A PERSON-CENTERED APPROACH TO THE MEDIATING EFFECT OF ATTENTION ON PERSONALITY SIMILARITY AND PREFERENCE USING EYE-TRACKING TECHNOLOGY

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ABSTRACT

A PERSON-CENTERED APPROACH TO THE MEDIATING EFFECT OF ATTENTION ON PERSONALITY SIMILARITY AND PREFERENCE USING EYE-TRACKING TECHNOLOGY

Gabriel Jose Sanchez

Similarity between personality traits has been observed to be predictive of preference and desirability in social relationships in various situations. Much of the research has approached detecting personality similarity on a trait-specific level using the Five Factor Model of personality or more recently by grouping individual personalities into clustered profiles using latent profile analysis. This study of 93 participants took a person-centered approach by detecting individual differences between participants' personality profiles and target person profiles using Euclidean distance as a dissimilarity index. We then proposed attention as a mediating factor behind the observed association between personality similarity and preference. Using this person-centered approach, we replicated previously observed outcomes that similarity between personalities predicted self-rated preferences. Attention, measured through fixation counts and dwell time using eye-tracking technology, was also predictive of preference. However, there was no observed mediating effect of attention on the association between personality similarity and preference.

Keywords: personality, person-centered, similarity, attention, eye-tracking, mediation analysis

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INTRODUCTION

There is a well-documented tendency for individuals to feel more connected with those who are more similar to themselves (McPherson, Smith-Lovin, & Cook, 2001). Likewise having similar personality characteristics influence intensity of attraction (Byrne, Griffitt, & Stefaniak, 1967; Montoya & Horton, 2008) between people, affecting processes such as selecting romantic partners (McCrae et al., 2008), and preferences and perceptions of work behaviors (Antonioni & Park, 2006). Importantly, it is the perceived similarity of personality traits, rather than actual similarities in personality traits, that influence such preferences (Selfhout et al., 2009; Strauss, Barrick, & Connerly, 2001). Liu & Zhang (2021) found that it is both very similar and very dissimilar personalities that predict the intensity of friendships. The purpose of the present research is to test hypotheses about the role of attention to personality information as one mechanism for the similarity-preference relation.

Person-Centered Approach to Personality

The pointless and misguided person-situation debate was an effort to establish the ascendency of either person characteristics or situational variables as the primary cause of human behavior (Goldberg, 1992; Kenrick & Funder, 1988). It was started by the claims of Mischel (1968) and others that trait concepts were largely irrelevant for understanding human behavior. It is now recognized that these claims were based on evidence that was methodologically and statistically flawed, such as using conceptually continuous variables like personality traits at categorical in ANOVAs (Chaplin, 2007). However, these criticisms pushed the research to refine their approaches, construct more valid

measures, and implement more appropriate analytic approaches (Fleeson, 2004; Furnham, 1981; Kenrick & Funder, 1988).

Importantly, one impact of the person-situation debate was a revival of Allport's (1937) position that different psychological processes, behaviors, and traits do not function in isolation from each other within a person, but rather they function as a coordinated system of processes, behaviors, and traits. Much of the research on personality, especially pertaining to similarities in personality influencing preferences, has been conducted using a trait-level or variable-centered approach, often times focusing on specific traits of the Five Factor Model (FFM), such as extraversion or conscientiousness. Research grounded in the FFM of personality, colloquially known as the Big Five, provides a robust framework for investigating the role of individual differences in shaping interpersonal preferences across cultures (McCrae & Costa, 1999). The FFM delineates five broad personality dimensions: Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism/Emotional Stability. Analyses using these dimensions, or traits, have dominated the field of personality research, offering a nuanced understanding of the multifaceted nature of personality, allowing researchers to examine how specific traits contribute to social interactions (Howard & Hoffman, 2018; Roberts et al., 2007; Woo et al., 2018). However, trait-centered approaches are still inconsistent with Allport's original theory of personality, telling us less about person-specific dynamics and weakening the predictive validity of outcomes, instead of providing information about trait structure and validity across an average of a sample (Asendorf, 2015; Grice, 2007; Liu & Zhang, 2021).

Profile Analysis and Distance

Recent years have seen numerous studies begin to approach personality research from a person-centered perspective rather than the variable-specific approach (Pilarska, 2018). The two higher-order factors (alpha factor: Agreeableness, Conscientiousness and Neuroticism/Emotional Stability; beta factor: Extraversion and Openness) have often been seen to covary, indicating that the traits interact and so when analyzed in isolation may be overlooking such shared variance (Digman, 1997; McCrae & Costa, 1987; Merz & Roesch, 2011). When approaching the research from a person-centered perspective, many studies to date have integrated latent profile analysis (LPA) to reveal distinct personality profiles using both the FFM and HEXACO (most popular 6-dimensional model of personality) models (Daljeet et al., 2017; Yin et al., 2021). The latent variable modeling approach of LPAs empirically identifies groupings or "types" of people into subpopulations, often referred to as "categories" or "profiles," deriving these latent profiles from observed values from sets of variables (Collins & Lanza, 2013; Howard & Hoffman, 2018; Wang & Hanges, 2011). It has been determined that when using the FFM or the HEXACO models to measure personality, three or four latent profiles emerge that are theoretically consistent with psychosocial theories that label people based on levels of adaptability or how "well-adjusted" someone is, although the openness trait was indiscriminate between the various profiles observed (Fisher & Robie, 2019; Isler et al., 2017; Merz & Roesch, 2011). Statistical methodologies similar but simpler than LPA have also been used to group people by their personality characteristics, such as cluster analysis, which groups based simply on distance of values without considering probability, and Q-factor analysis, which groups based on correlations between

