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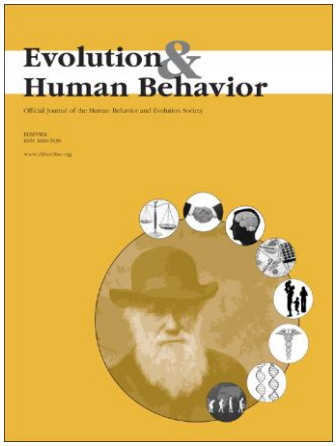

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PII: S1090-5138(17)30315-X
DOI: https://doi.org/10.1016/j.evolhumbehav.2017.12.008
Reference: ENS 6173
To appear in:
Received date: 11 October 2017
Revised date: 21 December 2017
Accepted date: 22 December 2017

Please cite this article as: Guanlin Wang, Minxuan Cao, Justina Sauciuvenaite, Ruth Bissland, Megan Hacker, Catherine Hambly, Lobke M. Vaanholt, Chaoqun Niu, Mark D. Faries, John R. Speakman , Different impacts of resources on opposite sex ratings of physical attractiveness by males and females. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Ens(2017), https://doi.org/10.1016/j.evolhumbehav.2017.12.008

Different impacts of resources on opposite sex ratings of physical attractiveness by males and females.

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Acknowledgements

We are grateful to the support of all the volunteers who participated in our study. We also thank Phil Stanforth and Julie Drake at the Fitness Institute of Texas at the University of

Texas at Austin for their assistance in providing the DEXA images and relevant data. We are grateful to all the members of the Molecular Energetics Group in IGDB and Energetics Group in UoA for their discussion and constructive comments on this project.

Competing interests

All authors declare no competing financial interests.

Data availability

The data and relevant protocols associated with this research are available at OSF http:// (shown after acceptance)

Authors' contributions

J.R.S. and G.L.W. conceived and designed the project. G.L.W., M.X.C., C.Q.N., J.S., R.B., C.H., L.M.V., and M.H. recruited volunteers from each local site. M.D.F provided the female and male images. G.L.W. and J.R.S. wrote the manuscript. All authors reviewed the manuscript.

Funding

This work was supported by National Natural Science Foundation of China (NSFC grant 91431102) and International Cooperation Program of Chinese Academy of Sciences (GJHZ1660). John R. Speakman was supported by the 1000 talents program of the Chinese government and a Wolfson merit award from the Royal Society. Guanlin Wang was awarded by the UCAS-UoA dual degree PhD training Program.

Abstract

Parental investment hypotheses regarding mate selection suggest that human males should seek partners featured by youth and high fertility. However, females should be more sensitive to resources that can be invested on themselves and their offspring. Previous studies indicate that economic status is indeed important in male attractiveness. However, no previous study has quantified and compared the impact of equivalent resources on male and female attractiveness. Annual salary is a direct way to evaluate economic status. Here, we combined images of male and female body shape with information on annual salary to elucidate the influence of economic status on the attractiveness ratings by opposite sex raters in American, Chinese and European populations. We found that ratings of attractiveness were around 1000 times more sensitive to salary for females rating males, compared to males rating females. These results indicate that higher economic status can offset lower physical attractiveness in men much more easily than in women. Neither raters' BMI nor age influenced this effect for females rating male attractiveness. This difference explains many features of human mating behavior and may pose a barrier for male engagement in low-consumption lifestyles.

Key words: physical attractiveness, economic status, parental investment theory

Word count: 5650

1. Introduction

Evolution has played a large role in mating behavior and how we view members of the opposite sex, in terms of their potential as reproductive partners (Buss & Schmitt, 1993; Trivers, 1972). Previous studies (Fan, Liu, Wu, & Dai, 2004; Faries & Bartholomew, 2012; Lassek & Gaulin, 2016; Singh, 1995; Stephen & Perera, 2014; Tovee & Cornelissen, 1999; Tovée & Cornelissen, 2001; Wang et al., 2015) across multiple cultures have shown that males consistently rate as more physically attractive females that display several physical features including lower levels of body adiposity (body fat percentage (BF %), lower body mass index (BMI)) and lower waist-to-hip ratio (WHR). An evolutionary model (Wang et al., 2015) suggested that these trait preferences are likely related to both female age and reproductive potential (fertility and fecundity). Female' body adiposity is a genuine signal of reproductive fitness that males use to evaluate potential partners (Buss, 2015; Buss, 1989; Schmitt, 2005). Although in males fertility and fecundity are less clearly linked to traits such as body adiposity and age, females are also strongly sensitive to male physical attributes (Mautz, Wong, Peters, & Jennions, 2013; Souza, Conroy-Beam, & Buss, 2016; Swami et al., 2007; Swami & Tovée, 2005). Greater height, lower body adiposity and greater shoulder-to-waist ratio (SWR) or chest-to-waist ratio (CWR), indicating optimal levels of upper body muscularity are consistently rated by females as more physically attractive (Mautz et al., 2013; Souza et al., 2016; Swami et al., 2007; Swami & Tovée, 2005) .

