# With a little help from my (undesirable) friends: The influence of sex ratio on preferences for the relative mate value of friends

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by
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of the requirements for the degree of Master of Philosophy in Psychology

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## Abstract

The present research examined whether who men and women choose to befriend

reflects evolved desires for managing intrasexual competition for mates. It is reasoned

that individuals should display a stronger preference for others of relatively lower

mate value to oneself when the local ecology exhibits signs of intense intrasexual

competition (when the operational sex ratio [OSR] is most unfavorable). Conversely,

an unfavorable OSR was expected to reduce the desirability of others of similar or

higher mate value. The possibility that this effect would be sex differentiated was also

examined. In particular, it was reasoned that these predictions should hold for women

(men) evaluating targets who varied on their levels of physical attractiveness (social

level). Two studies ($N_{\text{Study 1}} = 142$, $N_{\text{Study 2}} = 69$) were conducted to test these

predictions. In contrast to the predictions, individuals generally preferred targets of

relatively similar or higher mate value to oneself; this effect was generally consistent

across both an unfavorable and favorable OSR. Nonetheless, some evidence was

found that supports the proposed theoretical framework; it was shown that OSR can

have some level of influence on individuals' friendship preferences, and this

influence may be sex-differentiated. Overall, the findings are evaluated as consistent

with a broader view that individuals select their friends on the basis of costs and

benefits. Alternative interpretations, limitations, and future directions are discussed.

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**Chapter 1: Introduction**

It is a common refrain that *birds of the same feather flock together*, that

people typically display a preference for others who are more similar to themselves.

However, is similarity *always* preferable in one's friends? In other words, can

individuals benefit from desiring friends different from themselves? When and why

do people prefer having friends similar or dissimilar to oneself? Drawing on an

evolutionary perspective, I examine the possibility that similar others may pose a

threat of intrasexual competition and hamper one's own mating (and reproductive)

success; to this end, humans may have evolved psychological adaptations favoring

friends dissimilar (in particular, comparably worse-off) to oneself, especially on traits

desired by potential mates. Additionally, I examine if this is especially likely when

situations are, in and of themselves, highly competitive.

**Similarity in Friendships: A Universal Preference**

It is well-established that people are attracted to others who are similar to

themselves. This similarity-attraction effect – what some have termed the law of

attraction (e.g., Byrne et al., 1967) – has been demonstrated for various characteristics

such as class and age (McPherson et al., 2001), attitudes (Alves, 2018; Bahns et al.,

2017), personality (Wu et al., 2017), behaviors (Hafen et al., 2011), looks (Bailenson

et al., 2008; DeBruine, 2002), religion (Launay & Dunbar, 2015b), and even genotype

(Fowler et al., 2011). This preference for similarity has also been observed across

cultures, even though socioecological factors may influence the degree to which such

preferences are actualized. For instance, some societies may comprise of relatively

inflexible and embedded social networks that are closed to changes. In such societies

where relational mobility is relatively low individuals have limited opportunities for

venturing out of existing relationships and forming new ones, and the exercise of any

preferences they possess may be inhibited (see Yuki & Schug, 2012). Indeed, there is

evidence that while both Westerners and Easterners both prefer similar (as opposed to

dissimilar) others as friends, Westerners (who typically reside in relationally mobile

societies) perceive significant higher levels of similarity with their actual friends than

Easterners (who typically reside in relationally immobile societies) do (e.g., Schug et

al., 2009, Study 1). Notwithstanding such boundary conditions, reviews of the

literature indicate a real and robust preference for similarity, with one meta-analysis

of over 300 studies estimating a positive and large association between similarity and

attraction (Montoya et al., 2008).

**Similarity in Friendships: Evolved and Context-Dependent**

Additional lines of evidence show that this preference for choosing similar

others as interaction partners is neither a modern nor uniquely-human phenomenon.

For instance, studies on the Hadza hunter-gatherer group have shown that social

networks in such tribes tend to be formed between individuals with similar physical

characteristics (Apicella et al., 2012). Similarly, animal species such as dolphins,

chimpanzees, and meerkats have also been shown to prefer conspecifics of similar

age, sex, and personality (Benenson, 2019; Lusseau & Newman, 2004; Madden et al.,

2011; Massen & Koski, 2014). Importantly, the near universality of this preference

for similar others and, as discussed below, its evidently positive contributions to

reproductive success suggests that humans may have experienced an evolutionary

history of benefits from interacting with similar others.

According to some evolutionary theorists, the number of cooperation-based tasks (e.g., hunting, intergroup conflicts) that humans engaged in likely grew more numerous as social networks expanded during human evolution to include non-kin interactions (Di Stefano et al., 2015). However, in such interactions, ancestral humans likely encountered associated challenges in differentiating between potential cooperators and defectors, which would have been necessary to the experience of rewarding interactions (Haun & Over, 2015). From such a perspective, one's choice(s) of interaction partners would have carried significant evolutionary consequence; ancestral humans who gravitated towards interaction partners who displayed cues associated with greater cooperation would have benefitted from having more effective communication and stronger alliances (Fu et al., 2012). By extension, preferences associated with such benefits would have led to greater survival and reproduction and should exist at a greater frequency among humans today (Tooby & Cosmides, 2015).

Specifically, similarity may function as a cue for interaction partners who were more likely to be cooperative. Evidence for this comes from studies finding that similar others are more likely to share one's in-group status (Launay & Dunbar, 2015a), norms and behaviors (McElreath et al., 2003), or actually be one's kin (Park & Schaller, 2005). Relatedly, research indicates that friendships marked by greater similarity benefit from a range of positive outcomes such as increased closeness (Syed & Juan, 2012), stability (Hafen et al., 2011), satisfaction (Carli et al., 1991), and reduced conflict (Linden-Andersen et al., 2009). Taken together, this line of reasoning suggests that this preference for similarity may reflect the psychological

output of a psychological mechanism that evolved in response to the adaptive

challenges associated with identifying potential cooperators.

However, the psychological adaptations that facilitate this preference for

similarity are unlikely to be activated indiscriminately across every context. In

particular, from an evolutionary perspective, the preference for similarity reflects a

specific adaptation that evolved as a solution to an adaptive problem of

commensurate specificity (Lewis et al., 2011). Akin to an if-then rule, the behavioral

and psychological outputs (e.g., a preference for similar others) from such adaptations

(e.g., a cooperator-identifying mechanism) are likely to be activated only in response

to the narrow set of informational cues associated with the adaptive problem of

identifying potential cooperators (e.g., when having to choose an interaction partner

for tasks that substantially require cooperation) (Buss, 2015). Conversely, if cues

associated with the adaptive problem are different – hence signaling substantively

different adaptive problems – we should expect that these adaptive preferences for

similarity may not be activated. For instance, in domains where a preference for

dissimilar others promoted survival and reproduction, we may expect adaptations

promoting such preferences to have evolved instead (Lewis et al., 2011).

**When May Dissimilarity be Preferred in One's Friends?**

Although similar others can benefit an individual's pursuit of important goals

that require substantive levels of cooperation, similar others can also provide

competition for scarce resources (e.g., Hannan & Freeman, 1977). This is especially

likely when goal attainment by one individual necessarily precludes attainment by

others (Hibbard & Walton, 2016). Hence, similar individuals – who typically possess

similar goals and strategies for pursuing such goals – must inhibit others' goal pursuit act in order to further their own. In other words, intentionally or otherwise, similar individuals will enact goal-directed strategies that interfere with the strategies of others (Buss, 1989). In comparison, if individuals are dissimilar in terms of the goals they pursue and the strategies they employ in pursuing such goals, competition should lessen for everyone involved. From such an analysis, the preference for dissimilar others may have posed relatively greater benefits for ancestral humans when goals were competitive. As a corollary, under circumstances of strong competition where rewards are relatively scarce, natural selection may have favored psychological adaptations that guide individuals away from associating with similar others and towards dissimilar ones.

In particular, one domain in which strong competition exists is in mating. Because individuals typically seek the most desirable mate they can, they invariably face competition from other same-sex individuals in doing so. Given that no two same-sex rivals can simultaneously gain access to the same opposite-sex mate, the attainment one's own mating goals thus necessitates the failure of others' goals. From this perspective, displaying a preference for same-sex friends who possess similar traits (e.g., level of desirability) or goals (e.g., which mate to pursue) contributes to higher levels of competition for mates and threatens one's chances of mating success (Bleske & Buss, 2000; Lewis et al., 2015). Indeed, traits that individuals typically desire similarity in friends – physical attractiveness, intelligence, social status – are arguably the very same traits that contribute most to one's desirability as a mate (Bleske & Shackelford, 2001; Li et al., 2002); by extension, seeking similarity in

one's same-sex friends on these traits – be it similar traits or similar levels of such

traits – may inadvertently hamper one's own chances of successfully attracting a

desired mate.

　　　　In contrast, it may have been a more adaptive strategy for individuals to signal

their own desirability as a mate by creating a relative discrepancy between themselves

and any potential competitors, to highlight one's dissimilarity (and superiority) to

others. Indeed, one key mating strategy individuals have evolved to employ is to

differentiate themselves from their competitors (e.g., Buss, 2016). When motivated to

attract a mate, people tend to display traits desired by the opposite-sex – such as

(non)conformity (Griskevicius, Goldstein, et al., 2006), creativity (Griskevicius,

Cialdini, et al., 2006), kindness and status (Griskevicius et al., 2007), and physical

attractiveness (Hill & Durante, 2011) – at a level higher than their competitors.

Separate research indicates that associating with others of dissimilar (and specifically,

lower) levels of desirability may be beneficial. In one study where participants rated

the attractiveness of opposite-sex target faces, targets paired with attractive faces

were rated as significantly less attractive than when paired with unattractive faces

(Little et al., 2011; Study 3). Similar research on contrast effects also indicates that

associating with dissimilar others – in particular those who are comparably *worse-off*

– can be highly-beneficial; for instance, having first viewed pictures of highly

physically attractive potential mates, participants rated pictures of somewhat

physically attractive potential mates as even less desirable (Kenrick et al., 1989 Study

1). Taken together, these findings show that displaying a preference for dissimilar

others may have been beneficial for one's mating goals, and provide indication that

humans may have evolved specific psychological adaptations to highlight one's relatively superior mate value. Importantly, this is not to suggest that all forms of dissimilarity between oneself and others is beneficial; it is likely that only positive discrepancies (where one's relative superiority is highlighted) are preferable. Hence, as a direct consequence of such adaptations, it is possible that individuals may prefer as friends others who are of a relatively lower mate value, and to perceive others who are of similar or higher mate value as less desirable friends.