characteristics. Studies using LPA, Q-factor, or cluster analysis to determine personality profiles have found that the structural, person-centered approach results in personalities profiles that, similar to previous research from a variable-specific approach, are interpretable, consistent across demographics, and stable throughout adulthood (Daljeet et al., 2017; Ferguson & Hull, 2018; Gabriel et al., 2018; Pilarska, 2018; Specht et al., 2014; Yin et al., 2021).

It has been argued that statistical approaches, such as LPA, cluster analysis, or Q-factor analysis, that group people into profiles or clusters continue to introduce stereotype instability by studying group differences rather than individual differences (Asendorf, 2015; Grice, 2007). Asendorf (2015) found that using Euclidean distance, a measure of dissimilarity between distance matrices, maximizes the differences across people's individual profile in elevation (the mean of a person's profile), scatter (the variance of a person's profile), and shape (the pattern of a person's profile determined by the residual information after removing a profile's elevation and scatter). It is acknowledged that similarity between individuals is predictive of how similarly those individuals interpret and respond to observations, however, Cronbach & Gleser (1953) breakdown that determining similarity has often been reductive of personality and that indices of similarity assume scaled similarity between latent constructs. They go on to introduce Euclidean distance (D^2) as using the Pythagorean rule to determine distance between any two points on orthogonal axes that cover all variate dimensions, and so providing a mathematical and systematic basis for determining and interpreting similarity between measures of personality (Cronbach & Gleser, 1953).

$$D_{12}^2 = \sum_{j=1}^{k} \left(x_{j_1} - x_{j_2}\right)^2$$

Cronbach & Gleser (1953) continue that obtaining D rather than D^2 reduces how exaggerated individual differences are upon squaring and allows the distribution to be less skewed. In measuring similarity using Euclidean distance, three parameters are defined: elevation (mean), scatter (variance), and shape (pattern; Chaplin & Panter, 1993; Cronbach & Gleser, 1953). Euclidean distance and the three meaningful parameters (elevation, scatter, and shape) allow the determination of more than a single, simplified quality of similarity but rather a complex concept of similarity by assessing the assumption of the measures of each characteristic. Using Euclidean distance and its parameters in a person-centered approach provide the ability to compare individuals more distinctly and comparing individuals to theoretically derived profiles that integrate all possible combinations of the higher order factors of personality allows us to better interpret individual differences rather than trait or group differences.

Preference for Consistency and Similarity

An individual's preference for similarity is described as rooted in cognitive processes of social categorization, including self-identification, social stereotyping, and comparing the self to others (Abrams & Hogg, 1990; Mehajan & Wynn, 2012; Turner et al., 1987; Wilder, 1986). Mullen (1983) explored the effect of group dynamics on the individual, finding that in social groups or pairings, individuals turned to self-attention, concerning themselves with being similar to those they are being paired or grouped with. Even earlier, Byrne et al. (1967) found through a series of studies that people were attracted to those who were similar to themselves on a dimensional and abstract level of

personality, for which they are able to detect personality similarity without being able to verbalize such similarity.

Personality similarity has been studied on a trait level and across situations for decades. The results have been mixed when it comes to romantic relationships, friendships, and satisfaction in these relationships. Youyou et al. (2017) used various measures, including self-report, peer-report, and observational ratings, to assess personality and found that the beta factors of openness to experience and extraversion were more likely to be the similar traits between individuals in either a romantic relationship or friendship, though the association was only present in extraversion measured by self-report and not in the extraversion measured by peer-report or observations. Levy, Markell, & Cerf (2019) looked into dating preferences and found that when it comes to making first impressions in dating, the more similar someone was perceived, the more desirable they were, with the exception of introverts rarely matching with other introverts. Regarding satisfaction, a meta-analysis by Sayehmiri et al. (2020) found that neuroticism was the trait that best correlated with marital dissatisfaction and conscientiousness with marital satisfaction, however, it was unclear whether one or both partners shared the traits. Botwin, Buss, & Shackelford (1997) found that people desired those who were more similar to themselves in general, however, lower levels of agreeableness, emotional stability, and openness led to dissatisfaction regardless of similarity, indicating that beyond similarity, social desirability is relevant to longevity. Similarly, Gattis et al. (2004) found that lower levels of the alpha factors of emotional stability, conscientiousness, and agreeableness were related to marital dissatisfaction, especially when couples were dissimilar in these traits. Beyond intimate relationships,

Kim & MacCann (2017) found that students prefer professors who are more similar to themselves but desire or idealize professors who are higher than themselves on all traits but openness.

