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# Interactive effects of intrasexual competitiveness, same-sex competition, and physical attractiveness on temporal discounting

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ABSTRACT

Studies have shown that men discount the future and prefer immediate-but-smaller over delayed-but-larger rewards when exposed to mating opportunities (e.g., attractive opposite-sex targets) or threats (e.g., same-sex competition) whereas women's discounting in response to similar cues appears mixed, suggesting that mating-motivated discounting is primarily a male phenomenon. Importantly, this line of research has not yet examined the role of individual difference variables as well as how the attractiveness of potential mates and perceptions of competition jointly influence discounting rates. We conducted a novel test of the effect of trait intrasexual competitiveness (ISC) using dating profiles varying on target attractiveness and same-sex competition to observe their interactive effects on participants' discounting. Results showed that when targets were attractive, higher ISC was associated with steeper discounting for both men and women, and this association was stronger when competition was high rather than low. ISC still predicted discounting when targets were low in attractiveness but competition was high; high ISC did not predict discounting only in the low attractiveness and low competition condition. These findings reveal ISC as a factor that leads women to discount as much as men, and that high-ISC individuals may be more responsive to competition than to target attractiveness.

Researchers have noted that people's temporal orientations can be influenced by their mating motivations. For instance, men who viewed physically attractive women (Wilson & Daly, 2004) and women wearing swimsuits or lingerie (Kim & Zauberman, 2013; Van den Bergh et al., 2008) preferred a smaller sum of money immediately rather than a larger sum later—a phenomenon known as temporal discounting (Frederick et al., 2002). Conversely, neither men exposed to unattractive women nor women exposed to either attractive or unattractive men discounted the future (Wilson & Daly, 2004). From an evolutionary perspective, encountering a reproductive opportunity may instigate an eager, immediate-focused mindset for men given the greater reproductive fitness that accrue to them for short-term sexual encounters relative to women (Buss & Schmitt, 1993). Hence, men react to perceived mating opportunities with increased disinhibition and impulsivity. As demonstrated in car show rooms where scantily clad, attractive female models abound, sales professionals understand this phenomenon and utilize it to encourage impulse purchasing in male customers (Buss & Foley, 2020).

That mating motives increase men's impulsivity and future discounting alongside the less clear circumstances prompting women's discounting have contributed to a view of women as more risk-avoidant and less imprudent than men (Croson & Gneezy, 2009; Cross et al., 2011). Some subsequent findings, though, suggest that women may also discount when their interest in mating is heightened, such as during ovulation (Lucas & Koff, 2017; Vincent et al., 2023) or when certain sensory modalities (e.g., touching sexually suggestive stimuli; Festjens et al., 2014) are involved. Uncovering the circumstances that drive female discounting is important because concluding that women do not discount when investigations have been ineffective at revealing them constitutes a type 2 error. Indeed, researchers have noted that women can be risk-taking or opportunistic too, only that their approaches or the eliciting situations are more subtle or nuanced (Morgenroth et al., 2022; Nelson, 2015). Moreover, knowing when female short-sightedness occurs is important given the high costs of reproduction that women and girls may bear from mating judgment errors (Koehn & Jonason, 2018).

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To further elicit discounting effects—not only for men but also for women—it may be fruitful to investigate other contexts or factors that make people responsive to mating-related cues. An area that warrants more attention is how individual differences and contextual cues affect the desirability of romantic targets as the findings here are mixed. For example, some studies suggest that competitors influence target desirability favorably for women but unfavorably for men (Hill & Buss, 2008), while others indicate that men's judgments are more dependent on "objective" physical aspects whereas women's judgments are influenced by more "subjective" contextual aspects (Dunn & Doria, 2010; Guéguen, 2014). Importantly, variations in how attractiveness and competition interact for different individuals have scarcely been explored. Therefore, we examined two contextual factors—target attractiveness and intrasexual competition—and two individual difference variables—intrasexual competitiveness and sex—to gain a fuller understanding of how mating motives affect discounting.

