# The Role of Personality and Intelligence in Assortative Mating

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Assortative mating is the individuals' tendency to mate with those who are similar to them in some variables, at a higher rate than would be expected from random. This study aims to provide empirical evidence of assortative mating through the Big Five model of personality and two measures of intelligence using Spanish samples. The sample consisted of 244 Spanish couples. It was divided into two groups according to relationship time. The effect of age, educational level and socioeconomic status was controlled. The results showed strong assortative mating for intelligence and moderate for personality. The strongest correlations for Personality were found in Openness, Agreeableness and Conscientiousness. *Keywords: assortative mating, intelligence and personality.*

El emparejamiento selectivo es la tendencia de los individuos a emparejarse con aquellos que son semejantes a ellos en ciertas variables, más de  lo que cabría esperar por azar. El presente estudio pretende aportar evidencia empírica acerca del emparejamiento selectivo con muestras españolas a través del modelo Big Five de la personalidad y de dos medidas de inteligencia. La muestra estuvo compuesta por 244 parejas españolas, y fue dividida por el tiempo de relación en dos grupos. Se controló el efecto de la edad, el nivel académico y el nivel socioeconómico. Los resultados mostraron un fuerte emparejamiento selectivo en inteligencia y más moderado para la personalidad. Los rasgos de personalidad con mayores correlaciones fueron Apertura, Cordialidad y Responsabilidad. *Palabras clave: emparejamiento selectivo, inteligencia y personalidad.*

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Assortative mating is the mating of pairs more similar for some trait (physical or psychological) than would be expected from random mating (Colom, Aluja, & García, 2002; Díaz-Morales, Quiroga, Escribano, & Delgado, 2009). Díaz-Morales et al. (2009) carried out an in-depth analysis to test assortative mating tendencies empirically. In their study, couples were matched randomly and the difference between correlations of the personality and intelligence traits was analysed in comparison with real couples. This difference in correlations was found to be significant.

Due to the impact of assortative mating in several human phenomena (Buss, 1984; Flynn, 1999; Heath, Eaves, Nance, & Corey, 1987; Herrnstein & Murray, 1994; Jensen, 1978; Mare, 1991; Mascie-Taylor, 1989; Mascie-Taylor & Vandenberg, 1988; Qian & Preston, 1993; Vandenberg, 1972; Watkins & Meredith, 1981) some hypotheses have been proposed (Lykken & Tellegen, 1933) on mating tendencies. Out of these hypotheses, the one that has received most empirical support to date is the "Similarity Hypothesis". This hypothesis states that people choose individuals similar to themselves in variables such as sociodemographic, personality, intelligence, interests and/or values as mates (Colom et al., 2002).

Firstly, the greatest similarities amongst individuals of a couple have been found in sociodemographic variables, as these show the highest correlations (Buss, 1984; Feng & Baker, 1994). In relation to psychological variables, the results obtained in the revised research are consistent for intelligence but more unstable for personality traits.

Intelligence correlation coefficients vary between .44 and .55 (Colom et al., 2002; Díaz-Morales et al., 2009). According to these authors, this is the pure effect of intelligence, as is shown by the partial correlations found when the academic level is controlled. According to the data available to date for Spanish samples, it is possible to conclude, along the lines of Colom et al. (2002), that a tendency to mate according to similarities in intelligence exists. Linking these results to the definition of intelligence (Andrés-Pueyo, 1997; Andrés-Pueyo & Colom, 1998; Colom, 1998; Colom & Andrés- Pueyo, 1999; Juan-Espinosa, 1997), people mate according to similarities in their ability to understand the environment.

Assortative mating according to personality traits has been approached in research mainly through the PEN (Eysenck & Eysenck, 1985) and the Big-Five (Costa & McCrae, 1992) models. The Big-Five model has not to date been used in this context with Spanish samples. The McCrae et al. (2008) study used American, Czech and Russian samples. These authors obtain positive correlations (although with moderate intensities) for all personality traits, with some variance between the different samples.

