Mate preference priorities in the East and West: A cross-cultural test of the mate preference priority model

SCHOLARONE™
Manuscripts

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Mate preference priorities in the East and West: A cross-cultural test of the mate

preference priority model

Andrew G. Thomas (Swansea University)

Peter K. Jonason (Western Sydney University)

Jesse Blackburn (Swansea University)

Leif Edward Ottesen Kennair (Norwegian University of Science and Technology)

Rob Lowe (Swansea University)

John Malouff (The University of New England)

Steve Stewart-Williams (University of Nottingham)

Danielle Sulikowski (Charles Sturt University)

Norman P. Li (Singapore Management University)

Address correspondence to: Andrew G. Thomas, Department of Psychology, Swansea

University, Swansea, United Kingdom, SA2 8PP. Email: research@agthomas.net

Abstract

Objective: Mate choice involves trading-off several preferences. Research on this process tends to examine mate preference prioritization in homogenous samples using a small number of traits and thus provide little insight into whether prioritization patterns reflect a universal human nature. This study examined whether prioritization patterns, and their accompanying sex differences, are consistent across Eastern and Western cultures.

Method: In the largest test of the mate preference priority model to date, we asked an international sample of participants ($N = 2,477$) to design an ideal long-term partner by allocating mate dollars to eight traits using three budgets. Unlike previous versions of the task, we included traits known to vary in importance by culture (e.g., religiosity and chastity).

Results: Under low budget conditions, Eastern and Western participants differed in their mate dollar allocation for almost every trait (average $d = 0.42$), indicating that culture influences prioritization. Despite these differences, traits fundamental for the reproductive success of each sex in the ancestral environment were prioritized by both Eastern and Western participants.

Conclusion: The tendency to prioritize reproductively fundamental traits is present in both Eastern and Western cultures. The psychological mechanisms responsible for this process produce similar prioritization patterns despite cross-cultural variation.

Keywords: Mate choice; sex differences; cultural differences; mate preferences; evolutionary psychology

From humor and creativity to sexual history and body composition, psychologists have comprehensively catalogued the mating preferences of men and women (Buss, 1989; Chang, Wang, Shackelford, & Buss, 2011; Lukaszewski & Roney, 2010; Phelps, Rand, & Ryan, 2006; D. Singh & Young, 1995; Stewart-Williams, Butler, & Thomas, 2017). Still, knowledge of how these preferences are integrated and prioritized when choosing mates remains an underdeveloped area within both psychology and ethology (Li, Bailey, Kenrick, & Linsenmeier, 2002; Rosenthal, 2017). For some time, evolutionary theorists have used cross-cultural comparisons to establish the universals of human behavior. These comparisons have advanced psychological science by exploring the interaction between evolved psychological mechanisms and culture (Buss et al., 1990; Schmitt, 2003). However, studies that examine mate preference prioritization tend to use homogenous samples and thus neglect valuable opportunities to investigate the role of culture in mate selection. For this research, we collected a large international sample to examine cross-cultural similarities in how long-term mate preferences are prioritized. To our knowledge, this constitutes the largest and most diverse test to date of the mate preference priority model.

Measuring preference interaction

Historically, the traits that people prefer in their mates have been studied independently of one another (Buss, 1989; Kenrick, Groth, Trost, & Sadalla, 1993; Ting-Toomey, 1994; Yue, Chen, & Zhang, 2005), a tendency that has largely continued to the present day (Buss, Shackelford, & LeBlanc, 2000; Little, Jones, & DeBruine, 2011; Meltzer, McNulty, Jackson, & Karney, 2014). In reality, however, mate choice is a multivariate process that requires integrating and trading-off several preferences (Conroy-Beam, Goetz, & Buss, 2016; Rosenthal, 2017). A number of studies have examined this trade-off process in humans. For example, the priority of facial vs. bodily attractiveness has been tested by observing which people choose to reveal first when asked to judge the attractiveness of a

covered model (Wagstaff, Sulikowski, & Burke, 2015). Similarly, multivariate analysis has

been used to map how facial attractiveness, sexual dimorphism, and intelligence combine to

influence overall attractiveness (Lee, Dubbs, Von Hippel, Brooks, & Zietsch, 2014). Other

research has shown that social norms (e.g., the age of consent) can affect how people judge

physical attractiveness (Bennett, Lowe, & Petrova, 2015) and that potential suitors must

reach a basic threshold of physical attractiveness before traits, like intelligence, play a role in

mate choice (Jonason et al., 2019). One common element these studies share is that they

focus on interactions between a small numbers of variables within homogenous samples (e.g.,

Australian college students). A more effective way to examine the design features, and

performance parameters, of psychological mechanisms is to test how they react to varying

contextual input (Confer et al., 2010). Thus, there is scope to examine preference trade-offs

within a diverse sample to observe how culture affects prioritization patterns.

One method of examining preference trade-offs, and one which we use here, involves

participants constructing a hypothetical romantic partner using "mate dollars" to "buy" levels

of various traits (Li et al., 2002). When given a large budget to spend, decision-making is

relatively unconstrained, as with most preference surveys. This allows people to satisfy all of

their preferences. However, when given a smaller budget, participants have to choose among

their conflicting preferences and decide which traits are most important to them. This forced-

choice method provides unique insights over traditional Likert-style assessments of mate

preferences because it is more ecologically valid – real-life mate choice requires one to

consider and weigh-up the variety of features in a whole person, not isolated traits (e.g., Buss,

1989; Kenrick et al., 1993).

Comparing how participants allocate their mate dollars when budgets are small versus

large gives us insight into how they prioritize traits in a mate. Participants allocate their most

important traits (*necessities*) a large proportion of dollars first, causing these to dominate low

budgets. Then, as budgets become relaxed, these traits attract fewer and fewer additional

dollars as participants turn their attention to other characteristics. In contrast, the least

important traits (*luxuries*), which tend to take a back seat when budgets are low, receive more

dollars as budgets increase. Finally, some traits (*indispensables)* are given priority when

budgets are low but to a lesser extent than necessities and then continue to attract dollars at a

similar rate when budgets are relaxed (Li et al., 2002).

Findings from the budget allocation task tend to support the *mate preference priority

model* (Li, Valentine, & Patel, 2011). According to this model, ancestral humans who chose

long-term partners that were unable to reproduce or function within a pair-bond, even if they

possessed other desirable characteristics, typically had fewer offspring than those who chose

otherwise. Thus, there was a selection pressure for men and women to prioritize traits crucial

to reproductive success when picking a mate. This pressure led humans to evolve

psychological mechanisms that bias our mate preferences towards ensuring, first and

foremost, that we obtain a sufficient level of those attributes fundamental for successful

reproduction (Jonason, Nolland, & Tyler, 2017; Li et al., 2002; Li et al., 2011; Li et al.,

2013).

Three traits that consistently emerge as necessities in tests of the model are physical

attractiveness, kindness, and social status. Each would have been important for successful

reproduction in the ancestral past. Physical attractiveness would have been a cue of fertility,

and offspring produced with a physically attractive partner would likely be desirable mates

themselves (Bovet, Barkat-Defradas, Durand, Faurie, & Raymond, 2018; Cornwell & Perrett,

2008; Pflüger, Oberzaucher, Katina, Holzleitner, & Grammer, 2012; Rosenthal, 2017).

Choosing a kind and empathetic partner would have been fundamental to successful pair-

bonding, the primary mating arrangement in humans (Geary, 2000; Stewart-Williams &

Thomas, 2013). Kindness is also associated with greater parenting skills (e.g.,

responsiveness; Prinzie, Stams, Deković, Reijntjes, & Belsky, 2009) and may reflect the

extent to which a partner is capable of cooperating and willing to share his or her

reproductive resources (Jensen-Campbell, Graziano, & West, 1995; Li et al., 2002). Finally,

having a high-status partner would have been beneficial for both sexes, because of its

association with preferential access to resources within the community (Mulder & Beheim,

2011; Nelissen & Meijers, 2011; von Rueden, 2014).

Group differences in prioritization

The partner traits most important for reproductive success differ for each sex due to

historical asymmetries in the adaptive problems faced when reproducing (Buss & Schmitt,

1993; Jonason, Li, & Cason, 2009; Li et al., 2002; Li & Kenrick, 2006). For example,

because female fertility declines relatively quickly with age, men may have evolved to

prioritize at least a moderate amount of physical attractiveness and youthfulness in their long-

and short-term mates. Such prioritization is adaptive because in ancestral times, a moderately

physically attractive woman was likely to be sufficiently healthy and fertile (D. Singh &

Young, 1995). In contrast, because men's fertility declines less and more slowly over the

lifespan, male fertility has not been much of an adaptive problem for women. However, men

do differ widely in their ability to provide resources for a family. Thus, women may have

evolved to prioritize having at least a moderate amount of social status and resources – a level

that likely ensured offspring survivability in the ancestral past – in their long-term mates (Li

et al., 2002).

These sex differences are often least evident in long-term relationships where the

sexes' interests converge, and most evident in short-term relationships, where the greatest

conflicts arise (Buss & Schmitt, 1993; Jonason et al., 2009; Stewart-Williams & Thomas,

2013; Thomas, 2018; Trivers, 1972). Thus, it is not surprising that previous versions of the

budget allocation task have found that trait prioritization changes based on participant sex

and proposed relationship context. For example, men tend to place a greater premium on physical attractiveness than women, and both sexes prioritize kindness more in a long-term mate compared with a short-term mate (Li & Kenrick, 2006; Li et al., 2011).

