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The effect of childhood experiences on mate choice in personality traits: Homogamy and sexual imprinting

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ABSTRACT

We have made an attempt at demonstrating the effect of parental influence, particularly sexual imprinting, on human mate choice. Extending our earlier studies that focused on facial similarities between couples, and parents and couples, now we investigate resemblances in personality characters. Forty-nine couples and their parents filled in Caprara's Big Five Questionnaire and the s-EMBU retrospective attachment test. We found significant correlations between the young men's wives and their mothers in Conscientiousness that may be a key factor for similarity, given that it is related to the attitudes regarding parental investment. As far as the effect of childhood experiences are considered, we have controversial results. We found several significant relationships for the same-sex parents and a reverse relationship between the quality of parent–child attachment and the degree of similarity between the child's parent and spouse, that may contradict the ethological notion of sexual imprinting. As a possible interpretation, we emphasize the very complexity of detecting and using parental personality structure as a model in mate choice. In general, our results suggest that childhood experiences would play an important role in shaping mate preferences, and parental models may guide partner choice in terms of personality traits.

1. Introduction

1.1. Homogamy and phenotype matching

From the beginning of the 1980s several studies have been published which demonstrate that spouses resemble each other in a large number of personality traits. Positive correlations have been found between their age, education, intelligence, physical attraction, intro- and extraversion traits as well as in many other characteristic features (Bereczkei, Vörös, Gál, & Bernáth, 1997; Mascie-Taylor, 1988; Susanne & Lepage, 1988).

Explanations regarding the adaptive value of homogamy focus on the relationship between similarity, stability of the partnership, and fertility. Several studies demonstrated that when spouses are similar to each other in terms of physical appearance, age, education, personality factors, they stay together longer, are more satisfied with their marriage and bring up more children of their own than those who are not homogamous in terms of these traits (Bereczkei & Csanaky, 1996; Luo & Kohnen, 2005; Mascie-Taylor, 1988). A more recent analysis of couples of an Icelandic population born between 1800 and 1965 has shown a significant positive association between kinship and fertility, with the largest number of offspring observed for couples related at the level of third and fourth cousins (Helgason, Palsson, Guobjartsson, Kristjansson, & Stefansson, 2008). In the light of the extension of kin selection theory, marital harmony and reproductive success may be due to an increased altruism between spouses whose genetic material is similar even if they are not relatives (Rushton, 1989; Rushton, 2009).

Because of the fitness-gains entailed by homogamy, it has been suggested that natural selection preferred a complex psychological mechanism whereby organisms can recognize other organisms similar to them (Rushton, 1989). If similar phenotype reflects similar phenotype – which condition is met in the majority of physical, cognitive, and personality traits (Plomin, DeFries, McClearn, & McGuffin, 2005) – the detection of genetic similarity may be governed by a phenotypic matching mechanism (Pfenning & Sherman, 1995). Individuals have a special innate algorithm whereby they apply their own phenotype on to the unknown individual and will prefer those that have similar features. Several studies conducted in the animal kingdom demonstrate that animals can recognize their previously unknown relatives on the basis of visual or olfactory features (Blaustein, Bekoff, Beyers, & Daniels, 1991; Holmes, 1995). In the case of humans, people have been found to recognize the odor of their children and siblings (Porter, 1987; Weisfeld, Czilli, Phillips, Gall, & Lichtmana, 2003), select their close relatives among unknown faces (McLain, Setters, Moulton, & Pratt, 2000), and prefer self-resembling faces (DeBruine, 2004; Saxton, Little, Rowland, Gao, & Roberts, 2009). An event-related fMRI study has provided evidence for a neural network activated by self-face

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perception, involving right hemisphere structures with mirror properties (Uddin, Kaplan, Molnar-Szakacs, Zaidel, & Iacoboni, 2005).

1.2. Sexual imprinting in human behavior

An alternative explanation for assortative mating involves imprinting-like mechanisms in human mate choice (Bereczkei, Gyuris, Köves, & Bernath, 2002; Little, Penton-Voak, Burt, & Perrett, 2002). The notion of sexual imprinting has long been known in ethology (Lorenz, 1965). It means a learning process during which organisms can learn the characteristic features of their close relatives, and thereafter they prefer a partner in their mate choice that is not much but still slightly different from their parents and siblings that rear them. In other words, organisms are selected for maintaining an optimal balance between inbreeding and outbreeding (Alcock, 1998; Bateson, 1983). Cross-fostering experiments with various species of birds and mammals have revealed that during pair formation adults tend to prefer sexual partners that are similar to individuals that reared them (Immelmann, Pröve, Lassek, & Bischof, 1991; Spence & Smith, 2007; ten Cate, Verzijden, & Etman, 2006). It was also shown that offspring learn primarily the characteristics of the opposite-sex parents' and siblings' phenotype (Vos, 1995; Witte & Sawka, 2003).