Recently, a meta-analysis has been published that intends to analyse the level of relationship existing amongst the variables of the Big-Five model and the level of satisfaction with the relationship (Malouff, Thorsteinsson, Schutte, Bhullar, & Rooke, 2010). Even though it was not these authors' main objective, they argue in their study that the analyses of the assortative mating tendencies according to personality traits could not be performed for most of the revised literature. However, in those studies that did allow for such analyses, it was found that, out of the 39 associations revised, 31 were not statistically significant, six were significant in the direction of the similarity, and two were significant in the direction of no similarity. These authors conclude that the available evidence suggests there is no relationship between the Big-Five personality traits within the members of the couple. However, it should be highlighted that the main objective of this meta-analysis was not to analyse the assortative mating tendencies according to the Big-Five model but to analyse the relationship between the personality variables and the satisfaction with the relationship. For this reason, research studies relevant to the objective of this present study, such as the work by McCrae et al. (2008) previously cited, were not a part of the 19 studies analysed in Malouff et al.'s (2010) meta-analysis.

Within our context, positive and significant (although weak) correlations have been found for the Strength of Character (psychoticism) dimensions using the Pen model on Spanish samples (Colom et al., 2002). These authors conclude that the dimensions of the Pen model do not reveal important effects in assortative mating tendencies. Later, Díaz-Morales et al. (2009) used Buss' (1988) model of temperament evaluated through the scales created by Quiroga and Navascués (1995). This model analyzes specific personality traits, whereas the Pen model (Eysenck & Eysenck, 1985), used by Colom et al. (2002) defines very broad traits. In this second study, positive correlations are found, almost duplicating the magnitude of the correlations reported by Colom et al. (2002) with the exception of the dimensions of temperament of Activity and Fear. In the study by Díaz-Morales et al. (2009), these results are attributed to the instrument of measure used. The traits are more specific in Buss´ (1988) model and they allow detecting differential tendencies. If differential tendencies exist between facets of the same trait, then their effects would cancel each other out and yield a correlation of low magnitude when measuring it through the Pen model (Díaz-Morales et al., 2009).

On the other hand, Díaz-Morales et al.'s (2009) results show differential tendencies among couples with different relationship durations. Couples with less relationship time are more similar in sociability and nurturance, which the authors point out are prosocial traits, whereas couples with longer relationship time show higher correlations in intelligence.

Up to this point, the evidence revised follows the similarity hypothesis. However, other hypotheses have been proposed (Lykken & Tellegen, 1993) that can account for the negative correlations or the heterogeneity of the results obtained in previous studies.

The negative sign of the correlation coefficients in previous studies (Colom et al., 2002; Watson et al., 2004) support the "Complementary" theory, where individuals would look for mates not similar to themselves that could complement them. Evidence supporting this hypothesis is scarce.

In view of the heterogeneity of results, a third hypothesis was proposed, called the "Idiographic hypothesis" (Lykken & Tellegen, 1993). According to these authors, each individual possesses personal criteria to choose a mate. This hypothesis was empirically tested by comparing the wives of monozygotic (MZ) twins to the wives of dizygotic (DZ) twins. If the wives of MZ twins are more similar than the wives of DZ twins, then this hypothesis could not be rejected. The authors themselves carried out the comparison, obtaining negative results for 74 physiological variables. Later, Rushton and Bons (2005) did obtain similarities between MZ twins' spouses, more than for DZ twins' spouses.

On the other hand, the Social Homogamy hypothesis is proposed. This hypothesis consists of the lack of an active search on behalf of the individuals. Similarities would not be due to an active pairing, but rather to indirect influences that have to do with socioeconomic status, academic achievements and social environment (Botwin, Buss, & Shackelford, 1997; Eaves, Fulker, & Heath, 1989; Nagoshi & Johnson, 1994; Reynolds, Baker, & Pedersen, 2000; Tambs, Sundet, & Berg, 1993). This means that it is more probable that people that are more alike frequent the same environments and meet. The predominance of couples of the same generation and with similar academic achievements has been previously reported (Colom et al., 2002; Díaz-Morales et al., 2009; Gruber-Baldini, Schaie, & Willis, 1995; Watson et al., 2004). The way to approach this hypothesis empirically would be to control the sociodemographical variables and to observe the partial correlations. Watson et al. (2004) obtained results where the similarities in intelligence decreased when controlling age and academic achievements. However, Luo and Klohnen (2005) did not find any evidence to support this hypothesis. Using Spanish samples, Díaz-Morales et al. (2009) did not find the correlation coefficients in intelligence and personality variables altered when controlling similarities in age and academic achievements. Therefore, the data do not allow concluding that social homogamy explains mating, at least, not in our context.

