Research Article

ASSOCIATION FOR PSYCHOLOGICAL SCIENCE

Psychological Science
2020, Vol. 31(4) 408–423
© The Author(s) 2020
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/0956797620904154
www.psychologicalscience.org/PS
SAGE

Sex Differences in Mate Preferences Across 45 Countries: A Large-Scale Replication

TC

Kathryn V. Walter[1], Daniel Conroy-Beam[1], David M. Buss[2], Kelly Asao[2], Agnieszka Sorokowska[3,4], Piotr Sorokowski[5], Toivo Aavik[6], Grace Akello[7], Mohammad Madallh Alhababha[8], Charlotte Alm[9], Naumana Amjad[10], Afifa Anjum[10], Chiemezie S. Atama[11], Derya Atamtürk Duyar[12], Richard Ayebare[13], Carlota Batres[14], Mons Bendixen[15], Aicha Bensafia[16], Boris Bizumic[17], Mahmoud Boussena[18], Marina Butovskaya[19,20], Seda Can[21], Katarzyna Cantarero[22], Antonin Carrier[23], Hakan Cetinkaya[24], Ilona Croy[25], Rosa María Cueto[26], Marcin Czub[3], Daria Dronova[19], Seda Dural[21], Izzet Duyar[12], Berna Ertugrul[27], Agustín Espinosa[26], Ignacio Estevan[28], Carla Sofia Esteves[29], Luxi Fang[30], Tomasz Frackowiak[3], Jorge Contreras Garduño[31], Karina Ugalde González[32], Farida Guemaz[33], Petra Gyuris[34], Mária Halamová[35], Iskra Herak[36], Marina Horvat[37], Ivana Hromatko[38], Chin-Ming Hui[30], Jas Laile Jaafar[39], Feng Jiang[40], Konstantinos Kafetsios[41], Tina Kavčič[42], Leif Edward Ottesen Kennair[15], Nicolas Kervyn[36], Truong Thi Khanh Ha[43], Imran Ahmed Khilji[44], Nils C. Köbis[45], Hoang Moc Lan[43], András Láng[34], Georgina R. Lennard[17], Ernesto León[26], Torun Lindholm[9], Trinh Thi Linh[43], Giulia Lopez[46], Nguyen Van Luot[43], Alvaro Mailhos[28], Zoi Manesi[47], Rocio Martinez[48], Sarah L. McKerchar[17], Norbert Meskó[34], Girishwar Misra[49], Conal Monaghan[17], Emanuel C. Mora[50], Alba Moya-Garófano[48], Bojan Musil[51], Jean Carlos Natividade[52], Agnieszka Niemczyk[3], George Nizharadze[53], Elisabeth Oberzaucher[54], Anna Oleszkiewicz[3,4], Mohd Sofian Omar-Fauzee[55], Ike E. Onyishi[56], Baris Özener[12], Ariela Francesca Pagani[46], Vilmante Pakalniskiene[57], Miriam Parise[46], Farid Pazhoohi[58], Annette Pisanski[50], Katarzyna Pisanski[3,59], Edna Ponciano[60], Camelia Popa[61], Pavol Prokop[62,63], Muhammad Rizwan[64], Mario Sainz[65], Svjetlana Salkičević[66], Ruta Sargautyte[57], Ivan Sarmány-Schuller[67], Susanne Schmehl[54], Shivantika Sharad[68], Razi Sultan Siddiqui[69], Franco Simonetti[70], Stanislava Yordanova Stoyanova[71], Meri Tadinac[66], Marco Antonio Correa Varella[72], Christin-Melanie Vauclair[29], Luis Diego Vega[32], Dwi Ajeng Widarini[73], Gyesook Yoo[74], Marta Zat'ková[35], and Maja Zupančič[75]

[1]Department of Psychological and Brain Sciences, University of California, Santa Barbara; [2]Department of Psychology, University of Texas at Austin; [3]Institute of Psychology, University of Wroclaw; [4]Department of Otorhinolaryngology, Smell & Taste Clinic, Technische Universität Dresden; [5]Institute of Psychology, University of Opole; [6]Institute of Psychology, University of Tartu; [7]Department of Mental Health, Faculty of Medicine, Gulu University; [8]English Language Department, Middle East University; [9]Department of Psychology, Stockholm University; [10]Institute of Applied Psychology, University of the Punjab; [11]Department of Sociology and Anthropology, University of Nigeria; [12]Department of Anthropology, Istanbul University; [13]North Star Alliance, Kampala, Uganda; [14]Department of Psychology, Franklin and Marshall College; [15]Department of Psychology, Norwegian University of Science and Technology; [16]Laboratory Education-Formation-Travail (EFORT), Department of Sociology, University of Algiers; [17]Research School of Psychology, Australian National University; [18]Laboratory EFORT, Department of Psychology and Educational Sciences, University of Algiers; [19]Institute of Ethnology and Anthropology, Russian Academy of Sciences; [20]Center for Social Anthropology, Russian State University for the Humanities; [21]Department of Psychology, Izmir University of Economics; [22]Social Behavior Research Center, Faculty in Wroclaw, SWPS University of Social Sciences and Humanities; [23]Psychology Faculty (Center for the Study of Social Behavior), Université Catholique de Louvain; [24]Department of Psychology, Ankara University; [25]Department of Psychotherapy and Psychosomatic Medicine, Technische Universität Dresden; [26]Grupo de Psicología Política y Social, Departamento de Psicología, Pontificia Universidad Católica del Perú; [27]Department of Anthropology, Sivas Cumhuriyet University; [28]Facultad de Psicología, Universidad de la República; [29]Instituto Superior de Ciências do Trabalho e da Empresa, Instituto Universitário de Lisboa (ISCTE-IUL), Centro de Investigação e Intervenção Social, Instituto Universitário de Lisboa (CIS-IUL); [30]Department of Psychology, Chinese University of Hong Kong; [31]Escuela Nacional de Estudios Superiores, Universidad Nacional Autónoma de México (UNAM), Unidad Morelia; [32]Psychology Department, Universidad Latina de Costa Rica; [33]Laboratory EFORT, Department of Psychology and Educational Sciences, University of Setif; [34]Institute of Psychology, University of Pécs; [35]Faculty of Social Sciences and Health Care, Department of Psychological Sciences, Constantine the Philosopher University; [36]Louvain Research Institute in Management and Organisations, Université Catholique de Louvain; [37]Faculty of Arts, Department of Psychology, University of Maribor; [38]Department of Psychology, Faculty for Humanities and Social Sciences, University of Zagreb; [39]Department of Educational Psychology and Counseling, University of Malaya; [40]Organization and Human Resource Management, Central University of Finance and Economics; [41]Psychology Department, University of Crete; [42]Faculty of Education, University of Primorska; [43]Department of Psychology, University of Social Sciences and Humanities, Vietnam National University, Hanoi; [44]Department of Psychology, Islamabad Model College for Boys, F-10/4, Islamabad; [45]Department of Economics, Center for Research in Experimental Economics and Political Decision Mating, University of Amsterdam; [46]Department of Psychology, Università Cattolica del Sacro Cuore; [47]Department of Experimental and Applied Psychology, Vrije Universiteit Amsterdam; [48]Department of Social Psychology, University of Granada; [49]Department of Psychology, University of Delhi; [50]Department of Animal and Human Biology, Faculty of Biology, University of Havana; [51]Department of Psychology, Faculty of Arts, University of Maribor; [52]Department of Psychology, Pontifical Catholic University of Rio de Janeiro; [53]Department of Social Sciences, Free University of Tbilisi; [54]Faculty of Life Sciences, University of Vienna; [55]School of Education, Universiti Utara Malaysia; [56]Department of Psychology, University of Nigeria; [57]Institute of Psychology, Vilnius University; [58]Department of Psychology, University of British Columbia; [59]Equipe de Neuro-Ethologie Sensorielle (ENES), Centre de Recherche en Neurosciences de Lyon (CRNL), Centre National de la Recherche Scientifique (CNRS), University of Lyon/Saint-Étienne; [60]Institute of Psychology, University of the State of Rio de Janeiro; [61]Department of Psychology, Faculty for Humanities and Social Sciences, Universitatea Nationala de Arta Teatrala si Cinematografica-Centrul Internațional de Cercetare și Educație în Tehnologii Inovativ Creative (UNATC-CINETIc), Romanian Academy; [62]Department of Environmental Ecology, Faculty of Natural Sciences, Comenius University; [63]Institute of Zoology, Slovak Academy of Sciences; [64]Delve Business Network, Islamabad, Pakistan; [65]School of Psychology, University of Monterrey; [66]Department of Psychology, Faculty of Humanities and Social Sciences, University of Zagreb; [67]Center for Social and Psychological Sciences, Institute of Experimental Psychology, Slovak Academy of Sciences; [68]Department of Applied Psychology, Vivekananda College, University of Delhi; [69]Department of Management Sciences, DHA Suffa University; [70]School of Psychology, Pontifica Universidad Catolica de Chile; [71]Department of Psychology, South-West University "Neofit Rilski"; [72]Department of Experimental Psychology, Institute of Psychology, University of São Paulo; [73]Faculty of Communication, University Prof. Dr Moestopo (Beragama), Jakarta, 10270, Indonesia; [74]Department of Child and Family Studies, Kyung Hee University; and [75]Department of Psychology, Faculty of Arts, University of Ljubljana

