



Assortative preferences for personality and online dating apps: Individuals prefer profiles similar to themselves on agreeableness, openness, and extraversion

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ABSTRACT

Introduction: Established couples tend to have similar personalities (i.e., assortative mating); however, the mechanism for this effect is unclear. Individuals may initially be attracted to others who are like themselves (i.e., have assortative preferences). Alternatively, couples may become more similar over time. These explanations have been difficult to disentangle. Assortative mating may be less common in online situations as barriers related to social homogamy are removed. The current study experimentally investigates which, if any, of the Big Five personality traits were assortatively preferred in an online environment.

Methods: Online volunteers and paid participants (205 females and 178 males) viewed 100 ostensible dating profiles comprised of random pairings of facial images and personal descriptions, the latter of which were prepared for perceived personality. Participants indicated whether they would like to “match” with each profile, mimicking responses made on dating applications, and completed the Big Five Inventory (BFI-44).

Results: Participants showed assortative preferences for agreeableness, openness, and extraversion, but not for conscientiousness or emotional stability.

Conclusion: These results suggest that people exhibit assortative preferences in an online dating app environment. If these online preferences translate to long-term relationships, this could help explain similarities found in established couples identified in previous research.

1. Introduction

A renowned proverb states that “birds of a feather flock together”. This phrase suggests that individuals surround themselves with others with whom they share similarities. When applied to romantic partners, this is referred to as assortative mating (Buss, 1985). Indeed, individuals tend to choose a partner with whom they share similarities; this includes physical attributes, such as age, race, and attractiveness (Buss, 1985), but also non-physical characteristics, such as socio-political attitudes (Watson et al., 2004), socioeconomic status (Buss, 1985), and personality (e.g., Botwin et al., 1997).

Previous research investigating assortative mate choice and preferences for the Big Five personality traits (which includes agreeableness, conscientiousness, emotional stability, extraversion, and openness; McCrae & Costa, 1987) is mixed. Some previous research indicates that actual partners are only similar to each other on agreeableness, conscientiousness, and openness (Botwin et al., 1997; Escorial & Martín-

Buro, 2012; Rammstedt & Schupp, 2008), while other studies report a different pattern of results, such as McCrae et al. (2008) which found that partners resemble one another on agreeableness and openness, but not conscientiousness. Štěrbová et al. (2017) also found that homosexual couples reported being similar on conscientiousness, extraversion, and openness, but only observed assortative mating on extraversion for heterosexual couples. Further, some contradictory results suggest individuals may prefer partners who are similar to themselves in personality, but their actual romantic partners do not embody these preferences (Figueredo et al., 2006).

There are several potential explanations as to why established romantic couples may share similarities in personality (for a review, see Luo, 2017). First, couples' personalities may grow more similar across the length of a relationship. Consistent with this interpretation, married couples were reported to be more similar in personality than dating couples (Keller et al., 1996, however, see Gonzaga et al., 2010). Relatedly, couples that are dissimilar may either not get married or separate

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earlier than those who are more similar. Second, individuals may have met potential partners through their place of work or study, at a social or hobby club, or through a mutual friend. In these scenarios, potential partners are more likely to be of a similar age, social class, ethnicity, or share similar interests and attitudes. Therefore, similarities in personality within established couples may be due to the environment in which individuals are likely to meet potential partners (i.e., social homogamy or propinquity) and not due to assortative preferences per se (Mascie-Taylor & Vandenberg, 1988). Third, individuals may be attracted to others with whom they share similarities (i.e., display assortative preferences; Hunt et al., 2015) either for social compatibility reasons, or some evolved adaptive mechanism (e.g., increased relationship quality or satisfaction; Gonzaga et al., 2010; Luo & Klohnen, 2005; Russell & Wells, 1991, but see Watson et al., 2004).

