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ANTHROPOLOGY

The effect of mating market dynamics on partner preference and relationship quality among Himba pastoralists

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Relative mate value has long been believed to be a critical component of mate choice in humans. However, most empirical work focuses on preferences rather than actual pair formation, and data connecting partner preferences, partnership formation, and relationship quality remain rare. Here, we estimate mate value using >12,000 ratings by opposite-sex, in-group members to understand both hypothetical partnership preferences and actualized relationship dynamics. When evaluating hypothetical partnerships, people generally prefer individuals whose mate value is higher than their own, indicating an aspirational matching strategy. However, mate value comparisons of individuals in marital and nonmarital relationships show a positive correlation, suggesting that individuals tend to pair up with similarly desirable individuals. Furthermore, despite aspirational preferences, couples who are more closely matched reported greater relationship quality, measured through frequency of interactions, reported sexual histories, and partnership length.

INTRODUCTION

The study of human mating dynamics has been a major focus of evolutionary social science since Trivers (*1*) first posited the potential for sex-specific mating strategies. In this view, it is theorized that selection on mating behavior leads to different mate choice strategies in men and women (*2*–*4*). Women are posited to be more interested than men in finding a partner who is likely to be a reliable resource provider, and men are predicted to prefer women who demonstrate traits linked to fertility, notably the proxy measure of physical attractiveness.

Despite decades of research and a rich empirical literature, which largely supports these predictions, we still know little about how mate choice functions in real-world contexts. Much of the existing literature relies on surveys of trait preferences and ratings of hypothetical partners. While useful in illustrating sex-specific preferences, this approach fails to consider the dynamic nature of mate choice and the constraints that come with making choices within actual populations of individuals who vary both in their traits and their preferences, including, but not limited to, the local sex ratio, male-male competitive dynamics, the movement of individuals into and out of the mating pool, and the myriad impact of local cultural traditions. Other studies incorporate ratings of people's actual partners, but the study populations are often made up of a disaggregated set of participants (e.g., a study sample drawn from a city or university), limiting our ability to view partnerships within the dynamic mating markets that they are a part of (*5*). A richer understanding of human mating decisions requires incorporating sex-specific preferences within the market context to understand how relative mate value is the product of localized and context-specific factors.

In contrast with research on sex-specific preferences, the biological market model of mating emphasizes the ability of individuals to modulate behavior in response to local conditions (*6*, *7*). Within a local market, the community mating pool disconnected to some degree from the global mating pool of all reproducing individuals, more desirable individuals are predicted to have greater "buying power," enabling them to select higher-quality partners. For example, Buston and Emlen (*8*) show, in a cross-sectional survey, that individuals who rate themselves highly across 10 relevant traits also showed higher selectivity in potential partners for those traits. In other words, individuals who see themselves as more desirable leverage their higher value on the mating market, a pattern replicated in several other studies (*9*–*13*). Individuals have also been shown to be attentive to changes in their market position. For example, when perceptions of one's market strength are experimentally altered by viewing photos of attractive or unattractive same-sex individuals, people alter their own attractiveness ratings and their partner preferences (*14*). Likewise, changes in the operational sex ratio, the relative number of reproductively available males and females, can similarly elevate market strength of the more limited sex (*15*).

Evidence supports the notion that mating preferences are conditioned on perceived market value, but most existing studies rely on survey data, correlating self-assessments with mating preferences [e.g., (*8*)]. However, reported partner preferences do not necessarily correspond to actual mating decisions (*11*, *16*). For example, in a study of Shuar preferences, Pillsworth (*17*) found that despite rating physical attractiveness as relatively unimportant in a hypothetical task, ratings of actual potential partners revealed it to be an important factor. The direct comparison of stated versus revealed preferences in this study, along with the ability to have individuals rate known peers, was critical to highlighting the need for multifaceted and context-specific data when studying partner choice.

One rich source of information linking preferences and behavior are datasets from online dating services, which use actual interactions of potential romantic partners. This approach is powerful in that it can provide an objective assessment of mate value (as opposed to self-assessment) and relate that to both a person's preferences and their mating success. In one particularly elegant study, Bruch and Newman (*18*) find that people tend to contact potential partners of a similar or higher level of desirability. The data also show that as the gap between their own relative desirability and that of their target increases, users increase the length of their messages.

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Therefore, the authors describe people's preferences as being aspirational, reaching up the "hierarchy of desirability."

Aspirational mate pursuit, or seeking potential partners of higher mate value than yourself, can be risky. Higher-quality partners may require more time to coax, require extra investment, or be less stable. Discrepancies between preferences and partner traits can also lead to relationship dissatisfaction (*19*, *20*). Likewise, partners of higher mate value could be tempting targets for others (*21*). However, it is not sufficient to expect that discrepancy in mate value should result in partnership dissolution, as dissolution should be conditional on the potential for replaceability given current market conditions (*22*). Notably, mate satisfaction is lower when there are better alternatives available, but only for those of higher mate value than their partners. Despite the potential risks and investment required for securing a partner of higher mate value, studies of online dating markets indicate that it may be the norm.