Although humans have likely evolved to prioritize reproductively fundamental traits, this process may nevertheless be influenced by sociocultural factors. For example, while an American MTurk sample and a sample of Australian undergraduates did not differ in how they prioritized traits (Jonason et al., 2017), differences were found when comparing students from Singapore and the U.S. (Li et al., 2011), arguably more culturally discrepant groups. As in previous research, both groups of participants gave priority to physical attractiveness and kindness over creativity, and sex differences were found consistent with the reproductive asymmetries of each sex. However, cultural differences were also found. For example, women from Singapore placed more of a premium on social status and less on physical attractiveness than their U.S. counterparts. This provides a good example of how culture can interact with evolved mating psychology (Gangestad, Haselton, & Buss, 2006). In Eastern countries, where local norms favor long-term harmony and stability, social status is a highly valued indicator of relative social standing (Tu & Du, 1996) and used as a way of preserving harmony. Deferring to others with higher social status is important as direct confrontation is highly devalued in Asian cultures (Markus & Kitayama, 1991). Consistent with the difference in the valuation of social status, Asians, compared to Westerners, demonstrate higher expectations for academic performance (Sue & Okazaki, 1990) and place greater emphasis on financial and achievement aspects in career and business (Begley & Tan, 2001; Kim, Li, & Ng, 2005).

Of course, cultural norms and customs themselves may have adaptive significance (e.g., they may promote fitness enhancing behavior) or they could be arbitrary and maintained as a signal of group commitment (Richerson & Boyd, 2001). Nonetheless,

exploring the extent to which cultural variety impacts mate preference prioritization can help

us understand how much of an influence our evolved psychology has on mate choice. For

example, if prioritization patterns are fairly canalized, then we might expect group

differences to be restricted to a narrow window, with most cultures giving the same traits

"high priority".

In this research, we embarked on the largest and most diverse exploration of the mate

preference priority model to date by asking an international sample of participants from both

Eastern and Western cultures to design long-term partners using the budget allocation task.

We used eight traits in the task, including some from previous mate preference research (e.g.,

Buss, 1989; Li et al., 2002): *kindness*, *physical attractiveness*, *good financial prospects*,

humor, *creativity*, *chastity*, *wants children*, and *religiosity*. According to the mate preference

priority model, participants should prioritize those traits historically crucial for reproductive

success (Li et al., 2002). Of the eight traits, we predicted that kindness, physical

attractiveness, and good financial prospects (a modern cue of social status), would receive

priority because of their ties to reproductive success in the ancestral environment and the fact

that they have been consistently prioritized in previous budget allocation studies (Li et al.,

2002; Li & Kenrick, 2006; Li et al., 2011). While we expect that participants from both

culture groups will prioritize these traits, this process is likely to be influenced by culture. For

example, the stronger cultural focus on harmonious, non-confrontational relationships in East

Asian countries, may cause participants from Eastern nations to prioritize social status more

than those from Western ones. However, it is possible that this variation will not qualitatively

change the overall necessity/luxury pattern.

How might participants treat other traits during the task? Both creativity and humor

may have been somewhat important for reproductive success in our ancestral past,

functioning as sexually selected ornaments and, in the case of humor, a means of reinforcing

pair-bonds (Hall, 2017; Li et al., 2009; Miller, 2000). However, under constrained budgets

we expect preferences for these traits to take a back seat to those fundamental for

reproductive success. The benefits of having a creative partner do not outweigh the costs of

pair-bonding with someone who is unable to produce attractive offspring, bring resources

into the relationship, or support their partner. We can apply a similar logic to traits that have a

short evolutionary history or little association with reproductive success. We included three

such traits in this study, each known to vary in importance between cultures and previously

unused in a budget allocation study: religiosity, chastity, and the desire for children (Buss et

al., 2000; Chen, Austin, Miller, & Piercy, 2015; Pearce, Chuikova, Ramsey, &

Galyautdinova, 2010). Depending on culture, these attributes are often considered important

traits for suitors to have. For example, chastity was selected as important by less than 5% of a

British sample compared to almost 40% of a Chinese one (Higgins, Zheng, Liu, & Sun, 2002)

and chastity may be particularly unimportant in a more sexually liberal countries like Norway

(Kennair, Nordeide, Andreassen, Strønen, & Pallesen, 2011). Similarly, irreligiosity

continues to be more prevalent in Western cultures than Eastern ones (Hackett et al., 2012).

Thus, the attributes of religiosity and chastity are likely to be given greater priority by Eastern

participants, which may subsequently restrict how they spend their budget relative to Western

participants.

Having a partner with a strong desire for children may be more important to Western

participants. *Prima facie*, it seems this trait should be a universal necessity because of its ties

to reproduction. However, in terms of evolutionary history, family planning is only a recent

occurrence. In the Pleistocene, having children was a natural consequence of having sex,

regardless of the desire for offspring. Thus, it is hard to imagine a selection pressure to

prioritize such a trait, unless used as an indirect signal of partner commitment and fidelity.

Nonetheless, as contraception use is much more widespread in Western cultures (e.g.,

Monstad, Propper, & Salvanes, 2008; Rowe et al., 2016), than Eastern ones (e.g., Najimudeen & Sachchithanantham, 2014; K. Singh, Fong, & Loh, 2002), an interest in producing offspring may be a useful family planning cue in the West. Including these types of traits will allow us to observe how culturally variable preferences influence the prioritization of the more reproductively relevant ones. This constitutes a unique test of the mate preference priority model, which has traditionally been used with attributes that are reliably favored across cultures. As with humor and creativity, we anticipate these attributes to fall by the wayside when pitted against kindness, physical attractiveness, and good financial prospects, despite cross-cultural differences in their importance.

We tested three main hypotheses. First, in the overall sample, the traits of good financial prospects, physical attractiveness, and kindness will emerge as necessities (H1). Second, women will tend to give good financial prospects greater priority than men, who in turn will tend to prioritize physical attractiveness more than women (H2). Finally, these necessities and sex differences will be present across culture groups, despite cultural differences between them (H3).

Method

Participants

Participants were recruited from seven academic institutions in five countries: Australia, Malaysia, Norway, Singapore, and the United Kingdom. Institutions in Malaysia, Norway, and Singapore exclusively recruited students while the UK and Australian institutions encouraged students from their institutions to advertise the study online via social media to further recruitment using a snowballing method. Depending on institution, volunteers received either course credit or no compensation for participation. In total, 3,223 participants completed the task. After excluding those who did not provide sufficient information, the final sample consisted of 2,587 participants from 59 different countries.

To allow for cross-cultural comparisons, we took the top 10 countries represented in the sample and collapsed them into two groups (Table 1). The first group contained countries that were either in Europe or historically influenced by European culture (i.e., Australia, Norway, U.K., U.S.A., and New Zealand). The second group contained countries from East and South East Asia (i.e., Malaysia, Singapore, Hong Kong, China, and Indonesia). For simplicity, we refer to these groups as "Western" and "Eastern" respectively. The application of these labels is not without controversy (Hermans & Kempen, 1998; Vignoles et al., 2016); however, continuing with countries as a unit of analysis would have introduced problems of unequal sample sizes. Thus, collapsing these countries into larger culture groups allowed us to retain more participants in the analysis.

[Table 1 near here]

There were four notable differences in demographics between the Eastern and Western groups. The Eastern sample was younger ($M = 21.48$, $SD = 2.59$) than the Western sample ($M = 27.03$, $SD = 9.64$; $t(2485) = 15.76$, $p < .001$, $d = 0.79$) and were less likely to be in a committed relationship (31.70% vs 55.00%, $\chi^2(1, N = 2,487) = 116.15$, $p < .001$; $\varphi = .22$). To control for these differences, we included age and relationship status as covariates in the analysis. The importance of religion was also different between the groups. On a scale from 1 (*not important at all*) to 5 (*very important*), Eastern participants typically reported that religion was of average importance to them ($M = 3.20$, $SD = 1.47$), whereas Western participants reported that it was fairly unimportant ($M = 1.70$, $SD = 1.20$; $t(2393) = 26.05$, $p < .001$, $d = 1.12$). However, because religiosity was one of the preferences featured in the task, we did not include it as a covariate. Finally, 98.6% of the Eastern sample were students compared to 80.5% in the Western one. See the supplementary materials for general demographic information about the culture groups.

Country of socialization

The participants self-reported their country of socialization by answering the question "In which country were you raised?" If this was unavailable, we used the country in which they were born. The only exception to this was the Norwegian sample. Here, the local ethics board did not allow us to ask about country of birth or socialization, as they felt that this could threaten the anonymity of any non-Norwegian native because of the cultural homogeneity in Norway. However, given that this version of the study was completed in Norwegian, it is highly likely that all the participants were either born or raised in Norway. Thus, we categorized all participants from the Norwegian sample as Western.

Materials and procedure

The first author received ethical approval for the study from his local ethics committee in the UK. Other authors sought additional approval from their local committees where necessary. All institutions conducted the study in English apart from in Norway, where the materials were translated into Norwegian by one of the co-authors.

Participants began by providing informed consent and completing a demographic form. They were then given an introduction to percentiles using height as an example (e.g., that a person at the 50th percentile of height would be taller than 50% of all other people) and given a description of the seven traits used in the task (kindness, physical attractiveness, good financial prospects, humor, creativity, chastity, wants children, and religiosity). Next, they created three long-term partners by allocating "mate dollars" to these traits whereby $1 bought a 10-percentile increase for a given attribute. The task was repeated three times using low ($16), medium ($32), and high ($48) budgets. See the supplementary materials for full details and participant instructions. At the conclusion of the study, participants received a full debrief.

Data analysis and handling

Following Li et al. (2002), we began by subtracting the number of dollars assigned to each attribute in the medium budget from their equivalents in the high budget. This told us how the participants allocated their last 16 mate dollars. For simplicity, we refer to this as the "high budget" condition. By comparing this to how they allocated their first 16 dollars, which we call the "low budget" condition, we were able to observe how the participants' allocation pattern changed as the budgets increased and choice became less constrained. We also converted these numbers into percentages, which allowed us to retain the 7.2% of the sample who allocated slightly too few or too many dollars (up to +/- 10%).

Results

Our analyses consisted of general linear models incorporating the within-subjects factors of budget and trait and the between-subjects factors of sex and culture group. We explored significant interactions using Bonferroni corrected pair-wise comparisons. Age was included as a covariate, as was relationship status (1 = *married or in a committed relationship*, 2 = *divorced, single, or in an uncommitted relationship*).

