Off with her hair: Intrasexually competitive women advise other women to cut off more hair

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ABSTRACT

Intrasexual competition between women is often covert, and targets rivals' appearance. Here we investigate appearance advice as a vector for female intrasexual competition. Across two studies ($N = 192$, $N = 258$) women indicated how much hair they would recommend hypothetical clients have cut off in their hypothetical salon. Clients varied in their facial attractiveness (depicted pictorially), the condition of their hair, and how much hair they wished to have cut off. Participants also provided self-report measures of their own mate value and intrasexual competitiveness. In both studies, participants' intrasexual competitiveness positively predicted how much hair they recommended clients have cut off, especially when the hair was in good condition and the clients reported wanting as little as possible cut off – circumstances wherein cutting off too much hair is most likely to indicate sabotage. Considering data across both collectively, women tended to recommend cutting the most hair off clients they perceived to be as attractive as themselves. These data suggest that just like mating, intrasexual competition may be assortative with respect to mate value. They also demonstrate that competitive motives can impact female-female interactions even in scenarios which feature no prospective mates, and are nominally unrelated to mate guarding or mating competition.

1. Introduction

Reproductive success is ultimately relative. Individuals can therefore improve their own net reproductive success by negatively impacting the reproductive success of same sex rivals. For females, reproductive success hinges on gaining access to the highest quality males, while preventing rivals from doing the same (Rosvall, 2011). To this end, women engage in intrasexual competition to reduce their female rivals' mate value, and to influence males' mate choices, to ultimately maximise their own net reproductive success. Female intrasexual competition involves much indirect aggression, where a rival's actual or apparent mate quality is lowered, or participation in the mating market hampered, by derogation, gossip, social exclusion, and intimidation (Buss, 1988; Reynolds et al., 2018; Sulikowski et al., 2022). In the current study we explore an understudied vector for female intrasexual competition – appearance advice (a form of competitor manipulation, Fisher & Cox, 2011) operationalised as the amount of hair a client is advised to cut-off in the context of a hypothetical salon. We investigate the extent to which

advice to cut-off more hair is predicted by individual differences in intrasexual competition, mate value, and the client's facial attractiveness.

Female intrasexual competition tends not to involve physical aggression. Female bodies are especially vulnerable to damage from violent conflict, and indirect aggression is especially well-suited to thwarting other women's mate attraction efforts (Fisher & Krems, 2023). It may include gossiping, derogation, and exclusion (Buss, 1988; Reynolds et al., 2018) as well as rival manipulation via dishonest or disingenuous advice (such as telling another woman that her clothing is flattering when it is not, Fisher & Cox, 2011). In women, indirect aggression is associated with mating motivations (Young et al., 2017). It tends to peak around adolescence and early adulthood, when competition for mates is high (Archer, 2004; Hess & Hagen, 2006; Verona et al., 2008) Female indirect aggression frequently targets aspects of rivals that men prize in prospective long-term partners: attractiveness (Fisher, 2004) and chastity (Campbell, 1995, although indirect aggression in response to promiscuity may be less about damaging a promiscuous

rival's reputation, and more about policing the price of sex to keep it high, see Ayers & Goetz, 2022; Regnerus, 2012; Vaillancourt, 2013).

1.1. Intrasexual competition and mate value

Women perceive more physically attractive rivals to be fiercer mating competitors (Fink et al., 2014), and in adolescent girls, self-reported attractiveness positively predicts self-reported victimization by peers (Leenaars et al., 2008). The tendency of adolescent and young adult women to make upward social comparisons of physical attractiveness (implying that the focal individual is low on physical attractiveness) positively predicts indirect aggression perpetrated against peers (Arnocky et al., 2012). The same study reported that perpetrating indirect aggression was negatively associated with being a recipient of it. Collectively these findings present female intrasexual competition as asymmetrical with respect to mate quality. Lower mate quality women seem to perpetrate indirect aggression towards higher mate quality rivals, while those targeted tend not to reciprocate. Systematic targeting of higher quality rivals would be expected in the contexts of direct competition for currently available mates and in guarding against mate poaching. In both scenarios there would seem to be the most to gain by targeting rivals who, in the absence of your attempts to lower their apparent mate value, might be perceived by the (potential) mate in question to be a better option than yourself.

Female intrasexual competition, however, is likely more complex than the above synopsis suggests. For example, perpetrating indirect aggression is associated with earlier onset dating and sexual behaviour (Gallup et al., 2011; Pellegrini & Long, 2003; White et al., 2010) and high social status and perceived popularity (Arnocky & Vaillancourt, 2012). Further Gallup et al. (2011), reported positive, rather than negative relationships between being the perpetrator and victim of female indirect aggression, suggesting that some adolescent and young adult women (those with more sexual partners, Dane et al., 2017) are more likely than others to be involved in (potentially reciprocal) intrasexual competition, as both perpetrator and recipient. Gallup et al. (2011) also reported that being the target of indirect aggression was associated with lower self-perceived attractiveness and greater promiscuity. Collectively these findings depict relational aggression as being utilised by socially popular and attractive women, with lower mate value rivals being targets. The outcome of such interactions seems to be reproductive suppression of the lower mate value targets, who may retaliate with a combination of their own indirect aggression and by using promiscuity to undercut the market price of sex (Ayers & Goetz, 2022; Regnerus, 2012).

These two accounts of female intrasexual competition need not be mutually exclusive. The relationships between mate value, intrasexual competitiveness, and the perpetration of indirect aggression may well be context dependent. In the context of mate guarding, female intrasexual competition may be targeted up the mate value ladder. This makes adaptive sense if women are more likely to poach a mate when they perceive themselves as higher in mate value than their prospective mate's current partner (indeed, more attractive women are more likely to mate poach, Arnocky et al., 2013; Sunderani et al., 2013). This would compel the women guarding their mates, to target their competitive aggression towards woman of higher mate value. In broader contexts, where no specific mating motivation is present or primed, women with high social status (who also tend to be attractive and of high mate quality, Rahal et al., 2021) utilise indirect aggression to police, punish, and compromise the mating behaviour (and therefore the realised mate value) of lower ranked women. Since we did not prime mating motivations in the current studies, these considerations lead to predictions that intrasexual competition would be likely to manifest in the current studies in a downward direction, with higher mate value women aggressing against less attractive rivals.

2. Study 1

Younger women tend to have longer, healthier hair, and healthier hair correlates with actual bodily health (Hinsz et al., 2001), making it a potentially reliable indicator of a woman's youth, health, and therefore fertility. Women also report wanting longer hair than they have, and believe that men would also prefer them to have longer hair than they do (Jacobi & Cash, 1994). Men rate female faces with (experimentally added) long hair as more youthful, healthy, sexy and feminine (Mesko & Bereczkei, 2004), as well as more intelligent and dominant (Bereczkei & Mesko, 2006). Interestingly, long hair may also contribute to perceptions of promiscuity, when worn out rather than tied back (demonstrated solely by Matz & Hinsz, 2018). As such, recommending that a client cut off more of her hair, especially when that hair is healthy, could diminish the client's physical attractiveness, and hobble her capacity to manipulate signals of sexual intent.

In the first study of this paper, (all female) participants were presented with hypothetical female hair salon clients, who were either high or low on facial attractiveness. A portrait of each client, a close-up image of her hair (commensurately described as being in either good or poor condition), and the client's wishes to cut off "as little as possible", or "as much as necessary." Variations in the health of the hair, and the clients' wishes served dual purposes. Firstly, they provided participants with an obvious and plausible rationale for what was being studied (potentially lessening the salience of attractiveness variations across clients), and provided us with built-in manipulation checks. Confirming that participants did indeed cut more hair off those clients who wanted it, and when the hair was in poor condition allowed us to verify that our sample as a whole had engaged with these details for each client across the duration of the study. Secondly, these design features allowed us to create conditions that were especially amenable to intrasexual competition manifesting in the advice to cut off more hair. When the hair was in good condition and the client's wishes were to cut off as little as possible, recommendations to cut off more hair were expected to most strongly correlate with participants' intrasexual competitiveness.

To summarise our theoretical position and our predictions: if female intrasexual competition manifests in the context of appearance advice, then we hypothesise that intrasexual competitiveness will positively correlate with the amount of hair participants recommend that clients have cut off. If female intrasexual competition manifests in a downward manner (with respect to mate value) in the absence of immediate cues of direct competition or mate poaching, then we expect mate value to positively predict how much hair participants recommend clients have cut off, and that participants would recommend more hair be cut off from less attractive clients. Lastly, we predict these effects to be strongest when hair was described as being in good (rather than poor) condition, and clients indicated that they wanted as little as possible cut off. These circumstances provide the most potential for sabotage (removing healthy hair which the client does not want cut-off), while offering minimal justification, in terms of necessary hair maintenance, for cutting off almost any hair at all.

3. Method

3.1. Participants

Two-hundred and eight women completed the study. Sixteen were excluded for failing to identify their current or ideal partner as male ($N = 11$), for providing textual responses that could not be readily analysed ($N = 2$, for example: "I would cut off as much as she asked me to"), or for suggesting women cut off >50 cm of hair ($N = 3$, such responses were unrealistic since no stimulus photos depicted hair that long, and resulted in statistical outliers, even after data were transformed). The final sample of women ($N = 192$) were aged 17-64 yrs. ($M = 32.7$, $SD = 11.7$, although 19 did not provide their age). About one-third were single ($N = 61$, not in a relationship; $N = 9$, in a short/uncommitted relationship)

and the remaining partnered ($N = 22$, not living together; $N = 95$, living together; five did not provide their relationship status). Participants were recruited from an undergraduate participant pool ($N = 169$, for course credit) and from the general public ($N = 23$, for no compensation), and all gave informed consent under protocol number H18039, issued by the Charles Sturt University Human Research Ethics Committee.