While studies of online dating are able to go well beyond preference studies by looking at actual behavior, there are a number of shortcomings associated with this type of data. The nature of the vast online dating pool, the communication structure, and the evaluative mechanisms present in online dating markets differ markedly from more traditional partnership formation dynamics (*5*, *23*). First, the mating pool in online dating is exponentially larger. This large number of potential partners and the ease and low cost of a "bid" for any individual likely increase the number of interactions and, as a result, may lower the threshold for pursuing partners of higher quality (*18*). Second, the format of online dating tends to emphasize physical traits and prescripted self-assessments, both of which are often heavily curated and have the potential for being dishonest. Gathering information about potential partners online is limited and lacks the potential for gathering community perceptions. Third, the nature and pace of online dating facilitate simultaneous and sequential dating, and the wide availability of additional potential partners can promote a shopping mentality (*24*). Fourth, the ephemeral nature of these platforms lowers the stakes of a failed interaction.

Smaller-scale, more endogamous populations were likely dominant in our evolutionary history and are still common in much of the world. Even in larger, industrialized nations, many partnerships form within finite populations of largely known individuals (think college, church, or various neighborhood institutions). Hence, relative trait characteristics of potential mates can be directly assessed or learned through peers. This environment is very different from the one inferred in survey-based approaches or through online dating. Despite this, very few studies of human mating have examined dyadic interactions of known individuals within a bounded population [but see (*17*) for a notable exception]. Measuring individual preferences and assessments between known members of the community can be methodologically difficult; however, studies of individual partner preference within bounded populations have been conducted for other types of social partnerships. For example, among Hadza hunter-gatherers of Tanzania, individuals were asked about both their preferences for fellow campmates and to gift honey to three other people to track gift-giving networks in the same community (*25*). Partner preferences in relation to cooperation and food sharing have also been well studied in small, bounded populations (*26*–*28*). These studies point to the potential for similar work on romantic partnerships.

Here, we present data on both partner preferences and partnership formation in a small, rural community of Himba pastoralists living in northern Namibia. There are several reasons why the Himba community is well suited for this study. First, there is a substantial degree of personal choice in relationship decisions. While first marriages are typically arranged by parents, both partners have the ability to leave (or never consummate) the marriage, and most subsequent marriages are love matches (*29*, *30*). Second, in addition to formal marital partners, most Himba adults have concurrent informal partnerships (*31*). The combination of concurrency, divorce, and a relatively high degree of female autonomy means that the mating market is dynamic, with adults making decisions about romantic partnerships throughout adulthood (*32*). Third, despite the high degree of personal freedom in partner choice, most people find partners who live nearby, creating a highly endogamous local mating market. Last, the practice of concurrency and the high degree of female sexual autonomy are deeply embedded in Himba culture, not reactions to market conditions or globalization. Reports from throughout the 20th century report similar sexual practices in Himba and other closely related groups (*33*–*36*).

The endogamous mating market and the small-scale nature of the community allow us to capitalize on the fact that most people in the study area are familiar with one another. We constructed a measure of relative mate value based on thousands of Likert scale desirability ratings of known opposite-sex individuals. Using these ratings, we compare two competing models of mate choice. The market matching hypothesis predicts that participants' preferences will correspond to market principles, preferring mates of similar value to their own (operationalized here as $\pm^{1}/_{2}$ standardized difference in estimated mate value). In addition, the market matching hypothesis predicts that participants will not prefer individuals of substantially higher mate value (operationalized here as $>^{1}/_{2}$ standardized difference in desirability), because there would be greater competition for those individuals, and more desirable individuals should also be striving for partners of similar quality. This hypothesis has precedence, as studies in online mating markets illustrate that people tend to target individuals of approximately the same level of desirability (*18*). We use a broad definition of market value as the relative desirability as a relationship partner and do not consider sex-specific differences or implicit traits or qualities that might define a high-quality partner. In contrast to this market-based approach, the aspirational matching hypothesis predicts that participants will generally exhibit greater preference for individuals of higher quality, including those of higher quality than themselves. We then combine these estimates of mate value with detailed relationship histories that record both marital and nonmarital partnerships, reported frequency of contact, and sexual histories to understand how mate value affects the formation and persistence of real relationships. Here, biological market theory would predict that individuals of similar mate value would assort into relationships, but this prediction has not been tested in a real-world population. If this prediction is supported by the data, then we would predict that dyads of discordant value should have more unstable relationships, shown through relationship history data.

