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Intra- and Intersexual Mate Competition in Two Cultures

A Comparison of Women's Response to Mate Competition with Women and Gender-Nonbinary Males in Samoa and among the Istmo Zapotec

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Abstract
The present study examined women's mate competition tactics in response to female and feminine-male rivals in two cultures in which competition against both occurs. In Samoa and the Istmo Zapotec (Southern Mexico), women not only compete with other women (intrasexually) but also compete with rival feminine males (*intersexually*) in order to access/retain the same masculine men as sexual/romantic partners. Using a mixed-method paradigm, women were asked about their experiences of intra- and intersexual mate competition, and these narratives were recorded. The tactics reportedly employed by participants, and those attributed to mate competitors, were categorized according to established taxonomies of mate competition tactics, and their frequencies compared. Within-culture, the likelihood that participant women had ever experienced intra- and intersexual mate competition did not differ. Furthermore, participants reported a similar pattern of behavioral tactics whether their rival was another woman or a feminine male. These included benefit provisioning tactics during mate acquisition and cost-inflicting tactics during mate retention. Similarly, the mate competition tactics attributed to rival women and rival feminine males bore a striking resemblance, focused on enticing target men. Results highlight the mate competition tactics employed by women outside of a Euro-American context, and the way cultural factors impact mating landscapes presumed to be exclusively heterosexual. The presence of feminine males, alongside masculine men's willingness to engage in sexual activity with them, induces women in such cultures to compete intersexually in comparable ways to intrasexual competition with rival women.

Keywords Intersexual mate competition · Male androphilia · Cross-cultural research

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Acquiring and retaining a mate has been a recurrent adaptive problem among humans (Buss & Schmitt, 2019; Darwin, 1871). Differential parental investment (Trivers, 1972), including females' obligate care and males' greater variability in reproductive potential, has created sex differences in mate preferences (Buss, 1989; Conroy-Beam et al., 2015), and subsequent sex differences in mate competition tactics (Buss, 1988a, b; Fisher & Cox, 2011; Walters & Crawford, 1994). Although the sexes largely employ the same behavioral repertoire of mate competition tactics, there are some sex differences in the frequency with which these tactics are employed. For example, males are more likely to advertise status and resources, whereas females are more likely to emphasize youth and beauty (Buss, 1988a, b; Buss et al., 2008). Traditional models of mate competition and selection emphasized male competition followed by female choice (Darwin, 1871; Trivers, 1972). More recent theorizing has explicated the numerous ways in which both males and females compete intrasexually, with each sex then exercising mutual mate choice for desirable opposite-sex partners (Janicke et al., 2016; Stewart-Williams & Thomas, 2013).

Evolutionary psychologists have overwhelmingly examined human mating psychology as if interactions between reproductively viable partners (i.e., heterosexual interactions) were cordoned off entirely from same-sex interactions where no reproductive potential exists (e.g., Buss 2013; Davies & Shackelford, 2015; Fisher & Cox, 2011; Stockley & Campbell, 2013; Walters & Crawford, 1994), although some notable exceptions are documented (Bailey & Zuk, 2009; Denes et al., 2015; Sagarin et al., 2012; Scherer et al., 2013). This approach is understandable given that the vast majority of males and females are opposite-sex attracted, and thus most human sexual behavior is heterosexual (Bailey et al., 2016). However, theoretical lenses presuming heterosexual mating, or exclusively heterosexual behavior, fail to capture a more complex (and interesting) reality—reproductive and nonreproductive sex have developed and evolved in concert, with each reciprocally influencing the other (Bailey & Zuk, 2009; Vasey, 2006).

When males and females prefer the same sexual partners, who themselves behave in a bisexual manner, then *intersexual* mate competition can ensue (Vasey et al., 2014). Anecdotal accounts of intersexual mate competition exist for four avian and 14 mammalian species, including humans (Vasey et al., 2014). It seems likely that many potential examples of intersexual mate competition have gone completely unreported to date because researchers lack any sort of theoretical framework for even *recognizing* the existence of such interactions, let alone interpreting them. Quantitative research indicates that intersexual mate competition routinely occurs in certain Japanese macaque (*Macaca fuscata*) populations (Vasey, 1998). Similarly, recent cross-cultural research demonstrates that intersexual mate competition can manifest at appreciable rates among humans (Semenyna et al., 2020, 2022), with the incidence of such competition varying by cultural context.

In Euro-American contexts, intersexual mate competition between females and males for male sexual partners is rare, and women dismiss such "competition" as trivial when it does occur (Semenyna et al., 2020). This is because bisexual behavior among Euro-American men is relatively uncommon (Bailey et al., 2016), and exclusively same-sex attracted males (i.e., "gay" cisgender men) typically engage in

sexual interactions with one another. As such, the 2–4% of the male population who are gay men (Bailey et al., 2016) inhabit a mating enclave that is largely separated from heterosexual men and women. The same is not true in all cultures.

Unlike Euro-American contexts, where male same-sex sexual interactions typically occur between two cisgender "gay" men (i.e., *homogendered* relationships) (Bailey et al., 2016), in numerous cultures outside of Euro-America, cisgender men engage in same-sex behavior with a partner who is a natal male but occupies a culturally recognized gender category that exists beyond the "man" or "woman" binary (i.e., *heterogendered* relationships) (Murray, 2000; Nanda, 2014; Whitam, 1992, 1997). In such cultures, male androphilia (i.e., sexual attraction to adult males) is predominantly expressed in a feminine form that might be labeled "transgender" from a Euro-American perspective (e.g., Nanda 2014; VanderLaan et al., 2013). This expression of male androphilia is common in many cultures; geographically dispersed examples include the *bissu* of Sulawesi, the *hijra* of India, the *xanith* of Oman, the *'yan dandu* of Nigeria, and the *sao praphet song* of Thailand (Murray, 2000; Nanda, 2014).

In Samoa, natal males who are androphilic typically present in a noticeably feminine manner and are known as *fa'afafine*, a nonbinary gender category which translates to "in the manner of a woman" (Vasey & VanderLaan, 2016). Similarly, among the Istmo Zapotec of Oaxaca, Mexico, such males are known as *muxes* (Mirandé, 2016). In both locales, virtually all fa'afafine and muxes report exclusive androphilia and frequently engage in sexual interactions with masculine men who report predominant sexual attraction to women (i.e., gynephilia) (Gómez et al., 2017; Gómez Jiménez et al., 2020; Mirandé, 2016; Petterson et al., 2015, 2016, 2020). Fa'afafine and muxes freely acknowledge their male morphology (including male genitalia) and enjoy reasonably high acceptance of their gender expression and nonbinary identities, which are readily observable, widely understood, and occasionally celebrated within their respective cultures (Miano Borruso, 2002; Mirandé, 2017; Semenyna & Vasey, 2017). The population prevalence of both Samoan fa'afafine and Istmo Zapotec muxes is ~3–6% of all males (Gómez et al., 2018; Semenyna et al., 2017), a prevalence of exclusive male androphilia consistent with the frequency of Euro-American gay men in both the the past (Leser, 1961) and present (Bailey et al., 2016; Geary et al., 2018). The differential expression of male androphilia across cultures, and accompanying differences in gynephilic males' willingness to engage in same-sex (but *heterogendered*) sexual behavior, are leading explanations for why Samoan and Istmo Zapotec women report having experienced intersexual mate competition at drastically elevated rates (43% and 85%, respectively) relative to Euro-American (Canadian) women (15%) (Semenyna et al., 2020).

Importantly, there is some evidence that the gender nonbinary presentation of male androphilia prevalent outside of Euro-American cultures is the ancestral expression of the trait (VanderLaan et al., 2013). Specifically, societies in the Standard Cross-Cultural Sample where this feminine expression of male androphilia proliferates are characterized by a higher degree of sociocultural conditions thought to typify ancestral humans, including small-group hunter-gathering, shamanistic religious beliefs systems, and more egalitarian sociopolitical structures (VanderLaan et al., 2013). This raises the possibility that ancestral women faced both intra- and

intersexual mate competition, perhaps creating selection for specific tactics in the face of each. It is thus essential that studies seeking to understanding the evolution of intersexual mate competition include data from cultures where this form of male androphilia is expressed. The tactics used by women and rival feminine males during intersexual mate competition in Samoa and the Istmo Zapotec were reported by Semenyna et al. (2020), who used narratives of mate competition interactions collected from women in these cultures. Semenyna et al. (2020) did not report any data on *intrasexual* mate competition between women. As such, the present study reports additional data pertaining to women's intrasexual mate competition with rival women, allowing for novel analysis and insights.

Because no previous work has compared the tactics employed during intrasexual mate competition with those employed during intersexual mate competition, the present study sought to understand whether participants respond similarly or dissimilarly to female and feminine male rivals, and whether the tactics female participants attributed to rivals were comparable. This was examined in mate acquisition contexts, where neither the participant woman nor her rival were partnered with the target man when competition commenced, as well as mate retention contexts, where participants recounted defending their current partners from the advances of a rival.

