



# Friend or Foe? Mate Presence and Rival Type Influence Clothing-Based Female Intrasexual Competition

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## Abstract

Evolutionary psychologists have brought attention to women's intrasexual competition in ways that traditional perspectives have overlooked. Whereas most researchers have thus far focused on exploratory investigations of this phenomenon, we experimentally manipulated contextual factors that could affect intrasexual competition (e.g., rival type, presence of a potential mate) and assessed competitive behavior via clothing choice. Across two studies, female MTurk users ( $N_{\text{Study1}} = 131$ ;  $N_{\text{Study2}} = 262$ ) read a vignette describing an upcoming party then chose an outfit they would wear to that party from a set of clothing items that had been pre-rated on sexiness and revealingness by a separate sample ( $N = 100$ ). Within the vignette, we inserted participant-provided initials to manipulate the presence of a crush and the familiarity and attractiveness of their female party companion. Unexpectedly, we found a significant difference between outfit ratings for separates compared with dresses, so we incorporated this into our model. In study 1, among women who chose dresses, those who imagined attending the party with a more attractive acquaintance and their crush present chose more attractive outfits than women in the less attractive acquaintance condition. However, no such pattern was found for women who chose separates or women in the close friend condition. In study 2, a pre-registered direct replication showed that women in the acquaintance condition chose more attractive outfits than women in the close friend condition, but only in the crush present condition. Women's intrasexual competition mechanisms appear cost-sensitive and only prompt competitive tactics when rivals are particularly threatening.

**Keywords** Women · Intrasexual competition · Clothing · Friendship · Rivalry

Competition between members of the same sex for mates is a ubiquitous adaptive problem among sexually reproducing species, including our own, with female intrasexual competition frequently showcased in popular culture (e.g., *Mean Girls*, “Girlfriend” by Avril Lavigne, *Gossip Girl*). Intrasexual competition occurs when there are limited resources (e.g., high-value mates) in high demand by one sex and, therefore, individuals of that sex compete for access to those resources (Buss 1988). Humans engage in several types of strategies during intrasexual competition, but self-promotion strategies are the most common (Fisher and Cox 2011). The goal of these strategies is to make an individual seem more valuable as a mate by altering appearance (e.g., makeup,

clothing, perfume), adjusting behavior to signal desirable personality traits (e.g., honest, funny, caring), and even playing “hard to get” to simulate higher mate value (Schmitt and Buss 1996). Women employ different self-promotion tactics based on their degree of sexual interest and willingness to compete. For example, during women's fertile ovulatory window, or in the presence of attractive rivals, women are more likely to employ self-promotion strategies such as buying appearance-enhancing products, tanning, or dieting (Durante et al. 2011; Hill and Durante 2011; Hudders et al. 2014). Women's self-promotion strategies could therefore signal attractiveness or availability to potential mates and, simultaneously, competitiveness to potential rivals.

Within female alliances, however, signaling competition could be extremely costly. Yet, because women tend to form friendships with other women who are similar to them on physical attractiveness, social status, and interests (Bleske-Rechek and Lighthall 2010; Kalmijn and Flap 2001), they are presumably forming friendships with their

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main competitors. And women indeed appear keenly aware of the potential for competition: within friendships, the relatively less attractive friends perceive more mating rivalry with their relatively more attractive friends (Bleske-Rechek and Lighthall 2010). Furthermore, competition within friendships evokes a more intense negative reaction compared with competition between women who are strangers, particularly regarding acts showcasing sexual availability and appearance enhancement (Bleske-Rechek and Shackelford 2001). Women both actively assess possible competition from other women and find such competition within friendships to be costly and upsetting.

Because men routinely value physical attractiveness in a mate, appearance, and its enhancement, is a key context in which female intrasexual competition occurs. When assessing potential rivals, women specifically use clothing and attractiveness to determine degree and likelihood of competitive threat. Women are, in fact, less likely to pursue friendship with a woman wearing revealing clothing and less likely to introduce her to a romantic partner (Vaillancourt and Sharma 2011). A rival's attractiveness can also lead to indirect aggression: women are more likely to engage in derogation and exclusion when shown images of attractive women (Borau and Bonnefon 2017), especially around ovulation (Fisher 2004). When women are exposed to cues of intrasexual competition, they respond with mate-guarding behaviors which can prevent alliance formation or impose other costs on both themselves and their rivals.

The costliness of engaging in intrasexual competition with a friend suggests that we should see less appearance enhancement around close friends. Yet, research shows that within friendships, the relatively less attractive friend perceives greater competition (Bleske-Rechek and Lighthall 2010), therefore the level of attractiveness of the friend matters as well. No studies have yet to experimentally manipulate, simultaneously, the familiarity and attractiveness of a rival to assess the impact on women's intentions to engage in intrasexual competition when potential mates are present or absent. Given that women have an aversion to competition within close friendships (Bleske-Rechek and Shackelford 2001; Bleske-Rechek and Lighthall 2010), it is likely that they have context-specific strategies for when to enhance appearance and how aggressively to do so.