3.2. Materials

3.2.1. Stimuli

Fifty-six neutral expression female faces of apparent reproductive age were drawn from the UCT-HiFi face database. Two-hundred and thirty-six female faces from this database (all those of apparent reproductive age) had previously been rated for subjective femininity (from 1 to 15) by a sample of male and female raters. Using these ratings as a proxy for attractiveness we selected the 28 most feminine ($M = 10.97$, $SD = 0.61$) and 28 ($M = 6.18$, $SD = 0.52$) least feminine faces to use as the attractive and unattractive stimuli in the current study, respectively. We subsequently had these 56 faces rated for attractiveness (from 1 to 10) by a sample of women ($N = 56$, aged 18–56, $M = 31.3$, $SD = 10.4$ years). The attractive faces ($M = 5.55$, $SD = 1.24$) were rated significantly more attractive than the unattractive faces ($M = 3.27$, $SD = 1.29$, $t(55) = 18.99$, $p < .001$, $d = 0.90$).

The images were cropped to show just the head, hair and neck to the collar bone, set against a neutral background (RGB: 220,211,202), and displayed at a resolution of 72dpi, and a size of approximately 10x15cm. Displayed alongside each image was a supposed magnified view of the hair (7 cm in diameter). Hair images were not derived from the face images, but were sourced online and depicted hair that was in either good condition or poor condition. Multiple good and poor condition hair images were collated and colour matched to the stimulus images' hair, so that participants did not view the same hair condition picture multiple times across the study. All stimulus image manipulations were performed in Adobe Photoshop (CS5). Indicative stimuli are shown in Fig. 1.

3.2.2. Measures

3.2.2.1. Mate Value Scale (MVS).
The MVS (Edlund & Sagarin, 2014) is a four-item measure of global mate value ("Overall, how would you rate your level of desirability as a partner?") and is scored on a 7-point Likert scale. Responses are summed with higher scores indicating higher mate value. Reported internal reliability is high ($\alpha = 0.81$–0.92) and was also high in the current sample ($\alpha = 0.91$).

3.2.2.2. Mate Value Inventory (MVI-7, Short Form).
The MVI-7 short form (Kirsner et al., 2003) lists 17 attributes sought after in a mate (for example "ambitious", "generous", "good body"). Respondents indicate how well these attributes currently apply to them on a 7-point Likert scale ("extremely low on this trait" to "extremely high on this trait"). Responses are averaged with higher means indicating higher mate value. Reported internal reliability for women is acceptable ($\alpha = 0.61$), but was higher in the current sample ($\alpha = 0.87$).

3.2.2.3. Scale for Intrasexual Competitiveness Scale (SIC).
The SIC (Buunk & Fisher, 2009) is a 12-item measure of intrasexual competition, with items worded to match the sex of respondents (for example, for women: "I just don't like very ambitious women", "I tend to look for negative characteristics in attractive women"). Responses are on a 7-point Likert scale ("not at all applicable" to "completely applicable"). Reported internal reliability is high ($\alpha = 0.87$–0.88) and was similarly high ($\alpha = 0.93$) in the current sample.

3.3. Procedure

After providing informed consent, participants indicated their age, sex, relationship status (single, not in a relationship; in a short-term/uncommitted relationship; in a long-term relationship but not living together; in a long-term relationship and living together), and the sex of their current, (or ideal) partner. They then provided advice to female clients in a hair salon as though they were the hairdresser, as to how much hair the client ought to have cut off. Images of each client, alongside a supposed magnified view of their hair, were presented with a blurb indicating the client's name, the condition of the client's hair
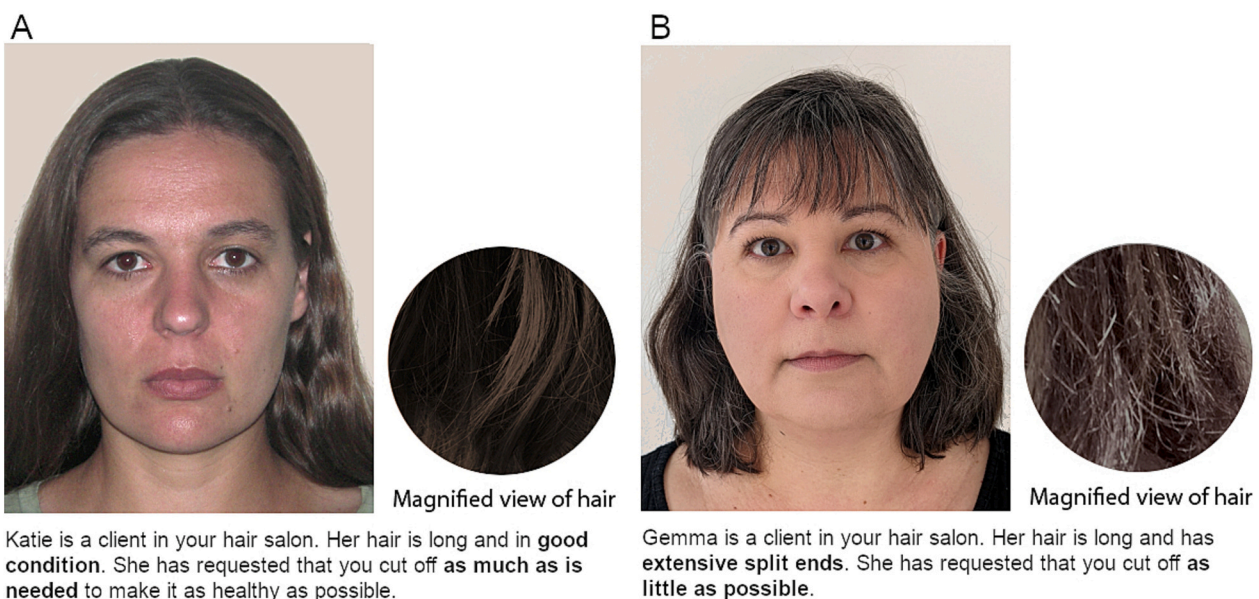
Fig. 1. Shows indicative stimuli from studies 1 and 2. Panel A is an example stimulus depicting a client with hair in good condition, requesting that the hairdresser cut off as much as needed to keep the hair healthy. Panel B depicts a client with hair in poor condition, requesting that the hairdresser cut off as little as possible. These images depict two of the authors and were not part of the actual stimulus set as those images are not for publication.

(poor or good), and how much hair each client wanted cut-off (as little as possible, or as much as necessary to keep it healthy). The same 56 (28 attractive and 28 unattractive) faces were shown to all participants (in random order), but whether any individual face was paired with hair in poor or good condition, and whether it was paired with an instruction to cut off as much hair as needed or as little as possible, was counter-balanced across participants.

Participants were provided with a text entry box for each client and told to indicate their response in centimetres. Where responses were provided with units other than centimetres indicated, they were converted to centimetres for analysis. After providing responses to all 56 faces (presented in random order to each participant), participants completed the SIC, MVS, and MVI. An online debrief statement then provided participants with an explanation of the study's aims and hypotheses.

3.4. Data analysis

All data were analysed using SPSS v29 for Mac. The amount of hair each participant recommended to be cut-off each client was averaged across the seven faces of each of the eight conditions (attractive/unat-tractive x good/poor hair condition x client's wishes). The means for the eight conditions were all positively skewed (0.893 to 2.204). Square-root transformation reduced skew (−0.134 to 0.794) for analysis, while graphs depict back-transformed means and standard errors.

The MVS and MVI were both included as they measure mate value in different ways. The former provides participants' consciously perceived worth as a partner, the latter garners ratings on a number of traits that are valued by potential partners. The MVS and MVI scores correlated strongly, while neither was related to SIC scores (see Table 1). A single mate-value factor (MVF) was then defined by converting both the MVS and MVI to their respective z-scores, entering the two sets of z-scores into a PCA and extracting the first component scores. Each scale loaded strongly onto this factor (0.906) and it accounted for 82 % of the total variance.

The MVF and SIC scores (the latter converted to z-scores), were then entered as covariates into a full-factorial 2 (attractiveness of stimulus face: high or low) x2 (condition of hair: poor or good) x2 (client's wishes: as little as possible or as much as needed) repeated-measures ANCOVA. Since age did not correlate with the dependent measure across any of the conditions (see Table 1), and ~ 10 % of the sample declined to provide

it, age was not controlled for in the analyses reported below.

4. Results

Table 1 shows the correlations between the individual difference variables and the dependent variables for Study 1. Contrary to pre-dictions, participant self-reported mate-value did not predict how much hair they recommended that clients cut off. In line with predictions, intrasexual competitiveness did tend to predict how much hair partici-pants recommended that clients have cut-off, as did the client's apparent mate value (operationalised as their facial attractiveness). Also as pre-dicted, the relationship between participant intrasexual competitiveness and advice and was most apparent when clients wished to have the minimum amount of hair cut off as possible. Detailed reports of the statistical model are below.