Attempts to initially attract a mate (i.e., mate acquisition) typically entail tactics that capture the attention of a desirable target via display of appealing qualities (Buss, 1988a; Fisher & Cox, 2011). Because of this, we predicted mate acquisition tactics would primarily focus on the target man, with both participants and their rivals attempting to attract the man's attention by facilitating opportunities to interact with him, flirting, and attempting to emphasize beauty or positive personal characteristics such as kindness or intelligence (Walter et al., 2020). We predicted that the tactics reported by participants, and those attributed to both female and feminine male rivals, would be largely similar, with all competitors focusing on alluring the target man with flirtatious attempts to solicit his attention. However, males are more likely to use tactics such as resource display and physical confrontation of rivals (Buss, 1988a, b), and the mating psychology of androphilic males tends to be similar to that of gynephilic males (Bailey et al., 1994; VanderLaan & Vasey, 2008). Because of this, we predicted that fa'afafine and muxes would be more likely to employ tactics such as resource display, overt sexual solicitations of target men, and more direct confrontation of mate competition rivals (i.e., women).

Mate-retention competition involves maintaining an existing partnership or defending a current mate from other interested parties (i.e., "mate-poachers") (Buss, 1988b; Buss & Shackelford, 1997; Lopes & Shackelford, 2018). Because partnered women have a vested interest in defending their mate against *any* interloper, regardless of whether the interloper is a rival woman or feminine male, we anticipated that participants would report similar tactics during mate-retention competition. This was predicted to include vigilance (i.e., keeping a watchful eye on a partner), guarding their mate from interacting with others, and making bids to secure the relationship by affirming commitment or threatening (emotional) consequences if they stray. However, because only intrasexual mate competition poses an actual conception risk (Sagarin et al., 2012), and thus an elevated danger of a man abandoning his partner and switching to a new mate (Buss et al., 2017), it is possible that participant women

will report heightened mate-retention tactics in response to women, as opposed to feminine males. Regarding the rivals in mate-retention competition, it was unclear a priori whether the tactics attributed to rival women would differ from rival feminine males. Because mate-poaching is "mate acquisition" from the poacher's perspective, we predicted that both women and feminine males would direct their attention toward the target man, aiming to entice him with flirtatious direct contact and sexual inducements. Once again, we predicted that fa'afafine and muxes would be more likely to employ tactics such as resource display, overt sexual solicitations, and direct confrontation of rivals when attempting to poach mates from women.

Methods

Ethical Approval

All study measures were approved by the Human Subject Research Committee at the authors' university. A Samoan research visa was obtained from the Samoa Immigration Office with the support of the Samoan Fa'afafine Association. Canadian foreign nationals and US citizens are permitted to conduct research in Mexico for a period of 180 days if they have a valid passport (Consulado de Carrera de México en Toronto, 2020). In addition, however, we obtained a letter endorsing our research from the Office of the Municipal President in Juchitán de Zaragoza, Mexico. Our research was further endorsed by some of the leaders of the muxe community in Juchitán. All participants signed informed consent forms before participation and completed basic biodemographic measures, including age, relationship status, and a 7-point Kinsey-style sexual orientation measure (Kinsey et al., 1948). Data on intersexual mate competition were presented in Semenyna et al. (2020), although the present manuscript includes additional data and novel analysis of intrasexual mate competition tactics, as well as a comparison of intra- and intersexual mate competition interactions.

Participants

Participants in both Samoa and the Istmo Zapotec were recruited through a network sampling procedure that involves contacting initial participants, who then provide referrals to additional participants, and so on. Participants were compensated for their time with either 20 Samoan Tala ($7 US), or 100 Mexican Pesos ($5 US). Samoan women ($n = 128$) were interviewed on the island of Upolu in the Independent State of Samoa, a Polynesian island nation in the South Pacific. This included feasibility pilot interviews with 25 women who were asked if they had ever experienced intersexual mate competition, as well as 103 women who were asked about their experiences of both intra- and intersexual mate competition. The average age of the Samoan women was 33.96 years (SD_{age} = 11.7, range 19–70). Most women were in heterosexual relationships (26 dating, 89 married), although some ($n = 13$) were single. Nearly all women

were exclusively heterosexual (Kinsey 0), although one woman was bisexual (Kinsey 3). We also interviewed Zapotec women ($n = 100$) in the Istmo region (Juchitán and Tehuantepec districts) of Oaxaca, Mexico. The average age of the Istmo Zapotec women was 32.55 years ($SD_{age} = 10.6$, range 18–70). Most were in heterosexual relationships (18 dating, 59 married), but some ($n = 23$) were single. Most were exclusively attracted to men ($n = 93$), but some were mostly heterosexual (Kinsey 1; $n = 6$) and one was bisexual (Kinsey 3).

Women were asked whether they had ever experienced a situation in which they and a fa'afafine or muxe (depending on culture) simultaneously competed for the romantic/sexual attention of the same man. Additionally, participants were asked if they had ever experienced a situation in which they and another woman were simultaneously interested in, and competed for, the romantic/sexual attention of the same man. These competition interactions could be in the context of either mate acquisition or mate retention. Participants who answered in the affirmative were then asked to provide detailed information about how the competition unfolded. All interviews were recorded with a digital audio recorder for later analysis. Interviews in Samoa were conducted in English and Samoan, and a Samoan-speaking research assistant was present for immediate translation. All interviews in the Istmo Zapotec were conducted in Spanish and later translated by the second author.

Treatment of Data

All recounts of mate competition interactions were transcribed and translated (when necessary), then coded by two independent raters using a psychometrically validated taxonomy of mate competition tactics (Barbaro et al., 2016; Brewer & Hamilton, 2014; Buss, 1988a, b; Buss et al., 2008; Pham et al., 2014; Shackelford et al., 2005), which is reproduced in Table 1. The first author coded all stories of mate competition, as did a trained research assistant blind to study hypotheses. The second coder was trained on the definition of each mate competition tactic and a limited number of example narratives, after which all stories were independently scored. Inter-rater reliability of initial ratings was high (Samoa: $92.86 \pm 4.23\%$ agreement, mean Cohen's $\kappa = 0.69$, $SD = 0.18$; Istmo Zapotec: $92.86 \pm 4.76\%$ agreement, mean Cohen's $\kappa = 0.69$, $SD = 0.18$) and disagreements were resolved via discussion between the raters until consensus was reached. Tactics were coded as either present or absent for each competitor. Cumulative frequencies were then calculated, and the presence/absence of each tactic compared between relevant categories of competitors using 2×2 contingency tables (GraphPad, 2020). Due to the large number of statistical comparisons, attempts were made to balance Type I and Type II errors by treating two-tailed Fisher's Exact p-values as suggestive if they fell below $p = .05$ and significant when $p \leq .005$ (Benjamin et al., 2018). Suggestive differences (i.e., $0.005 < p < .05$) are only reported in the text when Post hoc Power is ≥ 0.70 (Faul et al., 2007), and we encourage readers to treat such differences cautiously.

Table 1 Mate competition coding key and definition of tactics

Target manipulation	
Direct guarding	Physically interposing oneself between target and competitor (not violence against competitor).
Vigilance	Any act that is aimed at monitoring the behavior of the target (e.g., spying on target, call to check on, checking cell phone, snoop through belongings, etc.).
Concealing target	Any act aimed at not allowing the target and competitor to interact (e.g., take target away from gathering, or avoid going altogether).
Monopolize target	Any act aimed at not allowing target to interact with others (e.g., monopolizing time, money, attention, interrupting competitor's attempts to interact with target)
Negative inducements	
Jealousy induction	(Infidelity Threat) Any act that involves threatening to begin or pursue sexual or romantic relationships with someone other than the target (e.g., talk to someone else to make target jealous).
Punish target's threat of infidelity	Any negative reaction to the target beginning or pursuing a sexual or romantic relationship with another party (e.g., become angry when target flirts with others, threaten to break up if target cheats).
Emotional manipulation	Any act aimed at making the target feel guilty (or negative) about not pursuing a relationship with the target, or about pursuing or beginning a relationship with the competitor. (e.g., "I can't live without you.")
Commitment manipulation	Any act aimed at increasing the level of commitment between the individual and the target (e.g., demand total commitment, ask to marry).
Derogation of competitor	Any statement made toward the target that downgrades the competitor (e.g., calling the competitor ugly, a slut, not taking the competitor seriously, point out flaws). Derogation of physical attractiveness, personality traits, sexuality (e.g., "slut" or "bad in bed," etc.), or general gossip (i.e., character attack).
Positive inducements	
Resource display	Any offer or provisioning of material resources (e.g., money, food, drinks, gifts) toward the target (buying gifts, food/drinks, displays of resources such as cars or expensive possessions).
Sexual inducements	Offering sex to the target, behaving in manners that are sexually suggestive, acting sexy, performing sexual favors for the target, making appeals to target's sexual interests.
Appearance enhancement	Any act that is aimed at increasing physical attractiveness, in terms of physical appearance, when in the presence of target, or when expecting to be in the presence of the target (e.g., wearing nice clothes/jewelry, being well groomed, physical betterment via exercise, etc.).
Love and caring emphasis	Any act (verbal or nonverbal) that signals the individual loves or cares for the target (e.g., compliments, listening to their problems, taking interest in their lives, saying they love the target, displaying affection).
Submission and debasement	Doing or implying that the individual will do anything that the target asks of the individual. Putting own interests aside so the target gets his or her way. (E.g., "I went along with everything my partner/target said.")

