

Article

The Role of Breast Morphology in Women's Rival Derogation Tactics

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Abstract: Physical features that are desired by the opposite sex may drive competition between members of the same sex to gain access to potential mates. Women's breasts are considered sexually attractive to men, and it has been shown that women may engage in competitive tactics to compete with or derogate women with ideal physical traits (i.e., physically attractive features). In the current online study, we investigated Hispanic women's ($n = 114$) perceptions of breast stimuli that had been manipulated to display four levels of breast size (A-, B-, C-, and D-cup) and three levels of ptosis (i.e., levels of sagging: non, low, and high) and their likelihood of engaging in rival derogation tactics, such as verbal and indirect aggression. The findings demonstrated that women were more likely to engage in rival derogation towards women with larger breast sizes. Women's dispositional level of intrasexual competition did not play a role in rival derogation tactics. The results are in line with previous research suggesting that women's rival derogation tactics are likely to be targeted towards women with attractive features that are desired by men.

Keywords: intrasexual competition; breast size; ptosis; rival derogation



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1. Introduction

Sexual selection is the process of selecting traits that confer a fitness advantage through same-sex competition and mate choice [1]. Physical features that are desired by the opposite sex may drive competition between members of the same sex to gain access to potential mates. In humans, breast morphology is a sexually dimorphic trait, where breasts are larger in females compared to males, and this has been shown to be an important trait that men find attractive in women, perhaps due to breasts' association with reproductive value and fertility [2]. Women's breast morphology may drive competitive tactics in women, where women with desirable breasts may serve as direct competitors. Although women's perceptions of other women's physical features have been studied, the question of whether women engage in competitive tactics, such as verbal and indirect aggression, due to one another's breast morphology remains unexplored. Accordingly, the current study investigated the verbal and indirect competitive tactics that women employ against other women with variations in their breast morphology.

To access mates, women have to compete with other women. This competition may lead to behaviors that are meant to negatively affect other women in order for those who have acted to appear more positively to men in the mating arena. These intrasexual competitive strategies differ from men's, where men's intrasexual strategies are more direct (i.e., physical aggression and violence) [3,4] while women are more likely to utilize indirect tactics (i.e., non-physical strategies) [5], such as rival derogation [6,7]. Due to women's greater parental investment, selection has favored the use of intrasexual competitive strategies that do not increase the risk of harm to the mother and potentially her child [8,9]. Rival derogation is an effective strategy in women's intrasexual competition, as the woman does

not have to be in close proximity to the victim, can remain anonymous, and the effect can have long-lasting repercussions for the victim (e.g., damaged reputation) [9].

Indirect strategies are highly effective in women's competition, and they are often directed against women who are considered threats to themselves or to their current relationship. It has been suggested that women have evolved mechanisms that increase their vigilance to potential threats [10], and this is amplified by the features that men find important in other women [11], such as physical attractiveness. For instance, women consider attractive features, such as lower waist-to-hip ratios, facial femininity, and larger breasts, as potential threats [12]. Men place a premium on attractiveness and youth in mate choice due to their reproductive relevance [6,13]; therefore, women may be attentive to other attractive women and formulate strategies to mitigate the risk of compromising their relationship. Women use indirect strategies like gossiping when primed with relationship salient information, such as a woman showing interest in their current partner [14]. They may also increase their indirect aggressive tactics applied towards attractive women who dress provocatively [13], such as spreading rumors and increasing aggressive behavior towards them [15]. These strategies have been shown to be effective. Victims of aggression are less likely to be considered by other men if the perpetrator is attractive herself [16,17]. This suggests that indirectly aggressing towards another woman who is physically attractive may increase the competitiveness of a woman in the mating arena.