Abstract

Considerable research has examined human mate preferences across cultures, finding universal sex differences in preferences for attractiveness and resources as well as sources of systematic cultural variation. Two competing perspectives—an evolutionary psychological perspective and a biosocial role perspective—offer alternative explanations for these findings. However, the original data on which each perspective relies are decades old, and the literature is fraught with conflicting methods, analyses, results, and conclusions. Using a new 45-country sample (N = 14,399),

Corresponding Author:
Kathryn V. Walter, Department of Psychological and Brain Sciences, University of California, Santa Barbara, CA 93106
E-mail: kwalter@ucsb.edu

we attempted to replicate classic studies and test both the evolutionary and biosocial role perspectives. Support for universal sex differences in preferences remains robust: Men, more than women, prefer attractive, young mates, and women, more than men, prefer older mates with financial prospects. Cross-culturally, both sexes have mates closer to their own ages as gender equality increases. Beyond age of partner, neither pathogen prevalence nor gender equality robustly predicted sex differences or preferences across countries.

Keywords
mate preferences, sex differences, cross-cultural studies, evolutionary psychology, biosocial role theory, open data, preregistered

Received 5/3/19; Revision accepted 12/7/19

Sex differences are of broad interest across psychology. Their existence and importance are key topics in research areas spanning spatial navigation (e.g., Levine, Foley, Lourenco, Ehrlich, & Ratliff, 2016), education (e.g., in science, technology, engineering, and mathematics; Stoet & Geary, 2018), and neuroscience (e.g., Cahill, 2006). However, in no area have sex differences been a greater lightning rod than in human-mating research. Here, fundamental questions—why do sex differences exist? what differences exist? and how do they vary?—have been the subject of heated debate for decades.

Two perspectives offer alternative explanations of the nature and origin of sex differences in mate preferences: an evolutionary psychological perspective and a biosocial role perspective. Each has taken a body of contrasting findings as foundational to their approach, defining trenches in a decades-long standoff. However, psychological science has entered an era in which many once-foundational findings are being questioned because of revelations about prior methodological limitations, flexibility in research design, and the dearth of replication attempts (e.g., Simmons, Nelson, & Simonsohn, 2011). A close look at the literature on cross-cultural sex differences in mate preferences reveals that, as a whole, it suffers from many of these issues, including variability across studies in design and analysis as well as few attempts at replication.

Here, we attempted to remedy this by integrating and replicating prior work using more appropriate analytic techniques; preregistering the predictor, moderator, and control variables; reporting all results transparently in the same analytic framework; and using a new, large, in-person cross-cultural sample. In doing so, we simultaneously tested the predictions of both perspectives, providing a clearer comparison of the contrasting results within this literature and a more secure foundation for theoretical advances in this highly influential research area.

Cross-Cultural Universal Sex Differences

The evolutionary psychological perspective on sex differences in human mate preferences follows largely from the work of Buss (1989). Buss predicted that although both sexes are expected to prefer a mate who is kind, intelligent, and healthy, they are also expected to differentially prefer characteristics related to resources and fertility (see Buss & Barnes, 1986). Women face a larger minimum reproductive investment than men. This inequity has led to evolved psychologies in which women, more than men, prefer long-term partners with the ability to acquire and confer resources, but men, more than women, prefer partners with high reproductive value, indicated by attractiveness and relative youth.

To test these predictions, Buss collected ranked and rated mate preferences from more than 10,000 participants from 37 different cultures (Buss, 1989). Consistent with evolutionary hypotheses, results showed that both sexes ranked kindness and intelligence as most important across samples. In 36 out of 37 cultures, women rated “good financial prospects” as more important in a potential mate than men did. In 34 out of 37 cultures, men rated “good looks” as more important than women did. Furthermore, women preferred a spouse older than themselves, but men preferred a spouse younger than themselves, on average.

Kenrick and Keefe (1992) elaborated on these findings with additional evidence of a sex difference in age preference, reflected in marriage records and advertisements from various countries. Looking at trends of partner age differences across the life span, they found that women consistently marry older men as they age, whereas men marry increasingly younger women as they age.

Cross-Cultural Variability in Sex Differences

In 1999, Eagly and Wood proposed biosocial role theory (originally social role theory; see Wood & Eagly, 2012, for an updated overview) as an alternative explanation for the findings of Buss (1989). Biosocial role theory locates the origin of sex differences in the contrasting roles men and women occupy in society. Differences in upper-body strength and reproductive activities lead to a division of labor driven by efficiency but with male-dominated roles yielding greater status. Psychological sex differences result from the behaviors that men and women cultivate on the basis of societal expectations of gender roles.

Eagly and Wood (1999) hypothesized that sex differences would be larger in societies with greater gender inequality. To evaluate this, they reanalyzed Buss's (1989) data, examining the correlation between country-level sex differences in mate preferences and measures of gender equality. They found that gender-equality levels diminished (a) sex differences in age preferences and (b) ranked, but not rated, preferences for good earning capacity.

Zentner and Mitura (2012) reinforced these findings using rated preferences from Buss's (1989) data; a new 10-country online data set; and an updated measure of gender equality. Again, gender equality diminished the sex difference in age preferences in both samples. Furthermore, gender equality diminished the sex difference in rated preferences for good financial prospects in their new sample but not in the sample from Buss. They also calculated an overall sex difference for each country, which was negatively correlated with gender equality in both samples (but see Schmitt, 2012).

Challenging biosocial role theory, Gangestad, Haselton, and Buss (2006) reexamined cross-cultural variability in mate preferences, using gender equality and pathogen prevalence as competing predictors (see also Gangestad & Buss, 1993). They hypothesized that variability in mate preferences across cultures is driven by environmental factors historically relevant to fitness, such as pathogen prevalence. Gangestad et al. (2006) found that gender equality did not significantly predict any sex differences in preferences. However, Gangestad et al. analyzed composites of ranked and rated preferences from Buss (1989) and controlled for latitude, world region, and income—several methodological changes from those used by Eagly and Wood (1999). Furthermore, they found that in countries with higher pathogen prevalence, both men and women placed higher value on physical attractiveness, health, and intelligence, all of which are hypothesized cues of pathogen load.

The Current Study

The studies described here are central to the debate between the evolutionary and biosocial role perspectives. Their predictions, reviewed in Table 1, are core components of each perspective's research programs. However, these classics demand replication for several reasons. First, though this research area appears to contain an abundance of data, most studies actually reanalyzed the same data set: the sample from Buss (1989). Second, previous research did not account for the nested nature of the data. Updated analytic techniques allow for better analyses of cross-cultural data sets without conducting multiple *t* tests or calculating correlations on the basis of aggregated nation-level data. Finally, the conflicting findings in this literature are a challenge to compare because of great variability in design and analysis across studies. Prior studies differ in terms of the outcome, predictor, and control variables; measures; and analyses the authors used (see Table 2 for an overview). Because no two studies share a common methodological framework, it is unclear whether the discrepant findings in this literature generalize beyond each article's idiosyncratic approach.

In the current study, we attempted to correct for these issues by examining all of the competing hypotheses in these classic cross-cultural studies from the human-mating literature using a single analytic framework. Here we used a new, 45-country sample of comparable scope with the original data set, employed the previously proposed predictor and control variables, and report all of the results. Our intent is not to repeat each prior study exactly but rather to offer a unified, transparent, and principled framework for examining these phenomena. By removing the statistical limitations and variability in design that have characterized this literature, we were able to thoroughly reexamine the sex differences in mate preferences and predictors of cross-cultural variation and provide an updated and more secure launching point for investigations in this important area of research.