Table 1 (continued)

Direct contact (Proceptive)	Any nonsexual act that is aimed at encouraging future interaction (e.g., flirting, smiling, play with own or target's hair, brush target's arm, making the target feel at ease, seductive dancing).
Personality advertisement	Emphasizing personal attributes. Demonstrating or discussing personal abilities to appear more attractive (e.g., showing off positive attributes such as caring, helpful, nice, friendly, etc.).
Gain access	Gaining Access: Any act aimed at facilitating opportunities to interact with target, as well as taking opportunities to interact with target (≠ *Capitalizing on Opportunities*).
Competitor manipulation	
Signal possession	
Verbal signals of possession	Any verbal declaration in the presence of the target or competitor that suggests the target and individual are in a relationship (e.g., "bragged about relationship with target" or "told other that they and target were in love").
Physical signals of possession	Any physical act that suggests the target and individual are in a relationship (e.g., put arm around the target, kissed the target in front of others, holds targets hand in public).
Possessive ornamentation	When individual gives target an item that indicates they are in a relationship (e.g., ring, jewelry)
Negative inducements	
Derogate target to competitors	Degrading the target in some way to the competitor (e.g., tell other that target is "a pain," or putting down target).
Threaten competitor	(Intrasexual threats in some taxonomies): Threatening the competitor to induce the competitor to cease competing (e.g., glaring at competitor).
Violence against Rival	Any violent act directed toward the competitor (e.g., pushed, hit, kicked, or slapped rival).
Direct action	Intimidating Competitor. Any act suggesting to competitor that the competitor will lose (e.g., betting in favour of self to win the competition). Also, exhibiting anger toward competitor, or attempting to bully, intimidate, or confront rival.
Capitalize on opportunity	Waiting for opportune moments (e.g., when competitor is absent) to approach the target.
Coalitional strategies	Strategies of using coalitions to either retain or attract mate. These can employ any combination of the above strategies (e.g., vigilance, intimidation, verbal signs of possession, etc.). Any strategy that uses an existing alliance to either retain or attract a mate is a Coalitional Strategy.
Strategy matching	Either a competitor (or the participant) reporting engaging in the same behavior *after* their competitor does so (e.g., competitor 1 engages in flirting or seductive dancing, so competitor 2 does the same).

Data Availability

Raw data regarding frequency of mate competition tactics, the taxonomy of mate competition tactics coding key, and versions of the data tables with exact *p*-values,

are available on the Open Science Framework (https://osf.io/7wqsb/). Interview recordings and transcripts are unavailable, as per Institutional Ethical Requirements.

Results

Rates of Intra- and Intersexual Mate Competition

Among Samoan women, 43% (55/128) reported having engaged in intersexual mate competition for a man with a fa'afafine rival, yielding 51 intersexual mate competition events detailed enough for analysis, as reported in Semenyna et al. (2020). Among women asked about experiences of intrasexual mate competition, 57% (59/103) indicated that they had competed with a woman, although only 50 mate-retention events contained enough detail for analysis. The proportion of women who had experienced intrasexual mate competition in Samoa was slightly higher than for intersexual mate competition, although this difference did not reach traditional significance ($P = .065$, Fisher's Exact test). Because Samoan women reported so few intersexual mate acquisition events ($n = 10$), and no instances of intrasexual mate acquisition, analysis of Samoan data is constrained to mate retention events involving a woman or fa'afafine mate-poacher.

Among women in the Istmo Zapotec, 85% (85/100) reported that they engaged in intersexual mate competition for a man with a muxe rival, yielding 30 mate acquisition and 78 mate retention events. Most Istmo Zapotec women (92%) (92/100) also reported having engaged in some form of intrasexual mate competition, resulting in 53 mate acquisition and 87 mate retention events. As was the case in Samoa, the reported rates of intra- and intersexual mate competition in the Istmo Zapotec did not significantly differ ($P = .183$, Fisher's Exact test). Data from the Istmo Zapotec allows for meaningful comparison of intra- and intersexual mate competition in both acquisition and retention contests involving females and muxes.

Samoan Data

To illustrate the nature of Samoan mate competition narratives we first reproduce two accounts of mate competition. These narratives were selected because they were representative of common themes and patterns that emerged from the data discussed below. These examples have been edited slightly for clarity and to remove identifying details; they convey the similarities between participants' responses to rivals irrespective of sex or gender, and the comparable tactics of both fa'afafine and female interlopers. The first example involves intersexual mate competition experienced by a 43-year-old woman who discovered that her husband was having an affair with a fa'afafine.

> They met in the club, and they started an affair. They carried on, and he lied to me. I found out by his phone. He had the fa'afafine's number, so I dialed it,

and the fa'afafine answered. I told him, or her,[1] "why you call my husband?" And then he told me, "Who am I?" So, I told him, "He's my husband, he's *my* husband!" And he told me that they are friends, he's just a friend. But [the fa'afafine] is lying to me. Later, I saw his number again on the phone. I dialed his number again, and told him, "Don't you ever call my husband's phone again." And [my husband] always told me that he's just a friend, but he's a liar! My husband's mate at work told me that my husband slept with the fa'afafine.... So, I found my husband and the fa'afafine in the [hotel]. I went there. I found out that they slept together. We had a big fight in the lobby. I told the fa'afafine to "fuck off." We had a fight! I slapped her face, and she slapped me. My husband tried to separate us, and told me to leave. I said, "I'm not leaving without you." And then she came back, and [my husband] told me to leave, so I just left the hotel and went home. We had another big fight when he came home. I said, "Just go away." I told him to leave me alone. He said to me that "it's only a friend." He always *pepelo* [lie], but I asked him to stay with me, and never go to the fa'afafine anymore. He said he stopped, but I never believed him.

This narrative prominently illustrates several tactics, most noticeably the way the fa'afafine gained access to the target man, creating plans with him that culminated in a sexual liaison (i.e., a sexual inducement). The woman, vigilant of her husband's behavior and hearing about the affair via gossip, directly confronted the rival fa'afafine, relaying her possession of her mate verbally. When this failed, the woman sought out her husband and his fa'afafine lover, confronting both in the hotel lobby and coming to blows with her rival. Last, the woman pleaded with her husband, making clear the hurtful nature of his actions (emotional manipulation), while also seeking reassurance of his commitment (commitment manipulation) by asking him to remain in the relationship. Although direct violence against rivals was rare in our data, other tactics in this narrative conform to the broad patterns reported across participants and tabulated below.

Similar patterns emerged from Samoan women's stories of intrasexual competition. For example, a 49-year-old married participant had this to say when asked about mate competition with a woman:

I'm stressed with my husband right now. It is happening here in this village. I didn't know anything about it, but my husband went to the minister in the church and asked him if he could do confession because he had sins. Then, on Sunday the minister was preaching in church and said there is a man with a wife, and he is cheating on her with a girlfriend. Then the minister said their names, and I was shocked when I heard that it was my husband and another woman in the village! The other woman was married to another man in the village, but she was still having an affair with my husband. After church I went

[1] Samoans in general, and often fa'afafine themselves, refer to fa'afafine using both masculine and feminine pronouns, even within the same narrative or sentence, as illustrated in this passage. This is not intended as a slur toward fa'afafine by participant women, nor is it taken as insulting by fa'afafine; it simply reflects the fact that fa'afafine are readily acknowledged as being natal males.

> home with my husband, and we had a fight. I said to my husband "What are you doing? See what the pastor said in church? What are you doing with that woman? And what are you doing to me? That woman is a slut!" So, then my husband apologized on his knees, and I accepted the apology. The village fined my husband three big pigs for what he did. The woman's family was fined too. After that the woman moved away. I'm still suspicious about what my husband does. I have suffered a lot from this. I don't know how to talk to my husband now and I don't trust him.

This narrative is a succinct illustration of the often indirect and hidden means of competition between women. A rival woman had an ongoing affair (sexual inducement) with the target man. The affair was revealed publicly, as in many other instances of men's affairs with both fa'afafine and women which were subject to village gossip. The participant woman responded like many we interviewed, getting angry with her husband about the affair (punish target infidelity), making emotional appeals about how hurtful his actions were (emotional manipulation), and derogating her rival, ultimately eliciting an apology and affirmation of commitment.

Table 2 presents data for both inter- and intrasexual mate competition in Samoa.[2] As noted above, only data for mate poaching/retention interactions are reported. The first two columns of Table 2 report Samoan participants' behavior in response to female versus fa'afafine interlopers, which evidenced no significant differences. Overall, women's response to a rival involved directing the majority of their mate retention tactics toward their partners (i.e., men). Typically, this involved directing negative inducements toward their mate, as well as being vigilant against the advances of their rival, and this pattern was true whether their rival was a woman or a fa'afafine.

The third and fourth columns in Table 2 compare the reported behavior of female and fa'afafine rivals, which are remarkably similar. Individuals who made mate-poaching attempts focus most of their efforts on the target man, employing direct contact (flirting, etc.) as well as sexual inducements in a high number of competitive interactions. There was suggestive evidence that fa'afafine used more target manipulation ($P = .008$, Post hoc Power = 0.78) and appearance enhancement ($P = .021$, Post hoc Power = 0.70) than rival women. Only one significant difference emerged, such that rival fa'afafine reportedly engaged in more overall negative inducement tactics directed at participant women, although rates of these tactics were generally low.