## 1. Mating motives and temporal discounting

Temporal discounting refers to a decline in the subjective value of reward with increasing delay until its receipt (Frederick et al., 2002). This economic tradeoff reflects decisions that humans face of consuming in the present versus investing for the future. Discounting is an indicator of impulsivity (Baumann & Odum, 2012) and is marked by the tendency to maximize current pleasure while disregarding the future (e.g., spending money now instead of saving for a rainy day), or to prioritize immediate but smaller rewards over delayed but larger ones. Conversely, the act of sacrificing immediate pleasure for larger payoffs later (e.g., giving up on leisure activities to focus on building a career) is commonly referred to as delayed gratification. Studies have also linked temporal discounting with reduced self-control (Ashe & Wilson, 2020), impatience (Cruz Rambaud & Muñoz Torrecillas, 2016), and risk-taking (Baumann & Odum, 2012), all of which prompt acting sooner rather than later.

From an evolutionary perspective, men's discounting in response to mating-relevant stimuli reflects how men's reproductive fitness, more than women's, benefits from having more sexual partners. Whereas women's reproductive processes (e.g., pregnancy, childrearing) are costly and limit the number of offspring they can produce, men can increase their reproductive success by increasing the number of partners they inseminate (Trivers, 1972). Thus, whereas women evolved to be more cautious and selective than men when considering potential mates, men evolved to be more sexually opportunistic and eager for short-term, casual sex than women (Buss & Schmitt, 1993). Therefore, perceptions of sexually receptive women, particularly when they are physically attractive which serves as a cue to fertility (Symons, 1979), may induce men (but not women when viewing sexually receptive men) to become present-focused and more receptive to potential sexual opportunities.

Reflecting this adaptive opportunity-management mechanism, men are more likely than women to accept sexual invitations from opposite-sex strangers (Clark & Hatfield, 1989) and overestimate interest during interactions with the opposite sex (Perilloux et al., 2012). The desire to seize mating opportunities may manifest as impatience (Kim & Zauberman, 2013) and heightened risk appetite (e.g., unprotected sex, Skakoon-Sparling & Cramer, 2016; executing risky skateboarding stunts in the presence of an attractive female experimenter, Ronay & von Hippel, 2010), which are associated with a disinhibited preference for the immediate pursuit of gratification and disregard for safety in order to satiate romantic urges. Conversely, given the greater risks associated with reproduction for females, women's cautiousness results in lengthier evaluations of mates and less discounting (Wilson & Daly, 2004). These sex differences are also reflected in women being more likely to regret sexual actions (especially those involving casual sex) whereas men are likelier to regret missed sexual opportunities (Roese et al., 2006).

Despite the strong sex difference, evidence of discounting in women in more specific contexts exists, such as during the ovulatory phase where women's interest in mating increases as fertility peaks (Lucas & Koff, 2017). During ovulation, women feel more attractive (Schleifenbaum et al., 2021), have a stronger interest in men's physical attractiveness (Gangestad et al., 2007), and find outgroup men more attractive (Salvatore et al., 2017). Accordingly, women's discounting was highest at the late follicular phase of their menstrual cycle relative to the early follicular and luteal phases (Lucas & Koff, 2017). Ovulating women also exhibited discounting not only for money but also for food and sex (Vincent et al., 2023). Another study drew from the idea that women are less attuned to visual stimuli than men are (Hamann et al., 2004) and found that getting women to touch a pair of male boxers increased their preference for immediate monetary rewards (Study 1, female-only sample), though men's economic decisions were influenced by *both* visual and tactile sexual stimuli (Study 3, mixed-sex sample; Festjens et al., 2014). These findings suggest that women too can become more open to romantic possibilities when their mating motives are aroused, only that such contexts are more limited for women.

## 2. Intrasexual competition

Another determinant of reproductive outcomes is competition with same-sex rivals. As mating opportunities are limited and individuals must compete for reproductively viable mates, competitors pose a threat to mating success (Buss, 1988). Hence, competition increases mating motivation by spurring individuals to make haste, such as approaching a romantic target before others do. When exposed to pictures and vignettes indicating the increased presence of same-sex individuals, men shift toward preferring less money sooner over a delayed larger sum as well as a greater willingness to incur debt, but again women do not (Griskevicius et al., 2012).