Breast morphology is an important physical trait in mate choice, as men find women's breasts sexually attractive [18–22]. Considering that breasts are attractive to men, women are attentive to men's interest in them and are aware of women with attractive breast features. Throughout the literature, it is described that women with large, non-ptotic (i.e., firm) breasts are associated with being more fertile, youthful, and attractive [21–24], which may influence other women's vigilance when around women with these preferred features. Women are likely to rate other women displaying their breasts (i.e., cleavage exposure) negatively, such as viewing them as sexually permissive [25]. In Ghanaian women, for instance, exposing the breasts is perceived as being sexually promiscuous, which may lead women to be perceived as direct competitors [26]. Moreover, women are less likely to introduce their current partners to other women with a breast morphology that is attractive to men, such as large non-ptotic breasts [27]. An attractive breast morphology is also likely to elicit intrasexual competitive behaviors among women. For instance, women are more likely to enhance their behavior and wear revealing clothing when primed with breast images that show a large non-ptotic breast morphology [28]. Furthermore, research has shown that women rate women with exposed or visible nipple erection as sexually promiscuous and less intelligent [29]. They are also more likely to socially exclude these women and report more negative emotions when primed with women with exposed nipple erection [30,31]. Dispositional levels of intrasexual competition in women also contribute to their degree of perception of other women's physical appearances. Women who are more intrasexually competitive are more likely to increase their levels of physical enhancement when primed with women with larger breast sizes [28]. This suggests that dispositional levels of intrasexual competition, in addition to conditional priming (e.g., scenarios of partner threat), may influence women's perceptions of other women.

The current study investigated the role of breast morphology (i.e., breast size and ptosis) in affecting women's likelihood of engaging in verbal and indirect aggression in a predominantly Hispanic sample of women. Considering that men are attracted to women's breasts because they have reproductive relevance, we tested whether women were more likely to derogate women with certain breast morphologies, as achieved via image manipulation to show variations in breast size and ptosis (levels of sagging), by measuring their verbal and indirect (i.e., gossip, rumor spreading) aggression. Women may gain an advantage from engaging in intrasexually competitive strategies that are aimed at maximizing the harm to a victim while incurring a low cost to themselves [8,9]. Therefore, we predicted the following: (1) women would apply rival derogation tactics, such as verbal and indirect aggression, towards other women with large non-ptotic breasts,

and (2) their rival derogation tactics would be associated with the women's dispositional levels of intrasexual competition.

2. Materials and Methods

2.1. Participants

A G*Power analysis for a 4 (breast: A-, B, C-, and D-cup) \times 3 (ptosis: non, low, and high) repeated-measures design indicated that 71 participants were needed to detect a small to medium effect ($f = 0.10$, 80% power). One hundred and fourteen predominantly Hispanic women ($M = 23.82$, $SD = 5.51$) from Texas A&M International University participated in this online study in exchange for course credit. Women in this study were self-identified heterosexuals. In our sample, 29% of the women reported being single and 71% reported being in a relationship. The sample demographics consisted of Hispanic ($n = 111$) and white ($n = 3$) participants.

2.2. Measures

2.2.1. Breast Stimuli

The breast stimuli were adopted from Pazhoohi et al. [21]. The original image set includes 36 images with breasts manipulated for breast size (A-, B-, C-, and D cup), intermammary distance (small, intermediate, and large), and ptosis (non, low, and high), which can be described as levels of sagginess. Lower levels of ptosis (e.g., non-ptosis) indicate a firmer breast appearance while higher levels (e.g., high ptosis) indicate a saggy appearance. To reduce the number of images presented, we elected to use the intermediate level of intermammary distance and keep the 4 levels of breast sizes and 3 levels of breast ptosis, for a total of 12 images presented. The images were originally created in the Daz3d program. The images only include a view of the woman's lower neck to her upper torso (see Figure 1).

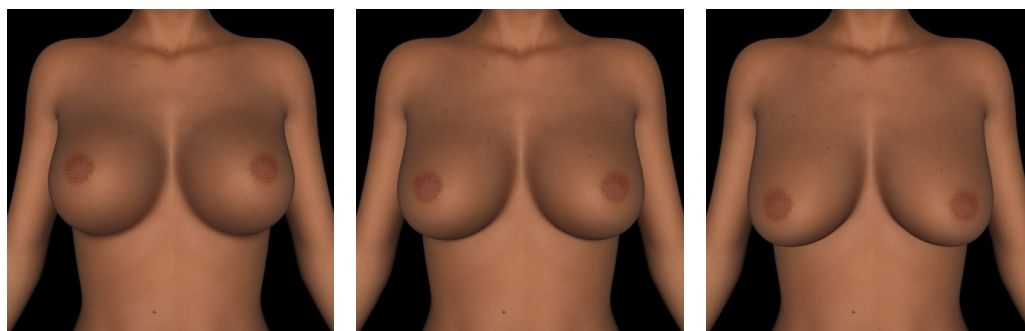


Figure 1. Examples of breast stimuli used. The breasts depicted represent D-cup breasts with non- (left), low (middle), and high (right) levels of ptosis.