As expected, we observed significant main effects of hair condition (F $(1,188) = 524.3$, $p < .001$, $\eta_\rho^2 = 0.736$) and client wishes ($F(1,188) = 298.6$, $p < .001$, $\eta_\rho^2 = 0.614$). Participants advised more hair to be cut-off when it was in poor condition, and when the client indicated that they were happy for as much to be cut-off as was needed. We also observed a significant interaction between hair condition and client wishes, (F $(1,188) = 4.592$, $p = .033$, $\eta_\rho^2 = 0.024$). The effect of client wishes was larger when hair was in poor condition ($p < .001$, $\eta_\rho^2 = 0.729$) than when it was in good condition ($p < .001$, $\eta_\rho^2 = 0.696$), with participants rec-ommending cutting off the most hair when it was in poor condition, and the client was happy for as much to be cut-off as needed.

The main effect of client attractiveness approached significance only ($F(1,188) = 3.556$, $p = .061$, $\eta_\rho^2 = 0.019$), but there was a significant interaction between client attractiveness and participant intrasexual competitiveness ($F(1,188) = 4.882$, $p = .028$, $\eta_\rho^2 = 0.025$). Highly competitive participants (one standard deviation above the mean) rec-ommended cutting more hair off less attractive clients than they rec-ommended cutting off more attractive clients ($F(1,188) = 8.387$, $p = .004$, $\eta_\rho^2 = 0.043$). At low levels (one standard deviation below the mean) of intrasexual competitiveness, participants' advice was unaf-fected by clients' attractiveness ($F(1,188) = 0.054$, $p = .816$, $\eta_\rho^2 < 0.001$, see Fig. 2).

We also observed a significant interaction between hair condition and client attractiveness ($F(1,188) = 8.794$, $p = .003$, $\eta_\rho^2 = 0.045$). When hair was in poor condition, client attractiveness did not impact how much hair was cut-off ($p = .561$, $\eta_\rho^2 = 0.002$). When hair was in good

Table 1

Pearson r correlations between all individual difference variables and between the individual difference variables and the dependent variables for Study 1.

Individual difference variables			1.	2.	3.	4.	5.
1. Age			–				
2. MVI (Mate Value Inventory)			0.121	–			
3. MVS (Mate Value Scale)			0.107	**0.640****	–		
4. MVF (Mate Value Factor)			0.126	**0.906****	**0.906****	–	
5. SIC (Scale for Intrasexual Competitiveness)			**−0.212****	−0.060	0.077	0.009	–

Dependent variables							
Client Attractiveness	Hair Condition	Client Wishes					
Attractive	Good	Min	−0.067	−0.082	0.004	−0.043	0.119
		Max	0.099	−0.042	0.048	0.003	0.026
	Poor	Min	−0.031	−0.044	0.050	0.003	0.114
		Max	−0.018	−0.056	0.066	0.006	0.043
Unattractive	Good	Min	−0.064	−0.049	−0.005	−0.030	**0.146***
		Max	0.108	−0.047	0.039	−0.004	0.061
	Poor	Min	−0.045	−0.020	0.098	0.043	0.140#
		Max	−0.035	−0.043	0.075	0.018	0.075

Values in bold font are statistically significant.
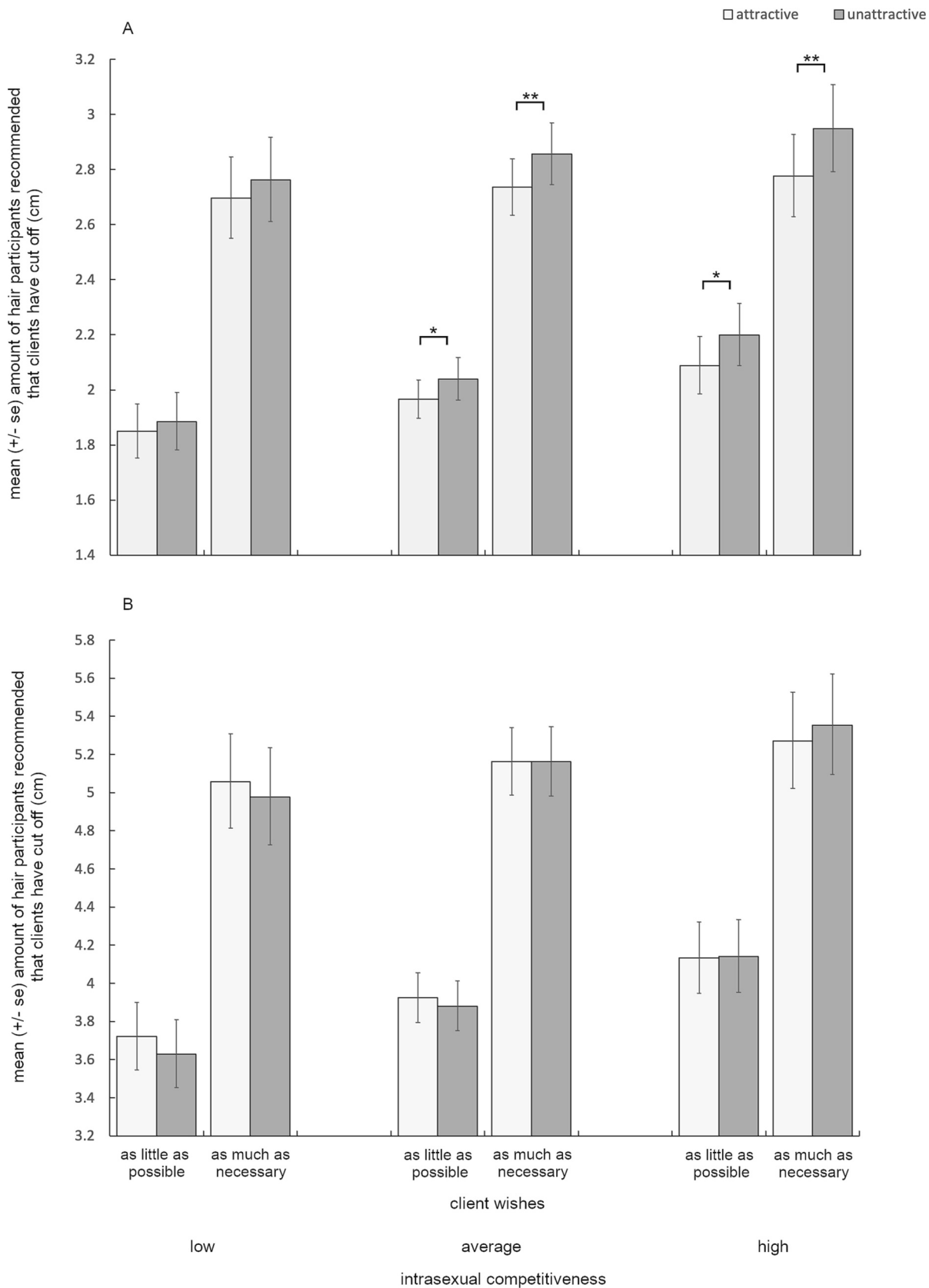* $p < .05$.
** $p < .01$.
\# $p < .1$.

Fig. 2. Shows the mean (± se) amount of hair that participants recommended clients have cut off when the hair was depicted in good condition (Panel A) or in poor condition (Panel B) in study 1. Across both panels participants recommended that more hair be cut off as their own intrasexual competitiveness increased. And when hair was depicted in good condition, participants recommended cutting more hair off the less attractive clients. *p < .05, **p < .01.

condition, participants recommended cutting significantly more hair off less attractive clients, compared to more attractive clients ($p = .001$, $\eta_\rho^2 = 0.057$).

We also observed a complex four-way interaction between hair condition, client attractiveness, intrasexual competitiveness, and mate value, $F(1,188) = 4.781$, $p = .030$, $\eta_\rho^2 = 0.025$. This interaction ultimately indicated that highly competitive, high mate value women cut more hair off less attractive rivals, regardless of hair quality; while highly competitive, low mate value women cut more hair off less attractive rivals, only when their hair was in good condition. The statistical unpacking of the interaction is described below.

We first estimated relevant three-way interactions at high and low levels (one standard deviation above and below the mean) of each covariate, respectively. The three-way interaction between hair condition, client attractiveness, and intrasexual competition was not significant at either high ($F(1,188) = 2.611$, $p = .108$, $\eta_\rho^2 = 0.014$) or low ($F(1,188) = 1.919$, $p = .168$, $\eta_\rho^2 = 0.010$) levels of mate value. However, the three-way interaction between hair condition, client attractiveness and mate value was moderated by intrasexual competition. At low levels of intrasexual competition, the hair condition, client attractiveness, and mate value interaction was not significant ($F(1,188) = 0.700$, $p = .404$, $\eta_\rho^2 = 0.004$), but at high levels of intrasexual competition, this three-way interaction was significant ($F(1,188) = 4.892$, $p = .028$, $\eta_\rho^2 = 0.025$). The pattern of this three-way interaction was further broken down to reveal that at high levels of mate value, hair condition did not interact with client attractiveness ($F(1,188) = 0.006$, $p = .941$, $\eta_\rho^2 < 0.001$) and participants cut more hair from unattractive clients ($F(1,188) = 5.299$, $p = .022$, $\eta_\rho^2 < 0.027$), regardless of hair quality. At low levels of mate value, the hair condition by client attractiveness interaction was significant ($F(1,188) = 8.684$, $p = .004$, $\eta_\rho^2 < 0.044$), as low mate value, highly competitive participants only cut more hair off the less attractive clients when the hair was in good condition ($p < .001$, $\eta_\rho^2 = 0.058$), not when it was in poor condition ($p = .587$, $\eta_\rho^2 = 0.002$).