The preceding discussion illustrates how displaying a preference for others of a lower mate value in one's same-sex friends can limit intrasexual competition for mates. However, two points are further worth noting. First, we may expect sex differences in the traits that are relevant for judging the similarity of a same-sex friend. If the preference for same-sex friends of relatively lower mate value functions to reduce intrasexual competition, it follows that individuals should prefer same-sex friends who are less desirable on traits that opposite-sex mates find most attractive. Because men and women evolved to prioritize different traits in a potential mate (Buss & Schmitt, 1993; Li et al., 2002), sex differences should also be observed in what individuals focus on when judging a friend's relative mate value to oneself. Given that men (women) have evolved to prioritize the physical attractiveness (social status) of a mate (Kenrick et al., 1990; Li et al., 2002) we can, accordingly, expect that women (men) should be especially concerned with extent to which a potential or current same-sex friend possesses similar levels of physical attractiveness (social status).

Second, we should expect such competition-management mechanisms to be sensitive to cues that track the level of competition in one's local environment. In other words, such adaptations may be especially sensitive and active in response to cues of increased intrasexual competition. One ecological variable associated with such a cue may be the operational sex ratio (OSR), defined as the proportion of viable potential mates in the total population. Cues to the OSR can convey information about the competition that individuals may encounter in attracting mates, which has implications for the effectiveness of one's mating tactics. In an allegorical mating marketplace, the sex in shorter supply can assert their demands on suitors while the sex in greater supply competes more vigorously for access to mates (Baumeister & Vohs, 2004). Indeed, when faced with unfavorable OSRs, both sexes may attempt to portray themselves as more desirable by adhering to the mating styles (e.g., willingness to engage in casual sex) of the opposite sex, or by displaying higher levels of traits (e.g., financial resources) desired by the opposite sex. (e.g., Griskevicius et al., 2012; Moss & Maner, 2016).

## Chapter 2: Current Research

The central argument is that humans may have evolved perceive individuals of a lower mate value than oneself as more desirable friends. Such a preference may have evolved as part of a suite of competition-management adaptations shaped by natural selection to limit intrasexual competition for mates. Within such a context, others who possess similar (or even higher) levels of desirability as a mate present threats to one's own survival and reproduction. In the service of mitigating such fitness threats, individuals may have evolved to manage such competition by displaying a preference for friends who are dissimilar to oneself – specifically, those of relatively lower value as a mate. Additionally, because ecological cues to the OSR can inform individuals about the competition individuals can expect to face, these context-sensitive competition-management adaptations may be especially activated under conditions of an unfavorable OSR (where more same-sex competitors exist in one's local ecology). Hence, Study 1 tested the prediction that (H1) individuals primed with cues to unfavorable OSRs should perceive targets of a relatively lower (similar or higher) mate value to be more (less) desirable as friends compared to those primed with cues to a favorable OSR.

Additionally, the current research also investigated the possibility that individuals' preferences for potential friends should depend on the extent to which potential friends possess higher, similar, or lower levels of traits valued by the opposite-sex (see Fig. 2.1). Because men especially desire physically attractive opposite-sex partners, women may have evolved to highlight their desirability as a mate by increasing their relative physical attractiveness compared to their friends; in

contrast, because women especially desire opposite-sex partners with higher social

level, men may have evolved to highlight their desirability as a mate by increasing

their relative social level compared to their friends. Hence, the current research also

tested the predictions that (H2) sex differences would be observed in these

preferences for potential friends when men and women were primed with cues to an

unfavorable (versus favorable) OSR, such that (H2a) for men, this preference for

others of relatively lower mate value when primed with unfavorable OSR cues would

be more pronounced when evaluating the social level of potential same-sex friends

and (H2b) for women, this preference should be more pronounced when evaluating

the physical attractiveness of potential same-sex friends. In Study 2, I replicated tests

of these same predictions using a different experimental design.

**Figure 2.1**

*Hypothesized theoretical model*
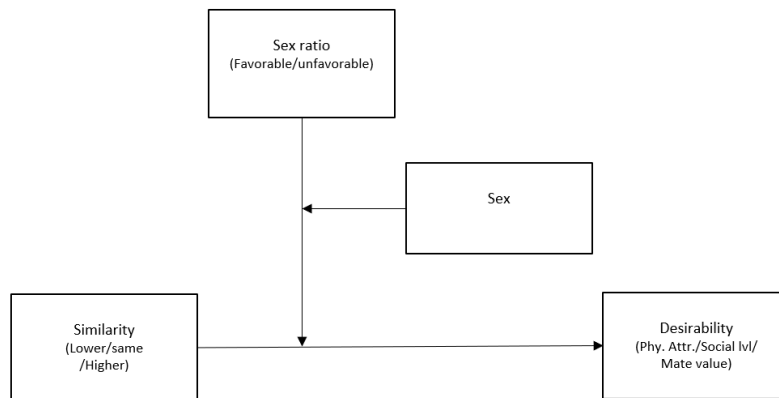
**Chapter 3: Study 1**

The aim of the current study was to investigate whether exposure to OSR cues influenced sex-differentiated preferences for different same-sex friends of different mate value discrepancies. To test both sets of hypotheses, mate value was operationalized two ways. Because hypothesis 1 was a prediction regarding the desirability of friends of varying levels of mate value in general, mate value was conceptualized as a measure of one's general desirability to potential mates. In comparison, hypotheses 2, 2a, and 2b tested how sex-differentiated aspects of mate value influenced perceptions of a potential friend's desirability; hence, mate value was conceptualized as the extent to which same-sex friends possessed traits specifically valued by opposite-sex mates (i.e., physical attractiveness [for a potential female friend] and social status [for a potential male friend]). Participants were randomly-assigned to be exposed to OSR cues that differed in their favorability, and were then asked to rate their preferences for same-sex friends with differing levels of mate value from themselves. Therefore, the current study employed a mixed-factorial quasi-experimental design; the independent variables included *Sex*, *OSR* (unfavorable or favorable), *mate value discrepancy* (lower, similar, or higher than oneself), and *Trait* (generalized mate value or physical attractiveness/social level). The dependent variable was the desirability of a potential same-sex friend.

**Method**

**Participants**

Power analysis conducted using G*Power (version 3.1.9.2) indicated that the sample size required to detect a small to medium effect size ($f = .17$) at a probability

of .95 is 108 participants. Undergraduate participants ($N = 142$, $M_{age} = 21.85$ years,

$SD_{age} = 1.83$ years) were recruited at Singapore Management University (SMU);

majority of the participants were women ($N = 86$, 60.6% of sample). Participants

were mostly single (57.0%); 40.8% were either dating someone or were in a romantic

relationship; 2.1% of participants did not report their relationship status. Most

participants were recruited from the social sciences faculty (57.7%; see Table 3.1).

All participants received either SGD $5 or 1 course credit upon completion of the

study.

**Materials and Procedure**

       **OSR manipulation.** Appendix A illustrates the flow of the study. Participants

were informed that they were taking part in two unrelated studies, the first of which

was ostensibly a memory test. The OSR manipulation was embedded within this

memory test and required participants to view three arrays of colored photos, each

containing 18 headshots (see Appendix B). The headshots comprised of men and

women – all of whom were of a similar age to participants – photographed against a

plain background. To ensure that physical attractiveness of the headshots did not

unduly influence participants' perceptions, only headshots pre-rated as being

moderately attractive – between 3 to 5 on a 7-point scale from 1 (*not at all*) to 7

(*extremely*) – were chosen. Of the headshots chosen, the mean level of physical

attractiveness was comparable between women ($M = 3.51$) than men ($M = 3.34$).

Under the guise of the memory task, participants were randomly assigned to either a

favorable or unfavorable sex ratio condition. In the favorable (unfavorable) sex ratio

condition, participants viewed photo arrays that comprised of 12, 13, and 14 opposite-

sex (same-sex) headshots. Participants were asked to count the number of men,

women, and bespectacled individuals in each array, and provided their responses via

sliders. The order in which arrays were presented was randomized. As a manipulation

check, participants were asked about the content of these photo arrays (e.g., were

there more men or women in the photos you viewed?) (Appendix C). The distribution

of participants is shown in Table 3.2.

**Table 3.1**

*Distribution of participants by faculty for Study 1*

| Faculty | $N$ (Total = 142) |
|---|---|
| Accountancy | 2 |
| Business Management | 9 |
| Economics | 17 |
| Information Systems | 9 |
| Law | 6 |
| Social Sciences | 82 |
| Other (non-SMU) | 18 |

**Table 3.2**

*Distribution of participants across conditions for Study 1*

| Sex ratio condition | Sex | |
|---|---|---|
| | Men | Women |
| Unfavorable | 27 | 43 |
| Favorable | 29 | 43 |

**Friendship ratings.** In what was ostensibly an unrelated study, participants

then engaged in a study examining their preferences for friends. Participants first

rated themselves, in comparison to other same-sex individuals, on traits commonly

desired in opposite-sex romantic partners, including: physical attractiveness,

liveliness, social level, kindness, and intelligence (Li et al., 2002). Descriptions were

provided for each trait. Participants also rated their own mate value using a 4-item

mate value scale (e.g., Overall, how do you believe you compare to other people in

desirability as a partner on the following scale?; Edlund & Sagarin, 2014). Internal

consistency for this scale was high (Cronbach's $\alpha = .91$), allowing for the creation of

a composite measure for self-perceived mate value. For all traits, ratings were

recoded to a 7-point scale anchored from 1 (much lower than everyone else) to 4

(similar to the average person) to 7 (much higher than everyone else). Comparing

against these ratings, participants were then asked to imagine meeting someone of the

same-sex who scored similarly to, higher than, and lower than themselves on such a

trait and to rate, on a 9-point scale from 0 (*not at all*) to 8 (*extremely so*), the extent to

which such a person would be a desirable friend (the key dependent variable),

trustworthy, and likeable (see Appendix D).

