

# Mate Scarcity Effects on Women's Wariness of Other Women

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## ABSTRACT

Previous studies have found that the scarcity of potential mates in the environment may influence mate-choice relevant behaviors, including intrasexual competition. In the current study, we investigated the relationship between the scarcity of Black men and women's perceptions of other women (i.e., potential competitors). Since Black men are factually scarce in Broward County, we predicted that women who believe that Black men are scarce may hold less favorable opinions of other women (i.e., potential competitors). We interpreted attitudes of wariness toward other women as likely proxies to intrasexual competition. Our results show that women who believe that desirable mates are hard to come by, tend to be warier of women in general. We also found a negative correlation between wariness of women and reported number of good female friends. These results are consistent with previous findings suggesting heightened intrasexual competition when competition for desirable mates is high due to a sex ratio imbalance.

## KEYWORDS

Sex Ratio Imbalance, Intrasexual Competition, Female Friendship, Mate Scarcity

## INTRODUCTION

### Sex Ratio Imbalances and Mate-Choice-Relevant Behaviors

The availability of good potential mates in the environment is an important variable that may influence mate-choice-relevant decisions (Barber, 2000; Hahn, Fisher, DeBruine and Jones, 2014; Stone, 2017; 2018; Ugglå and Anderson, 2018;

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Watkins, Jones, Little, DeBruine and Feinberg, 2012). For example, Ugglå & Anderson (2018), using data from Denmark, showed that divorce was more likely when people worked in settings where opposite-sex individuals were plentiful. Similarly, an analysis of 42 countries showed that when there are more women in the population relative to men, marriages tend to be less stable and women tend to give birth earlier (Barber, 2000; but also see Pollet, Stoevenbelt and Kuppens, 2017). Since heterosexual men prefer youthful women and shorter-term mating more than do women (Buss, 1989), their preferences and choices may align more when there are plenty of women around (see Stone, 2017; 2018). On the other hand, when the ratio of men versus women in a local population favors female choice, as it did for the US population in 1910, Pollet & Nettle (2008) found that women selected wealthier men for marriage. Men who did not acquire sufficient resources to marry, ended up legally single (Pollet & Nettle, 2008). Also using data from the US, Griskevicius et al. (2012) found a correlation between the number of single men in the population and impulsive use of credit cards. The authors then ran a series of studies showing that these financial expenditures were likely driven by men's intrasexual competition in efforts to attract and maintain romantic relationships with women (Griskevicius et al., 2012). Collectively, these studies provide some ecologically valid evidence for an association between the availability of potential mates in the environment and mate-choice relevant decisions that people make.

Other studies have used different methods to investigate the relationship between mate scarcity and mate-choice relevant behaviors. Using a survey method, Stone, Shackelford & Buss (2006) found that mating strategies shift as mate availability fluctuates. Similarly, using an experimental design, Moss and Maner (2015) found that when intrasexual competition is high, both men and women shift sociosexual orientations to meet the preferences of the scarcer sex. Watkins et al.'s (2012) experiment manipulated women's perceptions of mate scarcity just by showing more facial images of men versus women, and found that choosiness for facial symmetry decreased as potential romantic partners were perceived to be scarcer. Similarly, Hahn et al. (2014) also found that the motivational salience of attractive opposite-sex faces increased as competition for mates increased. More recently, Neuhoff and Sikich (2018) found that participants rated opposite-sex voices as more attractive when they were scarce than when they were plentiful. These studies show that sex ratio imbalances influence perceptions of mate-choice relevant facial and vocal stimuli.