Although attractiveness level is somewhat static, women must have mechanisms to take advantage of methods of enhancing their level of attractiveness for intrasexual competition. In the modern environment, this often appears in the form of makeup, diet pills, cosmetic enhancements and surgery, and of course clothing choice (Schmitt and Buss 1996). In our experiments, we used clothing

purchases as our measure of intrasexual competition because these are the kinds of purchases that also directly impact a woman's attractiveness and competitiveness in the mating market by enhancing her bodily attractiveness or even signaling sexual availability and clothing choice has been used as an outcome measure in prior studies of women's intrasexual competition (Durante et al. 2011; Hill and Durante 2011; Hudders et al. 2014). Our participants imagined they were going to a party and needed to select an outfit for the occasion from a set of clothing options that varied in revealingness and sexiness (as rated by a separate sample). We anticipated a three-way interaction between the familiarity of the party companion (i.e., close friend or acquaintance), the companion's relative attractiveness, and the presence or absence of a potential mate. We predicted that women would be more likely to engage in competition (i.e., choosing sexier, more revealing clothing) when told to imagine attending the party with a more attractive acquaintance (Bleske-Rechek and Lighthall 2010; Borau and Bonnefon 2017; Fisher 2004). We further predicted that women would be more motivated to compete with an acquaintance than a close friend (regardless of attractiveness level) if a potential mate was present to elicit intrasexual competition (Buss 1988).

## Study 1

### Method

#### Participants

Participants were recruited through MTurk with the following requirements: in the United States, primary language is English, successfully completed at least 95% of previous MTurk tasks, identify as a woman between the ages of 18 to 25 (as our hypotheses and the clothing choices were tailored to young women in the mating market). Participants received \$3.00 in compensation upon successful completion of the survey, titled "What would you wear?"

We removed data from our sample ( $N = 203$ ) from participants who failed any attention checks ( $N = 2$ ) or manipulation checks ( $N = 49$ ), women who skipped items on measures necessary to calculate covariates ( $N = 8$ ), as well as women who reported a homosexual ( $N = 8$ ) or other ( $N = 6$ ) sexual orientation, because the vignette included a male crush. The remaining sample ( $N = 131$ ; heterosexual,  $n = 101$ ; bisexual,  $n = 30$ ) was used for all subsequent analyses. Although our recruitment materials specified ages 18 to 25, our participants actually ranged in age from 20 to 26 ( $M = 23.54$ ,  $SD = 1.66$ ). The women self-reported

their ethnicities as White (66.4%), Black or African American (11.5%), Hispanic/Latina (7.6%), Asian American (5.3%), American Indian or Alaska Native (0.8%), or two or more races (8.4%). Participants indicated their relationship status as not in a relationship (28.2%), in a committed, open relationship (3.8%), or in a committed, closed relationship (67.9%).

## Materials and Procedure

**Clothing Pre-ratings** A separate sample of participants (50 women, 50 men) blind to the purpose of the main study was recruited through MTurk with the following requirements: located in the United States, speak English as their primary language, successfully completed at least 95% of their previous MTurk tasks. It was of particular importance that our pre-rating sample capture a diverse range of perspectives to produce ratings that reflect each clothing item's perceived sexiness or revealingness to most observers. All participants passed all attention checks and received \$2.00 in compensation. Participants ranged in age from 22 to 70 ( $M = 30.03$ ,  $SD = 6.84$ ). They reported their ethnicities as White (74%), Black or African American (11%), Hispanic/Latino(a) (5%), Asian American (6%), American Indian or Alaska Native (1%), two or more races (2%), or Other (1%).

We created a range of clothing items that varied in revealingness (see Fig. 1): four styles of tops (bandeau, camisole, short-sleeve shirt, long-sleeve shirt), five styles of bottoms (jeans, jean shorts, mini skirt, midi skirt, maxi skirt), six styles of dresses (sleeveless mini, long-sleeve mini, sleeveless midi, long-sleeve midi, short-sleeve maxi, long-sleeve maxi), and four styles of shoes (sneakers, flat sandals, low heels, high heels). We chose items with a solid color and simple structural design from a popular online clothing shop for young women. Each image was cropped to focus on the clothing item, then manipulated with Adobe Photoshop to produce five standard color options for each item (i.e., black, white, red, blue, yellow); shoes appeared in black only as they were included to enhance the immersion of the simulated online shopping experience and were not analyzed as part of the outfits.