2.2.2. Intrasexual Competition Scale

Individual differences in intrasexual competition were measured using the Buunk and Fisher [32] Intrasexual Competition Scale (ICS). This is a 12-item inventory where participants respond to statements such as, "I can't stand it when I meet another woman who is more attractive than I am". Responses to the instrument are measured on a Likert scale, where response options varied from "1 = strongly disagree" to "7 = strongly agree". The reliability for the instrument was a Cronbach's alpha = 0.91, which indicated that the ICS had excellent reliability. Higher scores on the measure indicate a higher propensity to engage in same-sex competition, while lower scores indicate a lower propensity for same-sex competition. The scores on the measure were averaged across the 12 items.

2.2.3. Dependent Variables

The dependent variables were 2 questions from the Mini-DIAS [33]. These questions measure one's propensity to engage in verbal and indirect aggression. Although the

complete Min-DIAS includes a question on physical aggression (i.e., likelihood of kicking, shoving), most research has pointed to men engaging in more physical confrontation [4]; therefore, we used the verbal and indirect items. We modified the Mini-DIAS to represent participants' "likelihood" of engaging in the behaviors, rather than the original response that concerns "how often" they would engage in them. For the verbal aggression question, participants were asked, "How likely are you to be verbally aggressive against the woman? (For example: yell at her, call her bad names, or say something hurtful to her)". For the indirect aggression question, participants were asked, "How likely are you to be indirectly aggressive against the woman? (For example: gossip maliciously about her, spread harmful rumors about her, or try to socially exclude her)". The responses for verbal and indirect aggression were on a 7-point scale, where the options varied from "1 = not very likely" to "7 = very likely". In this study, the results for verbal and indirect aggression were strongly correlated ($r = 0.88, p < 0.001$); therefore, they were averaged together to create a composite variable called rival derogation.

2.3. Procedure

This study was announced on Texas A&M International University's SONA research management system, titled "Perception of women's bodies". Participants were able to sign up and follow a Qualtrics link directing them to the study (IRB Approval #2021-11-02). Upon providing consent, women completed a set of demographic questions, such as age, sex, sexual orientation, ethnicity, and relationship status, and then they completed the Intrasexual Competition Scale. They were presented with instructions that they were to view images of women's breasts and provide ratings on being verbally and indirectly aggressive to the woman, which were part of the two questions from the Mini-DIAS scale that measures verbal and indirect aggression. This study had a repeated-measures design, where all women rated the 12 images. The 12 images were randomly presented, and the verbal and indirect aggression question were presented at the bottom of each image presentation screen. Once they had finished rating the images, the women were asked how realistic the images appeared and how honest they were in their ratings. When the women had completed this question set, they were dismissed. All responses were anonymous, and the question set could be completed in under 20 min.

3. Results

3.1. Descriptive Statistics

Women's overall level of intrasexual competition was $M = 1.91, SD = 1.02$. To measure the validity of the images used, the women reported their overall perceptions of how realistic the breast images were using a 1–7 Likert scale, where the response options varied from "1 = not very much" to "7 = very much". We also asked the women to report how honest they were in giving ratings using a 1–9 Likert scale, where the response options varied from "1 = not very much" to "9 = very much". Overall, the breast stimuli were rated as being realistic ($M = 5.17, SD = 1.55$), and the participants reported a high degree of honesty ($M = 8.53, SD = 1.27$) in their ratings.

Data Analysis

The data were analyzed using a 4 (breast size: A-, B-, C-, D-cup) \times 3 (ptosis: non, low, high) linear mixed-effects model, with intrasexual competition entered as a covariate, participants entered as a random effect, and rival derogation as the dependent variable. All post hoc comparisons were conducted using a Bonferroni correction. We used a linear-mixed-effects approach because there was variation among participants' responses, and we included a random intercept for each participant. Furthermore, since we wanted to test the relationship between intrasexual competition and women's ratings of breast morphology, we included women's intrasexual competition, as measured by the ICS scale in the model to test for its moderating effect. The overall variance explained for the model was $R^2_{\text{Marginal}} = 0.02$, and $R^2_{\text{Conditional}} = 0.77$.