Sexual imprinting-like processes have been demonstrated in human mate choice, too. For example, in a study it has been found that adults born to older parents are more attracted to partners of the opposite-sex with an older face than those born to younger parents (Perrett et al., 2002). Another study (Little et al., 2002) demonstrated similarity between the partners of males and females and their parents of the opposite-sex in respect of hair and eye color. When measuring facial proportions (e.g. nose length/face length, eye width/face width, etc.), a significant correlation was shown between the proportions of fathers' faces and chosen male faces, but only in cases when female participants reported a good relationship with their father during childhood (Wiszewska, Pawlowski, & Boothroyd, 2007).

Other studies investigated the possible ontogenetic background of imprinting-like processes. In line with the theoretical assumptions it has been found that physical and emotional relations between children and their parents influence the probability whether children will use the parental model in their mate choice at their adult age. One of the studies demonstrated that mothers who showed relatively more emotional warmth and less rejection towards their son in childhood were likely to become the most frequent match for their son's wife when pairing pictures (Bereczkei et al., 2002). This is also true of non-biological parents: the early relationship between a stepfather and his adopted daughter determines the probability of the daughter seeking a partner similar to her adoptive father (Bereczkei, Gyuris, & Weisfeld, 2004). These results suggest that in addition to the mechanism of genetically programmed phenotypic matching certain learning processes also participate in mate choice based on similarity.

1.3. Personality traits

Not only features of the face and physical appearance but internal features, especially personality traits, are also expected to play an important role in our partner relationships. However, relatively few studies have been conducted in this respect. Some of the earlier studies found positive correlations between spouses in terms of Extraversion and Emotional stability (Mascie-Taylor, 1988). Furthermore, correlations between spouses did not vary much with marital duration, implying a stronger effect of mate selection rather than convergence (Tambs & Moum, 1992). More recently, positive correlations have been found between spouses for the Extraversion and the Conscientiousness factors as well as for the calmness, concern and self-confidence personality traits (Little, Burt, & Perrett, 2006). It is noteworthy that these correlations can still be found even if age and physical attraction (represented on the face) are controlled. Controversial results have been found concerning the effect of the similarity between the spouses' personality structure on marital stability and quality (Arrindell & Luteijn, 2000; Gattis, Berns, Simpson, & Christensen, 2004).

1.4. Predictions

We hypothesize that if the quality of parent–child attachment influences the children's later mate choice, imprinting-like mechanisms would be involved in the measured similarity in personality traits among family members. If, however, the children's various experiences in their family environment will not modulate the resemblance between their opposite-sex parent and their spouse, phenotype matching should occur between partners, and the explanation of sexual imprinting may be ruled out.

This question can be answered by setting up the following predictions:

1. Spouses show a higher rate of similarity in terms of personality traits than individuals paired up randomly from a population.
2. The wife's personality structure is more similar to that of her husband's mother, and the husband's personality is more similar to that of the wife's father than to women and men randomly selected from a population.
3. The examined similarity in personality is expected to depend on how close the relationship between mother and son and father and daughter were in early childhood. Persons who had favorable experiences with their opposite-sex parent during childhood will be more likely to search for a partner resembling this parent in personality features than those who lived in a less favorable family environment.

2. Methods

Forty-nine young couples (mean age of men: 27.67 years, Std. deviation age: 6.53; mean age of women: 25.93 years, Std. deviation age: 5.81) and their opposite-sex parents participated in the study, a total of 294 individuals. The couples were randomly selected from full-time and part-time students of the University of Pécs, and thereafter their parents living in various places were also located. The main criteria for selecting the couples was that they should be partners for at least 5 years and/or they should be living in a committed relationship (should be engaged or married) at least for a year (mean duration of their love relationship was 5.73 years, Std. deviation 4.32 years).

