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Implicit and explicit compromises in long-term partner choice

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ABSTRACT

Individuals select mates adaptively, adjusting their ideal partner preferences in accordance with their own mate value, and prevailing environmental conditions. They may then select a mate that falls short of these preferences if they are unable to locate or attract someone who meets their ideals. In the current study we investigated the extent to which men and women of varying mate value compromise their mate choice decisions implicitly (by lowering their preferred ideals) or explicitly (by choosing a partner who falls short of their declared). Participants reported on their ideal trait preferences, the traits of an actual long-term partner, and their own mate value. We observed that both men and women engaged in substantial implicit compromise, with lower stated ideal preferences across all potential partner traits, as participant self-perceived mate value decreased. Explicit compromises were comparatively rare and unrelated to an individual's own mate value. We conclude that implicit compromise from both men and women plays a far greater role than does explicit compromise in either sex in driving assortative mating.

1. Background

Evolution has selected for opposite-sex mate-preferences for traits that indicate high mate quality (Boothroyd et al., 2007; Buss, 1989; Buss & Barnes, 1986; Buss & Schmitt, 1993; Eagly & Wood, 1991; Gangestad et al., 2006; Shackelford et al., 2005). Patterns of preferred qualities are not idiosyncratic, but tend to follow predictable patterns (Buss & Barnes, 1986; Christensen, 1947; Furnham, 2009; Hill, 1945; Rosenthal, 2017; Schwarz & Hassebrauck, 2012; Shackelford et al., 2005). Cross-culturally, both sexes report strong preferences for an intelligent (Li et al., 2002), kind and understanding partner, with whom they are in love (Buss & Dedden, 1990). Women (relative to men) are more attracted to cues that signal a partner's willingness and capacity to invest social, psychological, and material resources in her and their potential offspring (Boothroyd et al., 2007; Eagly & Wood, 1991). Men (relative to women) are more attracted to cues of reproductive potential, such as youth, health, and physical traits that predict fertility (Scheib et al., 1999; Thornhill & Gangestad, 1994, 1999). Collectively, intelligence, kindness, physical attractiveness (in women), and status and resources (in men) are rated as necessary traits by potential opposite sex partners (Li et al., 2002).

Mate preferences also vary as a function of environmental factors. Individuals place greater weight on cues of wealth as resource availability increases (Brooks et al., 2011), and women's preferences for a mate's financial prospects increase as their own personal wealth increases (Wiederman & Allgeier, 1992). Disease prevalence also positively predicts mate preferences for cues of disease resistance (Frederick & Haselton, 2007; Gangestad & Buss, 1993). In high-disease areas, women prefer more masculine male faces (as physical markers of high testosterone are honest indicators of immunocompetence, Foo et al., 2020), but when disease resistance is less likely to be important the interpersonal benefits of a less masculine partner, which include greater fidelity (Booth & Dabbs, 1993) and investment in children (Boothroyd et al., 2007) are preferred (Perrett et al., 1998; Thornhill & Gangestad, 2006). Overall, women apply stricter selection standards than do men (Buss & Shackelford, 2008; Penke et al., 2007; Regan, 1998b), potentially due to their greater direct commitment in time and energy to the reproductive process, and hence long-term negative consequences of making a poor choice (Waynforth, 2001), although sex differences in overall standards tend to be more pronounced in short-term, rather than long-term mating contexts (Thomas, 2018). In the face of a skewed operational sex-ratio, reducing the number of potential mates, men further relax their standards (to increase the likelihood of attaining a partner), while women increase theirs (possibly to guard against deceptive men seeking short-term liaisons only) (Stone et al., 2007). Relationship preferences also change within an individual in response to evolutionarily-relevant stimuli such as danger, parental-care and resource abundance (Thomas & Stewart-Williams, 2018), causing shifts

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between short-term and long-term mating preferences. Mate selection criteria differ with differing mating strategy: qualities prized in a long-term partner such as kindness and cooperation, may be prioritised lower than qualities such as attractiveness in a short-term partner, hence the same individual can have different preferences at different times under different circumstances (Thomas, 2018).

While mate preferences tend to reflect the traits present in an ideal partner (given current environmental conditions), not all mate choice decisions can reflect these preferences. The desired traits may not all be available in the one potential mate, or may not be available to the extent desired in the pool of available potential partners. Individuals may therefore differ in which qualities they prize the most, and the degree of compromise they will tolerate from the ideal partner, in an actual partner (Buss & Shackelford, 2008; Fletcher et al., 2004; Regan, 1998b). In the current study we sought to investigate how individual differences in mate value impact the extent to which men and women will compromise, the trait patterns of these compromises, and whether they manifest explicitly or implicitly, when making long-term mate choice decisions.

Mate value refers to the aggregate traits an individual possesses, which contribute to their reproductive potential, and typically comprises those traits that impact an individual's capacity to attract and retain a quality mate (Fisher et al., 2008; Waynforth, 2001). Not surprisingly, assessments of own mate-value tend to be comparative and are influenced by opposite-sex mating preferences. For example, women exposed to other attractive women, and men exposed to other high status men report decreases in self-perceived mate-value, while the converse exposures do not impact self-perceived mate-value (Gutierres et al., 1999).

Measurements of mate value are typically one of two kinds. Global measures, such as the self-perceived mating success scale (Landolt et al., 1995) include generic items such as “Members of the opposite sex are attracted to me”, and, from Edlund and Sagarin's (2014) mate value scale: “Overall, how good of a catch are you?” Trait-level approaches to measuring mate value, such as the mate value inventory (Kirsner et al., 2003) require participants to rate themselves on a series of traits that are theoretically relevant to mate value, with higher aggregate scores indicating higher overall mate-value. Trait-level approaches to mate value measurement have dominated studies investigating the relationship between ideal partner preferences and long-term partner selection (for example, Eastwick & Finkel, 2008; Eastwick et al., 2011; Fletcher et al., 1999; Li et al., 2013; Todd et al., 2007). It is also the approach we have adopted. However, simple aggregates of self-reported trait levels are insensitive to the patterns of opposite-sex mate preferences (Fisher et al., 2008). For example, men value physical attractiveness in a partner more than do women, and women value resources in a partner more than do men. As a result a highly physically attractive woman with few financial resources should have higher mate value than a highly physically attractive man with few financial resources. But simple aggregates of self-reported trait levels would assign equal mate value to these two hypothetical individuals. Therefore, for the current study we have adopted a more nuanced process for turning self-reported trait scores into a composite measure of mate value, by weighting each trait's contribution to the aggregate according to the opposite sex's reported valuation of those traits.