Mate choice theory suggests that because females invest more energy directly into reproduction than males, they should be more sensitive than males to cues indicating the

resources possessed by a putative mate (Buss, 2015; Buss, 1989; Eibl-Eibesfeldt, 1989; Hewlett, 1992; Trivers, 1972). Previous studies (Souza et al., 2016; Swami et al., 2007; Swami & Tovée, 2005) have suggested physical attributes of males rated as more attractive by females are not strongly linked to fertility, but may rather indicate the ability to acquire and retain resources in intra-sexual competition. This model predicts that females should also be more sensitive to direct indicators of resources (wealth). Several previous studies (Buss, 2015; Dunn & Hill, 2014; Dunn & Searle, 2010; Shuler & McCord, 2010; Souza et al., 2016) have indicated that females are sensitive to such cues. For example, in Brazil, a stronger preference by females for mates who had good financial prospects was found (Souza et al., 2016). Other studies also demonstrated that social context alters male attractiveness, such as ownership of luxury possessions like expensive cars or apartments (Dunn & Hill, 2014; Dunn & Searle, 2010; Shuler & McCord, 2010). Based on these previous studies, as predicted, male economic status seems likely to play an important role in mate selection. However, no previous study has quantified and compared the magnitude of this economic status effect in both males and females.

Annual income is an effective way to assess economic status, although the resource capacity is a consequence of several contributory factors like good education, ambition or luck (Von Rueden, Gurven, & Kaplan, 2008). Here we used sets of male and female DEXA images that varied in their body adiposity and body shape (waist-to-hip and waist-to-shoulder ratios in females and males respectively) to raters of the opposite sex who had to ~~rate~~ rank the physical attractiveness of the person in the image either excluding or including the annual

income of the person in the image. By comparing the ~~ratings~~ rankings we assessed the sensitivity of male and female attractiveness ratings of the opposite sex to resource cues. Differences in the sensitivity to salary cues may have profound effects on human behaviours that are designed to promote attractiveness to the opposite sex. In the discussion, we explore some of these consequences, for example, in the participation rates in cosmetic surgery procedures, the display of conspicuous consumption behaviour and the uptake of low consumption lifestyles.

2. Methods

2.1 Images excluding annual income

Both female and male DXA image were provided by University of Texas at Austin. We used a set of 21 female DXA images (Faries & Bartholomew, 2012; Wang et al., 2015) (Figure S1) that varied in body adiposity and waist-to-hip ratio (WHR) (7 levels of adiposity x 3 levels of WHR) and 15 male images that also varied in body adiposity and shoulder-to-waist ratio (SWR) (5 levels of adiposity x 3 levels of SWR). Both sets of images are in Figure S1 and exact details of each image can be found in Table S1. The number of images differed because we could not source images at higher adiposity in males that had the appropriate 3 levels of SWR. Raw data and materials are available at the open science framework (https://osf.io/yjp2v/). Further information and requests for resources and reagents should be directed to and will be fulfilled by Professor John Speakman j.speakman@abdn.ac.uk. Any

information related to participant subjects' personal information will not be shared owing to the confidential criterion of ethical review.

2.2 Images including annual income

The same sets of images were used including annual income as stimuli. Annual income (2013) in Beijing, Aberdeen, Panevezys, and Austin were used as 1x (x : fold of average annual income). Then we assigned 0.1x to 10x of average annual income for the 21 female images and 0.33x to 7.5x for 15 male images (Table S1). Annual income information was randomly assigned to each image breaking any correlation with the body adiposity. Average annual income by sex was used in Austin, USA as the local team found average annual income data for both female and male. In China, when we began this project, there was no publicly available data for female and male average annual income separately. The local teams in UK and Lithuania team followed the same protocol used in China.

2.3 Human Subjects

Participants from four cities including Beijing in China, Panevezys in Lithuania, Aberdeen in United Kingdom and Austin in United States were recruited through local universities in the surrounding urban area. 177 male subjects took part in female attractiveness ranking without salary information (Chinese: 111; European: 56, American 10), and 111 males were involved in ranking female attractiveness with salary information (Chinese: 47; European: 62, American 10). 196 female subjects (Chinese: 76; European: 92, American 28) ranked the male images without salary information and 160 female subjects(Chinese: 43; European: 89,

American 28) did this task with salary information included (More details: Table S2). Some of the subjects only took part in one task. Subjects from Aberdeen (UK) and Panevezys (Lithuania) were grouped together as representative of the European population in further analysis. Subjects in Beijing were classified as a Chinese population and in Austin as an American population. The overall study was approved by Institutional Review Board (IRB), Institute of Genetics and Developmental Biology, Chinese Academy of Sciences (IGDB-2013-IRB-005). In addition, local ethical approval was also obtained at UK site from the University of Aberdeen College of Life Science and Medicine Ethical Review Board (CERB/2014/12/1123). All the participants gave oral informed consent before taking part in the study. This work was registered at the open science framework (OSF: DOI 10.17605/OSF.IO/YJP2V)

2.4 Procedure

All tests were administered through individual face-to-face interview, with the only difference in procedure between different locations being the language used. Participants (raters) were asked for some basic demographic details (age, sex, ethnicity, height, weight) before the task started. Tasks on female and male attractiveness were performed separately. In the first visit, participants were given 21 female images/15 male images cards which were shuffled and in a random order, excluding income information. They were asked to ~~rate~~ rank the images from the most attractive to the least attractive. In the second visit, they were given the same set of images with annual income at the bottom of each image. The interval of these two visits was at least one week (in the Chinese and European populations, the interval for

female attractiveness including and excluding salary was over one year). For male attractiveness including and excluding salary, the interval was at least one week. It is therefore unlikely that subjects remembered their previous choices. They were also asked to ~~rate~~ rank the images from the most attractive to the least attractive taking the annual income information into account.