RESULTS

Himba men show a steeper hierarchy of desirability than women

Implicit to the biological market model of mating is that mate value should vary such that a hierarchy of desirability exists within any

given market. To evaluate this dynamic in the study population, we examined the raw proportion of ratings received by any individual. To visually assess the hierarchy of desirability before modeling, the average ratings for each individual were calculated (ratings on a four-point scale, 1 being the lowest). The distribution of these scores indicates a clear hierarchy of desirability, with men and women receiving an average rating of 1.44 and 1.88, respectively (Fig. 1). Notably, while the density distribution of both men's and women's ratings indicates that very few individuals in this population received many high ratings, men's ratings are generally more skewed, indicating a stronger hierarchy.

Desirability and choosiness are linked for men but not women

A basic prediction of market-based models is that more desirable individuals will be more selective in their preferences because they leverage higher value in the mating market. To test this, a cumulative ordered logit model predicted preference ratings of all men and women by rater desirability (n = 11,332). Results indicate a minor but sex-specific effect of rater desirability on preference, with the fixed effect predictor overlapping zero [$\beta = -0.17$, 95% credible interval (CI) = −0.91 to 0.74]. As shown in Fig. 2, men who are viewed as more desirable are also more selective (more likely to give lower preference ratings), while the slope of desirability on preference in women is minimal.

Himba exhibit aspirational partner preferences

Next, we examined the discrepancy between rater and ratee desirability on preference ratings. Here, because we were interested in comparing market matching versus aspirational matching hypotheses, the difference in community-assessed desirability for each dyad was categorized as the same (standardized desirability difference between $^1/_2$ and $-^1/_2$), as rater higher (difference of >0.5), or as ratee higher (difference of <−0.5). The "same" category was used as the index in the following models, so that "ratee-higher" and "rater-higher" categories were deviations from dyads where individuals were of approximately equal desirability. Figure 3A shows the predictions of market matching and aspirational matching hypotheses. In the market matching hypothesis, where individuals should indicate preference for individuals of similar desirability, ratee-higher and rater-higher distributions are lower than zero, indicating that these matches should be less desirable to participants than individuals of approximately equal desirability. Conversely, in the aspirational matching hypothesis, individuals are predicted to prefer potential partners of similar or greater desirability. The posterior distribution of the model shows support for the aspirational matching hypothesis, where raters prefer partners with desirability scores higher than their own (Fig. 3B).

Disparity in desirability is associated with less contact and more concurrent partnerships

To examine how differences in desirability contribute to real-world relationship dynamics, a set of participants completed relationship history surveys about all current formal (marital) and informal (nonmarital) partners (n = 94). Surveys included questions about relationship duration and frequency of contact (physically and via cell phone). Because of the high frequency of concurrent partnerships in this population, individuals were also asked whether each partner was thought to have many informal partners. As before, a categorical difference in desirability was calculated between the participant and their partner, and the posterior distribution of this categorical predictor was plotted (Fig. 4). There was little impact of desirability differences on frequency of in-person contact. However, compared to respondents who were approximately equal in desirability with their partners, those whose partners were more desirable or less desirable than themselves reported less phone contact with these partners. In addition, individuals who were less desirable than their partners were more likely to report that their partners had additional informal partners, whereas individuals who were more desirable than their partner believed their partners to be less likely to have many additional partners.

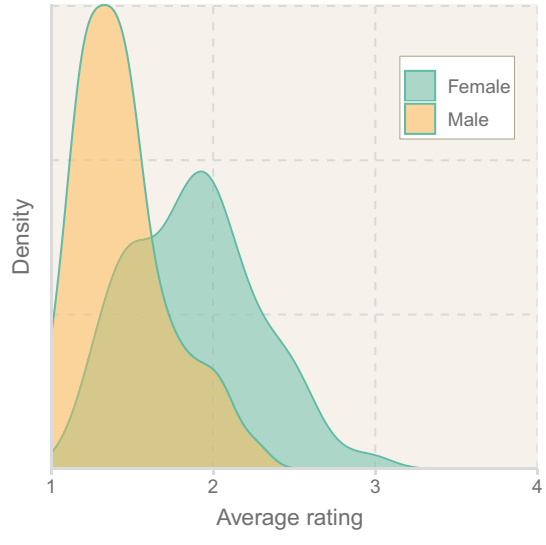

Fig. 1. Distribution of average desirability ratings by sex. Density distribution of participants based on their average rating received (1 being the lowest).

Fig. 2. Effect of rater desirability on preference ratings. Posterior predictions of the market-based model, showing the sex-specific impact of rater desirability on predicted ratings. The probability of each rating (1 to 4, with 4 being the highest) and 50, 80, and 95% credible intervals are shown.