As mentioned, *necessity* traits are those that are given priority during the allocation of the first 16 dollars (i.e., the low budget condition) and receive fewer dollars during the allocation of the last 16 dollars (i.e., the high budget condition). *Indispensable* traits are also prioritized when using a low budget but then receive a similar number of dollars in the high budget. Finally, *luxury* traits are not prioritized and receive more dollars when using the high budget compared to the low budget. To determine whether a trait was given priority, we used one-sample *t*-tests to see if it was allocated more than 12.5% of the dollars in the low budget condition (typically $2). As there were eight traits, we would expect a trait to receive this many dollars by chance.

As with previous versions of the task (Li et al., 2002; Li & Kenrick, 2006), there was a main effect of trait ($F[7, 17297] = 54.99$, $p < .001$, $\eta_p^2 = .02$) and a significant interaction

between trait and budget ($F[7, 17297] = 13.103$, $p < .001$, $\eta_p^2 < .01$). These significant effects confirmed that (a) participants spread their dollars unevenly among the traits and (b) this pattern differed between low and high budgets.

Follow-up analyses revealed that kindness, physical attractiveness, and good financial prospects were necessities. Humor, despite being a priority, received more dollars in the high budget condition than the low one, for reasons that became clear as we broke down larger interactions. The remaining traits were all luxuries (see Figure 1).

[Figure 1 near here]

Sex differences

An interaction between trait, budget, and sex ($F[7, 17297] = 41.830$, $p < .001$, $\eta_p^2 = .02$) suggested that the pattern of necessities and luxuries might differ by sex. Upon breaking down this interaction, we found that kindness and physical attractiveness were necessities for both sexes. Good financial prospects, however, was now a luxury for men, and a necessity for women (see Figure 2).

[Figure 2 near here]

We also found that a partner's humor was indispensable for men, receiving a similar amount of dollars across both budgets. The unusual pattern surrounding humor in the overall sample appeared to be driven by women, who, despite prioritizing humor, tended to assign slightly more dollars in the high budget, as is typical with luxury traits.

Of the remaining traits, chastity, creativity, and wants children were luxuries for both sexes. Religiosity, however, was only a luxury for men; women instead continued to allocate a similar number of dollars to religiosity in both budgets. As with humor, this pattern departs from what is normally found for luxury traits.

Sex differences were found in the low budget condition for all traits with the exception of kindness and humor. The most noticeable sex differences were for physical

attractiveness ($d = 0.55$), which tended to receive more dollars from men, and good financial

prospects ($d = 0.56$), which tended to receive more dollars from women (see Table 2).

[Table 2 near here]

Cross-cultural differences

The most complex significant interaction in the analyses was between trait, budget,

sex, and culture group ($F[7, 17297] = 6.810$, $p < .001$, $\eta_p^2 < .01$), suggesting that budget and

sex differences in dollar allocation may further vary by culture.

Eastern and Western women. Like the sample as a whole, kindness, physical

attractiveness, and good financial prospects were necessities for both groups of women.

However, humor was indispensable for Western women and a luxury for Eastern women.

These two divergent patterns, when collapsed, made it difficult to categorize how women

prioritized humor within the previous analysis (see Table 3).

[Table 3 near here]

Of the remaining traits, chastity and creativity were luxuries for both groups of

women as was religiosity for Western women. However, Eastern women, much like their

male counterparts, followed a pattern unusual among non-priority traits. Specifically, they

allocated fewer dollars to religiosity in the high budget condition. Similarly, while the desire

for children was a luxury for Eastern women, Western women allocated a similar number of

dollars to it across both budgets, despite it not being a priority.

Within the low budget, the groups of women differed in the number of dollars they

allocated to all traits with the exception of physical attractiveness. The most noticeable

culture group differences were for religiosity, which tended to receive more dollars from

Eastern women, and the desire for children, which tended to receive more from Western

women. With the exception of humor, these differences were not sufficiently large to cause a

change in the overall pattern of necessities and luxuries between the two groups of women (see Table 4).

[Table 4 near here]

Eastern and Western men. Kindness and physical attractiveness were necessities for both groups of men. Humor was also a necessity, but only for Western men. Eastern men considered it a luxury (see Table 3). Though not significantly above the "priority trait" threshold that we set, Eastern men gave slightly more dollars to good financial prospects than expected by chance in the low budget (13.06%) and as the budget increased, they assigned roughly the same amount of dollars, similar to *indispensable* traits (12.53%). In contrast, a partner with good financial prospects was a clear luxury for Western men.

Of the remaining traits, chastity, creativity, and the desire for children were luxuries for both groups of men as was religiosity in Western men. However, Eastern men allocated a similar amount of dollars to religiosity across both budgets, a pattern not usually found among non-priority traits.

Within the low budget, Eastern and Western men differed in the number of dollars they allocated to all traits with the exception of the desire for children. The most noticeable culture group differences were for humor, which tended to receive more dollars from Western men, and religiosity, which tended to receive more from Eastern men. With the exception of humor, these differences did not affect which traits were necessities and which were luxuries (see Table 4).

Other sex and cultural differences. All within-culture sex differences are displayed in Table 3. For brevity, we only discuss those relevant to our third hypothesis. As predicted, men allocated more dollars to physical attractiveness than women did in both Eastern ($d =$ 0.44) and Western ($d = 0.73$) cultures. In turn, women allocated more dollars to good financial prospects than men did in both Eastern ($d = 0.71$) and Western ($d = 0.48$) cultures.

We also found a general cultural difference in the importance of a partner's financial prospects. Both Eastern men ($d = 0.24$) and women ($d = 0.47$) allocated more dollars to good financial prospects than their Western counterparts. While these differences did not result in good financial prospects being a necessity in one culture group and a luxury in the other, this came close in the case of men (see above). The increase in importance of good financial prospects appeared to come at the expense of physical attractiveness (in men) and kindness (in women; see Table 4).

Summary of findings

Despite a host of differences between the sexes and culture groups, kindness and physical attractiveness were consistent necessities and creativity and chastity were consistent luxuries. Good financial prospects was a necessity for the sample as a whole. However, follow-up analyses revealed that women drove this pattern. Men did not prioritize good financial prospects in a partner, but while this followed the typical pattern of a luxury for Western men, Eastern men did not differ in their allocation between budgets. Eastern participants of both sexes appeared to place an additional premium on good financial prospects compared to their Western counterparts.

We found that sex differences in the number of dollars given to physical attractiveness and good financial prospects in the low budget condition were similar for both culture groups. Men tended to allocate more dollars to physical attractiveness than women, though this difference was smaller in the Eastern sample. Conversely, women typically allocated more dollars to good financial prospects than men, though this difference was smaller in the Western sample.

The task also revealed some interesting cultural differences in the importance of a partner's humor. When looking at the sample overall, dollars were allocated to humor in an unusual way. Specifically, while participants gave it priority, they also tended to increase

their allocation to humor in the high budget as if it were a luxury. Further analysis revealed that this pattern was the collective result of differences between the subgroups. Western participants of both sexes prioritized humor in a partner, with it being a necessity for men and indispensable for women. However, humor was a luxury for Eastern participants of both sexes. Despite cultural differences being present for almost every trait, humor was the only trait where it was luxury for one culture group and a necessity/indispensable trait for the other. Non-priority traits followed a luxury pattern, with two exceptions: (1) Western women allocated a similar amount of dollars to the desire for children in both budgets and (2) Eastern men continued to allocate the same amount of dollars to religiosity during the high budget while women gave less.

Discussion

Previous research on mate choice trade-offs has revealed that individuals prioritize reproductively fundamental traits when their ability to fully realize their mating desires is restricted and that this pattern of prioritization may be influenced by culture (Li et al., 2002; Li et al., 2011). In the present research, we used the budget allocation task to explore similarities and differences between Eastern and Western groups using a large international sample. We also included traits previously unused in the task, known to vary in importance across cultures (i.e., religiosity, chastity, and the desire for children). Overall, we found good support for our hypotheses. As predicted, kindness, good financial prospects, and physical attractiveness were necessities for the sample overall, replicating previous research in more homogenous samples (H1; Buss, 1989; Li et al., 2002; Li & Kenrick, 2006).

When the sexes were examined separately, both gave similar priority to kindness ($d = 0.08$). However, the sexes differed in how they prioritized physical attractiveness and good financial prospects (H2). Namely, physical attractiveness was typically more important to men ($d = 0.55$) and good financial prospects was more important to women ($d = 0.56$). These

sex differences are consistent with the evolutionary psychological literature and reflect the

sexual asymmetry in the benefits of having these traits in a partner (Buss, 1989; Jonason,

Valentine, & Li, 2012). Furthermore, having a partner with good financial prospects was only

a necessity for women, and was actually a luxury for men. In contrast, physical attractiveness

was a necessity for both sexes.

Finally, despite variation in how they spend their mate dollars, we found the same

pattern of necessities and sex differences in both culture groups (H3). However, good

financial prospects came close to our "priority threshold" in Eastern men, likely because of

an enhanced interest in this trait within Eastern participants overall. Recent research gives a

possible explanation for this increased premium. In East Asian cultures, collectivist values

that emphasize hierarchy and respect of authority combine with a desire for social harmony

which channels intrasexual competition for status away from direct confrontation and

towards the acquisition of prestigious occupations (Yong, Li, Jonason, & Tan, 2019).