Online dating and the use of dating platforms may help parse these potential explanations. Although online dating platforms may be used for a variety of reasons, seeking love has been reported to be a primary motivation for using the popular dating application Tinder (Sumter et al., 2017). In 2020, 12 % of U.S. adults reported having married or formed a committed relationship with someone they met online (Brown, 2020). Dating online to find a long-term romantic partner appears to be particularly prevalent among young adults; 21 % of individuals aged 18–29 report having married or formed a committed relationship with someone they initially met online (Brown, 2020). Dating applications (e.g., Tinder) and websites (e.g., PlentyOfFish) can vary widely on the amount of information provided on user profiles. For instance, Tinder profiles tend to contain very little personal information, potentially only an individual's location, age, one photograph, and, optionally, a short personal description, and profiles of potential partners shown to users are only limited by geographic location. As such, the rise in popularity of online dating may remove the social barriers of meeting only others with whom similarities are already shared (Lee, 2016; Neyt et al., 2020, however, see Ranzini et al., 2022). In the online dating environment, initial preferences and attraction can be indicated by users positively evaluating the profiles of others. When two online daters “match” (both positively evaluate the others' dating profile), further communication options tend to become available. This allows for the initial preferences and attraction between users to either develop (potentially forming a long-term relationship) or diminish. If assortative preference for personality is found within online dating situations, then similarities between couples could be, in part, explained by an initial attraction for similar individuals. Alternatively, if assortative preferences are not found, then the similarities of established couples would be better explained by social homogamy, or by couples becoming more similar over time.

Little previous research has investigated assortative preferences for personality in an online dating environment. This is important to investigate because online mate preferences will have an increasing impact upon the formation of romantic relationships as the popularity of online dating continues to rise. In a study investigating online preferences, Neyt et al. (2020) found that participants reported assortative preferences only on agreeableness and openness, failing to support patterns of assortative preference on conscientiousness typically found between existing couples (Botwin et al., 1997; Escorial & Martin-Buro, 2012; Rammstedt & Schupp, 2008). However, there are two key shortcomings of this research. First, Neyt et al. (2020) asked participants to rate only 16 profiles. Given that generalisability to a population of stimuli increases as a function of the number of stimuli, increasing the number of dating profiles rated by participants is important because it improves the generalisability of results, and by extension, the construct validity (Wells & Windschitl, 1999; Yarkoni, 2022). Second, when measuring participant personality of the Big Five traits, Neyt et al. (2020) used the Ten-Item Personality Inventory (TIPI; Gosling et al., 2003), which has reduced internal consistency (and therefore less power to detect an effect if it exists) compared to instruments with a larger number of items (Balgiu, 2018; Rammstedt & John, 2007). Regardless,

these contradictory results highlight the importance of further research into assortative preferences for personality, particularly in the increasingly popular online dating environment.

The aim of the current study is to investigate the degree to which assortative preferences for the Big Five personality traits is present in an ostensible online dating application. We improve on previous research investigating assortative preferences for personality in an online setting in two key ways. First, we use the full version of the Big Five Inventory (BFI-44) to measure participant personality. Second, we ask participants to rate 100 ostensible dating profile. Based on previous findings, we predict that participants will be significantly more likely to match with profiles with which they share similarities on scores of agreeableness, conscientiousness, and openness, but not emotional stability, nor extraversion.

2. Method

2.1. Participants

English-speaking participants were recruited via social media (e.g., Facebook, Twitter, and reddit) and from Prolific.co to complete an online survey. Participants recruited via social media did not receive any incentives for their participation, while those who completed the study on Prolific.co received a payment for participating. A minimum sample of 175 males and 175 females was determined by a power analysis via simulation to detect a fixed interaction effect of $Z_r = 0.15$ using a linear mixed effects model with a cross-classified random effect structure. A total of 530 participants started the survey; however, as the current study aimed to investigate heterosexual mate preferences, participants who did not identify as cis-gendered ($n = 39$), did not reported being attracted to the opposite sex ($n = 99$), or had significant missing data ($n = 10$) were removed from the sample. The final sample for analysis consisted of 178 male and 205 female participants ($M = 25.36$ years, $SD = 6.07$ years). Of the final sample, 330 were online volunteers recruited from social media and 53 paid participants were recruited from Prolific.co.

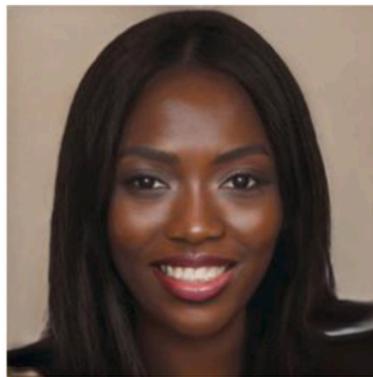
2.2. Materials

2.2.1. Dating profiles

Participants were asked to evaluate 100 ostensible dating app profiles comprised of randomly paired facial images (either male or female) and personal descriptions (for example dating profiles, see Fig. 1).

Facial images comprised of realistic AI generated photos from the academic set at generated.photos (Generated Photos, 2019). We selected 100 male and 100 female faces with a neutral background to use in the study. Facial images selected represented a range of ethnicities, including those that appeared Caucasian, Asian, Hispanic or Latino, Black, and multiracial. We also selected smiling faces (as opposed to neutral or those displaying another emotion) as these would more accurately represent facial images typically uploaded on dating applications. Images that were evidently computer generated were excluded (e.g., those that possessed obvious abnormalities).