Participants provided informed consent then rated the 79 items on revealingness (1 = *Not at All Revealing* to 10 = *Very Revealing*) and sexiness (1 = *Not at All Sexy* to 10 = *Very Sexy*). A one-way ANOVA showed that revealingness scores differed by color,  $F(3.64, 360.80) = 4.04$ ,  $p = .004$ <sup>1</sup>; Bonferroni post hoc tests demonstrated that participants rated yellow items ( $M = 4.48$ ,  $SD = 1.53$ ) significantly lower in revealingness than black ( $M = 4.66$ ,  $SD = 1.51$ ), white ( $M = 4.66$ ,  $SD = 1.48$ ), or red items ( $M = 4.63$ ,  $SD = 1.55$ ), but not blue items ( $M = 4.55$ ,

$SD = 1.53$ ); no other differences were significant. Sexiness scores also differed by color,  $F(4, 396) = 8.71$ ,  $p < .001$ ; Bonferroni post hoc tests demonstrated that participants rated yellow items ( $M = 5.53$ ,  $SD = 1.68$ ) significantly less sexy than black ( $M = 5.84$ ,  $SD = 1.65$ ), white ( $M = 5.80$ ,  $SD = 1.58$ ), or red items ( $M = 5.75$ ,  $SD = 1.64$ ), but not blue items ( $M = 4.559$ ,  $SD = 1.61$ ) which were rated significantly less sexy than black items and white items; no other differences were significant. These differences notwithstanding, revealingness scores and sexiness scores were highly correlated,  $r(135) = .92$ ,  $p < .001$ ; therefore, we averaged them together (using 5% trimmed means to avoid outliers throughout) to calculate an overall outfit attractiveness index for each participant's chosen outfit.

**Experimental Stimuli** After giving informed consent and completing basic demographic items, participants provided five sets of initials of people they know: a male crush, a female acquaintance less attractive than themselves, a female acquaintance more attractive than themselves, a close female friend less attractive than themselves, and a close female friend more attractive than themselves (the prompt for initials is provided in Appendix A). After random assignment, the corresponding initials were piped into the vignette they read accompanied by these instructions:

Please imagine that you are currently single or currently pursuing a sexual or romantic partner. Carefully read the scenario below and try to imagine that it is really happening to you and the people whose initials are included in the story.

The vignette described an upcoming party, including relevant attendees; we used vignettes to make participants to feel like they were actually attending a party and had to choose an outfit they would really wear. There were eight possible vignettes (see Appendix B, representing all combinations of crush presence, companion type, and companion attractiveness).

**Online Shopping Simulation** After reading the vignette, participants saw a page of clothing items to create an outfit for the party. Participants could choose shoes and either separates (i.e., top and bottom) or a dress from the pre-rated clothing described above. As mentioned above, we calculated an outfit attractiveness index for each participant by averaging the sexiness and revealingness pre-ratings for each clothing item they selected (not including shoes). Participants read the following instructions for the online shopping simulation:

<sup>1</sup> This model did not pass the sphericity assumption, so we report the Greenhouse-Geisser values.

Clothing Items



Fig. 1 Pre-rated Clothing Items



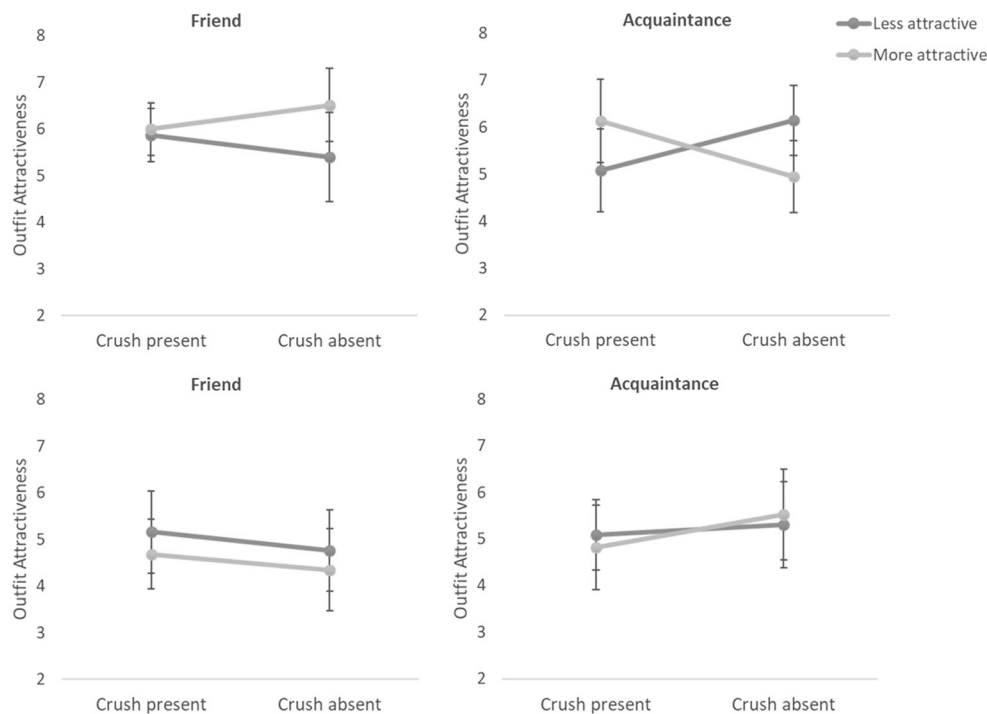
Fig. 1 (continued)

**Table 1** Factorial ANOVA of crush presence, companion type, companion attractiveness, and outfit type on outfit attractiveness for both studies