During mate-retention competition, the behavior of Samoan participant women was different from that of the interloper in both intrasexual (columns 1 vs. 3) and intersexual (columns 2 vs. 4) contests. During intrasexual competition, participant women used significantly more vigilance toward their partners, more emotionally punitive behaviors, more threats toward their competitor, and more coalitional strategies than female rivals. Conversely, there was suggestive evidence that

[2] Semenyna et al. (2020) report data on intersexual mate competition (i.e., the second and fourth columns in the data tables). Data pertaining to intrasexual mate competition (i.e., the first and third columns in the data tables) have not previously been reported, analyzed, or compared with intersexual mate competition.

Table 2 Mate retention tactics in Samoa

	Participant Behavior (% Reporting)		Competitor Behavior (% Reported)	
	Woman Rival ($n=50$)	*Fa'afafine* Rival ($n=41$)	Woman ($n=50$)	*Fa'afafine* ($n=41$)
Target Manipulation	94	90.2	70*	92.7
Guarding	56	53.7	2*	12.2*
Direct Guarding	2	4.9	0	0
Vigilance	48	41.5	2*	4.9*
Concealment	6	14.6	0	4.9
Monopolize	6	7.3	0	4.9
Negative Inducements	76	70.7	4*	2.4*
Jealousy Induction	0	2.4	0	0
Punish Threat of Infidelity	52	43.9	0*	0*
Emotional Manipulation	36	39.0	0*	0*
Commitment Manipulation	28	22.0	0*	0*
Derogate Competitor	8	2.4	4	2.4
Positive Inducements	23	24.4	68*	87.8*
Resource Display	0	4.9	10	26.8
Sexual Inducement	4	2.4	32*	46.3*
Appearance Enhancement	4	9.8	2	17.1
Love and Caring	14	12.2	8	7.3
Submission & Debasement	4	2.4	0	0
Direct Contact	4	4.9	34*	56.1*
Personality Advertisement	2	0	2	2.4
Gain Access	0	0	14	29.3*
Competitor Manipulation	46	34.1	18*	39.0
Signal Possession	32	24.4	18	26.8
Verbal Possession Signals	32	19.5	12	14.6
Physical Possession Signals	0	4.9	8	14.6
Possessive Ornamentation	0	0	0	0
Negative Inducements	40	19.5	**2***	**22.0**
Derogate Target	6	0	0	4.9
Threaten Competitor	20	7.3	0*	9.8
Violence against Rival	10	4.9	0	9.8
Direct Action	10	14.6	2	7.3
Capitalize on Opportunity	0	0	26*	24.4*
Coalitional Strategy	46	31.7	2*	7.3
Strategy Matching	6	9.8	8	9.8

Comparisons were made for both global tactic categories (**bold**) as well as the individual competitive tactics comprising these categories. An asterisk in the last two columns indicates a significant difference ($p<.005$) within competition types such that the competitors' behavior differs from that of participants. **Bold** numbers indicate a significant difference ($p<.005$) between the first two columns (participant response to female vs. fa'afafine rival), or the second two columns (female competitor vs. fa'afafine competitor behavior)

interloping women used more bids to gain access to the target man ($P = .013$, Post hoc Power = 0.72), and significantly more capitalizing on opportunities to interact with him, positive inducements, flirtatious direct contact, and sexual provocation, than participant women. During intersexual competition, there was suggestive evidence that participant women used more coalitional strategies ($P = .011$, Post hoc Power = 0.77), and significant evidence that they used more vigilance and emotionally punitive behaviors than rival fa'afafine. These rival fa'afafine were significantly more likely to capitalize on opportunities to interact with, or gain access to, the target man, after which they employed significantly more flirtatious direct contact and sexual inducements, and suggestive evidence of more resource display ($P = .013$, Post hoc Power = 0.74) relative to participant women.

Mate Acquisition in the Istmo Zapotec

We also provide representative illustrations of mate acquisition stories from the Istmo Zapotec before discussing the data. The first comes from a 29-year-old married woman, who recounted a time she competed against a muxe to initially attract her mate:

> Since we are in a society where muxes are part of it, we take it as normal and funny [to compete]. I liked a guy who was handsome. At a party, a muxe started to flirt with the guy. When we danced, the muxe tried to graze him and would blow kisses from a distance. The guy would just laugh.... He always maintained his distance with the muxe. A woman always tries to bring out her best qualities so that a guy would notice her. I tried to dress up, be gentle, and try to understand him. He would say that I was very beautiful, that he liked me a lot, he liked how I danced, how much I read, and he liked what I dedicated myself to. The guy never flirted with the muxe. He never paid attention to the muxe. I told the guy, "That 'girl' likes you." He didn't say anything about it. The muxe said, "You'll have a better time with me." The guy just made a sign meaning no thank you. Eventually, the guy and I started dating and now he is my husband.

Here, the intersexual mate competition rivals focus all attention on the target man. The muxe flirtatiously touches the man and attempts to capture his attention. The participant is similarly flirtatious, trying to accentuate her beauty (appearance enhancement) and positive attributes (personality advertisement), and even drawing attention to the fact that the muxe competitor is feminine but not female.

Instances of intrasexual mate acquisition were similar, with female rivals utilizing comparable tactics to attract the target man. One participant, a 35-year-old woman, recounted a time she competed with a friend, with each rival trying to enhance their appearance, flirt with the target man, and facilitate opportunities to interact with him (gain access):

> We both liked the person who is now my husband. We both did our thing without the other knowing in order to conquer the guy. When she found out, we fought and distanced ourselves. We both flirted with him. I would say to him

that I liked him a lot, that I wanted to be his girlfriend. I would invite him to get-togethers, and eventually we became a couple. She did the same things, but when she found out that we were going out, she got mad at me and stopped talking to me. I would dress up. You know how we women are [participant laughs]. She would do the same. I'm not sure whether he would flirt with her. I didn't know that she liked him. I found out when I started dating him. He told me that she flirted with him. I only saw them together when there were other people. We never talked about him. When she found out, she came wanting to fight. She said vulgar things, and asked, "Why? I thought you were my friend." I said, "But you never told me that you also liked him." I had no idea. I knew that she liked someone else because she told me. She knew that I liked him because I told her. She would talk to me about someone else. I said, "Why didn't you tell me? It's not my fault that he chose me."

Table 3 reports mate acquisition tactics in the Istmo Zapotec. No significant differences were found between participants' behaviors during intra- or intersexual mate competition (columns 1 vs. 2). Participants directed most behavior at the target man, rather than toward their rivals. This typically involved direct contact with the target man and appearance enhancement, regardless of competitor sex. Similarly, both female and muxe competitors directed most attention at the target man, using positive inducements such as flirtatious direct contact. Compared with female rivals, there was suggestive evidence that muxe rivals were more likely to direct positive inducements toward the target ($P = .006$, Post hoc Power = 0.82), including sexual provocations ($P = .009$, Post hoc Power = 0.71), and emphasizing love and caring ($P = .015$, Post hoc Power = 0.73; see the third and fourth columns in Table 3). As predicted, all individuals in these mate acquisition interactions primarily sought to impress the target man with positive inducements, although muxes employed these tactics more vigorously.

Mate Retention in the Istmo Zapotec

Overall patterns in mate retention competitions are again illustrated by participant narratives that exemplify broader patterns in the data tabulated below. Our first example comes from a 58-year-old woman, who relayed an instance where she defended a past partner from the advances of a muxe.

It happened on one occasion with the partner I was with before. I knew the muxe as well, but he went too far.[3] I didn't do anything about it. I didn't show my anger. When we got home, I gave him an ultimatum. The next time that he talked to the muxe, it would be over. It didn't happen again. We ended the relationship for other reasons. The muxe got close to him and said, "How handsome you are." The muxe touched his shoulder and was slowly lowering

[3] Much like Samoan women, Istmo Zapotec women would frequently vacillate between masculine and feminine pronouns when referring to a muxe.