Lastly, there was a five-way interaction between hair condition, client attractiveness, client wishes, intrasexual competitiveness, and mate value, $F(1,188) = 4.781$, $p = .030$, $\eta_\rho^2 = 0.025$.

We adopted an analogous approach to this interaction (systematically investigating the relevant four-way interactions at high and low values of the respective covariates). We were unable to identify any clear patterns of moderation, rendering the interaction uninterpretable.

5. Discussion

In study 1, we investigated the extent to which participants' mate-value and intrasexual competitiveness predicted the amount of hair they would recommend that attractive and unattractive salon clients have cut off. Highly competitive participants cut more hair off less attractive clients, while less competitive participants were not impacted by client attractiveness. This suggests that appearance advice may act as a vector for intrasexual competition, and that such competition (in this scenario at least) tends to be projected downward to less attractive competitors.

The absence of any simple effects or low-level interactions involving mate value, suggests that women across the mate-value spectrum engage in this type of downward-projected intrasexual competition. The effects of mate value that were observed were limited to moderating the impacts of hair condition. When participants were high in both competitiveness and mate value they cut more hair off less attractive clients, regardless of the condition of the hair. When participants were high in competitiveness but low in mate value, they only cut more hair from less attractive clients, when the hair was in good condition, not when it was in poor condition. High mate value, therefore, appeared to broaden the range of potential targets of intrasexual competition, but only for women who were also high in intrasexual competitive intent.

The effects of hair condition and client wishes that we observed were in line with predictions. Recommendations to cut off more hair most

clearly align with competitive tactics when the hair is in good condition and when the client wants as little hair cut off as possible. When hair is in poor condition, it is more ambiguous whether recommendations to cut more off would help or hinder the clients' attractiveness (and ultimately the health of their hair, too). Also, when clients express a wish to have as little hair as possible cut off, recommendations to cut off more hair are potentially more damaging to clients' self-perceived attractiveness, than the same recommendation given when the client is happy for as much hair as needed to be cut off. It is therefore consistent with an intrasexual competition account of the data that the only condition in which the simple bivariate correlation between intrasexual competitive intent and how much hair was recommended to be cut-off was significant was for unattractive clients with hair in good condition, who wanted as little hair as possible cut off.

6. Study 2

In Study 1, we only included faces that were high or low on attractiveness. More competitive participants cut more hair off the less attractive clients. But since we didn't include clients of average attractiveness (and therefore average implied mate value), we don't have a clear understanding of whether participants were tending to target women of absolutely low mate value, or just any women who were of lower perceived mate value than themselves – both scenarios would have produced the effects seen in Study 1. The majority of participants would likely have perceived the unattractive client group as low in mate value in absolute terms, as well as lower in mate value than themselves. With a dearth of clients of average levels of attractiveness, we also don't know how participants (most of which we can presume were around average levels of attractiveness) would advise clients they perceive to be their mate value equals. We targeted these research questions in the design of Study 2, by including clients of low, average, and high facial attractiveness.

7. Method

7.1. Participants

Two-hundred and seventy-nine women completed the study. Twenty-one were excluded for not indicating a preference for male partners. The final sample of women ($N = 258$) were aged 18-67 yrs. ($M = 34.8$, $SD = 10.5$, although 2 declined to provide their age). About one-quarter were single ($N = 62$, not in a relationship; $N = 10$, in a short/uncommitted relationship) and the remaining partnered ($N = 30$, not living together; $N = 156$, living together; five did not provide their relationship status). Participants were recruited from an undergraduate participant pool ($N = 228$, for course credit) and from the general public ($N = 30$, for no compensation), and all gave informed consent under protocol number H18039, issued by the Charles Sturt University Human Research Ethics Committee.

7.2. Materials

7.2.1. Stimuli

Forty-eight neutral expression female faces of apparent reproductive age were drawn from the UCT-HiFi face database. Based on prior femininity ratings, we selected 16 faces high in femininity ($M = 11.03$, $SD = 0.66$), low in femininity ($M = 6.11$, $SD = 0.60$), and average in femininity ($M = 8.70$, $SD = 0.72$). We subsequently had these 48 faces rated for attractiveness (from 1 to 10) by a sample of women ($N = 52$, aged 19–58, $M = 34.0$, $SD = 10.1$ years). A one-way repeated-measures ANOVA applied to the mean attractiveness scores revealed a significant main effect of attractiveness category ($F(2,104) = 243.6$, $p < .001$, $\eta_\rho^2 < 0.824$), with differences in perceived attractiveness corresponding to the different categories as intended. The highly attractive faces were rated as most attractive ($M = 5.12$, $SE = 0.18$), followed by the mid-level

attractive faces ($M = 4.17$, $SD = 0.17$) and the unattractive faces ($M = 3.42$, $SD = 0.16$, all pairwise comparisons were significant, p < .001).

Stimuli were cropped and presented as potential hairdressing clients, as described for study 1. Differently to study 1, we preceded the stimuli with a picture of a life-size credit card and a ruler to help give participants an accurate impression of the dependant variable units (cm).

7.2.2. Measures

The Mate Value Scale (MVS, Edlund & Sagarin, 2014), Mate Value Inventory (MVI-7, Short Form, Kirsner et al., 2003), and the Scale for Intrasexual Competitiveness (SIC, Buunk & Fisher, 2009) were used as described for study 1. Study 2 internal reliabilities for the three measures were high, $\alpha = 0.90$, $\alpha = 0.81$, and $\alpha = 0.90$, respectively.

7.3. Procedure

The procedure mirrored that described for Study 1. Participants provided the same demographics information as in Study 1, and were then asked to provide advice to female clients in a hair salon as though they were the hairdresser, as to how much hair the client ought to have cut off. The same 48 faces (16 each of highly attractive, unattractive, and mid-level attractive clients) were shown to all participants (in random order), but whether any individual face was paired with hair in poor or good condition, and whether it was paired with an instruction to cut off as much hair as needed or as little as possible, was counterbalanced across participants.

Unlike in study 1 (where participants were provided with a text entry box), in study 2 responses were on an 11-point Likert scale, with each point labelled from "1cm (or less)", "2 cm"…, to "10 cm", and "more than 10cm". After providing responses to all 48 client faces, participants were again shown each of the 48 faces one at a time (in a random order, and without accompanying information about hair condition), and this time asked to rate the attractiveness of each face "compared to your own face". Participants responded on a 21-point slider scale, with anchors at −10 ("Much less attractive than me"), 0 ("As attractive as I am"), and 10 ("Much more attractive than me"). Participants then completed the SIC, MVS, and MVI, and were debriefed via an online debrief statement.

8. Results

The amount of hair each participant recommended to be cut-off each client was averaged across the four faces of each of the 12 conditions (three levels of attractiveness x good/poor hair condition x client's wishes). As we adopted a Likert scale response format, these 12 means were approximately normally distributed and no transformations were applied. As in study 1, the MVS and MVI were combined into a single mate value factor, MVF (see Table 2). Each scale loaded strongly onto this factor (0.873) and it accounted for 76 % of the total variance. As in Study 1, the MVF and SIC scores (the latter converted to z-scores), were then entered as covariates into a full-factorial 3 (client attractiveness: low, medium or high) x2 (condition of hair: poor or good) x2 (client's wishes: as little as possible or as much as needed) repeated-measures ANCOVA. In this analysis we controlled for age in the final model as it positively correlated with the dependent measure across all conditions (see Table 2), and accounted for significant variance ($F(1,253) = 6.250$, $p = .003$, $\eta_\rho^2 = 0.024$). The two participants who declined to provide their age were assigned the mean age of 35 for these analyses. For the repeated-measures effects in this model, we adopted multivariate comparison procedures (Wilks' λ) due to multiple violations of the assumption of sphericity.

We observed significant main effects of hair condition ($\lambda = 0.252$, $F(1,253) = 752.7$, $p < .001$, $\eta_\rho^2 = 0.748$) and client wishes ($\lambda = 0.345$, $F(1,253) = 480.5$, $p < .001$, $\eta_\rho^2 = 0.655$), as participants cut off more hair when it was in poor condition, and when clients indicated they were happy for as much as necessary to be removed. Consistent with Study 1, we also observed a significant interaction between these variables, ($\lambda = 0.737$, $F(1,253) = 90.44$, $p < .001$, $\eta_\rho^2 = 0.263$). The effect of client wishes was larger when hair was in poor condition (p < .001, $\eta_\rho^2 = 0.607$) than when it was in good condition (p < .001, $\eta_\rho^2 = 0.570$), since participants recommended cutting off the most hair when it was in poor condition, and the client was happy for as much to be cut-off as needed.

We also observed a significant main effect of client attractiveness ($\lambda = 0.975$, $F(2,252) = 3.296$, $p = .039$, $\eta_\rho^2 = 0.025$), qualified by a significant interaction between client attractiveness and hair condition ($\lambda = 0.897$, $F(2,252) = 14.40$, $p < .001$, $\eta_\rho^2 = 0.103$). For hair in both good and poor condition, the simple effects of attractiveness were significant

Table 2
Pearson *r* correlations between all individual difference variables and between the individual difference variables and the dependent variables for Study 2.