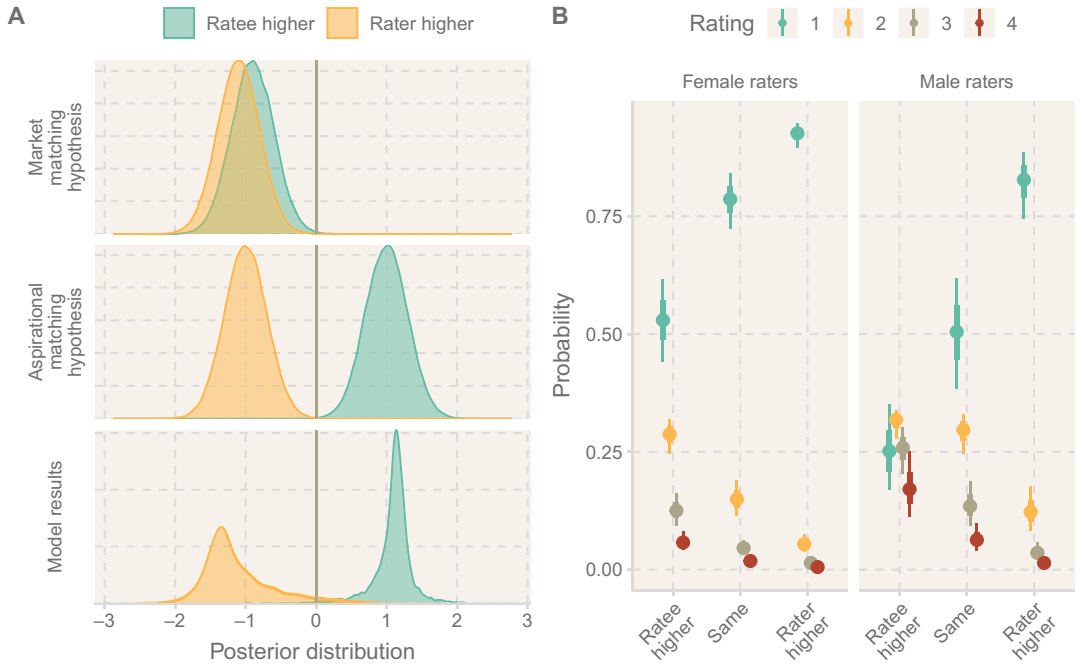

Fig. 3. Predictions and model results from mate preference analysis. (**A**) Predictions of matching and aspirational matching hypotheses on desirability ratings and the results of the model predicting desirability difference category on preference. Distributions represent the posterior of the categorical predictors of the categorical desirability difference variable, with "same" as the index category. (**B**) Posterior predictions of the model showing predicted probability of each rating (1 being the lowest).

Fig. 4. Posterior distributions of categorical predictor of desirability difference on relationship survey data, with same as the index category. Raters in this instance are those who completed the relationship survey, and ratees are the partners that they were reporting on. Because of concurrency, raters could report on multiple partners. See posterior predictions of these models in the Supplementary Materials.

Relationship histories reflect assortment for partners of similar desirability

In addition to hypothetical preference ratings, individuals also reported their sexual histories with each of the people they rated. Because sexual activity is a dyadic outcome, agreed on by both parties, all unique dyads where one or both parties reported history of sexual intercourse were used (n = 9720). Because we expect differential reporting of sexual activity between men and women, a varying intercept by respondent sex (male, female, or both) was included. The absolute value of the difference in desirability between individuals was used to assess whether relative market position between dyads predicted sexual history. The difference in desirability between partners negatively predicted the probability of past sex (β = −0.42, 95% CI = −0.60 to −0.25), indicating that, as relative desirability diverged between potential partners, the probability of a reported sexual history decreased.

To examine relative desirability within romantic partnerships, we combined dyads from relationship histories with demographic data on marital histories in this population to examine whether the hierarchy of desirability leads to positive assortment. Figure 5 shows the relationship between male and female desirability in all marital and nonmarital dyads where desirability was estimated. Male and female desirability estimates from real-world dyads exhibit a moderate correlation estimate of 0.51 (95% CI = 0.39 to 0.61, n = 128), with little difference between marital and nonmarital partners. As a comparison, individuals in the dataset were also randomly matched 20 times, and the trend lines were plotted to demonstrate that the correlation between partner qualities is not spurious but a function of positive assortment with similarly desirable individuals.

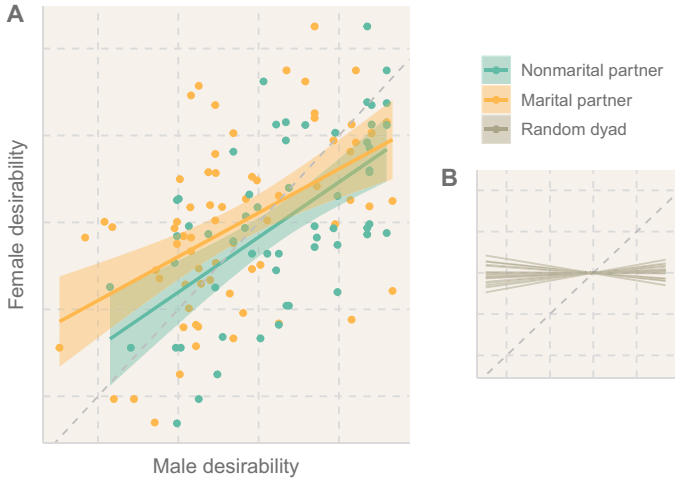

Fig. 5. Partner desirability on marital and nonmarital partnerships. (**A**) Correlation of standardized partner desirability estimates in marital and nonmarital partnerships from partnership surveys and marriage records exhibits a correlation estimate of 0.51. (**B**) Trend lines of the same sample of dyads randomly matched 20 times without replacement indicate that random matches do not show the same positive correlation as real-world partnerships.