Table 3 Mate acquisition tactics in the Istmo Zapotec

	Participant Behavior (% Reporting)		Competitor Behavior (% Reported)	
	Woman Rival ($n=53$)	*Muxe* Rival ($n=30$)	Woman ($n=53$)	*Muxe* ($n=30$)
Target Manipulation	75.5	80.0	81.1	96.7
Guarding	18.9	16.7	20.8	20
Direct Guarding	1.9	0	0	3.3
Vigilance	11.3	10.0	7.5	6.7
Concealment	3.8	6.7	0	3.3
Monopolize	3.8	0	9.4	10.0
Negative Inducements	26.4	36.7	22.6	26.7
Jealousy Induction	5.7	0	0	0
Punish Threat of Infidelity	5.7	6.7	3.8	0
Emotional Manipulation	17.0	16.7	5.7	3.3
Commitment Manipulation	7.5	10.0	3.8	3.3
Derogate Competitor	1.9	13.3	11.3	26.7
Positive Inducements	66.0	63.3	66.0	93.3*
Resource Display	0	3.3	3.8	20.0
Sexual Inducement	3.8	6.7	3.8	23.3
Appearance Enhancement	39.6	23.3	11.3*	13.3
Love and Caring	24.5	36.7	9.4	33.3
Submission & Debasement	1.9	3.3	0	0
Direct Contact	37.7	46.7	54.7	76.7
Personality Advertisement	3.8	6.7	1.9	0
Gain Access	28.3	30.0	30.2	23.3
Competitor Manipulation	37.7	46.7	52.8	66.7
Signal Possession	22.6	26.7	26.4	46.7
Verbal Possession Signals	22.6	26.7	26.4	43.3
Physical Possession Signals	1.9	0	0	3.3
Possessive Ornamentation	0	0	0	0
Negative Inducements	24.5	33.3	35.8	46.7
Derogate Target	0	3.3	1.9	6.7
Threaten Competitor	5.7	3.3	17.0	10.0
Violence against Rival	1.9	0	0	0
Direct Action	17.0	26.7	18.9	40.0
Capitalize on Opportunity	5.7	3.3	15.1	6.7
Coalitional Strategy	9.4	10.0	7.5	6.7
Strategy Matching	13.2	20.0	9.4	20.0

Comparisons were made for both global tactic categories (**bold**) as well as the individual competitive tactics comprising these categories. An asterisk in the last two columns indicates a significant difference ($p<.005$) within competition types such that the competitors' behavior differs from that of participants. **Bold** numbers indicate a significant difference ($p<.005$) between the first two columns (participant response to female vs. muxe rival), or the second two columns (female competitor vs. muxe competitor behavior)

his hand. I was focusing more on my partner's reaction than on the muxe. He knew by how I was looking at him that I wasn't agreeing with what was happening. He then tried to stop things with the muxe. I said a lot of things with my looks. I never talked to the muxe. The muxe understood that I got mad. I don't know if they saw each other again, and the muxe never approached me. When we got home, I said, "I don't want that to happen again and I don't want you to talk to the muxe again, at least not in front of me. If you do, the relationship is over." My partner told me, "It wasn't my fault. You saw it. We were there talking, he came and.. . ." I said, "Well, yeah. I didn't see anything, but maybe you gave him a signal while I wasn't looking." He said, "No. I don't do that. The muxe and I know each other. 'Hey, how are you? Come meet my family,' but that's all it was. Maybe it was because he was drunk that he did that." The muxe dressed like a woman. I think that something probably happened between them before. That's why the muxe was so blunt. That was what I thought, but I never proved it.

A somewhat analogous account of intrasexual mate competition comes from a 19-year-old woman, who recalled a time she defended her boyfriend from a rival woman who sought his attention.

I had a year and a half with my boyfriend. He was a waiter and worked in a place where a lot of girls came in. One day I had a desire to go to his work. I asked for him and they told me where he was. He was attending some female customers. I sat down to see what he would do. The girls would flirt with him. He would only laugh. When he looked at me, he went running towards me. We talked and I told him that I just wanted to see him. He told me he was working, and I said, "I can see how much you're working.... Be careful because I noticed those girls are after you." He just laughed and said, "I have to get back to work." He told me those girls would come three times a day and would ask for him specifically, especially one of them. She even asked for his number and sent him messages. I read the messages. She said, "hey, baby. Good night." He would sometimes message her back. He would flirt a little bit. I got jealous. I told him if he was going to keep doing that, then.... It made me upset. I had told him that if I saw him with another woman, I would end the relationship. He said that that wouldn't be the case. I talked with her through the phone. I got mad when I saw the messages and I talked to his mom about it. We read the messages together and we decided to call her. His mom asked him, "are you with [participant's boyfriend]?' The girl said no, but she hesitated. She said, "no, we're just friends." I also called her and said, "tell me the truth. It upsets me that you send him messages and that he responds. If you want to be together then go ahead and I'll step aside." She said, "of course not. If it upsets you, I'll stop doing it." He erased the messages and blocked her and that was that.

Both narratives of mate retention in the Istmo Zapotec illustrate the same basic pattern. An interested rival capitalizes on opportunities to interact with the target man, attempts to facilitate further interaction and communication with him,

and engages in varying degrees and forms of flirtation. Both participant women responded with vigilance of their partners, and their rivals, and employed emotionally punitive tactics toward their partners to secure fidelity. The woman engaged in intrasexual mate competition pushed her tactics even further, defending her mate by enlisting his mother in a coalitional bid to confront the rival woman.

Table 4 reports the frequency of tactics used during intra- and intersexual mate retention/poaching competition. There was suggestive evidence that Istmo Zapotec participants employed more guarding ($P = .008$, Post hoc Power = 0.75), and significantly more negative inducements toward their partner when competing against a female interloper (column 1) than they did when a muxe was attempting to poach their mate (column 2). Participants also reported significantly more vigilance over their mate, and more direct action (confrontation) of their rival, when competing against a female interloper. These differences may be due to the fact that 24.4% of female participants indicated that they did nothing in response to a muxe interloper because they believed that their partners were exclusively interested in women.

The third and fourth columns of Table 4 compare the reported behaviors of female and muxe interlopers during mate poaching attempts. There was suggestive evidence that muxe interlopers were more likely to employ target manipulation ($P = .011$, Post hoc Power = 0.74) and positive inducements ($P = .015$, Post hoc Power = 0.73). Furthermore, muxe interlopers were significantly more likely to employ resource display and verbal possession signals, compared with interloping females. These subtle differences are overshadowed by broad similarities, such that all interlopers, regardless of whether they were women or muxes, tended to use positive inducements directed at the target man, including flirting, sexual inducements, and emphasizing love/caring.

Within Istmo Zapotec mate-retention competitive interactions, participants' behaviors tended to reliably differ from those of the interlopers, regardless of whether the retention competition was intrasexual (columns 1 vs. 3) or intersexual (columns 2 vs. 4). There was suggestive evidence that participant women were more likely to employ target manipulation ($P = .009$, Post hoc Power = 0.78) and direct action ($P = .014$, Post hoc Power = 0.70) than their female rivals. Furthermore, there was suggestive evidence that participant women were more likely than muxes to try to conceal the target man ($P = .014$, Post hoc Power = 0.71). The numerous significant differences between participant and rival behavior in intra- and intersexual competition show that the interloper would typically employ tactics meant to entice the target man in some way, and participants responded in turn by vigilantly watching their partner and employing tactics of negative inducement meant to secure their relationship.

Discussion

The present study sought to compare the tactics employed during intrasexual mate competition between female participants and female rivals to the tactics employed during intersexual mate competition events, wherein women engaged in mate competition against feminine, gender-nonbinary males for the romantic/sexual attention

Table 4 Mate retention tactics in the Istmo Zapotec

	Participant Behavior (% Reporting)		Competitor Behavior (% Reported)	
	Woman Rival ($n=87$)	*Muxe* Rival ($n=78$)	Woman ($n=87$)	*Muxe* ($n=78$)
Target Manipulation	**96.6**	**66.7**	83.9	96.2*
Guarding	54.0	33.3	3.4*	2.6*
Direct Guarding	0	3.8	2.3	1.3
Vigilance	**48.3**	**23.1**	0*	0*
Concealment	16.1	9.0	0*	0
Monopolize	2.3	3.8	1.1	2.6
Negative Inducements	**93.1**	**60.3**	17.2*	10.3*
Jealousy Induction	0	0	0	1.3
Punish Threat of Infidelity	**80.5**	**43.6**	0*	0*
Emotional Manipulation	**50.6**	**23.1**	2.3*	0*
Commitment Manipulation	**39.1**	**14.1**	0*	0*
Derogate Competitor	4.6	6.4	16.1	10.3
Positive Inducements	10.3	5.1	81.6*	94.9*
Resource Display	0	0	**3.4**	**23.1***
Sexual Inducement	2.3	1.3	29.9*	43.6*
Appearance Enhancement	1.1	1.3	4.6	15.4*
Love and Caring	8.0	2.6	26.4*	34.6*
Submission & Debasement	1.1	0	1.1	1.3
Direct Contact	3.4	2.6	47.1*	62.8*
Personality Advertisement	0	0	2.3	1.3
Gain Access	0	1.3	51.7*	35.9*
Competitor Manipulation	44.8	35.9	20.7*	32.1
Signal Possession	13.8	24.4	5.7	16.7
Verbal Possession Signals	10.3	20.5	**2.3**	**15.4**
Physical Possession Signals	3.4	3.8	4.6	1.3
Possessive Ornamentation	0	0	0	0
Negative Inducements	**40.2**	**17.9**	18.4*	24.4
Derogate Target	4.6	0	1.1	0
Threaten Competitor	10.3	6.4	6.9	2.6
Violence against Rival	1.1	3.8	1.1	0
Direct Action	**28.7**	**10.3**	12.6	23.1
Capitalize on Opportunity	2.3	1.3	39.1*	21.8*
Coalitional Strategy	14.9	3.8	0*	0
Strategy Matching	3.4	3.8	0	2.6

Comparisons were made for both global tactic categories (**bold**) as well as the individual competitive tactics comprising these categories. An asterisk in the last two columns indicates a significant difference ($p < .005$) within competition types such that the competitors' behavior differs from that of participants. **Bold** numbers indicate a significant difference ($p < .005$) between the first two columns (participant response to female vs. muxe rival), or the second two columns (female competitor vs. muxe competitor behavior)

of the same target man. In both Samoa and the Istmo Zapotec, the likelihood that women had ever experienced intrasexual mate competition against a woman was comparable to having engaged in intersexual mate competition against a rival fa'afafine or muxe. This is not to say that intra- and intersexual mate competition occur at identical rates in these cultures, as the vast majority of mate competition in both cultures is still likely to be intrasexual. Such a finding simply highlights the fact that intersexual mate competition is a regular occurrence in these cultures (Semenyna et al., 2020) and is embedded within the broader heterosexual mating landscape.