## Results

Hypothesis 1 predicted that participants' preferences for potential friends of

different mate values should depend on the interaction between OSR and mate value

discrepancy. Hence, OSR, sex, and mate value discrepancy were entered into a

repeated measures general linear model (GLM). In line with Field's (2018)

recommendation on the reporting of F-statistics multivariate and repeated measures

designs, F-statistics reported below were treated with a Greenhouse-Geisser

correction. This provides an appropriate correction for when sphericity cannot be

assumed and, where sphericity can be assumed, provides a stricter benchmark for

significance testing. It should be noted that all results reported below were similar

regardless of the use of this correction. Additionally, Bonferroni-adjusted corrections

were used where all subsequent t-tests conducted. All mean ratings are shown in

Table 3.3.

**Table 3.3**

*Mean ratings of desirability across conditions, sex, and trait for Study 1*

|  |  | Trait | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | MV | General mate value | | Physical attractiveness | | Social status | |
| OSR | Discrep. | Men | Women | Men | Women | Men | Women |
| Favorable | Lower | 4.55 (1.24) | 5.02 (1.65) | 4.93 (1.39) | 5.28 (1.74) | 4.76 (1.62) | 5.23 (1.65) |
|  | Similar | 5.41 (1.15) | 6.44 (1.12) | 5.07 (1.31) | 5.74 (1.54) | 5.03 (1.48) | 6.07 (1.45) |
|  | Higher | 5.90 (1.47) | 6.19 (1.82) | 5.17 (1.34) | 5.23 (1.57) | 5.1 (1.35) | 5.49 (1.56) |
| Unfavorable | Lower | 4.67 (1.54) | 4.67 (1.78) | 4.67 (1.07) | 5.23 (1.23) | 4.52 (1.28) | 5.12 (1.45) |
|  | Similar | 5.15 (1.43) | 5.72 (1.59) | 4.89 (1.34) | 5.88 (1.26) | 4.93 (1.33) | 5.86 (1.52) |
|  | Higher | 5.11 (1.63) | 5.86 (1.64) | 4.85 (1.54) | 5.19 (1.58) | 4.89 (1.42) | 5.56 (1.39) |

*Note.* OSR manipulation = Operational sex ratio manipulation; MV discrep. = MV discrepancy

**OSR x Mate Value Discrepancy (Dependent Variable: General MV)**

Consistent with the manipulation, all participants assigned to a unfavorable

(favorable) OSR condition reported viewing more headshots of same-sex (opposite-

sex) individuals. Similarly, a main effect of the of OSR was observed, $F (1, 140) =$

$3.92$, $p = .050$, $\eta_p^2 = .03$; compared to a favorable OSR, participants primed with an

unfavorable OSR rated targets as less desirable. A significant main effect of mate

value discrepancy was also observed, $F (1.5, 213.7) = 33.88$, $p < .001$, $\eta_p^2 = .19$,

indicating that the desirability of a target as a potential friend differed according to

levels of mate value discrepancy. Unexpectedly, relatively lower mate value targets

were perceived as the least desirable targets. Whereas targets of similar or higher

mate value were perceived as similarly desirable ($p = 1.00$), both targets were

perceived as significantly more desirable than a target of relatively lower mate value

than oneself (for both *t*s, both *p*s < .001) (see Fig. 3.1).

**Figure 3.1**

*Mean ratings of desirability by mate value discrepancy for Study 1*
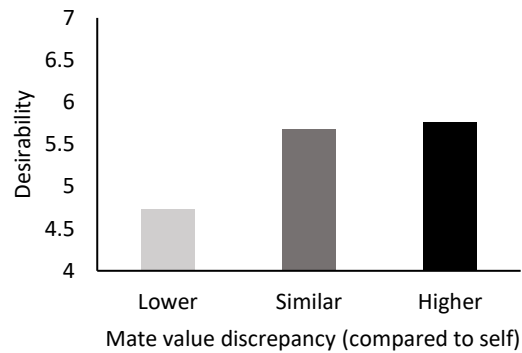


Contrary to hypothesis 1, the *Mate value discrepancy* x *OSR* interaction was

not significant, $F$ (1.5, 212.0) = 0.96, $p$ = .362, $\eta_p^2$ = .01, indicating that the effect of

mate value discrepancy on desirability ratings did not differ across OSR conditions.

Nonetheless, I proceeded to probe this interaction. Pairwise comparisons revealed that

compared to a favorable OSR, participants primed with an unfavorable OSR rated a

target of similar mate value to oneself as significantly less desirable ($p$ = .026) and

tended to rate a target of higher mate value than oneself as less desirable ($p$ = .078).

Figure 3.2 illustrates these findings graphically. Additionally, pairwise comparisons

of the two-way interaction indicated that in both favorable and unfavorable OSR

conditions, participants consistently rated a target of lower mate value as least

desirable for a friend. Across both conditions, ratings between a target of similar and

higher mate value did not differ (for both $t$s, $p$s = 1.00); ratings for a target of lower

mate value than oneself were significantly lower in all cases (for all $t$s, $p$s < .003).

**Figure 3.2**

*Mean desirability ratings according to OSR prime and mate value discrepancy for*

*Study 1*
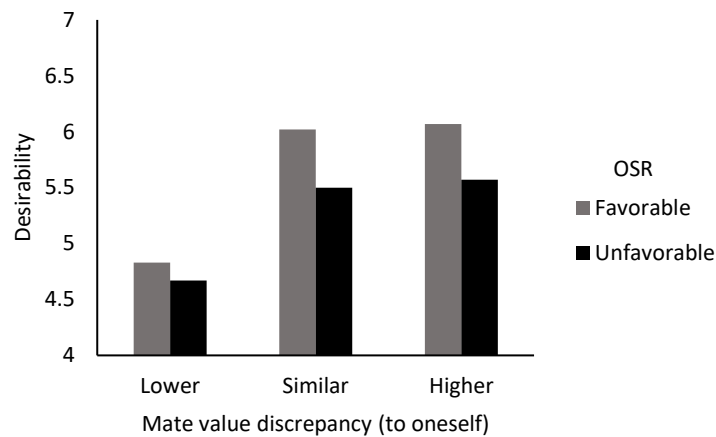


*Note.* OSR condition did not interact significantly with mate value discrepancy to influence participants' ratings. However, participants expose to the unfavorable (versus favorable) OSR prime rated significantly a target of similar mate value as significantly less desirable, and a target of higher mate value as somewhat less desirable.

**Exploratory findings.** In an exploratory fashion, we explored the possibility

of sex differences in target preferences. The *Mate value discrepancy* x *Sex* interaction

was not significant, $F$ (1.5, 206.3) = 1.77, $p$ = .181, $\eta_p^2$ = .01. However, in probing the

interaction, compared to men, women were significantly more likely rate a target of

similar mate value as more desirable ($p$ = .001), and somewhat more likely to rate a

target of higher mate value as a desirable friend ($p$ = .071). Compared to other targets,

both sexes preferred targets of relatively lower mate value least (for all $t$s, $p$s < .01)

and did not differ in their ratings here ($p$ = .385).

The *Mate value discrepancy* x *OSR* x *Sex* interaction was not significant, $F$ (1.5, 206.3) = 3.19, $p$ = .212, $\eta_p^2$ = .01. However, pairwise comparisons revealed that, to some extent, men and women may facultatively display different preferences in response to changes in the OSR. For women, targets of a similar mate value to themselves were perceived as significantly less desirable when primed with an unfavorable ($M$ = 5.72, $SD$ = 1.59) than a favorable ($M$ = 6.44, $SD$ = 1.12) OSR ($p$ = .014); ratings for other targets did not differ by OSR condition (for both $t$s, $p$s > .300). For men, targets of a higher mate value than themselves were perceived as somewhat less desirable when primed with an unfavorable ($M$ = 5.11, $SD$ = 1.63) than a favorable ($M$ = 5.90, $SD$ = 1.47) OSR ($p$ = .079); ratings for other targets did not differ by OSR condition (for both $t$s, $p$s > .450). Figure 3.3 illustrates these findings graphically. In particular, these findings provide some indication that cues to OSR may differentially influence men and women's preferences for specific types of friends.

**Figure 3.3**

*Men's and women's ratings of targets' desirability by OSR condition and mate value discrepancy for Study 1*
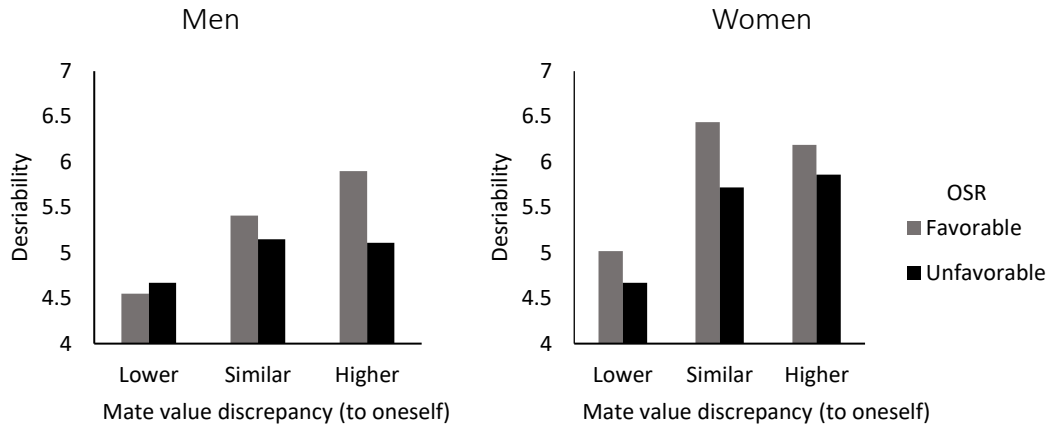


*Note.* Between OSR conditions, women's ratings differed significantly for the target of similar mate value; for men, ratings differed somewhat for the target of higher mate value. No other between-OSR condition differences were significant.