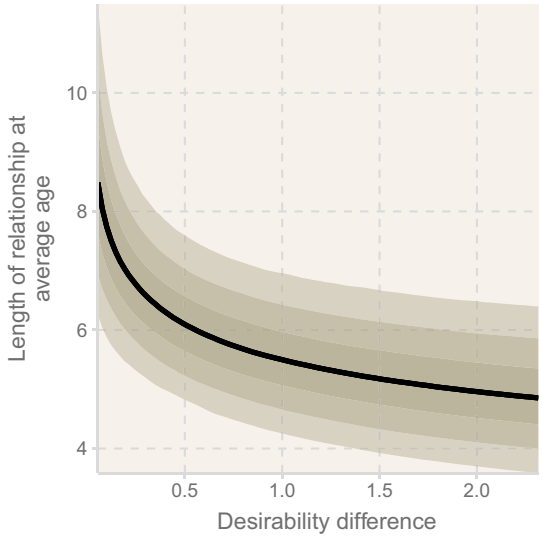

Fig. 6. Posterior predictions for the difference in desirability on relationship length. Line shows posterior median and 50, 80, and 95% CI for the effect of the absolute difference in desirability estimate between dyads on relationship length at average age for a marital pair.

Couples with similar mate value have longer-lasting relationships

Last, to examine the impact of differences in desirability on reported length of marital and nonmarital relationships, we calculated the absolute value of the desirability gap and used it to predict reported length of relationship in years. Desirability differences between individuals had a small but consistent negative effect on length of relationships ($\beta = -0.15$, 95% CI = −0.25 to −0.04), suggesting that couples who have a closer level of desirability tend to have longer relationships (Fig. 6).

DISCUSSION

Real-world partner dynamics are notoriously difficult to study, as they require longitudinal data and an ability to evaluate the pool of prospective suitors people are drawing partners from. Here, by combining a novel rating system with ethnographic interviews in a largely endogamous population of Himba pastoralists, we can determine people's position within the local mating market and use that to evaluate both their preferences and their realized partnerships. Using preference data, we test two competing hypotheses of partner preference to examine whether participants prefer more desirable partners or adhere to mating market predictions and prefer partners of similar desirability to themselves. Our data show that participants' preferences corresponded most closely with an aspirational mate choice strategy, with individuals generally preferring partners who were more desirable than themselves. While these relationship preference ratings represent idealized preferences and not actual attempts at relationship formation, they correspond well with research from online dating markets (*18*), indicating that aspirational mate choice may not just be a feature of online dating markets or experimental paradigms but a more common feature of people's preferences.

However, while Himba preference data conform most closely to an aspirational model, their relationship histories correspond best with the biological mating market approach. In both marital and nonmarital relationships, partners tend to be similar in relative mate value, exhibiting a moderate correlation. When examining reported sexual history data, similar dynamics are also found. Dyads of similar mate value are more likely to have reported a previous sexual relationship. In other words, while more desirable individuals are generally preferred by all, in the context of relationship formation, Himba men and women tend to pair up with similarly desirable partners. This may be a function of the most desirable members of the mating market exerting greatest choice in their partners, resulting in assortative mating.

Results from our relationship surveys help to explain the seemingly contradictory evidence for aspirational preferences and largely assortative partnerships. Well-matched dyads have longer-lasting relationships and report being in more frequent phone contact. In addition, participants who had partners of higher mate value were more likely to report that those partners had many additional partners. These findings suggest that mate value disparities result in relatively unstable relationships where the more desirable partner may be more likely to pursue other options on the mating market. This mirrors previous work showing that mate value disparities can result in lower relationship satisfaction (*20*). So while mismatched partnerships occur, they are less likely to be durable and long lasting, which could be contributing to the positive correlation in mate value between partners in extant dyads.

These results also highlight sex-specific adjustments in preference in response to local conditions. Sex ratio estimates in this population are remarkably female skewed (*32*). On the basis of mating market predictions, a female-biased sex ratio should result in high bargaining power for men, allowing them to be choosier in partner selection. This prediction is borne out in our model results, which indicate a stark sex difference in rater desirability on preference. Men, but not women, who have higher mate value are more discerning. However, this result should be considered alongside the other trend in our data, which shows that women in general are choosier than men. Women are much more likely than men to give

potential partners the lowest possible desirability rating (Fig. 2). It may be that a female-biased sex ratio makes women less susceptible to intrapopulation market effects, where they are less likely to exert selective preferences due to market position, while still exhibiting more generalized partner discrimination. Conversely, men who are generally less choosy cross-culturally exhibit higher market value when scarce. These results highlight the importance of interactions between generalized sex-specific preferences and intrapopulation market effects.