2.5 Standard score

To be consistent with previous papers on female physical attractiveness, and to use to same scale to facilitate comparison of the results which involved different numbers of female and male images, the rank position in the images were converted to attractiveness score in the range 1 to 9 for both female and male images following arithmetic progression (for female images: the score followed the formula $a_n = 1+ (n-1) * 0.4$ (where n was the rank order of the image from the least attractive to the most attractive i.e., n of the least attractive image was 1 so the score was $a_1 = 1+(1–1) * 0.4 = 1$, and n for the most attractive image was 21 so the score was $a_{21}=1+(21-1)*0.4=9$; for male images: the score followed the formula $a_n = 1 + (n-1)* 4/7$ (where n was the rank order of the image from the least attractive to the most attractive).Then we calculated the deviation by using the average score including income information minus the score excluding such information for each image to find out the income effect on attractiveness (Deviation = Average Ranking Score$_{[\text{with income}]}$ − Average Ranking Score $_{[\text{without income}]}$).

2.6 Statistical Analysis

R and R Studio were used to make plots and perform the regression analysis (R Team, 2015; R Core Team, 2000; Wickham, 2016). Annual income was transformed to log 10 (annual income) when making plots to normalize the distributions. Regression between salary sensitivity and raters BMI and age were used to analyze the effects of these variables on the rankings of opposite sex attractiveness.

3. Results

3.1 Economic status has a greater impact on ratings of male attractiveness

We used sets of male and female DEXA images that varied in their body adiposity and body shape (waist-to-hip and shoulder-to-waist ratios in females and males respectively) (Figure S1). These images were presented to raters of the opposite sex who had to ~~rate~~ rank the physical attractiveness of the person in the image. The images were presented either excluding or including the annual income of the person in the image. The assigned salaries were orthogonal to the body adiposity. By comparing the ratings when salary information was, or was not available we assessed the sensitivity of male and female attractiveness ratings of the opposite sex to resource cues. The sensitivity to resources was calculated from the differences in the ~~rated~~ ranked attractiveness of the images with and without the salary information(Deviation was equal to the average score of the images including the annual income minus the score without the salary information) . We then plotted the difference in rating as a function of annual income ($\log_{10}$). In all three populations, and for both sexes, there were positive relationships between the level of income and the difference in the ratings

(Figure 1). In male images, the relationships were as follows: American population ($y = 1.4578x – 6.9904$, $R^2 = 0.4575$, $F = 10.9$, $P < 0.01$), Chinese population ($y = 2.5982x – 13.085$, $R^2 = 0.7693$, $F = 43.4$, $P < 0.01$) and European population ($y = 1.778x – 8.2328$, $R^2 = 0.7111$, $F = 32.0$, $P < 0.01$). These regression fits implied that for each tenfold increase in salary, the attractiveness of men increased by 1.5 units in Americans (on a 9-point scale), 2.6 units in the Chinese and 1.8 units in Europeans. For female images, there was still a positive relationship, but it was not as strong or as steep as in the male images, ~~especially in the American population~~ (Figure 1). The fitted regressions between change in score and income were: for American ($y = 0.2322x – 1.0404$, $R^2 = 0.0349$, $F = 0.7$, $P = 0.4$), for the Chinese ($y = 0.6063x – 2.9355$, $R^2 = 0.1976$, $F = 4.7$, $P<0.05$) and for the European ($y = 0.4319x – 1.9163$, $R^2 = 0.3586$, $F = 10.6$, $P<0.01$) (Figure 1). This suggested that the impact of resources for females rating males was 7.5 (1.5/0.2) times greater Americans, 4.3 times (2.6 /0.6) greater in Chinese and 4.5 (1.8 /0.4) times greater in Europeans, compared with the salary impact on males rating females. When we pooled the sample together across populations, for male images we found that a ten-fold increase in salary would lead to a 1.92 point increase in the attractiveness score ($y = 1.9225x – 9.2675$, $R^2 = 0.7382$, $F = 36.7$, $P < 0.01$)(Figure 2). For female images, the same 10-fold salary increase would improve attractiveness by a score of 0.47 points ($y = 0.4692x – 2.1515$, $R^2 = 0.281$, $F = 7.4$, $P < 0.05$). Consequently, on average females were 4x (1.92/0.47) more sensitive to salary cues than were males (Figure 2). Because the salary is on a log scale this means that for a female to achieve the same 1.92 point increase in attractiveness that a male achieves by increasing his

salary 10 fold, a female would need to increase her salary 10,000 fold (4 log units). The effect of salary in females rating males is therefore about 1000x greater than the effect in males rating females.