For women's likelihood of engaging in rival derogation, there was a significant main effect for breast size, of $F(3, 1240.03) = 10.14, p < 0.001$. Women were more likely to engage in rival derogation towards women with a D-cup breast size ($M = 1.48, SE = 0.08$) compared to B-cup ($M = 1.31, SE = 0.08$) and A-cup ($M = 1.35, SE = 0.08$), but the difference was not significant compared to the C-cup breast size ($M = 1.41, SE = 0.08$) (see Figure 2). Furthermore, women were more likely to engage in rival derogation towards women with a C-cup breast size compared to those with a B-cup breast size ($p = 0.02$), but the difference was not significant compared to those with an A-cup breast size ($p = 0.42$). The main effects for ptosis, $F(2, 1240.02) = 1.33, p = 0.26$, and intrasexual competition, $F(1, 114.00) = 1.60, p = 0.20$, were not significant. The interactions between breast size and ptosis, $F(6, 1240.07) = 1.41, p = 0.20$, breast size and intrasexual competition, $F(3, 1240) = 0.83, p = 0.47$, ptosis and intrasexual competition, $F(2, 1240) = 0.83, p = 0.47$, and breast size, ptosis, and intrasexual competition, $F(6, 1240) = 0.13, p = 0.99$, were not significant. Overall, breast size contributed to rival derogation towards other women, with women with larger breast sizes more likely to be the victims of verbal and indirect aggression.

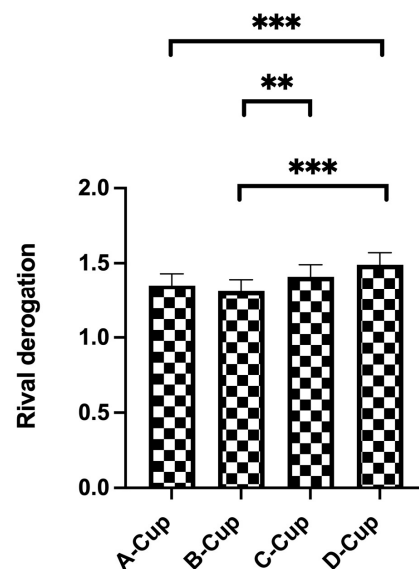


Figure 2. Mean level of rival derogation towards women displaying variation in breast size. Note: ** $p < 0.01$, *** $p < 0.001$.

4. Discussion

Physical traits that are desired by men can drive tactics of intrasexual competition in women. In the current study, we tested the role of breast morphology in impacting women's likelihood of engaging in rival derogation tactics, such as verbal and indirect aggression. Additionally, we tested whether women's intrasexual competitiveness was associated with an increase in rival derogation. Overall, women were more likely to engage in rival derogation toward women with larger breasts, most notably C and D cup sizes, compared to those with smaller breasts. We did not find any evidence that ptosis was associated with rival derogation, nor did we find support for intrasexual competition driving derogation tactics in women.

It has been suggested that women have psychological mechanisms that prompt them to compete with other women, primarily in the mating arena [10]. If men consider women with large non-ptotic breasts attractive [21], women may be more vigilant to those with such a breast morphology and engage in tactics to mitigate the risk of competition those women present [27]. The findings from the current study are aligned with previous research on women's perceptions of other women's breasts [27,28], primarily in reference to breast size. Large breast sizes in other women prompt women to perceive them as a sexual threat [27] and engage in tactics to compete with them, such as enhancing their own appearance [28].

Furthermore, considering that women are more likely to utilize non-physical means in their tactics to derogate a rival [8,9], it was predicted that women would engage in non-physical tactics to derogate women with attractive breast morphology. Indeed, our findings support the notion that women engage in rival derogation when prompted with images of women's breasts, and this is amplified if women's breasts are larger in size (C & D- cup breasts) compared to smaller breast sizes. Previous studies have shown that women will condemn other women who expose their breasts and will view them negatively [25], and this is also true for women who dress provocatively [15]. The use of rival derogation strategies through verbal and indirect means is highly effective, as they are aimed at maximizing harm to rivals while minimizing the risk of a retaliatory attack. Furthermore, derogation can also have long-lasting effects on victims, such as a damaged reputation, which may affect their reproductive opportunities [5]; and if the perpetrator of the derogation is attractive, it can positively benefit her [16].