Short personal descriptions were written to emulate descriptions often provided by users on online dating profiles. The personal descriptions were written to be gender-neutral so they could be paired with both male and female profiles. These personal descriptions were initially created to convey a variety of scores on each of the Big Five personality traits (agreeableness, conscientiousness, emotional stability, extraversion, and openness; see the Supplementary Materials for a full list of personal descriptions). These personal descriptions were then rated on all five personality traits by 110 independent raters ($M = 24.86$ years, $SD = 6.13$ years; 33 male, 77 female) recruited through social media. Raters were randomly assigned to rate all 100 personal descriptions on one of the Big Five personality traits. Therefore, each personal description received ratings for each of the Big Five personality traits



Whenever I'm going through a rough time I always tried to pick myself up and brush myself off. Tomorrow is always better.

Would you like to match with this person?

No Yes



I love theme parks and last year I went sky-diving. Give me a message if you're a fellow thrill seeker looking to share some exciting experiences!

Would you like to match with this person?

No Yes

Fig. 1. An example of ostensible dating profiles that were shown to participants who selected to view female (top) or male (bottom) profiles.

from independent raters, which were then used in subsequent analyses. To ensure participants understood what was meant by their assigned personality trait, example characteristics of high- and low-scoring individuals were provided. Participants were asked to rate whether they thought each of the 100 personal descriptions displayed high or low

levels of their assigned personality trait on a 7-point scale (from "Extremely Low" to "Extremely High"). Each personal description was rated on each of the Big Five personality traits by at least 20 raters, following suggestions in [Hehman et al. \(2018\)](#). Average perceived personality scores across raters for each personal description on each of the

Big Five personality traits were calculated and used in the final analyses. The consistency of raters was assessed via Cronbach's alpha, which indicated that there was high agreement between raters for each personality trait (alphas ranged from 0.76 to 0.91).

2.2.2. Big Five Inventory (BFI-44)

The BFI-44 (John & Srivastava, 1999) was used to measure participant personality on the Big Five personality traits, including extraversion, agreeableness, conscientiousness, neuroticism, and openness. Participants rated their agreement to 44 statements related to one of the personality traits on a 5-point scale (1 = Disagree Strongly, 5 = Agree Strongly). Using the provided scoring sheet, participants' scores on each of the Big Five personality traits were calculated. The BFI-44 provides a score of neuroticism; however, to maintain consistency with previous literature, participant's score on neuroticism was reverse coded and relabelled "emotional stability". See Supplementary Materials for the full scale.

2.3. Procedure

After providing informed consent, participants completed the BFI-44 (John & Srivastava, 1999) and a dating profiles task presented in a random order. For the dating profiles task, participants were shown 100 dating profiles where facial images (of their previously indicated preferred gender, either male or female) were randomly paired with personal descriptions, as described above. Participants were asked to indicate "no" or "yes" as to whether they would like to "match" with the profile, selecting a response automatically displayed the next profile. The option "no" was presented on the left and "yes" was presented on the right to imitate popular dating applications. To ensure full understanding of the task, participants were informed that, on popular dating applications, "matching" with someone would allow for direct communication, and by not matching individuals indicate that they are not interested in pursuing further interactions.

2.4. Analysis

All analyses were conducted using the R statistical software (R Core Team, 2020) using the tidyverse (Wickham et al., 2019), lme4 (Bates et al., 2014), and lmerTest (Kuznetsova et al., 2017) packages. Separate binomial mixed effect models were performed for each of the Big Five personality traits separately. The outcome variable was whether participants selected "yes" or "no" in response to matching with a dating profile (coded as 1 and 0 respectively). The fixed effects were the z-standardised mean personality rating of the personal description (as measured by the independent raters), the participant's z-standardised personality scores (as measured by the BFI-44) and the interaction between the two. For the hypothesis to be supported, a significant interaction between participant personality scores and personal description perceived personality scores consistent with assortative preferences should be found for agreeableness, conscientiousness and openness, but not for extraversion or emotional stability (e.g., participants higher in agreeableness would also prefer high agreeableness in the personal description). Random effects were included in the analysis to control for non-independence in responses not accounted for by the fixed effects (e.g., mean differences in attractiveness of the images or desirability of the descriptions, or variation in the level of choosiness between participants). The grouping variables for the random effects included participant ID, image ID, and personal description ID. Random intercepts and slopes were specified maximally according to Barr et al. (2013) and Barr (2013). For the full R analysis script see the Supplementary Materials.