Researchers have explored the possibility that women compete by enhancing appearance rather than gaining monetary status (Buss & Schmitt, 2019). One study found that exposing women to intrasexual competition increased preferences for attractiveness-enhancing luxury goods (Hudders et al., 2014), but a subsequent study using the discounting paradigm did not find any increased discounting of future gains for appearance-enhancing products (Widman & Weldon, 2020). In sum, the literature suggests a clearer discounting effect of men's mating motivation in response to attractive opposite-sex targets *and* same-sex competition. Although competition can influence women's self-enhancement motives, where discounting is concerned a more localized tendency exists such as during ovulation or through non-visual modalities.

We set out to investigate an overlooked individual difference that may apply to both men and women—intrasexual competitiveness (ISC). People who score high on ISC are more aggressive against the same sex (Davis et al., 2023), jealous of rivals (Zurriaga et al., 2018), and keen to attract the attention of the opposite sex (Barel, 2019). Accordingly, intrasexually competitive women may be, just like men are in general, prone to discounting, especially when facing competition for mates. Likewise, highly competitive men may exhibit more discounting than less competitive men.

As we noted earlier, researchers have yet to examine the interactive effects of target attractiveness and competition, which is a significant oversight because these factors have synergistic effects on desirability assessments (Dunn & Doria, 2010; Hahn et al., 2014). For instance, a question that remains unresolved unless these factors are simultaneously tested is whether competition still induces discounting when targets are unattractive. On the one hand, intense competition (e.g., from unbalanced sex ratios; Moss & Maner, 2016) can enhance the desirability and attractiveness of the sex being competed for (Hahn et al., 2014); on the other hand, people might disregard targets that fall below their requirements for certain traits—such as physical attractiveness for men (Li et al., 2002; Yong et al., 2022)—which then renders competition for such targets irrelevant. An investigation of the joint effects of target attractiveness, competition, ISC, and sex on discounting

is timely to address such questions.

## 3. The current study

This study examined how the attractiveness of opposite-sex targets and intensity of competition influence discounting. We also looked at the influence of ISC on discounting in response to varying levels of target attractiveness and competition, and tested whether these patterns differed between men and women. We hypothesized that men would discount more than women when exposed to attractive opposite-sex targets and greater competition, and that individuals of both sexes with higher ISC would discount more than those with lower ISC. As it is unclear how target attractiveness, competition, ISC, and sex would interact to influence discounting, we left these predictions open.

## 4. Method

We conducted a 2 (participant sex: male vs. female) × 2 (target attractiveness: low vs. high) × 2 (same-sex competition: low vs. high) factorial experiment with discounting as the dependent variable. ISC was also included to observe its associations with discounting across conditions.

### 4.1. Participants

G*power analyses recommended $N = 434$ to detect small effects ($f^2 = 0.03$) in factorial studies at 80 % power and $\alpha = 0.05$ (Faul et al., 2007). Given our interest in judgments of the opposite sex and the stimuli used were photographs of white Americans, the study was advertised on MTurk as seeking heterosexual American participants. 667 individuals self-reporting as heterosexual participated to complete a survey which included the mating stimulus (a "dating profile" task), two (i.e., pre-stimulus and post-stimulus) discounting tasks, and several measures in exchange for US$1. This larger sample was obtained in anticipation of participants failing the rationality checks inserted within the discounting tasks (Myerson et al., 2014). The rationality checks asked participants to choose between receiving a larger reward sooner or a smaller reward later. Since choosing the latter indicates an incorrect understanding of the choice options, those who did so were removed. The final sample included 616 American participants (220 males, $M_{age} = 34.6$ years, $SD_{age} = 10.5$; 396 females; $M_{age} = 33.6$ years, $SD_{age} = 10.4$) comprising Caucasian or white (59.1 %), Asian (24.4 %), African American or black (7.95 %), Hispanic (2.44 %), native American (0.33 %), multiracial (2.11 %), and unknown ethnicities (3.73 %).