### Sex Ratio Imbalances and Intrasexual Competition

A recent review of the literature on sex ratio imbalances in mate choice by Stone (2017) highlights work on sex ratio bias and intrasexual competition. From one theoretical perspective, mate scarcity likely drives intrasexual competition for desirable mates as more competitors engage in active mate-seeking behaviors. The scarcer sex may become more valuable as the demand increases (see Stone 2017;

2018). Sex ratio imbalances therefore may influence the efforts required by individuals to secure mates and to maintain established relationships, including efforts to ward off same-sex competitors. However, different studies employing different methods have found mixed results and it is unclear how, in which contexts and whether sex ratio biases influence intrasexual competition amongst women (see Stone, 2017, 2018). The mixed results may possibly be due to the different operationalization of the sex ratio variable in different studies (see Pollet, Stoevenbelt and Kuppens, 2017). It seems that only one published study has found that women report higher relational aggression when they perceive men to be scarce (Arnocky, Ribout, Mirza & Knack, 2014), and a need for future studies investigating sex ratio imbalances and women's intrasexual competition has been identified (see Stone, 2017).

### Attractiveness and Intrasexual Competition

Compared to men, women's intrasexual tactics are less physically aggressive and may include a plethora of behaviors corresponding to relational aggression including manipulation, gossip, competitor derogation and selective affiliation (see Fisher, 2013). In particular, women seem to be very sensitive to the attractiveness of other women (see Fisher, 2013). For example, Little and Manion (2006) found that women's self-rated attractiveness decreased after viewing images of highly attractive women. Fisher (2004) found that women derogate other women more when they are most fertile. This was interpreted as heightened intrasexual competition when women are hormonally motivated to mate (see Fisher, 2004). Similarly, Bleske-Rachek, Kolb & Quigley (2014) found that women tend to affiliate in friendship with women of similar physical attractiveness (both self-rated and other-rated) and that less attractive friends tend to feel higher mating rivalry with friends in the context of intrasexual competition. Additionally, Little, Caldwell, Jones and DeBruine (2011) found that women judged the attractiveness of facial images of men more favorably when these men were shown coupled with attractive women, and these effects were specific to the context of mate-choice-copying. These findings suggest that in the real world, women's attractiveness may influence other women's interest in pursuing their romantic partners. Building on these findings, Zhuang, Ji, Zhao, Fan and Li (2017) recently investigated neural correlates of female mate-choice-copying and found that judgments of the attractiveness of other women influence attractiveness judgments of their male romantic partners but not their male friends. The authors suggested that domain-specific regions of the brain are active in the context of judging others' attractiveness while learning about mate preferences. Collectively, these studies point to the importance of attractiveness (of the self, relative to potential competitors) in understanding women's attitudes toward other women.

### Relationship Status and Intrasexual Competition

Intrasexual competition includes the efforts to outcompete rivals both while attracting a mate, and while mate guarding in an established romantic relationship (see Fisher, 2013). Partnered women are sensitive to potential threats posed by likely poachers (see Fisher, 2013). Indeed, there is an established body of literature on mate retention tactics showing that partnered women tend to use appearance enhancement more than do partnered men (Shackelford & Buss, 1997). Interestingly, De Miguel & Buss (2011) found that participants' commitment to the relationship was associated with differential use of tactics such as appearance enhancement and jealousy induction. Although these studies show that attractiveness is important in securing mates, they also show that appearance enhancement is used by partnered women as a tactic in intrasexual competition to ward off rivals (see Fisher, 2013). On the other hand, single women's willingness to engage in uncommitted relationships has been found to be associated with women's perceptions of the attractiveness of other women and men (Sacco et al., 2012). Additionally, Karimi-Malekabadi, Ghanbarina, Afhami and Chegeni (2019) found that non-married women engage in more competitor derogation than do their married counterparts. As such, relationship status seems to be an important variable to consider in understanding women's perceptions of potential rivals and potential mates.