The features of mate acquisition competition could only be analyzed among the Istmo Zapotec, where interviews yielded a sufficient number of such events. As predicted, all individuals in these contests directed the majority of their behavior toward the target man, seeking to gain his attention by engaging in flirtatious behavior. A few significant differences emerged in mate acquisition stories. Muxes employed more positive inducements overall, including sexual inducements toward target men. This is not to say that competitors did not engage in mate acquisition tactics directed at their rivals, as a sizeable minority of competitors tried to lay claim to the target man by signaling possession or directing negative inducements toward their competitor during direct confrontations.

Comparison of tactics employed during intra- and intersexual mate retention competition showed that participant women in both cultures used largely comparable tactics. That is, both Samoan and Istmo Zapotec participant women directed most behaviors toward their male partner, engaging in guarding and emotionally punitive tactics meant to secure the relationship. This was true whether the attempted mate poacher was a woman or a feminine gender-nonbinary male. While this pattern characterized the Istmo Zapotec, participants from this culture nonetheless reported somewhat muted reactions toward muxe interlopers as compared with rival women, although it is not entirely clear why. One possibility is that rival women represent a reproductive threat (Sagarin et al., 2012), provoking a stronger reaction from women staving off the specter of partners diverting resources or relational investment. This explanation is unlikely, however, given that Zapotec women tend to view the thought of partner infidelity with a muxe as more upsetting than infidelity with a woman (Semenyna et al., 2021). It could also be that the overall pattern of tactics employed by muxes incited an altered behavioral riposte from participant women. However, because the mate-poaching behaviors of rival women and muxes were largely analogous (see next paragraph), it is most likely that participants' idle responses were driven by their beliefs about the situation and their partner's sexual preferences. Many Istmo Zapotec women expressed incredulity at the idea that their partners would have sex with a muxe and instead dismissed muxes' flirtatious advances as comical, but harmless. These same beliefs seemingly underpin Zapotec women's greater upset toward infidelity with a muxe, as such behavior would be (wrongly) taken to indicate concealed androphilia (Semenyna et al., 2021). Furthermore, muxes vary in their relative feminine/masculine presentation (Gómez Jiménez et al., 2020, 2021), and it is possible that women who did nothing in response to a muxe mate-poacher did so because muxes in those interactions presented in a relatively more masculine fashion. As such, some participants simply failed to view

muxes as genuine competitors. This assumption appears to be a mistaken one, given that 12% of mate-poaching attempts made by muxe resulted in successful seduction of the target man (Semenyna et al., 2020). This is likely a conservative estimate of muxes' sexual success given the clandestine nature of many such interactions, and women's reticence to believe rumors or evidence that their boyfriends/husbands were involved. Both factors would lower participant reports of successful mate-poaching by muxes.

During mate poaching attempts, the behavior of mate-poachers was largely comparable across sex, gender, and culture, with both women and feminine gender-nonbinary males attempting to gain access to the target man by enticing him with flirtation (direct contact) or sexual inducements. In Samoa, numerous participants communicated qualitatively that fa'afafine often competed more intensely and provocatively than rival women, but only suggestive differences in this domain were found here. It is possible this represents Type II error given that (a) the smaller number of mate competition stories obtained in Samoa lowers statistical power, (b) we adopted a more conservative significance threshold, and (c) our coding scheme quantified the presence of tactics but not their intensity. In the Istmo Zapotec, the behaviors of both female and muxe mate-poachers were substantially similar. However, muxes were more likely overall to employ positive inducements, including resource display, which is a male-typical tactic (Buss, 1988a, b; Buss et al., 2008), whereas women were more likely to engage in attempts to gain access to the target man or capitalize on fortuitous opportunities to interact with him in the absence of his female partner (see also Schmitt & Buss 2001). The former difference is consistent with qualitative documentation that some muxe entice masculine men with gifts of clothing, food/alcohol, or even money, in exchange for sex (Mirandé, 2017). The latter difference could be due to females' general tendency to engage in social and competitive tactics that reduce the likelihood of direct confrontation with rivals (Björkqvist, 1994; Campbell, 2013, 2016), and women may be especially reluctant to confront a male rival who is feminine but nonetheless male-typical in size and strength. Furthermore, numerous participants indicated that muxes were able to be flirtatious and sexually provocative in ways that would receive social opprobrium if displayed by a woman. These especially provocative bids for the attention of men may be related to fa'afafine and muxes sex-typical interest in short-term mating, an interest that would be consistent with patterns observed among Euro-American gay men (Bailey et al., 1994). Overt sexual solicitations, alongside appearance-enhancing techniques to mask male primary and secondary sex characteristics, may be necessary to entice target men who are typically more sexually interested in women.

The overall pattern of results shows that participants report employing similar tactics in both intra- and intersexual mate competition episodes. In mate acquisition contests, the behavior of women and gender-nonbinary males is largely akin, with all competitors attempting to attract and impress the target man. The overall pattern of mate-retention competition was similar in both intra- and intersexual contests as well, with participant women describing cost-inflicting behavior toward their partner (e.g., punish threat of infidelity, emotional manipulation), whereas both female and gender-nonbinary male interlopers directed benefit provisioning behaviors at the target man (e.g., direct contact), as has been found in

Euro-American research on intrasexual competition (Buss et al., 2008; Shackelford et al., 2005). It is likely that women have long faced intersexual mate competition because the ancestral form of male androphilia is the feminine expression (VanderLaan et al., 2013). However, this has not produced a unique cognitive/behavioral response (sensu Tooby & Cosmides 1992), and it appears that women's intrasexual mate competition tactics are simply coopted and applied to situations involving intersexual mate competition. In this regard, the tactics employed during intersexual mate competition interactions could be characterized as exaptations (Gould & Vrba, 1982). In addition to this insight, the present study adds valuable data regarding the cross-cultural utility of mate competition taxonomies derived from Euro-American samples (Buss, 1988a, b; Fisher & Cox, 2011; Walters & Crawford, 1994), as well as confirmation that many of the tactics employed by Euro-American women in mate acquisition and mate retention are likewise employed by women in the distinct cultures of Samoa and the Istmo Zapotec.

Some readers may be curious why we characterize intersexual mate competition in the framework of Darwinian sexual selection given that same-sex sexual behavior poses no conception risk and is of little or no reproductive consequence compared with intrasexual contests. Following this logic, fa'afafine and muxes are nonreproductive competitors, which some readers might see as compromising our suggestion that intersexual mate competition is relevant in an evolutionary sense. These feminine males certainly represent viable mate competitors, as illustrated by the fact that women in Samoa and the Istmo Zapotec responded to fa'afafine and muxe competitors in much the same way as they responded to rival women. Furthermore, we have documented that in an appreciable number of instances, feminine males won sexual access to target men (Semenyna et al., 2020), directly impacting sexual, and perhaps reproductively relevant, opportunities for women. Relatedly, sexual selection frameworks have motivated research into the ways sex ratios impact mate competition (e.g., de Jong et al., 2012; Marlowe & Berbesque, 2012; Schacht & Borgerhoff Mulder, 2015; Walter et al., 2021). Biased sex ratios are predicted to produce intensified mate competition among the more plentiful sex, who are subsequently more likely to capitulate to the preferred mating strategies of the rarer sex (Durante et al., 2012; Weir et al., 2011). In locales such as Samoa, or among the Istmo Zapotec, where fa'afafine and muxes represent ~ 3–6% of the male population (Gómez et al., 2018; Semenyna et al., 2017), these feminine males may influence sex ratios by being viable sexual partners for men, thus distorting the "female" side of these equations. Future studies could examine whether the presence of feminine androphilic males impacts women's mating psychology and mate competition motivation. Relatedly, research could evaluate how men in these cultures perceive the mating tactics discussed here, and whether certain tactics are more appealing or successful depending on their use by women or feminine males. Last, although data exist regarding women's reactions to infidelity involving women or gender-nonbinary males (Semenyna et al., 2021), it would be of interest to understand the broader social reaction to men's affairs with gender-nonbinary males as opposed to women, and whether they receive similar or differential reproach (see also Petterson & Vasey 2022).

Several limitations must be noted about the present study. First, neither sample was representative and thus cannot inform conclusive prevalence estimates of any specific type of mate competition. Second, the narratives used for documenting the features of intersexual mate competition were one-sided, with women reporting on their own behavior as well as that of their competitors. This undoubtedly impacted our results, given human tendencies to overstate their positive attributes and downplay behaviors and traits that are more negative (Blasberg et al., 2014). Because the present study focused on behavior during mate competition, it seems especially likely that participants would cast their own behavior in a favorable light, and that of their opponents as less so. Third, the qualitative analysis and coding of mate competition narratives also necessitated the loss of important contextual information, and many of the subtleties of the mate competition interactions. The true events on which participant narratives were based were undoubtedly richer in detail than our interviews captured. Additionally, many of the extant nuances that were relayed in mate competition stories were further simplified by the qualitative coding scheme that dichotomized the presence or absence of tactics but did not quantify their intensity.