	Study 1 <i>F</i> (1, 110)	$\eta_p^2$	Study 2 <i>F</i> (1, 242)	$\eta_p^2$
SOI	0.42	0.00	8.88**	.04
MV	3.10	0.03	3.07	.01
ISC	3.83*	0.03	0.19	.00
SDO	0.96	0.01	2.74	.01
CRUSH	0.18	0.00	0.09	.00
COMPANION	0.29	0.00	2.76	.01
ATTR	0.06	0.00	0.13	.00
OUTFIT	15.05***	0.12	47.75***	.17
CRUSH × COMPANION	0.92	0.01	2.76	.01
CRUSH × ATTR	0.17	0.00	0.13	.00
CRUSH × OUTFIT	0.02	0.00	1.39	.01
COMPANION × ATTR	0.00	0.00	0.28	.00
COMPANION × OUTFIT	4.52*	0.04	0.03	.00
ATTR × OUTFIT	1.32	0.01	0.05	.00
CRUSH × COMPANION × ATTR	1.67	0.02	0.07	.00
CRUSH × COMPANION × OUTFIT	0.99	0.01	4.02*	.02
CRUSH × ATTR × OUTFIT	0.70	0.01	1.54	.01
COMPANION × ATTR × OUTFIT	0.43	0.00	3.27	.01
CRUSH × COMPANION × ATTR × OUTFIT	5.08*	0.04	0.45	.00

SOI sociosexual orientation, MV mate value, ISC intrasexual competition, SDO social dominance orientation, CRUSH crush presence, COMPANION companion type (close friend or acquaintance), ATTR relative attractiveness of companion (higher or lower), OUTFIT dress or separates

\* $p < .05$ ; \*\*\* $p < .001$



**Fig. 2** Estimated marginal mean outfit attractiveness scores for women in study 1 who chose dresses (top) and separates (bottom), as a function of companion type, companion attractiveness, and crush presence

Now, imagine you are online shopping for an outfit for the party in the scenario. You can either pick an outfit that's made up of one top and one bottom or you can choose one dress. After indicating your preferred outfit combination below, the clothing items that you can choose from will appear. However, if you wish to see the items from the other outfit option, you can reselect a different answer choice for this question.

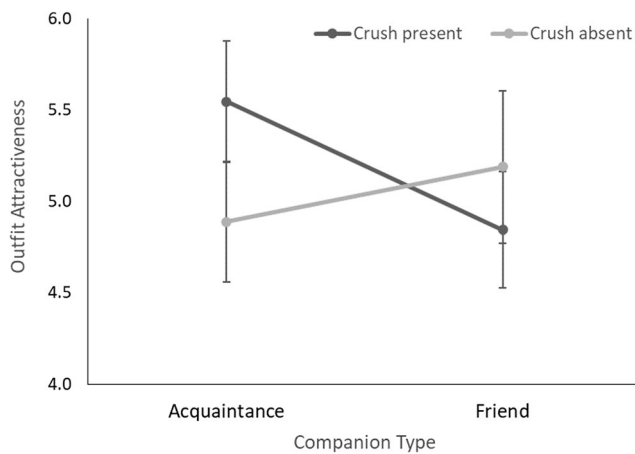
**Individual Difference Measures** Finally, participants responded to several measures (presented in randomized order) we believed would represent individual differences in women's tendencies to engage in intrasexual competition above and beyond the effects we sought to measure with our manipulations. We anticipated that women who were more socially competitive in general (Social Dominance Scale; SDO; Pratto et al. 1994) and with other women specifically (Intrasexual Competition Scale; ISC; Buunk and Fisher 2009) would be more likely to demonstrate enhanced clothing choice. We also expected that self-perceived mate value (Mate Value Scale; MV; Edlund and Sagarin 2014) and interest in short-term mating (Revised Sociosexual Orientation Scale; SOI-R; Penke and Asendorpf 2008) could translate into more competitive behavior overall. Each measure demonstrated good or excellent reliability in this sample (SDO:  $\alpha = .92$ ; SOI-R:  $\alpha = .82$ ; ISC:  $\alpha = .88$ ; MV:  $\alpha = .92$ ) and are included as covariates in our analyses.

## Results

During exploration of the dataset, we discovered an unanticipated large effect of outfit type on outfit attractiveness scores,  $t(128) = 4.65$ ,  $p < .001$ ,  $d = 0.82$ , 95% CI of mean difference [0.50, 1.25], such that dresses were rated significantly higher (i.e., more sexy and revealing;  $M = 5.80$ ,  $SD = 1.00$ ) than separates ( $M = 4.93$ ,  $SD = 1.15$ ). We therefore included outfit type in the full ANCOVA we tested: 2 (companion familiarity: close friend or acquaintance)  $\times$  2 (companion attractiveness: attractive or unattractive)  $\times$  2 (crush presence: present or absent)  $\times$  2 (outfit type: separates or dress) on participants' outfit attractiveness scores, with MV, SDO, SOI-R, and ISC scores entered as covariates. Note that participants who did not complete items necessary to score a covariate were excluded from analyses containing covariates so  $N$ s will vary.