Our results suggest the presence of a universal aspect of human mate selection that

sees people prioritize those traits that were fundamental for reproductive success in the

ancestral past. This process is also strongly influenced, but not counteracted, by sociocultural

factors. That is, people appear to separately adhere to both their evolved mate preferences

and socioculturally imposed ones (Gangestad et al., 2006). These two forces are not

necessarily at odds. From an evolutionary perspective, it may be adaptive for mate choice

mechanisms to incorporate cultural norms and other environmental cues that have adaptive

significance (e.g., traits are valued by a culture can reflect local conditions pertinent to

survival) and not following norms may be socially costly as it indicates a lower commitment

to the group (Richerson & Boyd, 2001). It may also be the case that cultural differences in

prioritization are the product of evoked culture. In other words, prioritization mechanisms are

facultative and use sociocultural and environmental factors to calibrate themselves in

predictable ways (Gangestad et al., 2006; Schmitt, 2015; Tooby & Cosmides, 1990). While

our findings are consistent with both these interpretations, they do not allow us to disentangle

the relative contribution of evoked culture and cultural transmission to the cross-cultural

variation found for each trait. What we do know is that, regardless of the specific mechanism

by which culture affects prioritization, the tendency to prioritize traits fundamental to

successful reproduction is somewhat canalized, causing similar necessity and luxury patterns

to emerge across culture groups.

Additional findings

In addition to these key findings, we found differences between the sexes and culture

groups that we did not predict *a priori*. Of these, the most noticeable difference involved

humor. This was the only trait that was prioritized in one culture group (Western) but not the

other (Eastern). This should not be taken as evidence that a partner's humor is unimportant in

Eastern cultures. Rather it appears that Eastern participants spread their dollars more evenly

than Western ones. For example, in the low budget condition, the smallest percentage of the

budget Western participants allocated to a trait (religiosity) was 1.20% and 2.49% for men

and women respectively. In contrast, the smallest percentage for Eastern men and woman

was 6.24% and 4.94% (creativity). Thus, the Western group appeared to have more free

dollars to allocate to other traits, while Eastern participants were more constrained, resulting

in fewer dollars spent on humor by the Eastern group. This cultural difference is consistent

with the idea that humor is fairly high up the mating "hierarchy of needs" but is less

fundamental to reproductive success than kindness, physical attractiveness, and social status

(Hall, 2017; Li et al., 2009; Miller, 2000). Thus, it becomes a priority only when needs for

more culturally important traits are satisfied. An alternative explanation for this cultural

difference may lie in humor's relationship with social status. Among Western samples,

humor was found to enhance social status in some contexts and interact with status to

increase attractiveness in others (Greengross & Miller, 2008). Should cultural norms sever

these associations, then we may expect people to give humor less priority. However, there

has yet to be a comprehensive examination of the cultural differences in the function of

humor as a pathway to status (Greengross, personal communication) and so this idea warrants

investigation.

The fact that Western women showed a stronger preference than all other sub-groups

for their partner to want children also requires further exploration. A possible source of this

pattern involves culture differences in family planning and contraceptive use (Najimudeen &

Sachchithanantham, 2014; K. Singh et al., 2002). However, it is also worth considering if this

effect was the result of differences in age and relationship status between samples (see

Limitations), despite our efforts to statistically control for them.

A final noteworthy finding concerns the small number of non-priority traits that

showed an unusual pattern of change between budgets. Luxury traits tend to attract fewer

dollars in low budgets, when participants focus on their necessities. Then, once these

preferences are satisfied, participants begin to allocate more dollars to them. The result is that

luxury traits receive fewer dollars in low budgets than in high ones. Yet, in a few cases here

(e.g., religiosity in the Eastern group, desire for children in Western women) participants

gave non-priority traits the same amount of dollars, regardless of budget. One possible

explanation for this finding is that the benefits of these traits suffer from diminished returns.

Religion is a highly assortative trait (Watson et al., 2004), and a small amount of commitment

to the same religion may indicate that a partner's belief system is compatible with one's own,

compared to following a different denomination or being irreligious. Having a partner with

similar religious views can be important in cultures where intra-faith marriage is the norm

(Shenhav, Campos, & Goldberg, 2017; Yahya & Boag, 2014). However, increases in

religiosity beyond this level may not yield the same benefits. Moving from an irreligious

partner to one who follows the same faith but is not committed to it, is a larger qualitative shift than moving from a partner who is somewhat committed to a faith to one who is highly committed. Another way of conceptualizing this issue is that not all traits share the same preference functions (Rosenthal, 2017). Some, like social status, may have a directional or sigmoidal function, whereby status increases attractiveness in a linear or curvilinear manner. Others, like religiosity, may have a unimodal function with an "optimal" level and attractiveness dissipating the more an individual deviates from this value.

Limitations

The study had three main limitations. First, there was a large discrepancy in the sample sizes between the Eastern and Western groups. While unlikely to affect the analysis itself, a more balanced sample of Eastern participants would have allowed us to investigate country-specific effects. With the current sample, we could only do this for the Malaysian and Singaporean subsamples, leading to the exclusion of participants from China, Hong Kong, and Indonesia. Second, the Eastern sample was considerably younger than the Western one, and less likely to be in a relationship. It is well established that mate preferences can change with age (e.g., Schwarz & Hassebrauck, 2012) and so we attempted to control for these differences during the analyses. However, as the differences were large, this may not have been wholly successful and may explain the large cross-cultural differences found in the desire for children trait.

A final limitation surrounded sampling. Our sample was not WEIRD (Henrich, Heine, & Norenzayan, 2010), but it was arguably "EIR" as participants were predominantly well-educated students from industrialized countries. Thus, while our study was more diverse than other studies of mate preference prioritization, it provides only a starting point for considering the impact of culture on this process. Those traits most fundamental to reproductive success appear to be necessities among students from different cultures, but to

fully explore the mate preference priority model we would need to examine more diverse

samples, including non-students and those from different types of societies (e.g., pastoralists

and hunter-gathers). That being said, research has shown that cultural differences emerge

between groups even when the samples share traits that are not representative of their wider

populations. For example, a recent investigation of sexual regret as a function of

sociosexuality and religiosity found meaningful cultural differences between Norwegian and

US participants despite their shared student status, given the relevant cultural differences in

gender egalitarianism, secularism and sexual liberalism (Bendixen, Asao, Wyckoff, Buss, &

Kennair, 2017).

Future directions

Understanding how mating preferences are integrated and traded-off as part of mate

choice remains a relatively unexplored area of psychology, both in human and non-human

animals (Conroy-Beam et al., 2016; Rosenthal, 2017). In humans, this exploration is

generally limited to considering how a small number of preferences interact within typically

homogenous groups (e.g., Bennett et al., 2015; Lee et al., 2014; Wagstaff et al., 2015). The

budget allocation task allows one to examine group similarities and differences in the

prioritization of several traits across contexts. Thus, it provides a powerful tool for

establishing the design features of the psychological adaptations behind mate choice.

Future research could use the task to examine trade-offs in a more nuanced manner by

examining sub-components of reproductively important traits. For example, although

physical attractiveness is consistently found to be a dominant trait, there is scope to explore

this in a more nuanced manner by considering separate elements of physical attractiveness,

including facial symmetry, skin complexion, body composition, and muscle mass (Lassek &

Gaulin, 2009; Little et al., 2011). Similarly, social status could be broken down into

dominance and prestige (von Rueden, Gurven, & Kaplan, 2011). Other traits that may be of

interest include intelligence and sexual compatibility. Intelligence has been used with budget allocation tasks before (Li et al., 2002) and, like humor and creativity, is hypothesized to be a sexually selected ornament (Miller, 2000). While we chose to exclude it here in favor of more culturally variable traits, a similar cross-cultural study including intelligence would be of great theoretical value to researchers interested in the universal nature of this preference. If mate preference mechanisms have evolved to prioritize traits fundamental to reproductive success, then we would expect traits that signal consistency in sexual access to be highly sought after. Thus, sexually compatibility, which signals concordance in sexual desire and habits, may also prove an interesting characteristic to include in prioritization research.

Another environmental cue that could affect prioritization is relationship context. While the task has been applied to short- and long-term relationships (e.g. Li & Kenrick, 2006) as well as partner proximity (e.g., Jonason et al., 2017), other relationship arrangements that might be worthy of study include polyamory, 'booty calls', friends-with-benefits arrangements, and swinging (Jonason et al., 2012). Similarly, change in preference patterns over time or following exposure to evolutionarily relevant cues (e.g., threat, resource availability) could be measured using budget allocation (Thomas & Stewart-Williams, 2018).

Conclusion

Using an international sample, we found that a long-term partner's kindness, physical attractiveness, and financial prospects were necessities in both Eastern and Western cultures and that these groups showed similar sex differences in the importance of physical attractiveness and good financial prospects. Our findings suggest that (a) humans prioritize traits that are fundamental for reproductive success when selecting mates and (b) the mechanisms responsible for this process produce similar prioritization patterns despite cross-cultural variation. At the same time, we found that culture can influence prioritization, with a greater Eastern emphasis on good financial prospects and a Western emphasis on sense of

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

humor providing good examples. These results are consistent with the idea that mate

preference prioritization results from an interaction between evolved mate preferences and

socioculturally imposed ones, with the former being of stronger influence when it comes to

reproductively fundamental traits. They demonstrate that using diverse samples to examine

mate preference trade-offs can help us understand the universal nature of mating preferences,

which ultimately offers us a deeper insight into the mechanisms that govern human mate

choice.

Acknowledgments

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research

authorship, and/or publication of this article.