3.2 Raters' BMI did not modulate the salary effect on males' attractiveness

As there was a salary effect of male attractiveness, we also explored whether the female raters' BMI or age affected their sensitivity to resource cues, since previous work has suggested sensitivity to salary cues may depend on female BMI (Pawlowski & Jasienska, 2008). We calculated the deviations for the male attractiveness using the difference between the scores with and without the salary information for the paired samples. We plotted these deviations as function of the annual income (log10) and calculated slopes for each individual in each population. In all three populations, we did not find any significant relationship between raters' BMI (American: $F = 0.493$, $P = 0.489$; Chinese: $F = 3.748$, $P = 0.060$; European: $F = 2.929$, $P = 0.091$) or age (American: $F = 0.267$, $P = 0.610$; Chinese: $F = 1.150$, $P = 0.290$; European: $F = 0.473$, $P = 0.494$) and their sensitivity to resources.

4. Discussion

Our study aimed to evaluate whether females are more sensitive to resources when rating male attractiveness than males are when rating females. Using images that were ranked with and without salary information we found females are roughly a thousand times more sensitive

to salary when rating males than are males rating females. Our study confirms the evolutionary expectation that females should be more sensitive to resources than males. This difference between the sexes has major impacts on human male and female mating strategies and can explain many disparities in male and female mating behavior. Given that males are largely insensitive to cues indicating resources, females can most effectively enhance their mating prospects by making themselves physically more attractive. Numerous studies have shown that physical attractiveness in females is strongly negatively related to adiposity (Fan et al., 2004; Faries & Bartholomew, 2012; Lassek & Gaulin, 2016; Singh, 1995; Stephen & Perera, 2014; Tovee & Cornelissen, 1999; Tovée & Cornelissen, 2001; Wang et al., 2015). This predicts females with obesity should show more body dissatisfaction than males with obesity, and greater enrollment in and expenditure on activities geared towards weight loss. These predictions are both supported. Females show much greater enrollment in weight loss classes (del Mar Bibiloni, Coll, Pich, Pons, & Tur, 2017; Millstein et al., 2008; Tsai, Lv, Xiao, & Ma, 2016). Moreover, body dissatisfaction of females increases after being exposed to images of thin models, when compared to images of larger individuals or inanimate objects, but effects in males are inconsistent (Agliata & Tantleff-Dunn, 2004; Grabe, Ward, & Hyde, 2008; Groesz, Levine, & Murnen, 2002; Ogden & Mundray, 1996; van den Berg et al., 2007).

The cosmetics market is heavily dominated by products for women (Souiden & Diagne, 2009). Make-up significantly enhances female facial attractiveness compared with the same face with no make-up(Mulhern, Fieldman, Hussey, Lévêque, & Pineau, 2003; Ueno et al., 2014). Make-up may cover wrinkles and improve skin texture which makes females look

younger, which is a marker for reproductive potential. Females were also regarded as healthier and more confident when wearing make-up (Nash, Fieldman, Hussey, Lévêque, & Pineau, 2006). Although there is an increasing market for male cosmetics, testimonials by men on such goods clearly indicate the difficulties men find using such typically feminine products, and that they do not regard their function as enhancement of beauty, but rather as 'corrective repair' (Hall, Gough, & Seymour‐Smith, 2013). Another method that may be used to improve physical attractiveness is plastic surgery. Published statistics by the American Society of Plastic Surgeons show a strong female bias for most procedures. Of 1,651,910 cosmetic surgery procedures (such as breast augmentation, liposuction and rhinoplasty) conducted in the USA in 2016, 1,437,139 of these (87%) were conducted on females. Also of 13,932,962 'minimally invasive' cosmetic procedures (such as Botox injections, chemical skin peels, laser hair removal etc). 12,832,141 of these (92%) were performed on females. The only procedures where more males were treated than females are hair transplantation (28% female), calf augmentation (43% female) and chin augmentation (45% female).

On the other hand, males can offset poor physical attractiveness, or further enhance existing good looks, by demonstrating their large levels of resources. In a similar vein recent work has indicated that proxies for intelligence may also offset low facial attractiveness in males but not females, although there was no evidence of an effect in those who were already good looking, (Watkins, 2017). This could be because intelligence may be a marker for potential income (Ceci & Williams, 1997) . Over the range of salaries we used the relationship between salary and improvement in attractiveness was linear on a log scale of

salary, and hence this suggests that progressively larger salaries were necessary to achieve the same impact on attractiveness. The importance of demonstrating resources in males may explain demonstrations of generosity by males in the form of gift giving during courtship, which are rarely reciprocated by females (Buss, 1989). Males contribute more money to charity when observed by females, than when observed by individuals of the same sex, but in contrast there was no difference in female charity donations under different observer conditions (Iredale, Van Vugt, & Dunbar, 2008). Similarly, variation in sex composition of a group affected how much money single males donated to 'public good', which was higher when females were present (Tognetti, Dubois, Faurie, & Willinger, 2016). Finally, males were prepared to compete for a trophy that demonstrated their generosity, but females would not (Pan & Houser, 2011).