## OSR x Mate Value Discrepancy (Dependent Variable: Sex-Differentiated MV)

Whereas hypothesis 1 essentially predicted a *Mate value discrepancy* x *OSR* interaction, hypothesis 2 proposed that these interactions would be sex-differentiated, extending beyond a general conceptualization of mate value to specific traits that are often desired by potential mates (i.e., physical attractiveness, social level). As such, hypothesis 2 predicted a *Mate value discrepancy* x *OSR* x *Sex* x *Trait* interaction. If one's preferences for friends function in part to limit competition for mates, then these preferences should be most sensitive for targets who vary on traits especially desired by the opposite-sex. For men (women), the effects of OSR cues on friendship preferences should be most pronounced when considering the targets that vary in their relative level of social status (physical attractiveness). To test these predictions, OSR,

sex, and mate value discrepancy, and trait (physical attractiveness, social level) were entered into a repeated measures general linear model (GLM).

Overall, hypothesis 2 was not supported. A main effect of *Sex* was observed, $F$ (1, 138) = 10.27, $p$ = .002, $\eta_p^2$ = .07; more than men ($M$ = 4.90, $SE$ = 0.14), women ($M$ = 5.49, $SE$ = 0.12) provided higher desirability ratings in general. Although a main effect of *Mate value discrepancy* was also observed, $F$ (1.7, 241.9) = 8.06, $p$ = .001, $\eta_p^2$ = .06, targets of similar mate value were perceived as significantly more desirable than targets of relatively lower mate value ($p$ < .001), and marginally more desirable than targets of higher mate value ($p$ = .084); ratings for targets of relatively lower and higher mate value did not differ significantly ($p$ = .330). Although the *Mate value discrepancy* x *Trait* interaction was not significant, $F$ (1.9, 256.5) = 2.10, $p$ = .129, $\eta_p^2$ = .02, similar patterns were observed when ratings for physical attractiveness and social level were examined separately. For both traits, targets of similar mate value were perceived as more desirable than those of lower mate value; ratings for targets of relatively lower and higher mate values did not differ (see Fig. 3.4).

**Figure 3.4**

*Mean ratings of targets desirability by trait and mate value discrepancy for Study 1*
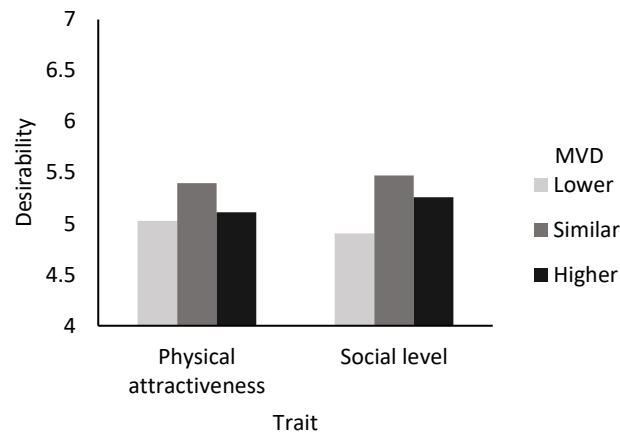


The *Sex* x *Mate value discrepancy* interaction was marginally-significant, $F$ (2, 241.9) = 3.00, $p$ = .059, $\eta_p^2$ = .02; women rated targets of relatively lower or similar mate value as more desirable than men did (for both $t$s, $p$s < .04), but both sexes did not differ in their ratings for targets of relatively higher mate value ($p$ = .107). The *Sex* x *OSR* x *Mate value discrepancy* interaction was not significant, $F$ (1.8, 241.9) = 0.07, $p$ = .914; for both men and women, target ratings did not differ for in either the favorable or unfavorable OSR condition (for all ts, all ps > .400). The predicted four-way interaction did not emerge, $F$ (1.9, 256.5) = .34, $p$ = .697, $\eta_p^2$ = .00. Nonetheless, pairwise comparisons for this interaction were examined. Neither hypothesis 2a nor 2b were supported; compared to when primed with favorable cues, men (women) primed with unfavorable cues did not rate targets of relatively lower, similar, or higher levels of social level (physical attractiveness) as significantly more or less desirable as a potential same-sex friend; this indicated that the OSR manipulation had no significant impact on target ratings. There was no evidence that

men and women perceived targets of lower mate value as more desirable same-sex

friends. Regardless of OSR prime, mean ratings of similar targets were equal to or

higher than that of relatively lower mate value targets – in no situation were targets of

relatively lower mate value rated as more desirable than targets of similar mate value.

**Figure 3.5**

*Mean ratings of targets' desirability by sex, trait, and OSR condition for Study 1*
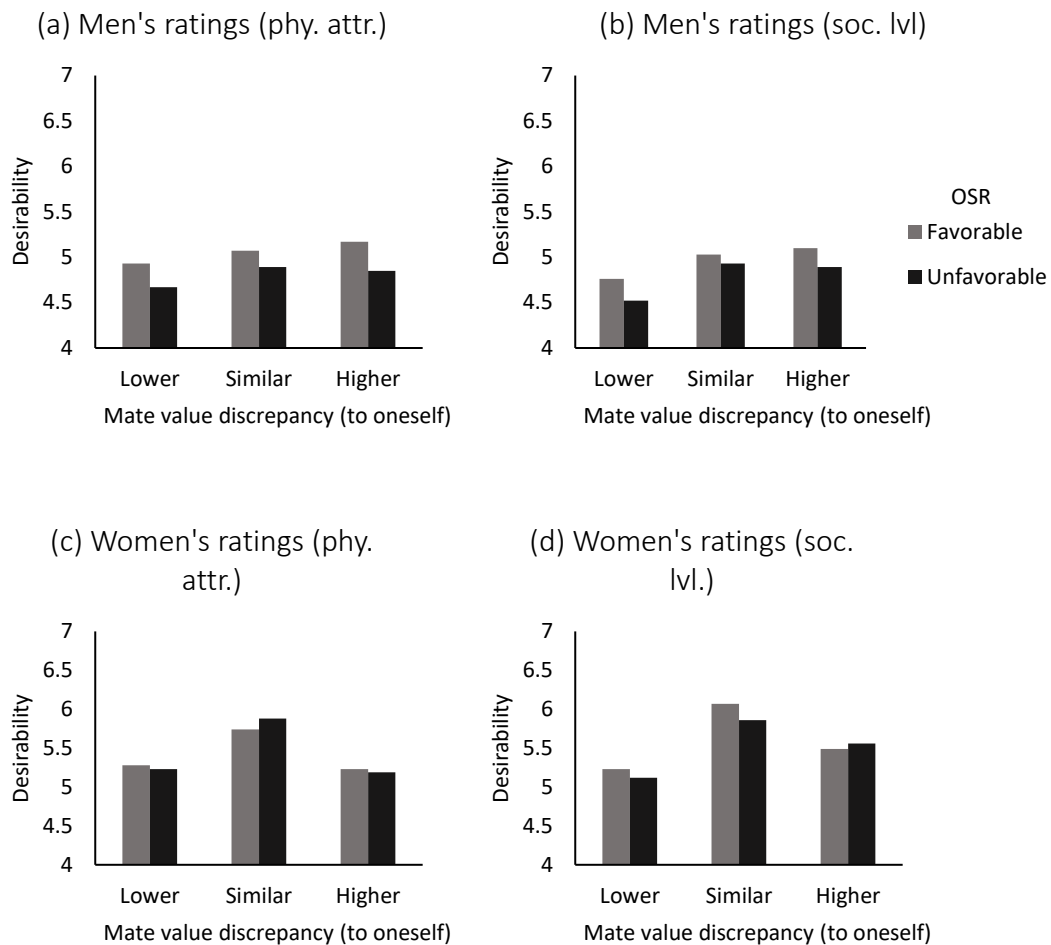


*Note.* Phy. attr. = physical attractiveness; soc. lvl = social level. Hypothesis 2a and 2b predicted the interaction pattern that targets of relatively lower mate value would be perceived as more desirable than targets of similar or higher mate values, especially under primes of unfavorable OSR. Sex differences were expected, and these interaction patterns were expected in Figure 3.4(a) and 3.4(d). In contrast to these predictions, OSR did not significantly influence target ratings; at all levels of mate

value discrepancy for both sexes and traits, target ratings did not differ significantly across OSR conditions.

## Discussion

Study 1 examined the possibility that cues to increased intrasexual competition – specifically through the exposure to an unfavorable OSR – might activate an evolved preference for friends of relatively lower mate value to oneself (Hypothesis 1). Study 1 also examined if such preferences would manifest in a sex differentiated manner (Hypotheses 2); specifically, I examined the possibility that men (women) would display a preference for friends who possessed relatively lower social levels (physical attractiveness). Overall, evidence supporting these hypotheses were limited.

Generally, a preference for targets with relatively similar levels of mate value was found. This was true whether mate value was operationalized generally, or as a sex-specific trait. The evidence indicates that individuals do not prefer potential interaction partners perceived as less desirable than oneself. Such a finding is consistent with others who have found that individuals generally avoid affiliating with others who are less popular or desirable than themselves, and instead set a benchmark for their interaction partners – potentially to maintain (if not gain) status and avoid being perceived as undesirable or unpopular (Dijkstra et al., 2013). However, just because individuals display an avoidance of low-status or undesirable interaction partners does not imply a greater preference for high-status or highly desirable interaction partners. Indeed, pairwise comparisons showed that the preference for targets ostensibly more desirable than oneself did not differ significantly from the preference for targets ostensibly similar to oneself; in many

cases, the mean ratings for relatively more desirable targets were lower than that for targets of similar desirability.

Nonetheless, there was some evidence that cues to an unfavorable OSR may lead individuals to attempt to manage intrasexual competition for mates. Although participants primed with an unfavorable OSR did not increase their preference for a target of relatively lower mate value, they showed a decreased preference for targets of relatively similar (and to some extent, relatively higher) mate value. This was true when mate value was operationalized generally, but not in terms of specific traits desired by opposite-sex partners. However, we found some evidence that cues to an unfavorable OSR may influence men and women's preferences differently; whereas women preferred targets of *similar* mate value significantly less, men's preferences for targets of relatively *higher* mate value somewhat less. Although these findings should be interpreted with caution given that the interactions were generally non-significant, implications for these findings are proposed in the General Discussion.