Individual difference variables	1.	2.	3.	4.	5.
1. Age	–				
2. MVI (Mate Value Inventory)	**0.209**[**]	–			
3. MVS (Mate Value Scale)	0.078	**0.525**[**]	–		
4. MVF (Mate Value Factor)	**0.164**[**]	**0.873**[**]	**0.873**[**]	–	
5. SIC (Scale for Intrasexual Competitiveness)	−0.001	**−0.167**[*]	0.054	−0.065	–

Dependent variables							
Client Attractiveness	Hair Condition	Client Wishes					
Highly Attractive	Good	Min	**−0.159**[*]	−0.079	0.005	−0.043	0.111[#]
		Max	**−0.109**[#]	−0.026	0.006	−0.011	0.090
	Poor	Min	**−0.128**[*]	−0.023	−0.017	−0.023	0.084
		Max	−0.098	0.044	−0.012	0.018	−0.024
Mid-level Attractive	Good	Min	**−0.167**[**]	−0.051	0.021	−0.017	**0.148**[*]
		Max	**−0.154**[*]	−0.034	0.021	−0.007	0.078
	Poor	Min	**−0.154**[*]	−0.052	−0.035	−0.049	0.092
		Max	**−0.119**[#]	0.007	−0.016	−0.005	−0.016
Unattractive	Good	Min	**−0.116**[#]	−0.048	0.006	−0.024	0.113[#]
		Max	**−0.126**[*]	0.006	0.017	0.014	0.047
	Poor	Min	**−0.156**[*]	−0.032	−0.017	−0.028	0.082
		Max	**−0.140**[*]	0.028	0.034	0.036	−0.021

Values in bold font are statistically significant.
[*] $p < .05$.
[**] $p < .01$.
[#] $p < .1$.

(good: $\lambda = 0.897$, $F(2,252) = 14.46$, $p < .001$, $\eta_\rho^2 = 0.103$; poor: $\lambda = 0.962$, $F(2,252) = 4.984$, $p = .008$, $\eta_\rho^2 = 0.038$). When hair was in good condition, participants recommended cutting the most hair off the clients of average attractiveness, and the least hair off the most attractive clients (all pairwise comparisons across levels of client attractiveness were significant, all $p < .011$, see Fig. 3A). When hair was in poor condition, the effects of client attractiveness were reversed with the least hair cut off the clients of average attractiveness, compared to both the least attractive ($p = .002$) and most attractive ($p = .039$) clients, with similar amounts of hair cut off the least and most attractive clients ($p = .250$, see Fig. 3B).

We also observed a significant three-way interaction between hair condition, client wishes, and intrasexual competitiveness ($\lambda = 0.984$, $F(1,253) = 4.184$, $p = .042$, $\eta_\rho^2 = 0.016$). To test our prediction that participant intrasexual competitiveness would most strongly predict the amount of hair cut off when the hair was in good condition and the client wanted the least amount cut as possible, we examined the main effect of the intrasexual competitiveness covariate across four follow-up ANCOVA models (each with attractiveness of the client as the repeated-measure). As predicted only when the client's hair was in good condition and the client wanted the minimum amount of hair cut-off, did participant intrasexual competitiveness significantly predict how much hair was cut off ($F(1,253) = 4.785$, $p = .030$, $\eta_\rho^2 = 0.019$). At the other three combinations of client wishes by hair condition, the main effect of intrasexual competitiveness was not significant (all $F(1,253) < 2.594$, all $p > .109$, all $\eta_\rho^2 < 0.010$).

The only other significant term in the model, was the four-way interaction between client wishes, client attractiveness, intrasexual competition and mate-value ($\lambda = 0.971$, $F(2,252) = 3.744$, $p = .025$, $\eta_\rho^2 = 0.029$). We probed this interaction by estimating the relevant three-way interactions, at low and high levels of each covariate, respectively. No systematic patterns of moderation were observed, rendering the four-way interaction uninterpretable.

The relative attractiveness ratings of the faces were then used to examine how clients' attractiveness, relative to the participant predicted how much hair was cut off. We split the faces (uniquely for each participant) into those the participant perceived as less attractive than themselves (rated less than -1), more attractive than themselves (rated >1), as attractive as themselves (rated from -1 to 1). We initially inspected how the amount of hair cut off was distributed over the full factorial model, replacing the three a priori attractiveness levels with the three relative attractiveness levels (less attractive than me, as attractive as me, more attractive than me). However, since the allocation of stimulus faces to categories was dependent on how participants rated them, we couldn't guarantee scores in all cells for all participants (if a participant chose not to label any of the faces presented with poor hair condition and flexible client wishes as less attractive than themselves, then they would have no score in that cell). Only 64 participants had data in all cells over the full factorial model. When we averaged over hair condition and client wishes, 189 participants had data in all cells. We therefore modelled the impacts of relative client attractiveness using these 189 participants, and a one-way (relative attractiveness: less attractive than me, as attractive as me, more attractive than me), repeated-measures ANCOVA with MVF and SIC scores as the covariates, controlling for age.

Here, we observed no significant main effect of relative attractiveness ($\lambda = 0.994$, $F(2,183) = 0.559$, $p = .573$, $\eta_\rho^2 = 0.006$), but we did see a significant interaction between relative attractiveness and intrasexual competition ($\lambda = 0.961$, $F(2,183) = 3.731$, $p = .026$, $\eta_\rho^2 = 0.039$). At low levels of intrasexual competition (one and a half standard deviations below the mean), participants cut more hair off women they perceived to be as attractive as themselves, compared to women they perceived to be less attractive than themselves ($p = .028$). At high levels of intrasexual competition (one and a half standard deviations above the mean), this pattern reverses and participants cut less hair off women they perceived to be as attractive as themselves, compared to women they

perceived to be less attractive than themselves ($p = .023$). None of the pairwise comparisons involving women perceived as more attractive than the participant, were significant at either high or low levels on intrasexual competition (all $p > .090$, see Fig. 4).

In addition to using the relative attractiveness ratings to re-classify stimuli for the above analyses, we also analysed the ratings themselves, to determine the extent to which they were related to participants' intrasexual competitiveness. We subjected the ratings to a one-way repeated-measures ANCOVA, with client attractiveness as the within-subjects variable (3 levels: low, average, high) with mate-value, intrasexual competition, and their interaction as covariates, controlling for age. In this model, both age ($F(1,253) = 17.66$, $p < .001$, $\eta_\rho^2 = 0.065$) and mate value accounted for significant variance ($F(1,253) = 35.71$, $p < .001$, $\eta_\rho^2 = 0.124$). Since ratings were provided on a self-referent scale (less attractive than me – more attractive than me) it is unsurprising that younger women and women of higher self-reported mate-value provided lower overall scores. Also unsurprising was the main effect of client attractiveness ($\lambda = 0.254$, $F(2,252) = 370.2$, $p < .001$, $\eta_\rho^2 = 0.746$), with participants providing the highest ratings for the highly attractive women and the lowest ratings for the women of low attractiveness (all pairwise simple effects were significant, all $p < .001$, all $\eta_\rho^2 > 0.599$). More interesting was the significant main effect of intrasexual competitiveness ($F(1,253) = 5.520$, $p = .020$, $\eta_\rho^2 = 0.021$), as more competitive participants tended to provide lower overall scores. There was also a significant interaction between client attractiveness and intrasexual competitiveness ($\lambda = 0.967$, $F(2,252) = 4.277$, $p = .015$, $\eta_\rho^2 = 0.033$). The interaction was best accounted for by the observation that (while simultaneously controlling for mate-value and age) intrasexual competition negatively predicted the relative attractiveness ratings given to the women of low ($\beta = -0.185$, $t = 3.233$, $p < .001$) and average ($\beta = -0.133$, $t = 2.298$, $p = .022$) attractiveness, but not those given to the women of high attractiveness ($\beta = -0.079$, $t = 1.358$, $p = .176$). No other main effects or interactions were significant (all other p's > 0.317).

To summarise the key results of Study 2, intrasexual competition scores positively predicted how much hair was cut off when clients' hair was in good condition, and the clients wanted the least amount possible cut off. When clients' hair was in good condition, participants cut the most hair off the clients of average attractiveness, and the least hair off the most attractive clients. When the relative attractiveness (relative to each participant's self-perceived own attractiveness) of the clients was considered, participants low on intrasexual competition cut more hair off those clients they rated to be as attractive as themselves, compared to those they rated to be less attractive than themselves. Highly intrasexually competitive participants reversed this effect, cutting more hair of those clients they rated to be less attractive than themselves, compared to those they rated to be as attractive as themselves. When the relative attractiveness ratings were themselves analysed, it was revealed that intrasexual competitiveness negatively predicted the ratings given to clients of both low and average attractiveness, but did not predict the ratings given to the highly attractive clients.

9. Discussion

In Study 2, we sought to clarify the impacts of client attractiveness on the amount of hair participants recommended that those clients have cut off. Under the circumstances most conducive to intrasexual competition (when participants hair was in good condition, and the clients wanted as little hair as possible cut off – the only combination of conditions under which SIC scores directly predicted how much hair was cut-off), participants recommended cutting the most hair off clients of average (compared to high or low) attractiveness. We also replicated the observation from Study 1, whereby more hair was cut off the least attractive clients, compared to the most attractive clients.