Method

This study integrated, advanced, and conceptually replicated classic cross-cultural studies from the human-mating literature. Specifically, we examined sex differences in mate preferences across cultures and their multivariate effect sizes (Buss, 1989; Conroy-Beam, Buss, Pham, & Shackelford, 2015), sex differences in the age of chosen long-term partners (Buss, 1989; Kenrick & Keefe, 1992), cross-cultural variability in mate preferences as a function of pathogen prevalence (Gangestad & Buss, 1993; Gangestad et al., 2006), and cross-cultural variability in sex differences in mate preferences as a function of gender equality (Eagly & Wood, 1999; Zentner & Mitura, 2012).

Participants

Data were collected in 2016 from participants in 45 different countries ($N = 14,399$; 7,909 female, or 54.93%). All participant data were collected in person because

Table 1. Predictions About the Relationship Between Outcome and Predictor Variables in Cross-Cultural Mate-Preference Research From Evolutionary and Biosocial Role Perspectives

Outcome variable and perspective	Predictor variable: Sex	Predictor variable: Sex and gender equality	Predictor variable: Pathogen prevalence
Good financial prospects			
Evolutionary	Large sex difference	No prediction	No relationship
Biosocial	Sex difference insofar as there is gender inequality	Decrease in sex difference as gender equality increases	No prediction
Physical attractiveness			
Evolutionary	Large sex difference	No prediction	Increase in preference as pathogen prevalence increases
Biosocial	Sex difference insofar as there is gender inequality	Decrease in sex difference as gender equality increases	No prediction
Intelligence			
Evolutionary	Little or no sex difference; high level preferred	No prediction	Increase in preference as pathogen prevalence increases
Biosocial	Sex difference insofar as there is gender inequality	Decrease in sex difference as gender equality increases	No prediction
Kindness			
Evolutionary	Little or no sex difference; high level preferred	No prediction	No relationship
Biosocial	Sex difference insofar as there is gender inequality	Decrease in sex difference as gender equality increases	No prediction
Health			
Evolutionary	Little or no sex difference; high level preferred	No prediction	Increase in preference as pathogen prevalence increases
Biosocial	Sex difference insofar as there is gender inequality	Decrease in sex difference as gender equality increases	No prediction
Age choice			
Evolutionary	Large sex difference	No prediction	No relationship
Biosocial	Sex difference insofar as there is gender inequality	Decrease in sex difference as gender equality increases	No prediction

online samples tend to be less representative of populations in developing countries (Batres & Perrett, 2014). At each study site, data were collected from both university populations and community samples. Because of a lack of records from about half of the sites, there is incomplete information about the percentage of each type of sample. From the sites that did keep records (n = 6,604), 47.21% (n = 3,118) came from community samples. Participants ranged in age from 18 to 91 years (Mdn = 25, M = 28.78, SD = 10.62). Of the total sample, most participants reported being in ongoing, committed relationships (n = 9,206, or 63.93%).

Surveys were distributed to participants through a collaborative cross-cultural data-collection project. Researchers around the world were contacted as part of our goal to include as many country sites as possible, and the resulting countries are those in which researchers were willing and able to collect data at the time of the study. All researchers involved in data collection were required to provide a fixed sample size based on the number of local contributors.

Participants who were under the age of 18 at the time of the survey were excluded from all analyses. Participants who did not fill out any part of the mate-preferences survey or did not report their sex were excluded as well. Two countries surveyed (Serbia and Ukraine) did not include the mate-preferences portion of the survey and were not included in analyses, bringing the total down to 45 countries. Participants did not indicate mate age in four countries (Bulgaria, Jordan, Vietnam, and Uruguay), and those countries were not included in age analyses. Some participants reported very young ages for mates (< 10 years). We were concerned that at least some of these reports may have been erroneous. Therefore, all analyses for age differences were run twice: first for all reported mate ages (n = 8,920), and second, only for participants with reported mate ages older than 10 (n = 8,614). Below,

Table 2. Overview of the Methodological and Analytic Approaches in the Literature on Cross-Cultural Sex Differences in Mate Preferences

Article	Data source	Outcome variable	Predictor variable	Control variable	Analysis	Findings
Buss (1989)	37-culture data set	Rated and ranked preferences	Sex	None	Country-level *t* tests	Sex differences exist in preferences for physical attractiveness, good financial prospects, and age of partner.
Kenrick & Keefe (1992)	Marriage records and newspaper ads across cultures	Preferred age of partner and actual age of partner	Sex and age	None	ANOVA	Men marry younger partners, especially as they age; women marry older partners.
Gangestad & Buss (1993)	Buss (1989) data set	Rated preference for physical attractiveness	Pathogen-prevalence index	Latitude, world region, income	Country-level correlations	Pathogen prevalence increases preference for physical attractiveness.
Eagly & Wood (1999)	Buss (1989) data set	Rated and ranked preferences	Sex and gender-equality measures (GEM and GDI)	None	Country-level correlations	Gender equality diminishes sex differences in some preferences.
Gangestad, Haselton, & Buss (2006)	Buss (1989) data set	Composites of ranked and rated preferences	Sex, gender equality (GEM and GDI), and pathogen-prevalence index	Latitude, world region, income	Country-level regression	Pathogen prevalence, but not gender equality, predicts mate preferences.
Zentner & Mitura (2012)	Buss (1989) data set and a new 10-country online data set	Rated preferences; overall preference composites	Sex, gender equality (GGGI)	Varied; latitude, GDP per capita, religion, age, education, social class	Country-level correlations, ANOVA	Gender equality predicts overall sex differences in preferences.
Current study	New 45- country in-person data set	Ideal trait-level preference ratings	Sex, pathogen prevalence (three measures), gender equality (five measures)	Latitude, world region, GDP per capita, religion	Multilevel models with participants nested within countries	See Results section.

Note: ANOVA = analysis of variance; GDI = Gender-Related Development Index; GDP = gross domestic product; GEM = Gender Empowerment Measure; GGGI = Global Gender Gap Index.

we report the results of analyses with reported mate ages older than 10. For results with all reported mate ages, see the Supplemental Material available online.

Measures

Mate preferences. Participants completed a 5-item questionnaire on ideal mate preferences for a long-term romantic partner. These instructions appeared at the top of the questionnaire:

> For the following questions we are interested in what you desire in an ideal long-term mate (e.g. committed, romantic relationship). Each of the following is a trait that a potential mate might have. For each trait, please select the option that best represents your ideal long-term mate. Please remember we are interested in your preferences for ideal long-term (committed, romantic) mates.

Participants then rated their ideal romantic partner on five traits: kindness, intelligence, health, physical attractiveness, and good financial prospects. All items were rated on bipolar adjective scales ranging from 1 (*very unintelligent; very unkind; very unhealthy; very physically unattractive; very poor financial prospects*) to 7 (*very intelligent; very kind; very healthy; very physically attractive; very good financial prospects*). We were limited to asking about these five items because of survey space and participant time constraints. Kindness, intelligence, and health were chosen because prior literature has found these to be universally desirable in potential mates; physical attractiveness and financial prospects were chosen to attempt to replicate prior universal sex differences.

This item format differed slightly from that used by Buss (1989) because we wished to address several potential limitations of the original item format. First, in the prior measure, participants were asked to rate how "important or desirable" they found each characteristic on a scale from "irrelevant or unimportant" to "indispensable." However, because the original item format asked about only the positive pole of each dimension, it potentially confounded both the importance of a trait dimension and the preferred value of that trait dimension. Participants who provided a low-importance rating to the characteristic "good financial prospect" could mean to say either that (a) their partner's wealth is unimportant to them, regardless of whether it is high or low, or (b) their partner's wealth is very important to them, but they prefer a partner with more modest financial prospects. The original item format did not allow a researcher to unambiguously discriminate between these possibilities. The bipolar-adjective format asks about preferred trait value alone and therefore more clearly represents what participants prefer in a partner.

Second, the original Buss (1989) questionnaire asked participants to rank their preference for kindness compared with other preferences, but Buss did not collect rated preferences for kindness. Additionally, the rated item for intelligence was double-barreled ("education and intelligence"). We included rated items for "kindness" and "intelligence" to more precisely test the preferred value and sex difference in preference for these dimensions.