3. Results

The fixed effects estimates for all models are reported in Table 1. For full model results, including estimated random effects, see

Table 1 The estimated fixed effects for the models predicting whether participants chose to match depending their own score on each personality trait and personal description score on each personality trait.

	Agreeableness			Conscientiousness			Emotional stability			Extraversion			Openness		
	Estimate (std error)	Z value	p value	Estimate (std error)	Z value	p value	Estimate (std error)	Z value	p value	Estimate (std error)	Z value	p value	Estimate (std error)	Z value	p value
Intercept	-0.39(0.08)	-4.65	<0.001***	-0.41(0.09)	-4.81	<0.001***	-0.43(0.08)	-5.05	<0.001***	-0.40(0.08)	-5.01	<0.001***	-0.41(0.09)	-4.80	<0.001***
Participant Score	0.03(0.03)	1.00	0.319	-0.02(0.03)	-0.62	0.538	0.00(0.03)	0.01	0.991	-0.01(0.02)	-0.46	0.645	0.02(0.03)	0.75	0.451
Personal Description Score	0.30(0.06)	4.90	<0.001***	-0.02(0.06)	-0.31	0.750	0.22(0.07)	2.98	0.003**	-0.43(0.05)	-8.36	<0.001***	0.02(0.06)	0.30	0.761
Participant Score * Personal Description Score	0.06(0.02)	2.43	0.015*	-0.00(0.02)	-0.02	0.984	0.00(0.02)	0.22	0.830	0.07(0.02)	3.21	0.001**	0.07(0.02)	3.82	<0.001***

* p < 0.05.
 ** p < 0.01.
 *** p < 0.001.

Supplementary Materials.

3.1. Participant personality on matches

In all models, there were no significant main effects of participant's personality scores on agreeableness, conscientiousness, emotional stability, extraversion, or openness. This finding would suggest that a participant's personality does not affect the number of matches they are likely to give.

3.2. Perceived personality of personal description on matches

Significant, positive main effects of personal description agreeableness and emotional stability scores were found, suggesting that participants, overall, tended to prefer profiles with personal descriptions that were perceived as agreeable and emotionally stable. A significant, negative main effect was found for perceived extraversion, suggesting that participants preferred profiles that were perceived as more introverted. No significant main effects were found for perceived conscientiousness or openness, suggesting that these perceived personality traits did not influence the number of matches a personal description is likely to obtain.

3.3. Assortative preferences for personality

Significant interaction effects were found between participant agreeableness and personal description perceived agreeableness (Fig. 2), as well as between participant openness and the perceived openness of the personal description (Fig. 3). These results are consistent with the predictions that participants would display assortative preferences for agreeableness and openness. Also as predicted, no significant interaction between participant and personal description score on emotional stability were found (Fig. 4).

Contrary to previous findings with established couples and our hypothesis, no significant interaction was found between participant conscientiousness and the perceived conscientiousness of personal description (Fig. 5). Furthermore, contrary to predictions, we found a positive, significant interaction between participant extraversion and

the perceived extraversion of the personal description. This finding indicates that participants tended to assortatively select for extraversion, against our prediction (see Fig. 6).

4. Discussion

Based on previous research on assortative preferences for personality in romantic partners (e.g., Botwin et al., 1997; Rammstedt & Schupp, 2008), we predicted that participants would display assortative preferences for agreeableness, conscientiousness, and openness, but not extraversion, nor emotional stability. Indeed, the current study provides evidence for assortative preferences for agreeableness and openness, but not for emotional stability. Contrary to predictions, we also found assortative preferences for extraversion, but not for conscientiousness.

Consistent with previous findings (Botwin et al., 1997; Neyt et al., 2020; Rammstedt & Schupp, 2008), assortative preferences were found for agreeableness. High agreeableness relates to trust, generosity, and helpful behaviours (Costa & McCrae, 1992; Yarkoni et al., 2015); these characteristics are all associated with cooperation which has been a primary reason for the success of human evolution. Consistent with this notion, a significant, positive main effect of personal description agreeableness score indicates that individuals tended to prefer dating profiles perceived as highly agreeable, regardless of their own level of agreeableness. The significant interaction term in the agreeableness model would indicate that those who are more cooperative themselves in particular value this trait in a profile.

