

Beauty and the beholder

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A BEAUTIFUL human face inspires pleasure and interest and often attracts riveted attention. But what constitutes beauty? There must be some general understanding of the concept, however vaguely defined; for instance, even two-month-old infants prefer to gaze at faces that adults find attractive¹. In recent years scientists have joined plastic surgeons and cosmetic companies in taking a deep interest in the question, and one such research group — Perrett, May and Yoshikawa — reports its latest results in this issue². The findings are scarcely definitive; in this area it is difficult to conceive of any that could be. But they add a new dimension to psychological, anthropological and biological thought on the subject.

The common notion has been that beauty is in the eye of the beholder, that individual attraction is not predictable beyond our knowledge of a person's particular culture, historical era or personal history. Beauty has also become a politicized issue. In her bestselling book, *The Beauty Myth*, Naomi Wolf³ argues that there is no such thing as a quality called beauty that "objectively and universally exists". In a society such as the present-day United States, where women earn consistently more than men in only two professions (modelling and prostitution), and where both cosmetics and weight loss programmes are enormously profitable industries, one can see the obvious concern in even contemplating perception of

beauty as a universal.

But the assumption that beauty is an arbitrary cultural convention may simply not be true. Perrett *et al.* belong to a growing body of scientists who are beginning to challenge it, just as scientists have begun to question anew many other assumptions about the relationship between human behaviour and culture. As Cosmides, Tooby and Barkow⁴ have pointed out: "Culture is not causeless and disembodied. It is generated in rich and intricate ways by information-processing mechanisms situated in human minds. These mechanisms are, in turn, the elaborately sculpted product of the evolutionary process. Therefore, to understand the relationship between biology and culture one must first understand the architecture of our evolved psychology."

Until the 1960s, it was believed that languages could vary arbitrarily and without limit, but now there is a consensus among linguists that there is a universal grammar underlying this diversity⁵. Similarly, it was once thought that facial expressions of emotion could vary arbitrarily across cultures, until Ekman and others showed that a wide variety of emotions are expressed cross-culturally by the same facial movements⁶. Ekman made the important distinction between the expression of emotion and the cultural variation that may exist in the rules for displaying those emotions. Likewise, although some aspects of judgements of

human facial beauty may be influenced by culture or individual history, the general geometric features of a face that give rise to perception of beauty may be universal, and the perception of these features may be governed by circuits shaped by natural selection in the human brain.

What is the evidence for this, and what would a universally beautiful face look like? Donald Symons, an anthropologist, proposed⁷ that beauty is averageness — the average values of the features of faces in a human population. Symons made the prediction on the basis of evolutionary biology and the principle that, during most periods, evolutionary pressures operate against the extremes of the population⁸. If this stabilizing selection principle is at work, and people with average physical properties have the best chance of survival, one would maximize fitness by being attracted to and mating with partners displaying such properties. There would thus be selection pressure to find average features attractive.

The hypothesis was tested in 1990 by Langlois and Roggman⁹, who used a computerized version of a technique developed by Galton a century earlier¹⁰ (see box). Galton superimposed photographs to create composites of faces, and to his surprise and frustration (one of his aims had been to create a prototypical criminal) the composite appeared more attractive than any of the individual photos that went into it. Langlois and Roggman confirmed this effect using ratings by college students of computer-generated composite faces.

Averageness, however, need not be the only criterion for beauty that natural selection might have favoured. When there is competition for partners — the precondition for Darwin's 'sexual selection' — those animals with certain kinds of extreme traits can often be preferred¹¹. Such extreme traits, the peacock's tail being the most famous example, can be a sign of the owner's innate resistance to disease and parasites, or an advertisement of its ability to gain sufficient resources to be able to 'afford' the flamboyant trait. Any disadvantage of the extremeness of the trait might be offset by the advantage of its attractiveness to potential mates.

Evolutionary biologists have thus painted two portraits of the face of beauty, one composed of features that are at the mean of the population, and another composed of at least some features at the population extreme. Perrett and colleagues attempt to discern whether averageness alone is beauty or whether we too may prefer the peacock. Using composites of either Caucasian or Japanese faces, they found that in both cases faces rated as 'attractive' were preferred to the composite of the sample from which the faces were selected; moreover, an attractive composite could be made more attractive

Galton and composite portraits.

In Francis Galton's pioneering paper of 1878, which Nancy Etcoff mentions in the main article, Galton describes how he "caused trials to be made" of ways of extracting typical characteristics from drawings of different faces. He reports how a photographic process, involving a stereoscope,

... enables us to obtain with mechanical precision a generalised picture; one that represents no man in particular, but portrays an imaginary figure, possessing the average features of any given group of men. These ideal faces have a surprising air of reality. Nobody who glanced at one of them for the first time, would doubt its being the likeness of a living person.

Technologies change. The woodcut reproduced here appeared in the paper, but has been computer enhanced to improve the quality of reproduction.



It came with these comments:

... This composite is made out of only three components, and its three-fold origin is to be traced in the ears, and the buttons to the vest. To the credit of my judgment the original photograph is a very exact average of its components ... However the judgment of the wood engraver is different. His rendering of the composite has made it exactly like one of its components, which it must be borne in mind he had never seen. It is just as though an artist drawing a child had used a portrait closely resembling its deceased father, having overlooked an equally strong likeness to its deceased mother

Wistfully, Galton adds

I trust that the beauty of the woodcut will not be much diminished by the necessarily coarse process of newspaper printing. T.L.