Finally, ratings were made on the original Buss (1989) questionnaire using a relatively restricted 4-point scale, which may not allow enough response variation to detect subtle sex differences. We opted for a 7-point scale to allow participants more response variation.

Age. Participants reported their own age in years as part of a demographic questionnaire. Participants in relationships also reported the age of their actual partner. Buss (1989) asked participants about their ideal age preferences, not about their actual age choices. We were unable to include items measuring age preferences because of participant time constraints; for this reason, we originally planned to analyze only the rated preferences. However, before preregistering our analysis plan, we decided to examine age as a variable as well in light of the importance of age and age choices in the prior literature (Eagly & Wood, 1999; Kenrick & Keefe, 1992).

Pathogen prevalence. The three pathogen measures were (a) the pathogen-prevalence index developed by Low (1990) and used by Gangestad and Buss (1993), (b) years of life lost to communicable diseases (World Health Organization, 2015; following DeBruine, Jones, Crawford, Welling, & Little, 2010), and (c) the average of years of life lost to infectious and parasitic diseases and estimated deaths resulting from infectious and parasitic diseases (World Health Organization, 2015). Because the data retrieved from the World Health Organization were gross values, we divided each country's score by its population size to produce comparable values across countries (United Nations Department of Economic and Social Affairs, 2015). To create the third index, we standardized the two variables (estimated deaths and years of life lost to infectious and parasitic diseases) and averaged them for each country. The new index was highly correlated with the other two indexes (r = .60 with the Low index; r = .97 with years of life lost to communicable diseases).

Gender equality. Gender-equality measures consisted of the Gender-Related Development Index (GDI) and Gender Empowerment Measure (GEM) used by Eagly and Wood (1999), the Global Gender Gap Index (GGGI;

World Economic Forum, 2016), the Gender Inequality Index (GII; United Nations Development Programme, 2015b), the updated version of the GDI (United Nations Development Programme, 2015a), and a composite variable created through principal component analysis using the updated GDI, GGGI, and GII. These three variables were entered into a principal component analysis to extract the first principal component. Scores on this principal component were used as each country's gender-equality composite score. This composite measure of gender equality explained 80.67% of the variance in the GDI, GGGI, and GII and accordingly was highly correlated with all included measures of gender equality (GEM 1995: $r = .87$; GDI 1995: $r = .81$; GII: $r = .90$; GDI 2015: $r = .89$; and GGGI 2016: $r = .90$).

Control variables. Control variables included gross domestic product (GDP) per capita (Central Intelligence Agency, 2016), latitude (Central Intelligence Agency, 2016), world region (from Gangestad et al., 2006), and most common religion (from Zentner & Mitura, 2012; Central Intelligence Agency, 2016). All controls were based on those used in previous studies of cross-cultural sex differences in preferences, and we used the most current information available at the time of analyses. Although Gangestad et al. (2006) used mean country income to control for affluence, we defined affluence as GDP per capita.

Analyses

All primary analyses were conducted using multilevel models. In these models, participants were nested within countries. The models included random effects for both slopes and intercepts. Multilevel models provide several advantages over traditional approaches, such as conducting multiple *t* tests or country-level correlations, for analyzing this kind of cross-cultural data. These models allow for an estimation of overall sex differences in mate preferences in the data and an estimate of the variability in these sex differences across cultures based on the random effects. The use of a single multilevel model to assess sex differences across cultures also minimizes both alpha inflation and the risk of Type II errors relative to the approach of conducting multiple *t* tests (e.g., Buss, 1989). For cross-cultural comparisons, these models take advantage of the nested nature of the data, yielding more statistical power relative to the approach of calculating correlations based on aggregated nation-level data (e.g., Eagly & Wood, 1999).

Additionally, because of the challenge of collecting cross-cultural data, sample sizes varied from country to country (ranging from 80 in El Salvador to 1,061 in Turkey). If effect sizes varied more widely in smaller samples, this would suggest that a substantial portion of the cross-cultural variation in sex differences is due to sampling error, adding considerable noise to cross-cultural comparisons. To assess the risk of this, we plotted country-level sex differences against sample size from each country to create funnel plots (see the Supplemental Material). The triangular shape of the graphs illustrates that larger samples have Cohen's *d* values closer to the average sex difference whereas smaller samples are more varied. This indicates that one source of cross-cultural variation is indeed sampling error. However, multilevel models account for this error introduced by variability in sample size by accounting for unequal sample sizes in estimating the random slopes. Finally, multilevel models allow for all analyses to be conducted within the same modeling framework, allowing for a clearer interpretation of the results.

Overall, analyses included multilevel models to examine sex differences in univariate mate preferences and partner age, multivariate analyses using Mahalanobis distance (*D*) and logistic regression to assess overall sex differences, and multilevel models with moderators (pathogen prevalence and gender equality) to examine cross-cultural variation in preferences and partner age.

Sex differences in mate preferences. Five multilevel models, one for each preference (kindness, intelligence, health, good financial prospects, physical attractiveness), assessed sex differences in mate preferences across cultures. In these models, the preference variable was the outcome variable, and participant sex (male or female) was the predictor. Mate-preference variables were standardized across countries prior to analysis to provide slope values comparable with Cohen's *d*.

Actual partner age. One multilevel model assessed sex differences in actual partner age across cultures. In this model, the difference between self and partner age was the outcome variable, and participant sex (male or female) was the predictor. This difference was standardized across countries prior to analysis to provide slope values comparable with Cohen's *d*.

Multivariate analyses. The five preference variables were used to calculate the *D* between males and females within each country. Additionally, *D* was calculated separately for putatively sex-differentiated preferences (good financial prospects and physical attractiveness) and those preferences not expected to be as strongly sex differentiated (intelligence, kindness, health). Bootstrapping was used to estimate 95% confidence intervals (CIs) around these *D* values for each country (for a full list, see Table S3 in the Supplemental Material).

A Monte Carlo cross-validated logistic regression was used to assess the ability of preferences to predict participant sex. Logistic regression models were trained in a random training set to predict participant sex using their ideal mate preferences; these models were then applied in a separate testing set to predict the sex of participants. Each fold of this cross-validation left out 10% of the data for testing. The relevant outcome variable was the percentage of participant sexes accurately predicted by the model in the testing set. This process was repeated for 10,000 iterations, providing an estimate of out-of-sample predictive accuracy of preferences and estimated CIs.

Pathogen prevalence. The effect of pathogen prevalence on ideal mate preferences was tested in a series of multilevel models predicting preferences from nation-level pathogen-prevalence indexes. Three multilevel models were fitted for each of the five mate-preference variables. Each model used the relevant ideal-mate preference as the outcome variable and predicted this variable using one of three pathogen-prevalence indexes.

Gender equality. The effect of nation-level gender equality on sex differences in mate preferences was examined by fitting a series of multilevel models predicting ideal-mate preferences from sex and nation-level gender equality. Each model had one of the five mate-preference variables as an outcome variable. These models used the interaction of participant sex and a gender-equality variable as the predictor, along with all relevant main effects.

Controls. For all cross-cultural comparisons, we ran both a base model with no controls and models that attempt to approximate relevant controls used in the original articles (Gangestad & Buss, 1993; Gangestad et al., 2006; Zentner & Mitura, 2012). Each of the control models included a standard set of control variables: latitude, GDP per capita, world region, and most common religion. These variables were selected because they were each used in the studies we replicated. Here, we report the results of models without the control variables. The results of models with the control variables are included in the Supplemental Material. Outcome variables were standardized in all analyses. Predictor variables, with the exception of sex, were also standardized.

The analysis plan for this project was preregistered prior to data analyses. The preregistration, data, and analysis scripts can be accessed at https://osf.io/gb5cn/. All data were analyzed in the R programming environment (R Core Team, 2017).

Results

Sex differences in mate preferences

Across cultures, women reported a higher preference for an ideal mate with good financial prospects than men, on average, $b = -0.30$, $SE = 0.03$, $p < .001$ (Fig. 1). Mate preferences were standardized across countries prior to analysis, so this and all b values can be interpreted as equivalent to Cohen's ds. The average for women was 5.48, 95% CI = [5.46, 5.51], and the average for men was 5.11, 95% CI = [5.08, 5.14]. The smallest sex difference was in Spain, $b = -0.12$, and the largest sex difference was in China, $b = -0.56$. Furthermore, men reported a higher preference for a physically attractive ideal mate than women, on average, $b = 0.27$, $SE = 0.03$, $p < .001$. The average for women was 5.56, 95% CI = [5.53, 5.58], and the average for men was 5.85, 95% CI = [5.83, 5.88]. The sex difference (b) ranged from −0.07 in China to 0.50 in Brazil.