As R. W. Emerson stated, "we aim above the mark to hit the mark." Our data reflect just this type of strategy. When looking at preferences alone, Himba are shown to aspire toward partnerships with those of greater mate value than their own. These preferences indicate that Himba are well attuned to mating market dynamics and their place within them. However, the operationalization of those dynamics means that actual partnerships shake out into a mostly assortative pattern and further that assortative matches tend to be more stable. The combination of a biological market approach with the aspirational mate choice strategy fits well for Himba and may be more generally indicative of partnership dynamics in real-world contexts.

METHODS

Study population

The Himba are a population of seminomadic pastoralists living mainly in Kunene region of Namibia, as well as southwest Angola. Since 2010, we have been working mainly within one community, located halfway between the regional capital of Opuwo and the border town of Epupa. Himba are highly mobile, but at any given time, about 40 households are present in this community, with a population of about 1000 individuals.

Romantic partnerships among Himba take several forms. Marriage is arranged by parents; however, love matches are common. In addition, informal partnerships, both premarital and extramarital, are also frequent, resulting in a high frequency of premarital and extramarital births. This means that partner choice is the norm in this population. Divorce is common and can be easily initiated by either party. The practice of double descent helps to support these norms, as inheritance is largely matrilateral, and women remain connected to members of their matriclan after marriage, allowing them to easily shift residences between marriages. Additional information about partner choice (*31*, *37*), the practice of concurrency (*29*, *38*), and partnership dynamics (*32*, *39*) has been previously published about this population.

Preference data

To collect desirability data, participants completed a rating task on a tablet computer. Participants were shown a randomized series of headshots of opposite-sex individuals in the community. Participants were asked to rate how desirable that person was to be in a relationship with, responding using a four-item Likert scale (none/low/medium/high denoted as 1 to 4). Participants rated up to 100 community members using this task, with the ability to skip kin and any individuals that they did not know. Male participants were only asked to rate women up to 10 years older than themselves, while there were no age restrictions for female participants.

Relationship histories

A subset of men and women answered a series of questions about current marital and nonmarital relationships [for details, see (*32*)]. Questions included how frequently they saw their partner in person and spoke on the phone (rarely/sometimes/often), whether they believed their partner had many other nonmarital partners (yes/no), and how long they had been together (in years).

Statistical analysis

Baseline desirability for all individuals was estimated using a cumulative ordered logit model. Because we were interested in estimating each ratee's desirability and correcting for variation in each rater's selectivity and used these estimates as predictors in later models, varying intercepts for both rater and ratee were estimated. Varying intercept means for each ratee were determined and then used as predictors in later models. Using coefficients as predictors has the advantage of already being standardized and zero centered, and this also removes the limitation of having to estimate an ordered outcome for each individual. Correlation of desirability between real-world partnerships was ascertained by fitting standardized male and female desirability within a multivariate Bayesian framework, estimating residual correlations without predictors.

Cumulative ordered logit models were then used to estimate preference ratings. Because women are known to be more discerning on this task, a varying intercept for rater sex and varying slopes for standardized age difference between rater and ratee were included in these models. To compare desirability mismatches, differences between rater and ratee coefficients were calculated and standardized. However, because we are comparing aspirational matching versus market matching hypotheses, the latter of which predicts nonlinear effects of desirability difference (equal levels of trait values/desirability are predicted to be most desirable, while dyads where the rater is more or less desirable should be less preferred), three desirability difference categories were calculated. Desirability coefficients between $-{}^{1}/_{2}$ and ${}^{1}/_{2}$ standardized difference were considered of similar levels of trait/desirability, while values above were coded as rater higher, and values below were coded as ratee higher. This categorical variable was used to predict the effect of desirability differences between rater and ratee, as a whole, and by rater sex. The category of approximately equivalent desirability was used as the index category, with ratee-higher and rater-higher categories as deviations from the index.

To examine how differences in desirability were associated with reported length of relationship from the relationship history data, the log absolute difference between rater and ratee was used as a predictor in a Poisson multilevel model. Standardized age of respondent was included, and type of relationship (marital versus nonmarital) was included as predictors. In addition, a varying intercept by respondents was included, because some respondents reported multiple relationships. Similarly, differences in desirability on ratings of frequency of contact with partners were estimated via cumulative ordered logit multilevel models, and belief about whether partners have additional informal partners was estimated via a multilevel Bernoulli model.

To estimate the association between differences in desirability on reported sexual histories, the absolute desirability difference between each dyad where ratings were collected was used as a predictor of reported past sex by either party in a multilevel Bernoulli model. Varying intercepts by individual men and women and a spline for age difference were also included.