A limitation of Study 1 concerns the strength of the OSR manipulation employed. One interpretation of the findings reported here is that OSR may exert limited influence on one's preferences for same-sex friends. On the other hand, it is also possible that the manipulation used may not have been an effective cue, and hence not have exerted significant influence on perceptions of intrasexual competition. Specifically, participants were simply shown arrays of headshots that differed in the proportion of men and women in a context-free manner. Although these photo arrays consisted of headshots of undergraduates who were recruited from the same environment, such a manipulation of the OSR may not have been realistic

enough. Previous research using a similar paradigm have accompanied the

presentation of such arrays with additional information emphasizing that the OSR

skews presented ostensibly reflect the actual conditions of the local environment. The

provision of such informational cues that suggest similar changes in the *local* OSR

may be key to highlighting its salience; indeed, any changes to the (un)favorability of

one's immediate and local environment is likely to be more salient and impactful than

that of a far-flung environment. Hence, the lack of contextual cues in the current

manipulation may have limited the effectiveness of the current manipulation in

varying perceptions of intrasexual competition. Additionally, given that majority of

participants (57.7%) were recruited from the social sciences faculty – well known to

comprise of significantly more undergraduate women than men – stronger contextual

cues could have helped to provide greater realism for the manipulation. To address

this limitation, Study 2 employed a stronger and more contextualized manipulation of

OSR.

## Chapter 4: Study 2

The main limitation of Study 1 was the potentially ineffective manipulation of OSR. Hence, study 2 employed an improved manipulation of OSR to test both sets of hypotheses.

## Method

### Participants

Undergraduate participants ($N = 69$, $M_{age} = 21.85$ years, $SD_{age} = 1.83$ years) were recruited at Singapore Management University (SMU). Data collection was stopped prematurely due to poor sign up rates and a lack of funds. Majority of the participants were women ($N = 49$, 71.0% of sample). Participants were mostly single (60.9%); 37.7% were either dating someone or were in a romantic relationship; the relationship status of 1 participant was not reported. A majority of the sample recruited comprised of student from the Business Management faculty, (see Table 4.1). All participants received either SGD $5 upon completion of the study.

### Materials and Procedure

**OSR manipulation.** Appendix E depicts the flow of the study. Two OSR manipulations were used, each of which comprised of a favorable and unfavorable OSR condition. The first comprised of a writing task ostensibly meant to examine participants' mental visualization abilities, while the second comprised of a photo-counting task adapted from Study 1 as an ostensible test of memory. Though no order effects were expected, the order of manipulations were randomly assigned; that is, some participants completed the writing task first before the priming task, while others were assigned to the tasks in reverse order. Additionally, participants assigned

to an unfavorable or favorable OSR condition for one task were respectively assigned

to the unfavorable or favorable OSR condition for the other task. The distribution of

participants to each condition is shown in Table 4.2.

      ***Writing task.*** As an ostensible test of mental visualization skills, participants

were given at least 2.5 minutes (with no time limit) to imagine and describe, in as

vivid and detailed a manner as possible, how life would be like if there were "*now*

*more men than women (or women than men) of a similar age in SMU, the local area,*

*and in Singapore*". Participants were asked to describe how "*different aspects of life*

*would be impacted (e.g., How you would spend your time? How you would*

*socialize?)*" and their "*thoughts, emotions, and actions while living in such a*

*situation*".

      ***Photo-counting task.*** All participants viewed the same arrays as used in Study

1. However, in Study 2, participants were told that the each array consisted of

individuals who (a) participated at a recent speed dating event for local university

students, (b) were recent graduates of the university, or (c) were current students at

the university. In the favorable (unfavorable) sex ratio condition, participants viewed

photo arrays that comprised of 12, 13, and 14 opposite-sex (same-sex) headshots. As

an ostensible test of their perception, participants were first shown each array (and the

accompanying contextual information) for 1 s, and were asked to estimate the number

of men and women in each array. Participants then viewed each array again for 15 s,

seemingly to check the accuracy of their previous estimates. A manipulation check

similar to that used in Study 1 was employed here. The order in which arrays were

presented was randomized. The distribution of participants is shown in Table 3.2.

**Friendship ratings.** Similar to Study 1, participants then engaged in a study examining their preferences for friends in a study unrelated to the manipulations. Participants first rated themselves, in comparison to other same-sex individuals, on traits commonly desired in opposite-sex romantic partners, including: physical attractiveness, social level, and mate value.

**Table 4.1**

*Distribution of participants by faculty for Study 2*

| Faculty | $N$ (Total = 69) |
|---|---|
| Accountancy | 10 |
| Business Management | 33 |
| Economics | 9 |
| Information Systems | 8 |
| Law | 0 |
| Social Sciences | 9 |

**Table 4.2**

*Distribution of participants across conditions for Study 2*

| Sex ratio condition | Sex | |
|---|---|---|
| | Men | Women |
| Unfavorable | 10 | 25 |
| Favorable | 10 | 24 |

**Results and Discussion**

Similar to Study 1, two sets of analyses were conducted for the general and sex-specific operationalizations of mate value. In both sets of analyses, OSR, sex, and mate value discrepancy were entered into a repeated measures GLM. Where applicable, Greenhouse-Geisser and Bonferroni corrected values were reported. Mean ratings are shown in Table 4.3.

**Table 4.3**

*Mean ratings of desirability across conditions, sex, and trait for Study 2*

| | | Trait | | | | | |
| | | General mate value | | Physical attractiveness | | Social status | |
| OSR | MV Discrep. | Men | Women | Men | Women | Men | Women |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Favorable | Lower | 4.80 (2.10) | 4.83 (1.52) | 5.10 (1.52) | 5.00 (1.44) | 5.50 (1.43) | 5.04 (1.52) |
| | Similar | 5.60 (1.26) | 5.46 (2.06) | 5.70 (1.06) | 5.17 (1.69) | 6.20 (1.23) | 5.42 (1.72) |
| | Higher | 5.90 (1.37) | 6.13 (1.42) | 5.70 (1.42) | 5.42 (1.56) | 5.60 (1.84) | 5.46 (1.69) |
| Unfavorable | Lower | 5.30 (0.95) | 4.72 (1.28) | 4.90 (1.10) | 5.04 (1.51) | 5.20 (1.32) | 4.64 (1.25) |
| | Similar | 5.90 (0.99) | 5.80 (1.08) | 5.50 (0.97) | 5.24 (1.30) | 5.10 (1.45) | 5.52 (1.23) |
| | Higher | 6.20 (1.23) | 6.28 (1.31) | 6.00 (1.15) | 5.20 (1.53) | 6.20 (1.23) | 5.68 (1.57) |

*Note.* OSR manipulation = Operational sex ratio manipulation; MV discrep. = MV discrepancy

**OSR x Mate Value Discrepancy (Dependent Variable: General MV)**

Results of the manipulation check showed that participants in the unfavorable (favorable) OSR conditions perceived photo arrays to contain more same-sex (opposite-sex) photos, indicating that the OSR manipulations worked. In examining responses for the writing tasks, most participants described at least one way in which they imagined their lives would change in response to changes in the OSR, suggesting that the writing task successfully activated perceptions of change in the local OSR. Only 4 participants indicated that their lives were unlikely to change; all were undergraduate men assigned to an unfavorable OSR (more men than women) condition, and all cited their being in the Information Sciences faculty – which consistently has a student population skewed towards men – as a reason for the lack of change.

However, a main effect of OSR was not observed, $F(1, 65) = 0.67$, $p = .416$, $\eta_p^2 = .01$, indicating that participants exposed to an unfavorable and favorable OSR did not differ in their target ratings. Nonetheless, a main effect of Mate value

discrepancy was observed, $F$ (1.7, 111.7) = 18.0, $p < .001$, $\eta_p^2 = .22$; targets of

relatively lower mate value ($M = 4.91$, $SD = 0.20$) were perceived as less desirable

than targets of relatively similar ($M = 5.69$, $SD = 0.20$) or higher mate value ($M =$

6.13, $SD = 0.18$) (for both $t$s, $p$s $< .001$), while ratings for targets of relatively similar

or higher mate value did not differ ($p = .095$) (see Figure 4.1).

**Figure 4.1**

*Target ratings by mate value discrepancy for Study 2*
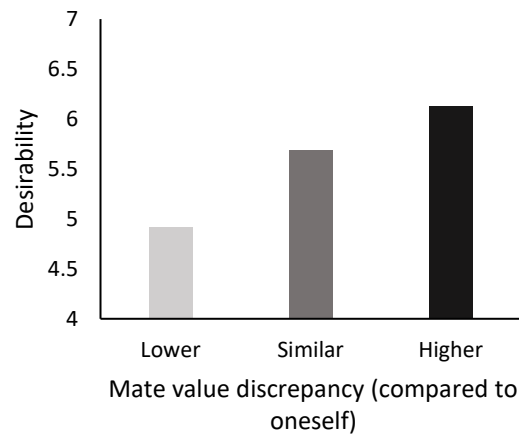


Hypothesis 1 was not supported, given the non-significant *Mate value*

*discrepancy* x *OSR* interaction, $F$ (1.7, 111.7) = 0..05, $p = .929$, $\eta_p^2 = .00$. This

indicated that the effect of mate value discrepancy on desirability ratings did not

differ across OSR conditions. Similar to Study 1, I proceeded to probe this

interaction. Pairwise comparisons revealed that participants in both OSR conditions

did not differ in their ratings for targets at all levels of mate value discrepancy (for all

$t$s, all $p$s $> .400$). Pairwise comparisons revealed that in both OSR conditions, targets

of relatively lower mate value were perceived as less desirable than targets of

relatively similar or higher mate value (for all $t$s, $p$s < .02), while ratings for targets of relatively similar or higher mate value did not differ (for all $t$s, $p$s > .250) (see Figure 4.2).