Recent work (Conroy-Beam, 2018; Conroy-Beam et al., 2019; Conroy-Beam & Buss, 2017) has used Euclidean distances calculated in multi-dimensional space, between the participants' self-reported values on multiple traits and the opposite sex's mean preferences for those traits, to calculate mate-value. Such Euclidean distance-based mate value estimates predict attraction to potential mates, relationship satisfaction, and the capacity to attract and retain mates that match stated ideal preferences (Conroy-Beam, 2018). The key conceptual difference between Conroy-Beam's Euclidean distance method for calculating mate value, and the method we have adopted in the current study, is that our method explicitly prioritises (and weights) those traits that are most highly valued by the opposite sex at the expense of those that are less highly valued, without penalising individuals who exceed mean opposite-sex preferences on certain traits. While direct quantitative comparisons between the two methods are beyond the scope of the current study, such comparisons would be valuable for future investigations to pursue.

Compromise in mate choice (broadly defined as acceptance of a mate who is lower in quality than other potential mates in the pool) may occur in spite of explicit preferences for a higher quality mate. Budget allocation tasks (Li et al., 2002) have been used to investigate such explicit compromises when participants are forced to trade-off high levels of one trait for high levels of another. These tasks compare preferences for levels of a series of traits, when the aggregate level of all traits that can be requested is constrained to various extents. Under high constraints, where participants can request reasonable levels of very few traits only, familiar sex differences emerge: women spend more of their allocated budget than do men on resources and status, whereas men spend more than do women on physical attractiveness (Edlund & Sagarin, 2010; Li et al., 2002; Thomas et al., 2019). The potential for such designs to directly inform on the impacts of mate value on explicit mate-choice compromises however, may be limited. This is because budget allocation tasks artificially level the playing field between high and low mate value individuals (Edlund & Sagarin, 2010), creating an inherent confound between participants' own mate value and the ecological validity of the task. High budgetary constraints best emulate the conditions under which low mate-value individuals likely make real-life mate choice decisions: being unable to demand high levels of many (or any) traits. Imposing such limitations on high mate-value individuals, however, may not reveal functionally relevant patterns of compromise, since a refusal to compromise may well be the most adaptive mate-choice strategy for such individuals (Arnocky, 2018; Buss & Shackelford, 2008). As such, comparisons between individuals of varying mate value, within and across different levels of budgetary constraint may have limited utility in revealing the patterns of explicit compromise from ideal preferences to actual mate choice that manifest in the real world. (Note that this is not a blanket criticism of budget allocation tasks, per se, which very elegantly discriminate between those traits deemed necessary, and those deemed to be luxuries. It is only the utility of applying this paradigm to the question of mate value specifically that we question.)

Speed-dating paradigms provide potential evidence of such compromises in the real world, with participants' pre-measured ideal preferences generally not aligning with their subsequent choices (Eastwick & Finkel, 2008; Todd et al., 2007). The extent to which such observations provide evidence of compromise, as opposed to revealing the limited validity of self-reported ideal partner preferences, however, has been debated (Eastwick et al., 2014; Trivers, 2000). Li et al. (2013) addressed several limitations of previous speed dating studies (including a lack of variance in key traits in prospective partners) and observed that the sex differences in hypothetical partner preferences (for physical attractiveness and resource potential) carried over to the real-world speed dating context, and within-sex individual differences in preferences for these traits were also reflected in their real-world choices. The four studies within Li et al. (2013) thus collectively confirmed both the real-world validity of hypothetical ideal mate preferences, and the utility of speed-dating paradigms, provided they are carefully designed and controlled. Whether speed-dating paradigms are appropriate for assessing explicit compromise in long-term mating contexts, though, is still unclear. While Li and colleagues' design demonstrated that the paradigm is sensitive to differences between long-term and short-term mating motives, Eastwick et al. (2011) reported correspondences between ideal partner preferences and judgements of hypothetical partners (which the participants had not met), as well as between ideal partner preferences and actual long-term partners. However, they failed to observe a relationship between ideal preferences and judgements of potential partners that participants had just

met. This suggests that the speed-dating context – which involves judgements of potential partners that have only just been met – may not be able to capture the kinds of compromise decisions that individuals make, possibly over a relatively extended period of time, during the transition from a potential partner to a stable pair bond. Li and colleagues themselves suggested that the initial stages of partner evaluation may be more about assessing and rejecting individuals based on them failing to meet minimum standards on certain key criteria, rather than assessing how they stack up against one's ideal preferences. For these reasons speed-dating paradigms may not be that informative with respect to explicit compromises in long-term partner choice.

Few studies have assessed how ideal partner preferences differ from the characteristics of actual long-term partners, and whether these deviations systematically vary with mate value. We do know that when the correspondence between ideal partner preferences and actual partner characteristics is high, relationship satisfaction is also high, whether ideal preferences were assessed prior (Eastwick et al., 2011) or during (Fletcher et al., 1999) the relationship, Eastwick and colleagues also assessed mate value, and reported no evidence that it moderated the relationship between ideal/actual trait correspondence and relationship satisfaction. Because these authors were primarily focused on the extent to which ideal preferences predicted actual partner characteristics and relationship outcomes, they did not provide systematic analyses of how individual characteristics deviated from ideal preferences for those characteristics, and whether these deviations could be predicted by mate value. We have focused on such analyses in the current study.

Compromises in mate choice may also occur implicitly, via preferences for a lower quality mate. We refer to such compromises as implicit, since they occur at the level of preference formation. The compromise inherent in subsequent decisions that are in line with those preferences is thus implicit. The ubiquitous nature of such implicit compromises is illustrated by the fact the when people are asked to rate their ideal partner on universally desired traits, such as kindness, physical attractiveness, and wealth, they rarely provide perfect scores (Fletcher et al., 1999).

An individual's own mate value is one of the most influential factors affecting implicit compromise in ideal mate standards, at least for women (Buss & Shackelford, 2008; Fisher et al., 2008; Miner et al., 2009). Previous studies suggest that women more accurately perceive their own mate-value than do men (Eastwick & Finkel, 2008). Self-perceived mate-value consistently and robustly predicts women's ideal mate preferences (Buss & Shackelford, 2008; Little et al., 2001; Regan, 1998b), with higher mate-value women preferring higher quality mates. But mate-value is reportedly less related to men's mate-selection criteria. High mate value men reported higher minimum standards of attractiveness in a potential long-term partner (Regan, 1998a); and men of higher social status exhibited stronger preferences for women of high social status (Regan, 1998b), although both of these effects manifested among a large collection of non-significant mate-value by trait correlations. Buston and Emlen (2003), however, reported similarly strong relationships between men's and women's ideal preferences for 4 mate-relevant traits and self-ratings on those same traits. Todd et al. (2007) replicated these self-report relationships, but then observed that while women's stated preferences for mate quality positively correlated with subsequent mate choices (in a speed-dating paradigm), men's stated preferences did not. As such, it remains unclear whether women are indeed better than men at perceiving their own mate-value, and adjusting their partner preferences, and choices, accordingly.