### The Current Study

In light of the identified gap in the literature investigating sex ratio imbalances and intrasexual competition, the current study set out to investigate whether mate scarcity was associated with women's opinions about other women (i.e., potential rivals). Less favorable opinions about other women may be precursors to behaviors associated with intrasexual competition (see Fisher, 2013). Previous research has focused on opinion-based self-reports as measures of intrasexual competition (Buunk & Fisher, 2009). In the current study, we wanted to investigate whether an actual *and* perceived mate shortage was associated with women's attitudes toward women in general. Given that in Broward County, Black men, relative to men of other social categories, tend to be particularly scarce and keep on disappearing as they age (suburbanstats.org), intrasexual competition for Black men may be heightened amongst women interested in Black men. Indeed, while on average there are 93 men to 100 women in Broward County, there are less than 24 Black men per 100 women. With each decade of age, Black men seem to disappear from the population of Broward County and the gender disparity becomes even more apparent (suburbanstats.org). Pollet, Stoevenbelt and Kuppens (2017) argued that aggregate measures of sex ratios may be misleading in social and behavioral research. As such, we predicted that women's attitudes toward women in general may be less favorable amongst women who are particularly aware of the factual shortage of desirable mates (i.e., Black men). In other words, that Black men

are factually scarce in the population would most affect women who are particularly interested in Black men as potential romantic partners. Women without such a strong preference may not be feeling the effects of this sex ratio bias to the same extent.

The scarcity of Black men in the population as an indicator of sex ratio imbalances has been used in previous studies and findings from these studies indicate that Black men scarcity is associated with women's mate-choice relevant behaviors (South, 1993; Spanier & Glick, 1980; see Stone 2018 for a review). Since mate-choice relevant behaviors include efforts to attract mates and ward off rivals (Fisher, 2013), we expected this type of race scarcity to be associated with women's attitudes toward other women (i.e., potential competitors) as a proxy of intrasexual competition. We hypothesized that women who are aware of the sex ratio imbalance may be less likely to trust or befriend other women, may be more likely to prefer to be around men, and may engage in gossip and rumor-spreading within their female friendships.

Since attractiveness (Bleske-Rachek, Kolb & Quigley, 2014; Fisher, 2004) and relationship status (Sacco et al., 2012) have been found to be important yet understudied variables to consider in investigating women's affiliations with women, we also included these variables in our investigation. Attractiveness and relationship status may be associated with opinions of other women and may influence the predicted association between sex ratio bias and attitudes toward potential rivals. We set out to quantify women's attractiveness using ratings of the self on a Likert-type scale, since self-rated attractiveness has been found to be associated with mate-choice relevant perceptions (Vukovic et al., 2008) and is correlated to other-rated attractiveness (Little, 2001). Additionally, we included data on women's reported number of good female friends to find out whether women's feelings of social acceptance by women would disrupt the predicted effect of mate scarcity on attitudes toward women (i.e., intrasexual competitors). Should there be an effect of mate scarcity on women's attitudes toward women while controlling for number of good female friends, this would provide evidence that the effect is not driven simply by feelings of social acceptance by women.

## MATERIALS AND METHODS

### Procedures

Participants were recruited to voluntarily complete a paper and pen survey in the Psychology Lab. IRB approval was granted by the institution prior to the collection of data. Participants signed consent forms before participating and were later debriefed. There was no compensation offered for participation. The survey is attached in the Appendix. The survey was designed to be inclusive with open-ended questions (i.e., Age, Sex, Sexual Orientation, Race, Ethnicity, Relationship Status, Length of time in South Florida). The survey included questions about ratings of

other women designed to tap into participants' attitudes and feelings of trust and comfort around other women (i.e., potential competitors) and jealousy and gossip with actual female friends (i.e., potential competitors). Previous studies have also used opinion-based reports to measure women's intrasexual competition (Buunk & Fisher, 2009; Karimi-Malekabadi, 2019; Arnocky, 2014). The survey asked explicit questions about trusting other women, affiliating with other women in friendship, comfort around women vs. men, opinions about the vengefulness and competitiveness of women, and jealousy and gossip related to female friends specifically. As such, our questions were designed to be geared toward views of women as a gender, as well as competitive behaviors aimed at female friends, and were different from the questions asked in previous research (see Buunk & Fisher, 2009).