Family members were requested to complete the Caprara Big Five Questionnaire adapted to Hungary (Rózsa, Kő, & Oláh, 2006). The BFQ contains five main dimensions, each with two subscales. It also has a "*Lie*", or in other words, a Social Desirability scale which was developed to measure sincerity. Each subscale consists of 12 items. Responses are given on a five-scale Likert scale. So, the subjects filling out the questionnaire were asked to examine 132 descriptive statements and decide to what extent they can agree with them (Rózsa et al., 2006). In our study we worked with the *main factors* of the BFQ, which are: Energy, Agreeableness, Conscientiousness, Emotional stability and Openness.

In addition to the BFQ questionnaire, the 49 young couples also had to fill out the s-EMBU retrospective attachment (Arindell et al., 1999), which is used to show how adults can remember the rearing behavior of their parents. This test consists of three subscales: Emotional Warmth, Overprotection and Rejection, each of which

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comprises eight items. Respondents had to indicate the degree of agreement separately for both parents on a scale of one to four.

For the purpose of distinguishing negative and positive parent–child relationships, only the Emotional Warmth and the Rejection scales were used in our study. The standard scores of the main BFQ factors were turned into *T* values (Rózsa, 2006), and then the data were evaluated using the SPSS 15.0 for Windows statistical program package.

Our data had a normal distribution and were analyzed using the special variance analysis of SPSS: intraclass correlation and within that, "one-way coefficient." Since the intraclass correlation coefficient also indicates the relative homogeneity of intraclass variables compared to total variance, the significant result also includes the randomization formulated in the hypothesis.

3. Results

3.1. Similarities in personality

The data of the couples show correlations in the Extraversion ($r = 0.41$, $p < 0.01$), Conscientiousness ($r = 0.28$, $p < 0.05$) and Openness ($r = 0.38$, $p < 0.05$) main scales. In other words, the spouses resemble each other in these personality traits (Table 1).

The data of the wives and their husbands' mothers were similar in terms of Conscientiousness ($r = 0.25$, $p < 0.05$), that is, this is where mother-in-law–daughter-in-law similarity can be seen. In this personality factor, significant association has been found between wife and father-in-law ($r = 0.26$, $p < 0.05$).

No correlation has been found between the husbands and their wives' father. So, sexual imprinting presumed to underlie the matching of personality traits could be demonstrated only in the case of men.

3.2. Personality and childhood experiences

Our next question concerns the correlation between the similarity of wife-mother and husband-father on the main scales of the BFQ and the scores of the EMBU Rejection and Emotional Warmth factors. The results show that maternal Rejection and Emotional Warmth have an influence on the mate choice of boys. Maternal love exhibits the strongest effect in the Agreeableness factor; the less emotional warmth mothers nurtured for their sons, the more daughter-in-laws and mother-in-laws resembled each other in this trait ($F(1, 44) = 6.60$, $p < 0.05$). The more rejection men experience by their mother in their childhood, the more likely they are to choose women who resemble their mother in Emotional stability (Covariance analysis, $F(1, 44) = 4{,}57$, $p < 0.05$). There was a tendency for association in the Agreeableness ($F(1, 44) = 3.64$, $p = 0.06$) and the Openness ($F(1, 44) = 3.07$, $p = 0.08$) factors.

We have not been able to demonstrate clearly whether women are influenced by paternal Rejection and Emotional Warmth in their mate choice. The s-EMBU paternal Rejection scale has no relationship with the factors of the woman's father and her spouse measured in the BFQ. However, the Emotional Warmth scale does show a negative association with the Conscientiousness factor of the woman's father and her spouse ($F(1, 44) = 3.30$, $p = 0.07$).

We found significant relationships for the same-sex parents, as well. Paternal rejection has a negative influence on the association between the men's wife and father in Conscientiousness ($F(1, 36) = 7.75$, $p < 0.01$). Maternal emotional warmth shows a positive influence on the relationship between the women's husband and mother in Openness ($F(1, 42) = 5.45$, $p < 0.05$).

3.3. Intraclass correlations

Next, both the husbands and the wives were divided into two groups on the basis of the answers given to the retrospective attachment test according to whether they achieved a low or high score in the s-EMBU Emotional Warmth and Rejection scales. The grouping was based on the median of the scale values. That was necessary because we wanted to get a more accurate picture of how the relationship of the men and women with the opposite-sex parents influenced their mate choice. The analysis was done with the method of intraclass correlation, and presented on Table 2.

Our results regarding the mate choice of men show that there is no correlation between the BFQ data of the mother of men who experienced a small degree of Rejection and their spouses. However, tendency for correlation has been found between the data of the mother of men who received little love from their mother (Emotional Warmth scale) and those of their spouses on the Conscientiousness scale ($r = 0.29$, $p = 0.08$).