Interactions between client attractiveness and participant intrasexual competitiveness, suggest a reasonably straightforward account of how disingenuous appearance advice manifests as female intrasexual
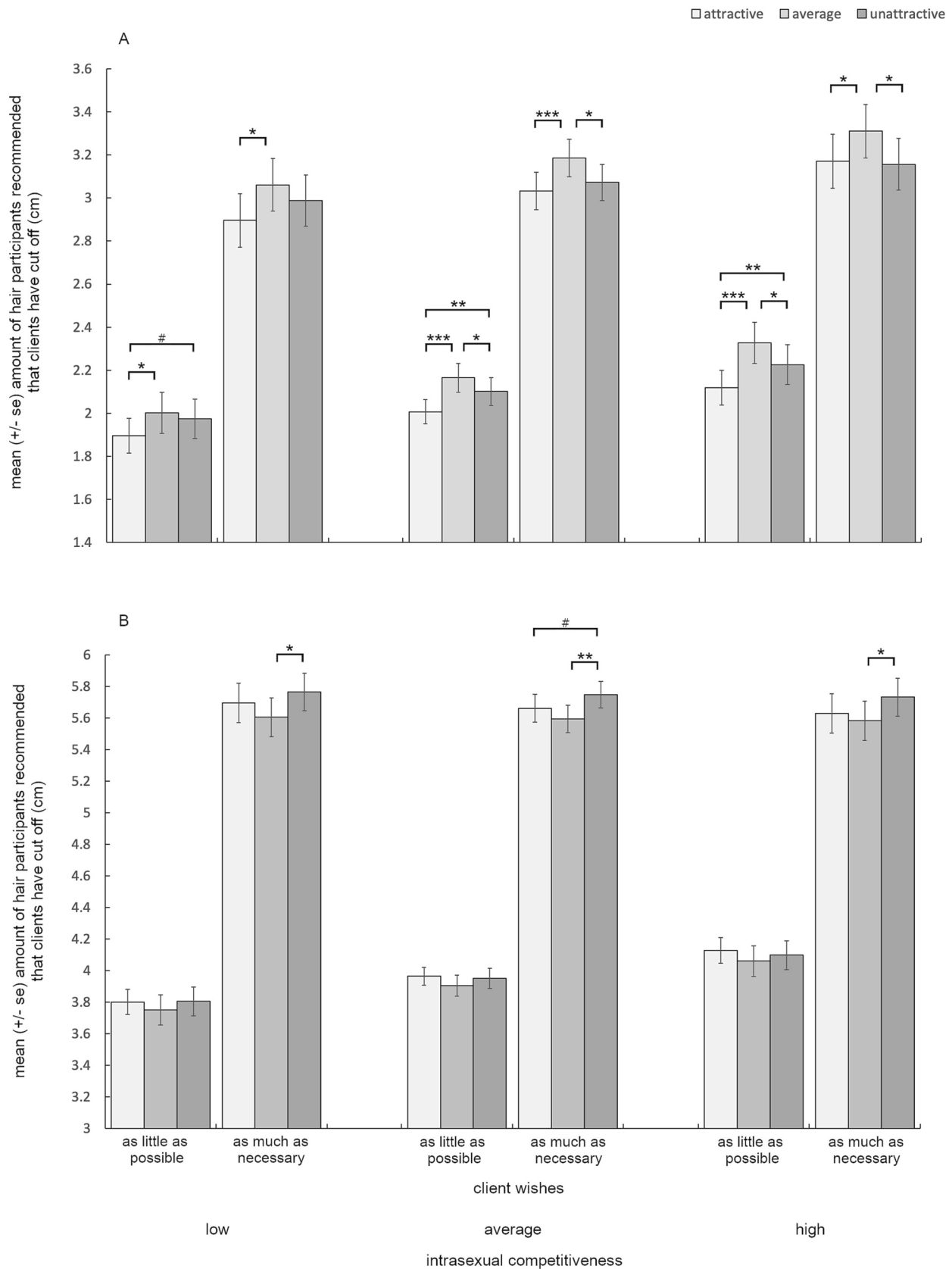
Fig. 3. Shows the mean (± se) amount of hair that participants recommended clients have cut off when the hair was depicted in good condition (Panel A) or in poor condition (Panel B) in study 2. Across Panel A participants recommended that more hair be cut off as their own intrasexual competitiveness increased. When hair was depicted in good condition, participants recommended cutting the most hair off the clients of average attractiveness. *p < .05, **p < .01, ***p < .001.
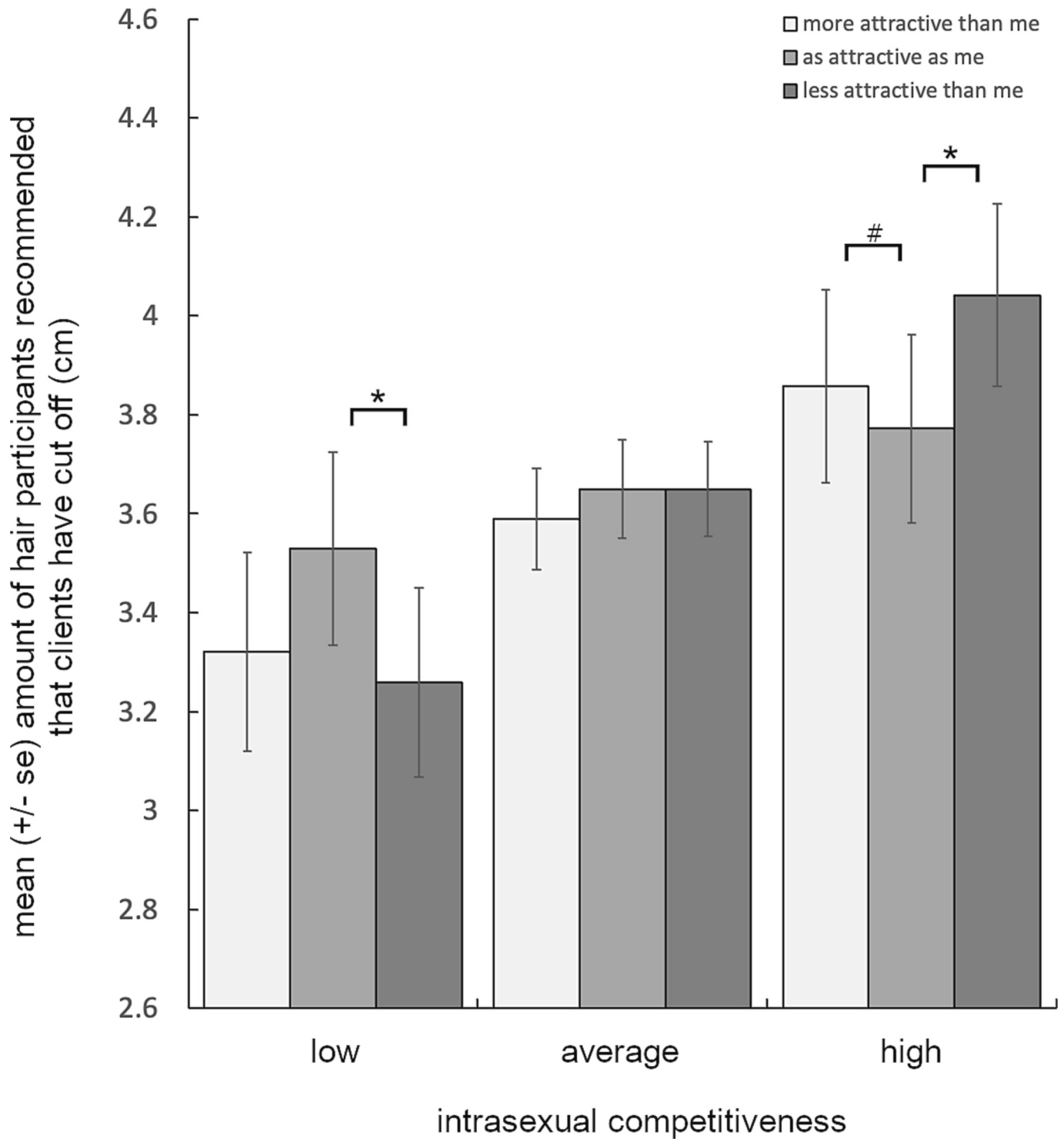
Fig. 4. Shows the mean (± se) amount of hair that participants recommended clients have cut off in study 2, as a function of whether participants perceived the clients to less attractive than themselves, as attractive as themselves, or more attractive than themselves. Participants low on intrasexual competition cut the most hair off clients they perceived to be as attractive as themselves, while those high in intrasexual competition cut the most hair off those they indicated were less attractive than themselves. $^{\#}p < .1$, $^{*}p < .05$.

competition. The primary targets are other women of average to low attractiveness. There is an apparent inconsistency, however, in terms of how intrasexual competition moderates this effect. Analyses based on the absolute attractiveness categories of clients, indicate that the impacts of client attractiveness remain consistent across the range of intrasexual competitiveness. The most hair is cut from the clients of average attractiveness, followed next by those of low attractiveness, but

this effect increases with participant intrasexual competitiveness. As women report being more competitive, their advice is more strongly impacted by client attractiveness. This interpretation is also consistent with the results of Study 1.