Furthermore, we found small but still-significant sex differences in reported ideal preference for kindness, intelligence, and health. However, both men and women reported higher preferences for these traits in an ideal partner than for good financial prospects or for physical attractiveness. Women reported preferences for kinder ideal mates than men, on average, $b = -0.12$, $SE = 0.02$, $p < .001$. The average for women was 6.23, 95% CI = [6.21, 6.26], and the average for men was 6.12, 95% CI = [6.10, 6.15]. The sex difference (b) ranged from −0.23 in the United States to 0.06 in Uganda. Women also reported preferences for greater intelligence in ideal mates, on average, $b = -0.12$, $SE = 0.02$, $p < .001$. The average for women was 6.03, 95% CI = [6.01, 6.05], and the average for men was 5.92, 95% CI = [5.89, 5.94]. The sex difference (b) ranged from −0.35 in China to 0.04 in Algeria. Finally, women reported preferences for healthier ideal mates than men, on average, $b = -0.09$, $SE = 0.03$, $p = .001$. The average for women was 6.10, 95% CI = [6.08, 6.12], and the average for men was 6.00, 95% CI = [5.98, 6.03]. The sex difference (b) ranged from −0.29 in Belgium to 0.10 in Hungary.

Overall, we replicated the sex differences in preferences for resources and attractiveness found in Buss (1989). Buss computed country-level t tests and found that women rated "good financial prospects" as more important in a potential mate than men did, while men rated "good looks" as more important than women did across cultures. Here, using multilevel models, we found that these sex differences in mate preferences remain robust around the world. Furthermore, consistent with Buss (1989), our results showed that health, kindness, and intelligence were highly valued by both men and women; however, we found that women, on average, tend to prefer more of each of these characteristics than do men.

Actual partner age

In terms of sex differences in the age of mated partners men reported having partners younger than themselves, whereas women reported having partners older than

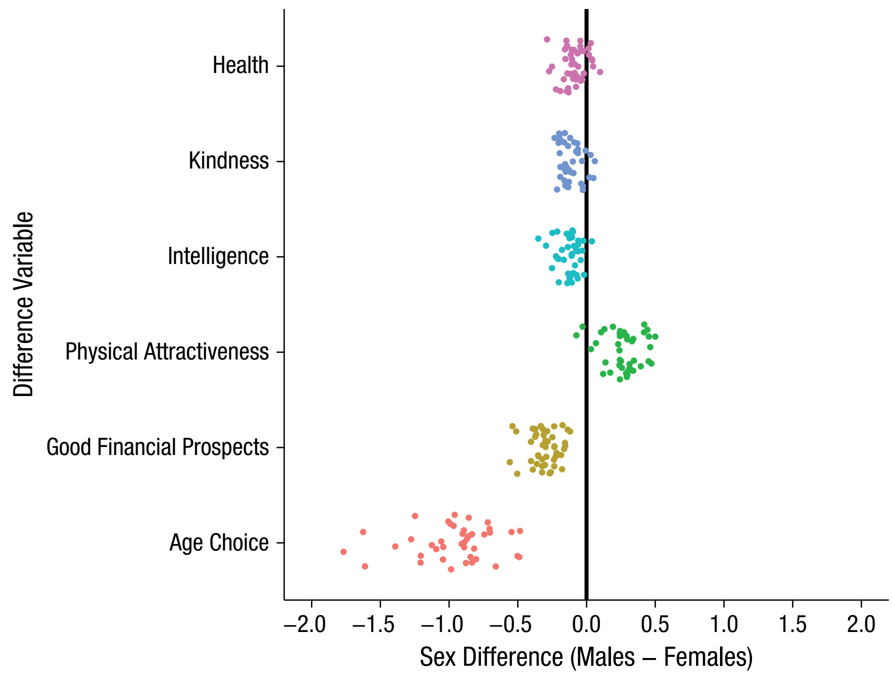

Fig. 1. Sex differences in each of five mate preferences and in age choice across countries. Dot position reflects the random slope value (*b*) for each country. The black line depicts where values would fall if there were no sex difference. For the five mate preferences, positive values indicate that men had a higher preference than women for a particular trait, and negative values indicate that women had a higher preference than men for a particular trait. For age choice, negative values indicate that men had younger partners and women had older partners. Data are jittered to reduce overplotting, and data for each variable are colored differently for easier readability.

themselves, on average, $b = -0.96$, $SE = 0.05$, $p < .001$. Women reported partners older than themselves, $M = 2.43$, 95% CI = [2.31, 2.55], and men reported partners younger than themselves, $M = -2.26$, 95% CI = [−2.39, −2.13]. The sex differences (*b*s) ranged from −1.77 in Algeria to −0.48 in the United States. Overall, we replicated the work of Buss (1989) and Kenrick and Keefe (1992). Using a combination of *t* tests and analyses of variance (ANOVAs), both Buss (1989) and Kenrick and Keefe (1992) found that women preferred a spouse older than themselves whereas men preferred a spouse younger than themselves, on average. Additionally, Kenrick and Keefe (1992) found that women tended to marry partners older than themselves, while men tended to marry partners younger than themselves. Using multilevel models, we replicated this pattern, finding that as men's age increased, they reported increasingly younger partners, on average, whereas as women's age increased, the reported age of their partners remained consistently a few years older than themselves, on average (Fig. 2).

Multivariate effect size

We found when calculating the Mahalanobis *D* between males and females that on the basis of all five preference variables within each country, the overall sex difference was relatively large, mean $D = 0.73$. These *D* values ranged from 1.42, 95% CI = [1.15, 1.86], in Georgia to 0.30, 95% CI = [0.19, 0.62], in Nigeria (Fig. 3). Our results were consistent overall with those of Conroy-Beam et al. (2015). Using the data from all 18 preferences (excluding age) from Buss (1989), Conroy-Beam et al. found that the mean Mahalanobis *D* between males and females was 1.46.

Additionally, *D* was calculated separately for putatively sex-differentiated preferences (good financial prospects and physical attractiveness), resulting in an average *D* of 0.62, ranging from 0.26, 95% CI = [0.08, 0.52], in Sweden to 1.08, 95% CI = [0.77, 1.48], in Georgia. For those preferences not expected to be as strongly sex differentiated (intelligence, kindness, health), the Mahalanobis *D* was comparatively small: 0.33, ranging

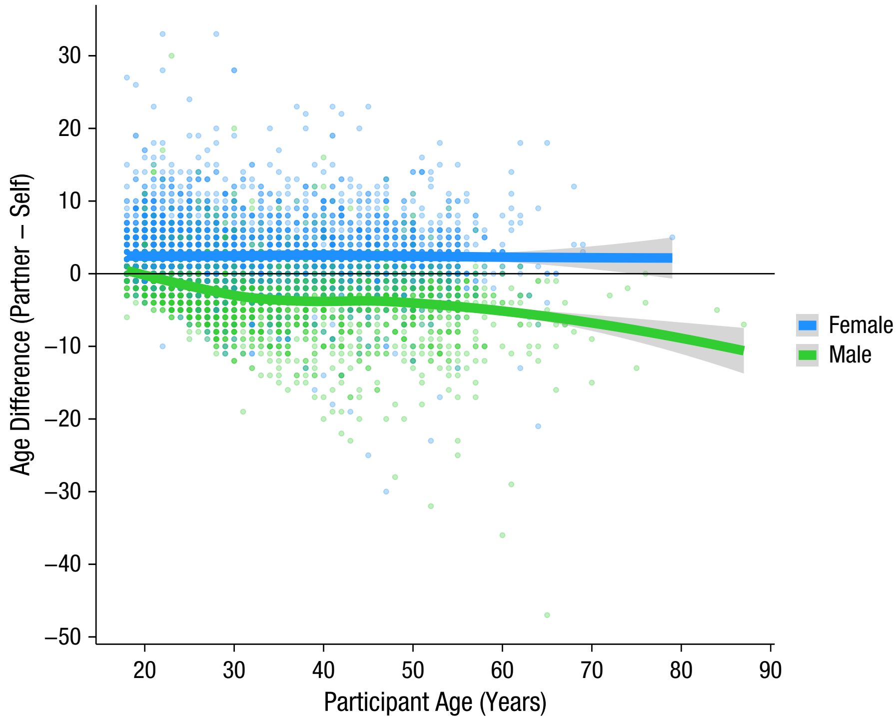

Fig. 2. Age difference between participants and their partners as a function of participants' ages, separately for female and male participants. Data are jittered to reduce overplotting. Trend lines were generated by locally estimated scatterplot smoothing to illustrate the pattern of the data. Shaded areas indicate 95% confidence intervals.

from 0.05, 95% CI = [0.05, 0.34], in Italy to 0.73, 95% CI = [0.36, 1.31], in Germany. (For a full list of country *D* values and CIs, see the Supplemental Material.)