There was a significant correlation between the mother and the spouse of the men who experienced a high degree of Rejection by their mother on the Emotional stability main scale ($r = 0.35$, $p < 0.05$). There was a tendency for correlations between the data in the Conscientiousness ($r = 0.30$, $p = 0.07$) factors. There was no correlation in the main BFQ factors between the data of the mother and the spouse of men who experienced a high degree of love from their mother in most of their childhood.

When the effects of the same-sex parents on mate choice were taken into consideration, several matches were also given. Men who had experienced a low level of paternal rejection and a high level of paternal emotional warmth during childhood were more likely to prefer a partner resembling their father in the Conscientiousness factor than men who grew up in a less favorable family environment (Rejection: $r = 0.72$, $p < 0.001$; Emotional Warmth: $r = 0.45$, $p < 0.05$). A non-significant tendency has been found between father and his daughter-in-law for Openness ($r = 0.303$, $p = 0.09$). Women who had experienced high emotional warmth from their mothers were more likely to choose a partner resembling their mother in Openness ($r = 0.44$, $p < 0.05$), and women whose mother had been rejecting during childhood preferred a partner who proved to be similar to this parent in the Emotional stability factor ($r = 0.41$, $p < 0.05$).

Table 1
Resemblance between spouses and between parents and spouses in the Big Five personality dimension (measured on PFQ scales).

BFQ/examine	Participant	Extraversion	Agreeableness	Conscientiousness	Emotional stability	Openness
Homogamy	49 couples	0.41**	0.13	0.28*	0.17	0.38*
Sexual imprinting	Wife-mother-in law	0.11	−0.00	0.25*	0.13	−0.04
	Wife-father-in-law	−0.03	0.03	0.26*	−0.03	0.03
	Husband-mother-in law	−0.09	−0.10	0.11	0.03	0.11
	Husband-father-in-law	0.00	0.09	−0.08	0.17	−0.03

* $p < 0.05$.
** $p < 0.01$.

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Table 2
Relationships between parental attitudes (measured on EMBU scale) and personality characters (measured on BFQ scales) in favorable and unfavorable family environment.

			Men					Women				
			Extraversion	Agreeableness	Conscientiousness	Emotional stability	Openness	Extraversion	Agreeableness	Conscientiousness	Emotional stability	Openness
Opposite-sex parent	Rejection	Low	0.02	−0.21	0.14	−0.15	−0.23	−0.08	−0.03	−0.03	0.08	−0.05
		High	0.20	0.24	0.30*	0.35**	0.20	−0.10	−0.13	0.16	0.09	0.24
	Emotion warmth	Low	0.10	0.26	0.29*	0.20	0.04	−0.08	−0.15	0.26	0.14	0.05
		High	0.14	−0.23	0.22	0.08	−0.14	−0.10	−0.16	−0.21	0.00	0.18
Same-sex parent	Rejection	Low	0.28	0.03	0.72***	−0.12	0.30*	0.11	−0.23	0.33*	−0.18	0.05
		High	−0.24	0.04	−0.03	0.13	−0.09	−0.02	0.19	−0.24	0.41**	−0.12
	Emotion warmth	Low	−0.24	−0.11	0.09	0.30	−0.05	0.00	0.03	−0.10	0.26	−0.26*
		High	0.1	0.16	0.45**	0.23	0.07	0.05	0.17	−0.03	0.07	0.44**

* $0.05 < p > 0.1$.
** $p < 0.05$.
*** $p < 0.001$.

4. Discussion

In our study, we addressed the issue whether the parental model has any influence on mate choice in the dimension of personality traits, as claimed by the sexual imprinting hypothesis. Our results suggest that people seek to choose a partner for their long-term relationship whose certain personality traits resemble those of their parents, and this tendency is strongly related to their childhood experiences about parents.

We first found mates resemble each other in several personality factors. Our results show that the members of the 49 couples represented in our study resemble each other in terms of the Extraversion, Conscientiousness and Openness personality traits. This finding supports our first hypothesis in that spouses exhibit a higher rate of similarity in certain personality traits than randomly paired individuals taken from a population. The data of the couples especially show a strong correlation in the Extraversion factor, which is in line with the data presented by other studies (e.g. Keller, Thiessen, & Young, 1996). It is quite conceivable that this factor plays an important role in long-lasting partner relationships. It is possible, for example, that an extraverted individual finds it hard to go out, explore and share new experiences with an introverted person, and she/he rather search for a more extraverted partner for a long-term relationship.