Also consistent with previous research with established couples, our findings also support the notion that individuals displayed assortative preferences for a profile with which they share similar levels of openness. We found no significant main effect of personal description perceived openness score, indicating that no particular level of openness is preferentially desired. Since openness relates to creativity and curiosity (Costa & McCrae, 1992), these findings are perhaps contrary to literature that suggest creativity is desirable in a partner (Kaufman et al., 2016; Miller, 2000). Instead, our results indicate that individuals tend to prefer profiles with which they share a similar level of openness.

In line with previous findings (Botwin et al., 1997; Farley & Davis, 1977; Figueredo et al., 2006; Glicksohn & Golan, 2001; Neyt et al., 2020;

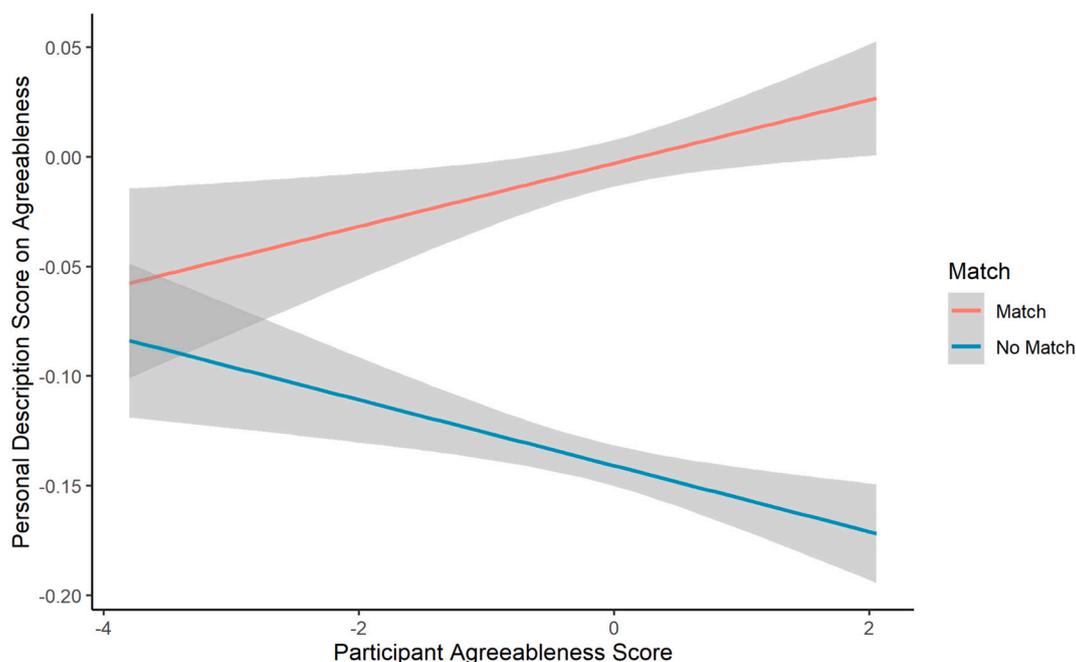


Fig. 2. The association between participant agreeableness and the perceived agreeableness of the personal description separated based on whether participants chose match (red) or no match (blue).