### 4.2. Materials

#### 4.2.1. Intrasexual competitiveness

ISC was measured using a 12-item intrasexual competition scale (Buunk & Fisher, 2009) which included items like "When I go out, I can't stand it when women/men pay more attention to a same-sex friend of mine than to me" rated on a scale of 1 (not at all applicable) to 7 (completely applicable). Ratings were averaged to create a composite score ($\alpha = 0.92$). Men ($M = 3.34$, $SD = 1.29$) scored higher on ISC than women ($M = 3.01$, $SD = 1.42$), $t(614) = 2.84$, $p = .005$.

#### 4.2.2. Temporal discounting

Participants completed pre-stimulus and post-stimulus discounting tasks which included nine binary choices between a smaller-sooner reward and a larger-later reward (Wilson & Daly, 2004). A discounting change score was derived from the differential between each participant's pre- and post-stimulus sooner-smaller-reward choice proportions, resulting in an individual discounting tendency ranging from −1 to 1. For example, if a participant chose the sooner-smaller reward 4 out of 9 times in the pre-stimulus discounting task, the pre-stimulus score would be 4/9 = 0.44. If they next chose the sooner-smaller reward 5 out of 9 times in the post-stimulus discounting task, the post-stimulus score would then be 5/9 = 0.56. The difference between the pre- and post-stimulus scores, 0.56–0.44 = 0.12, would reflect the discounting change tendency. The pooled data showed no difference in average discounting change between men ($M = -0.01$, $SD = 0.11$) and women ($M = -0.02$, $SD = 0.13$), $t(614) = 1.11$, $p = .268$.

#### 4.2.3. Mating stimulus

A dating profile task served as the mating stimulus, whereby participants were asked to imagine being users of a dating platform. To facilitate our cover story and ensure sufficient exposure to the stimulus, participants were instructed to view 12 opposite-sex profiles (Figs. 1 and 2) and rate their romantic appeal on a scale of 1 (very unappealing) to 7 (very appealing).

The profiles contained three components. First, each profile included an opposite-sex photograph which was taken from a set of photos of white American undergraduates that were rated in a previous study (Li et al., 2010) on a scale of 1 (extremely unattractive) to 9 (extremely attractive). A total of 48 photos were obtained to create two attractiveness levels per sex (i.e., 12 low-attractiveness males, 12 low-attractiveness females, 12 high-attractiveness males, 12 high-attractiveness females) by choosing the least attractive male ($M = 1.82$, $SD = 0.34$) and female photos ($M = 1.59$, $SD = 0.26$) and most attractive male ($M = 7.51$, $SD = 0.27$) and female photos ($M = 7.84$, $SD = 0.32$). Second, two (low vs. high) competition levels were created by displaying different quantities of same-sex viewers' faces on each profile: 0 to 2 (few competitors; Fig. 1) versus 13 to 15 (many competitors; Fig. 2). Third, brief self-introductions were added to increase the realism of the profiles. These self-descriptions, which contained trivial information such as the target's favorite color and hobbies in a standardized manner, were designed to be generic so that participants would perceive having a better sense of the target without actually learning much. Each profile occupied an individual webpage and the order of profiles was randomized.

An attractiveness manipulation check was conducted using the romantic appeal ratings, and targets were judged as more appealing in the high-attractiveness condition ($M = 4.14$, $SD = 1.26$) than in the low-attractiveness condition ($M = 2.23$, $SD = 1.21$). $t(614) = 19.2$, $p < .001$. An attention check for competition was done after participants completed the dating profile task by asking them to estimate the average number of same-sex viewers they saw in each profile earlier, and more same-sex viewers were estimated in the high-competition condition ($M = 12.2$, $SD = 3.88$) than in the low-competition condition ($M = 3.36$, $SD = 3.50$), $t(614) = 29.9$, $p < .001$.