A Monte Carlo cross-validated logistic regression was used to assess the ability of preferences to predict participant sex. The average predictive accuracy was significantly above chance, $M = 0.63$, 95% CI = [0.61, 0.65].

Pathogen prevalence

Table 3 shows the results of the multilevel models predicting preferences from nation-level pathogen-prevalence indexes without control variables. Pathogen prevalence predicted preference for an ideal mate with good financial prospects for all measures. Additionally, pathogen prevalence predicted preference for a healthy ideal mate for just one of the measures (the measure used by Gangestad & Buss, 1993), $\beta = 0.20$, $SE = 0.05$, $p = .002$. However, when the control variables, latitude, GDP, world region, and religion were included, pathogen prevalence did not significantly predict any outcome variables (see the Supplemental Material). Overall, our results did not replicate the findings of Gangestad and Buss (1993) or Gangestad et al. (2006). Although the authors of the original articles, using country-level correlations and regression and controlling for latitude, world region, and income, found that preferences for physical attractiveness, intelligence, and health were higher in countries with increased pathogen prevalence, our data (analyzed using multilevel models) did not show the same pattern with or without controls.

Gender equality

Table 4 shows the results of the multilevel models predicting ideal mate preferences from sex and nation-level gender equality without control variables. Gender equality predicted the sex difference in the actual age of long-term romantic partners for every measure of gender equality. Using the composite measure, we found that gender equality predicted the change in both men's age choices, $b = 0.09$, $SE = 0.03$, $p = .016$, and women's age choices, $b = -0.07$, $SE = 0.02$, $p = .007$ (Fig. 4). However, two countries (Nigeria and Malaysia) did not have composite gender-equality scores because of missing values (Nigeria does not have a GII value, and Malaysia does not have a 2015 GDI value). To take advantage of the age data from these two countries, we

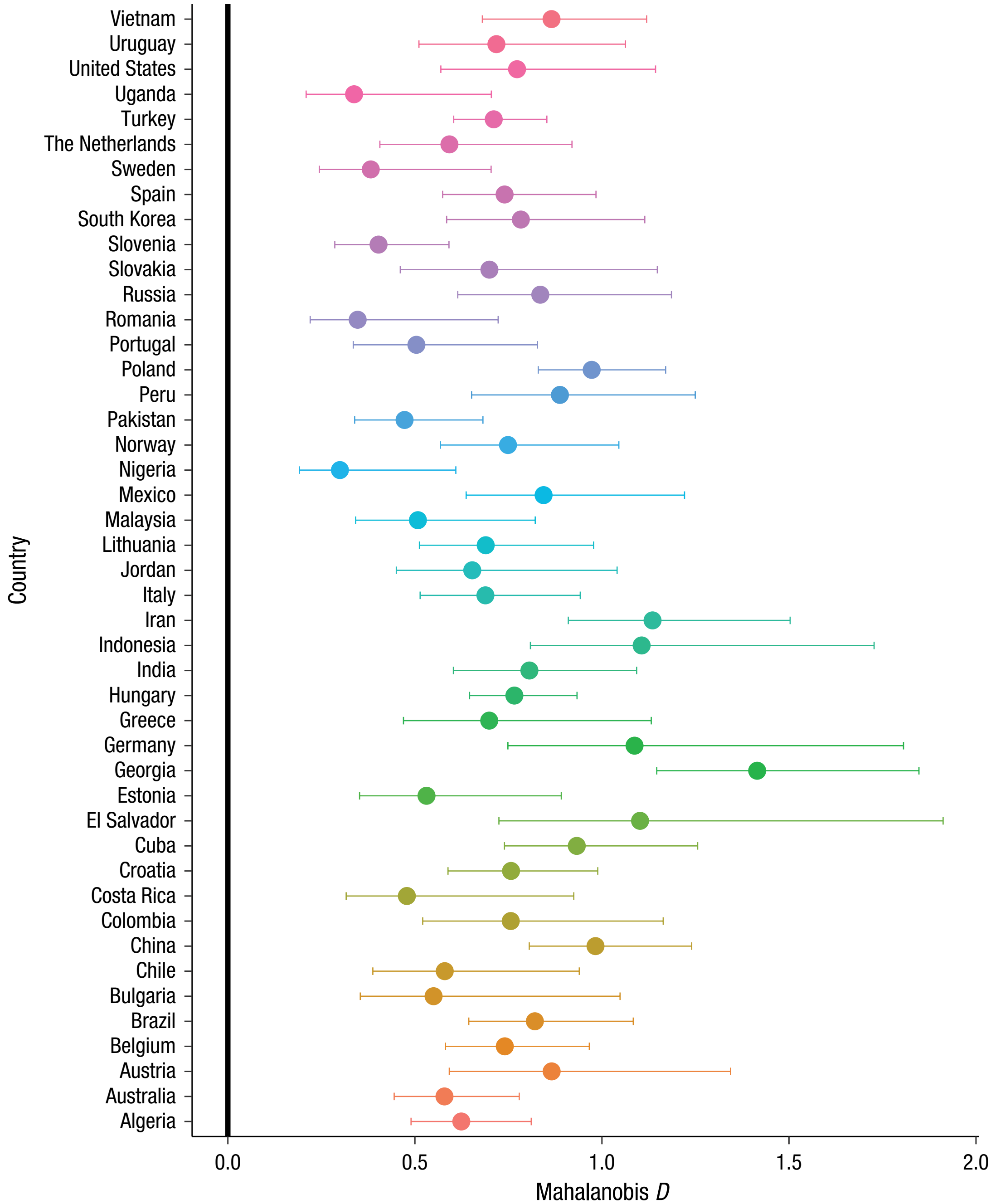

Fig. 3. Mahalanobis distance (*D*) for each country in the current data set. Larger *D* values indicate more sex differentiation in the overall pattern of mate preferences. Error bars represent bootstrapped 95% confidence intervals (CIs). *D*s and CIs for each country are color coded differently for easier readability.

ran an additional analysis looking at the change in both sexes' age choices predicted by the GGGI. Using the GGGI, we found that gender equality again predicted the change in women's age choices, $b = -0.07$, $SE = 0.03$, $p = .013$, and men's age choices were marginally significant in the predicted direction, $b = 0.06$, $SE = 0.03$, $p = .075$.

However, gender equality did not robustly predict sex differences in any of the mate-preference measures. The only exception to this was that one of the measures of gender equality, the GGGI, predicted the sex difference in preferences for an ideal mate with good financial prospects, $b = 0.06$, $SE = 0.03$, $p = .036$. This replicates the relationship between the GGGI and good

Table 3. Results of Multilevel Models Predicting Each of Five Mate Preferences and Age Difference From Pathogen-Prevalence Indexes

Predictor and outcome variable	β	*SE*	*p*
Gangestad & Buss (1993)			
Good financial prospects	0.13	0.05	.027*
Physical attractiveness	−0.01	0.04	.897
Kindness	−0.002	0.05	.963
Intelligence	0.03	0.04	.536
Health	0.20	0.05	.002**
Age difference	0.01	0.02	.608
Years of life lost to communicable diseases			
Good financial prospects	0.08	0.03	.014*
Physical attractiveness	0.04	0.03	.163
Kindness	−0.01	0.03	.693
Intelligence	−0.004	0.03	.908
Health	0.04	0.04	.321
Age difference	−0.01	0.02	.419
Composite			
Good financial prospects	0.08	0.03	.012*
Physical attractiveness	0.05	0.03	.120
Kindness	−0.01	0.03	.724
Intelligence	−0.0001	0.03	.997
Health	0.04	0.03	.290
Age difference	−0.06	0.07	.447

*$p < .05$. **$p < .01$.