Implicit compromises in mate preferences are presumably adaptive. While generic mate preferences (as indicated by population-level averages) tend to point to higher quality individuals being preferred as partners, any given individual is unlikely to be able to attract and retain a very high quality partner, being limited by their own mate quality (Feingold, 1988), the availability of potential mates (Todd et al., 2007), and the presence of competitors (Buss & Schmitt, 1993). Attempts to attract mates that are unattainable, or un-retainable, potentially result in missed opportunities to partner with other attainable individuals and increases the risks of wasted investment and desertion. Conversely, preferences for mates that are lower in quality than would be attainable would be similarly maladaptive. Adaptive compromises in mate preferences would therefore be expected to direct individuals towards the highest quality mates that they would be able to attract and retain, given their own mate value, and the prevailing circumstances (Li et al., 2002; Todd et al., 2007; Wood & Brumbaugh, 2009).

1.1. The current study

In the current study we sought to investigate the extent to which mate preferences are compromised implicitly and explicitly, respectively, in the choice of long-term partners, and whether an individuals' own mate value predicts the extent to which they implicitly or explicitly compromise on individual traits. We recruited men and women to provide ratings of ideal partner traits, ratings of themselves on those traits, and ratings of either their current or most recent, (if they are single) long-term partner on those traits. These traits included the 64 characteristics of the mate selection preferences scale (Schwarz & Hassebrauck, 2012), which reduce into 12 factors (kind and understanding, sociable, wealthy, intellectual, physically attractive, humorous, cultivated, similar, dominant, emotional, resourceful, and individual); and estimates of the level of facial sexual dimorphism and body shape (both via image selection tasks).

We calculated individual participants' mate value by using a weighted aggregate of their self-reported traits (weighted according to the overall ideal preferences indicated by the opposite sex in the current sample) and then allocated participants to a low, medium, or high mate value designation accordingly. Explicit compromise was operationalized as the difference in traits levels indicated as desired in the ideal partner and those indicated as present in a current (or former) long-term partner. Implicit compromise was operationalized by assuming that the highest mate value individuals would exhibit negligible compromise in their ideal preferences, desiring the highest mate value partners there are (Buss & Shackelford, 2008). Medium and low mate value individuals were then assumed to have implicitly compromised in traits, to the extent that their ideal partner preferences deviated from those of the high mate value individuals on those traits. We then explored the extent to which various mate-quality relevant traits were compromised explicitly, and implicitly, by men and women of high, medium and low self-reported mate value.

2. Materials and method

2.1. Participants

A total of 329 participants completed the study. Fourteen participants were excluded for having same-sex partners, 2 for failing to indicate their own sex and/or providing conflicting answers to questions about their sex (such as indicating that they were male, but choosing a female body as one that looked most similar to their own), and 4 for returning surveys with excessive missing responses (25+). Mate Preferences and Mate Value analyses included data from all remaining male (N = 82, aged 18–80, M = 38.2, SD = 18.1) and female (N = 227, aged 18-82 yrs., M = 35.5, SD = 13.0) participants. Mate Compromise analyses required participants to have a current or former long-term partner on which to report, and so were restricted to 68 men (aged 18–80, M = 41.3, SD = 17.8, 11 of whom reported on a former partner) and 207 women (aged 18–82, M = 36.3, SD = 12.8, 28 of whom reported on a former partner). All participants were recruited through social media or undergraduate psychology courses (for which they received credit) and provided informed consent under HREC protocol number 113/2014/09 (approved by the Charles Sturt University Human Research Ethics Committee).

2.2. Instruments and measures

2.2.1. Mate selection preferences

This scale (Schwarz & Hassebrauck, 2012) was selected as it combines lists of traits from various well-used instruments such as Mate Preferences Questionnaire (Buss, 1989; Buss & Barnes, 1986), and the Mate Preference Survey (Buston & Emlen, 2003). Participants rated themselves, their current (or most recent, if they were currently single) long-term partner and their ideal partner on 64 characteristics, from 1 (does not apply at all/not important at all) to 6 (applies a great deal/extremely important). Principal Components Analysis (Varimax rotation) yielded 12 factors (Table S1), many of which mirrored the 12 factors found by Schwarz and Hassebrauck (2012). There were differences in the characteristics making up some factors, particularly Factor 1 Kind and Understanding. In this study these characteristics loaded onto one main factor, while in the work of Schwarz and Hassebrauk there were three individual factors: 'Kind and Understanding', 'Pleasant', and 'Reliable' (compared in Table S1). Differences in loading of some qualities onto the different factors is not surprising since the original version of the scale was applied in Germany and so the connotations of words used in the scale may have differed between the German sample and our Australian sample. For example, in the original paper, the quality 'Kind' loaded most strongly onto the factor 'Pleasant', not the factor 'Kind and Understanding'. In our data 'Kind' loaded most strongly onto 'Kind and Understanding', not surprisingly.

2.2.2. Self-report of face sexual dimorphism and body shape

To estimate participants' face and body shape, they were presented with arrays of faces (Fig. 1) and bodies (Fig. 2). Arrays of faces were created using average male and average female Caucasian faces ($N = 50$ individual faces in each average) morphed along the vector between them, using Psychomorph software (Tiddeman & Perrett, 2001) to create a continuum of faces that ranged in 10% increments from twice the femininity of the average female face (100% feminine) through androgyny (0%), up to twice the masculinity present in an average male face (100% masculine). The faces were presented as two separate continua (excluding androgyny) and choices were scored from 1 (10% masculine or feminine) to 10 (100% masculine or feminine). Given that participants were primarily recruited from the undergraduate population of an Australian regional university, the vast majority would have been choosing faces from an own-race set.

The body array comprised two 3 × 3 grids of 9 body images created using MakeHuman software (Bastioni et al., 2014). The male images (Fig. 2A) increased in muscularity down the grid (low medium, and high), and decreased in shoulder to hip ratio across the grid (1.7, 1.5, and 1.3), while female images (Fig. 2B) increased in body mass index down the grid (thin, normal, and overweight) and waist-to-hip ratio across the grid (0.7, 0.8, and 0.9). The attractiveness (to the opposite sex) of each body shape was ascertained by how often each was chosen by the opposite sex as their ideal partner's body shape. Based on these frequencies, ordinal scores were allocated for each choice, reflecting the desirability of the body shape chosen. Table S2 shows the allocation of scores for the different body shape options.