**Primary Analyses** As shown in Table 1, the four-way interaction was significant,  $F(1, 110) = 5.08$ ,  $p = .03$ ,  $\eta_p^2 = .04$ . To break down this complex interaction, we conducted independent three-way ANCOVAs for women who chose dresses (see Fig. 2) and those who chose separates (see Fig. 3). Among women who selected separates ( $N = 66$ ), none of the main effects ( $ps > .11$ ), interactions ( $ps > .17$ ), nor covariates ( $ps > .07$ ) were significant in the three-way ANCOVA.

Among women who selected dresses ( $N = 64$ ), however, the three-way interaction was significant:  $F(1, 52) =$



**Fig. 3** Estimated marginal mean outfit attractiveness scores for women in study 2 who chose separates, as a function of companion type and crush presence

6.67,  $p = .01$ ,  $\eta_p^2 = .11$ . None of the covariates exerted a significant effect ( $ps > .07$ ), nor did we document any significant main effects ( $ps > .20$ ) nor two-way interactions ( $ps > .32$ ). Among women in the close friend condition who selected dresses, the two-way interaction between crush presence and companion attractiveness was not significant,  $F(1, 29) = 1.92$ ,  $p = .18$ ,  $\eta_p^2 = .06$ . Among women in the acquaintance condition who selected dresses, however, the two-way interaction between crush presence and companion attractiveness was significant,  $F(1, 19) = 8.14$ ,  $p = .01$ ,  $\eta_p^2 = .30$ . Simple slope analysis indicated that women in the more attractive acquaintance condition chose significantly more attractive dresses in the crush present condition than in the crush absent condition,  $b = 1.30$ ,  $p = .04$ ,  $\beta = 0.64$ , 95% CI for  $b$  [0.10, 2.51]; women in the less attractive acquaintance condition, however, did not significantly differ between crush present and absent conditions ( $p = .27$ ) in the attractiveness of the dresses they chose.

We also examined outfit type as a dependent variable and found no evidence of women selecting dresses or separates based on crush condition,  $\chi^2(1) = 0.08$ ,  $p = .78$ , companion type,  $\chi^2(1) = 0.20$ ,  $p = .65$ , nor attractiveness of companion,  $\chi^2(1) = 0.01$ ,  $p = .93$ . There were no significant differences between women who selected separates and those who selected dresses in scores on any of the covariates, all  $ps > .30$ .

**Supplemental Analyses** Although not part of our main hypotheses, we did evaluate the so-called “red effect” (Elliot et al. 2012; Guéguen 2012; Kayser et al. 2016). As mentioned above, red clothing items were rated sexier and more revealing than blue or yellow items, but just as sexy as black or white items. In the main survey, we found no evidence of women selecting more red items based on

condition (all  $\chi^2$  test  $ps > .40$ ). The only significant effect, among several tests, was a potential effect of MV,  $t(135) = 2.70$ ,  $p = .01$ ,  $d = 0.46$ : women who selected at least one red item had higher self-reported MV ( $M = 5.31$ ,  $SD = 0.94$ ) than women who selected no red items ( $M = 4.42$ ,  $SD = 1.27$ ). There were no significant differences in SOI-R, SDO, or ISC scores between women who did or did not include red items, all  $ps > .24$ ; therefore, the MV result should be interpreted with caution.

## Study 2

Because we were not anticipating a four-way interaction in study 1, our sample size was relatively small. We thus pre-registered a direct replication attempt (<https://osf.io/f54d3>) using exactly the same sampling procedures and method<sup>2</sup>, but soliciting a larger sample. We used G\*Power (Faul et al. 2007) to determine the sample size necessary to detect a similar sized effect ( $f = .20$ ) with an alpha of .05, power of .90, 16 groups, and 4 covariates and calculated  $N = 265$ . We decided to aim for a larger sample (the limit of our budget was 420 participants) to assure at least this level of power, knowing we would likely need to exclude some participants from analyses.

As in study 1, we removed data from certain participants from our original sample ( $N = 420$ ). Specifically, we removed participants who failed any attention checks ( $N = 19$ ) or manipulation checks ( $N = 128$ ), women who—by a mistake in the survey programming—chose more than one dress ( $N = 22$ ) and who reported a homosexual ( $N = 14$ ) or other ( $N = 11$ ) sexual orientation, because the vignette included a male crush, and used the remaining sample ( $N = 262$ ; heterosexual,  $n = 206$ ; bisexual,  $n = 56$ ) for all following analyses. Our participants ranged in age from 19 to 28 ( $M = 23.79$ ,  $SD = 1.54$ ). Participants self-reported their ethnicities as White (70%), Black or African American (10%), Hispanic/Latina (5%), Asian American (12%), American Indian or Alaska Native (1%), two or more races (3%), or “other” (<1%). Participants indicated their relationship status as not in a relationship (36%), in a committed, open relationship (5%), or in a committed, closed relationship (59%).