Finally, the "Convergence hypothesis" has been proposed, according to which pairing would not occur due to initial similarities, but rather due to an increase in similarity through time (Price & Vandenberg, 1980). Watson et al. (2004) analysed this hypothesis and concluded that there was no convergence, as they even found data that showed divergence for Openness (couples with longer relationship times were less similar in this variable). Data from Colom et al. (2002) and Díaz-Morales et al. (2009)

show greater similarity amongst long-term couples than among short-term couples. However, neither of these studies reports whether these differences in correlations are statistically significant.

The present study tries to contribute more empirical evidence for mating in personality and intelligence traits, following the line of previous studies with Spanish samples (Colom et al., 2002 & Díaz-Morales et al., 2009). The objective of this study is to analyse the role of personality through the Big-Five model, (as it has never been approached using Spanish samples), taking the effect of intelligence and the sociodemographical variables observed in previous research (Colom et al., 2002; Díaz-Morales et al., 2009) into account.

## Method

### Participants

The present study's sample was composed of 244 heterosexual couples (488 participants). The mean age of the participants was 32.68 ($SD$ = 13.65) and ranged between 16 and 80 years of age. There were no significant sex differences for the age variable. Out of these participants, 59.7% of the couples were single, 37.2% were married, 0.4% were unmarried, 2.1% were divorced and 0.4% were widowed. The mean relationship time was 132.46 months ($SD$ = 144.45). This variable shows a strong positive asymmetry. However, the fact that the SD is higher than the mean is not due to the presence of extreme cases in the distribution.

### Instruments

Sociodemographic Data
A sociodemographic data sheet was created were participants were asked about their age, sex, status, academic achievements, socioeconomic level and relationship time.

The socioeconomic level and the academic achievements were evaluated through multiple choice items that included 3 response categories for the first one (low, medium, high) and 4 response categories for the second one (no studies, primary, secondary and university studies).

Personality Measures
The abbreviated version of the NEO-PI-R test (Costa & McCrae, 2002) was used, i.e.: the NEO-FFI in its Spanish version. It has 60 items in a Likert-type answer scale with five possible answers. This instrument measures the Big-Five personality traits: Neuroticism, Extroversion, Openness to experience, Agreeableness and Conscientiousness. The reliability coefficients were .83, .82, .78, .81 and .79 respectively. The reliability coefficients were similar for males and females.

Table 1
*Descriptive statistics corresponding to males and females within the analysed sample, Student t and effect size*

|  | MALES | | FEMALES | | $t$ | $d$ |
|---|---|---|---|---|---|---|
|  | Mean | SD | Mean | SD |  |  |
| Age | 33.64 | 14.12 | 31.63 | 13.20 | 1.596 | .147 |
| Neuroticism | 17.40 | 7.25 | 22.41 | 7.89 | −7.270** | .661 |
| Extraversion | 30.86 | 7.49 | 32.02 | 7.43 | −1.712 | .156 |
| Openness | 26.04 | 7.56 | 29.21 | 7.98 | −4.494** | .408 |
| Agreeableness | 26.02 | 6.68 | 29.48 | 6.81 | −5.650** | .513 |
| Conscientiousness | 30.14 | 7.70 | 30.05 | 7.73 | .128 | .012 |
| Abstract Reasoning | 16.95 | 5.75 | 16.82 | 5.92 | .251 | .022 |
| Verbal Reasoning | 28.84 | 9.28 | 27.89 | 8.51 | 1.201 | .109 |

Note: ** $p < .001$

Intelligence Measures

The intelligence measures were obtained applying the R and V factors of the Primary Mental Abilities test (Thurstone & Thurstone, 1938). The reliability of each one of the factors is .94 and .87 respectively.

The PMA-IR is composed of 30 items and is a good measure of the "g" factor. It evaluates abstract reasoning and ability to infer relationships (Thurstone & Thurstone, 1938).

The PMA-V is composed of 50 items and it measures the ability to understand and express ideas with words (Thurstone & Thurstone, 1938).