The analyses based on clients' attractiveness relative to the participants, suggests a different pattern. According to these data, highly competitive participants primarily target those they perceive to be less

attractive than themselves (rather than those they perceive to be as attractive). This paradox could be resolved by considering that highly competitive participants generally perceived the clients of average attractiveness to be less attractive than themselves. While this is how highly competitive participants rated the clients of average attractiveness (as less attractive than themselves), they still rated them as more attractive than the clients of low attractiveness and still cut more hair from them. Self-reported mate value and intrasexual competitiveness were largely unrelated in our sample, so it is unlikely that highly competitive participants, generally, were any more attractive themselves than less competitive participants. Instead, we suggest that the lower relative attractiveness ratings that highly competitive participants gave to the clients of average (and low) attractiveness are probably indicative of derogation (Fisher, 2004). Intrasexual competitiveness negatively predicted relative attractiveness ratings, (for average and low attractiveness clients, after controlling for mate value and age), further suggesting that derogation played a role in those ratings.

The above is an important point, because it changes the apparent interpretation of the impacts of relative attractiveness. We don't believe that highly competitive participants are actually shifting the primary focus of their competition to rivals they perceive to be less attractive than themselves. Rather, we think it most likely that highly competitive participants are primarily targeting their mate quality peers, just as less competitive participants are. But highly competitive participants were also more derogatory when rating the attractiveness of these peers, being more likely than other participants to shift their mate quality equals into the 'less attractive than me' category. As such, the results of Studies 1 and 2 together suggest that in the context of advice given to a putative stranger, in the absence of any immediate mating target, or any overt competitive threat, women direct disingenuous appearance advice primarily towards their mate quality equals, and secondarily towards those who rank lower (rather than higher) than themselves.

10. General discussion

Indirect aggression is a primary vehicle for female intrasexual competition. Across two studies, we investigated an understudied mode of indirect aggression, rival manipulation via disingenuous or damaging appearance advice. Participants advised hypothetical salon clients how much hair they ought to have cut-off. When the hair was in good condition and clients advised that they wanted as little as possible cut-off, participants' self-reported intrasexual competitiveness positively predicted how much hair they recommend that clients have cut off. Client attractiveness also impacted how much hair participants recommend they have cut off. When the hair was in good condition and clients advised that they wanted as little as possible cut-off, participants recommended cutting the most hair off clients of average attractiveness, and also tended to cut more hair from clients of low attractiveness, compared to clients of high attractiveness. When clients' relative attractiveness (relative to participants' own attractiveness) was considered, participants who were relatively low on intrasexual competition recommended cutting the most hair off clients they perceived to be as attractive as themselves. Participants who were high on intrasexual competitiveness recommended cutting the most hair off clients they rated as being less attractive than themselves. We attributed this shift to rival derogation impacting the attractiveness ratings, however (see detailed argument above), concluding that across the spectrum of intrasexual competitiveness, women primarily targeted their mate quality peers with advice to cut off more hair. Participants' self-reported mate value played a negligible role in all of these effects. The current findings support appearance advice as a vector for female-female competition.

An unexplored distinction is whether recommendations to cut off excess amounts of hair constituted attempts to reduce rivals' physical attractiveness (since men consider longer hair more to be more attractive, Mesko & Bereczkei, 2004), or to hobble rivals' capacity to signal

sexual intent (since long hair worn out, rather than tied back, may be interpreted as a signal of potential sexual availability, Matz & Hinsz, 2018). Either or both of these outcomes may have influenced responses in the current study. It is possible, for example, that advice to cut more hair off clients of low attractiveness (compared to those of high attractiveness) reflect attempts to curtail such women's capacity to signal sexual intent. Since these rivals were already perceived as substantially less attractive than the participants, and both female and male mating preferences actively encourage assortative mating by mate value (Williams & Sulikowski, 2020), it seems unlikely that the majority of participants perceived these less attractive rivals as long-term mating threats, or would have much to gain by further lowering these rivals' attractiveness. However, a lower quality rival may be able to mate upwards by signalling sexual availability for relatively little male investment (Buss & Schmitt, 1993; Gangestad & Simpson, 2000; Regnerus, 2012), effectively lowering the market price of sex. Hence, limiting a low-quality rivals' capacity to signal sexual availability by encouraging her to cut off of more of her hair, could be a competitive tactic targeting promiscuity. Women are known to use intrasexual competitive tactics to police each other's promiscuity, (Ayers & Goetz, 2022; Muggleton et al., 2019; Vaillancourt & Sharma, 2011). Whether or not limiting promiscuity was one of the motive's driving participants' responses in the current study cannot be determined based on our data, but is an interesting possibility for future studies to investigate.

It is unsurprising that the impacts of participant intrasexual competitiveness and client attractiveness on how much hair was cut off, were attenuated when clients' hair was in poor condition. When hair has extensive split ends, it becomes ambiguous whether or not cutting off substantial amounts would constitute rival sabotage. On the one hand it reduces the overall length of the hair, which we argue does constitute rival sabotage when that hair is in good condition. On the other hand, the best way to immediately improve the look of hair with extensive split ends, and to eventually allow that hair to grow back longer and healthier, is to cut all of those split ends off. This makes it difficult to determine whether appearance sabotage would manifest as cutting off more or less hair with extensive split ends. In study 2, there was an apparent reversal of the impacts of client attractiveness when the hair was in poor condition, with the least hair cut off from clients of average attractiveness (compared to when hair was in good condition, and the most was cut off these clients). This tempts us to suspect that cutting off less hair when extensive split ends were present, especially when clients indicated that they were happy for as much as needed to be cut off, may well have constituted rival sabotage. However, the current data are not sufficiently compelling on this point. Another study designed to untangle the competing motives of cutting off another woman's hair to make it shorter, versus cutting it off to make it healthier, would be needed to draw firm conclusions on this point.

Our brief review of prior findings suggested that in the absence of an overt mating threat, female intrasexual competition would more likely to manifest in a downward direction, than in an upward direction. Indeed, we observed that women of low attractiveness were targeted more so than women of high attractiveness in both studies. Study 2, however, revealed that the primary targets of competition in our study were women of average attractiveness, those perceived by participants to be as attractive as themselves. Least targeted were highly attractive women. These are interesting observations because the primary costs of female indirect aggression are the risk of retaliation and reputational harm (an aggressing female may be perceived as less kind, and therefore less appealing as a prospective mate Fisher et al., 2010,). The hypothetical context presented within the current studies appears especially conducive to risk-free aggression. The client is ostensibly a stranger with no future interactions or opportunities for retaliation implied. Placing the participant in the role of the hairdresser also provides a circumstance in which it would be necessary for some hair to be cut-off, introducing plausible deniability that an act of aggression had taken place at all. That aggression was nevertheless attenuated by client attractiveness, suggests

that the associated risks may not be the primary factor driving women to refrain targeting their competitive tactics towards highly attractive rivals.

Assortative mating means that competitors who are too far out of your league are likely targeting mates who are also too far out of your league (Williams & Sulikowski, 2020). As such, highly attractive women may not actually present a mating threat for the majority of other (less attractive women), and so may not be perceived as relevant rivals. Equally, while some appearance sabotage tactics may have devastating potential (such as using bullying to induce or exacerbate eating disorders, Abed, 1998; Lie et al., 2019), most such tactics likely have only a limited capacity to harm rivals' appearance. A very attractive woman with short hair is still, in all likelihood, a very attractive woman. To provide any benefit to the actor, sabotage tactics with limited potential would need to target rivals whose attractiveness does not exceed the actor's by more than the sabotage can potentially overcome. Less hair cut from more attractive clients may therefore reflect a combination of a lack of mating threat presented by these clients (for the majority of participants, at least) coupled with the relatively limited capacity that excessive hair cutting has to sabotage a (highly attractive) rivals' appearance.

The largely null effects of participants' self-reported mate value warrant some consideration. The mate value factor we used explained substantial variance in the self-referential attractiveness score, suggesting that it was a reasonable proxy for participant attractiveness, and therefore mate value. We had initially theorised that female intrasexual competition may project up the mate-value ladder in the context of mate guarding (where a woman may need to guard her mate from a higher mate value rival), and downwards in other contexts. We then hypothesised that in the current studies, intrasexual competition would be more likely to be directed down the mate value ladder, than up it. This led us to further predict that higher mate value women would engage in more competitive behaviour (by cutting more healthy hair off clients who didn't want it cut-off), than lower mate value women. While we did observe more downward than upward competition, the primary targets were those clients that participants perceived to be as attractive as themselves.

Targeting rivals of similar mate value with sabotaging tactics is functionally adaptive. If successful, it may lower a prospective rival's mate value enough that she no longer targets the same mates as the aggressor. Targeting rivals of higher mate value may not be adaptive if the outcome is that those rivals' mate value is lowered. They may become a direct competitor for the aggressor's potential mates, when previously they were not. Of course, the adaptive deterrent from engaging a higher mate value rival in competitive manipulation, is nullified if that rival is already attempting to poach the potential aggressor's mate.

Such horizontal competition, coupled with the observation that intrasexual competitiveness and mate value were largely unrelated overall in the current study, leads us to a theory of stratified female-female competition. Assortative mating by mate quality means that any individuals' pool of potential mates and rivals is primarily comprised of people of similar mate value to themselves. The majority of mating interactions (whether intersexual attraction or intrasexual competition) likely play out between individuals of similar mate quality. Fisher and Fernández (2017) have previously mounted precisely these arguments, but they were at the time untested. Stratified female-female competition, defined by primarily horizontal competitive interactions occurring with similar frequency all along the mate value continuum, may account for a substantial proportion of competitive female-female interactions.

