9316	.812
Age				10.3	1316	.311
Political orientation				0.43	1316	.515
Social status				6.01	1316	.014
B. Enjoyment of sexualization	Model 1			Model 2		
	Walds χ^2	*df*	*p*	Walds χ^2	*df*	*p*
Intercept	0.04	1319	.839	0.05	1316	.830
Sex ratio	1.98	2319	.372	1.19	2316	.552
Mate value	45.46	1319	<.001	35.55	1316	<.001
Sex ratio × mate value	4.38	2319	.112	4.03	2316	.133
Manipulation within SR	11.60	9319	.237	13.19	9316	.154
Age				<.01	1316	.977
Political orientation				5.50	1316	.019
Social status				0.10	1316	.752
C. Cosmetic surgery	Model 1			Model 2		
	Walds χ^2	*df*	*p*	Walds χ^2	*df*	*p*
Intercept	<.01	1319	.955	<.01	1316	.949
Sex ratio	3.40	2319	.182	3.08	2316	.215
Mate value	6.46	1319	.011	7.55	1316	.006
Sex ratio × mate value	2.93	2319	.231	3.17	2316	.205
Manipulation within SR	12.05	9319	.211	12.41	9316	.191
Age				1.13	1316	.288
Political orientation				0.06	1316	.805
Social status				1.01	1316	.315

Note. Model A1 χ^2 (1, 14) = 151.03, p = <.001, AIC = 827.82. Model A2 χ^2 (1, 17) = 158.50, p = <.001, AIC = 826.35. Model B1 χ^2 (1, 14) = 57.02, p = <.001, AIC = 921.83. Model B2 χ^2 (1, 17) = 62.88, p = <.001, AIC = 921.97. Model C1 χ^2 (1, 14) = 24.27, p = .042, AIC = 954.58. Model C2 χ^2 (1, 17) = 26.28, p = .069, AIC = 958.57

research delineating causal pathways between sex ratio alterations and intrasexual competition will help clarify whether our divergent results are reflective of true null effects.

One criticism may be that the measures we used—body image satisfaction, enjoyment of sexualization, and support for cosmetic surgery—were too removed from the

typical domains of female:female competition to warrant sex ratio effects. Although these measures are novel operationalizations of intrasexual competition, their construct validity is supported by previous research. The Enjoyment of Sexualization Scale (Liss et al. 2011) has been shown to predict actual sexualizing behavior (Ramsey and Marotta 2017), which is a strategy women engage in to attract mates and out-do competitors (Allen and Gervais 2012). High intrasexual competition predicts sexualization in women (Fisher and Cox 2011) and body image dissatisfaction (Karsay et al. 2018), and a strong motivation for cosmetic surgery is to attract mates and elevate beauty (Atari et al. 2017). For these reasons, although our measures were not traditional components of female attractiveness enhancement, they do demonstrate strong construct validity.

Although we find that sex ratios do not affect self-sexualization, to conclude that female sexualization has no biological drive, or that it is solely a reaction to patriarchal cultural norms (e.g., Peterson 2010), would at this stage be premature. One biological framework for our findings which we believe has been generally under-appreciated in evolutionary theorizing, is the importance of the quantity versus quality of available male mates. Evidence in non-human animals highlights that female intrasexual competition is more responsive to the quality of potential mates, rather than their quantity (Rosvall 2011). Such an account has been raised by researchers studying female competition in humans (Blake et al. 2018), and our manipulations of mate quantity rather than mate quality may partially account for the null results seen here.

Studies of the effects of sex ratios on mating in humans have also shown more reliable effects in men compared with women (Adimora et al. 2013; Kandrik et al. 2015; Pollet and Nettle 2009; Schmitt et al. 2004). Indeed, some scholars speculate that low sex ratio environments may increase competition among women over resources, and not necessarily physical attractiveness (Stone 2017). Future work might productively explore other outcomes of intrasexual competition in women, including competition over reproductively relevant resources. Investigations of the relationship between biased sex ratios, mate quality and resource scarcity may be particularly promising avenues for future work.

On Mate Value and Sexualization

Irrespective of our manipulations of mating competition, individual differences in mate value significantly covaried with all three measures of women's self-sexualization, and were robust to the inclusion of other potential sources of covariation (subjective social status, age and political orientation). Women who scored highly on mate value were more likely to show satisfaction with their body image and greater enjoyment of sexualizing behaviors. Given that self-perceived mate value refers to the belief one has about their own desirability to the opposite sex, these statistically significant relationships highlight the degree to which women's behavior and psychology have been shaped by men's mate preferences (or at minimum, what women *believe* that men prefer in mates). Such results support the longstanding feminist claim that women's preoccupation with their physical appearance is exacerbated by cultural conditions where female beauty is paramount (Fredrickson and Roberts 1997). Although excellent research has considered the drivers of problematic aspects of physical appearance enhancement outcomes in women (e.g., Fredrickson and Roberts 1997), individual

body image is rarely conceptualized from this evolutionary perspective. The large effect of mate value on body image in the current study suggest that the effect of low self-perceived mate value in the etiology of problematic body image may be a fruitful avenue for future work.