*Data Analyses*

Firstly, the Pearson correlations in personality (NEO-FFI) for the 5 big factors: Neuroticism (N), Extroversion (E), Openness (O), Agreeableness (A) and Conscientiousness (C) and the two intelligence factors, Abstract reasoning (PMA-R) and verbal reasoning (PMA-V) were calculated. The correlation coefficients obtained for personality and intelligence could be because couples are of a certain age, socioeconomic level or have achieved a certain academic level. The partial correlation is calculated, controlling the effect of similarities among members of a couple according to the mentioned variables, both together and separately.

Subsequently, the sample was divided into two groups: couples with a relationship time up to 73 months ($n = 120$, with ages ranging from 16 to 58) and couples with relationship time over 73 months ($n = 120$, with ages between 20 and 80) and the analyses previously described were replicated.

Finally, to detect how the level of difference in age, academic achievement and socioeconomic level can account for differences among couple members in personality and intelligence, a stepwise linear regression analysis was performed. The score resulting from the difference (absolute value) obtained for each couple as a result of subtracting the standard scores of each member for each one of the personality and intelligence traits evaluated was used as dependant variable. The independent variables were the difference (absolute value) between the sociodemographic variables.

Results

The descriptive statistics, student t and effect size correspondent to males and females of the sample according to age, personality and intelligence traits are shown in Table 1.

As is apparent from Table 1, there are only significant sex differences for Neuroticism, Openness and Agreeableness, all in favour of women. The effect sizes for these differences are moderate in every case (range of d.408-.661) (Cohen, 1992).

The values of the correlations are shown in Table 2. Couples are similar in all variables analysed, with significant and positive correlations for all cases except for the variable Extroversion, which was not found to be significant.

The greatest similarities are found for sociodemographic variables (age, academic achievements and economic level), followed by the intelligence factors. In relation to personality variables, the highest correlations were of moderate intensity and were found for the Openness, Conscientiousness and Agreeableness traits.

Since correlations for the sociodemographic variables were so high, it is possible that the correlations in personality and intelligence could be explain by age, academic achievement and socioeconomic level. However, as partial correlations show, the effect of personality and intelligence is genuine as there are no great variations in correlation coefficients when the mentioned variables are controlled.

The correlations are higher in the group of couples with more than 73 months of relationship time for all sociodemographic variables and personality with the

Table 2

*Pearson correlation coefficients and partial correlations (covariables: age, academic achievements and economic level) between male and female's scores for personality and intelligence, according to relationship time*

| | $r$ | Controlling age | Controlling academic achiavements | Controlling socioeconomic level | Controlling all variables | Up to 73 months | More than 73 months |
|---|---|---|---|---|---|---|---|
| Age | .973*** | | | | | .902*** | .938*** |
| Academic achievements | .483*** | | | | | .412*** | .514*** |
| Economic level | .443*** | | | | | .208*** | .657*** |
| Neuroticism | .197** | .212** | .174** | .188** | .198** | .194* | .223* |
| Extraversion | .065 | .02 | .054*** | .057 | .012 | .015 | .044 |
| Openness | .288*** | .289*** | .265*** | .276*** | .248*** | .312*** | .215* |
| Agreeableness | .241*** | .236*** | .247*** | .255*** | .255*** | .196* | .267** |
| Conscientiousness | .287*** | .244*** | .284*** | .283*** | .237*** | .199* | .218* |
| Abstract reasoning | .451*** | .433*** | .439*** | .454*** | .404*** | .438*** | .403*** |
| Verbal reasoning | .405*** | .435*** | .438*** | .465*** | .463*** | .490*** | .335*** |

Note: $n = 244$; *** $p < .001$, ** $p < .01$, * $p < .05$; $n = 120$ couples with up to 73 months together, $n = 102$ couples with more than 73 months together