Attention and Eye-Tracking Technology

The cognitive process of attention, selecting some information while ignoring the rest, has been found to be a key feature in decision making (Mukherjee & Srinivasan, 2013). Plaks et al. (2001) found that one's own perception of traits is what influences whether someone pays more attention to consistent/preferred information or inconsistent/unpreferred information, which then maintains pre-established ideas, views, or stereotypes. Though there has been evidence that people pay more attention to information that they prefer or are more attracted to (Leder et al., 2010; Mitrovice et al., 2020; Shimojo et al., 2010), other research has indicated that attention is drawn by novelty, where complex and unfamiliar stimuli draws and holds attention more than simple and familiar information (Fantz, 1964; Horstmann & Herwig, 2016; Karacan & Hayhoe, 2008; Martin, 1975).

Relatively recent advances in technology, particularly eye-tracking technology, offer a novel avenue to investigate the role of attention in shaping social preferences. Mitrovic et al. (2020) recently integrated eye-tracking technology to explore the role of attention on visual preference, finding that people often looked longer at stimuli they preferred, or aligned with their own "subjective taste" of art. This effect was seen previously by Leder et al. (2010) in measuring attraction between people, coining the idea that "attractiveness demands longer looks," as well as by Shimojo et al. (2010), who found that people originally gaze at different stimuli equally but then would return more

often to and look longer at the one they eventually would rate as more attractive. This latter study was done with both faces and shapes, and observed higher preference ratings towards the stimuli people paid more attention to. Though this study evaluated attention's role in preference for visual art and not for other's personality, it introduces the idea of objectively monitoring what people are paying attention to and how that is influenced by pre-existing constructs. Eye tracking provides a direct measure of visual attention, allowing researchers to examine how individuals allocate their attention. Applying eye tracking to explore the mediating role of attention in the relationship between personality similarity and social preferences represents a cutting-edge approach that can unveil the cognitive intricacies of personal preference.

The Present Study

The current study aimed to build upon the literature on the effect of personality differences on social preferences by using a person-centered approach rather than a trait-specific approach in determining differences in personality and integrate eye tracking technology as an objective measure of attention to explain the association between personality and preference. Rather than clustering people into groups, we continued to assess the personality of the individual, creating a measure of distance between an individual and various targets. The hypothesis we aimed to test was that people prefer others who have more similar personalities to themselves, mediated by paying more attention to those who are more similar. This is the first study to incorporate both a person-centered approach to determine personality-based preferences and eye tracking technology to obtain objective attentional data to explore the cognitive processes behind judgement.

METHODS

Participants

Participants were recruited primarily from St. John's University's undergraduate and graduate psychology programs through word-of-mouth and the university's participant pool and research management tool, Sona Systems (https://www.sona-systems.com), between January 2022 and June 2023. A total of 93 participants consented to and completed both the Personality Screening Survey (PSS), which collected demographic and personality information, and the Personality and Attention using Eye Tracking Technology study (PAETT), designed to observe the relationship between attention to person and situational traits and preference. Table 1 shows the characteristics of the participants. Both study protocols were approved by the institutional review board at St. John's University.

Measures and Procedures

Participant Personality

The Johnson International Personality Item Pool – Neuroticism, Extraversion, Openness – 120 item version (IPIP-NEO-120; Johnson, 2014) was administered through Qualtrics (Qualtrics, Provo, Utah, USA) during the PSS study as a measurement of the FFM (Big Five). The IPIP-NEO-120 demonstrated high internal consistency between the 24-items per factor: neuroticism (α=0.90), extraversion (α =0.89), openness to experience (α =0.81), conscientiousness (α =0.90), and agreeableness (α =0.86). The items were measured on a visual analog scale that ranged from "not accurate" (1) to "extremely accurate" (7).

Based on the IPIP-NEO-120 guidelines, some items were reverse scored, followed by calculating sums of the Big Five and their facets. All items of neuroticism were reverse scored to calculate emotional stability as a trait for perceived directional consistency in profile shape. The Big Five composite scores each had a possible range from 24 to 168. Higher scores on each of the variables indicated that the person was more emotionally stable, agreeable, conscientious, extraverted, and open to experience.

Target Personality

Participants were shown written prompts of people and situations, known as target person and target situation respectively, that described a person based on the Big Five characteristics and a situation based on the DIAMONDS characteristics during the PAETT study. Twelve target person profiles were constructed based on a modified version of the FFM and its higher-order factors for social desirability (Digman, 1997), for which high and low combinations, excluding all-high and all-low, were used (see *Figure 1*). These target person profiles described the alpha traits of the target person as either "very" (high) or "not at all" (low) "neurotic" (emotional stability), "dependable" (conscientiousness), and "agreeable," paired with incongruent beta traits (i.e., " very outgoing" [high extraversion] and " very conventional" [low openness to experience], or "not at all outgoing" [low extraversion] and "not at all conventional [high openness to experience]). A target person profile was given a score of 168 for each trait coded as high and a score of 24 for each trait coded as low.