### 4.3. Procedure

Participants were asked to complete 1) the ISC measure, 2) the first (pre-stimulus) discounting task, 3) the dating profile (mating stimulus) task, 4) the second (post-stimulus) discounting task, and 5) demographics. The experimental treatment involved randomly assigning participants to one of four attractiveness × competition conditions: 1) low and low, 2) low and high, 3) high and low, and 4) high and high.

## 5. Results

Table 1 presents the correlation matrix. Discounting was regressed onto the predictor variables of participant sex, target attractiveness, same-sex competition, ISC, and their interactions in two linear regression models (Table 2). The continuous ISC variable was standardized and categorical variables (sex, attractiveness, competition) were contrast-coded. We reported 95 % confidence intervals in square brackets for the main effect sizes.

Results showed neither an effect of sex on temporal discounting nor any interaction effects of sex and the other variables on discounting (see Table 2). Hence, our overall sex difference hypothesis was not

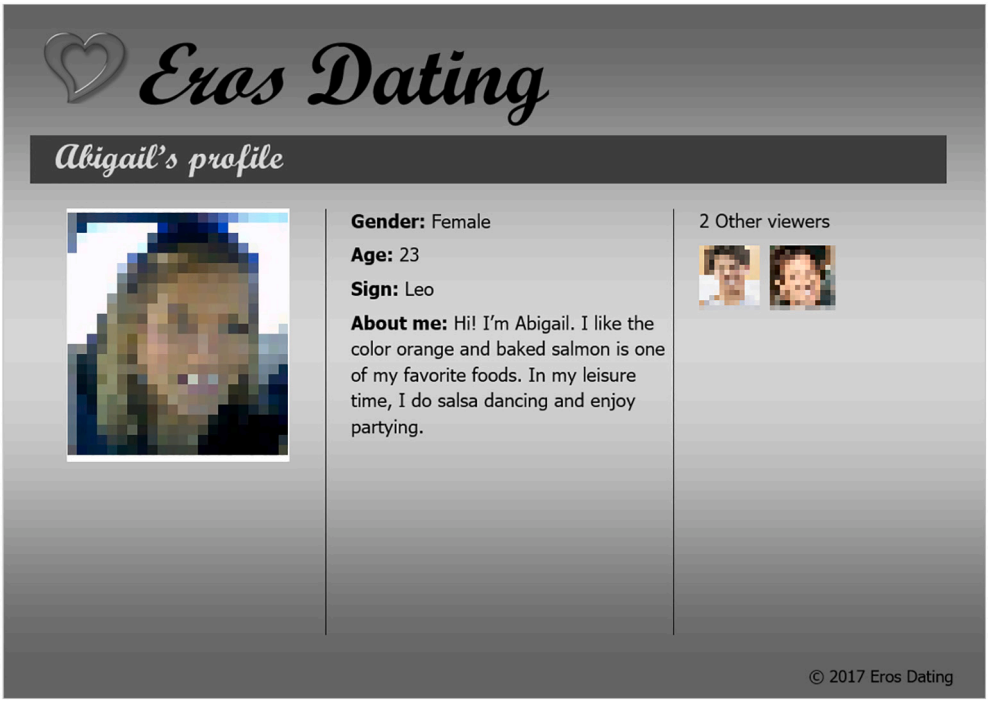


**Fig. 1.** A profile with low same-sex competition (with faces blurred here).

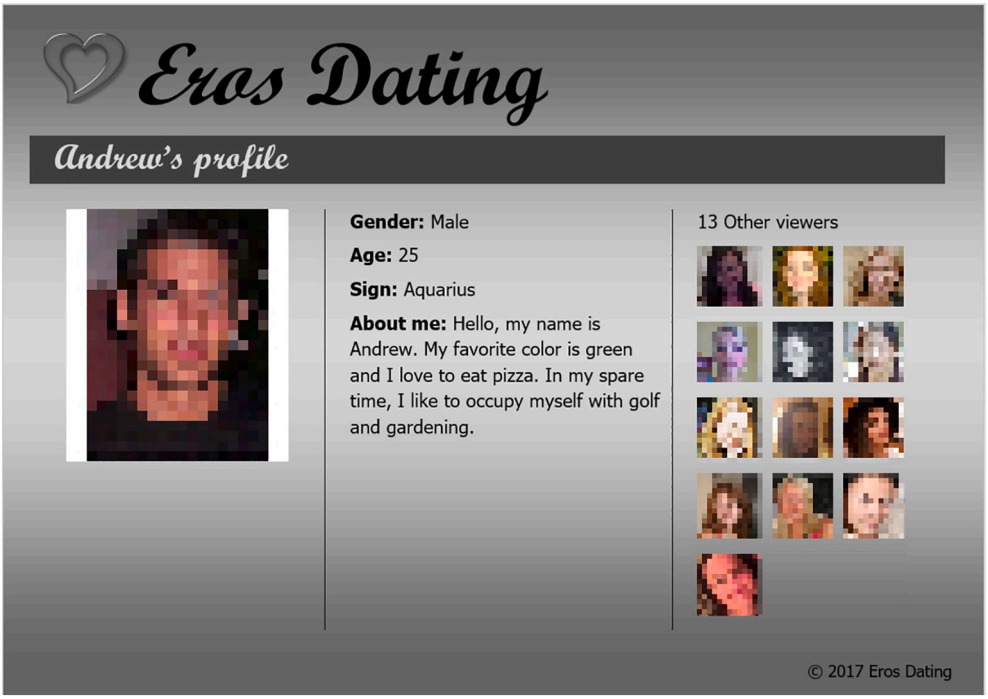


**Fig. 2.** A profile with high same-sex competition (with faces blurred here).

supported. Moreover, neither target attractiveness nor competition alone affected participants' discounting inclinations. However, there was a significant effect of ISC as higher-ISC participants discounted more than lower-ISC participants did, $\beta = 0.15$, [0.06, 0.24], $t(600) = 3.34$, $p < .001$.