Table 3

*Stepwise Linear Regression analysis for the differences in Personality and Intelligence variables*

| | | DEPENDANT VARIABLES | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | DIF-N | DIF-E | DIF-O | DIF-A | DIF-C | DIF-R | DIF-V |
| INDEPENDENT VARIABLES | | | | | | | | |
| DIF-AGE | Standard Beta | | | .261 | | | | –.137 |
| | Change in $R^2$ | NI | NI | .068 | NI | NI | NI | .019 |
| | Sig. | | | .001 | | | | .040 |
| DIF-ACADEMIC | Standard Beta | | | | | | .154 | |
| | Change in $R^2$ | NI | NI | NI | NI | NI | .024 | NI |
| | Sig. | | | | | | .021 | |
| DIF-ECONOMIC | Standard Beta | | | | | | | |
| | Change in $R^2$ | NI | NI | NI | NI | NI | NI | NI |
| | Sig. | | | | | | | |
| | Model's $R^2$ | — | — | .068 | — | — | .024 | .019 |

Note: DIF: Differences between members of a couple (absolut values); AGE: Age; ACADEMIC.: Academic achievements; ECONOMIC: Socioeconomic level; N: Neuroticism, E: Extraversion; O: Openness; A: Agreeableness; C: Conscientiousness; R: Abstract reasoning; V: Verbal reasoning; NI: Not included.

exception of the Openness trait. This trait obtains a higher correlation coefficient for couples with up to 73 months of relationship time.

In relation to intelligence, the highest correlations are found for the up to 73 months group, for both intelligence variables: Economic level and Verbal reasoning.

The results of the Stepwise Linear Regression are shown in Table 3. It has been found that the differences in age account for some of the differences in Openness and Verbal reasoning, whereas differences in academic achievements explain some of the differences in Abstract reasoning.

However, as Table 3 indicates, the explained variance percentages are, in all cases, very small.

## Discussion

The similarities among the couples of the analysed sample are in line with the results found in earlier studies both for personality (Díaz-Morales et al., 2009, McCrae et al., 2008), and intelligence (Bouchard & McGue, 1981; Colom et al., 2002; Díaz-Morales et al., 2009). Therefore,

this study yields empirical evidence that supports the similarity in assortative mating hypothesis, that is, people tend to mate with those most similar to themselves and not with those that complement them.

Couples are very similar across all sociodemographic variables (Colom et al., 2002; Díaz-Morales et al., 2009; Gruber-Baldini et al., 1995; Watson et al., 2004) However, the similarity across the psychological variables analysed cannot be attributed to these variables, as the correlations remain stable when these variables are controlled (Colom et al., 2002; Díaz-Morales et al., 2009). The role of personality and intelligence according to the results of this present study, is genuine which, in turn, invalidates the idea that the social homogamy hypothesis can explain similarities in personality and intelligence between members of a couple. In this same way, the possibility that the sociodemographic variables could explain the differences in the evaluated psychological variables was analysed. This analysis showed that these variables do not affect similarity as has been previously described and that they do not account for differences between members of a couple.

Couples with more than 73 months of relationship time are more similar in the sociodemographic variables than those couples with less than 73 months. However, this difference between groups was only statistically significant for socioeconomic level (the correlation magnitude changes from .20 to .65; $p < .001$). Therefore, if seems that the similarity in socioeconomic level is less for group with less than 73 months of relationship time. This result would go against the social homogamy hypothesis, which states that couples do not mate in an active manner but rather they meet when present in places that are in accordance with their socioeconomic status and that they pair off with partners similar to themselves in these type of variables. If couples with shorter relationships time (those coupled most recently) differ in their socioeconomic level, it is because social homogamy does not occur. The fact that the correlations of couples with longer relationships are much more intense suggests that these couples that have consolidated their relationship and live together tend to be considered as belonging to the same socioeconomic status.

In relation to the psychological variables, we can conclude that personality traits play a reduced role in assortative mating, as the magnitude of the correlations is moderate in all cases. When the different personality traits are observed, our results are in line with those obtained by McCrae et al. (2008). The obtained correlations were positive for all traits without exception, and even slightly higher than obtained by McCrae et al. (2008). Therefore, assortative mating occurs for all personality traits even though its effects are reduced. These results go against results obtained in other revised studies (Colom et al., 2002; Figueredo, Sefcek, & Jones, 2006; Luo & Klohnen, 2005; Watson et al., 2004) where similarities where only found for some personality traits, and even some negative correlations were found.