References

Begley, T. M., & Tan, W.-L. (2001). The socio-cultural environment for entrepreneurship: A comparison between East Asian and Anglo-Saxon countries. *Journal of international business studies, 32*, 537-553. doi: 10.1057/palgrave.jibs.8490983

Bendixen, M., Asao, K., Wyckoff, J. P., Buss, D. M., & Kennair, L. E. O. (2017). Sexual regret in US and Norway: Effects of culture and individual differences in religiosity and mating strategy. *Personality and Individual Differences, 116*, 246-251. doi: 10.1016/j.paid.2017.04.054

Bennett, P., Lowe, R., & Petrova, H. (2015). Heterosexual men's ratings of sexual attractiveness of adolescent girls: A cross-cultural analysis. *Archives of Sexual Behavior, 44*, 2201-2206. doi: 10.1007/s10508-015-0504-6

Bovet, J., Barkat-Defradas, M., Durand, V., Faurie, C., & Raymond, M. (2018). Women's attractiveness is linked to expected age at menopause. *Journal of Evolutionary Biology, 31*, 229-238. doi: 10.1111/jeb.13214

Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences, 12*, 1-49. doi: 10.1017/s0140525x00023992

Buss, D. M., Abbott, M., Angleitner, A., Asherian, A., Biaggio, A., Blanco-Villasenor, A., . . . Yang, K.-S. (1990). International preferences in selecting mates: A study of 37 cultures. *Journal of Cross-Cultural Psychology, 21*, 5-47. doi: 10.1177/0022022190211001

Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review, 100*, 204-232. doi: 10.1037/0033-295x.100.2.204

Buss, D. M., Shackelford, T. K., & LeBlanc, G. J. (2000). Number of children desired and

preferred spousal age difference: Context-specific mate preference patterns across 37

cultures. *Evolution and Human Behavior, 21*, 323-331. doi: 10.1016/S1090-

5138(00)00048-9

Chang, L., Wang, Y., Shackelford, T. K., & Buss, D. M. (2011). Chinese mate preferences:

Cultural evolution and continuity across a quarter of a century. *Personality and*

Individual Differences, 50, 678-683. doi: 10.1016/j.paid.2010.12.016

Chen, R., Austin, J. P., Miller, J. K., & Piercy, F. P. (2015). Chinese and American

individuals' mate selection criteria: Updates, modifications, and extensions. *Journal*

of Cross-Cultural Psychology, 46, 101-118. doi: 10.1177/0022022114551793

Confer, J. C., Easton, J. A., Fleischman, D. S., Goetz, C. D., Lewis, D. M., Perilloux, C., &

Buss, D. M. (2010). Evolutionary psychology: Controversies, questions, prospects,

and limitations. *American Psychologist, 65*, 110-126. doi: 10.1037/a0018413

Conroy-Beam, D., Goetz, C. D., & Buss, D. M. (2016). What predicts romantic relationship

satisfaction and mate retention intensity: Mate preference fulfillment or mate value

discrepancies? *Evolution and Human Behavior, 37*, 440-448. doi:

doi:10.1016/j.evolhumbehav.2016.04.003

Cornwell, R. E., & Perrett, D. I. (2008). Sexy sons and sexy daughters: The influence of

parents' facial characteristics on offspring. *Animal Behaviour, 76*, 1843-1853. doi:

10.1016/j.anbehav.2008.07.031

Gangestad, S. W., Haselton, M. G., & Buss, D. M. (2006). Evolutionary foundations of

cultural variation: Evoked culture and mate preferences. *Psychological Inquiry, 17*,

75-95.

Geary, D. C. (2000). Evolution and proximate expression of human paternal investment.

Psychol Bull, 126, 55-77. doi: 10.1037/0033-2909.126.1.55

Greengross, G., & Miller, G. F. (2008). Dissing oneself versus dissing rivals: Effects of

status, personality, and sex on the short-term and long-term attractiveness of self-

deprecating and other-deprecating humor. *Evolutionary Psychology, 6*. doi:

10.1177/147470490800600303

Hackett, C., Grim, B., Stonawski, M., Skirbekk, V., Potančoková, M., & Abel, G. (2012). *The

global religious landscape: A report on the size and distribution of the world's major

religious groups as of 2010.* Washington DC: Pew Research Center.

Hall, J. A. (2017). Humor in romantic relationships: A meta-analysis. *Personal Relationships,

24*, 306-322. doi: 10.1111/pere.12183

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world?

Behavioral and Brain Sciences, 33, 61-83. doi: 10.1017/S0140525X0999152X

Hermans, H. J., & Kempen, H. J. (1998). Moving cultures: The perilous problems of cultural

dichotomies in a globalizing society. *American Psychologist, 53*, 1111-1120. doi:

10.1037/0003-066X.53.10.1111

Higgins, L. T., Zheng, M., Liu, Y., & Sun, C. H. (2002). Attitudes to marriage and sexual

behaviors: A survey of gender and culture differences in China and United Kingdom.

Sex Roles, 46, 75-89. doi: 10.1023/A:1016565426011

Jensen-Campbell, L. A., Graziano, W. G., & West, S. G. (1995). Dominance, prosocial

orientation, and female preferences: Do nice guys really finish last? *Journal of

Personality and Social Psychology, 68*, 427. doi: 10.1037/0022-3514.68.3.427

Jonason, P. K., Li, N. P., & Cason, M. J. (2009). The "booty call": A compromise between

men's and women's ideal mating strategies. *The Journal of Sex Research, 46*, 460-470.

doi: 10.1080/00224490902775827

Jonason, P. K., Marsh, K., Dib, O., Plush, D., Doszpot, M., Fung, E., . . . Di Pietro, K.

(2019). Is smart sexy? Examining the role of relative intelligence in mate preferences.

Personality and Individual Differences, 139, 53-59. doi: 10.1016/j.paid.2018.11.009

Jonason, P. K., Nolland, M., & Tyler, M. D. (2017). Incorporating geographic distance into

mate preference research: Necessities and luxuries, 2.0. *Personal Relationships, 24*,

585-597. doi: 10.1111/pere.12199

Jonason, P. K., Valentine, K. A., & Li, N. P. (2012). Human mating. In V. S. Ramachandran

(Ed.), *Encyclopedia of human behavior* (2nd ed., Vol. 2, pp. 371-377). Oxford,

England: Academic Press.

Kennair, L. E. O., Nordeide, J., Andreassen, S., Strønen, J., & Pallesen, S. (2011). Sex

differences in jealousy: A study from Norway. *Nordic Psychology, 1*, 20-34. doi:

10.1027/1901-2276/a000025

Kenrick, D. T., Groth, G. E., Trost, M. R., & Sadalla, E. K. (1993). Integrating evolutionary

and social-exchange perspectives on relationships - effects of gender, self-appraisal,

and involvement level on mate selection criteria. *Journal of Personality and Social

Psychology, 64*, 951-969. doi: 10.1037/0022-3514.64.6.951

Kim, B. K., Li, L. C., & Ng, G. F. (2005). The Asian Smerican values scale--

multidimensional: Development, reliability, and validity. *Cultural diversity and ethnic

minority psychology, 11*, 187. doi: 10.1037/1099-9809.11.3.187

Lassek, W. D., & Gaulin, S. J. C. (2009). Costs and benefits of fat-free muscle mass in men:

Relationship to mating success, dietary requirements, and native immunity. *Evolution

and Human Behavior, 30*, 322-328. doi: 10.1016/j.evolhumbehav.2009.04.002

Lee, A. J., Dubbs, S. L., Von Hippel, W., Brooks, R. C., & Zietsch, B. P. (2014). A

multivariate approach to human mate preferences. *Evolution and Human Behavior,

35*, 193-203. doi: 10.1016/j.evolhumbehav.2014.01.003

Li, N. P., Bailey, J. M., Kenrick, D. T., & Linsenmeier, J. A. W. (2002). The necessities and

luxuries of mate preferences: Testing the tradeoffs. *Journal of Personality and Social

Psychology, 82*, 947-955. doi: 10.1037/0022-3514.82.6.947

Li, N. P., Griskevicius, V., Durante, K., Jonason, P. K., J Pasisz, D., & Aumer, K. (2009). An

evolutionary perspective on humor: Sexual selection or interest indication?

Personality and Social Psychology Bulletin, 35, 923-936. doi:

10.1177/0146167209334786

Li, N. P., & Kenrick, D. T. (2006). Sex similarities and differences in preferences for short-

term mates: What, whether, and why. *Journal of Personality and Social Psychology,

90*, 468-489. doi: 10.1037/0022-3514.90.3.468

Li, N. P., Valentine, K. A., & Patel, L. (2011). Mate preferences in the US and Singapore: A

cross-cultural test of the mate preference priority model. *Personality and Individual

Differences, 50,* 291-294. doi: 10.1016/j.paid.2010.10.005

Li, N. P., Yong, J. C., Tov, W., Sng, O., Fletcher, G. J., Valentine, K. A., . . . Balliet, D.

(2013). Mate preferences do predict attraction and choices in the early stages of mate

selection. *Journal of Personality and Social Psychology, 105*, 757. doi:

10.1037/a0033777

Little, A. C., Jones, B. C., & DeBruine, L. M. (2011). Facial attractiveness: Evolutionary

based research. *Philosophical transactions of the Royal Society of London. Series B,

Biological sciences, 366*, 1638-1659. doi: 10.1098/rstb.2010.0404

Lukaszewski, A. W., & Roney, J. R. (2010). Kind toward whom? Mate preferences for

personality traits are target specific. *Evolution and Human Behavior, 31*, 29-38. doi:

10.1016/j.evolhumbehav.2009.06.008

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*, 224. doi: 10.1037/0033-295X.98.2.224

Meltzer, A. L., McNulty, J. K., Jackson, G. L., & Karney, B. R. (2014). Sex differences in the implications of partner physical attractiveness for the trajectory of marital satisfaction. *Journal of Personality and Social Psychology, 106*, 418-428. doi: 10.1037/a0034424

Miller, G. (2000). *The mating mind : How sexual choice shaped the evolution of human nature* (1st ed.). New York: Doubleday.

Monstad, K., Propper, C., & Salvanes, K. G. (2008). Education and fertility: Evidence from a natural experiment. *The Scandinavian Journal of Economics, 110*, 827-852. doi: 10.1111/j.1467-9442.2008.00563.x

Mulder, M. B., & Beheim, B. A. (2011). Understanding the nature of wealth and its effects on human fitness. *Philosophical Transactions of the Royal Society B: Biological Sciences, 366*, 344-356. doi: 10.1098/rstb.2010.0231

Najimudeen, M., & Sachchithanantham, K. (2014). An insight into low contraceptive prevalence in Malaysia and its probable consequences. *Int J Reprod Contracept Obstet Gynecol, 3*, 493-496. doi: 10.5455/2320-1770.ijrcog20140943

Nelissen, R. M., & Meijers, M. H. (2011). Social benefits of luxury brands as costly signals of wealth and status. *Evolution and Human Behavior, 32*, 343-355. doi: 10.1016/j.evolhumbehav.2010.12.002

Pearce, A. R., Chuikova, T., Ramsey, A., & Galyautdinova, S. (2010). A positive psychology perspective on mate preferences in the United States and Russia. *Journal of Cross-Cultural Psychology, 41*, 742-757. doi: 10.1177/0022022110361775

Pflüger, L. S., Oberzaucher, E., Katina, S., Holzleitner, I. J., & Grammer, K. (2012). Cues to fertility: Perceived attractiveness and facial shape predict reproductive success.