**Figure 4.2**

*Target ratings by mate value discrepancy and OSR for Study 2*
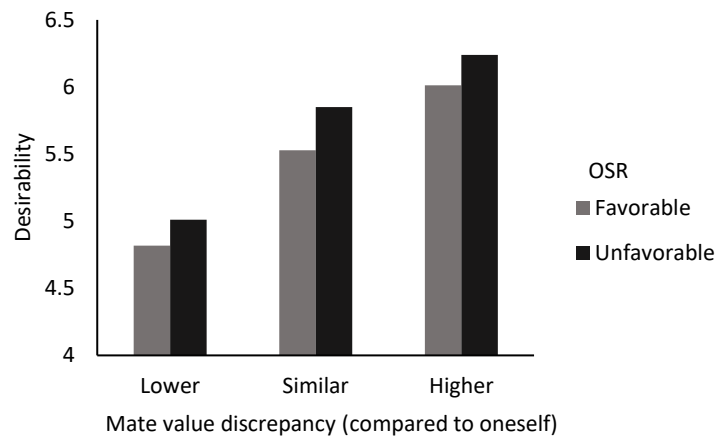


*Note.* Although participants primed with an unfavorable OSR rated targets at all level of mate value discrepancy as more desirable, these differences were not significant. The interaction between OSR and mate value discrepancy was also not significant, and target ratings across mate value discrepancy were in the same pattern that emerged for the main effect of mate value discrepancy

**OSR x Mate Value Discrepancy (Dependent Variable: Sex-Differentiated MV)**

As in Study 1, hypotheses 2a and 2b were tested by entering OSR, sex, mate value discrepancy, and trait (physical attractiveness, social level) into a repeated measures general linear model (GLM).  Similar to Study 1, hypothesis 2 was not supported. Men ($M$ = 5.64, $SD$ = 0.24) provided higher desirability ratings than women ($M$ = 5.24, $SD$ = 0.16) in general, though this effect of *Sex* did not reach significance, $F (1, 65) = 1.99$, $p = .163$, $\eta_p^2 = .03$. However, a main effect of *Mate value discrepancy* emerged, $F (1.7, 113.1) = 7.58$, $p = .001$, $\eta_p^2 = .10$. Targets of

relatively lower mate value ($M = 5.05$, $SD = 0.17$) were rated as significantly less desirable than targets of relatively similar ($M = 5.61$, $SD = 0.17$) and higher mate value ($M = 5.66$, $SD = 0.19$) (for both $t$s, both $p$s $< .010$), while target ratings for relatively similar and higher mate value did not differ significantly ($p = 1.00$). Similar rating patterns were separately observed for targets that varied on levels of physical attractiveness and social level. Relatively less physically attractive targets were rated as somewhat less desirable than targets of similar physical attractiveness ($p = .061$), and significantly less desirable than relatively more physically attractive targets ($p = .021$); ratings for targets of similar and higher physical attractiveness did not differ ($p = 1.00$). On the other hand, targets of relatively lower social level were rated as significantly less desirable than targets of relatively similar of higher social levels (for both $t$s, $p$s $< .03$), the both of which did not differ ($p = 1.00$) (see Fig. 4.3).

**Figure 4.3**

*Target ratings by mate value discrepancy and trait for Study 2*
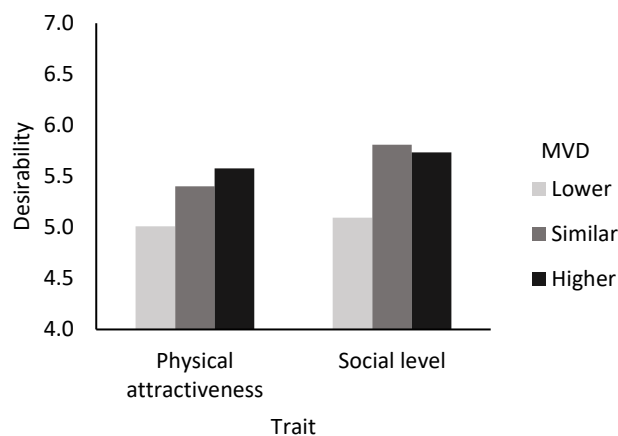
The four-way interaction predicted by the theoretical model did not emerge, $F$ (1.7, 112.8) = 0.16, $p$ = .820, $\eta_p^2$ = .00. When examining pairwise comparisons for this interaction, neither hypothesis 2a nor 2b were supported. Compared to when primed with a favorable OSR, men (women) primed with an unfavorable OSR did not rate targets of relatively lower, similar, or higher levels of social level (physical attractiveness) as significantly more or less desirable (for all $t$s, all $p$s > .300); this indicated that the OSR manipulation had no significant impact on target ratings. There was no evidence that men and women perceived targets of lower mate value as more desirable same-sex friends. Regardless of OSR prime, mean ratings of similar targets were equal to or higher than that of relatively lower mate value targets – in no situation were targets of relatively lower mate value rated as more desirable than targets of similar mate value.

**Chapter 5: General Discussion**

Across two studies, I sought to examine whether changes in OSR conditions might activate specific preferences for friends, as part of an evolved psychology attuned towards limiting intrasexual competition. According to this line of reasoning, unfavorable OSR conditions should activate preferences for friends of relatively lower mate value. Additionally, these competition-managing preferences should manifest in a sex-differentiated manner, such that men (women) should prefer friends who display a relatively lower social level (physical attractiveness) than oneself. A summary of all findings is shown in Table 5.1 below. In general, little support was found for the hypothesized results.

**Table 5.1**

*Summary of findings for studies 1 and 2*

| | | Significance | | Pairwise comparisons | |
|---|---|---|---|---|---|
| MV | Interaction | Study 1 | Study 2 | Study 1 | Study 2 |
| General | Mate value discrepancy (MVD) | *** | *** | Similar MV targets more (equally) desirable than lower (higher) MV targets | |
| | Sex | * | | Women rate targets more desirable than men | |
| | OSR | * | | Targets less desirable in unfavorable OSR than favorable OSR | |
| | MVD x Sex | | | Women find similar MV targets more desirable and higher MV targets somewhat more desirable than men | For women, similar MV targets more (less) desirable than lower (higher) MV targets. For men, similar MV targets more (equally) desirable than lower (higher) MV targets |
| | **MVD x OSR (H1)** | | | In unfavorable OSR, similar MV targets less desirable, higher MV targets somewhat less desirable | No OSR effect at all levels of MV |
| | MVD x Sex x OSR | | | For women, similar MV targets less desirable under unfavorable OSR. For men, higher MV targets somewhat less desirable under unfavorable OSR | For both men and women, no OSR effect at all levels of MV |

| Trait (Phy attr./ Soc. Lvl) | Effect | | | | |
|---|---|---|---|---|---|
| | MVD | ** | *** | Similar MV targets more (equally) desirable than lower (higher) MV targets | |
| | Sex | ** | | Women rate targets more desirable than men | |
| | OSR | | | | |
| | Trait | | † | | Social level more desirable than physical attractiveness |
| | MVD x Sex | † | | Women find lower and similar MV targets more desirable than men | For women, similar MV targets more (less) desirable than lower (higher) MV targets<br>For men, similar MV targets more (equally) desirable than lower (higher) MV targets |
| | MVD x OSR | | | | |
| | MVD x Trait | | | No trait differences at all levels of MV | Similar level of social level more desirable than similar level of physical attractiveness |
| | MVD x Sex x OSR | | | For both sexes, no OSR effects at all levels of MV | |
| | MVD x Sex x Trait | | | For women, targets of higher physical attractiveness less desirable than targets of higher social level | For men, targets of similar physical attractiveness less desirable than targets of higher social level |
| | MVD x Trait x OSR | | | No effect of OSR at all levels of both traits | |
| | Trait x OSR x Sex | | | For both sexes, no OSR effects for both traits | |
| | **MVD x Sex x Trait x OSR (H2a, 2b)** | | | Targets with similar levels of both traits always rated as most desirable in both OSR conditions | |

*Note.* *** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$. Phy. attr. = physical attractiveness, Soc. lvl. = social level.

Under the significance column, unless stated, all effects were non-significant. Under the pairwise comparisons column, unless stated, no theoretically-meaningful and significant pairwise comparisons found.

Hypothesized interactions are denoted in bold.

OSR influenced target ratings only when mate value was defined generally. That is, changes in the OSR influenced a target's desirability as a potential same-sex friend when participants considered mate value as an index of desirability to potential mates (Edlund & Sagarin, 2014), but not when participants considered mate value in terms of traits typically viewed to influence men and women's mate value. This finding is inconsistent with the expectation that men's (women's) desirability as a mate should be closely tracked by their level of social status (physical attractiveness) (Buss & Schmitt, 1993). However, one interpretation of the findings here is that the relationship between mate value and specific traits may not be as clear-cut. Indeed,

others have noted that mate value frequently encompasses multiple contributing

factors beyond physical attractiveness and social status (e.g., kindness, intelligence),

and have measured it as such (Kirsner et al., 2003). Additionally, others have also

shown that although individuals are seemingly able to accurately gauge their own

value as a mate, they are often not as adept at articulating the multiple factors that

contribute to such evaluations (Edlund & Sagarin, 2010, 2014). Hence, it is possible

that the dual operationalizations of mate value in studies presented may in fact reflect

two theoretically-distinct and independent sets of findings, rather than

interchangeable proxies of one another. Given that the general conceptualization of

mate value as an index of one's desirability is more directly related to one's ability to

outcompete other same-sex competitors, it makes sense that the influence of OSR

emerged only when participants rated targets that varied along such a dimension.

The evidence presented is consistent with the broader similarity-attraction

literature in identifying a general preference for similar others. Indeed, targets of a

similar mate value were consistently rated as more desirable interaction partners than

targets of lower mate value, and this preference emerged among both men and

women who were exposed to both unfavorable and favorable OSR cues. However,

targets of higher mate value were rated as equally desirable to targets of similar mate

value, indicating that people may not be attracted to similarity *per se* but, rather,

specific traits associated that are also found in interaction partners of higher mate

value. Such an interpretation is consistent with theorizing that interpersonal attraction

reflects a preference for others who display a capacity for and willingness to facilitate

an individual's own goals (Montoya & Horton, 2014). Within the context of

managing intrasexual competition, the present findings raise the possibility that associating with others who are at least as (if not more) desirable as oneself may, overall, facilitate less intense intrasexual competition for mates. For instance, although having friends of similar or higher status and desirability can directly pose a threat to one's success in attracting mates, it is possible that such associations can respectively maintain or increase one's own level popularity or desirability (Dijkstra et al., 2010, 2013); should the benefits outweigh the costs, then associating with similar or more desirable others may contribute positively one's own attractiveness to potential mates overall and reduce intrasexual competition. In contrast, although having friends of lower status or desirability may provide less direct competition for mates, associating with undesirable or unpopular individuals may detract from one's own desirability as an interaction partner and potential mate; likewise, should the costs outweigh the benefits, then associating with less desirable others may reduce one's own attractiveness as a potential mate overall and increase intrasexual competition. Future research may seek to examine the extent to which such cost-benefit evaluations are actually employed, and to tease both opposing effects apart to gain greater clarity on the weightage of each factor on friendship preferences.