Table 4. Results of Multilevel Models Predicting Each of Five Mate Preferences and Age Difference From Sex and Gender Equality

Predictor and outcome variable	*b*	*SE*	*p*
Gender-Related Development Index (1995)			
Good financial prospects	0.02	0.03	.414
Physical attractiveness	0.04	0.03	.208
Kindness	−0.02	0.02	.449
Intelligence	−0.01	0.03	.648
Health	0.02	0.03	.393
Age difference	0.19	0.06	.002**
Gender Empowerment Measure (1995)			
Good financial prospects	0.04	0.03	.214
Physical attractiveness	0.03	0.04	.366
Kindness	−0.03	0.02	.143
Intelligence	0.02	0.03	.556
Health	0.05	0.03	.139
Age difference	0.16	0.06	.007**
Gender Inequality Index (2015)			
Good financial prospects	−0.03	0.03	.277
Physical attractiveness	0.03	0.03	.250
Kindness	0.01	0.02	.734
Intelligence	0.004	0.02	.853
Health	0.02	0.03	.383
Age difference	−0.13	0.03	.008**
Global Gender Gap Index (2016)			
Good financial prospects	0.06	0.03	.036*
Physical attractiveness	0.03	0.03	.387
Kindness	−0.04	0.02	.139
Intelligence	0.03	0.02	.202
Health	0.02	0.03	.529
Age difference	0.13	0.06	.027*
Gender-Related Development Index (2015)			
Good financial prospects	0.02	0.03	.423
Physical attractiveness	0.05	0.03	.139
Kindness	−0.02	0.03	.397
Intelligence	−0.02	0.03	.489
Health	0.01	0.03	.828
Age difference	0.18	0.06	.003**
Composite			
Good financial prospects	0.05	0.03	.107
Physical attractiveness	0.002	0.03	.951
Kindness	−0.03	0.03	.305
Intelligence	0.005	0.03	.863
Health	−0.004	0.03	.873
Age difference	0.15	0.05	.007**

Note: The Gender Inequality Index (2015) was reverse scored.
*$p < .05$. **$p < .01$.

financial prospects that Zentner and Mitura (2012) found in their new 10-country sample. Including latitude, GDP, world region, and religion as controls—similar to the controls used by both Gangestad et al. (2006) and Zentner and Mitura (2012)— did not change the pattern of results (see the Supplemental Material). Overall, our results only partially corroborated the findings of Eagly and Wood (1999) and Zentner and Mitura (2012). These studies, using country-level correlations and ANOVAs, found that gender equality predicted sex differences in preferences; here, using multilevel models, we found evidence only that gender equality predicts sex differences in the actual age of partners but no evidence that gender equality predicts mate preferences.

Furthermore, here we examined the predictive power of pathogen prevalence and gender equality separately. However, Gangestad et al. (2006) used pathogen prevalence and gender equality as competing predictors of mate preferences. Although this was not a part of our preregistered analysis plan, we ran the pathogen-prevalence and gender-equality analyses again but included both variables as simultaneous predictors to more closely replicate the methodology of Gangestad et al. Including both variables as simultaneous predictors, along with control variables, did not systematically change the results (see the Supplemental Material). In line with Gangestad et al.'s findings, our results showed that gender equality demonstrated little power

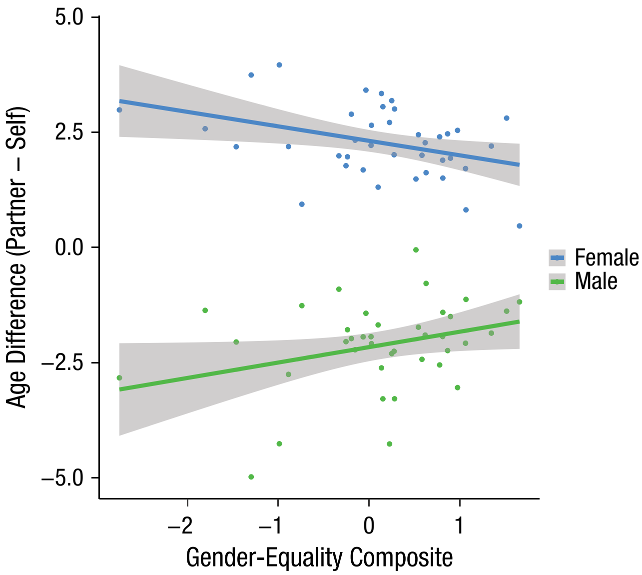

Fig. 4. Average age difference between participants and their partners for each country in the current data set as a function of each country's standardized gender-equality composite score. Results are given separately for females and males. Best fitting regression lines are shown for each sex; shaded areas indicate 95% confidence intervals.

to predict mate preferences. However, in contrast to Gangestad et al.'s findings, our results showed that pathogen prevalence demonstrates little power to predict mate preferences.

Discussion

The debate surrounding sex differences in mate preferences has remained unresolved for decades, partly because of an unstandardized supporting literature hampered by methodological and analytical limitations. We corrected for these issues by offering a unified, transparent, and principled framework to test key theoretical predictions from both an evolutionary and biosocial perspective. Overall, cross-culturally, universal sex differences in mate preferences remained empirically robust. Women around the world, on average, indicated preferences for an ideal long-term mate with greater financial prospects, whereas men on average indicated preferences for more physically attractive mates. Women had partners that were a few years older than themselves, on average, while men had partners increasingly younger than themselves as they aged. Additionally, women indicated slightly higher preferences for kindness, intelligence, and health in a long-term mate, replicating other mate-preference studies (e.g., Fletcher, Tither, O'Loughlin, Friesen, & Overall, 2004; Schwarz & Hassebrauck, 2012; Souza, Conroy-Beam, & Buss, 2016). Furthermore, the sex difference in the multivariate pattern of preferences was relatively large, affording above-chance (63%) classification of sex based on mate preferences alone.

Findings concerning cross-cultural variability were mixed. Consistent with biosocial role theory, our findings showed that the sex difference in age of partner decreased as gender equality increased. However, inconsistent with biosocial role theory, our results provided little support for a relationship between sex differences in mate preferences and gender equality. One exception was the relationship between the GGGI and good financial prospects, which was consistent with Zentner and Mitura's (2012) findings. However, gender-equality measures differ slightly in components, so this result may be due to a particular factor of the GGGI—a result that was not clear from Zentner and Mitura's work, but was revealed by our more thorough analysis and reporting. There was also no evidence of a relationship between pathogen prevalence and preferences for attractiveness, intelligence, and health. Therefore, our results failed to support the evolutionary prediction of Gangestad and Buss (1993). The only exception was preference for resources, but this relationship did not remain significant after adding control variables.

These failures to replicate could come from a variety of sources. The prior literature's mixed results could be due to idiosyncratic analysis choices in individual studies or because prior analysis techniques did not account for sampling error introduced by cross-country comparisons. It is also possible that the patterns of cross-cultural variability in the prior literature were particular to the time period of the original studies; most data in this research area are over 30 years old. Nonetheless, what is clear from our conceptual replication, is that, whereas sex differences in mate preferences and age choice persist, gender equality and pathogen prevalence do not hold up as robust predictors of variability in mate preferences across cultures or across time.

Although we corrected for shortcomings of the prior literature, this study also had limitations. First, although our preference measures were designed to improve on the potential limitations of the measures used by Buss (1989), it is possible that differences in item format accounted for the difference between our findings and prior results. However, we successfully replicated the sex differences found by Buss (1989), indicating that these measures are sufficient to detect true effects. Furthermore, preferred trait-value ratings and preference-importance ratings tended to be strongly correlated (see the Supplemental Material). Finally, another recent study used the exact measures used by Buss (1989) and still failed to replicate the relationship between sex differences in preferences and gender equality (Zhang, Lee, DeBruine, & Jones, 2019).

Second, although we found limited evidence supporting predictors of cross-cultural variability, it is unclear whether country-level variables such as pathogen prevalence and gender equality reflect the ecological surroundings or the experience of participants. The measurements that form the nation-level predictors may be temporally and spatially distal to the environmental cues available to participant psychologies. Measures that more directly tap the information available to mate-preference psychology might yield different results than relatively abstract nation-level predictors.