Each participant sat down in the lab and completed the survey in the presence of the researchers. All participants were students or staff at Broward College. Most participants did not ask for clarification. Some participants asked for clarification when they did not understand a word and the researcher(s) explained the question. Most questions that were posed were about the meaning of *Sexual Orientation* and *Race* versus *Ethnicity*.

### Participants: Sexual Orientation, Age, Years in Florida, Race and Relationship Status

A total of two hundred and fifty women participated in the study. Six different sexual orientations were reported whereby 87.2% ( $n = 198$ ) reported they were *heterosexual/straight*, while 18 participants reported they were *bisexual*, 6 were *lesbian*, 2 were *pansexual*, 1 was *bicurious* and 2 were *asexual*. The rest of the participants left that question blank. Participants ranged in age from 18 to 69 years old ( $M = 21.56$ ,  $SD = 6.19$ ), had lived on average of 15.23 years in South Florida ( $SD = 9.09$ ), and had a mean Self-Rated Attractiveness of 7.63 out of 10. We asked participants to report both their race and their ethnicity. Participants reported a total of 34 different ethnicities. After grouping participants who reported they were White (race) and Hispanic (ethnicity) into the wider Hispanic category, while for example, White (race) and European (ethnicity) participants were coded as White, we ended up with a sample ( $n = 248$ ) of Black ( $n = 125$ , 50% of sample), Hispanic ( $n = 89$ , 35.6% of sample), White ( $n = 16$ ), Asian ( $n = 11$ ), Mixed ( $n = 6$ ) and Other ( $n = 1$ ) participants. Some participants had written down possibly incompatible races and ethnicities such as Haitian (race) and African American (ethnicity). They were grouped into our larger race category of Black. Participants also reported their relationship status ( $n = 249$ ). Since this question was open-ended, we categorized words like "*in a relationship*", "*dating*", "*taken*", "*committed*" and "*married*" as "*in a relationship*", while "*single*" was the only category coding for "*single*". Although we did not inquire about relationship commitment or the nature or quality of the relationship, after coding, 142 participants were categorized as single, while 107 were categorized as in a relationship.



## Analyses

*Note.* For the following analyses, we excluded non-heterosexual participants.

### Scarcity of Black Men Variable

Participants circled either TRUE or FALSE for each of the following statements:

*For a long-term relationship, such as marriage, I am only considering a Black partner.*

*I only date Black men.*

*A good Black man is hard to find.*

Of the three prompts that tapped into women's perceptions of the scarcity of Black men (*only considering Black long-term partner* ( $n = 32$  circled TRUE), *only date Black men* ( $n = 27$  circled TRUE), *a good Black man is hard to find* ( $n = 73$  circled TRUE), only the third yielded groups large enough to include in the main analyses. Seventy-three women circled TRUE that *a good Black man is hard to find*, while 123 circled FALSE. As such, for the main analyses, we only used the variable *a good Black man is hard to find* as a measure of women's awareness of the scarcity of potential romantic partners. Women who circled that *a good Black man is hard to find* were more likely to circle that they *only considered a Black long-term partner* ( $r = .62, p < .001, n = 195$ ) and that they *only date Black men* ( $r = .242, p = .001, n = 195$ ).

### Wariness of Women Variable

We could not use all nine of the variables of women's ratings of women (see Appendix), as the last three questions were printed on the second page of the survey, and many participants did not answer them. Including the last three questions would have reduced the sample size due to the missing data. Therefore, our questions in the analyses focused only on women's opinions of women as a gender, rather than reports of jealousy and gossip in already established female friendships. We reverse coded the questions "*Women make good best friends*" and "*I trust other women*" so that all the variables would go in the same direction as the other variables assessing attitudes toward women in general. Higher scores indicated stronger agreement with the following six statements: *Women are vengeful; Women are competitive; Women do not make good best friends; I do not trust other women; I feel more defensive around women than I do around men; I feel more comfortable around men than I do around women.* Internal reliability for the six variables on this self-developed scale was Chronbach's  $\alpha = .65$ , and would not improve if any items were to be deleted. As such, we chose to include all six items in a Factor Analysis to produce what we termed hereafter a "*Wariness of Women*" factor with Eigen Value of 2.22, which explained 37% of the variance in scores and onto which the 6 variables (for Means and SDs, see Table 1) loaded as shown in