Males show strong affinities to luxury brands which act as signals of wealth and status (Berger, 2017; Lee, Ko, & Megehee, 2015; Nelissen & Meijers, 2011) and serve as 'costly signals' of mate value (Bird, Smith, & Bird, 2001). This is exemplified by male interest in and spending on luxury cars (Hennighausen, Hudders, Lange, & Fink, 2016; Sundie et al., 2011) which seem to serve a function in both inter-sexual attraction and intra-sexual competition. Luxury car brands have exclusively masculine 'brand genders'(Grohmann, 2009; Lieven, Grohmann, Herrmann, Landwehr, & Tilburg, 2014) and males were highly resistive to gender contamination of the masculine Porsche brand when it launched the Cayenne SUV (Avery, 2012). Brand gender is a marketing concept where a brand is identified as being purchased predominantly by one sex or the other and marketing and

promotional activity is therefore predominantly directed at that sex. Purchasing a conspicuous luxury car gave males increased feelings of social status (Hennighausen et al., 2016), while other males regarded the owners of luxury cars as more likely to be a rival and 'mate poacher'. Living in an area where there are lots of owners of high prestige cars (specifically Porsche and Ferrari) reduces income satisfaction of males not owning such cars (Winkelmann, 2012).

Conspicuous consumption is largely a male phenomenon (Griskevicius et al., 2007; Sundie et al., 2011) predominantly triggered by short-term mating motives. Females respond to these signals by enhancing their evaluation of conspicuously spending males as potential short-term mates (Sundie et al., 2011). Early studies suggested that males who are exposed to pictures of attractive females had increased stated willingness to purchase conspicuous consumption items, however, a recent meta-analysis of eight studies attempting to replicate these effects indicated no successful replication – suggesting exposure to such primes does not change behavior (Shanks et al., 2015). Nevertheless, simply handling a large amount of cash increased male ambitions in terms of mate attractiveness on a date, but had no impact on females (Yong & Li, 2012). Although consumption of luxury items by males appears to act as a costly signal of resources and hence mate value (Griskevicius et al., 2007; Sundie et al., 2011) it is not an exclusively male activity. Some females also spend copious amounts of money on luxury goods (Hudders, De Backer, Fisher, & Vyncke, 2014). Consistent with our findings that such spending will only slightly improve attractiveness to males, this consumption seems to be driven more by an intra-sexual competition motive than for inter-

sexual attraction (Hudders et al., 2014). Females who purchase such luxury goods are perceived by other women who do not consume luxuries as less loyal, less mature and less smart, but more flirtatious, ambitious and sexy(Hudders et al., 2014).

The focus by males on high consumption as a costly signal of resource availability may have some important consequences beyond the world of sales and marketing. In particular it may provide a barrier to reducing consumption as part of a low-consumption lifestyle (Brooks & Wilson, 2015) and stigmatization of low cost environmentally friendly behaviors. Men are currently less likely to embrace low-consumption sustainable products (Brough, Wilkie, Ma, Isaac, & Gal, 2016) and this is seen as a predominantly 'feminine' activity. This might be understood because demonstrations of low consumption may evoke low status which would be more important for male attractiveness than for females. On the other hand at some point the high cost of 'green' products may make them attractive to males as a mechanism to demonstrate wealth status (Griskevicius, Tybur, & Van den Bergh, 2010). This suggests encouraging males into low consumption lifestyles may require gender targeted marketing strategies that do not conflict with their desire to demonstrate mate value.

Our study has several limitations. The ratings of attractiveness were made of two-dimensional soft tissue DEXA images which is clearly not a real world scenario. The raters were all relatively young and hence the focus on resources may not generalize to other ages. Subjects had to rank the images, which precluded them rating individuals as equally attractive. However, in a previous study we compared rankings with ratings and these were not significantly different (Wang et al., 2015). Another limitation was that we did not exclude

anyone according to their sexual orientation that may influence the analysis. Moreover, subjects were told directly what the salaries of the people in the images were and such information is likely to also not be directly available in most real world situations. The range of salaries we used and the range of levels of attractiveness were bounded and hence we cannot rule out the possibility that outside these limits the effect of salary on attractiveness wanes. That is it may be possible to be so unattractive that no level of salary can compensate, or so beautiful that salary also cannot improve on perfection. Already the effect is non-linear (linear against logged salary) and hence progressively greater and greater sums are necessary to achieve the same marginal improvement in attractiveness. The sample of subjects from the USA was also relatively small when compared with the other countries. Any differences between the US and the other countries may then be an artefact of the low sample size.

In conclusion, we found that females were a thousand times more sensitive than males to economic status cues when rating opposite sex attractiveness. This effect was not modulated by the raters' BMI or age. The disparity underpins large sex differences in human mating behavior, with implications for marketing and sales strategies, and has wider consequences for example in adoption of sustainable lifestyles.

Ethical statement

The overall study was approved by Institutional Review Board (IRB), Institute of Genetics and Developmental Biology, Chinese Academy of Sciences (IGDB-2013-IRB-005). In

addition, local ethical approval was also obtained at UK site from the University of Aberdeen College of Life Science and Medicine Ethical Review Board (CERB/2014/12/1123). All the participants gave oral informed consent before taking part in the study. This work was registered at the open science framework (OSF: DOI 10.17605/OSF.IO/YJP2V)

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Figure legend

Figure 1. Relationship between annual income (log 10) and deviation of attractiveness score between images including and excluding annual income information in each population. The x-axis is the log10 annual income of Texas (Where we recruited the American population), Beijing (where we recruited the Chinese population), mean (log10 annual income) of log 10 annual income in Aberdeen and Lithuania (where we recruited the European populations)

and). The y-axis refers to deviation that using attractiveness score including annual income information minus attractiveness score excluding income. For male images, when the x changed by 1 (10 times change in annual income), the deviation will be changed by 1.5 in American , 2.6 in Chinese and 1.8 in European population respectively. For female image, the deviation will be changed by 0.2, 0.6 and 0.5 in American, Chinese and European population separately.