Sex differences in mate preferences have far-reaching implications in many domains of human life and many fields of scientific inquiry. The foundations of sex-differences research therefore demand careful consideration. Using a thorough and transparent approach, we found that the universal sex differences predicted by an evolutionary psychological perspective remained robust 30 years after their initial publication. However, previously reported sources of cross-cultural variation—pathogen prevalence and gender equality—were largely unable to explain the variations in our data. Even in this highly influential research area, characterized by large samples and intense scientific scrutiny, the lack of replication and the variability in design between prior studies resulted in ambiguous empirical support for competing theoretical perspectives. Here, we reground the evidence relating to long-standing hypotheses and debates in the field, and we invite human-mating researchers to embark on new research programs aimed at discovering more robust predictors of cross-cultural variability in mate preferences.

Transparency

Action Editor: James K. McNulty
Editor: D. Stephen Lindsay
Author Contributions
K. V. Walter and D. Conroy-Beam created the analysis plan, D. Conroy-Beam collected the data, and K. V. Walter and D. Conroy-Beam analyzed the data. K. V. Walter drafted the manuscript, and D. Conroy-Beam and D. M. Buss edited the manuscript. A. Sorokowska and P. Sorokowski organized the research group and managed project communication. All other authors collected data in their respective countries.
Declaration of Conflicting Interests
The author(s) declared that there were no conflicts of interest with respect to the authorship or the publication of this article.
Funding
This material is based on work supported by the National Science Foundation under Grant No. 1845586. T. T. K. Ha was supported by Grant No. 501.01-2016.02 from the Vietnam National Foundation for Science and Technology Development (NAFOSTED). A. Oleszkiewicz was supported by the Ministry of Science and Higher Education (Grant No. 626/STYP/12/2017). A. Sorokowska and P. Sorokowski were supported by National Science Center—Poland (Grant No. 2014/13/B/HS6/02644). M. Butovskaya and D. Dronova were supported by State Assignment Project No. 01201370995 of the Institute of Ethnology and Anthropology, Moscow, Russia. P. Gyuris, A. Láng, and N. Meskó were supported by the Hungarian Scientific Research Fund (OTKA; Grant No. K125437). F. Jiang was supported by the National Nature Science Foundation of China (Grant No. 71971225).
Open Practices
All data have been made publicly available via the Open Science Framework and can be accessed at https://osf.io/gb5cn/. The design and analysis plans for this study were preregistered at https://osf.io/726jc. One additional analysis not included in the analysis plan was run (see the Results section). The complete Open Practices Disclosure for this article can be found at http://journals.sagepub.com/doi/suppl/10.1177/0956797620904154. This article has received the badges for Open Data and Preregistration. More information about the Open Practices badges can be found at http://www.psychologicalscience.org/publications/badges.
TC

ORCID iDs

Kathryn V. Walter https://orcid.org/0000-0002-4574-2900
Carlota Batres https://orcid.org/0000-0002-3833-7667
Ignacio Estevan https://orcid.org/0000-0003-4743-1310

Supplemental Material

Additional supporting information can be found at http://journals.sagepub.com/doi/suppl/10.1177/0956797620904154

References

Batres, C., & Perrett, D. I. (2014). The influence of the digital divide on face preferences in El Salvador: People without Internet access prefer more feminine men, more masculine women, and women with higher adiposity. *PLOS ONE*, *9*(7), Article e100966. doi:10.1371/journal.pone.0100966

Buss, D. M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, *12*, 1–14. doi:10.1017/S0140525X00023992

Buss, D. M., & Barnes, M. (1986). Preferences in human mate selection. *Journal of Personality and Social Psychology*, *50*, 559–570. doi:10.1037/0022-3514.50.3.559

Cahill, L. (2006). Why sex matters for neuroscience. *Nature Reviews Neuroscience*, *7*, 477–484. doi:10.1038/nrn1909

Central Intelligence Agency. (2016). *The world factbook*. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/rankorder/2119rank.html

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

DeBruine, L. M., Jones, B. C., Crawford, J. R., Welling, L. L. M., & Little, A. C. (2010). The health of a nation predicts their mate preferences: Cross-cultural variation in women's preferences for masculinized male faces. *Proceedings of the Royal Society of London B: Biological Sciences*, *277*, 2405–2410. doi:10.1098/rspb.2009.2184

Eagly, A. H., & Wood, W. (1999). The origins of sex differences in human behavior: Evolved dispositions versus social roles. *American Psychologist*, *54*, 408–423. doi:10.1037/0003-066X.54.6.408

Fletcher, G., Tither, J., O'Loughlin, C., Friesen, M., & Overall, N. (2004). Warm and homely or cold and beautiful? Sex differences in trading off traits in mate selection. *Personality and Social Psychology Bulletin*, *30*, 659–672. doi:10.1177/0146167203262847

Gangestad, S. W., & Buss, D. M. (1993). Pathogen prevalence and human mate preferences. *Ethology and Sociobiology*, *14*, 89–96. doi:10.1016/0162-3095(93)90009-7

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.

Kenrick, D. C., & Keefe, R. (1992). Age preferences in mates reflect sex differences in mating strategies. *Behavioral and Brain Sciences*, *15*, 75–133. doi:10.1017/S0140525X00067595

Levine, S. C., Foley, A., Lourenco, S., Ehrlich, S., & Ratliff, K. (2016). Sex differences in spatial cognition: Advancing the conversation. *Wiley Interdisciplinary Reviews: Cognitive Science*, *7*, 127–155. doi:10.1002/wcs.1380

Low, B. S. (1990). Marriage systems and pathogen stress in human societies. *American Zoologist*, *30*, 325–340. doi:10.1093/icb/30.2.325

R Core Team. (2017). R: *A language and environment for statistical computing*. Retrieved from http://www.R-project.org

Schmitt, D. P. (2012). When the difference is in the details: A critique of "*Stepping out of the caveman's shadow: Nations' gender gap predicts degree of sex differentiation in mate preferences*." *Evolutionary Psychology*, *10*, 720–726.

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

Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011). False-positive psychology: Undisclosed flexibility in data collection and analysis allows presenting anything as significant. *Psychological Science*, *22*, 1359–1366. doi:10.1177/0956797611417632

Souza, A. L., Conroy-Beam, D., & Buss, D. M. (2016). Mate preferences in Brazil: Evolved desires and cultural evolution over three decades. *Personality and Individual Differences*, *95*, 45–49. doi:10.1016/j.paid.2016.01.053

Stoet, G., & Geary, D. C. (2018). The gender-equality paradox in science, technology, engineering, and mathematics education. *Psychological Science*, *29*, 581–593. doi:10.1177/0956797617741719

United Nations Department of Economic and Social Affairs. (2015). *The world population prospects: 2015 revision*. Retrieved from http://www.un.org/en/development/desa/publications/world-population-prospects-2015-revision.html

United Nations Development Programme. (2015a). *Gender Development Index (GDI)*. Retrieved from http://hdr.undp.org/en/indicators/137906#

United Nations Development Programme. (2015b). *Gender Inequality Index (GII)*. Retrieved from http://hdr.undp.org/en/indicators/68606#

Wood, W., & Eagly, A. H. (2012). Biosocial construction of sex differences and similarities in behavior. In J. M. Olson & M. P. Zanna (Eds.), *Advances in experimental social psychology* (Vol. 46, pp. 55–123). San Diego, CA: Academic Press. doi:10.1016/B978-0-12-394281-4.00002-7

World Economic Forum. (2016). *Global gender gap report 2016*. Retrieved from http://reports.weforum.org/global-gender-gap-report-2016/rankings/

World Health Organization. (2015). *Disease burden and mortality estimates: Cause-specific mortality, 2000–2016*. Retrieved from http://www.who.int/healthinfo/global_burden_disease/estimates/en/

Zentner, M., & Mitura, K. (2012). Stepping out of the caveman's shadow: Nations' gender gap predicts degree of sex differentiation in mate preferences. *Psychological Science*, *23*, 1176–1185. doi:10.1177/0956797612441004

Zhang, L., Lee, A. J., DeBruine, L. M., & Jones, B. C. (2019). Are sex differences in preferences for physical attractiveness and good earning capacity in potential mates smaller in countries with greater gender equality? *Evolutionary Psychology*, *17*(2). doi:10.1177/1474704919852921