Table 2. A Correlation Matrix for the six friendship variables showed no issues with multicollinearity. What we termed *Wariness of Women* is a measure of feelings toward women overall, tapping into feelings about the trustworthiness of women, feelings of comfort around women and opinions about the competitiveness and vengefulness of women likely to influence decisions about whether to affiliate with other women. Although *Wariness of Women* is not a direct measure of intrasexual competition, it likely taps into cognitions that precede competitive behaviors, such as exclusion (see Fisher, 2014), and may be conceptualized as awareness of threats posed by potential competitors (i.e., other women) that is likely a proxy to intrasexual competition.

Table 1. Means and Standard Deviations for the six items assessing participants' perceptions of women

	M	SD
<i>Women are vengeful.</i>	6.49	2.25
<i>Women are competitive.</i>	8.03	1.87
<i>Women make good best friends.</i>	7.04	2.37
<i>I trust other women.</i>	5.99	2.43
<i>I feel more defensive around women than I do around men.</i>	5.40	3.08
<i>I feel more comfortable around men than I do around women</i>	5.67	2.99

Table 2. Loadings of each of the wariness variables onto the *Wariness of Women* factor which explained 37% of the variance in scores and had an Eigen Value of 2.22. Higher scores indicate higher wariness toward women in general.

	Component 1
<i>Women are vengeful.</i>	.60
<i>Women are competitive.</i>	.54
<i>Women DO NOT make good best friends.</i>	.57
<i>I DON'T trust other women.</i>	.72
<i>I feel more defensive around women than I do around men.</i>	.65
<i>I feel more comfortable around men than I do around women</i>	.55

## MAIN ANALYSES AND RESULTS

*Self-rated attractiveness* and *number of good female friends* were not normally distributed, so we log-transformed them. An ANCOVA in SPSS (Dependent Variable: *Wariness of Women*; Fixed Factors: *a good Black man is hard to find* AND *relationship status*; Covariates: *self-rated attractiveness* AND *number of good female friends*) revealed a main effect of *a good Black man is hard to find* on *Wariness of Women* ( $F(1, 173) = 4.51, p = .035, \text{Eta Squared} = .03$ , Figure 1) so that women who thought that Black men were scarce were significantly warier of women ( $M = .23, SEM = .13, n = 65$ ) than were women who thought that Black men were not scarce ( $M = -.11, SEM = .09, n = 108$ ). There was also a main effect of *Number of Good Female Friends* on *Wariness of Women* ( $F(1, 173) = 22.17, p <$



.001, Eta Squared = .12). No other main effects or interactions were found (all  $p > .25$ ). Including participant age as a covariate also made no difference to the pattern of results. Additionally, excluding the covariates one by one, or together, did not affect the main effect of mate scarcity on *Wariness of Women*.

Next, to interpret the main effect of *Number of Female Friends* on *Wariness of Women*, we ran a Pearson Correlation which revealed a significant inverse relationship between the two variables ( $r = -.38, p < .001, n = 182$ , Figure 2).



*Figure 1. Wariness of Women* by perceptions of mate scarcity. Women who thought that a good Black man was hard to find were significantly warier of women than were women who did not think Black men were scarce (Error bars: 95% CI). *Wariness of Women* is a Factor achieved by PCA and composed of six measures of attitudes toward women overall. Higher values on *Wariness of Women* represent stronger unfavorable views of women.