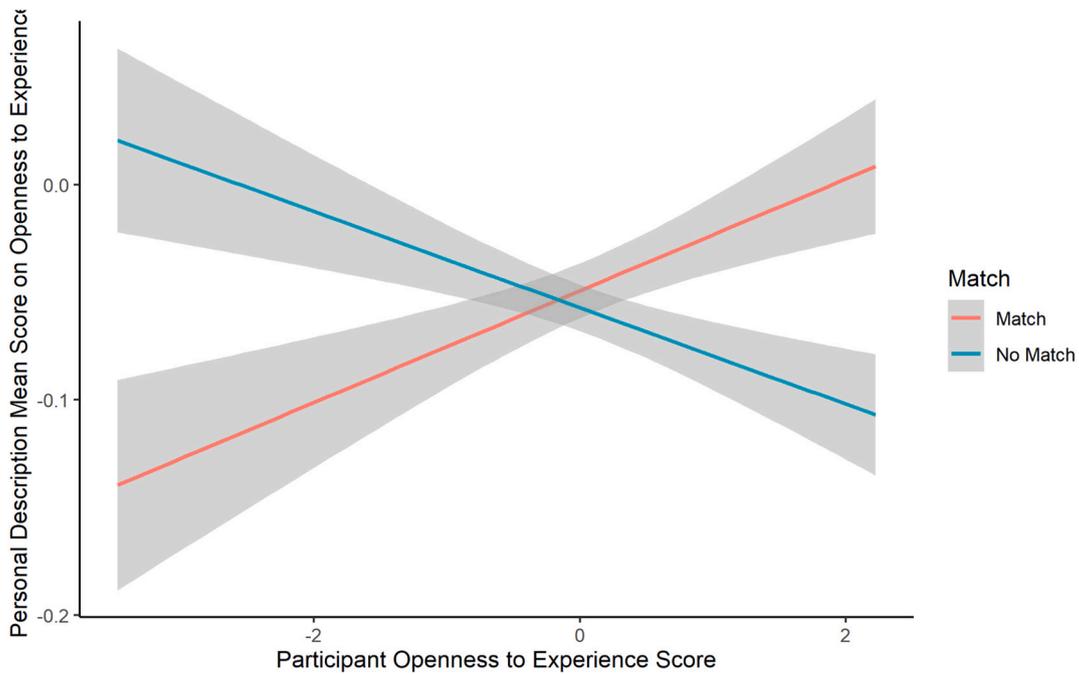


Fig. 3. The association between participant openness and the perceived openness of the personal description separated based on whether participants chose match (red) or no match (blue).

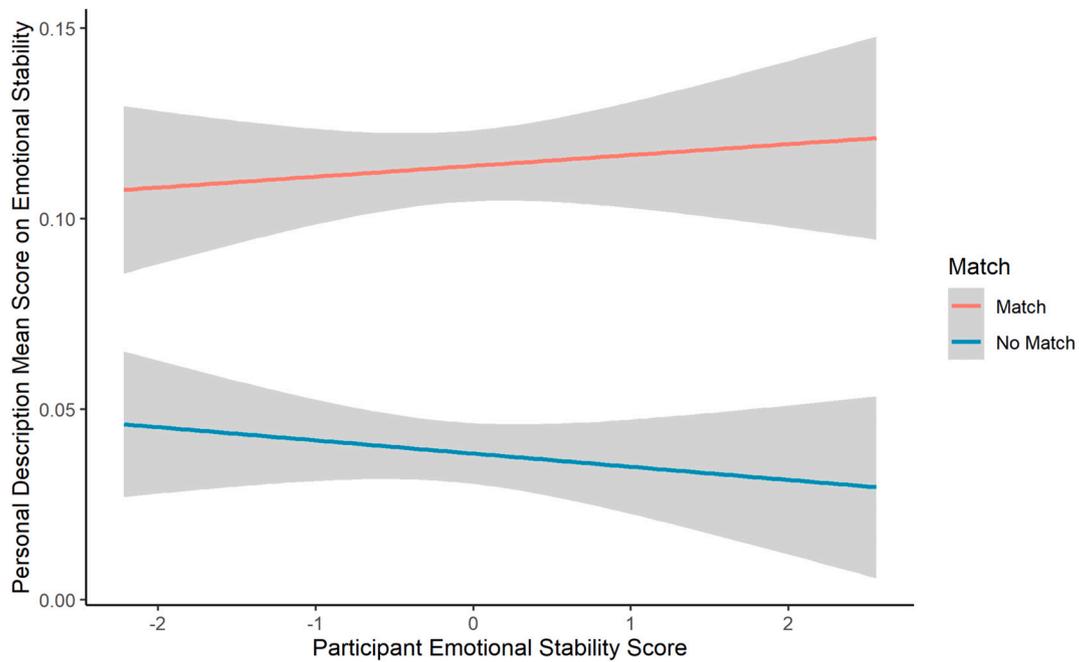


Fig. 4. The association between participant emotional stability and the perceived emotional stability of the personal description separated based on whether participants chose match (red) or no match (blue).

Rammstedt & Schupp, 2008), our study found no evidence for assortative preferences for emotional stability. However, the current study did find a significant, positive main effect of personal description perceived emotional stability, suggesting that personal descriptions perceived as emotionally stable were preferred by participants. Emotionally stable individuals tend to provide their partners with greater relationship satisfaction than partners who are more neurotic (Botwin et al., 1997). Therefore, individuals may select a partner who can offer them this benefit regardless of the level of emotional stability they themselves can offer.

Contrary to predictions, we found no evidence of assortative preferences for conscientiousness. Our results contradicts findings investigating similarities in established couples (Botwin et al., 1997; Figueredo et al., 2006; Rammstedt & Schupp, 2008), but is in line with previous research investigating online dating preferences (Neyt et al., 2020). Collectively, these findings would suggest that conscientiousness is not assortatively selected for during initial attraction, but instead, perhaps, over time couples become more similar on conscientiousness, or relationships with couples with differing levels of conscientiousness are less likely to survive long-term.