Given these results, we explored further interactions with ISC included but not sex. Analyses revealed significant interactions for ISC × target attractiveness × competition, $\beta = -0.09$, [−0.18, 0.0], $t(600) = -2.06$, $p = .039$, and ISC × competition, $\beta = 0.10$, [0.01, 0.19], $t(600) = 2.21$, $p = .027$. Specifically, higher-ISC participants discounted more than lower-ISC participants in all conditions except the low-attractiveness and low-competition condition (Fig. 3). Furthermore, when targets were attractive, the discounting effect of ISC did not differ between the high- and low-competition conditions, $\beta = 0.01$, $SE = 0.13$, $t(600) = 0.11$, $p = .91$, but when targets had low attractiveness, this effect is larger in the high (vs. low) competition condition, $\beta = 0.38$, $SE = 0.01$, $t(600) = 3.01$, $p = .003$. These findings partly support our predictions. On the one hand, we did not find the expected greater

**Table 1**
Correlation matrix of the study variables.

| | Discounting | Attractiveness | Competition | Sex | ISC |
|---|---|---|---|---|---|
| Discounting | 1 | | | | |
| Attractiveness | 0.019 | 1 | | | |
| Competition | 0.025 | 0.071 | 1 | | |
| Sex | 0.045 | −0.005 | −0.033 | 1 | |
| ISC | 0.157*** | 0.027 | 0.065 | 0.114** | 1 |

*Notes*. Sex was coded as 0 = female, 1 = male. Attractiveness and competition were coded as 0 = low, 1 = high. *$p < .05$, **$p < .01$, ***$p < .001$.

discounting in response to attractive targets or competition for men versus women. On the other hand, we found that high-ISC individuals responded to competition by discounting more, especially when targets were attractive. High ISC also prompted more discounting even when targets were unattractive under high competition; only when target attractiveness and competition were both low did ISC not predict discounting.