These target person profiles were each paired with three out of six target situation profiles, designed from a modified DIAMONDS, an eight-dimensional model of situation characteristics (Rauthmann et al., 2014). The target situation profiles were designed

varying five of the eight modified traits of the DIAMONDS: “stress” (adversity), “responsibility” (duty), “intimacy” (mating), “sociality,” and “intellect.” The characteristics of positivity, negativity, and deception were excluded to create more congruent pairings between the target person profiles and the target situation profiles.

Thirty-six pairings between the twelve target person profiles and three of the six target situation profiles were determined and treated as experimental trials that were administered during the experiment. The order in which the experimental trials were administered were randomized and counterbalanced per participant. Upon reviewing results from a pilot study, it had been decided that twenty seconds was sufficient to allow participants to read and process the information without memorizing it, before removing the information and asking them to rate their preference. The randomization and timed nature of the experiment were treated as attempts to decrease habituation. Two untimed practice trials of unused pairings of target person profiles and target situation profiles were administered prior to the thirty-six experimental trials. These practice trials were treated as an attempt to familiarize participants with the task and the content to reduce novelty.

Profiles	1	2	3	4	5	6	7	8	9	10	11	12	Profile
E	+	+	+	+	+	+	-	-	-	-	-	-	E
O	-	-	-	-	-	-	+	+	+	+	+	+	O
C	+	+	-	+	-	-	+	+	-	+	-	-	C
A	+	-	+	-	+	-	+	-	+	-	+	-	A
ES	-	+	+	-	-	+	-	+	+	-	-	+	ES

Figure 1. Target Person profiles by personality trait polarity.

E=Extraversion, O=Openness to Experience, C=Conscientiousness, A=Agreeableness, ES=Emotional Stability

Dissimilarity Indices

A dissimilarity index and indices for each of its parameters were created comparing the distance between each participant's personality characteristics to each target person's personality traits following Cronbach and Gleser's (1953) process. The Euclidian distance (D) formula, the square root of the sum of the squared differences between traits, was used to compute how dissimilar a participant's personality profile was from each of the designed target person profiles, assessing person-specific personality profiles rather than clustered profiles or individual traits. The following equation was used, where "pp" represents the participant's score and "tp" represents the target person's score on a given trait (E for extraversion, O for openness, C for consciousness, A for agreeableness, and ES for emotional stability):

$$D = \sqrt{\left(E_{pp} - E_{tp}\right)^2 + \left(O_{pp} - O_{tp}\right)^2 + \left(C_{pp} - C_{tp}\right)^2 + \left(A_{pp} - A_{tp}\right)^2 + \left(ES_{pp} - ES_{tp}\right)^2}$$

The dissimilarity index, Euclidean distance, is zero if the participant's personality profile is identical to the target person profile and increases depending on how different they are based on elevation, shape, and scatter. Each participant had twelve dissimilarity index scores, one for each target person profile.

The Euclidean distance parameters were then calculated through a series of calculations. Elevation scores were calculated by finding the mean of each participant profile and each target person profile.

$$Elevation = \frac{E + O + C + A + ES}{5}$$

Scatter scores were calculated by finding the standard deviation within each profile, multiplied by the square root of the number of characteristics (5). “M” representing the mean, which is the elevation score.

$$Scatter = \sqrt{\frac{(E-M)^2 + (0-M)^2 + (C-M)^2 + (A-M)^2 + (ES-M)^2}{5}} x\sqrt{5}$$

The distance between elevation scores were then calculated by finding the difference between each participant’s elevation score and each target person’s elevation score.

$$Elevation\ Distance = Elevation_{pp} - Elevation_{tp}$$

The distance between scatter scores were then calculated by finding the difference between each participant’s scatter score and each target person’s scatter score.

$$Scatter\ Distance = Scatter_{pp} - Scatter_{tp}$$

New profiles of deviation scores for all participants and target persons were then created by removing elevation scores from each characteristic score (each of the Big Five: E, O, C, A, ES). Each participant’s elevation score was subtracted from each of their characteristic scores and each target person’s elevation score subtracted from each of their characteristic scores. The Euclidean distance formula was then repeated with these deviation profiles to determine the dissimilarity index without elevation between each participant from each target person.

New profiles were then created for all participants and target persons by removing scatter scores from each individual characteristic score. Each score on the deviation profiles was divided by the respective participant’s or target person’s scatter score. Removing both elevation and scatter left the residual information known as shape. The

Euclidean distance formula was then repeated with these profiles of shape to determine the dissimilarity index of shape between each participant from each target person.

Attention

Eye Link 1000 Plus tracked eye movement monocularly at 2000 Hz while participants were set up on a head stabilizing mount. The PAETT experiment was programmed using Experiment Builder software (SR Research, Ltd., Ottawa, Ontario, Canada). All participants were positioned into the head stabilizer mount and the eye tracker was focused and calibrated. Calibration was conducted by collecting fixation samples by having participants focus and follow targets on the screen to map gaze. This was done at least twice for every participant as a form of validating the mapping sequence. Throughout the experiment, researchers monitored eye movement and logged drift. Between each trial, the experiment displayed a target as a method of correcting drift. If drift became apparent, researchers recalibrated and then returned to the experiment. The researcher logs and the recorded trial sequences were used to manually correct drift correction post-experimentation. For inter-rater reliability, two researchers at separate times manually corrected fixations. If both individuals made the same corrections, they were kept; if agreement was not met, the corrections were discarded.