Contrary to our hypotheses, breast ptosis and dispositional levels of intrasexual competition were not associated with verbal or indirect aggression. Prior research has established an association between breast ptosis and perceived indicators of a woman's reproductive value, attractiveness, and youthfulness [21–24]. It has been hypothesized that this may lead women to feel threatened by those with non-ptotic (i.e., firm) breasts, potentially leading to aggressive behaviors as a form of rivalry [27,28]. However, the findings from the current study diverge from this hypothesis, suggesting that women do not necessarily resort to aggression, either verbally or indirect, against others with non-ptotic breasts. The results further imply that while larger breast sizes may provoke aggressive rival derogation tactics, ptosis does not have the same effect. One argument could be that breast ptosis is often a marker of a woman's age, as ptosis increases as women grow older [24]. Our participants were young, and they may pay more attention to breast size as that is more easily discernible among women their age compared to levels of sagging; therefore, they do not consider women as competitive rivals based on variations in ptosis. This proposition highlights a need for further research in order for us to comprehensively understand the nuances of our findings. Moreover, in the present study, women's dispositional levels of intrasexual competition were not associated with their verbal or indirect aggression. Previous research has pointed out that women who engage in greater intrasexual competition may enhance their appearance when primed with women with large non-ptotic breasts [28]. This suggests that given the strong importance men place on women's breast morphology, most notably size, women, in general, are attentive to this factor. We propose that their attentiveness to breast morphology leads women to engage in derogation regardless of their dispositional levels of intrasexual competition.

Limitations

The current study did not test for state-dependent competitive scenarios, which may be achieved by incorporating an intrasexual competitive priming task. Research has shown that priming intrasexual competition by using a partner threat task can increase derogation tactics in women, such as rating them less favorably or in preventing their partner from interacting with an attractive woman [34]. Therefore, using a partner threat prime to investigate verbal and aggressive behavioral tactics offers a fruitful avenue for research. This study is also limited in the breast morphological features used, such as relying only on the breast size and ptosis. These factors were selected from the Pazhoohi et al. [21] image set to reduce the number of repeated stimuli for participants, adopting 12 images rather than the original 36. Nonetheless, the intermammary distance or cleavage could be incorporated in future studies. Moreover, it is of interest to test the correlation of derogation tactics with breast morphology when clothed women are presented, rather than the nude image set used. It is unlikely that women will be viewing other women completely naked; therefore, employing a study similar to that of Ayers and Goetz [25], where women's cleavage is the only part of their chest exposed, will increase the ecological validity. Also, the role of nipple erection could be considered, given recent research on how women may

socially exclude other women whose nipples are visibly erect [29]. Furthermore, the use of a single item each to measure verbal and indirect aggression is a limitation of the present study. Using multiple measures for these constructs in future studies could add to the validity of the investigation of aggressive behaviors. Additionally, our findings represent a single study of women from a university sample, and future studies could expand these findings by using a more diverse sample or implementing a cross-cultural comparison. One approach that could be beneficial to enhance the significance of the findings produced is that of Widman et al. [35], where measures of physiological activity (e.g., pupil dilation, heart rate) are used to gauge women's levels of competition and vigilance. Lastly, there are cross-cultural variations in perceptions of women's breasts. The current study focused on a primarily Hispanic female sample, for which a previous study showed that larger breasts were considered threatening and were associated with increased intrasexually competitive behavior [28], but larger breasts are not always perceived as sexually attractive [36,37]. This warrants further exploration of the cultural dynamics of intrasexual competition and women's breast morphology.

5. Conclusions

In conclusion, our research provides valuable insights into the dynamics of female intrasexual competition, particularly highlighting the greater significance of breast size than ptosis in driving rival derogation tactics like verbal and indirect aggression. Contrary to our initial hypotheses, ptosis did not emerge as a factor influencing such competitive behaviors, nor did the dispositional levels of intrasexual competitiveness correlate with increased derogation tactics. Instead, the findings underscore that larger breast sizes are a more potent trigger for rivalry among women, leading to strategic non-physical derogation tactics.

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