## Results

We first tested the full four-way ANCOVA evaluated in study 1: a 2 (companion familiarity: close friend or acquaintance)  $\times$  2 (companion attractiveness: attractive or unattractive)  $\times$  2 (crush presence: present or absent)  $\times$  2 (outfit type: separates or dress) on participants’ outfit

attractiveness scores, with MV, SDO, SOI-R, and ISC scores entered as covariates. In this sample, the overall ANCOVA was not significant, as shown in Table 1. The analysis did reveal, however, a significant three-way interaction between outfit type, companion type, and crush presence,  $F(1, 242) = 4.02$ ,  $p < .05$ . We also examined a trend for a three-way interaction between outfit type, companion type, and companion attractiveness,  $F(1, 242) = 3.27$ ,  $p = .07$ , but post hoc tests revealed no significant main or interaction effects (all  $ps > .12$ ). The SOI-R covariate exerted a significant effect,  $F(1, 242) = 8.88$ ,  $p = .003$ , and SDO and MV showed trends ( $ps < .10$ ), while ISC did not exert any significant effect ( $p = .67$ ).

We investigated the significant three-way interaction between outfit type, companion type, and crush presence by conducting independent two-way ANCOVAs (using the same four covariates) for women who chose dresses and women who chose separates. Among women who chose dresses, none of the effects nor covariates were significant. Among women who chose separates, however, the interaction between companion type and crush presence was significant,  $F(1, 139) = 7.97$ ,  $p = .005$ , as was the covariate of SOI-R ( $p < .001$ ), such that higher SOI-R scores were correlated with higher outfit scores. Simple slopes analyses indicated that, as shown in Figs. 2, 3, women in the crush present condition chose significantly more attractive outfits in the acquaintance condition than in the friend condition,  $b = -0.71$ ,  $\beta = -0.30$ ,  $p = .005$ , 95% CI for  $b$   $[-1.20, -0.23]$ ; women in the crush absent condition, however, did not significantly differ in outfit scores between crush present and absent conditions,  $b = 0.25$ ,  $\beta = 0.12$ ,  $p = .32$ , 95% CI for  $b$   $[-.25, 0.75]$ .

We also examined outfit type as a dependent variable and found no evidence of women selecting dresses or separates based on crush condition,  $\chi^2(1) = 0.47$ ,  $p = .49$ , nor attractiveness of companion,  $\chi^2(1) = 0.001$ ,  $p = .98$ , but there was a trend toward selecting a dress with friends (49%) more often than with acquaintances (38%),  $\chi^2(1) = 3.20$ ,  $p = .07$ . There were no significant differences between women who selected separates and those who selected dresses in scores on any of the covariates, all  $ps > .44$ .

**Supplemental Analyses** As in study 1, we evaluated the “red effect” in our data. Again, we found no evidence of women selecting more red items based on crush condition,  $\chi^2(1) = 1.44$ ,  $p = .23$ , nor attractiveness of companion ( $\chi^2(1) = 0.14$ ,  $p = .71$ ), but there was a trend toward wearing more red with acquaintances (27%) compared with friends (18%),  $\chi^2(1) = 3.34$ ,  $p = .07$ . There were no significant differences in MV, SOI-R, SDO, nor ISC between women who selected at least one red item and those who did not, all  $ps > .30$ .

## General Discussion

Our study was designed to examine how situational variables would affect women’s degree of intrasexual competitiveness through clothing choice. As we predicted, the three variables we manipulated (presence of potential mate, companion type, companion attractiveness) interacted in nuanced ways to influence women’s clothing choices in both studies. We further documented an additional unanticipated variable of outfit type (separates or dress). In the pre-rating sample, dresses were rated as significantly sexier and more revealing than separate clothing items.

The results from study 1 showed that, among women assigned to the acquaintance condition who chose dresses, total outfit attractiveness was impacted by the combined influence of the relative attractiveness of their party companion and the presence of their crush. That is, women who chose dresses and imagined attending the hypothetical party with an attractive acquaintance and with their crushes present chose outfits that were more attractive (i.e., more revealing and sexier) than women in similar contexts whose crushes would be absent. In contrast, in the conditions with the less attractive acquaintance, women chose outfits that were rated as similarly attractive (i.e., revealing and sexy) regardless of the presence of a crush. However, this pattern did not emerge in the close friend conditions, or among women who selected separates. This difference suggests that outfit attractiveness was not necessarily influenced by party companion attractiveness or crush presence in the context of close friendships.

In study 2, we found that companion no longer influenced outfit selection, but ultimately, the results highlighted a similar overall conclusion: women seek to avoid intrasexual competition more so within close friendships than within acquaintanceships. Specifically, among women who chose separates and who imagined attending a party with a crush present, women imagining an acquaintance as a party companion chose more attractive outfits than women imagining a close friend. Ultimately, our results show not only that contextual factors (e.g., rival attractiveness and familiarity, presence of a crush) impact how women choose specific clothing items, but also that these factors might additionally affect how women decide to present themselves (e.g., wearing a more attractive outfit or choosing the color red).