Evolution and Human Behavior, 33, 708-714. doi:

10.1016/j.evolhumbehav.2012.05.005

Phelps, S. M., Rand, A. D., & Ryan, M. J. (2006). A cognitive framework for mate choice

and species recognition. *The American Naturalist, 167*, 28-42. doi: 10.1086/498538

Prinzie, P., Stams, G. J. J., Deković, M., Reijntjes, A. H., & Belsky, J. (2009). The relations

between parents' big five personality factors and parenting: A meta-analytic review.

Journal of Personality and Social Psychology, 97, 351. doi: 10.1037/a0015823

Richerson, P. J., & Boyd, R. (2001). The evolution of subjective commitment to groups: A

tribal instincts hypothesis. In R. M. Nesse (Ed.), *Evolution and the capacity for

commitment* (pp. 186-202). New York: Russell Sage Foundation.

Rosenthal, G. G. (2017). *Mate choice: The evolution of sexual decision making from

microbes to humans*. Princeton, NJ: Princeton University Press.

Rowe, H., Holton, S., Kirkman, M., Bayly, C., Jordan, L., McNamee, K., . . . Fisher, J.

(2016). Prevalence and distribution of unintended pregnancy: The understanding

fertility management in australia national survey. *Australian and New Zealand

Journal of Public Health, 40*, 104-109. doi: 10.1111/1753-6405.12461

Schmitt, D. P. (2003). Universal sex differences in the desire for sexual variety: Tests from

52 nations, 6 continents, and 13 islands. *Journal of Personality and Social

Psychology, 85*, 85-104. doi: 10.1037/0022-3514.85.1.85

Schmitt, D. P. (2015). The evolution of culturally-variable sex differences: Men and women

are not always different, but when they are…it appears not to result from patriarchy or

sex role socialization. In T. K. Shackelford & R. D. Hansen (Eds.), *The evolution of

sexuality* (pp. 221-256). Cham: Springer International Publishing.

Schwarz, S., & Hassebrauck, M. (2012). Sex and age differences in mate-selection

preferences. *Human Nature, 23*, 447-466. doi: 10.1007/s12110-012-9152-x

Shenhav, S., Campos, B., & Goldberg, W. A. (2017). Dating out is intercultural: Experience and perceived parent disapproval by ethnicity and immigrant generation. *Journal of Social and Personal Relationships, 34*, 397-422. doi: 10.1177/0265407516640387

Singh, D., & Young, R. K. (1995). Body weight, waist-to-hip ratio, breasts, and hips: Role in judgments of female attractiveness and desirability for relationships. *Ethology and Sociobiology, 16*, 483-507. doi: 10.1016/0162-3095(95)00074-7

Singh, K., Fong, Y., & Loh, S. (2002). Profile of women presenting for abortions in Singapore at the national university hospital. *Contraception, 66*, 41-46. doi: 10.1016/S0010-7824(02)00317-7

Stewart-Williams, S., Butler, C. A., & Thomas, A. G. (2017). Sexual history and present attractiveness: People want a mate with a bit of a past, but not too much. *The Journal of Sex Research, 54*, 1097-1105. doi: 10.1080/00224499.2016.1232690

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

Sue, S., & Okazaki, S. (1990). Asian-American educational achievements: A phenomenon in search of an explanation. *American Psychologist, 45*, 913. doi: 10.1037/1948-1985.S.1.45

Thomas, A. G. (2018). Lowering partner standards in a short-term mating context. In T. K. Shackelford & V. A. Weekes-Shackelford (Eds.), *Encyclopedia of evolutionary psychological science* (pp. 1-3). Cham: Springer International Publishing.

Thomas, A. G., & Stewart-Williams, S. (2018). Mating strategy flexibility in the laboratory: Preferences for long- and short-term mating change in response to evolutionarily relevant variables. *Evolution and Human Behavior, 39*, 82-93. doi: 10.1016/j.evolhumbehav.2017.10.004

Ting-Toomey, S. (1994). Face and facework: An introduction. In S. Ting-Toomey (Ed.), *The challenge of facework: Cross-cultural and interpersonal issues* (pp. 1-14): SUNY Press.

Tooby, J., & Cosmides, L. (1990). On the universality of human nature and the uniqueness of the individual: The role of genetics and adaptation. *Journal of Personality, 58*, 17-67.

Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man, 1871-1971* (pp. 136-179). Chicago: Aldine-Atherton.

Tu, W., & Du, W. (1996). *Confucian traditions in east asian modernity: Moral education and economic culture in japan and the four mini-dragons*: Harvard University Press.

Vignoles, V. L., Owe, E., Becker, M., Smith, P. B., Easterbrook, M. J., Brown, R., . . . Cadena, M. P. (2016). Beyond the 'East-West' dichotomy: Global variation in cultural models of selfhood. *Journal of Experimental Psychology: General, 145*, 966-1000. doi: 10.1037/xge0000175

von Rueden, C. (2014). The roots and fruits of social status in small-scale human societies. In J. T. Cheng, J. L. Tracy & C. Anderson (Eds.), *The psychology of social status* (pp. 179-200): Springer.

von Rueden, C., Gurven, M., & Kaplan, H. (2011). Why do men seek status? Fitness payoffs to dominance and prestige. *Proceedings of the Royal Society B: Biological Sciences, 278*, 2223-2232. doi: 10.1098/rspb.2010.2145

Wagstaff, D., Sulikowski, D., & Burke, D. (2015). Sex-differences in preference for looking at the face or body in short-term and long-term mating contexts. *Evolution, Mind and Behaviour, 13*, 1-17. doi: 10.1556/2050.2015.0003

Watson, D., Klohnen, E. C., Casillas, A., Nus Simms, E., Haig, J., & Berry, D. S. (2004). Match makers and deal breakers: Analyses of assortative mating in newlywed

couples. *Journal of Personality, 72*, 1029-1068. doi: 10.1111/j.0022-

3506.2004.00289.x

Yahya, S., & Boag, S. (2014). Till faith do us part…: Relation between religious affiliation

and attitudes toward cross-cultural and interfaith dating and marriage. *Marriage &*

Family Review, 50, 480-504. doi: 10.1080/01494929.2014.909376

Yong, J. C., Li, N. P., Jonason, P. K., & Tan, Y. W. (2019). East Asian low marriage and

birth rates: The role of life history strategy, culture, and social status affordance.

Personality and Individual Differences, 141, 127-132. doi:

10.1016/j.paid.2019.01.009

Yue, G., Chen, H., & Zhang, Y. (2005). Verification of evolutionary hypothesis on human

mate selection mechanism in cross-culture context. *Acta Psychologica Sinica, 37*,