Interest areas (IA) were designed into the experiment to designate various areas of focus on each trial's stimuli, such as the overall areas the person stimulus and the situation stimulus as well as the specific areas the individual characteristics of each stimulus Variables on run count (how frequently the eye entered an IA), fixation count (how frequently the eye fixated, based on non-saccadic gaussians, on an IA), and dwell

time in milliseconds (the duration for which the eye fixated on an IA) were recorded and extracted from the Data Viewer software (SR Research, Ltd., Ottawa, Ontario, Canada).

Preference

After viewing each trial for 20-seconds, participants were prompted by the experiment to rate their preference for interacting with the paired target person and target situation profile on a 1-item Likert scale that ranged from "Dislike Very Much" (1) to "Like Very Much" (7).

Analytic Approach

Bivariate correlations were used to determine associations between the personality, attention, and preference variables. A mediation analysis was conducted to investigate the mediating effect of attention on the association between dissimilarity and preference. Data corrections, such as the inter-rater drift corrections, were made through the Data Viewer software prior to extraction of the attention and preference variables. The dissimilarity indices using the Euclidean distance formula was created using R Version 3.3.0 (R Foundation for Statistical Computing Vienna, Austria.) and RStudio Version 2023.12.0+369 (RStudio, PBC., Boston, MA.). All analyses were conducted using JASP Version 0.18.3 (JASP Team).

RESULTS

Descriptive statistics for the participants who completed both the PSS and PAETT studies can be found in Table 1. Pearson correlations of the primary outcome variables are displayed in Table 2. Pearson correlations of the attention variables and the preference rating variable (PR) with the parameters (distance between elevations, distance without elevation, distance between scatter, and distance between shape) of the Euclidean distance variables can be found in Table 3. As expected, there was a strong positive association between the two target person variables, a strong positive association between the target situation variables, and a strong negative association between each of the target person variables with each of the target situation variables. Significant but weak associations were observed between PR and all variables, with the exception of the Euclidean distance parameter of Scatter. There was no observed association between any of the attention variables with any of the dissimilarity variables (Euclidean distance and its parameters), with the exception of Shape.

Table 1. *Participant characteristics.*

	Sample (N=93)
	M (SD) or n (%)
Age (years)	21.43 (3.54)
Female Gender (%)	70 (75.27%)
Race/Ethnicity (%)	
Non-Hispanic White	41 (44.09%)
Non-Hispanic Black	15 (16.13%)
Non-Hispanic Asian	15 (16.13%)
Hispanic	12 (12.90%)
Other	10 (10.75%)
Personality Traits	
Extraversion	106.66 (17.44)
Openness to Experiences	114.95 (15.38)
Conscientiousness	122.16 (16.99)
Agreeableness	129.79 (16.02)
Emotional Stability	92.07 (20.08)

Table 2. *Pearson's correlations of primary variables with the Euclidean Distance variable represented as the Dissimilarity Index (D).*

		1	2	3	4	5	6
1. Dissimilarity Index (D)	Pearson's r	—					
	p-value	—					
2. Person Target FC	Pearson's r	0.042	—				
	p-value	0.158	—				
3. Situation Target FC	Pearson's r	-0.025	-0.493***	—			
	p-value	0.411	< .001	—			
4. Person Target MSC	Pearson's r	0.026	0.832***	-0.773***	—		
	p-value	0.381	< .001	< .001	—		
5. Situation Target MSC	Pearson's r	-0.025	-0.765***	0.817***	-0.828***	—	
	p-value	0.400	< .001	< .001	< .001	—	
6. PR	Pearson's r	-0.145***	-0.127***	0.129***	-0.116***	0.161***	—
	p-value	< .001	< .001	< .001	< .001	< .001	—

* p < .05; ** p < .01; *** p < .001
FC = Fixation Count; MSC = Dwell Time in Milliseconds; PR = Preference Rating

Table 3. *Pearson's correlations of primary variables with the parameters of the Euclidean Distance: distance between elevation, distance after removing elevation, distance between scatter, distance between shape.*

		Elevation	without Elevation	Scatter	Shape
Person Target FC	Pearson's r	0.030	0.039	-0.044	0.058
	p-value	0.319	0.188	0.141	0.051
Situation Target FC	Pearson's r	0.018	-0.036	0.006	-0.058
	p-value	0.553	0.229	0.837	0.053
Person Target MSC	Pearson's r	0.017	0.020	-0.049	0.045
	p-value	0.579	0.515	0.102	0.136
Situation Target MSC	Pearson's r	-0.007	-0.036	0.037	-0.062*
	p-value	0.812	0.234	0.212	0.038
PR	Pearson's r	-0.270***	-0.074*	0.030	-0.090**
	p-value	< .001	0 .013	0.321	0.003