2.3. Procedure

Participants completed the Mate Selection Preferences questionnaire rating themselves, their long-term partner (defined as "someone with whom you have been together in a committed relationship with for at least 3-months and are intending on staying in a relationship with for the foreseeable future") and an imagined ideal partner on each of the 64 qualities. Item scores were averaged to obtain factor scores for each participant for their ratings of themselves, their partner, and their ideal partner, respectively, on each of the 12 factors listed in Table S1. Participants without a current partner were instructed to complete the partner items with respect to their most recent long-term partner, if they'd ever had one. Participants also provided a relationship satisfaction rating for this current (or most recent) relationship (from 1 = very unsatisfied to 5 = extremely satisfied).

Participants also provided the following information about themselves and, where relevant, their partner: age, sex, highest level of education, and personal and family annual income (scored as 1: $0 - $20,000; 2: $20,000 - $50,000; 3: $50,000 - $80,000; 4: $80,000 - $120,000; 5: $120,000 - $200,000; and 6: > $200,000). Participants also rated their subjective impressions of their own wealth and their family wealth (1 = a great deal less wealthy than most of my peers, 2 = a bit less wealthy than most of my peers, 3 = about average wealth compared to my peers, 4 = a bit wealthier than most of my peers, 5 = much wealthier than most of my peers). Lastly, participants nominated the faces and bodies that looked most like their own, most like their partner's, and most like their ideal partner's, respectively.

3. Results

3.1. Calculating each participants' mate value

Three separate Mate Value Component scores were calculated: Personality Mate Value, Physical Attractiveness Mate Value, and Wealth and Resources Mate Value. These three components reflect the three clusters of qualities known to be important in mate choice: behavioural/personality cues of mating strategy, physical cues of health and genetic quality, and resources. Since the traits contributing to each component are differentially important to the two sexes, we calculated an individual's mate value by weighting the traits contributing to each of these components according to measured opposite sex preferences. Since resources, for example, are more important to women seeking a partner, than for men seeking a partner, having resources should increase a man's mate value more than it should increase a woman's mate value. The weighting procedure we applied reflected these sex differences, and is described below.

We first combined responses on the Mate Selection Preferences Inventory (when participants were responding with respect to their own qualities) with information about the participants' physical appearance (height, and face and body shape); and resource acquisition potential (wealth, income and education) – all the information relied upon to estimate Overall Mate Value. A complete list of the measures contributing to each Mate Value Component is available in Table S3. Since scores varied depending on the scales used to measure them, (for example, Factor scores were out of a maximum of six, level of education and wealth were scored out of a maximum of five, and height was measured in centimetres) all measures were first converted into z-scores, (across the whole sample to preserve any sex-differences), to make them comparable.

Next, we wanted our calculation of mate value to differentially reflect the preferences for different characteristics expressed by the opposite sex. When rating their ideal partner, participants allocated a score out of six for the importance of each quality. For example, men's mean score for attractiveness was 4.44, while the same for women 4.06. As such, it was more important to men that their ideal partner be physically attractive than it was to women. Participants' *Z*-scores on all the mate value relevant measures were therefore transformed (separately for each sex) so that their standard deviations now reflected the importance of that particular characteristic as indicated by the opposite sex's ideal partner preferences.[1] This had the effect of ensuring that

[1] The weighting was applied by multiplying the z-scores of each measure by $X_F/2.60$, where X_F is the mean importance score given to the relevant Factor by the opposite sex on the Mate Selection Preferences Inventory, when responding with respect to their ideal partners. By dividing the mean importance scores by 2.6, the subsequent weightings ranged from 1.27 to 2.06. This way, highly desirable characteristics could have a maximum of approximately double the

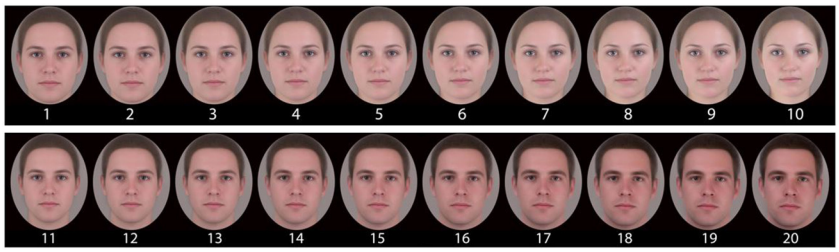

Fig. 1. Shows the continua of female (top) and male (bottom) faces, from which participants chose the face most similar to their own. Average male and female faces were morphed along the vector between them, away from each other to create more feminine female and more masculine male faces, and towards each other to create less feminine female and less masculine male faces. Male faces increase in masculinity from left to right, while female faces increase in femininity from left to right.

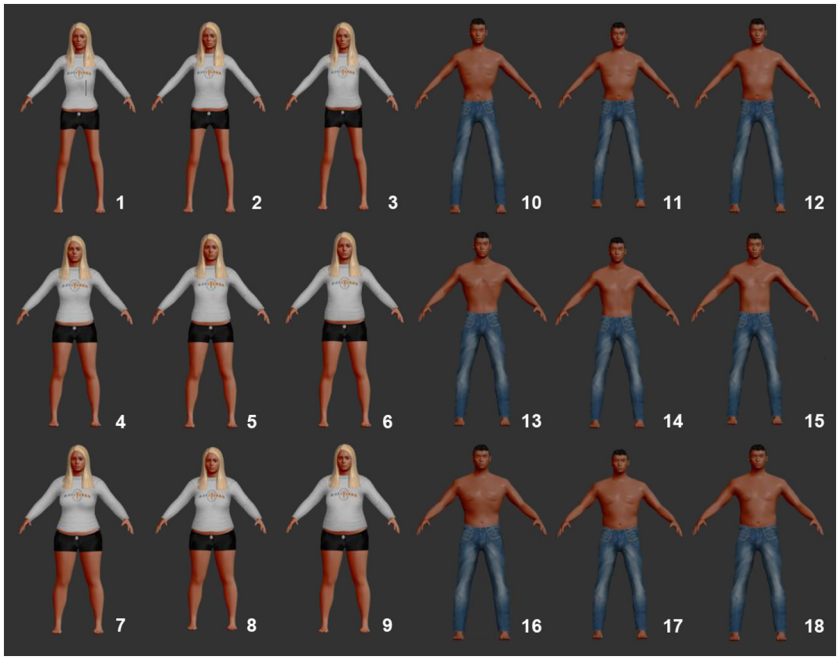

Fig. 2. Shows the arrays of female (left) and male (right) bodies from which participants selected the one most similar to their own. Female bodies varied in waist-to-hip ratio (increasing from left to right) and body mass index (increasing from top to bottom). Male bodies varied in shoulder-to-hip ratio (decreasing from left to right) and muscularity (increasing from top to bottom) for men.

individuals scoring highly on an important trait would see their Overall Mate Value increase more than would individuals scoring equally highly on a less important trait. Similarly, participants scoring low on an important trait would see their Overall Mate Value decrease more than individuals scoring equally low on a less important trait. The measures contributing to each Mate Value Component and their respective weights are also shown in Table S3. The Overall Mate Value Score was then calculated by dividing each of the Component Mate Value scores by the number of traits contributing to them, and summing the three resultant values together.