Figure 2. Relationship between annual income (log 10) and deviation of attractiveness score between images including and excluding annual income information in all the populations (pooled sample). In pooled sample, for male images, when the x changed by 1 (10 times change in annual income), the attractiveness score will be changed by 1.92. For female image, it will be changed by 0.47. The salary effect is around 4 times (1.92/0.47) in male attractiveness than female.

Figures

Figure 1.

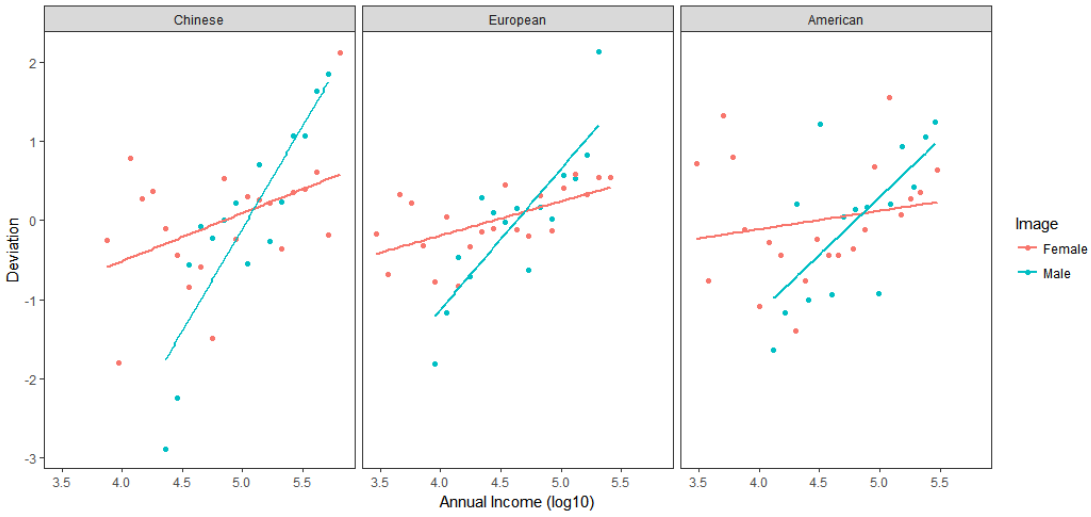
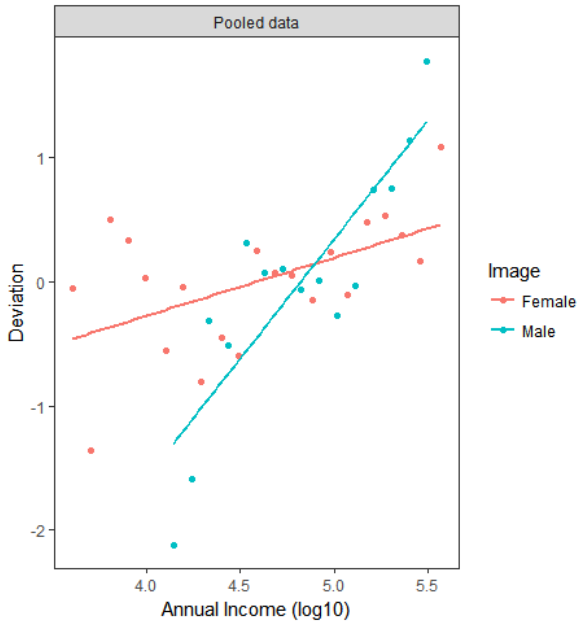


Figure 2.