## 6. Discussion

Research has shown that men discount the future when confronted with mating opportunities (e.g., attractive opposite-sex targets; Wilson & Daly, 2004) and threats (i.e., mating rivals; Griskevicius et al., 2012), whereas women's discounting depends on factors such as ovulatory status (Lucas & Koff, 2017) or touch (instead of sight; Festjens et al., 2014). Although these findings portray mating-induced discounting more as a male phenomenon, we noted the shortage of research on individual differences in this area and tested whether ISC would elevate people's responsiveness to mating cues and increase discounting in women. Moreover, we examined how target attractiveness and competition would interact to gain a dynamic understanding of the factors underlying discounting. We found that when targets were attractive, higher ISC was associated with a stronger preference for immediate-but-smaller over delayed-but-larger gains for *both* men and women, and this was more pronounced in the high-competition condition. ISC still predicted discounting when targets were low in attractiveness but competition was high, with the only condition that did not lead high-ISC participants to increase discounting being the low-attractiveness and low-competition condition.

## 7. Implications, limitations, and future directions

Despite links between the attractiveness of and competition for mates in mating judgments (e.g., Hahn et al., 2014; Moss & Maner, 2016), it had been unknown how these factors would interact depending on perceiver characteristics. Our high-ISC participants were quite motivated by competition as discounting was induced by competition over and above the attractiveness of targets, thus attesting to the specificity of ISC as an evolved mechanism to be sensitive and responsive to competition (Buunk & Fisher, 2009). Another inference is that whether targets are seen as desirable depends somewhat on demand or interest from others (Dunn & Doria, 2010; Moss & Maner, 2016). Further tests of how attractiveness and competition influence one another across more contexts will be insightful.

As discounting is relevant when a premium exists on gaining attention from prospective mates *now* (e.g., short-term mating; Buss & Schmitt, 1993) and we found that high-ISC participants discounted more than low-ISC participants did, a pertinent question is how ISC relates to sexual strategies (e.g., seeking uncommitted vs. committed partnerships). On the one hand, people are reasonably expected to take action if a rival approaches a love interest; on the other hand, if individuals still feel eager to approach romantic targets without contextual effects (e.g., competition, attractiveness), this might imply the functioning of variety- or quantity-driven mating strategies. Some ways to further probe the evolutionary roots of ISC include using frameworks from life history theory (Buunk & Massar, 2021) and developmental psychology (Buunk et al., 2014).

As there were no effects of target attractiveness or competition on discounting until ISC was accounted for and this pattern was similar for

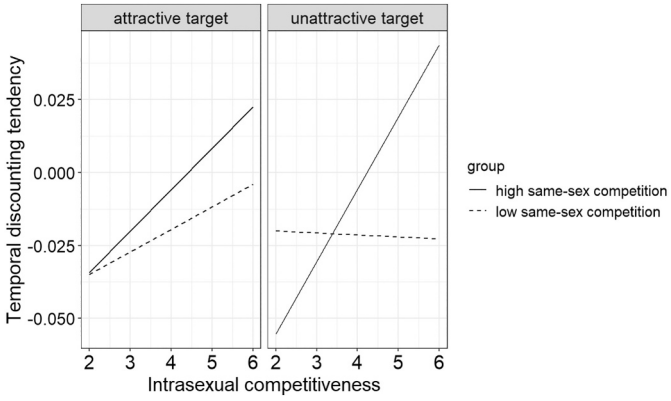


**Fig. 3.** Estimated effect of participants' intrasexual competitiveness on discounting moderated by target attractiveness and intensity of same-sex competition.