The findings of the current study contribute to the growing literature on female intrasexual competition from an evolutionary perspective and bolster a body of research showing that women are intolerant of mating rivalry with female friends (Bleske-Rechek and Shackelford 2001; Vaillancourt and Sharma 2011). Close friends are arguably more trusted not to engage in mating rivalry and, therefore, should elicit less intrasexual competition compared with acquaintances (Bleske-Rechek and Shackelford 2001). When potential



competitors are less familiar (i.e., less trusted), women are motivated to adopt more competitive strategies (e.g., wearing revealing clothing). This pattern could also reflect a mechanism that dampens intrasexual competitive motives in the context of close friendships to preserve friendships that could otherwise be ruined through competition for mates. In addition to familiarity, the results of study 1 suggest that rival attractiveness might also influence the extent to which women are motivated to compete intrasexually, though this effect was not replicated in study 2. The pattern in study 1 is in line with previous research showing that a competitor's appearance (e.g., attractiveness, clothing) motivates women to engage in more intrasexual competitiveness (Borau and Bonnefon 2017; Buss 1988; Fisher 2004; Fisher and Cox 2011; Vaillancourt and Sharma 2011).

The current study poses several theoretical and practical implications. Our results indicate that women's intrasexual competition mechanisms are sophisticated and likely weigh multiple variables simultaneously (e.g., familiarity, attractiveness of rivals, presence of potential mates). Moreover, we found repeatedly that women's tendency to engage in competition decreases around close friends relative to acquaintances, which suggests that women trust their friends to stay away from their potential mates. Our results also demonstrate that women might take advantage of people's perceptions of different styles of clothing (i.e., dresses, separates) to employ outfit choice strategically (e.g., wearing a dress or the color red when greater competition is present).

Though we find these explanations of the findings reasonable, there are some limitations to consider. First, we could not control for the degree of relative attractiveness between the participants and their friends or acquaintances. Instead, in pursuit of a more immersive experience, we used the initials of actual people the participant knew. Through this method, we obtained arguably more ecologically valid results regarding how familiarity affects intrasexual competition compared with alternative methods of presenting companions (e.g., preselected pictures of strangers). But because friends tend to assort based on attractiveness (Bleske-Rechek and Lighthall 2010), among other traits, this could have limited our ability to detect an effect of companion attractiveness on clothing choices, particularly among friends. This limitation, however, also means that our findings reflect the most common friendships in reality (i.e., assortative). A similar limitation is that although the insertion of the crush's initials into the vignette arguably increased realism, the desirability of the "crush" was impossible to control across conditions. Participants could have selected a true crush, or a current mate, or even an unrealistic crush (such as a celebrity). Future studies could incorporate pre-rated photos of attractive and unattractive competitors and crushes instead of using initials of people the participants know; this could address the limitation of not being able to control for attractiveness of both the

competitors and mates, while sacrificing some realism and immersion.

Although the current study measured intrasexual competitiveness using clothing choice, previous research has shown that women commonly employ other types of strategies, such as rival derogation (Buss 1988; Fisher and Cox 2011) or showing off luxury items (Hudders et al. 2014). Women likely tailor strategy type to the situation. For example, when multiple competitors are present, women might use behavioral strategies that draw the attention of a mate (e.g., rival derogation, flirtatious behavior). In contexts with fewer competitors, however, subtler strategies, such as altering one's appearance via clothing and makeup, might be more effective.

In closing, the current study extends our understanding of women's intrasexual competition psychology. Our results provide valuable information about situational factors impacting women's motivation to engage in intrasexual competition and the ways in which a commonplace strategy (i.e., clothing choice) is enacted to compete with other women. Additionally, this research sheds light on potential adaptive problems that would have been present in an ancestral environment: deciding with whom to engage in competition (e.g., close friends or acquaintances, someone who is more attractive or less attractive) and identifying cues of competition (e.g., rival's appearance, sex ratio). Our findings highlight the facultative nature of women's intrasexual competition mechanisms: they take into account the costliness of competition and motivate competitive tactics only when necessary (e.g., with someone less trusted, with a more attractive competitor). When competing could be costly (e.g., in a friendship) or a waste of energy (e.g., competing with someone less attractive), women down-regulate their competitive strategies. Perhaps, there is some truth to the common themes of intrasexual competition in mainstream media: friends do not date friends' boyfriends, but any other woman might.

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## Compliance with ethical standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

## Appendix A Prompt to collect initials

Instructions: You're going to read a story that may incorporate certain people you know. To make the story as realistic as possible, the actual initials of people you know will be placed in the text. The story you will read will have a selection of some of the individuals you list, but not all of the initials will

be used. In order to do this, please provide initials for the following individuals in your life:

The initials of a man you have a crush on:

The initials of a female acquaintance you think is more attractive than yourself:

The initials of a female acquaintance you think is less attractive than yourself:

The initials of a close female friend you think is more attractive than yourself:

The initials of a close female friend you think is less attractive than yourself:

## Appendix B Vignettes

Participants were randomly assigned to one of the following vignettes, and, within the vignette, whether they saw initials of a more or less attractive friend or acquaintance. Participants provided initials earlier in the survey and piped into the story where [INITIALS] occurs.