561-568.
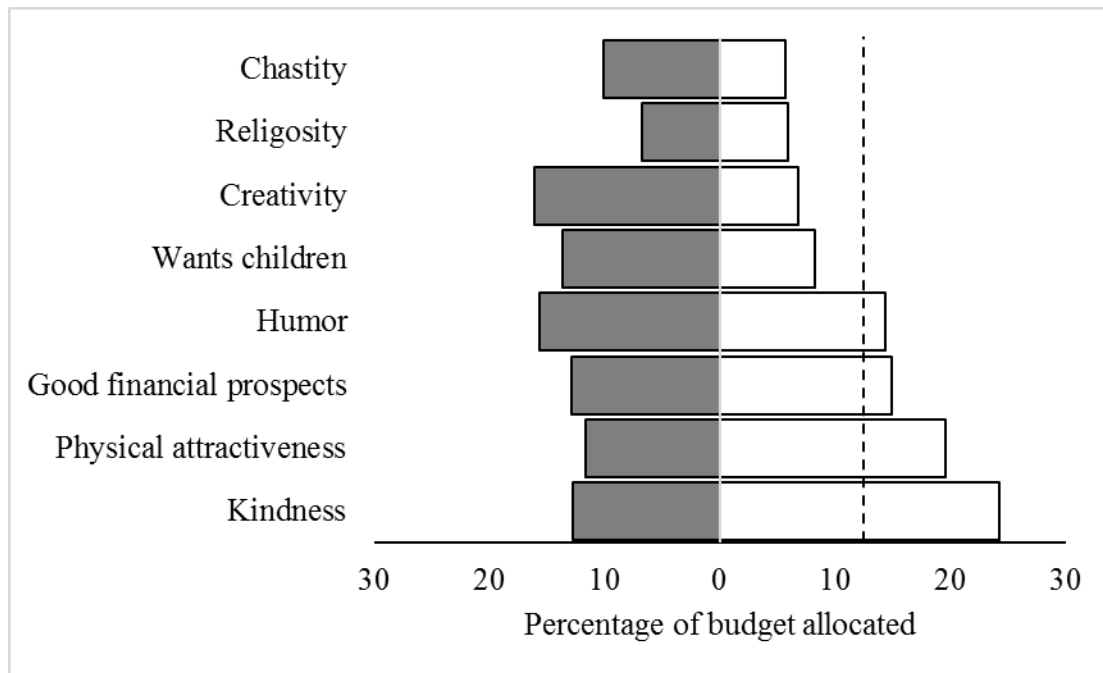
Figure 1. Percentage of mate dollars assigned to each trait in the low budget (white) and high budget (grey) conditions. The vertical dashed line indicates how many dollars we would expect each trait to receive by chance.
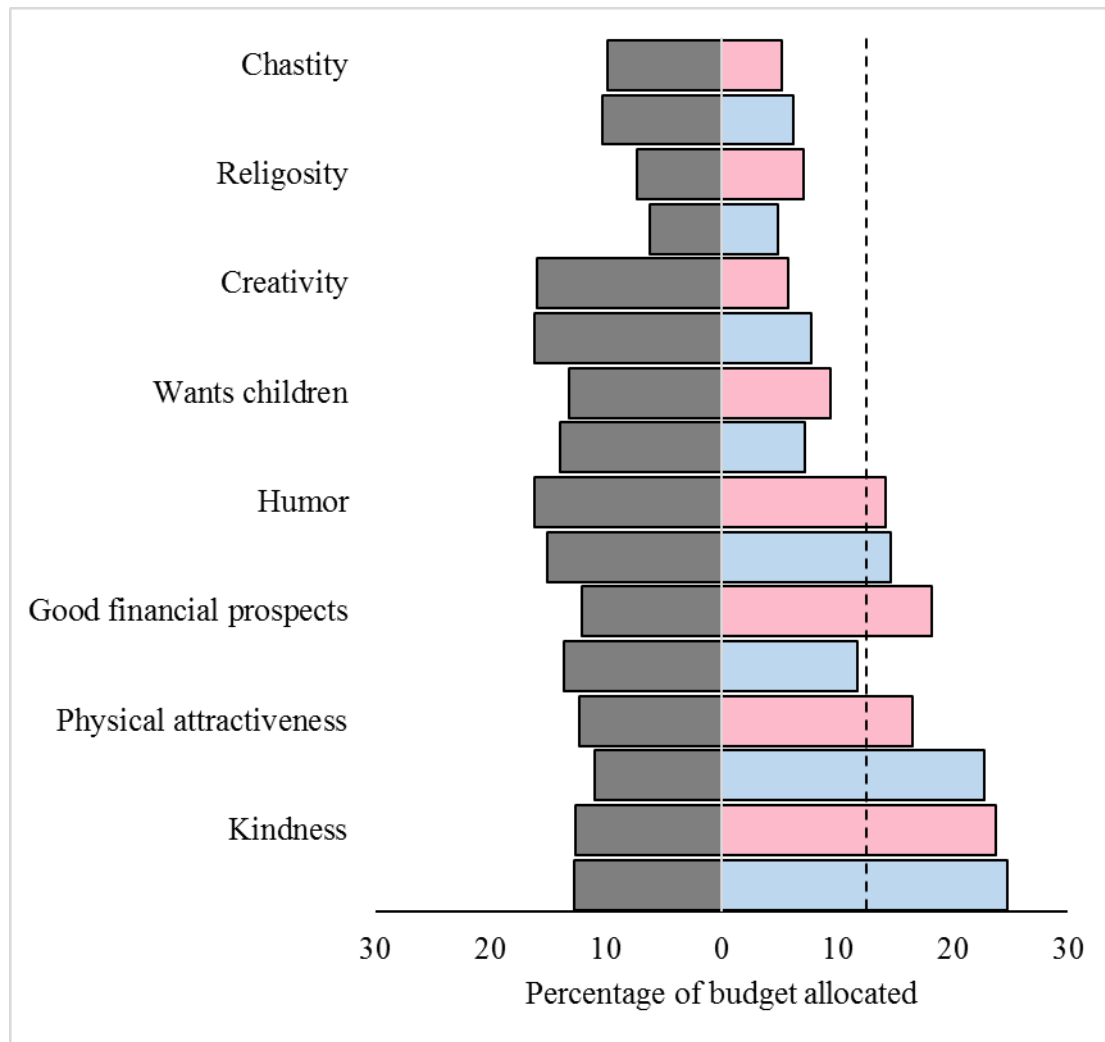
Figure 2. Sex differences in mate dollar allocation. The colored bars indicate the percentage

of mate dollars assigned to each trait in the low budget condition (blue = men, pink =

women). The grey bars indicate the percentage assigned in the high budget condition.

Table 1. Culture group allocation based on self-reported country of socialization.

Eastern cultures (n = 773)		Western cultures (n = 1,704)	
Country	n	Country	n
Malaysia	445	Australia	819
Singapore	269	Norway	492
Hong Kong	37	United Kingdom	357
China	11	United States	23
Indonesia	11	New Zealand	13

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table 2. The percentage of dollars allocated to each trait when spending the first (low budget) and last (high budget) 16 mate dollars. Changes between budgets are displayed as well as sex differences.

Trait	Women M (SE) Low	Women M (SE) High	Δ	d	Men M (SE) Low	Men M (SE) High	Δ	d	Sex differences Low Δ	Sex differences Low d	Sex differences High Δ	Sex differences High d
Kindness	23.78_a (0.35)	12.61_a (0.25)	-11.17**	-1.01	24.74_a (0.37)	12.82_a (0.27)	-11.92**	-1.14	-0.96	-0.08	-0.20	-0.02
Physical attractiveness	16.52_b (0.31)	12.31_a (0.24)	-4.21**	-0.41	22.73_b (0.34)	10.95_b (0.25)	-11.78**	-1.22	-6.21**	-0.55	1.36**	0.16
Good financial prospects	18.16_c (0.31)	12.04_a (0.26)	-6.12**	-0.57	11.80_c (0.34)	13.69_a (0.28)	1.89**	0.19	6.37**	0.56	-1.64**	-0.17
Humor	14.16_d (0.32)	16.25_b (0.28)	2.10**	0.19	14.69_d (0.34)	15.12_c (0.30)	0.43	0.04	-0.53	-0.05	1.13**	0.11
Wants Children	9.40_e (0.31)	13.20_a (0.32)	3.80**	0.33	7.21_e (0.33)	13.98_{ac} (0.34)	6.77**	0.61	2.19**	0.2	-0.78	-0.07
Creativity	5.72_f (0.24)	15.99_b (0.30)	10.27**	1.02	7.82_e (0.26)	16.18_c (0.33)	8.36**	0.88	-2.10**	-0.24	-0.19	-0.02
Religiosity	7.07_g (0.29)	7.34_c (0.26)	0.28	0.03	4.84_f (0.31)	6.20_d (0.28)	1.36**	0.14	2.23**	0.21	1.14**	0.12
Chastity	5.20_f (0.28)	9.84_c (0.30)	4.64**	0.43	6.18_g (0.30)	10.33_b (0.33)	4.16**	0.41	-0.98*	-0.1	-0.50	-0.05

M = Estimated Marginal Mean, SE = Standard Error of the Mean, d = Cohen's d effect size, Δ = Difference between marginal means. Within each column, means with different subscripts are significantly different. *$p < .05$, **$p < .01$.

1
2
3 **Table 3.** The percentage of dollars allocated to each trait when spending the first (low budget) and last (high budget) 16 mate dollars. Sex and culture groups are
4
5 displayed separately.
6
7

	Women				Men				Sex differences			
	M *(SE)*				M *(SE)*				Low		High	
Trait	Low	High	Δ	*d*	Low	High	Δ	*d*	Δ	*d*	Δ	*d*
Eastern sample												
Kindness	21.57_a (0.59)	12.05_a (0.43)	-9.53**	-0.94	25.57_a (0.60)	11.86_a (0.43)	-13.71**	-1.37	-3.99**	-0.34	0.19	0.02
Physical attractiveness	16.23_b (0.54)	11.39_{ab} (0.41)	-4.84**	-0.51	20.90_b (0.55)	10.38_{ab} (0.41)	-10.52**	-1.13	-4.67**	-0.44	1.01	0.13
Good financial prospects	20.71_a (0.54)	10.65_{ac} (0.45)	-10.07**	-1.02	13.06_c (0.55)	12.53_{ac} (0.45)	-0.531	-0.05	7.65**	0.71	-1.89**	-0.21
Humor	11.06_c (0.54)	15.98_d (0.48)	4.92**	0.49	11.03_{cd} (0.55)	14.72_{cde} (0.49)	3.69**	0.36	0.03	0.00	1.26	0.13
Wants children	6.19_{de} (0.53)	12.91_{ae} (0.55)	6.72**	0.63	6.58_{efg} (0.54)	14.47_{ce} (0.56)	7.89**	0.74	-0.39	-0.04	-1.55*	-0.14
Creativity	4.94_d (0.41)	15.17_{de} (0.52)	10.23**	1.11	6.24_{eh} (0.42)	14.85_{de} (0.53)	8.61**	0.93	-1.30*	-0.16	0.32	0.03
Religiosity	11.64_c (0.50)	9.92_{bcf} (0.45)	-1.72*	-0.18	8.48_{dfi} (0.51)	8.53_b (0.45)	0.06	0.01	3.16**	0.32	1.39*	0.16
Chastity	7.64_e (0.48)	11.60_{af} (0.52)	3.96**	0.40	8.14_{ghi} (0.49)	12.50_{ae} (0.53)	4.35**	0.44	-0.50	-0.05	-0.90	-0.09
Western sample												
Kindness	25.98_a (0.37)	13.18_a (0.27)	-12.80**	-1.27	23.91_a (0.44)	13.77_a (0.31)	-10.14**	-1.02	2.07**	0.18	-0.60	-0.07

Physical attractiveness	16.81_b (0.34)	13.23_a (0.25)	-3.57**	-0.38	24.56_a (0.40)	11.52_b (0.30)	-13.04**	-1.40	-7.76**	-0.73	1.71**	0.22
Good financial prospects	15.61_b (0.34)	13.44_a (0.28)	-2.17**	-0.22	10.53_b (0.40)	14.84_{ac} (0.33)	4.31**	0.44	5.08**	0.48	-1.40**	-0.16
Humor	17.25_b (0.34)	16.53_b (0.30)	-0.72	-0.07	18.35_c (0.40)	15.52_c (0.36)	-2.83**	-0.28	-1.10*	-0.10	1.01*	0.11
Wants children	12.61_c (0.33)	13.48_a (0.34)	0.87	0.08	7.84_d (0.39)	13.50_a (0.40)	5.66**	0.54	4.77**	0.46	-0.02	0.00
Creativity	6.50_d (0.26)	16.81_b (0.33)	10.31**	1.11	9.40_{bd} (0.30)	17.51_d (0.39)	8.11**	0.89	-2.90**	-0.36	-0.70	-0.07
Religiosity	2.49_e (0.31)	4.76_c (0.28)	2.27**	0.24	1.20_e (0.37)	3.86_e (0.33)	2.66**	0.29	1.29*	0.13	0.90*	0.10
Chastity	2.76_e (0.30)	8.07_d (0.33)	5.32**	0.53	4.21_f (0.35)	8.17_f (0.39)	3.96**	0.40	-1.46**	-0.15	-0.10	-0.01

M = Estimated Marginal Mean, SE = Standard Error of the Mean, d = Cohen's d effect size, Δ = Difference between marginal means. Within each column, means

with different subscripts are significantly different. *p < .05, **p < .01

Table 4. Cultural differences in the percentage of dollars allocated to each trait for the first (low budget) 16 mate dollars spent during the task. Men and women are shown separately.