11. Conclusion

In the current study, female intrasexual competition via rival manipulation was investigated. More competitive participants advised hypothetical salon clients to cut off more hair when that hair was healthy and when clients expressed a wish to have as little hair cut off as possible. Participants advised clients they perceived to be as attractive as themselves to cut off the most hair, and also advised unattractive clients to cut of more than they advised highly attractive clients to cut off. Other than targeting women of similar perceived attractiveness, participants own mate-value had limited impact on haircut advice, suggesting that this type of female intrasexual competition manifests consistently along the mate value spectrum. We observed these effects in a context – advice about a haircut – that was ostensibly unrelated to any identifiable, or implied, mating opportunity or mating threat. These observations lead us to concur with Ayers and Goetz (2022), that future research should broaden the contextual scope within which female intrasexual competition is investigated. We suspect that intrasexually competitive motives may influence the full breadth of female-female interactions, whenever opportunities to manipulate the reproductive outcomes of other women present themselves, irrespective of whether or not those interactions involve an identifiable mating threat for any woman involved.

CRediT authorship contribution statement

Danielle Sulikowski Conceptualization, Methodology, Software, Formal analysis, Resources, Data curation, Writing – original draft, Visualization, Project Management. **Melinda Williams** Conceptualization, Methodology, Software, Resources, Data curation, Writing – review and editing, Supervision. **Gautami Nair** Methodology, Investigation. **Brittany Shepherd** Methodology, Investigation. **Anne Wilson** Methodology, Investigation. **Audrey Tran** Methodology, Investigation. **Danielle Wagstaff** Conceptualization, Writing – review and editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

We have provided the data as supplementary material

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2023.112406.

References

Abed, R. T. (1998). The sexual competition hypothesis for eating disorders. *British Journal of Medical Psychology, 71*, 525–547.

Archer, J. (2004). Sex differences in aggression in real-world settings: A meta-analytic review. *Review of General Psychology, 8*, 291–322.

Arnocky, S., Sunderani, S., Miller, J. L., & Vaillancourt, T. (2012). Jealousy mediates the relationship between attractiveness comparison and females' indirect aggression. *Personal Relationships, 19*, 290–303.

Arnocky, S., Sunderani, S., & Vaillancourt, T. (2013). Mate-poaching and mating success in humans. *Journal of Evolutionary Psychology, 11*(2), 65–83.

Arnocky, S., & Vaillancourt, T. (2012). A multi-informant longitudinal study on the relationship between aggression, peer victimization, and dating status in adolescence. *Evolutionary Psychology, 10* (147470491201000207).

Ayers, J. D., & Goetz, A. T. (2022). Coordinated condemnation in women's intrasexual competition. *Personality and Individual Differences, 185*, Article 111294.

Bereczkei, T., & Mesko, N. (2006). Hair length, facial attractiveness, personality attribution: A multiple fitness model of hairdressing. *Review of Psychology, 13*, 35–42.

Buss, D. M. (1988). The evolution of human intrasexual competition: Tactics of mate attraction. *Journal of Personality and Social Psychology, 54*, 616.

Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review, 100*, 204–232.

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

Campbell, A. (1995). A few good men: Evolutionary psychology and female adolescent aggression. *Ethology and Sociobiology, 16*, 99–123.

Dane, A. V., Marini, Z. A., Volk, A. A., & Vaillancourt, T. (2017). Physical and relational bullying and victimization: Differential relations with adolescent dating and sexual behavior. *Aggressive Behavior, 43*(2), 111–122.

Edlund, J. E., & Sagarin, B. J. (2014). The mate value scale. *Personality and Individual Differences, 64*, 72–77.

Fink, B., Klappauf, D., Brewer, G., & Shackelford, T. K. (2014). Female physical characteristics and intra-sexual competition in women. *Personality and Individual Differences, 58*, 138–141.

Fisher, M., & Cox, A. (2011). Four strategies used during intrasexual competition for mates. *Personal Relationships, 18*(1), 20–38.

Fisher, M., Shaw, S., Worth, K., Smith, L., & Reeve, C. (2010). How we view those who derogate: Perceptions of female competitor derogators. *Journal of Social, Evolutionary, and Cultural Psychology, 4*, 265–276.

Fisher, M. L. (2004). Female intrasexual competition decreases female facial attractiveness. *Proceedings of the Royal Society of London. Series B: Biological Sciences, 271*, S283–S285.

Fisher, M. L., & Fernández, A. M. (2017). The influence of women's mate value on intrasexual competition. In M. L. Fisher (Ed.), *The Oxford handbook of women and competition* (pp. 281–299). Oxford University Press.

Fisher, M. L., & Krems, J. A. (2023). An evolutionary review of female intrasexual competition. In D. M. Buss (Ed.), *The Oxford handbook of human mating* (p. 378). Oxford University Press.

Gallup, A. C., O'Brien, D. T., & Wilson, D. S. (2011). Intrasexual peer aggression and dating behavior during adolescence: An evolutionary perspective. *Aggressive Behavior, 37*, 258–267.

Gangestad, S. W., & Simpson, J. A. (2000). The evolution of human mating: Trade-offs and strategic pluralism. *Behavioral and Brain Sciences, 23*, 573–587.

Hess, N. H., & Hagen, E. H. (2006). Sex differences in indirect aggression: Psychological evidence from young adults. *Evolution and Human Behavior, 27*, 231–245.

Hinsz, V. B., Matz, D. C., & Patience, R. A. (2001). Does women's hair signal reproductive potential? *Journal of Experimental Social Psychology, 37*, 166–172.

Jacobi, L., & Cash, T. F. (1994). In pursuit of the perfect appearance: Discrepancies among self-ideal percepts of multiple physical attributes. *Journal of Applied Social Psychology, 24*, 379–396.

Kirsner, B. R., Figueredo, A. J., & Jacobs, W. J. (2003). Self, friends, and lovers: Structural relations among Beck Depression Inventory scores and perceived mate values. *Journal of Affective Disorders, 75*(2), 131–148.

Leenaars, L. S., Dane, A. V., & Marini, Z. A. (2008). Evolutionary perspective on indirect victimization in adolescence: The role of attractiveness, dating and sexual behavior.

Aggressive Behavior: Official Journal of the International Society for Research on Aggression, 34, 404–415.

Lie, S.Ø., Rø, Ø., & Bang, L. (2019). Is bullying and teasing associated with eating disorders? A systematic review and meta-analysis. *International Journal of Eating Disorders, 52*, 497–514.

Matz, D. C., & Hinsz, V. B. (2018). Women's hair as a cue to desired relationship and parenting characteristics. *The Journal of Social Psychology, 158*(5), 558–573.

Mesko, N., & Bereczkei, T. (2004). Hairstyle as an adaptive means of displaying phenotypic quality. *Human Nature, 15*(3), 251–270.

Muggleton, N. K., Tarran, S. R., & Fincher, C. L. (2019). Who punishes promiscuous women? Both women and men are prejudiced towards sexually-accessible women, but only women inflict costly punishment. *Evolution and Human Behavior, 40*, 259–268.

Pellegrini, A. D., & Long, J. D. (2003). A sexual selection theory longitudinal analysis of sexual segregation and integration in early adolescence. *Journal of Experimental Child Psychology, 85*, 257–278.

Rahal, D., Fales, M. R., Haselton, M. G., Slavich, G. M., & Robles, T. F. (2021). Cues of social status: Associations between attractiveness, dominance, and status. *Evolutionary Psychology, 19* (14747049211056160).

Regnerus, M. (2012). Mating market dynamics, sex-ratio imbalances, and their consequences. *Society, 49*, 500–505.

Reynolds, T., Baumeister, R. F., & Maner, J. K. (2018). Competitive reputation manipulation: Women strategically transmit social information about romantic rivals. *Journal of Experimental Social Psychology, 78*, 195–209.

Rosvall, K. A. (2011). Intrasexual competition in females: Evidence for sexual selection? *Behavioral Ecology, 22*(6), 1131–1140.

Sulikowski, D., Ensor, M., & Wagstaff, D. (2022). Mate-value moderates the function of make-up as a signal of intrasexual aggression. *Personality and Individual Differences, 185*, Article 111275.

Sunderani, S., Arnocky, S., & Vaillancourt, T. (2013). Individual differences in mate poaching: An examination of hormonal, dispositional, and behavioral mate-value traits. *Archives of Sexual Behavior, 42*, 533–542.

Vaillancourt, T. (2013). Do human females use indirect aggression as an intrasexual competition strategy? *Philosophical Transactions of the Royal Society B: Biological Sciences, 368*(1631), 20130080.

Vaillancourt, T., & Sharma, A. (2011). Intolerance of sexy peers: Intrasexual competition among women. *Aggressive Behavior, 37*, 569–577.

Verona, E., Sadeh, N., Case, S. M., Reed, A., & Bhattacharjee, A. (2008). Self-reported use of different forms of aggression in late adolescence and emerging adulthood. *Assessment, 15*, 493–510.

White, D. D., Gallup, A. C., & Gallup, G. G., Jr. (2010). Indirect peer aggression in adolescence and reproductive behavior. *Evolutionary Psychology, 8*(1), 14747049100080006.

Williams, M., & Sulikowski, D. (2020). Implicit and explicit compromises in long-term partner choice. *Personality and Individual Differences, 166*, Article 110226.

Young, R., Len-Ríos, M., & Young, H. (2017). Romantic motivations for social media use, social comparison, and online aggression among adolescents. *Computers in Human Behavior, 75*, 385–395.