Despite these limitations, and the preliminary nature of our results, the current study is promising. Our results indicate that within two unrelated cultures, a comparable proportion of women have experienced intra- and intersexual mate competition. This illustrates that the presence of feminine gender-nonbinary males, in combination with gynephilic men's willingness to engage in sexual interactions with them (Petterson et al., 2020), noticeably alters the heterosexual mating landscape. Furthermore, intersexual mate competition shares much in common with intrasexual mate competition. Not only do reproductive and nonreproductive behaviors evolve and develop in concert (Bailey & Zuk, 2009; Vasey, 2006), so too does intra- and intersexual mate competition. We hope that the present study alerts researchers to the existence of intersexual mate competition among humans (and nonhuman species), fomenting refinements to sexual-selection-based theoretical frameworks, and motivating further empirical documentation and investigation of this phenomenon.

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Data Availability The summary data associated with this research, along with further supporting documentation, are available at https://osf.io/7wqsb/.

Code Availability Not applicable.

Declarations

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

Ethics Approval The materials and methodology for this study were approved by the Human Subject Research Committee of the University of Lethbridge (#2016-046).

References

Bailey, J. M., Gaulin, S., Agyei, Y., & Gladue, B. A. (1994). Effects of gender and sexual orientation on evolutionarily relevant aspects of human mating psychology. *Journal of Personality and Social Psychology, 66,* 1081–1093. https://doi.org/10.1037//0022-3514.66.6.1081

Bailey, J. M., Vasey, P. L., Diamond, L. M., Breedlove, S. M., Vilain, E., & Epprecht, M. (2016). Sexual orientation, controversy, and science. *Psychological Science in the Public Interest, 17,* 45–101. https://doi.org/10.1177/1529100616637616

Bailey, N. W., & Zuk, M. (2009). Same-sex sexual behavior and evolution. *Trends in Ecology and Evolution, 24,* 439–446. https://doi.org/10.1016/j.tree.2009.03.014

Barbaro, Nicole, Shackelford, Todd K., & Weekes-Shackelford, Viviana A. (2016). Mothers and fathers perform more mate retention behaviors than individuals without children. *Human Nature, 27*(3), 316–333. https://doi.org/10.1007/s12110-016-9261-z.

Benjamin, D. J., Berger, J. O., Johannesson, M., Nosek, B. A., Wagenmakers, E. J., Berk, R., & Johnson, V. E. (2018). Redefine statistical significance. *Nature Human Behaviour, 2,* 6–10. https://doi.org/10.1038/s41562-017-0189-z

Björkqvist, K. (1994). Sex differences in physical, verbal, and indirect aggression: A review of recent research. *Sex Roles, 30,* 177–188. https://doi.org/10.1007/BF01420988

Blasberg, S. A., Rogers, K. H., & Paulhus, D. L. (2014). The Bidimensional Impression Management Index (BIMI): Measuring agentic and communal forms of impression management. *Journal of Personality Assessment, 96,* 523–531. https://doi.org/10.1080/00223891.2013.862252

Brewer, G., & Hamilton, V. (2014). Female mate retention, sexual orientation, and gender identity. *Evolutionary Behavioral Sciences, 8,* 12–19. https://doi.org/10.1037/h0097245

Buss, D. M. (1988a). The evolution of human intrasexual competition: Tactics of mate attraction. *Journal of Personality and Social Psychology, 54,* 616–628. https://doi.org/10.1037//0022-3514.54.4.616

Buss, D. M. (1988b). From vigilance to violence: Tactics of mate retention in American undergraduates. *Ethology and Sociobiology, 9,* 291–317. https://doi.org/10.1016/0162-3095(88)90010-6

Buss, D. M. (1989). Sex-differences in human mate preferences: Evolutionary hypothesis tested in 37 cultures. *Behavioral and Brain Sciences, 12,* 1–14. https://doi.org/10.1017/S0140525x00023992

Buss, D. M. (2013). The science of human mating strategies: An historical perspective. *Psychological Inquiry, 24,* 171–177. https://doi.org/10.1080/1047840X.2013.819552

Buss, D. M., Goetz, C., Duntley, J. D., Asao, K., & Conroy-Beam, D. (2017). The mate switching hypothesis. *Personality and Individual Differences, 104,* 143–149. https://doi.org/10.1016/j.paid.2016.07.022

Buss, D. M., & Schmitt, D. P. (2019). Mate preferences and their behavioral manifestations. *Annual Review of Psychology, 70,* 77–110. https://doi.org/10.1146/annurev-psych-010418-103408

Buss, D. M., & Shackelford, T. K. (1997). From vigilance to violence: Mate retention tactics in married couples. *Journal of Personality and Social Psychology, 72,* 346–361. https://doi.org/10.1037//0022-3514.72.2.346

Buss, D. M., Shackelford, T. K., & McKibbin, W. F. (2008). The Mate Retention Inventory-Short Form (MRI-SF). *Personality and Individual Differences, 44,* 322–334. https://doi.org/10.1016/j.paid.2007.08.013

Campbell, A. (2013). The evolutionary psychology of women's aggression. *Philosophical Transactions of the Royal Society B, 368*(1631), 20130078. https://doi.org/10.1098/rstb.2013.0078

Campbell, A. (2016). Women's competition and aggression. In D. M. Buss (Ed.), *The Handbook of Evolutionary Psychology* (pp. 684–703). Wiley

Conroy-Beam, D., Buss, D. M., Pham, M. N., & Shackelford, T. K. (2015). How sexually dimorphic are human mate preferences? *Personality and Social Psychology Bulletin, 41,* 1082–1093. https://doi.org/10.1177/0146167215590987

Consulado de Carrera de México en Toronto (2020). *Visitors who do not require a visa, with a stay up to 180 days*. Retrieved Semptember 6, 2019 from https://consulmex.sre.gob.mx/toronto/index.php/en/servicesforeigners/visas?id=225

Darwin, C. (1871). *The descent of man, and selection in relation to sex*. J. Murray

Davies, A. P. C., & Shackelford, T. K. (2015). Comparisons of the effectiveness of mate-attraction tactics across mate poaching and general attraction and across types of romantic relationships. *Personality and Individual Differences, 85,* 140–144. https://doi.org/10.1016/j.paid.2015.05.001

de Jong, K., Forsgren, E., Sandvik, H., & Amundsen, T. (2012). Measuring mating competition correctly: Available evidence supports operational sex ratio theory. *Behavioral Ecology, 23,* 1170–1177. https://doi.org/10.1093/beheco/ars094

Denes, A., Lannutti, P. J., & Bevan, J. L. (2015). Same-sex infidelity in heterosexual romantic relationships: Investigating emotional, relational, and communicative responses. *Personal Relationships, 22,* 414–430. https://doi.org/10.1111/pere.12087

Durante, K. M., Griskevicius, V., Simpson, J. A., Cantu, S. M., & Tybur, J. M. (2012). Sex ratio and women's career choice: Does a scarcity of men lead women to choose briefcase over baby? *Journal of Personality and Social Psychology, 103,* 121–134. https://doi.org/10.1037/a0027949

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39,* 175–191. https://doi.org/10.3758/BF03193146

Fisher, M., & Cox, A. (2011). Four strategies used during intrasexual competition for mates. *Personal Relationships, 18,* 20–38. https://doi.org/10.1111/j.1475-6811.2010.01307.x

Geary, R. S., Tanton, C., Erens, B., Clifton, S., Prah, P., Wellings, K., & Mercer, C. H. (2018). Sexual identity, attraction and behaviour in Britain: The implications of using different dimensions of sexual orientation to estimate the size of sexual minority populations and inform public health interventions. *PLoS One, 13*(1), e0189607. https://doi.org/10.1371/journal.pone.0189607

Gómez, F. R., Semenyna, S. W., Court, L., & Vasey, P. L. (2017). Recalled separation anxiety in childhood in Istmo Zapotec men, women, and *muxes. Archives of Sexual Behavior, 46,* 109–117. https://doi.org/10.1007/s10508-016-0917-x

Gómez, F. R., Semenyna, S. W., Court, L., & Vasey, P. L. (2018). Familial patterning and prevalence of male androphilia among Istmo Zapotec men and *muxes. PLoS One, 13,* e0192683. https://doi.org/10.1371/journal.pone.0192683

Gómez Jiménez, F. R., Court, L., & Vasey, P. L. (2020). A retrospective study of childhood sex-typed behavior in Istmo Zapotec men, women, and *muxes. Archives of Sexual Behavior, 49,* 467–477. https://doi.org/10.1007/s10508-019-01544-6

Gómez Jiménez, F. R., Court, L., & Vasey, P. L. (2021). Occupational preferences and recalled childhood sex-atypical behavior among Istmo Zapotec men, women, and *muxes. Human Nature, 32,* 729-747. https://doi.org/10.1007/s12110-021-09417-5

Gould, S. J., & Vrba, E. S. (1982). Exaptation—A missing term in the science of form. *Paleobiology, 8,* 4–15. https://doi.org/10.1017/S0094837300004310

GraphPad. (2020). *Analyze a 2 × 2 contingency table*. Graph Pad Software. https://www.graphpad.com/quickcalcs/contingency1.cfm

