Measuring attractiveness

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Ms AMJ of Richmond, VA, asked me, her personal economist, for a lit review of academic studies of attractiveness. So, Ms AMJ and whoever else may be around, I offer you this haphazard and arbitrary romp through the literature on beauty and its correlation to symmetry, BMI, WHR, VHR, and 2D:4D.

Innate attractiveness

We'll start with the infant studies, which try to get around the culture/innateness thing by using subjects too young to comprehend culture. Maurer and Barrera [1981] showed the images depicted in Figure one in front of 1- to 2-month old kids. For those using text browsers: one image has features arranged as a proper face, and on the others, the features are either random or symmetric but not a face. They found that the two month olds fixate more on the face than the others but the one month olds don't, implying that face recognition comes in somewhere during that time. So some quantity of our processing of people's faces comes either from hard-wiring or stimuli well before the kid can comprehend culture. [The sample is smaller than I'm comfortable with, 20 1-month and 15 2-months, but I guess these are a pain to conduct: "An additional six babies did not complete the experiment because they cried (N=3) or fell asleep (N=3)."]

So it would not be a great leap to presume that beyond the basic shape of the face, there are other things that are hard-wired into the brain, but it's not entirely obvious as to how fine-grained that hard-wiring is. For example, how about symmetry? The study above didn't find much difference between the symmetric and the asymmetric non-faces, but those weren't faces. Samuels et al. [1994] showed babies symmetric faces and attractive faces, and found that the babies paid more attention to the more attractive faces than the more symmetric. F and DC [2003] found that perfectly symmetric faces were judged (by adults) to be more Neurotic, less Agreeable and less Conscientious than normal faces, but not more or less atractive.

But there's not just symmetry: there are hundreds of ways in which we can collate and dissect women's faces and bodies. The standard, gleaned from back issues of Playboy, is that a .68 waist-to-hip ratio (WHR) is the ideal shape for a bunny. PT and Davis [2001] report this figure, and that "there has been no appreciable change in either BMI [body mass index] or WHR in centerfolds

Figure 1: Am I hot or not?

over the past 20y. Based on current recommendations for the classification of underweight (BMI $< 18.5 kg/m^2$), 70% of the centerfolds were underweight. Further, 77.5% of the centerfolds were $< 85\%$ of their ideal body weight."

But Fan et al. [2004] think that using WHR is all BS: the real measure of attractiveness is volume divided by the square of height. [I presume we measure a woman's volume by dunking her in a giant test-tube and measuring the quantity of water she displaces.] They also propose (waist height)/(chin height) as a secondary measure, meaning that women that are all legs are more attractive.

Sugiyama [2004] thinks that the waist-to-hip measure confounds some sort of innate waist-to-hipness with body fat, and that it doesn't take into account cultural conditions. He finds that the forager-horticulturalist men of Ecuadorian Amazonia take both into account when judging women.

Connolly et al. [2004] showed female shillouettes to boys aged 6 to 17, and found that the younger boys thought the more underweight and lower WHR images were "nicer or more attractive", and the preference shifted toward more average weight and the above .7 WHR as they aged. I only have the abstract, and so can't go into further detail; also, we'll never know whether the shift is due to hormones or culture.

My overall personal impression is that yes, there are certain basic shapes that people are hard-wired to recognize as human or female, but after that baseline is established and we've determined what we're looking at, a hundred other harder-to-measure-and-standardize details become important.

Other things I learned

Here are some things I stumbled over while putting together the above that I thought were fun/interesting.

Beer goggles Undergrad subjects were asked to rate faces of the same sex, opposite sex, and "non-face objects", then given booze and asked to do the same. Booze led to a positive increase only in the attractiveness ratings of the opposite sex, indicating that booze is not about loving the world more, it's about wanting to sleep with people more. [Jones et al., 2003]

Earnings: Hammermesh and Biddle found that yes, cute people do make more money. There's about a 7-9 percent penalty for being homely and about a 5 percent premium for being attractive. This is true for both boys and girls, and they even claim (unconvincingly) that the effect is larger for boys. One reason for the attractiveness premium could be things like self-esteem; self-esteem measures are indeed correlated to both earnings and cuteness, but the authors find that including these measures doesn't affect the significance of the attractiveness coefficients. [But they don't do the Right Thing, which would be a likelihood ratio test comparing the specifications with self-esteem and without. But that doesn't affect the results reported here, though.] [Hammermesh and Biddle, 1994]

Self-evaluation Boy and girl undergrads were asked to rate their own attractiveness and then photographed. Then, the photographs were rated by undergrads at another university. Note that, as in all the other studies I've looked at, there was a high degree of consensus among photo raters about who was attractive and who wasn't, and this was regardless of both rater and ratee's gender. This study found that girls' ratings of their own attractiveness was significantly correlated to the ratings of their photo (i.e., girls know if they're cute or not), while boys' self-ratings were basically uncorrelated with the ratings of their photos (i.e., boys have no frigging clue). The authors conclude that girls spend all day fretting about these things, and therefore have good information, while boys just don't think about it that much.[Rand and Hall, 1983]

Finger length The ratio of (length of index finger)/(length of ring finger) is larger for girls than for boys: [Fink et al., 2003]

> The length of the second digit (the index finger) relative to the length of the fourth digit (the ring finger) is sexually dimorphic as males have a lower second to fourth digit ratio (2D:4D). The sexual dimorphism is determined as early as the 14th week of fetal life, and remains unchanged at puberty. There is evidence that sex differences in 2D:4D arise from in utero concentrations of sex steroids, with a low 2D:4D (male typical ratio) being positively related to prenatal testosterone, while a high 2D:4D (female typical ratio) is positively associated with prenatal oestrogen.

To go even further, it is claimed that there is a link between male homosexuality and high fetal testosterone, so the 2D:4D ratio, by extension, may be

correlated to homosexuality. I don't wanna mess this one up, so here's the entire abstract from Robinson SJ [2000]:

> Sexual orientation may be influenced by prenatal levels of testosterone and oestrogen. There is evidence that the ratio of the length of 2nd and 4th digits (2D:4D) is negatively related to prenatal testosterone and positively to oestrogen. We report that (a) 2D:4D was lower in a sample of 88 homosexual men than in 88 sex- and age-matched controls recruited without regard to sexual orientation, [b]) within the homosexual sample, there was a significant positive relationship between mean 2D:4D ratio and exclusive homosexuality, (c) overall, there was a decrease in 2D:4D from controls to homosexual men to bisexual men and (d) fraternal birth order, a positive predictor of male homosexuality, was not associated with 2D:4D in a sample of 240 Caucasian men recruited without regard to sexual orientation and 45 homosexual men. Further work is needed to confirm the relationships between 2D:4D and sexual orientation. However, these and other recent data tend to support an association between male homosexuality and high fetal testosterone. Very high testosterone levels may be associated with a sexual preference for both men and women.

The subsequent lit seemed to back these guys up. E.g., I found this study, with a very descriptive title: "Are 2D : 4D finger-length ratios related to sexual orientation? Yes for men, no for women".[Lippa, 2003]

[Before you start measuring all your friends' fingers: since homosexuals are such a small sample of the population, the 2D:4D ratio is not a good predictor of homosexuality, even though there is evidently a strong correlation. You'll get enough Type II errors to make your orientation-through-finger-length project junk.]

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