* p < .05; ** p < .01; *** p < .001
FC = Fixation Count; MSC = Dwell Time in Milliseconds; PR = Preference Rating

Mediation analyses using bias-corrected percentile bootstrapping with 1000 replications were conducted with the dissimilarity index as the independent variables, PR as the dependent variable, and each of the four attention variables as unique mediating variables. Without an association between the dissimilarity index and the attention variables, it was expected that there would be no mediating effect. Figures 2 and 3 illustrate the regression estimates and standard errors of paths a, b, the direct effects, and total effects. These figures illustrate no mediating effect on the association between the dissimilarity index and PR from time spent looking at the person target (MSC1; indirect effect= -1.506×10^{-4}, p=0.393) nor from time spent looking at the situation target (MSC2; indirect effect= -2.037×10^{-4}, p=0.405). Similar effects were observed when fixation count on the person target (FC1; indirect effect= -2.620x10-4, p=0.181) and the situation target (FC2; indirect effect= -1.585x10-4, p=0.419) were used as mediators.

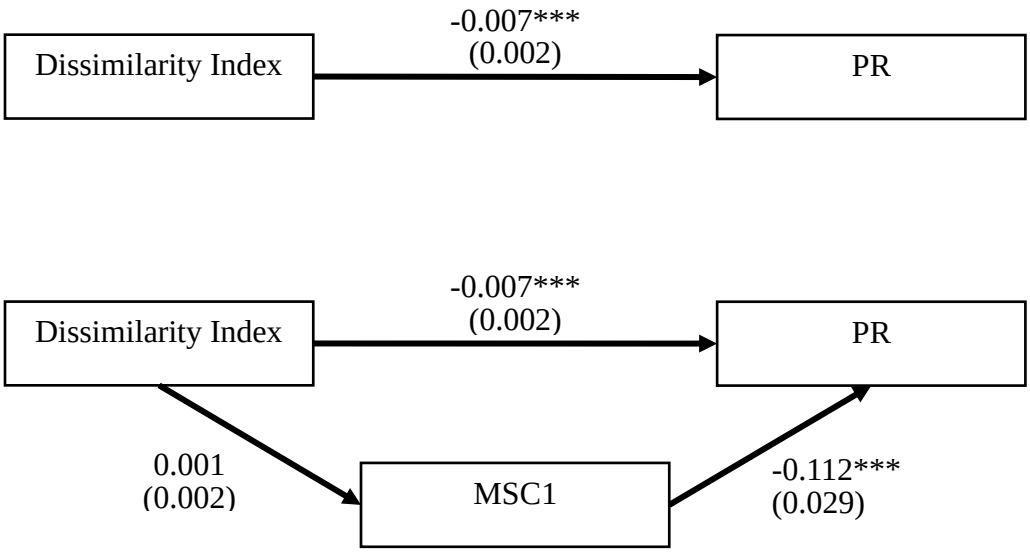

Figure 2. Path diagrams of mediation model with the Dissimilarity Index as the independent variable, preference rating (PR) as the dependent variable, and person-focused dwell time in milliseconds (MSC1) as the mediator.

* p < .05; ** p < .01; *** p < .001

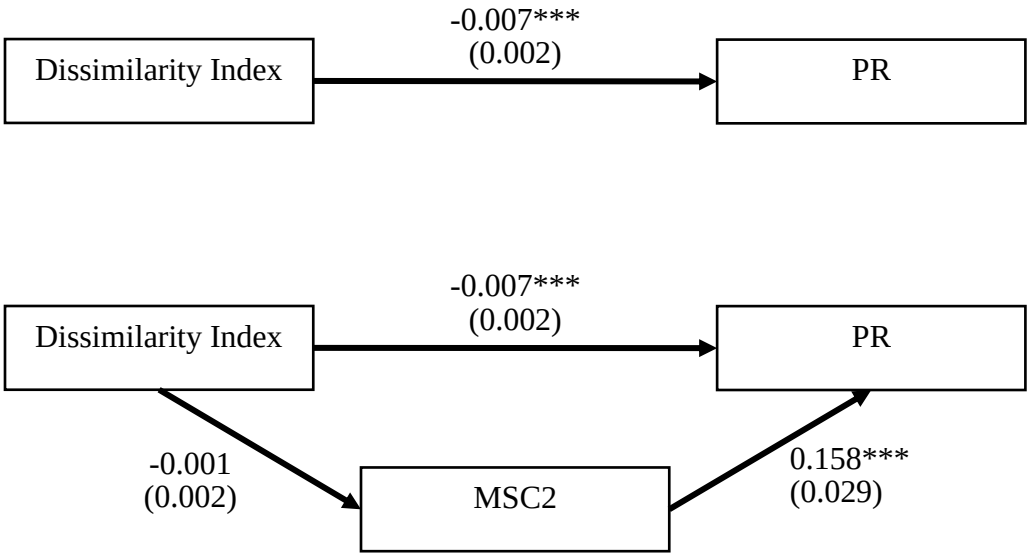

Figure 3. Path diagrams of mediation model with the Dissimilarity Index as the independent variable, preference rating (PR) as the dependent variable, and situation-focused dwell time in milliseconds (MSC2) as the mediator.