	M (*SE*)		Δ	*d*
	East	West		
Women				
Kindness	21.57_a (0.59)	25.98_a (0.37)	-4.41**	-0.38
Physical attractiveness	16.23_b (0.54)	16.81_b (0.34)	-0.57	-0.05
Good financial prospects	20.71_a (0.54)	15.61_b (0.34)	5.11**	0.47
Humor	11.06_c (0.54)	17.25_b (0.34)	-6.19**	-0.58
Wants children	6.19_{de} (0.53)	12.61_c (0.33)	-6.42**	-0.61
Creativity	4.94_d (0.41)	6.50_d (0.26)	-1.56**	-0.19
Religiosity	11.64_c (0.50)	2.49_e (0.31)	9.15**	0.93
Chastity	7.64_e (0.48)	2.76_e (0.30)	4.88**	0.51
Men				
Kindness	25.57_a (0.60)	23.91_a (0.44)	1.66*	0.14
Physical attractiveness	20.90_b (0.55)	24.56_a (0.40)	-3.66**	-0.34
Good financial prospects	13.06_c (0.55)	10.53_b (0.40)	2.54**	0.24
Humor	11.03_{cd} (0.55)	18.35_c (0.40)	-7.32**	-0.69
Wants children	6.58_{efg} (0.54)	7.84_d (0.39)	-1.26	-0.12
Creativity	6.24_{eh} (0.42)	9.40_{bd} (0.30)	-3.15**	-0.39
Religiosity	8.48_{dfi} (0.51)	1.20_e (0.37)	7.28**	0.74
Chastity	8.14_{ghi} (0.49)	4.21_f (0.35)	3.93**	0.42

M = Estimated Marginal Mean, *SE* = Standard Error of the Mean, *d* = Cohen's *d* effect size, Δ = Difference between marginal means. Within each column, means

with different subscripts are significantly different. *$p < .05$, **$p < .01$

Budget allocation task information and participant instructions

The following pages contain the budget allocation task materials that were presented to the participants as part of the study. When it came to describing the eight characteristics, we did not provide 100th percentile examples as to do so would have been inconsistent between attributes. This is because it is easier to convey the total absence and average level of most traits than their natural ceiling. An example of the dollar allocation grid from the "high" budget is provided. This was modified with lower number for the "medium" and "low" budgets.

Introduction

For this survey, you will be using percentile scales to describe the characteristics pertaining to your ideal romantic partner. The percentile scales correspond to how a person measures against all others of the same sex that you might encounter on a busy street during a typical week.

For example, suppose you are male and that your relevant population of potential mates are women. . . Let's look at the characteristic of height. If we could rank all the women by their height, then the tallest woman would be at the 100th percentile of height - she is taller than 100% of all the women. The woman at the 50th percentile of height is taller than 50% of all the women - she is at the median, or roughly, average. The shortest woman is at the 0th percentile of height - she is taller than 0% of all the women.

There will be 8 characteristics that describe your romantic partner. The characteristics sheet tells you what each characteristic means and what a typical 50th percentile and 0th percentile person might be like. Please take a minute to read them over.

All your responses are anonymous, so please respond as honestly and candidly as possible (do not worry about how politically correct or socially desirable your selections are).

Please take your time because you may have some tough choices to make.

Characteristics Sheet

The population of comparison is anyone who might be seen on a very busy street in your local area during a given week.

Physical attractiveness

A person's physical appearance (i.e., body & face). Does not include how they dress.

• 50th percentile (average) = pleasant-looking, may have a nice feature or two, reasonable face, but they're not striking

• 0th percentile = least physically attractive person seen on the busy street

Good financial prospects

An individual's earning capacity, linked to the kind of job they have or intend to have.

• 50th percentile (average) = average earning capacity. Holds or will hold a full-time job. Will earn enough to cover the costs of living and a small amount of disposable income.

• 0th percentile = the individual has very poor job prospects. If they are able to maintain a job, they will still struggle to cover the costs of living.

Creativity

A person's level of artistic ability and originality – how artistically talented they are and the extent to which they stray off the beaten path.

• 50th percentile (average) = may occasionally demonstrate originality, perhaps able to write a poem or play a song

• 0th percentile = lowest creativity of anyone seen on the busy street - no creativity or artistic talent at all

Kindness

A person's benevolence or willingness to be helpful to others.

• 50th percentile (average) = usually helpful to close friends, especially when there is time

• 0th percentile = least kind person seen on the busy street - no willingness to help others

Humor

How funny and witty someone is – their ability to make you laugh or laugh at what you say.

• 50th percentile (average) = the person has an average sense of humour. They are funny at times, can tell a few good jokes and laugh at others' jokes

• 0th percentile = the person has no sense of humour, they are unable to make you laugh or be made to laugh and are very serious

Religiosity

How seriously the person takes religion and their contribution to the religious community.

• 50th percentile (average) = the individual is religious, observes mandatory services and rituals. Only occasionally engages in non-mandatory observances.

• 0th percentile = the person is not religious. He or she does not participate in any religious activities.

Chastity

How open the individual is to sexual activity before marriage.

• 50th percentile (average) = the person is somewhat hesitant to engage in a sexual relationship outside of marriage

• 0th percentile = the person definitely wants to have sex before they are married

Wants children

The person's desire to start a family and have children.

• 50th percentile (average) = the person would like to start a family, but wants only an average number of children.

• 0th percentile = this person never wants to have children

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Long-term mate design (High budget example)

Please design your ideal long-term mate by circling a percentile level for each of the following 8 characteristics. Assume that this is someone who you will be with for many years and possibly marry and have a family with. Of course, you may not be currently looking for someone like this, but for this part of the survey, assume that you are.

To prevent you from choosing a "10" in everything, you will have to pay for each of your selections. Assume that each level is also your cost in "mate dollars" (example: 50th percentile = level 5 = 5 mate dollars; 80th percentile = level 8 = 8 mate dollars).

You have only 48 mate dollars to spend, so make sure that all the numbers you circle add up to 48. If you do not circle a level for a characteristic, it will be assumed that the bottom level is chosen for that characteristic!

Characteristics that describe your long-term mate								
Percentile	Physical Attractiveness	Good Financial Prospects	Creativity	Kindness	Humorous	Religious	Chaste	Wants Children
100th = the top	10	10	10	10	10	10	10	10
90th = above 90%	9	9	9	9	9	9	9	9
80th = above 80%	8	8	8	8	8	8	8	8
70th = above 70%	7	7	7	7	7	7	7	7
60th = above 60%	6	6	6	6	6	6	6	6
50th = middle	5	5	5	5	5	5	5	5
40th = above 40%	4	4	4	4	4	4	4	4
30th = above 30%	3	3	3	3	3	3	3	3
20th = above 20%	2	2	2	2	2	2	2	2
10th = above 10%	1	1	1	1	1	1	1	1
0th = the bottom	0	0	0	0	0	0	0	0
Add up the value of your selections (must equal 48): _____								

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table S1. General demographic information for the Eastern and Western samples.

	Eastern (n = 774)	Western (n = 1,723)
Sex (%)		
Women	51.1	58.6
Men	48.9	41.4
Sexuality (%)		
Heterosexual	93.5	89.1
Homosexual	2.3	3.1
Bisexual	3.2	6.5
Other	0.8	1.0
Relationship status (%)		
Married	0.8	16.4
Divorced	-	2.8
Committed	30.9	38.9
Uncommitted	4.9	5.7
Single	63.4	36.1
Other	-	0.1
Socio-economic status (%)		
Upper	1.0	1.3
Upper-middle	24.1	24.1
Middle	59.1	50.1
Lower-middle	11.6	19.6
Lower	3.2	4.6
Students (%)	98.6	80.5
Religiousness (%)		
Christianity	27	30.1
Islam	19.3	2.2
Hinduism	2.2	0.4
Buddhism	27.4	1.4
None	22.6	64.3
Other	1.4	1.7
Other descriptives (M (SD))		
Age	21.48 (2.59)	27.03 (9.64)
Importance of religion	3.20 (1.48)	1.70 (1.20)

Table S2. Full list of countries that participants represented in the task. Only the top 10 represented countries were included in the Eastern and Western culture groups.

Country	*n*
Eastern cultures (n = 774)	
Malaysia	445
Singapore	269
Hong Kong	37
China	11
Indonesia	11
Western cultures (n = 1,723)	
Australia	819
Norway	492
United Kingdom	357
United States	23
New Zealand	13
Not categorized (n = 110)	
India	8
Netherlands	7
Canada, France	6
Germany, Ireland, Vietnam	5
Philippines	4
Pakistan, Russia, South Africa, Sri Lanka	3
Argentina, Austria, Brunei, Cuba, Greece, Hungary, Iraq, Italy, Japan, Lebanon, Poland, Romania, Saudi Arabia, South Korea, Thailand	2
Other	1