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ATTRACTIVENESS OF COMPOSITE FACES: A COMPARATIVE STUDY

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ABSTRACT: Data are presented which give cross cultural generality to the observation by Langlois and Roggman (1990) that young southwest American college students found composite faces more attractive than the individual faces from which they were derived. These authors attributed the phenomenon to a cognitive mechanism of prototypicality originating in an evolutionary process of stabilising selection towards facial averageness. In this study New Zealand Caucasian and New Zealand Chinese students, together with indigenous students in China, Nigeria and India chose composite New Zealand Caucasian faces as more attractive than the individual faces from which they were constructed. The preference was greater for female than for male faces. Caution is expressed over attributing the phenomenon to either typicality or stabilising selection.

INTRODUCTION

Langlois and Roggman (1990) digitised photographs of student faces and arithmetically averaged groups of the resulting matrices of numeric grey values to construct composite portraits. Southwest American undergraduates rated the individual and composite faces for attractiveness. Both male and female composites were rated as more attractive than the individual faces from which they were derived.

The attractiveness of the composite female face was noted long ago (Austin, 1877, Stoddart, 1886) but Katz (1952) was probably the first to make the general claim that average is beautiful. "Apparently, in contrast with intelligence tests, where what is average characterises mediocrity, the average represented in the composite portrait represents the norm of beauty." (p. 211). He concluded that the absence of asymmetries in the composite gave it "ideal traits."

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Concluding, like Katz, that composites derived in this way are average faces, Langlois and Roggman interpreted their results as evidence of an evolutionary process of stabilising selection towards averageness which governs our perception of facial attractiveness and gives it an important role in mate selection. As a proximal mechanism, Langlois and Roggman invoked the cognitive concept of prototypicality.

Basically, stabilizing selection recognizes the population mean for a particular trait as the optimum class. Deviations from it will be selected against. (Johnson, 1976). If average human faces indicate biologically optimum individuals, and if composite faces are average faces, then Langlois and Roggman have provided an intriguing evolutionary explanation of our preference for attractive partners.

While it may be difficult to show that the possessor of an average face is an optimum individual it is nevertheless obvious that something is amiss with one who has two eyes of different size and on the same side of the face.

Is the attractiveness of the composite face a general phenomenon in our species? As Langlois and Roggman admit, evidence from south west American undergraduates is insufficient to justify the conclusion that the attractiveness of the composite face is a human universal. Supporting cross-cultural evidence is however available. In a study by the author (summary results, not including those from China were reported in Shepherd, 1989) attractiveness judgements of composite versus individual caucasian faces were made by young people of four different races living in five different cultural settings. All were presented with twelve sets of female and eight sets of male faces. Each set consisted of six New Zealand caucasian faces and a seventh, photographic composite face constructed from them by Galton's method (Galton 1883, Appendix B).

METHOD

The composite faces

To produce the composites faces, 150 Caucasian members of a large first year psychology class at the University of Canterbury volunteered their faces to be photographed. Monochrome photographs were taken under standard distance and lighting conditions, full face, with spectacles and facial jewellry removed. They were visually sorted according to face shape and size, into groups of six. Faces not chosen

were those whose bearers had blinked, which had gross defects or which had a shape which was not sufficiently common to combine readily with another five. Photographic composites were made from each group by brief exposure of individual faces to produce a composite print. Non-hairy margins of the individual faces were lightly "hazed" during printing to match the blurring which characterised the margins of the composites. Each composite was positioned randomly in its group of six individuals to produce twelve sets of seven female and eight sets of seven male faces. The sets were mounted in groups of four, reduced photographically, screened to 100 mesh and printed on 29cm x 21cm sheets. The final printed size of each face was approximately 1.5cm x 2cm. Each face in each set was identified numerically. The effect of screening and size reduction was to obliterate skin blemishes which clearly distinguished some individuals from composites in the original photographs. Groups of five sheets containing the twelve female and eight male sets were stapled together with the female faces presented first.

Procedure

New Zealand students were each presented with the booklet of faces and asked to, "choose in each set of seven faces the one you think is most attractive, the one you like best. Indicate this face by putting a circle around its number." They were asked to state their sex, age, ethnic origin and the number of years they had lived in New Zealand.