3.2. Implicit and explicit compromise

In order to identify where compromises in mate preferences (implicit compromises) and mate choice (explicit compromises) were taking place, we first examined the preferences (ideal partner factor scores) of high mate value participants (those participants whose Overall Mate Value Score was in the top third of the sample, for their sex). These preferences were the benchmark preferences to which others were compared, under the assumption that the ideal partner preferences of the highest mate value participants would show the least (or no) compromise (Buss & Shackelford, 2008). Thus, implicit compromises were operationalized as the difference in expressed ideal partner preferences between the high mate value participants and the medium (middle third) and low (bottom third) mate value participants, respectively.

(*footnote continued*)
weighting of less preferred characteristics.

Explicit compromises were defined as differences between the perceived levels of a trait in a person's actual partner, and the reported levels of that trait desired in an ideal partner (representing a mate choice that differs from explicitly reported preferences). Compromise scores were calculated for each participant for each of the twelve factors, by subtracting their Partner score from their Ideal score. We then investigated how sex and Overall Mate Value impacted both implicit and explicit compromise across the difference factors.

3.2.1. Ideal partner preferences and implicit compromise

To investigate whether reported preferences in ideal mate qualities were affected by an individual's own mate value and sex, a 12 (the 12 factors of the Mate Selection Preferences Inventory) x 2 (sex) x 3 (mate value group: high medium and low, reflecting an ordinal split of the sample) mixed analysis of variance (ANOVA) was applied to the ideal partner preference scores.

There was a significant main effect of factor, Wilks' $\lambda = 0.211$, F (11, 293) = 99.37, $p < .001$, $\eta_p^2 = 0.79$, and a significant sex by factor interaction, Wilks' $\lambda = 0.803$, F (11, 293) = 6.52, $p < .001$, $\eta_p^2 = 0.20$, as men and women exhibited different patterns of overall preferences across the 12 factors. While the sexes shared the same top six preferences (Kindness and Understanding, Cultivated, Similar, Individual, Intellectual and Humorous, in almost the same order to see Fig. 3), they differed as expected with women indicating stronger preferences than did men for wealthy ($p < .001$) and kind and understanding ($p < .001$) partners, and men more strongly preferring physically attractive partners ($p = .007$). Women also exhibited a stronger preference for a more cultivated ($p = .006$) and similar ($p = .025$) partner than did men, although these differences were not predicted a

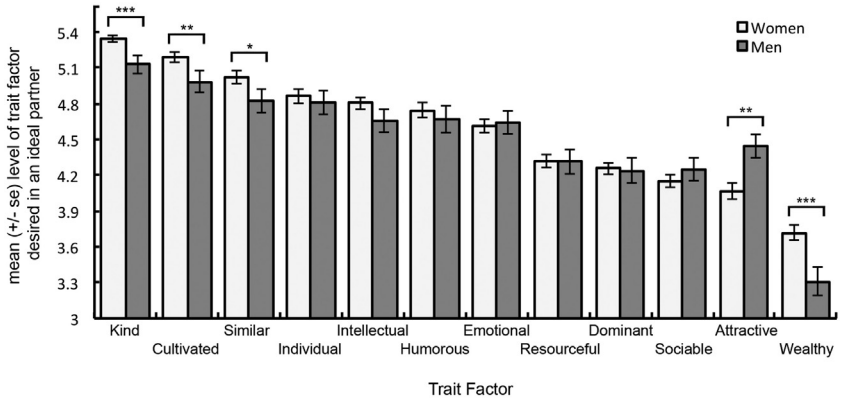

Fig. 3. Shows the mean (+/− se) level of each trait factor men and women desired in an ideal partner. Trait factors are ordered left to right from the most desired to the least desired (in women). Women desired higher levels of kind, wealthy, cultivated, and similar, while men desired higher levels of attractive. ***$p < .001$, **$p < .01$, *$p < .05$.

priori and the latter would not survive a Bonferroni correction for multiple comparisons.

We also observed a significant main effect of mate value group, $F(1,303) = 50.224$, $p < .001$, $\eta_p^2 = 0.249$, and a significant mate value group by factor interaction, Wilks' $\lambda = 0.846$, $F(22,584) = 2.309$, $p = .001$, $\eta_p^2 = 0.080$. Participants of high and medium mate value (compared to medium, $p < .001$, and low, $p < .001$ mate value participants, respectively) were more demanding of desirable partner traits overall. These same comparisons remained significant when data from men (high vs medium: $p = .003$, medium vs low: $p = .001$) and women (both $p < .001$) were examined separately. Considering the 12 factors separately, pairwise comparisons revealed that for all 12 factors, high mate value participants were significantly more demanding than were low mate value participants (all $p < .001$), suggesting that implicit compromises in mate preferences occur to at least some extent across all types of traits. All 12 comparisons remained significant even when data from men (all $p < .005$) and women (all $p < .020$) were examined separately. Subsequent comparisons within each factor between high and medium, and medium and low mate value participants, respectively, revealed that high mate value participants reported wanting higher levels of 9 of the 12 factors in an ideal partner (all $p < .025$, excluding Humourous: $p = .068$, Emotional: $p = .268$, and Individual: $p = .092$) compared to medium mate value participants. Medium mate value participants also reported stronger desires for 9 of the 12 factors (all $p < .022$, excluding Wealthy: $p = .399$, Cultivated: $p = .113$, and Dominant: $p = .094$), compared to low mate value participants. These results are depicted in Fig. 4A (women) and 4B (men).

The mate value by sex interaction was not significant, $F(2,303) = 0.868$, $p = .421$, $\eta_p^2 = 0.006$, suggesting that men and women, overall, exhibited similar levels of implicit compromise in mate preferences as their own mate value decreased. Similarly, neither the main effect of sex, $F(1,303) = 3.156$, $p = .077$, $\eta_p^2 = 0.010$, nor the three-way factor by sex by mate value interaction, Wilks' $\lambda = 0.899$, $F(22,586) = 1.456$, $p = .083$, $\eta_p^2 = 0.052$, were significant. Since the latter approached significance it is worth noting, with caution, that while power analyses suggested our male sample size was adequate, it was nevertheless substantially smaller than our female sample size. As such we cannot rule out with overwhelming conviction that non-significant results pertaining to sex differences (or indeed to the male sample size in isolation) represent Type II errors. We consider the implications of this further in the discussion.