Although mate value positively predicted body image satisfaction and enjoyment of sexualization, high mate value women were less likely to use cosmetic surgery to improve their attractiveness. As women with high mate value also tend to have higher self-esteem (Brase and Guy 2004), these women are likely to perceive themselves as sufficiently attractive and feel less pressure to undergo plastic surgery. Research by Arnocky and Piché (2014) showed that social comparison concerns mediated the effect of intrasexual competition on willingness to undergo cosmetic surgery. Given that women with low mate value may feel that they compare poorly to other women, this may lead to a ceiling effect on cosmetic surgery intentions, irrespective of the degree of mating competition in the environment. This prediction is further supported by previous research which suggests that women with poor self-perceptions are more accepting of cosmetic surgery (Sarwer et al. 1998), willing to spend more on the surgery (Arnocky and Piché 2014) and are more accepting of the risks of beauty enhancement (Hill and Durante 2011).

Another alternative is that women may feel differently about cosmetic surgery for themselves versus others, especially if they feel their mate value is low. In this event, cosmetic surgery for the self allows women to make themselves more competitive in the mating arena, while advocating cosmetic surgery for others could be a disadvantage. We found some evidence of this in our exploratory analysis, though effect sizes were modest. Future research understanding the costs and benefits of holding attitudes toward cosmetic surgery in particular mating markets would be a welcome addition to future work.

One limitation of the current work is that without manipulating mate value, we cannot determine causal relationships between mate value and our self-sexualization outcomes. An alternative possibility to high mate value preceding self-sexualization, for example, is that when women self-sexualize, they receive positive reinforcement which leads them to feel more confident (Yatsenko 2014). Through repeated exposure to such positive social cues, women who learn to enjoy sexualization may develop a vigilance with monitoring and maintaining their physical appearance. Over time, these cues could lead to improved confidence and self-perceptions of high mate quality. Likewise, given extensive research highlighting the culturally upheld value of physical attractiveness in women (Maestripieri et al. 2017), the choice to purposefully change one's physical appearance or engage in sexualization may be a strategic attempt to improve one's mate value. Covariation between mate value and sexualization in the current study may thus indicate that research has previously underestimated how women may use sexualization strategies in a functional and agentic manner.

Another further limitation relates to the use of sex ratio primes in general. It is fair to assume that our participants had dating experience in their own environment, and our experimental manipulations may not have been strong enough to convince participants of the experimental sex ratio, given their own extensive experiential sampling. The magnitude of our sex ratio manipulations also differed between primes, and though we do not find any statistical evidence that this difference affected our outcome variables, this may have led to some primes being more convincing than others. Future work in

this field may benefit from considering manipulations of the sex ratio in real life dating events, like speed dating (Finkel et al. 2007). Alternatively, within-subject designs that follow individuals residing from one dating market to another (e.g., freshman students moving from their hometown to a college environment) may also prove insightful.

Conclusion

Women are motivated to sexualize for a plethora of cultural and contextual reasons, and not just to improve outcomes in highly competitive mating environments. Our prediction that women with low perceptions of mate value would be most vulnerable to increased sexualization under conditions of mate scarcity was not supported. Instead, we found that enjoyment of self-sexualization and body image satisfaction covaried with the belief that one was a high-quality romantic partner. We also found that self-perceived mate value negatively covaried with women's likelihood of engaging in cosmetic surgery. Findings are consistent with the notion that women's preoccupation with their physical appearance is exacerbated by cultural conditions that emphasize female beauty, and by indicators of self-perceived mate quality. As an emerging approach to sexualization, further research is required to better understand the relationship between mate value and female intentions to sexualize behaviour.

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Compliance with Ethical Standards

Conflict of Interest Lindsie Arthur declares that she has no conflict of interest. Robert Brooks declares that he has no conflict of interest. Khandis Blake declares that she has no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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Affiliations

Lindsie C. Arthur[1] · Robert C. Brooks[2] · Khandis R. Blake[1]

✉ Lindsie C. Arthur
Lindsie.C.Arthur@gmail.com

[1] Melbourne School of Psychological Sciences | MDHS, University of Melbourne, Level 8, Redmond Barry Building, Tin Alley, Victoria 3010, Australia

[2] School of Biological, Earth and Environmental Sciences, University of New South Wales, Biological Sciences Building (D26), Randwick, NSW 2052, Australia