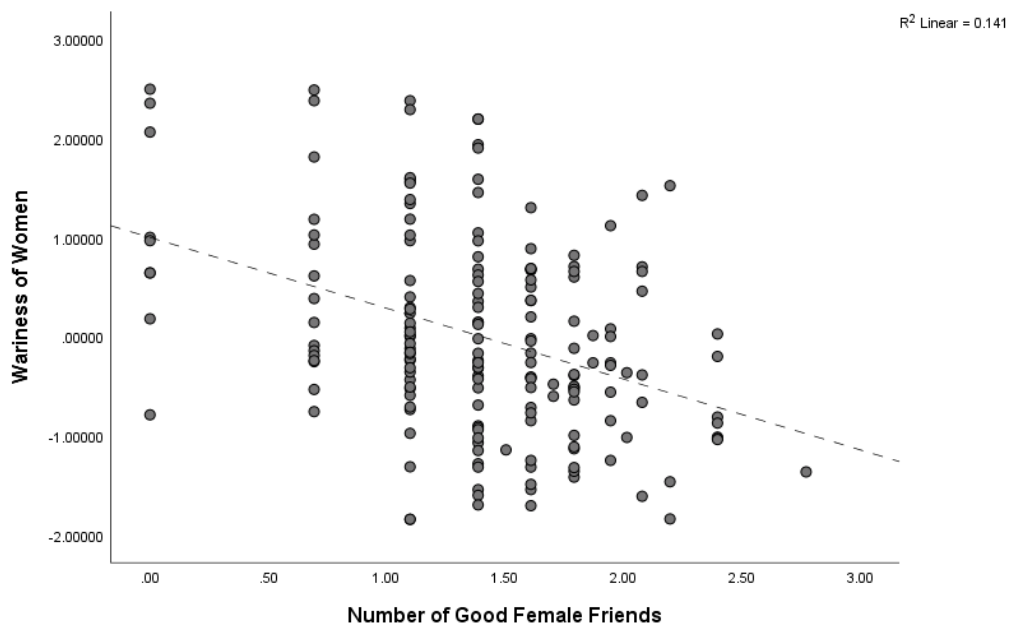


Figure 2. The significant negative correlation between *Wariness of Women* and *Number of Good Female Friends* (log transformed). *Wariness of Women* is a Factor achieved by PCA and composed of six measures of attitudes toward women overall. Higher values on *Wariness of Women* represent stronger unfavorable views of women.

## DISCUSSION

In the current study, we investigated the effects of sex ratio bias on women's attitudes of other women. Our results show that, while controlling for self-rated attractiveness and number of good female friends, women who believe that desirable mates are hard to come by, tend to be warier of women in general. Specifically, women who thought that a good Black man was hard to find in a romantic context, scored higher on a component variable we termed *Wariness of Women*. This variable was derived via principle component analysis and comprised of a series of questions intended to measure attitudes about other women, including perceptions of women's trustworthiness, vengefulness, competitiveness, propensity to make good friends, as well as comfort and defensiveness around women. Women who thought that a good Black man was hard to find had less favorable attitudes toward other women and held opinions less likely to lead to affiliation with women in the context of friendship. Because number of good female friends was a covariate in the analyses, the results were not driven by possible feelings of social acceptance by other women.

Our results show that women who perceived desirable mates to be scarce, tended to view other women less favorably. We had predicted this result based on theories about heightened intrasexual competition when mates are scarce (see Stone, 2017; 2018). Our results are consistent with previous findings that women tend to report heightened relational aggression toward women when they are primed to think that mates are scarce (Arnocky et al., 2018). Although in our study, *Wariness of Women* was not a direct measure of intrasexual competition, it is likely that less favorable attitudes toward women could lead to intrasexual competitiveness including exclusion, gossip and other means of relational aggression (see Fisher, 2013; see Buunk & Fisher, 2009). As such, wariness of women is likely a proxy to intrasexual competition. However, future studies should probably employ behavioral and other more direct measures of intrasexual competition.