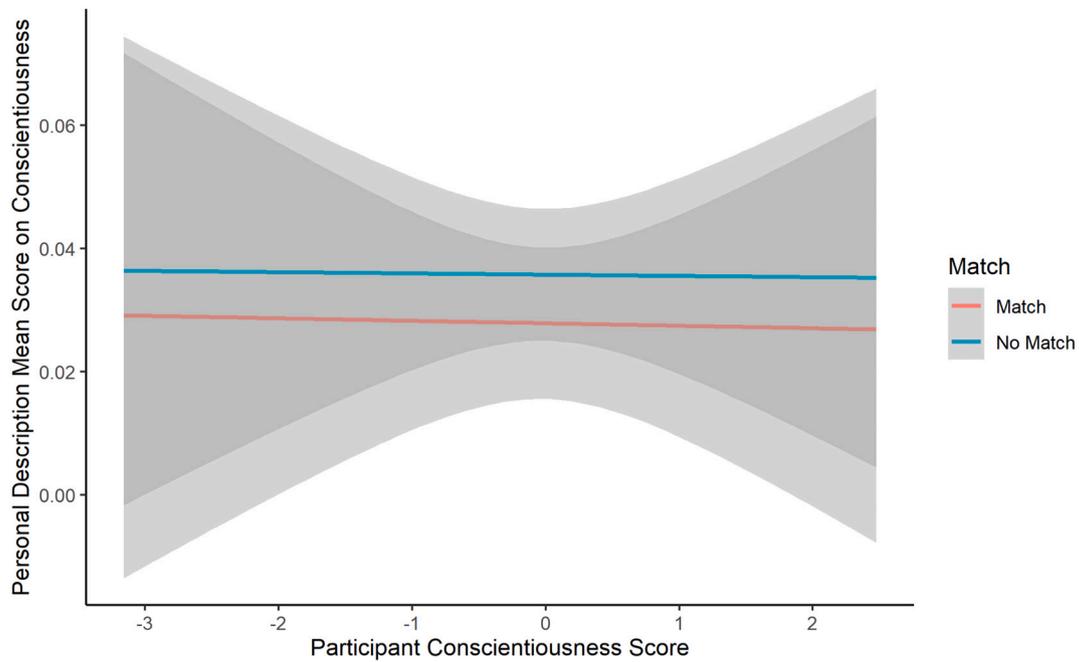


Fig. 5. The association between participant conscientiousness and the perceived conscientiousness of the personal description separated based on whether participants chose match (red) or no match (blue).

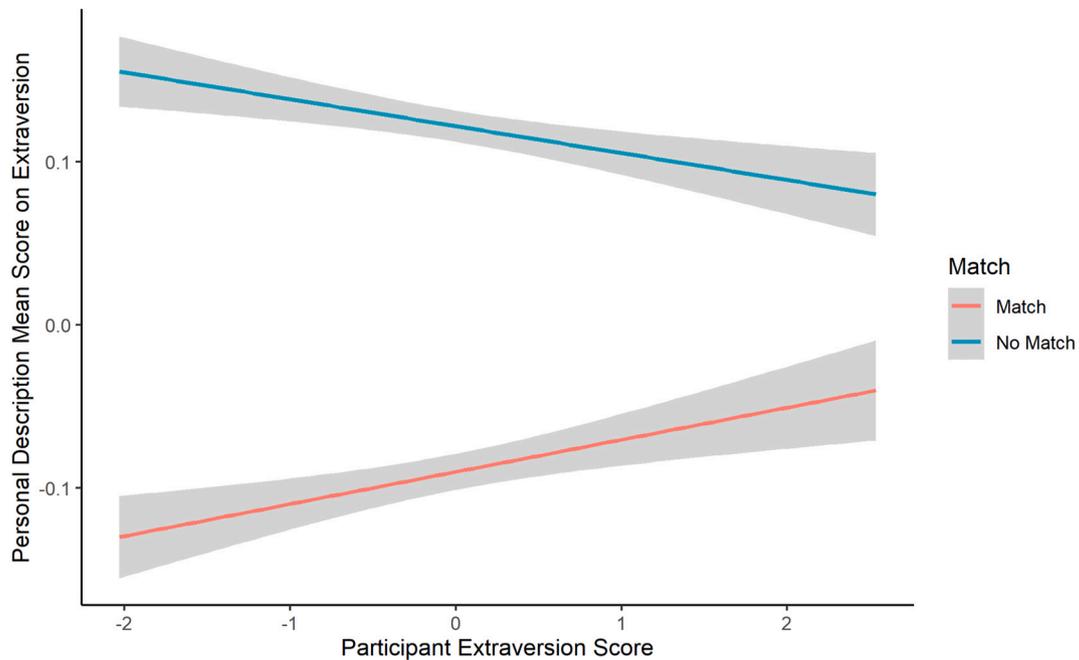


Fig. 6. The association between participant extraversion and the perceived extraversion of the personal description separated based on whether participants chose match (red) or no match (blue).