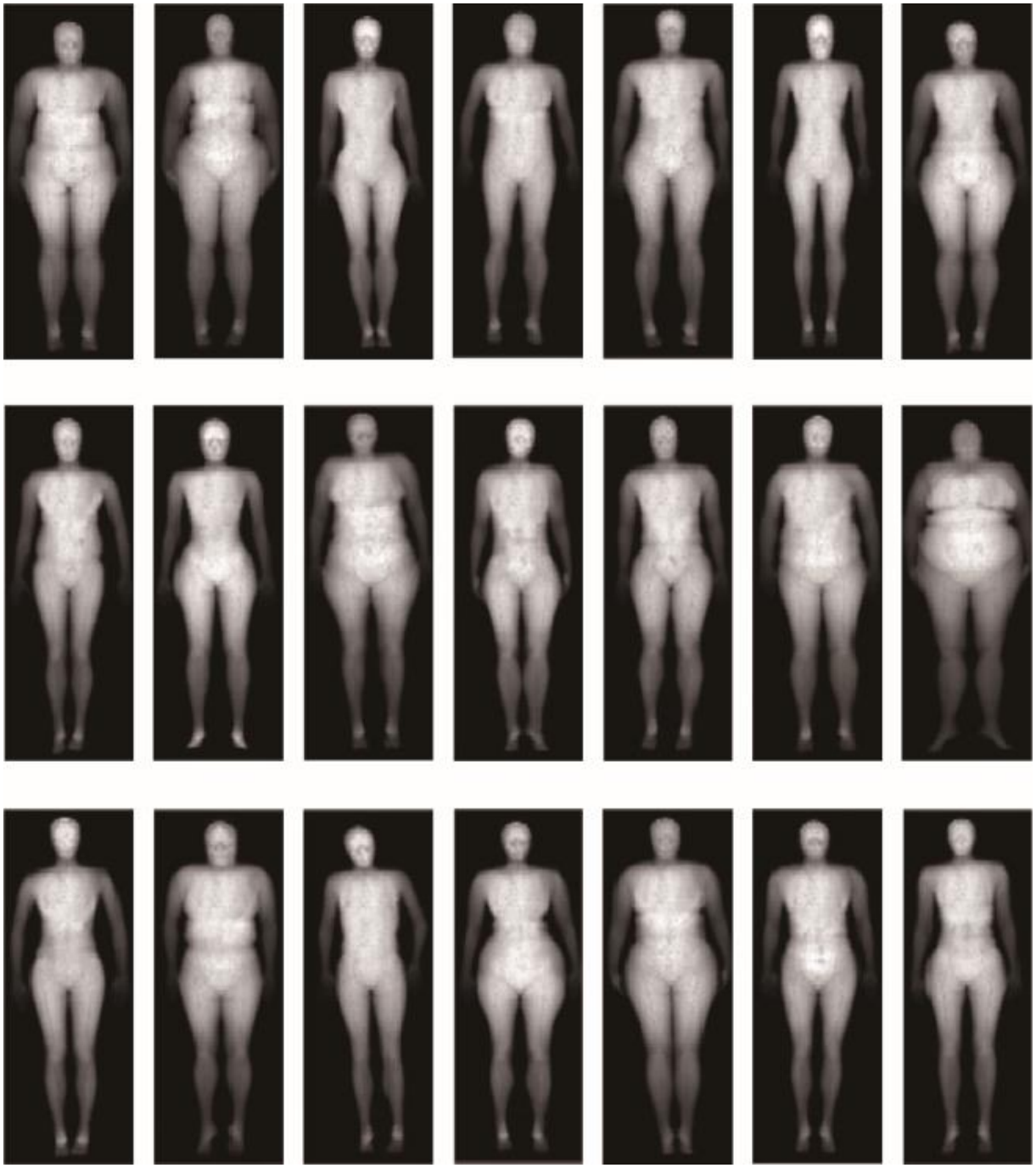

Pooled data
Deviation
1
0
-1
-2
4.0
4.5
5.0
5.5
Annual Income (log10)
Image
Female
Male

Appendix. Supplementary Data

Supplementary Figure 1. The complete set of female and male DEXA images used in the present study.
Supplemental table 1. Information for both female and male images.
Supplemental table 2. Demographic and anthropometric information of raters.

Figure S1. a. female DEXA images; b. male DEXA images

a.



b.