In the current study, we also found a significant inverse correlation between number of good female friends and wariness of women. Women with less favorable opinions about other women were less likely to report having many good female friends. These results are consistent with the interpretation that less favorable opinions about women (i.e., higher wariness of women) lead to less affiliation with women in friendship, likely due to intrasexual competition as per the main effect of mate scarcity on wariness of women. Alternatively, it could be the case that women who are warier of women tend to form those opinions based on experiences with rejection by female friends possibly due to poor social skills necessary to establish and maintain such friendships.

Our sample was recruited in Broward County where the sex ratio imbalance is factual with women significantly outnumbering Black men in particular (suburbanstats.org). Actual race scarcity as a measure of sex ratio bias has been used before in studies investigating women's choice of romantic partners (South, 1993; Spanier & Glick, 1980; see Stone, 2018). However, perceived mate scarcity in this already skewed population may be a better measure of sex ratio bias as Pollet, Stoevenbelt and Kuppens (2017) argued that aggregate measures of sex ratios may be misleading. In Broward County, the older the age group, the less Black men there are relative to women (suburbanstats.org). Although the incarceration rates of Black men have been on a decline, the numbers remain alarming and provide an important factor to consider in understanding the causes to the sex ratio imbalance (Gramlich, 2018). As such, sex ratio bias seems to be more complicated and may be better understood from an additional attitudinal perspective rather than simply being a numbers game (see Pollet, Stoevenbelt & Kuppens, 2017). In other words, the sex ratio discrepancy may be most salient for women who are romantically interested in Black men.

Additionally, our mate scarcity variable of *a good Black man is hard to find* was correlated positively with women's desires to *partner up long term only with a Black partner* and women's reports of *only dating Black men*. As such, our mate scarcity variable did tap into women's opinions of Black men in the context of romantic relationships, and women who thought that *a good Black man was hard to find* were likely to desire Black men in particular. However, that more women did not

report that they only *wanted long term Black partners and only dated Black men* than women who thought *a good Black man is hard to find* suggests that women's actual choices may not align with their ideal preferences. Perhaps women's ideal preferences are adaptively offset by the pool of available mates from which to choose (see Stone 2017, 2018). In other words, although women may prefer a partner of a particular phenotype, it would not be adaptive to be so specific considering that securing such a specific mate is unlikely relative to other options in the pool. Moreover, although we asked our participants whether it was hard to find a good Black man, we never did ask them what makes one a "good" Black man? This is something to be considered for future studies.

Also worth noting was that our sample was diverse in terms of ethnicity and sexual orientation. That some participants were confused about their race and ethnicity suggests that these categories are not monolithic and that demographic categorization of participants based on race may be misleading. Also, over 9% of the sample left the question on sexual orientation blank. Perhaps some participants left the question blank due to confusion or fear of disclosure. This brings up an issue with the classification of the self-reported nature of the sexual orientation variable and perhaps a Kinsey-type scale would have been more informative, given that the sample was diverse. Additionally, although we did not ask our sample about their preferences for age in romantic partners, our sample was young with likely preferences for young romantic partners based on previous research (Boothroyd, 2005). Participant age as a covariate did not disrupt the main effect of sex ratio bias on opinions of other women, but there was also no main effect of age on wariness of women when age was included as a covariate. Future studies however, should investigate the opinions of older women, and/or women interested in older Black men, given that mate scarcity would be most salient for them. As Black men disappear from the population with each decade of age (suburbanstats.org), perhaps older women or women with a preference for older Black men would feel warier of women more so than women interested in younger Black men.