3.2.2. Explicit compromise

To investigate compromise at an explicit level (i.e. a compromise made by the participant when choosing a partner that differs from explicitly declared ideal partner characteristics) each participant's degree of compromise was calculated by subtracting their current (or most recent) partners' scores from their ideal preference on each of the 12 mate preference factors, to create a factor compromise score. While the theoretical range for degree of compromise is −6 to +6 (with a higher negative value meaning that the participant's partner rated better on that specific factor than did their ideal, and a positive value indicating a greater degree of compromise since the partner did not meet the ideal on that trait), actual compromise scores never exceeded ± 5, and rarely exceeded ± 1. Mean compromise scores for men and women across the three mate-value groups never exceeded ± 1. One-sample *t*-tests applied to these mean compromise scores confirmed that scores significantly exceeding zero were relatively uncommon. For women, explicit compromise was observed across all three mate-value groups for a kind and understanding, similar, and cultivated partner. Low mate-value women compromised on humour, medium mate-value women on emotional, and high mate value women on emotional and intellectual. Explicit compromise was even rarer in men with robust compromise only observed in high mate value men for a humourous and similar partner (full results are in Table 1).

A 12 (the 12 factors) x 2 (sex) x 3 (Mate Value Group) mixed analysis of variance was then applied to these compromise scores to more formally investigate how they were affected by sex and mate value. There was a significant effect of factor, Wilks' $\lambda = 0.636$, $F(11,264) = 13.757$, $p < .001$, $\eta_p^2 = 0.364$, as well as a significant factor by sex interaction, Wilks' $\lambda = 0.843$, $F(11,264) = 4.456$, $p < .001$, $\eta_p^2 = 0.157$, confirming that men and women compromised to different extents across the 12 factors. Pairwise comparisons revealed that women compromised more than did men on Kind and Understanding ($p = .001$), Wealthy ($p < .001$), Intellectual ($p = .004$), Cultivated ($p = .027$), and Emotional ($p = .020$), while men did not compromise significantly more than did women on any factor.

While neither the main effects of sex, $F(1,274) = 2.709$, $p = .101$, $\eta_p^2 = 0.010$, and mate value group, $F(2,274) = 0.381$, $p = .683$, $\eta_p^2 = 0.003$, nor their interaction, $F(2,274) = 0.203$, $p = .817$, $\eta_p^2 = 0.001$, were significant, the three way interaction between factor, mate value group and sex was significant, Wilks' $\lambda = 0.870$, $F(22,528) = 1.725$, $p = .023$, $\eta_p^2 = 0.067$, confirming that men and women differed in how mate value affected their patterns of explicit compromises across the 12 factors. In contrast to the implicit compromises, which differed significantly between the mate-value groups in both men and women across all 12 factors, there were relatively few significant simple effects of mate value for the explicit compromise scores. Low, medium, and high mate value men did not differ in their levels of explicit compromise across any of the 12 traits (all $p > .070$, although the greater prospect of Type II errors within the male, compared to the female sample should also be noted here). Low mate value women compromised more than did medium mate value women on Humorous ($p = .022$); and high mate value women compromised more on Dominance ($p = .032$) than did medium mate value women, but compromised less on Individual than did low ($p = .019$) mate value women. Explicit compromises are shown in Figs. 5A (women) and 5B (men).

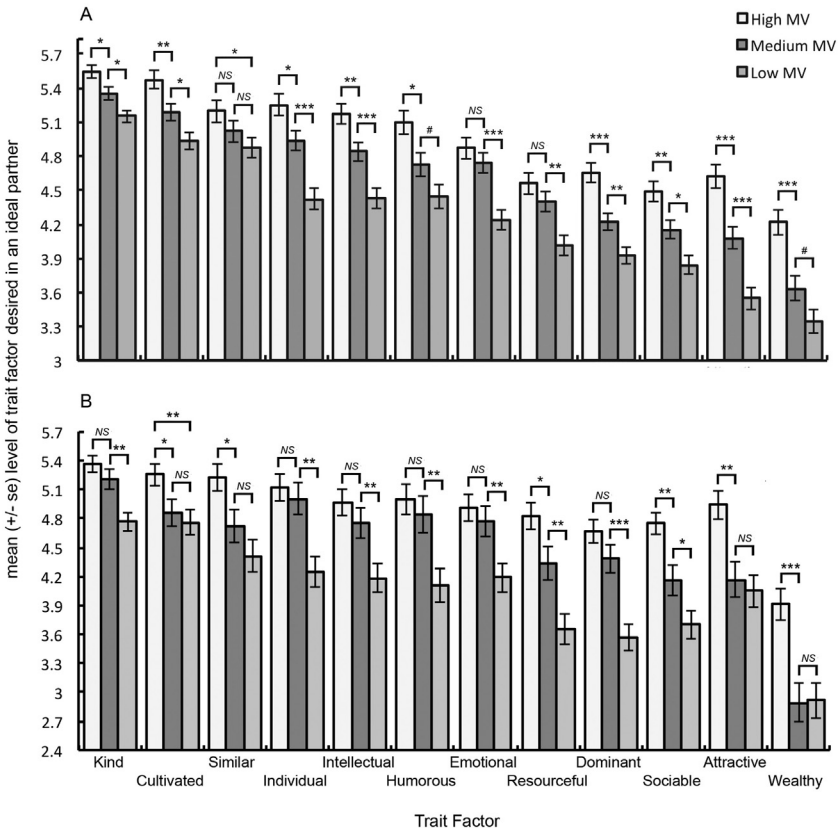

Fig. 4. Shows the mean (+/− se) level of each trait factor women (A) and men (B) desired in an ideal partner, shown separately for low, medium, and high mate quality individuals. In all cases, the desired level of each trait factor decreased significantly as mate value decreased (where the significance of the direct comparison between the high and low mate value groups is not indicated, the associated *p*-value is < 0.001). ***$p < .001$, **$p < .01$, *$p < .05$, #$p < .1$, *NS* $p > .1$.

Table 1
Explicit compromise observed for low, medium and high mate value men and women across 12 mate value factors.