* p < .05; ** p < .01; *** p < .001

These mediation analyses were replicated using each of the parameters of Euclidean distance (distance between Elevation, distance without Elevation, distance between Scatter, and distance between Shape) as unique independent variables. Similar to the mediating effect of the dissimilarity index, there was no mediating effect of MSC1 between the distance between Elevation and PR (indirect effect=-1.094x10^{-4}, p=0.582), between the distance without Elevation and PR (indirect effect=-1.218x10^{-4}, p=0.52), or the distance between Scatter (indirect effect=3.925x10^{-4}, p=0.132). There was also no mediating effect of MSC2 between the distance between Elevation and PR (indirect effect=-6.732x10^{-5}, p=0.811), between the distance without Elevation and PR (indirect effect=--3.095 x10^{-4}, p=0.244), or the distance between Scatter (indirect effect=3.446x10^{-4}, p=0.223). Similar effects were seen when using the FC1 and FC2 as mediators.

Unlike the other dissimilarity indices, a significant path between shape and the attention variable of dwell time in milliseconds on the target situation emerged. However, there was no observed mediating effect of FC1 (indirect effect=-0.021, p=0.078), FC2 (indirect effect=-0.021, p=0.079), MSC1 (Figure 4; indirect effect=-0.014, p=0.165), or MSC2 (Figure 5; indirect effect=-0.028, p=0.053) between the Shape and PR. Though the indirect effects when using Shape were different from when using any of the other independent variables, the total effects and the direct effects were comparable between all the variations of the attention variable, indicating no mediating effect.

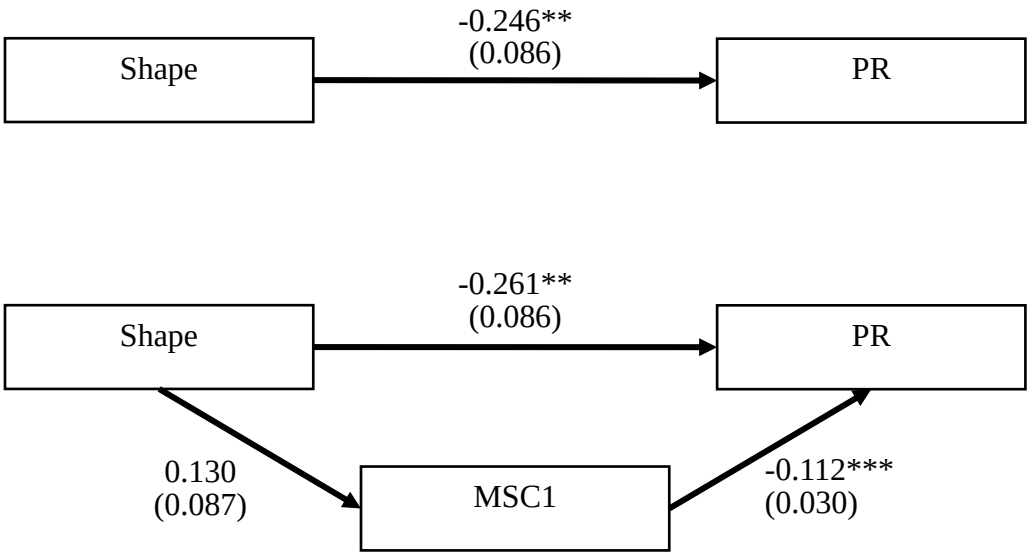

Figure 4. Path diagrams of mediation model with the Shape parameter of the Euclidean Distance as the independent variable, preference rating (PR) as the dependent variable, and person-focused dwell time in milliseconds (MSC1) as the mediator.