Although the predictions were not supported, findings in Study 1 provide some avenues for future research. While the *Mate value discrepancy* x *OSR* interaction was not significant, pairwise comparisons showed that targets of similar mate value (but not physical attractiveness or social level) were rated as less desirable when participants were exposed to an unfavorable OSR; this effect of OSR seemed to replicate among ratings of targets of relatively higher mate value. While unexpected,

these findings can be interpreted as consistent with the theoretical framework

proposed here, that unfavorable OSR cues may activate some form of competition

management mechanisms. In line with the cost-benefit interpretation above, the

findings here indicate that the costs of associating with targets relatively lower mate

value are potentially so high that such targets remain undesirable interaction partners

regardless of the level of intrasexual competition. In contrast, although the benefits of

associating with those of similar or higher desirability may be high, these benefits

may reduce as intrasexual competition increases.

Despite the non-significant *Mate value discrepancy* x *OSR* x *Sex* interaction,

pairwise comparisons offered some indication that these competition management

mechanisms may be sex-differentiated, potentially reflecting where competition is

most intense for both sexes. Specifically, although mean desirability ratings of targets

were lower at all levels of mate value in an unfavorable versus favorable OSR, this

change only reached significance for women rating targets of a similar mate value;

for men, this difference tended towards significance for targets of higher mate value.

These results are potentially consistent with the broader evolutionary mating

literature. For instance, individuals of similar mate value are generally more likely to

be competing in the same mating pool and for the same mates (Kardum et al., 2019).

However, the intensity of this competition between women of similar mate value may

be compounded by the fact that women's mate choice tend to also be influenced by

that of other women. As an example, women tend to perceive as more desirable the

mates that other women find desirable (i.e., mate copying; Parker & Burkley, 2009),

which may further intensify intrasexual competition. As such, insofar that women of

similar mate value are (a) more likely to compete within the same mating pool and (b) are more likely to copy the mate choice of other competitors, they may face especially intense competition with one another. Our findings reflect such a possibility, that women may be more averse to other same-sex competitors of similar mate value, especially under conditions of high intrasexual competition. In contrast, for men, intrasexual competition is theorized to be even more intense due to the higher variation in reproductive success among men (Trivers, 1972). Because men of higher mate value are likely to experience high levels of reproductive success and men of low mate value may experience little to no reproductive success (Pollet & Nettle, 2009), men are theorized to have evolved to compete extremely vigorously for mates, with men of higher mate value representing the greatest threat to one's mating success. Hence, as shown in the evidence presented here, men may have evolved to be averse to interacting (and invariably competing with) other high mate value individuals.

Hence, while the lack of an overall interaction term suggests that these initial exploratory findings must be interpreted with caution, they provide a basis for which future tests may examine in an even more rigorous and targeted fashion. Specifically, future research guided by the findings presented here should consider the ways in which the various opposing forces acting on friendship preferences – stemming from the various costs and benefits of interacting with higher, similar, or higher mate value others – can be teased apart, and the extent to which socioecological cues to intrasexual competition influence such preferences.

**Limitations and Future Directions**

It is worth noting that Study 2 was limited by its small sample size, raising the possibility that analyses conducted lacked statistical power. Unforeseen circumstances hindered the completion of participant recruitment. Hence, although Study 2 sought to replicate the findings of Study 1 using a more effective manipulation, the lack of statistically-significant findings may either genuinely reflect that OSR does not influence friendship preferences or reflect a lack of statistical power. As such, future designs that are well-powered can provide more conclusive evidence to the effectiveness of a stronger manipulation and provide greater clarity for the link between OSR and friendship preferences.

Additionally, it is also a possibility that the size of effects reported here may have been affected by the occurrence of socially desirable responding. In particular, participants may have wished to avoid displaying an explicit preference for friends of similar attractiveness or social standing, given that preferences for such traits may be viewed as socially undesirable (e.g., shallow or superficial). In part, such as account suggests that effects reported here may in fact be attenuated, potentially limiting a clear understanding of the relationships being studied. Future studies may seek to examine similar hypotheses using designs that employ alternative measures for a target's desirability; for instance, using implicit measures, one can operationalize a target's desirability in terms of reaction time.

Beyond these methodological shortcomings that may be readily addressed in future studies, an alternative and theoretically-interesting interpretation for the (lack of) effect sizes reported here relates to the role of various evolutionarily-related factors that may, theoretically, modulate them. First, a clear extension of the research

here is to examine the role of individuals' motivations at the point of evaluating the

potential desirability of a friend. Cottrell et al. (2007) showed, for instance, that

depending on the type of relationship individuals seek to build, the traits that are

desired in a potential interaction partner may also differ. Hence, it is possible that

when evaluating targets friends with whom one is more likely to be in the presence of

potential mates (e.g., wingman), individuals' preferences may be more aligned with

the hypotheses here (e.g., Ackerman & Kenrick, 2009). Second, it is also likely that

individuals motivated towards attracting a mate may be more attuned towards the

relative desirability of potential friends. For instance, individuals primed specifically

with the motivation to attract an opposite-sex mate (as opposed to avoiding threats to

survival) have also been shown to adjust their mating strategies in ways that increased

their mating success (e.g., Hill & Durante, 2011); similarly, it is possible that

manipulations that activate such motivation may catalyze the activation of the

friendship preferences hypothesized here, as part of a psychology shaped to manage

intrasexual competition. Third, it is also possible that whether one prefers friends of

varying levels of desirability than oneself may be contingent on individual difference

factors such as self-esteem. Basking in reflected glory (BIRG)– the tendency for

individuals to associate with positive, successful, or prestigious groups – is a tactic

theorized to boost one's self-esteem (Cialdini & Richardson, 1980). Low self-esteem

has been shown to increase one's likelihood of BIRGing (Aberson, 1999); as a

parallel, it is possible that such individuals may also prefer associating with others of

higher desirability than oneself, compared to individuals with higher levels of self-

esteem. The incorporation of such theoretical extensions provide appropriate avenues for future research.

One final avenue for future research is to investigate the potential for cultural differences in one's friendship preferences. As mentioned prior, societal-level differences in relational mobility can influence individual-level choices for interaction partners (Yuki & Schug, 2012); in particular, individuals in less relationally mobile societies may find it harder exert their preferences in friends given that social networks in such societies are typically also less malleable (Schug et al., 2009). Given that participants in the current research were all recruited from a predominantly collectivistic society that is less relationally mobile, the findings here may not generalize to samples recruited from more relationally mobile societies. In such societies, we may expect preferences to be even more exaggerated.

**Conclusion**

The research presented here examined the possibility that evolved psychological mechanisms may differentially influence how men and women choose who to befriend depending on socioecological cues to intrasexual competition. The findings provide some evidence that this may be the case and suggest that although friends may often help us, they can also compete with us.