**Table 2**
Results of multiple linear regressions.

| Predictors | Discounting (model 1) | | | | Discounting (model 2) | | | |
|---|---|---|---|---|---|---|---|---|
| | ß | 95%CI | *t* | *p* | ß | 95%CI | *t* | *p* |
| Sex | 0.04 | −0.04,0.13 | 1.05 | 0.295 | 0.02 | −0.06,0.11 | 0.57 | 0.570 |
| Attractiveness | 0.02 | −0.06,0.11 | 0.53 | 0.593 | 0.03 | −0.06,0.11 | 0.60 | 0.549 |
| Competition | 0.04 | −0.04,0.12 | 0.94 | 0.345 | 0.03 | −0.06,0.11 | 0.61 | 0.543 |
| Sex × Attractiveness | 0.02 | −0.06,0.10 | 0.46 | 0.649 | 0.03 | −0.06,0.11 | 0.65 | 0.517 |
| Sex × Competition | 0.05 | −0.03,0.14 | 1.27 | 0.203 | 0.04 | −0.05,0.12 | 0.84 | 0.402 |
| Attractiveness × Competition | 0.02 | −0.06,0.10 | 0.45 | 0.651 | 0.01 | −0.07,0.10 | 0.28 | 0.778 |
| (Sex × Competition) × Attractiveness | 0.05 | −0.03,0.14 | 1.28 | 0.202 | 0.07 | −0.01,0.15 | 1.67 | 0.096 |
| ISC | | | | | 0.15 | 0.06,0.24 | 3.34 | **0.001** |
| Sex × ISC | | | | | −0.01 | −0.10,0.08 | −0.21 | 0.831 |
| Attractiveness × ISC | | | | | 0.01 | −0.08,0.10 | 0.26 | 0.791 |
| Competition × ISC | | | | | 0.10 | 0.01,0.19 | 2.21 | **0.027** |
| (Sex × Attractiveness) × ISC | | | | | −0.03 | −0.12,0.06 | −0.69 | 0.488 |
| (Sex × Competition) × ISC | | | | | −0.00 | −0.09,0.09 | −0.02 | 0.988 |
| (Attractiveness × Competition) × ISC | | | | | −0.09 | −0.18,-0.00 | −2.06 | **0.039** |
| (Sex × Attractiveness × Competition) × ISC | | | | | 0.01 | −0.08,0.09 | 0.13 | 0.895 |
| Observations | 616 | | | | 616 | | | |
| $R^2$ / $R^2$ adjusted | 0.009 / -0.003 | | | | 0.050 / 0.027 | | | |

both sexes, this result accords only partially with past research (e.g., Griskevicius et al., 2012; Wilson & Daly, 2004). Prior findings were perhaps not fully replicated because of our use of stimuli varying in target attractiveness and competition, which is arguably more complex than the single-variable stimuli used in earlier studies. As such, the influence of key variables may have been diluted across the various stimuli presented and thus not all participants were sufficiently impacted from exposure. Another possibility is reduced attentiveness from our use of MTurk participants as opposed to the physically present lab participants in prior investigations. Nevertheless, we showed that although discounting in the general population can sometimes be obscured, accounting for ISC is a powerful way to coax discounting effects in addition to demarcating differences between individuals in responsiveness to mating cues.

Some limitations are associated with our findings. First, we defined attractiveness as facial attractiveness, whereas other features (e.g., physique, voice) that might instigate discounting were not examined. The consideration of more avenues to arouse desire is essential since discounting effects previously thought to be absent could be activated using alternative sensory pathways (Festjens et al., 2014). Moreover, our discussion of mating motivation as deriving from targets being attractive or sexually receptive (especially where men's motivations are concerned) implies that these factors can overlap such that targets become more attractive the more sexually available they are perceived to be. Thus, future research should consider assessing the interplay between attractiveness and factors such as ovulatory status, sociosexuality, and other cues to fertility or availability (Welling & Orille, 2023). Second, while our use of Caucasian faces facilitated the standardization of stimulus materials, our findings may be less generalizable to other cultural settings where attractiveness criteria may vary. Finally, although both high-ISC men and women discounted more after seeing attractive targets in the high-competition condition, we did not examine sex-differentiated mechanisms that might underlie these responses. According to evolutionary theories of mating (Symons, 1979), women's desirability appraisals are driven more by social status indicators, whereas men's appraisals arise from health and fertility cues. Testing these specific pathways will clarify our findings while validating broader mate preference theories.

## CRediT authorship contribution statement

**Jose C. Yong:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Data curation, Conceptualization. **Indra Alam Syah Aziz:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Hualin Xiao:** Writing – review & editing, Formal analysis, Data curation. **Norman P. Li:** Writing – review & editing, Supervision, Resources, Methodology, Funding acquisition, Conceptualization.

## Declaration of competing interest

None.

## Data availability

Data will be made available on request.

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