Sex	Men			Women		
Mate value	Low	Medium	High	Low	Medium	High
Kind & understanding	0.22	0.50[a]	0.23	**0.88**[b]	**0.65**[b]	**0.74**[b]
Sociable	−0.04	0.13	0.45[a]	0.32[a]	0.18	0.39[a]
Wealthy	−0.11	−0.74	−0.25	0.25[a]	0.02	0.29[a]
Intellectual	0.01	−0.18	−0.16	0.28	0.25[a]	**0.43**[b]
Physically attractive	0.17	−0.27	0.03	−0.18	0.16	−0.02
Humorous	0.25	0.30	**0.58**[b]	**0.54**[b]	0.08	0.29[a]
Cultivated	0.29	0.16	−0.04	**0.56**[b]	**0.38**[b]	**0.38**[b]
Similar	0.57[a]	0.56[a]	**0.70**[b]	**0.99**[b]	**0.63**[b]	**0.61**[b]
Dominant	−0.15	0.21	0.13	0.00	−0.21	0.12
Emotional	0.03	0.40	0.20	0.41[a]	**0.70**[b]	**0.70**[b]
Resourceful	−0.14	0.09	0.29	0.20	0.01	−0.03
Individual	−0.08	0.13	−0.06	0.29[a]	0.21	0.15

[a] Compromise is significantly above zero (uncorrected alpha of 0.05).
[b] Compromise is significantly above zero (corrected alpha of 0.004, for 12 comparisons, shown in bold).

4. Discussion

In the present study we investigated how men's and women's own mate value impacted their ideal partner preferences, and how ideal partner preferences deviated from the traits reported in an actual current (or recent) long-term partner. Our findings were consistent with well-established sex-specific preferences in mate selection criteria: men reported a greater preference for attractiveness in a potential partner and women showed greater preference for wealth and generosity (Buss, 1988, 1989; Buss & Barnes, 1986; Buss & Schmitt, 1993; Buss & Shackelford, 2008; Buss et al., 2001; Eastwick & Finkel, 2008; Feingold, 1992; Furnham, 2009). In addition, women showed significantly greater preference for attributes indicative of kindness/reliability, similar values/interests and good manners/politeness (i.e. cultivated) than did men. As expected from previous reports (Buss & Barnes, 1986; Howard et al., 1987; Li et al., 2002; Shackelford et al., 2005) both sexes rated personality characteristics as more important than wealth/attractiveness, with kindness and understanding as the most important quality, followed by similarity to their partner and pleasantness/politeness.

Implicit compromise in mate choice was operationalized in the current study as significantly relaxed ideal partner preferences in medium and low mate-value individuals, respectively, when compared to high mate value individuals within each sex (under the assumption that little to no compromise in mate choice is expected in the highest mate value individuals, Buss & Shackelford, 2008, Conroy-Beam, 2018). Implicit compromise was observed in the ideal preferences of lower mate-value men and women across all twelve mate selection factors. For the majority of these 12 factors, more compromise was observed in low than in medium mate-value participants, providing compelling evidence that downward adjustments of mate preferences, proportionate to (self-perceived) own mate value, are a key mechanism driving quality-based assortative mating in both sexes.

In contrast, explicit compromise, operationalized by comparing ideal partner ratings to real partner ratings was observed for far fewer traits. Both sexes compromised to some extent on similarity of their partner to themselves, while women also compromised on how kind and understanding, and how cultivated their partner was. Few other explicit compromises were observed. Furthermore, there was no evidence that explicit compromises varied systematically with mate quality in either men or women. This could be because implicit compromises in mate preferences are largely driven by an individual's own mate value and intrinsic qualities, and how these qualities interact with the prevailing environmental conditions. Explicit compromises in mate choice may reflect the stochastic nature of actual partnership opportunities individuals encounter. Regardless, these data suggest that explicit compromises in mate choice decisions, especially in men, play a

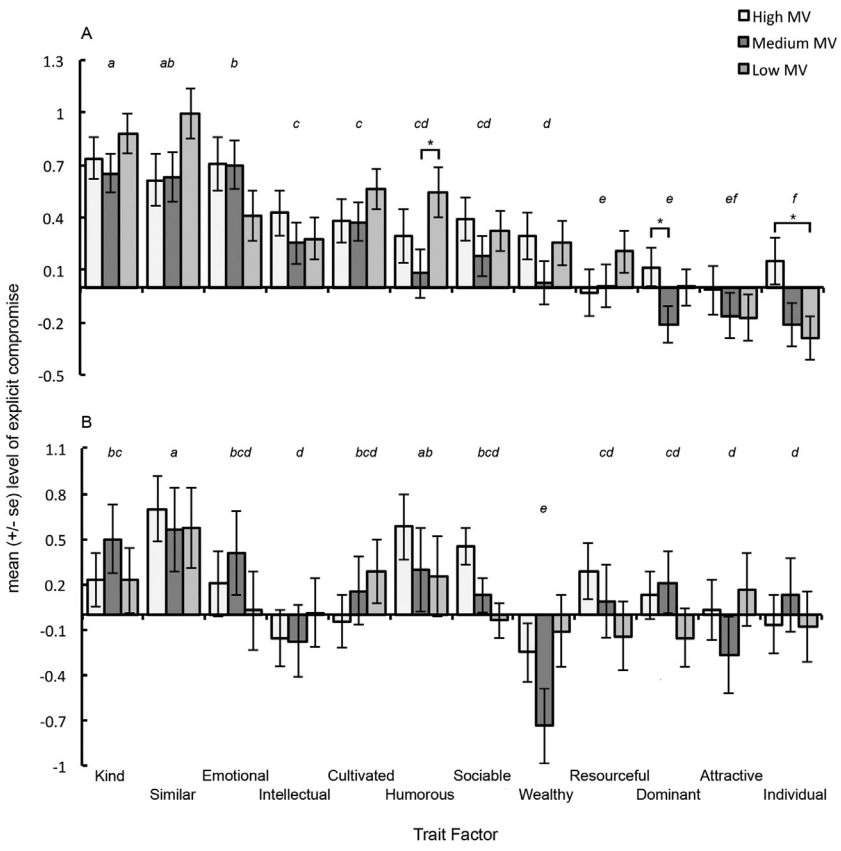

Fig. 5. Shows the mean (+/− se) level of explicit compromise in each trait factor women (A) and men (B) exhibited in their choice of long-term partner, where explicit compromise is defined as the level of a trait factor desired in an ideal partner, minus the level of that trait factor participants reported their current long-term partner exhibited (where the significance of pairwise comparisons is not indicated, the associated *p*-value is > 0.1). *$p < .05$, different lower case letters denote significant differences between factors (averaged over mate value groups), according to an uncorrected alpha of 0.05.

much smaller role than do implicit compromises in promoting assortative mating.

While men may be less choosy than are women when selecting potential short-term partners, the sexes are similarly choosy when selecting long-term partners (Buss & Shackelford, 2008; Furnham, 2009; Hald & Høgh-Olesen, 2010; Regan, 1998a and 1998b; Thomas, 2018). The data from the current study further support this conclusion as we observed similar overall levels of implicit compromise in men and women, with medium and low mate value men and women compromising their ideal preferences to similar extents compared to high mate value men and women. Similarly, both sexes exhibited comparatively low levels of explicit compromise across all mate-value groups. This confirms that both men and women adjust their ideal preferences in concert with their self-perceived mate value, and that the sexes adhere to these preferences with comparable rigidity across varying levels of mate value.