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**Appendices**

**Appendix A**

**Flow for Study 1**
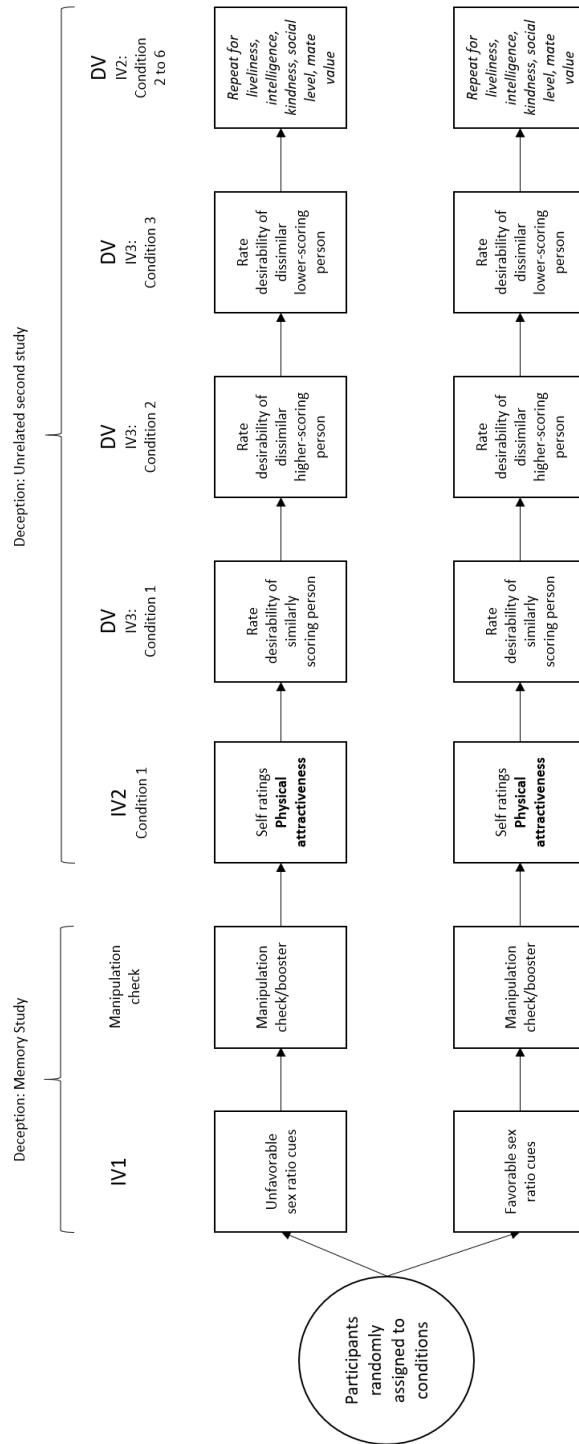
## Appendix B

## Photo stimulus

**Array 1:** Unfavorable OSR for men/favorable OSR for women (12 men)

**Array 2:** Unfavorable OSR for men/favorable OSR for women (13 men)

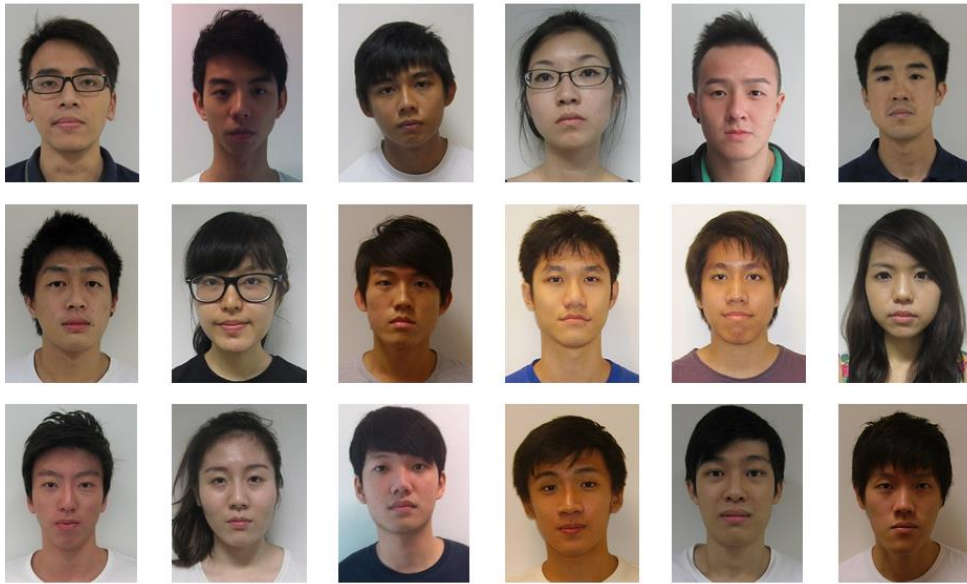**Array 3:** Unfavorable OSR for men/favorable OSR for women (14 men)

**Array 4:** Favorable OSR for men/unfavorable OSR for women (12 women)

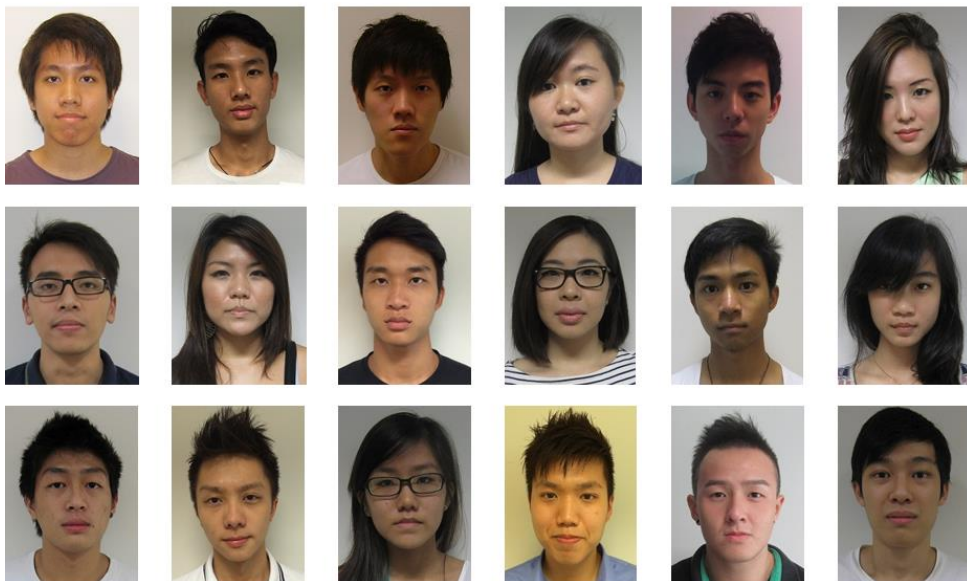**Array 5:** Favorable OSR for men/unfavorable OSR for women (13 women)

**Array 6:** Favorable OSR for men/unfavorable OSR for women (14 women)
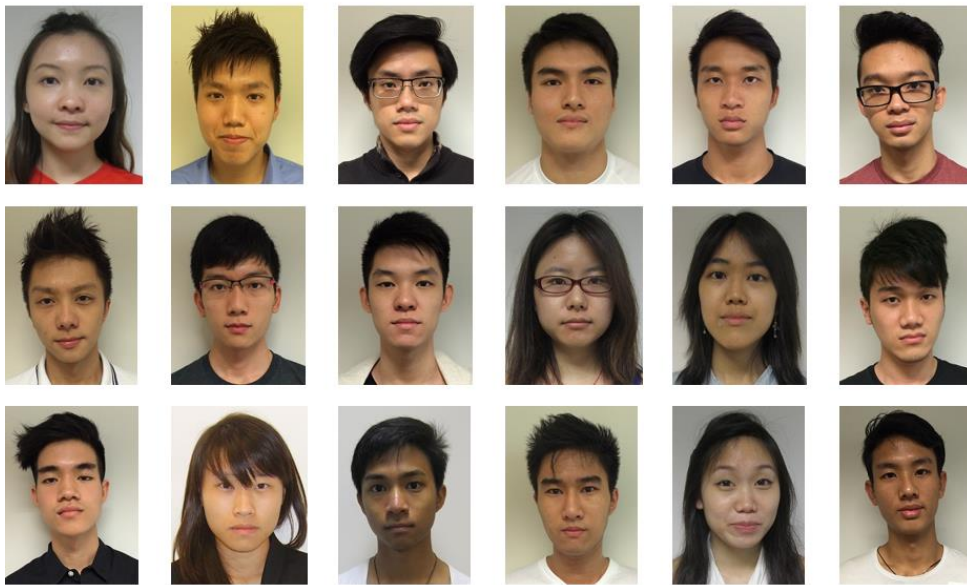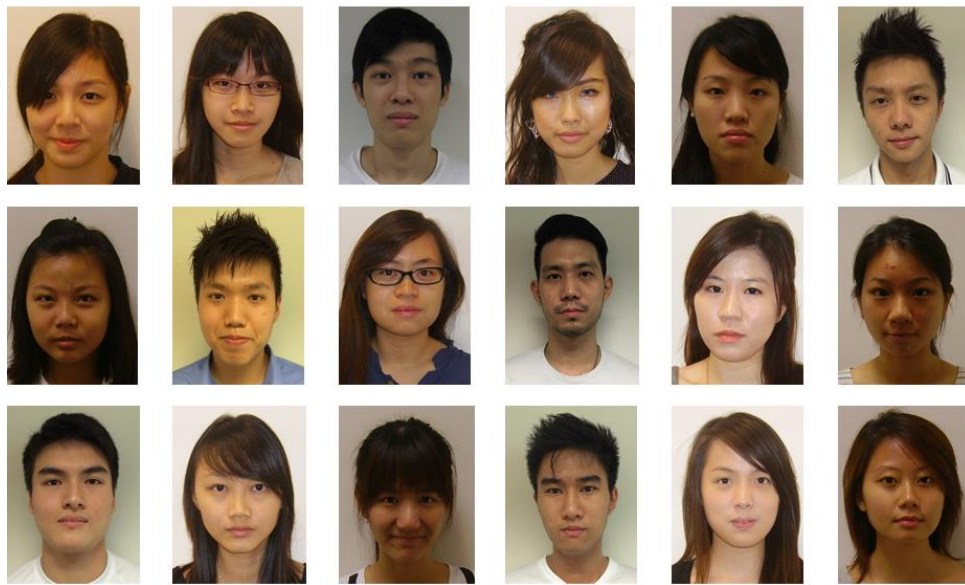
**(see arrays on next pages)**

*Array 1*



*Array 2*

*Array 3*



*Array 4*

*Array 5*



*Array 6*

**Appendix C**

**Manipulation Check**

*Manipulation Check*

1. What were the photos that you viewed?

    a. Photos of men and women

    b. Photos of farm animals

    c. Photos of scenery

    d. None of the above

2. Based on all the photos you've seen, were there more men or women?

    a. More men

    b. More women

    c. Roughly equal number of men and women

    d. Not sure

3. Based on all the photos you've seen, were there more or less people wearing spectacles?

    a. More people wearing spectacles

    b. Less people wearing spectacles

    c. Roughly equal number of people wearing and not wearing spectacles

    d. Not sure

**Appendix D**

**Friendship ratings**

*Friendship Preferences: self-ratings*

In this part of the study, we are interested in your opinions about yourself and

potential friends. There are no right or wrong answers, we are only interested in your

honest opinions.

Below are some traits that people commonly desire in themselves and others

(descriptions for each trait has been provided). Using a scale from -3 (much lower

than everyone else) to 0 (similarly to the average person) to +3 (much higher than

everyone else), how would you rate yourself on these traits relative to your peers of

the same sex?


    **Trait**

    Description (see next page for trait descriptions)


Imagine you just met someone of the same sex who scored *similarly to yourself /*

*higher than yourself / lower than yourself* on **Trait**. On a scale from 0 (*not at all*) to 8

(*extremely so*), to what extent do you think such a person would be

    Trustworthy

    Likeable

    Someone you would like to be friends with

*Note:* For mate value, self-rating was replaced with the use of the mate value scale (see below)

### *Trait descriptions*

Physical attractiveness: Describes a person's physical attractiveness (i.e., body and face). Does not include how they dress.

Social Level: A person's social situation or social class - what kind of job they have or intend to have (if at all), their education, living arrangement, they type of clothes the (can afford to) wear, etc.

Intelligence: How knowledgeable a person generally is, ability to speak and think sensibly

Kindness: A person's benevolence and willingness to help others

Liveliness: How lively a person's mannerisms or behaviors are, or how outgoing they are

### *Mate value scale*

Overall, how would you rate your level of desirability as a partner?

Overall, how would members of the opposite sex rate your level of desirability as a partner?

Rated on a scale from 1 (extremely undesirable) to 7 (extremely desirable)

Overall, how good a catch are you?

Rated on a scale from 1 (very bad catch) to 7 (very good catch)

Overall, how do you believe you compare to other people in desirability as a partner?

Rated on a scale from 1 (very much below average) to 4 (average) to 7 (very

much above average)

**Appendix E**

**Flow for Study 2**