Nigerian, Indian and Chinese students each received the same booklet of faces, and an answer sheet listing the numbers of the faces in each set. They were asked to indicate their preferred faces by circling numbers on the answer sheets. Nigerian and Indian students were given instructions on the answer sheet in English, while instructions for Chinese students were printed in Chinese. All were asked to give their sex, age and ethnic origin.

Subjects were asked to choose in each set, the face they thought most attractive. All were tertiary students in their respective countries; New Zealand (University of Canterbury-New Zealand caucasians, and Chinese who had lived in New Zealand for between one and four years), India (indigenous students at the University of Lucknow), China (indigenous students at Lhanzou Railway College), and Nigeria (indigenous male students at the University of Sokoto, women did not attend the university). Two scores were calculated for each student: the percentage of composite female faces chosen (from a

total of twelve) and the percentage of composite male faces chosen (from a total of eight).

RESULTS

Analysis of variance of these data was carried out with ethnic group and gender of subject as between subject factors and sex of face as a within subject factor. (Nigerians, with no data available from female students, were omitted from the analysis.) The analysis yielded significant main effects for ethnic group [$F(3,361) = 27.07$, p $< .0001$], gender of subject [$F (1, 361) = 7.22$, p$< .01$] and sex of

Table 1. Mean percentage choice of composite male and female faces tested against a chance expectancy of 14.28%.

Group tested	Gender of face	Percentage choice	t	p
NZ Caucasian men, N=59	Female faces	62.49	15.440	<.0001
Mean age 22 yrs 8 months	Male faces	32.03	5.367	<.0001
NZ Caucasian women, N=50	Female faces	52.25	11.823	<.0001
	Male faces	22.25	3.650	=.0006
Mean age 21 yrs 5 months				
NZ Chinese men, N=23	Female faces	65.89	11.952	<.0001
Mean age 21 years 8 months	Male faces	30.11	2.946	=.0077
NZ Chinese women, N=28	Female faces	66.65	12.431	<.0001
Mean age 20 yrs 8 months	Male faces	37.02	4.916	<.0001
Indian men, N=50	Female faces	31.35	5.439	<.0001
Mean age 24 yrs 3 months	Male faces	15.93	0.716	=.4773
Indian women, N=59	Female faces	33.58	6.687	<.0001
Mran age 24 yrs 4 months	Male faces	19.70	2.413	=.0190
Nigerian men, N=91	Female faces	29.19	5.760	<.0001
Mean age 24 yrs 3 months	Male faces	16.97	1.304	=.1957
Chinese men, N=50	Female faces	54.31	10.916	<.0001
Mean age 21 yrs	Male faces	24.76	3.923	=.0003
Chinese women, N=53	Female faces	48.06	10.338	<.0001
Mean age 19 yrs 1 month	Male faces	21.15	2.685	=.0098

face [F (1,361) = 442.81, p<.0001]. Of the interactions, only ethnic group x sex of face was significant (F (3,361) = 11.015, p<.0001).

Table 1 presents the mean preferences for composite male and female faces by male and female students in each ethnic category. (Data from Nigerian men have been included in this table although they were not included in the analysis of variance.) Probability values are those against a null hypothesis of M = 14.28%. All groups showed significant preferences for both male and female composites, with the exception of Indian and Nigerian men who showed only chance responses to composite male faces. All groups showed a significantly greater preference for female than for male composites.   The preference for the composite caucasian face was greatest for students living in New Zealand followed closely by indigenous Chinese students, and was lowest for indigenous Indian and Nigerian students. The significant interaction resulted from a weaker preference for female over male composites by Indian students.

To gain a measure of agreement between the nine groups of students in their ordering of the faces, each face was given a score representing the numbers of individuals in each group who chose it as the most attractive in its set.   Correlations (r) were then calculated between all pairs of groups.

Correlations averaged +.752 (S.D. = .125) for female faces and +.589 (S.D. = .138) for male faces and all were significant beyond the 1% level. The level of agreement in ordering female faces (M = +.752, S.D. = .125) was significantly higher [t (35) = 8.589, p <.001] than agreement in the ordering of males faces (M = +.589, S.D. = .138).