Our conclusions regarding the central role of implicit compromise in driving assortative mating (and the much smaller role of explicit compromise) arises from the relatively high similarity between self-reported ideal partner preferences, and actual partner traits reported by our participants. The relatively high mean age of our sample (mid to late thirties) provided for participants being able to report on long-lasting long-term relationships, more so than would have been the case had the sample consisted primarily of participants in their early twenties as is the case with most previous studies on this topic (Buss, 1988, 1989; Buss & Barnes, 1986; Shackelford et al., 2005). The correspondence between the ideal partner preferences observed here (including in patterns of sex differences) and those reported in much younger samples inspires confidence in the suitability of our sample for addressing these types of research questions (Feingold, 1990, 1992; Fisher et al., 2008).

Our sample's age profile, however, does mean that the time since our participants chose their long-term partner would be substantial in many cases. This could mean that participants' (self-perceived) mate value has changed from the time they made these compromises to the time when they reported on both them and their mate value in the current study. We considered mate-value categorically (low, medium, and high), so relatively modest changes in mate value over time would be unlikely to impact the designated mate value category we applied to each participant, and thus unlikely to impact our analyses or conclusions. On the other hand, we cannot be certain of the magnitude (or direction) of potential mate value changes that may have occurred since relationship formation, and only extended longitudinal studies could reveal whether such changes represent a challenge to the conclusions drawn here.

There may also have been plenty of opportunity for participants to re-shape the ideal partner preferences they had when they met their long-term partner, to match their partner's traits and qualities. Fletcher et al. (2000) reported that perceived partner qualities in early weeks of new relationships predicted reported ideal preferences several months later. While these data confirm some shifting of ideal preferences towards the qualities of a long-term partner, the data were collected from the very early, tumultuous stages of romantic relationships, and may not generalise to more long-term stable relationships. Further, several studies report that the concordance between ideal preferences and current partner traits predicts both relationship satisfaction and future relationship dissolution. This implies that ideal preferences serve a functional purpose throughout relationships by providing a yardstick against which a current partner's qualities can be assessed, guiding evaluations of the partner and the relationship (Eastwick et al., 2011; Simpson et al., 2000). For such a mechanism to function adaptively, there must be a limit on the extent to which ideal partner preferences can conform to the observed qualities of a current partner. The extent to which our data may have overestimated the role of implicit compromise and underestimated the role of explicit compromise in driving assortative mating depends on this theoretical limit. Only data collected over many years, even decades, could reveal the extent to which and under what circumstances, ideal partner preferences change over the

course of a long-term relationship to emulate, or otherwise, the characteristics of an individual's partner.

Explicit compromise effects might also have been over-estimated in our study. Since we used between-group comparisons to estimate implicit compromise, general misperceptions about the importance of certain traits in a prospective partner would have been unlikely to affect our estimates of implicit compromise (provided that individuals across the mate-value spectrum held the same misperceptions). The same cannot be said for our estimates of explicit compromise. Explicit compromise was estimated by comparing participants' ideal and actual partner ratings. Therefore, if people, generally, tend to overestimate the importance of a trait, this would show-up in our explicit compromise measures only.

Given that patterns of explicit compromise were limited to very few traits and did not tend to vary with mate-value it is possible that such misperceptions may have contributed to them. Similarity featured prominently as an explicitly compromised partner quality. Unlike the other traits we measured, similarity is not an intrinsic trait of an individual but a relational term between oneself and a prospective partner. It is also difficult to know how participants conceived of similarity as these ratings were being applied (since partners may be similar or different across any or all of the remaining traits). Conventional wisdom may dictate that for a relationship to be successful the people involved should be compatible and have similar interests, attitudes, and goals. It could well be that the high stated desire for similarity in a potential partner reflects this belief, more than it reflects adaptively attenuated ideal partner preferences. Since choosing a partner who is less similar to oneself does not necessarily equate to choosing a lower quality partner, it is also questionable as to whether explicit compromises on partner similarity should be viewed as mate-choice compromises at all.

Lastly, the number of men in our sample is substantially lower than the number of women. While our a priori power analyses suggested adequate sample sizes, there is no doubt that we had more power to detect potential effects of mate value within our female sample, than within our male sample. This appears to have minimally impacted our implicit compromise analyses, as we observed significant compromise in our male sample across all 12 traits examined (as we did in our female sample). With respect to explicit compromises, these were detected in both sexes, and with sufficient power to also observe sex differences in the extent of compromise observed for some traits. We did not, however, observe any statistically significant effects of mate value on explicit compromise across any of the 12 traits in men, but did observe such effect across 3 of the 12 traits in women. Given the generally low levels of explicit compromise observed across the whole sample (relative to implicit compromise), we cannot rule out the potential for either Type I errors in the female sample, or the potential for Type II errors in the male sample. Nor can we rule out that there are small, but meaningful sex differences in the patterns of explicit and implicit compromise that high, medium, and low mate value men and women exhibit, that only a study with substantially more power than ours might detect. In spite of these possibilities, the size of our sample appears statistically adequate (based on coherence of a large number of significant effects within both the male and female samples alike) to support the conclusions we draw here: that implicit compromise based on (self-perceived) mate-value is observed across the spectrum of preferred partner traits to similar extents in both sexes, and plays a larger role in driving assortative mating than does explicit compromise which is observed to much lesser extent in both sexes.

In this study we investigated the extent to which individuals compromise the quality of potential partners implicitly, by adjusting their ideal partner preferences in accordance with their own mate-value, and explicitly, by choosing partners who fall short of these preferred ideal standards. We observed that both men and women engage in substantial levels of implicit compromise, with lower mate-value individuals reporting lower ideal levels of preferred traits, across all 12 trait factors measured. Explicit compromise was comparatively more rare and unrelated to self-perceived mate value, with men and women tending to adhere to their stated ideals in long-term partner selection (with the exception that both sexes tended to report having partners less similar to themselves than they would ideally prefer). From this, we can conclude that implicit compromise in mate choice plays a greater role in promoting assortative mating than does explicit compromise. This study measured ideal preferences at the same time as participants reported on the traits of an actual long-term partner, however, and so there is the possibility that we over-estimated implicit compromise and underestimated explicit compromise, to the extent that ideal preferences shift over time to match the qualities of a current partner.

CRediT authorship contribution statement

Melinda Williams:Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft.**Danielle Sulikowski**:Conceptualization, Methodology, Resources, Formal analysis, Writing - review & editing, Supervision.

Appendix A. Supplementary tables

Supplementary tables to this article can be found online at https://doi.org/10.1016/j.paid.2020.110226.

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