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Assortative Mating for IQ and Personality Due to Propinquity and Personal Preference

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The role of personal preference as an active process in mate selection is contrasted with the more passive results of limitations of available mates due to social, educational, and geographical propinquity. The role of personal preference estimated after removing the effects of variables representing propinquity was still significant for IQ and Eysenck's extraversion–introversion and inconsistency (lie) scales, even though small.

KEY WORDS: assortative mating; IQ; Eysenck's Personality Inventory (EPI); extraversion; neuroticism.

INTRODUCTION

Positive assortative mating occurs when phenotypically similar individuals marry in greater numbers than would be expected by chance. Positive assortative mating has been well documented for both anthropometric and psychometric traits (Spuhler, 1968; Roberts, 1977; Vandenberg, 1972). If these traits have significant heritabilities, then changes in the genetic structure of the population can arise.

It is proposed that type and length of education, social class, and area of residence cause geographical and social propinquity which limits the availability of possible mates and thus acts as a major influence in spouse similarity. For most individuals it is only after this general "passive" selection process has occurred, and within the range of those possible mates, that more "active" personal preference for physical and psychological attributes can play a role.

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The present study considers the extent to which the similarity between spouses for IQ and personality can be "explained" by social, educational, geographical, and familial propinquity, i.e., it attempts to differentiate the broader effects of propinquity from specific mate selection based on personal preference per se. In this study we are making an approximation to the concepts of active and passive factors. It would require a longitudinal study to separate real active and passive factors (Epstein and Guttman, 1984).

MATERIALS AND METHODS

All analyses presented here are based on 193 British husband and wife pairs. Specific details of the sample and sampling techniques are presented elsewhere (Mascie-Taylor and Gibson, 1979). It is sufficient to note here that the sample was an urban one and that the prime aim of the study was to collect family data for anthropometric and other biological variables (Mascie-Taylor, 1981).

The IQ test used was the Wechsler Adult Intelligence Scale (WAIS; Wechsler, 1958) and it comprises 11 subtests, 6 of which measure primarily verbal IQ and 5 visuospatial IQ. Because of the excessive time involved in completing full Wechsler tests in field situations (Harrison *et al.*, 1976), only four verbal (comprehension, similarities, vocabulary, and digit span) and three visuospatial subtests (block design, object assembly, and digit symbol) were used. Age-corrected Total IQ (TIQ) scores are obtained from respective Verbal (VIQ) and Performance (PIQ, visuospatial) scores.

Answers to the questions on Eysenck's Personality Inventory (EPI; Eysenck, 1970) can be used to obtain estimates of the extraversion/introversion and neuroticism of the subject. The inventory includes what was originally described as a lie scale but is now considered a measure of reliability involving consistency as well as truthfulness of response.

RESULTS

Marital Associations for Psychometric Variables

Table I presents the mean IQs of the seven subtests and three IQ components and personality scores for husbands and wives. Husbands scored significantly higher than their wives on all three IQ components but on only three subtests, namely, comprehension, block design, and object assembly, while wives scored significantly higher on the neuroti-

Table I. IQs and Personality of Husbands and Wives

	Husband		Wife			
IQ	Mean	SD	Mean	SD	Paired *t* test	*P*
Comprehension	13.38	2.86	12.14	3.04	4.98	<0.001
Similarities	11.73	2.23	11.51	2.19	1.27	NS
Vocabulary	12.51	2.87	12.27	2.96	1.04	NS
Digit span	11.42	2.98	11.39	2.98	0.12	NS
Block design	12.26	2.29	11.47	2.38	3.67	<0.001
Object assembly	12.34	2.53	11.56	2.55	3.48	<0.001
Digit symbol	11.04	2.36	11.24	2.46	0.97	NS
Verbal	112.67	11.79	110.73	11.76	6.69	<0.001
Performance	112.51	11.81	110.10	12.69	10.07	<0.001
Total	113.22	10.67	111.19	10.99	9.39	<0.001
Personality						
Extraversion	11.72	4.26	10.95	4.04	1.62	NS
Neuroticism	9.29	4.51	12.03	5.02	5.65	<0.001
Inconsistency	3.30	1.71	3.20	1.74	0.87	NS

cism scale. Positive and significant spousal associations were found for all IQ subtests and IQ components and two of the personality variables, extraversion/introversion and inconsistency (Table II).

Propinquity and Spousal Association for IQ

How much of the observed spousal association for IQ (and personality) can be accounted for by other factors and variables? There are several possible statistical strategies which can be used to answer this question. The first, and probably most obvious, is to determine the partial correlation coefficient between husband and wife IQ, having allowed for the social, educational, geographical, and familial propinquity.