The data of our study has provided some support for prediction 2 that concerns the similarities of personality structures between the spouse and the opposite-sex parents. We found significant correlations between the young men's wives and their mothers on the Conscientiousness scale. Conscientiousness seems to be a key factor for similarity, which can be related to the attitudes regarding parental investment (Buss, 1996). In the long run, it pays to choose a partner who can make a commitment to the partner relationship and the family just like we do. Furthermore – in accordance with the sexual imprinting hypothesis – no association has been found between the partner and the same-sex parents in personality dimensions. At the same time, we could not support the predicted associations between the female participants' husband and their father.

As far as our third prediction is concerned, the results are quite contradictory. Whereas experiences in family proved to have a large effect on similarity-based mate preferences, some of the results did not meet our expectations. First, we found several significant relationships for the same-sex parents that may contradict the notion of sexual imprinting that has been developed by ethologists. In animal studies they found that adults prefer sexual partners that are similar to the opposite-sex parent that reared them (Vos, 1995; Witte & Sawka, 2003). In the overwhelming majority of animal species, females invest more time and energy in raising offspring than males, and offspring – not surprisingly – imprint to their mothers. In humans, however, where less difference exists between the sexes in parental investment, children may be imprinted to both parents. Further studies are needed to clarify how males and females provide models for imprinting processes during a long period of childhood.

Second, contrary to prediction 3, we have found similarity in the Emotional stability and Agreeableness factors for men who experienced a high degree of Rejection and little Emotional Warmth from their mother during childhood. In other words, the unfavorable early relationships increased the likelihood of men choosing a partner who resembles their mother in certain personality traits. These results seem to be controversial in the light of the earlier studies that examined the role of childhood experiences in shaping mate preferences concerning facial similarity (Bereczkei et al., 2002, 2004; Wiszewska et al., 2007). The authors found that the more emotional warmth and less rejection the opposite-sex parent provided for their children, the more facial similarity was per-

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ceived between this parent and the children's spouses. As a possible interpretation, the authors stated that children who experience a favorable family environment and rewarding social contacts with their parents are inclined to shape a mental representation of the parent's physical appearance, and search for a partner who fits that perceptual schema.

Why did we not find a similar positive association in personality features between the quality of parent–child attachment and the degree of child–spouse similarity? Detecting resemblances concerning personality features, and using a mental representation of parental personality characters in searching for a mate may be a much more complex process than simply shaping a "perceptual schema" on similar faces. Theoretically, it is not obvious that a strong and linear association would exist between the child's physical and emotional closeness to parents and the degree of using the parental personality structure as a model in the later mate choice. Various effects in family and even beyond family may deeply influence the development of these representations, such as the particular norms and values in the family, the other parent's rearing behavior, the adolescents' memories on and attitudes to their parents' behavior during childhood, etc.

It is possible, for example, that the partner resembles the male subject's mother with negative rearing behavior in certain traits, but differs from her in other, more positive features. As possible supportive evidence, we found a positive correlation between wives and mothers showing rejection towards their son during childhood in Emotional stability that involves both positive and negative traits in a sense of a social relationship, such as anxiety, the ability to cope with emotions, irritability and the capability to control dissatisfaction and anger. Another possible interpretation lies in a process, called re-traumatization, in which the "bad" maternal pattern exerts its influence as a trauma, and this trauma is repeated later in mate choice (Fonagy & Target, 2003). The man cannot break away from his childhood fixation to his mother, and one of the possible consequences is that he chooses a partner similar to mother with whom he had a bad relationship during childhood.

Apart from these difficulties in interpretation, the present study has confirmed that learning processes in family play an important role in finding partners with similar personality traits. The fact that the children's various experiences in their family environment modulate the resemblance between their opposite-sex parent and their spouses confirms that, besides phenotype matching, a learning mechanism influences mating preferences for resemblances in personality. However, due to our controversial results, the former theoretical considerations of sexual imprinting should be revised. Further studies are required to address the issue as to how social learning mechanisms work in shaping mate preferences, what role the imprinting-like mechanism plays in this process, and how positive and negative parental attitudes influence one's mate choice later. Likewise, we need to find an empirical answer to the question as to how similarity fits in the complex system of mate choice working on the basis of various different criteria and preferences, such as attractiveness intelligence, and others.

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