In the current study, the self-developed nature of the scale tapping into wariness of women was not ideal. Although there were only six items on the scale and with more items, Chronbach's alpha would likely have been higher (Cortina, 1993), stronger interrater reliability would make for a better tool. Due to loss of data points, we could not include all the questions we set out to investigate as the last three questions were printed on the second page of the survey and many participants did not fill them in. As such, we lost data points on women's intrasexually competitive behaviors directed toward their actual friends. Our questions were different to the items on the Intrasexual Competition Scale (Buunk & Fisher, 2009) and designed to explicitly ask about participants' opinions of other women's trustworthiness, competitiveness, vengefulness, propensity to make good friends, as well as feelings of jealousy, comfort and defensiveness around women, and engagement in rumors and gossip about friends. Future research may wish to parse these questions apart and create a more solid wariness of women construct specific to the domain of female friendship.

In the current study, there were no main effects or interactive effects of self-rated attractiveness or relationship status on wariness of women. That relationship status did not influence wariness of women is somewhat surprising considering that partnered women employ a variety of mate-retention tactics to maintain their established relationships (see Fisher, 2013). However, our variable of partnership status was dichotomous and we did not ask women to report their commitment to the relationship. As such, future studies should more carefully categorize relationship status, including a clearer definition of singleness, since, for example, a woman dating multiple men may consider herself single, while another woman dating one man may consider herself in a relationship. Additionally, we did not ask about partnered women's commitment to the romantic relationship, which seems to be an important variable to consider when investigating the link between relationship status and mate-choice relevant behaviors (Sacco et al., 2012). It may also be the case however, that relationship status has no effect on wariness of women, which future studies should address.

Lastly, that self-rated attractiveness did not influence the main effect of sex ratio bias on wariness of women is somewhat surprising considering that women's mate value is strongly associated with their attractiveness and mate retention techniques (Sela et al., 2018), and that self-rated attractiveness is correlated to other-rated attractiveness (Little, 2001). It may be the case that self-rated attractiveness is not the best measure of women's attractiveness, so future studies should employ better or aggregate measurements in more specific contexts. It could also be the case that attractiveness of partner relative to self, influences mate-retention tactics and intrasexual competition (Sela et al., 2018). Additionally, commitment to relationship (see Sacco et al., 2012) may interact with these effects. Alternatively, perhaps there is no link between attractiveness and wariness of women, which would be consistent with a study that found that BMI (i.e., a predictor of attractiveness) did not predict women's intrasexual competition (Fernandez, Munoz-Reyes, & Dufey, 2014). In any case, more published research is required to better understand the effects of different measures of attractiveness and mate value on perceptions, cognitions and behaviors directed toward competitors.

In conclusion, the current study found that in a population where Black men are scarce, women who are particularly aware of this scarcity, tend to view other women less favorably. Our mate scarcity variable relied on both actual statistical data as well as participant perception. This is one of the few studies to operationalize mate scarcity based on race (South, 1993; Spanier & Glick, 1980; see Stone 2018 for a review). The current study also found that women who viewed other women less favorably, tended to report having a lower number of good female friends. Our study points to a link between sex ratio bias and women's views of other women. Future studies should further investigate the effects of sex ratio bias on women's intrasexual competition, and especially in the context of friendships with women.

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## APPENDIX

### Survey

Age:

Sex:

Sexual Orientation:

Race:

Ethnicity:

Relationship status:

How long have you lived in South Florida:

How attractive are you on a scale from 1 to 10 (1 is very unattractive while 10 is extremely attractive):

For a long-term relationship, such as marriage, I am only considering a black partner: T/F

I only date black men: T/F

A good black man is hard to find: T/F

How many good female friends do you have?

**Rate the following statements on a scale from 1 (disagree strongly) to 10 (agree strongly).**

Women are vengeful.

Women are competitive.

Women make good best friends.

I trust other women.

I feel more defensive around women than I do men.

I feel more comfortable around men than I do around women.

I am sometimes jealous of my female friends.

In the past, I have gossiped about a female friend who was flirting with the person I liked in a romantic way.

In the past, I started a rumor to get back at a friend who flirted with the person I liked in a romantic way.