Table II presents the partial correlations for the seven IQ subtests and the three IQ components, having allowed for the spousal association for type of and years of education, social class (their parents' and theirs on leaving school and at marriage), respective family size and birth order, locality (whether born within the city boundary of Cambridge or outside), and personality.

All partial correlation coefficients with the exception of digit span remained significant. All four verbal subtest partial correlations are lower than the original first-order correlations. Two of the Performance subtest

Table II. Spousal Association for IQ and Personality

IQ	First-order correlation	*P*	Partial correlation	*P*
Comprehension	+0.185	<0.01	+0.168	<0.02
Similarities	+0.397	<0.001	+0.183	<0.02
Vocabulary	+0.372	<0.001	+0.224	<0.005
Digit span	+0.221	<0.002	+0.119	NS
Block design	+0.177	<0.02	+0.219	<0.005
Object assembly	+0.255	<0.001	+0.264	<0.001
Digit symbol	+0.282	<0.001	+0.196	<0.010
Verbal	+0.340	<0.001	+0.195	<0.010
Performance	+0.285	<0.001	+0.176	<0.020
Total	+0.403	<0.001	+0.212	<0.006
Personality				
Extraversion	+0.233	<0.001	+0.172	<0.02
Neuroticism	+0.072	NS	+0.030	NS
Inconsistency	+0.235	<0.001	+0.267	<0.001

partial correlations increased and thus the explained variance rose to 4.8 and 7.0% for block design and object assembly, respectively (these results imply underlying complex partial correlation matrices). All three IQ components' partial correlation coefficients are lower than the original first-order correlations although all remain significant. It would appear that of the original explained variance (R^2) for Total IQ of 16%, nearly 10% of the spousal association is "caused" by propinquity. There remains only 6% which can be ascribed to active mate choice. For Verbal and Performance IQ, original R^2 values were 12 and 8%, and these fell to 4 and 3%, respectively.

The second approach makes use of the multivariate statistical technique of stepwise multiple regression. It enables one to remove the effects of confounding variables before determining the importance of a desired factor. In this case one examines the association between husband's IQ and wife's IQ, but entering educational, social, familial, and geographical propinquity first and wife's IQ last. The statistical importance of each of the variables can be determined.

The results of these analyses are presented in Table III. For all three IQ components and six of the seven IQ subtests (as with the partial correlation coefficients), the addition of the last term, wife's IQ significantly contributes to the explained sums of squares, suggesting that personal

Table III. Multiple Regression Analysis for IQ

Item	Comprehension		Similarities		Vocabulary		Digit span	
	P	R^{2a}	*P*	R^2	*P*	R^2	*P*	R^2
School type	<0.025	8.7	<0.001	14.7	<0.001	15.2	<0.001	17.6
Family size	NS	3.3	NS	3.4	NS	4.4	NS	2.9
Birth order	<0.05	7.6	NS	4.4	NS	1.4	NS	2.8
Locality	NS	5.7	NS	5.3	NS	5.5	<0.05	6.0
Social class (parent)	NS	5.2	<0.001	12.2	<0.05	8.0	<0.05	7.0
Social class (marriage)	<0.025	7.4	NS	3.1	NS	5.1	NS	5.8
Personality	NS	2.4	NS	3.6	NS	0.9	NS	1.9
Years of education	NS	0.3	NS	0.9	NS	2.1	NS	0.4
Wives' IQ	<0.05	1.7	<0.05	1.7	<0.01	2.9	NS	0.8
Total R^2		42.3		49.2		45.5		45.2

	Performance subtest					
	Block design		Object assembly		Digit symbol	
Item	*P*	R^2	*P*	R^2	*P*	R^2
School type	<0.001	12.2	<0.001	10.8	<0.025	6.9
Family size	NS	3.1	NS	1.3	NS	4.8
Birth order	NS	4.8	NS	2.1	NS	4.2
Locality	NS	5.5	NS	2.1	NS	4.8
Social class (parent)	NS	4.2	NS	7.0	<0.025	8.1
Social class (marriage)	NS	1.7	NS	4.9	<0.025	8.2
Personality	NS	2.9	NS	1.7	NS	3.4
Years of education	<0.05	3.1	NS	1.0	<0.025	3.0
Wives' IQ	<0.05	3.0	<0.001	4.8	<0.025	2.2
Total R^2		40.5		35.7		45.6

	Component					
	Verbal		Performance		Total	
Item	*P*	R^2	*P*	R^2	*P*	R^2
School type	<0.001	18.7	<0.001	15.0	<0.001	19.0
Family size	NS	4.8	NS	1.5	NS	2.4
Birth order	NS	3.7	NS	5.8	NS	5.7
Locality	<0.01	8.4	NS	5.5	<0.01	8.0
Social class (parent)	<0.001	12.1	<0.025	8.7	<0.001	13.9
Social class (marriage)	NS	4.5	NS	5.3	NS	4.9
Personality	NS	1.7	NS	3.2	NS	1.6
Years of education	NS	1.3	NS	2.1	NS	1.4
Wives' IQ	<0.001	1.8	<0.025	1.7	<0.001	2.0
Total R^2		57.0		47.8		58.9

[a] R^2 is expressed as a percentage.

selection for IQ similarity had occurred over and above the similarity produced by propinquity. The only exception was digit span, whose partial correlation was also nonsignificant.