The personality traits where members of a couple were found to be most similar were Openness, Agreeableness and Conscientiousness. These results are congruent with previous studies with Spanish samples. On one hand, these results follow those obtained by McCrae et al. (2008) where the strongest correlations were for Openness. On the other hand, our results follow previous studies where the greatest similarities were found for Character Strength (Colom et al., 2002), Sociability and Nurturance (Díaz-Morales et al., 2009), traits empirically related to Agreeableness and Conscientiousness. These results suggest that when it comes to mating, the similarity in the search for stimuli and experiences, in willingness to help others and in taking responsibility becomes an important factor.

The magnitude of the correlations was slightly higher for the group of couples with over 73 months of relationship, except for the Openness trait. However, these differences were not found to be significant in any case. This evidence would be incompatible with the Convergence hypothesis. The similarity between members of a couple does not increase significantly with time, as the similarities between couples with shorter relationship times do not differ from those with longer relationship times.

Similarities in intelligence are within the values found in previous studies with Spanish samples (Colom et al., 2002; Díaz-Morales et al., 2009). It is interesting to point out that these similarities are not explained by age, academic achievements or socioeconomic level.

The values for intelligence are much higher than those for personality. Therefore, it seems intelligence plays a much more important role in assortative mating tendencies. In practice, this means that people tend to mate according to abilities such as reasoning, planning, problem-solving, abstract thinking, understanding complex ideas, quick learning and learning from experience (Andrés-Pueyo, 1997; Andrés-Pueyo & Colom, 1998; Colom, 1998; Colom & Andrés- Pueyo, 1999; Juan-Espinosa, 1997). In conclusion, people tend to mate with each other based on similarities in their ability to understand their surroundings rather than based on similarities in their personalities, that is, the usual or primarily way of responding to certain situations (Colom, 1998; Juan-Espinosa & García, 2004).

The correlations for intelligence were slightly higher for the group with up to 73 months of relationship time. The revised literature (Colom et al., 2002; Díaz-Morales et al., 2009) found the inverse tendency, that is, that the couples with more than 73 months of relationship time showed the more intense correlations for intelligence. However, either of these revised studies mentions if this difference was found to be significant. In the present study, only the difference between the Verbal reasoning correlations was found to be significant ($p < .05$). Therefore, the data from this present study are again incompatible with the Convergence hypothesis as there are no differences between both groups of couples for Abstract reasoning and the correlation is higher for Verbal

reasoning in couples with shorter relationship time. It seems that similarity in intelligence is not only important for relationships to last (Díaz-Morales et al., 2009) but also plays a key role in the first stages of mating.

It is interesting that couples with shorter relationship times show a greater similarity for verbal reasoning. This ability entails the crystallisation of fluid intelligence in comprehension and reasoning after exposure to problems with the environment (Juan-Espinosa, 1997). Therefore, from the very beginning, people tend to mate with those that can express and understand ideas in the same way they do.

The repercussions of assortative mating are discussed firstly in terms of the heritability associated to the traits, as assortative mating causes an increase in the genetic differences that on average separate families (Colom et al., 2002; Jensen, 1998; Mascie-Taylor, 1989; Mascie-Taylor & Vandenberg, 1988; Watkins & Meredith, 1981). Secondly, assortative mating also has repercussions on relationship maintenance. Díaz-Morales et al. (2009) highlight similarity in intelligence as a protecting factor for relationships.

If the tendencies in assortative mating in Spain reported in previous studies are compared, our data show a slight increase in assortative mating for couples with shorter relationship times, as the correlations are higher for this group than in previous studies (Díaz-Morales et al., 2009). A slight increase was also found in mating for an American sample (Herrnstein & Murray, 1994). However, the interpretations given by these authors should be carefully considered, as they deal in a different cultural context.

In summary, the present study reports a tendency to mate according to similarities in intelligence and personality plays a reduced role in mating, highlighting the Openness, Agreeableness and Conscientiousness traits whereas Intelligence plays a much more relevant role.

With the exception of Verbal reasoning, no difference was found between couples with shorter relationship times and couples with longer relationship times. Therefore, the Convergence hypothesis could not explain our results. In the same way, the similarities found for the psychological traits analysed cannot be attributed to the similarity in sociodemographic variables, hence, there is no evidence supporting social homogamy.

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