All analyses were run in R via RStudio (*40*, *41*). Multilevel models were fitted to RStan (*42*) using the brms package (*43*), and convergence

was assessed by examining $\hat{R}$ values. All models used 4000 iterations, half warm-up, and were run on three chains. All models included regularizing priors for predictors (β~Normal[0,1]) and variance parameters (σ~Exponential[1]). Other packages for data cleaning and visualization include tidyverse (*44*), cowplot (*45*), broom (*46*), modelr (*47*), tidybayes (*48*), and janitor (*49*). Full model descriptions, summary statistics, additional posterior predictions, and additional statistical and sample size details are available in the Supplementary Materials. Oral consent was obtained from all participants in accordance with approved study procedures by the Institutional Review Board at the University of California, Los Angeles (IRB-10-000238).

SUPPLEMENTARY MATERIALS

Supplementary material for this article is available at https://science.org/doi/10.1126/sciadv.abm5629

REFERENCES AND NOTES

1. R. L. Trivers, Parental investment and sexual selection, in *Sexual Selection and the Descent of Man*, B. Campbell, Ed. (Aldine-Atherton, Chicago, 1972), pp. 136–179.
2. D. M. Buss, Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behav. Brain Sci.* **12**, 1–14 (1989).
3. D. M. Buss, M. Barnes, Preferences in human mate selection. *J. Pers. Soc. Psychol.* **50**, 559–570 (1986).
4. T. K. Shackelford, D. P. Schmitt, D. M. Buss, Universal dimensions of human mate preferences. *Personal. Individ. Differ.* **39**, 447–458 (2005).
5. C. D. Goetz, E. G. Pillsworth, D. M. Buss, D. Conroy-Beam, Evolutionary mismatch in mating. *Front. Psychol.* **10**, 2709 (2019).
6. R. Noë, P. Hammerstein, Biological markets: Supply and demand determine the effect of partner choice in cooperation, mutualism and mating. *Behav. Ecol. Sociobiol.* **35**, 1–11 (1994).
7. R. Noë, Local mating markets in humans and non-human animals. *Behav. Ecol. Sociobiol.* **71**, 148 (2017).
8. P. M. Buston, S. T. Emlen, Cognitive processes underlying human mate choice: The relationship between self-perception and mate preference in Western society. *Proc. Natl. Acad. Sci. U.S.A.* **100**, 8805–8810 (2003).
9. L. Lee, G. Loewenstein, D. Ariely, J. Hong, J. Young, If I'm not hot, are you hot or not? *Psychol. Sci.* **19**, 669–677 (2008).
10. R. Kurzban, J. Weeden, HurryDate: Mate preferences in action. *Evol. Hum. Behav.* **26**, 227–244 (2005).
11. P. M. Todd, L. Penke, B. Fasolo, A. P. Lenton, Different cognitive processes underlie human mate choices and mate preferences. *Proc. Natl. Acad. Sci. U.S.A.* **104**, 15011–15016 (2007).
12. J. E. Edlund, B. J. Sagarin, Mate value and mate preferences: An investigation into decisions made with and without constraints. *Personal. Individ. Differ.* **49**, 835–839 (2010).
13. K. Harper, F. Stanley, M. Sidari, A. J. Lee, B. Zietsch, The role of accurate self-assessments in optimising mate choice, 10.31234/osf.io/4qmuv (2021).
14. A. C. Little, H. Mannion, Viewing attractive or unattractive same-sex individuals changes self-rated attractiveness and face preferences in women. *Anim. Behav.* **72**, 981–987 (2006).
15. S. T. Emlen, L. W. Oring, Ecology, sexual selection, and the evolution of mating systems. *Science* **197**, 215–223 (1977).
16. P. W. Eastwick, A. H. Eagly, E. J. Finkel, S. E. Johnson, Implicit and explicit preferences for physical attractiveness in a romantic partner: A double dissociation in predictive validity. *J. Pers. Soc. Psychol.* **101**, 993–1011 (2011).
17. E. G. Pillsworth, Mate preferences among the Shuar of Ecuador: Trait rankings and peer evaluations. *Evol. Hum. Behav.* **29**, 256–267 (2008).
18. E. E. Bruch, M. E. J. Newman, Aspirational pursuit of mates in online dating markets. *Sci. Adv.* **4**, eaap9815 (2018).
19. A. L. Meltzer, J. K. McNulty, G. L. Jackson, B. R. Karney, Sex differences in the implications of partner physical attractiveness for the trajectory of marital satisfaction. *J. Pers. Soc. Psychol.* **106**, 418–428 (2014).
20. D. Conroy-Beam, C. D. Goetz, D. M. Buss, What predicts romantic relationship satisfaction and mate retention intensity: Mate preference fulfillment or mate value discrepancies? *Evol. Hum. Behav.* **37**, 440–448 (2016).