Finally, we found support for significant assortative preferences on extraversion. This contradicts overall trends found in previous research (Botwin et al., 1997; Farley & Davis, 1977; Figueredo et al., 2006; Glicksohn & Golan, 2001; Neyt et al., 2020; Rammstedt & Schupp, 2008), but is consistent with other studies (e.g., Štěrbová et al., 2017). There are several considerations that could help explain these divergent findings. First, data collection was conducted during the COVID-19 pandemic; this included drastic changes in how people socialised and interacted during that period. Many of the personal descriptions that were perceived high on extraversion included activities that could have

been considered risky at the time (e.g., going out dancing, or socialising in a group). Given that extraversion is related to risk-taking behaviours (Nicholson et al., 2005), participants may, instead, have been demonstrating assortative preference for risk-taking propensity. Supporting this interpretation, we also found, perhaps surprisingly, a significant, negative main effect of personal description extraversion score, which may indicate an overall preference for personal descriptions that were perceived as low risk-taking. Alternatively, it is important to consider the purpose of online dating applications. For example, Tinder may be primarily used to meet potential short-term partners (e.g., “one-night

stands"). As such, assortative preference for extraversion may be important in this context, but less important when more long-term relationships are considered.

A strength of the current study is that we can be confident that the effects reported are due to perceived personality traits of the personal descriptions, despite the presence of the facial images. Personal descriptions were randomly paired with images and the data was analysed using mixed effects modelling. By including random effects for images in the models, the potential influence of the facial images (e.g., differences in facial attractiveness) on match responses was accounted for. Including facial images also helps maintain ecological validity and we can be confident that assortative preference for certain personality traits exist even in the presence of physical attributes, which has previously been shown to have the largest impact on attractiveness judgements for online dating profiles (Fiore et al., 2008).

Other than those already mentioned, there are further considerations when interpreting the results. First, for model simplicity, each model only considered one personality trait at a time. As such, it is unclear how the separate personality traits could interact to inform preferences. Second, our study focused on heterosexual preferences; previous research has suggested that patterns of assortative preference may be different for homosexual relationships (Štěrbová et al., 2017). Third, participants in the current sample were relatively young and likely from Western, English-speaking backgrounds. Future research may aim to compare assortative preferences for personality of individuals of different ages and nationalities.

5. Conclusion

As the popularity of online dating platforms continues to rise, it is likely that online mate preferences will have an increasing impact upon the formation of romantic relationships. Given that couples who have similar personalities tend to report greater relationship satisfaction (e.g., Gonzaga et al., 2010; Luo & Klohnen, 2005), online assortative preferences are likely to have an important influence on relationship outcomes.

Results from our study supports the notion that individuals display assortative preferences for certain personality dimensions, particularly agreeableness and openness. Our results could help, in part, explain previous findings that established couples tend to be more similar on personality, and that such effects are not solely due to social homogamy or couples becoming more similar over time. However, it is important to note that the stability of personality over a lifetime is not yet fully understood. As such, while our study supports the notion that individuals are initially attracted to others with whom they share similarities on certain personality traits, it does not speak to whether couples' personalities converge over time. Further, in the modern environment of online dating, while indicating a preference and matching with a potential partner is a necessary first step in the formation of a long-term relationship, it is unclear whether these effects translate to latter stages of extended human courtship. Future, longitudinal research could be conducted to investigate similarities of personality between the same individuals at the levels of initial attraction, short-term and, finally, long-term dating situations (e.g., Gonzaga et al., 2010).

CRedit authorship contribution statement

J.D.L.M. developed the research question. J.D.L.M. and A.L. designed the study. J.D.L.M. gathered the study materials and collected the data. J.D.L.M. analysed the data under the supervision of A.L. J.D.L.M. wrote the initial draft of the manuscript, and both A.L. and J.D.L.M. revised it. A.L. supervised the project.

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Declaration of competing interest

None.

Data availability

The dataset generated and analysed during this study is available on the OSF repository at <https://osf.io/msu37/>.

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