* p < .05; ** p < .01; *** p < .001

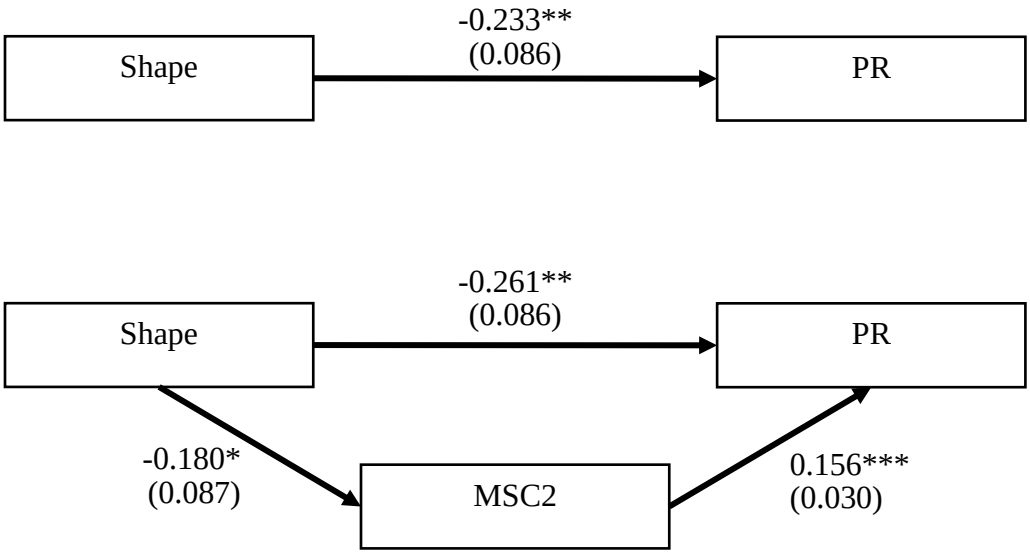

Figure 5. Path diagrams of mediation model with the Shape parameter of the Euclidean Distance as the independent variable, preference rating (PR) as the dependent variable, and situation-focused dwell time in milliseconds (MSC2) as the mediator.

* p < .05; ** p < .01; *** p < .001

DISCUSSION

In this study of person-centered personality in graduate and undergraduate students, both being dissimilar from and how much attention was paid to the presented target person's personality characteristics were associated with preference ratings towards that target profile. When a mediation model was applied, no association was found in the path from dissimilarity to attention and no change was seen in the direct effect between personality dissimilarity and preference, indicating that attention does not mediate this relationship. The same results were observed when looking at each parameter of the dissimilarity index (Euclidean distance), such as the distance between Elevations, without Elevation, Scatters, and Shapes. Ultimately, our hypothesis that people would pay more attention to those with similar personalities to themselves was not observed. These findings may be helpful to inform a person-centered approach to personality research exploring the mechanisms behind the relationship between personality similarity and preference.

It can be argued that people with more similar personalities to themselves are simpler to understand or easier to imagine, possibly even more familiar to a person compared to those more dissimilar to themselves. Perhaps observed associations are evident of similarity being comparable to familiarity. Our study implemented two practice trials prior to the thirty-six experimental trials and all person profiles were shown in random order three times, each time paired with a different situation profile, throughout the experiment. This attempt to control habituation and novelty may have been helpful in controlling some aspects of novelty of information and task, leading to the idea that dissimilarity is more impactful than familiarity. We also modified the words

used for person traits in the person profiles due to information from circumplex models of the Big Five (Hofstee et al., 1992) and anecdotal information collected from pilot trials that indicated certain words had a larger cognitive demand when it came to interpreting and understanding personality types. However, much research has shown that attention to reading words is highly influenced by word length, word complexity, and previous exposure to the word (Clifton et al., 2007). No research was found on the complexities and commonality of personality-specific words, and so our findings may or may not be attributed to the participants' individual exposure to the words used in our study, which was not recorded.

Limitations and Future Directions

The choice was made to create person profiles based on most possible combinations of FFM personality traits due to inconclusive research on definitively common or uncommon personality profiles (Yin et al., 2021). However, there is evidence of certain social desirability pertaining to the polarity of certain personality traits (Digman, 1997). Taking this into account, some of the created person profiles may be representative of less common or less desirable personality types regardless of similarity to the person's own personality profile. How common or desirable a profile is, irrespective of the person's own personality, can be reflective to the previously discussed research explaining novelty as binding attention. Using LPA to develop common personality profiles as targets to imitate real life personality types rather than a systematic combination of FFM traits can be helpful in future studies to generalize findings to real world settings. Additionally, considering social desirability, using participant's own personality as a target profile in direct comparison with varying other profiles can be an

interesting approach in future studies to determine the difference between familiarity and bias.

Previously discussed research indicated that perceived personality similarity or one's perception of how similar personality traits are to their own, rather than actual similarity, is more influential to judgement, preference, and/or attraction (Montoya et al., 2008; Plaks et al., 2001; Selfhout et al., 2009; Strauss, Barrick, & Connerly, 2001). Considering these findings, future studies may benefit from collecting information on perceived personality similarity as well as measured personality. Additional measures asking participants to rank or rate person profiles and situation profiles both independently and together (the current study only having done the ladder), as well as indicate what they perceive the situational trait profiles to be representative of (i.e., short-term situations like working on a group project, traveling with someone, being at a party, or long-term situations like being coworkers, living with someone, or being in a relationship with someone) may be helpful in exploring people's preferences for others and for situations regardless of the combination and how that may change when paired as well as explore the influence of assumptions, imagination, and perception on preference and judgement.

CONCLUSION

In conclusion, in our study of undergraduate and graduate college students, both attention and dissimilarity to other's personality are associated with a person's preference towards that personality type regardless of the situation. However, attention does not mediate the relationship between personality dissimilarity and preference. These findings add to the literature using a person-centered approach to personality rather than the more common trait-specific approach while advancing the literature to a more individualized person-centered approach rather than using the current method of grouping people by common personality profiles or individual traits. The use of objective measures, such as eye-tracking technology, and investigating attention as a mediator also advances the current literature by going beyond the argument of whether or not there is an association and exploring the reasons behind why there is a relationship between personality and preference or judgement.

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