21. D. P. Schmitt, D. M. Buss, Human mate poaching: Tactics and temptations for infiltrating existing mateships. *J. Pers. Soc. Psychol.* **80**, 894–917 (2001).
22. D. Conroy-Beam, C. D. Goetz, D. M. Buss, in *Advances in Experimental Social Psychology*, J. M. Olson, M. P. Zanna, Eds. (Elsevier, 2015), vol. 51, pp. 1–39.
23. E. J. Finkel, P. W. Eastwick, B. R. Karney, H. T. Reis, S. Sprecher, Online dating: A critical analysis from the perspective of psychological science. *Psychol. Sci. Public Interest* **13**, 3–66 (2012).
24. R. D. Heino, N. B. Ellison, J. L. Gibbs, Relationshopping: Investigating the market metaphor in online dating. *J. Soc. Pers. Relat.* **27**, 427–447 (2010).
25. C. L. Apicella, F. W. Marlowe, J. H. Fowler, N. A. Christakis, Social networks and cooperation in hunter-gatherers. *Nature* **481**, 497–501 (2012).
26. J. M. Koster, G. Leckie, Food sharing networks in lowland Nicaragua: An application of the social relations model to count data. *Soc. Netw.* **38**, 100–110 (2014).
27. E. Ready, E. A. Power, Why wage earners hunt: Food sharing, social structure, and influence in an Arctic mixed economy. *Curr. Anthropol.* **59**, 74–97 (2018).
28. D. A. Nolin, Food-sharing networks in Lamalera, Indonesia: Reciprocity, kinship, and distance. *Hum. Nat.* **21**, 243–268 (2010).
29. B. A. Scelza, Female choice and extra-pair paternity in a traditional human population. *Biol. Lett.* **7**, 889–891 (2011).
30. B. A. Scelza, S. P. Prall, N. E. Levine, The disequilibrium of double descent: Changing inheritance norms among Himba pastoralists. *Philos. Trans. R. Soc. B: Biol. Sci.* **374**, 20180072 (2019).
31. B. A. Scelza, S. P. Prall, Partner preferences in the context of concurrency: What Himba want in formal and informal partners. *Evol. Hum. Behav.* **39**, 212–219 (2018).
32. B. Scelza, S. Prall, K. Starkweather, The role of spousal separation on norms related to gender and sexuality among Himba pastoralists. *Soc. Sci.* **10**, 174 (2021).
33. G. D. Gibson, Herero marriage. *Rhodes-Livingst. J.* **24**, 1–37 (1959).
34. H. Harpending, R. Pennington, Herero households. *Hum. Ecol.* **18**, 417–439 (1990).
35. S. Van Wolputte, Sex in troubled times: Moral panic, polyamory and freedom in north-west Namibia. *Anthropol. South. Africa* **39**, 31–45 (2016).
36. M. Bollig, *Risk Management in a Hazardous Environment: A Comparative Study of two Pastoral Societies* (Studies in Human Ecology and Adaptation, Springer US, 2006).
37. S. P. Prall, B. A. Scelza, Resource demands reduce partner discrimination in Himba women. *Evol. Hum. Sci.* **2**, e45 (2020).
38. B. A. Scelza, S. P. Prall, N. Swinford, S. Gopalan, E. G. Atkinson, R. McElreath, J. Sheehama, B. M. Henn, High rate of extrapair paternity in a human population demonstrates diversity in human reproductive strategies. *Sci. Adv.* **6**, eaay6195 (2020).
39. B. A. Scelza, Jealousy in a small-scale, natural fertility population: The roles of paternity, investment and love in jealous response. *Evol. Hum. Behav.* **35**, 103–108 (2014).
40. R Core Team, *R: A Language and Environment for Statistical Computing* (R Foundation for Statistical Computing, 2020); www.R-project.org/.
41. RStudio Team, *RStudio: Integrated Development Environment for R* (RStudio PBC, 2020); http://rstudio.com/.
42. Stan Development Team, *RStan: The R interface to Stan* (2019); http://mc-stan.org/.
43. P.-C. Bürkner, brms: An R package for Bayesian multilevel models using Stan. *J. Stat. Softw.* **80**, 1–28 (2017).
44. H. Wickham, *tidyverse: Easily Install and Load the "Tidyverse"* (2017); https://CRAN.R-project.org/package=tidyverse.
45. C. Wilke, *cowplot: Streamlined Plot Theme and Plot Annotations for "ggplot2"* (2017); https://CRAN.R-project.org/package=cowplot.
46. D. Robinson, A. Hayes, *broom: Convert Statistical Analysis Objects into Tidy Tibbles* (2019); https://CRAN.R-project.org/package=broom.
47. H. Wickham, *modelr: Modelling Functions that Work with the Pipe* (2020); https://CRAN.R-project.org/package=modelr.
48. M. Kay, *tidybayes: Tidy Data and Geoms for Bayesian Models* (2020); https://doi.org/10.5281/zenodo.1308151.
49. S. Firke, *janitor: Simple Tools for Examining and Cleaning Dirty Data* (2021); https://CRAN.R-project.org/package=janitor.

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