DISCUSSION

These data suggest that something more than social learning was influencing the judgments, at least of female facial attractiveness.   It is difficult to avoid the conclusion that these young adults belonging to very different ethnic groups, were behaving as members of the same species and not merely as products of their own different cultures. Some supporting evidence comes from the finding of Samuels and Ewy (1985) that both three and six month old human infants discriminated between photographs of faces which were similar in gross physical appearance but differed in attractiveness rated by adults.

But there is also evidence of cultural influences on the students'

judgments. Preference for the composite New Zealand caucasian faces was stronger among students exposed directly to New Zealand cultural norms than among those remote from that culture. Among the non-caucasian students, Chinese who had lived in New Zealand exhibited the highest levels of agreement with New Zealand students in their ordering of New Zealand caucasian faces.

Whereas Langlois and Roggman found similar attrativeness ratings for male and female composite faces, in these data there is consistently more frequent choice of female composites, and in the case of Indian and Nigerian men, the composite caucasian male face is chosen no more often than would be expected by chance.

If our perception of composite faces as attractive is the result of an evolutionary process of stabilizing selection towards the average , it becomes necessary to explain why this process has been less powerful (or perhaps, is more modifiable by social learning) in the case of male faces. It might be that facial attractiveness is more crucial for men's preferences for women, but not vice versa. Certainly Buss (1989) found physical attractiveness to be a stronger determinant of male than female partner choice in thirty seven different human cultures.

A more serious problem with Langlois and Roggman's explanation in terms of stabilising selection stems from their assumption that the composite face is an average and hence a prototypical face. While both the photographic composite and that produced by averaging matrices of numeric grey values yield a credible face in which areas of light and dark have been averaged, it is not clear that this is an average face in any prototypical sense. The very fact that composite faces are perceived as more attractive than individual faces indicates that they are not typical with respect to attractiveness. Facial averageness in a prototypical sense might better be measured by the median than the arithmetic mean - by selecting the individual face which differs least from other individual faces. While the median face might thus be a face which had no distinctive features, it is likely that the composite face is characterised by distinctive features. Superimposing individual features, whether photographically or digitally, will tend to produce a composite feature that is larger than the median feature. This is because the larger individual features will still be represented in the composite, albeit more faintly, and may add to its perceived size. Just what are the perceived boundaries of a composite feature would need to be established before it could be accepted as an average feature.

Empirical studies to date have demonstrated only that the

composite face is an attractive face, whether it is computer generated or produced photographically. It remains to be shown that the composite face is an average face in any generally accepted prototypical sense or that it is perceived as an average face in a popular sense or that it is regarded as typical of any particular class of faces. In the meantime we may conclude only that the attractiveness of the composite face is a phenomenon of human perception that remains robust across wide ethnic and cultural boundaries. We may not conclude that it is a prototypical face the perceived attractiveness of which results from an evolutionary process of stabilizing selection.

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REFERENCES

Austin, A. D. (1877) in Galton, F. (1883). *Inquiries into human faculty and its development.* (p.226). London: MacMillan.

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

Galton, F. (1883). *Inquiries into human faculty and its development.* London: MacMillan.

Johnson, C. (1976). *Introduction to natural selection.* (p.48). Baltimore: University Park Press.

Katz, D. (1952). Le portrait composite et la typologie. *Ikon (Revue internationale de Filmologie), 2*, 207-214.

Langlois, J.K., & Roggman, L.A. (1990). Attractive faces are only average. *Psychological Science, 1*, 115 - 121.

Samuels, C.A., & Ewy, R. (1985). Aesthetic perception of faces during infancy. *British Journal of Developmental Psychology, 3*, 221 - 228.

Shepherd, J.W. (1989). The face and social attribution. In A.W. Young & H.D. Ellis,(Eds.), *Handbook of research on face processing* (pp 289 - 320). Amsterdam: Elsevier.

Stoddart, J.T. (1886). Composite portraiture. *Science, 8*, 89-91.