For all seven IQ subtests and three IQ components the personality variables do not contribute significant convariance; apparently these personality measures did not affect IQ similarity.

Table IV. Multiple Regression Analysis for Personality

Item	Extraversion		Neuroticism		Inconsistency	
	P	R^2	P	R^2	P	R^2
School type	NS	6.5	NS	2.4	NS	5.7
Family size	NS	3.6	NS	5.0	NS	6.7
Birth order	NS	2.5	NS	1.9	NS	1.9
Locality	NS	2.1	NS	0.3	NS	6.2
Social class (parent)	NS	7.1	NS	2.3	NS	5.0
Social class (marriage)	NS	5.7	NS	6.9	NS	5.3
IQ	NS	2.3	NS	3.2	NS	2.4
Years of education	NS	1.0	<0.05	3.6	NS	1.8
Wives' personality	<0.025	2.1	NS	0.1	<0.001	4.6
Total R^2		32.9		25.7		39.6

Propinquity and Spousal Association for Personality

Analyses similar to those described above were undertaken for the three personality variables. The partial correlations for extraversion/introversion and inconsistency were both significant (Table III). For both variables the first-order R^2 accounted for a relatively small amount of the explained spousal association (5.4 and 5.25% for extraversion/introversion and inconsistency, respectively). For extraversion, propinquity accounted for some 2.5% of the association, leaving an equal amount to personal preference. The result for inconsistency surprisingly increased the explained variance to 7% (also implying an underlying complex partial correlation matrix structure).

The results of the other analysis, i.e., the stepwise multiple regression, are presented in Table IV. For both extraversion/introversion and inconsistency the wife's values contributed significantly to the sums of squares, confirming the contribution of personal preference to the spouse similarity even after the effects of the propinquity measures have been removed. For neuroticism this was not the case.

DISCUSSION

This study has attempted to differentiate between active and passive elements of mate selection and to determine their relative contribution to assortative mating. We have defined passive elements as those resulting from educational, social, and geographical propinquity. Active elements are the additional features resulting from personal choice. We do not have any direct measure of personal preference and hence their influences, after partialing geographical and social propinquity, may be incorrect.

We initially determined the overall degree of assortative mating for IQ and personality. In all cases, with the exception of neuroticism, the first-order correlation coefficients are positive and significant, indicating positive assortative mating for these psychometric variables.

How much of these spousal similarities is due to passive and how much to active elements? Both partial correlation and stepwise multiple regression analyses yield essentially similar results. For IQ the passive component was the largest contributor; for personality the contributions were approximately equal. In the case of IQ subtests and IQ components, the passive factors accounted for approximately two-thirds of the total; however, the remaining third ascribed to personal choice was still significant. For personality, the overall assortative mating levels were quite low (Table II), but even so the personal-choice component was still significant. Personality played no role in mate similarity for IQ, or vice versa.

REFERENCES

Epstein, E. E., and Guttman, R. (1984). Mate selection in man: Evidence, theory, and outcome. *Soc. Biol.* **31**:243.

Eysenck, H. J. (1970). The inheritance of extraversion/introversion. *Acta. Psychol.* **12**:95.

Harrison, G. A., Gibson, J. B., and Hiorns, R. W. (1976). Assortative marriage for psychometric, personality and anthropometric variation in a group of Oxfordshire villages. *J. Biosoc. Sci.* **8**:145.

Mascie-Taylor, C. G. N. (1981). Hand preference and personality traits. *Cortex* **17**:319.

Mascie-Taylor, C. G. N., and Gibson, J. B. (1979). Assortative marriage and IQ components. *Ann. Hum. Biol.* **6**:1.

Roberts, D. F. (1977). Assortative mating in man—Husband-wife correlations in physical characteristics. *Bull. Eugen. Soc. Suppl.* **2**.

Spuhler, J. N. (1968). Assortative mating with respect to physical characteristics. *Eugen. Q.* **15**:128.

Vandenberg, S. G. (1972). Assortative mating, or who marries whom? *Behav. Genet.* **2**:127.

Wechsler, R. D. (1958). *The Measurement and Appraisal of Adult Intelligence*, 4th ed. Williams and Wilkins, Baltimore.

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