### Crush Absent

It's two weeks until the biggest party of the year, and you know you can't miss it! You're really excited because you've been anticipating going for a while. You promised your friend, [INITIALS], that you would go to the party with her. You aren't really sure who is going to attend the party because your crush, [INITIALS], said he wouldn't be there, so you and your friend are planning on staying with each other for most of the night. To prepare for the party, you decide to do some online shopping to pick out an outfit.

### Crush Present

It's two weeks until the biggest party of the year, and you know you can't miss it! You're really excited because your crush, [INITIALS] said he was going to the party and mentioned meeting up there. You promised your friend, [INITIALS] that you would go to the party with her. You aren't really sure who is going to attend the party, so you and your friend are planning on staying with each other for most of the night. To prepare for the party, you decide to do some online shopping to pick out an outfit.

## References

- Bleske-Rechek, A. L., & Lighthall, M. (2010). Attractiveness and rivalry in women's friendships with women. *Human Nature, 21*(1), 82–97. [https://doi.org/10.1007/978-1493903146\\_18](https://doi.org/10.1007/978-1493903146_18).
- Bleske-Rechek, A. L., & Shackelford, T. K. (2001). Poaching, promiscuity, and deceit: combating mating rivalry in same-sex friendships. *Personal Relationships, 8*, 407–424. <https://doi.org/10.1111/j.1475-6811.2001.tb00048.x>.
- Borau, S., & Bonnefon, J. F. (2017). The imaginary intrasexual competition: advertisements featuring provocative female models trigger women to engage in indirect aggression. *Journal of Business Ethics, 157*, 45–63. <https://doi.org/10.1007/s10551-017-3643-y>.
- Buss, D. M. (1988). The evolution of human intrasexual competition: tactics of mate attraction. *Journal of Personality and Social Psychology, 54*(4), 616–628. <https://doi.org/10.1037/0022-3514.54.4.616>.
- Buunk, A. P., & Fisher, M. (2009). Individual differences in intrasexual competition. *Journal of Evolutionary Psychology, 7*(1), 37–48. <https://doi.org/10.1556/JEP.7.2009.1.5>.
- Durante, K. M., Griskevicius, V., Hill, S. E., Perilloux, C., & Li, N. P. (2011). Ovulation, female competition, and product choice: hormonal influences on consumer behavior. *Journal of Consumer Research, 37*(6), 921–934. <https://doi.org/10.1086/656575>.
- Edlund, J. E., & Sagarin, B. J. (2014). The mate value scale. *Personality and Individual Differences, 64*, 72–77. <https://doi.org/10.1016/j.paid.2014.02.005>.
- Elliot, A. J., Greitemeyer, T., & Pazada, A. D. (2012). Women's use of red clothing as a sexual signal in intrasexual interaction. *Journal of Experimental Social Psychology, 49*, 599–602. <https://doi.org/10.1016/j.jesp.2012.10.001>.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G\*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175–191.
- Fisher, M. L. (2004). Female intrasexual competition decreases female facial attractiveness. *Proceedings of the Royal Society London, 271*, 283–285. <https://doi.org/10.1098/rsbl.2004.0160>.
- Fisher, M., & Cox, A. (2011). Four strategies used during intrasexual competition for mates. *Personal Relationships, 18*(1), 20–38. <https://doi.org/10.1111/j.1475-6811.2010.01307.x>.
- Hill, S. E., & Durante, K. M. (2011). Courtship, competition, and the pursuit of attractiveness: mating goals facilitate health-related risk taking and strategic risk suppression in women. *Personality and Social Psychology Bulletin, 37*(3), 383–394. <https://doi.org/10.1177/0146167210395603>.
- Hudders, L., De Backer, C., Fisher, M., & Vyncke, P. (2014). The rival wears Prada: luxury consumption as a female competition strategy. *Evolutionary Psychology, 12*(3), 570–587. <https://doi.org/10.1177/147470491401200306>.
- Kalmijn, M., & Flap, H. (2001). Assortative meeting and mating: unintended consequences of organized settings for partner choices. *Social Forces, 79*(4), 1289–1312.
- Penke, L., & Asendorpf, J. B. (2008). Beyond global sociosexual orientations: a more differentiated look at sociosexuality and its effects on courtship and romantic relationships. *Journal of Personality and Social Psychology, 95*(5), 1113–1135. <https://doi.org/10.1037/0022-3514.95.5.1113>.
- Pratto, F., Sidanius, J., Stallworth, L. M., & Malle, B. F. (1994). Social dominance orientation: a personality variable predicting social and political attitudes. *Journal of Personality and Social Psychology, 67*(4), 741–763. <https://doi.org/10.1037/0022-3514.67.4.741>.
- Schmitt, D. P., & Buss, D. M. (1996). Strategic self-promotion and competitor derogation: sex and context effects on the perceived effectiveness of mate attraction tactics. *Journal of Personality and Social Psychology, 70*, 1185–1204. <https://doi.org/10.1037/0022-3514.70.6.1185>.
- Vaillancourt, T., & Sharma, A. (2011). Intolerance of sexy peers: intrasexual competition among women. *Aggressive Behavior, 37*(6), 569–577. <https://doi.org/10.1002/ab.20413>.

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