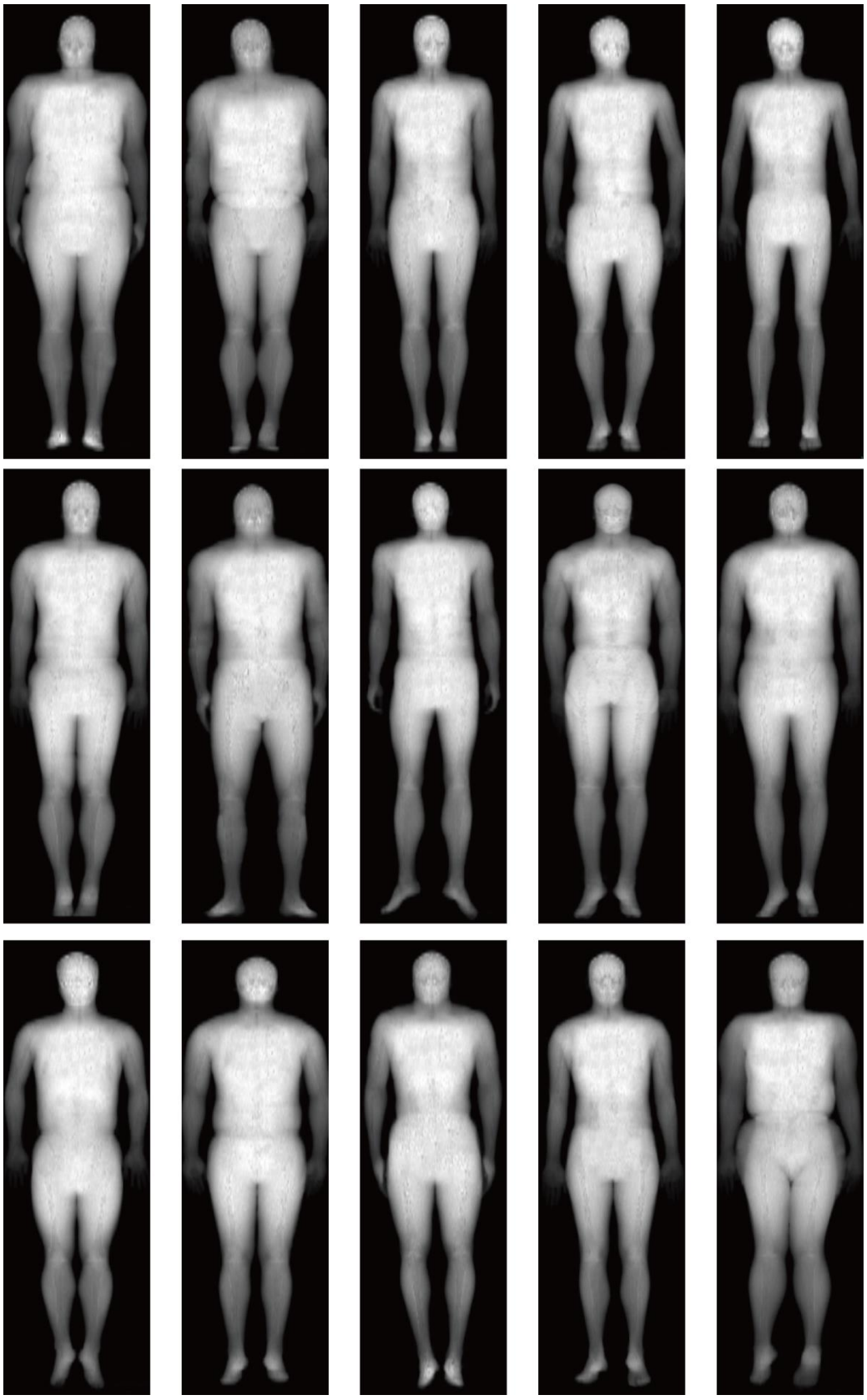


Table S1. Information for both female and male images.

a. female image information

Image	Body fat percentage (BF%)	Waist-to-hip ratio (WHR)	Average Annual Income			
			Beijing (CNY)	Panevezys （LTL）	Aberdeen (GBP)	AUSTIN* (USD)
1	44	0.74	7,465	2,970	2,899	3,031
2	50	0.64	14,580	5,801	5,662	6,063
3	23	0.66	108,627	43,219	42,188	45,472
4	30	0.88	135,782	54,023	52,734	60,630
5	35	0.72	55,617	22,128	21,600	24,252
6	23	0.68	414,376	164,866	160,933	181,890
7	45	0.66	28,477	11,330	11,059	12,126
8	35	0.82	647,465	257,604	251,457	303,150
9	32	0.61	44,492	17,702	17,280	20,210
10	49	0.75	212,162	84,412	82,397	90,945
11	20	0.66	35,595	14,162	13,824	15,157
12	29	0.71	169,728	67,529	65,918	75,787
13	42	0.88	86,901	34,575	33,750	37,893
14	49	0.81	265,203	105,515	102,997	121,260
15	19	0.72	22,782	9,064	8,847	10,105
16	38	0.82	11,665	4,641	4,530	5,052
17	19	0.76	9,330	3,712	3,624	3,789
18	38	0.64	331,502	131,893	128,746	151,575
19	40	0.71	**69,521**	**27,660**	**27,000**	**30,315**
20	25	0.76	18,075	7,251	7,078	7,578
21	29	0.63	517,972	206,083	201,166	218,268

b. male image information

Image	Body fat percentage (BF%)	Shoulder-to-waist ratio (SWR)	Average Annual Income			
			Beijing (CNY)	Panevezys （LTL）	Aberdeen (GBP)	AUSTIN* (USD)
1	37.2	1.48	331,502	131,893	128,746	190,919
2	26.1	1.48	86,901	34,575	33,750	50,031
3	18.3	1.56	212,162	84,412	82,397	122,076
4	22.5	1.6	44,492	17,702	17,280	25,616
5	6.8	1.61	28,477	11,330	11,059	16,410
6	5.9	1.62	414,376	164,866	160,933	238,579
7	21.7	1.62	**69,521**	**27,660**	**27,000**	**40,025**
8	18.6	1.63	22,782	9,064	8,847	13,208
9	11.9	1.63	108,627	43,219	42,188	62,439
10	32.3	1.64	55,617	22,128	21,600	32,020
11	22.5	1.66	517,972	206,083	201,166	289,186
12	30.7	1.66	35,595	14,162	13,824	20,412
13	11	1.69	265,203	105,515	102,997	152,495
14	19.1	1.7	169,728	67,529	65,918	97,661
15	28.2	1.7	135,782	54,023	52,734	78,048

*

1. In Austin, the salary were assigned separately by female and male average annual income.

2. Bold number represent the average annual income

Table S2. Demographic and anthropometric information of raters.

a. Male raters of female images excluding salary information

Population	Sample Szie	Age(mean ± S.D.)	BMI(mean ± S.D.)
Chinese	111	25±4	22±3
European	56	24±7	24±4
American	10	22±2	27±6
Total	177		

b. Male raters of female images including salary information

Population	Sample Szie	Age(mean ± S.D.)	BMI(mean ± S.D.)
Chinese	47	27±3	23±3
European	62	27±11	24±4
American	10	22±2	27±6
Total	119		

c. Female raters of male images excluding salary information

Population	Sample Szie	Age(mean ± S.D.)	BMI(mean ± S.D.)
Chinese	76	29±10	21±2
European	92	30±11	23±4
American	28	20±1	23±3
Total	196		

d. female raters of male images including salary information

Population	Sample Szie	Age(mean ± S.D.)	BMI(mean ± S.D.)
Chinese	43	26±9	20±2
European	89	30±12	23±4
American	28	20±1	23±3
Total	160		