Janicke, T., Häderer, I. K., Lajeunesse, M. J., & Anthes, N. (2016). Darwinian sex roles confirmed across the animal kingdom. *Science Advances, 2,* e1500983. https://doi.org/10.1126/sciadv.1500983

Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behavior in the human male*. Saunders

Leser, H. (1961). The Hirschfeld Institute for Sexology. In A. Ellis, & A. Abarnel (Eds.), *Encyclopedia of sexual behavior* (pp. 967–970). Hawthorn Books

Lopes, G. S., & Shackelford, T. K. (2018). Disengaged, exhaustive, benevolent: Three distinct strategies of mate retention. *Journal of Social and Personal Relationships, 36,* 2677–2692. https://doi.org/10.1177/0265407518797023

Marlowe, F. W., & Berbesque, J. C. (2012). The human operational sex ratio: Effects of marriage, concealed ovulation, and menopause on mate competition. *Journal of Human Evolution, 63,* 834–842. https://doi.org/10.1016/j.jhevol.2012.09.004

Miano Borruso, M. (2002). *Hombre, mujer y muxe' en el Istmo de Tehuantepec*. Playa y Valdés

Mirandé, A. (2016). Hombres mujeres: An indigenous third gender. *Men and Masculinities, 19,* 384–409. https://doi.org/10.1177/1097184x15602746

Mirandé, A. (2017). *Behind the mask: Gender hybridity in a Zapotec community*. University of Arizona Press

Murray, S. O. (2000). *Homosexualities*. The University of Chicago Press

Nanda, S. (2014). *Gender diversity: Cross-cultural variations*. Waveland Press

Petterson, L. J., Dixson, B. J., Little, A. C., & Vasey, P. L. (2015). Viewing time measures of sexual orientation in Samoan cisgender men who engage in sexual interactions with *fa'afafine. PLoS One, 10,* e0116529. https://doi.org/10.1371/journal.pone.0116529

Petterson, L. J., Dixson, B. J., Little, A. C., & Vasey, P. L. (2016). Reconsidering male bisexuality: Sexual activity role and sexual attraction in Samoan men who engage in sexual interactions with *fa'afafine Psychology of Sexual Orientation and Gender Diversity, 3,* 11–26. https://doi.org/10.1037/sgd0000160

Petterson, L. J., Dixson, B. J., Little, A. C., & Vasey, P. L. (2020). Heterogeneity in the sexual orientations of men who have sex with *fa'afafine* in Samoa. *Archives of Sexual Behavior, 49,* 517–529. https://doi.org/10.1007/s10508-020-01646-6

Petterson, L. J., & Vasey, P. L. (2022). Men's sexual interest in feminine trans individuals across cultures. *Journal of Sex Research*. https://doi.org/10.1080/00224499.2021.2013429

Pham, M. N., Barbaro, N., & Shackelford, T. K. (2014). Development and initial validation of the coalitional mate retention inventory. *Evolutionary Psychological Science, 1,* 4–12. https://doi.org/10.1007/s40806-014-0001-5

Sagarin, B. J., Becker, D. V., Guadagno, R. E., Wilkinson, W. W., & Nicastle, L. D. (2012). A reproductive threat-based model of evolved sex differences in jealousy. *Evolutionary Psychology, 10,* 487–503. https://doi.org/10.1177/147470491201000307

Schacht, R., & Borgerhoff Mulder, M. (2015). Sex ratio effects on reproductive strategies in humans. *Royal Society Open Science, 2,* 140402. https://doi.org/10.1098/rsos.140402

Scherer, C. R., Akers, E. G., & Kolbe, K. L. (2013). Bisexuals and the sex differences in jealousy hypothesis. *Journal of Social and Personal Relationships, 30,* 1064–1071. https://doi.org/10.1177/0265407513481446

Schmitt, D. P., & Buss, D. M. (2001). Human mate poaching: Tactics and temptations for infiltrating existing mateships. *Journal of Personality and Social Psychology, 80,* 894–917. https://doi.org/10.1037//0022-3514.80.6.894

Semenyna, S. W., Gómez Jiménez, F. R., VanderLaan, D. P., & Vasey, P. L. (2020). Inter-sexual mate competition in three cultures. *PLoS One*, *15*. https://doi.org/10.1371/journal.pone.0236549

Semenyna, S. W., Gómez Jiménez, F. R., & Vasey, P. L. (2021). Women's reaction to opposite- and same-sex infidelity in three cultures: Data from Canada, Samoa, and the Istmo Zapotec. *Human Nature, 32,* 450–469. https://doi.org/10.1007/s12110-021-09405-9

Semenyna, S. W., Gómez Jiménez, F. R., & Vasey, P. L. (2022). Mate competition between the sexes: Evidence from two non-Western cultures. In D. M. Buss, & P. Durkee (Eds.), *Handbook of human mating*. Oxford University Press

Semenyna, S. W., VanderLaan, D. P., Petterson, L. J., & Vasey, P. L. (2017). Familial patterning and prevalence of male androphilia in Samoa. *Journal of Sex Research, 54,* 1077–1084. https://doi.org/10.1080/00224499.2016.1218416

Semenyna, S. W., & Vasey, P. L. (2017). Bullying, physical aggression, gender-atypicality, and sexual orientation in Samoan males. *Archives of Sexual Behavior, 46,* 1375–1381. https://doi.org/10.1007/s10508-015-0676-0

Shackelford, T. K., Goetz, A. T., & Buss, D. M. (2005). Mate retention in marriage: Further evidence of the reliability of the Mate Retention Inventory. *Personality and Individual Differences, 39,* 415–425. https://doi.org/10.1016/j.paid.2005.01.018

Stewart-Williams, S., & Thomas, A. G. (2013). The ape that thought it was a peacock: Does evolutionary psychology exaggerate human sex differences? *Psychological Inquiry, 24,* 137–168. https://doi.org/10.1080/1047840x.2013.804899

Stockley, P., & Campbell, A. (2013). Female competition and aggression: Interdisciplinary perspectives. *Philosophical Transactions of the Royal Society B, 368*(1631), 20130073. https://doi.org/10.1098/rstb.2013.0073

Tooby, J., & Cosmides, L. (1992). The psychological foundations of culture. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind* (pp. 19–136). Oxford University Press

Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man* (pp. 136–179). Aldine-Atherton

VanderLaan, D. P., & Vasey, P. L. (2008). Mate retention behavior of men and women in heterosexual and homosexual relationships. *Archives of Sexual Behavior, 37,* 572–585. https://doi.org/10.1007/s10508-006-9139-y

VanderLaan, D. P., Ren, Z., & Vasey, P. L. (2013). Male androphilia in the ancestral environment. An ethnological analysis. *Human Nature, 24,* 375–401. https://doi.org/10.1007/s12110-013-9182-z

Vasey, P. L. (1998). Female choice and inter-sexual competition for female sexual partners in Japanese macaques. *Behaviour, 135,* 579–597

Vasey, P. L. (2006). Where do we go from here? Research on the evolution of homosexual behaviour in animals. In V. Sommer, & P. L. Vasey (Eds.), *Homosexual behaviour in animals: An evolutionary perspective* (pp. 349–364). Cambridge University Press

Vasey, P. L., Leca, J. B., Gunst, N., & VanderLaan, D. P. (2014). Female homosexual behavior and intersexual mate competition in Japanese macaques: Possible implications for sexual selection theory. *Neuroscience and Biobehavioral Reviews, 46,* 573–578. https://doi.org/10.1016/j.neubiorev.2014.09.002

Vasey, P. L., & VanderLaan, D. P. (2016). *Fa'afafine*. In T. K. Shackelford & V. A. Weekes-Shackelford (Eds.), *Encyclopedia of evolutionary psychological science*. Springer. https://doi.org/10.1007/978-3-319-16999-6_46-1

Walter, K. V., Conroy-Beam, D., Buss, D. M., Asao, K., Sorokowska, A., Sorokowski, P., & Zupančič, B. (2020). Sex differences in mate preferences across 45 countries: A large-scale replication. *Psychological Science, 31,* 408–423. https://doi.org/10.1177/0956797620904154

Walter, K. V., Conroy-Beam, D., Buss, D. M., Asao, K., Sorokowska, A., Sorokowski, P. … Zupančič, B. (2021). M. Sex differences in human mate preferences vary across sex ratios. *Proceedings of the Royal Society, B: Biological Sciences, 288*, 20211115. https://doi.org/10.1098/rspb.2021.1115

Walters, S., & Crawford, C. B. (1994). The importance of mate attraction for intrasexual competition in men and women. *Ethology and Sociobiology, 15,* 5–30. https://doi.org/10.1016/0162-3095(94)90025-6

Weir, L. K., Grant, J. W., & Hutchings, J. A. (2011). The influence of operational sex ratio on the intensity of competition for mates. *The American Naturalist, 177,* 167–176. https://doi.org/10.1086/657918

Whitam, F. L. (1992). Bayot and callboy: Homosexual-heterosexual relations in the Philippines. In S. O. Murray (Ed.), *Oceanic homosexualities* (pp. 231–248). Garland

Whitam, F. L. (1997). Culturally universal aspects of male homosexual transvestites and transsexuals. In B. Bullough, V. Bullough, & J. Elias (Eds.), *Gender blending* (pp. 189–203). Prometheus

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