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Quantifying the Association between Personality Similarity and Marital Adjustment Using Profile Correlations: A Cautionary Tale

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Abstract

Profile correlations are sometimes used to quantify personality trait similarity between relationship partners. These coefficients are then used to test whether similar couples are happier couples. The current paper describes several different methods of calculating profile correlations and outlines procedures for testing whether these coefficients are related to marital adjustment in a sample of 1,643 couples. There was little evidence that profile correlations were related to marital adjustment after accounting for normativeness (i.e., the degree to which individual's matched the typical personality profile) and when accounting for each individual's personality attributes. Results suggest that researchers using profile correlations should be cautious given that the interpretation and psychological meaning of results often depend on how the coefficients are calculated.

Keywords

profile similarity; profile correlation; personality traits; marital adjustment

Are spouses who are more similar in terms of their personalities more satisfied with their marriages? This interesting and important question advances research concerning the association between personality traits and relationships beyond the study of the "main effects" of personality attributes to the examination of dyadic effects (e.g., Dyrenforth, Kashy, Donnellan, & Lucas, 2010; Gonzaga, Campos, & Bradbury, 2007; Gonzaga, Carter, & Buckwalter, 2010; Luo, Chen, Yue, Zhang, Zhaoyang, & Xu, 2008; Montoya, Horton, & Kirchner, 2008). As it stands, existing research has provided inconsistent answers to this seemingly straightforward question largely because there are a number of conceptual and methodological complexities involved in assessing personality trait similarity in relationships (see Kenny, Kashy, & Cook, 2006). The most consistent findings in the literature are based on studies using the profile correlation to assess personality similarity (e.g. Gonzaga et al., 2007; Luo et al,. 2008). However, profile correlations are subject to a number of methodological issues (Cronbach & Gleser, 1953; Furr, 2008; Kenny et al., 2006) that can make these studies difficult to interpret. The objective of this paper is to illustrate how different profile coefficients can be used to evaluate how personality trait similarity is

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related to marital adjustment using a large sample of married couples (see Humbad, Donnellan, Iacono, & Burt, 2010). Understanding these issues is critical because research about similarity informs how psychologists evaluate online dating services which claim that personality compatibility is an important ingredient in successful relationships (Finkel, Eastwick, Karny, Reis, & Sprecher, 2012).

Previous Research on Personality and Relationships

There is increasing recognition that personality traits are associated with the qualities of and stability of romantic relationships (e.g., Caughlin, Huston, & Houts, 2000; Donnellan, Assad, Robins, & Conger, 2007; Dyrenforth et al., 2010; Humbad, Donnellan, Iacono, & Burt, 2010; Karney & Bradbury, 1995; Kelly & Conley, 1987; Robins, Caspi & Moffitt, 2000; Watson, Hubbard, & Weise, 2000; see Malouff, Thorsteinsson, Schutte, Bhullar, & Rooke, 2010 for a meta-analytic review). Indeed, personality attributes are an important part of the Vulnerability-Stress-Adaptation model (Karney & Bradbury, 1995) which is a frequently used approach for conceptualizing the factors that contribute to relationship adjustment and stability. According to the VSA, traits indirectly impact marital quality through adaptive couple processes such as affective reactions to conflict and interpersonal skills related to problem solving (see e.g., Gonzaga et al., 2007, p. 35). In this model, individual differences in personality serve as one of the “enduring strengths and vulnerabilities” that influence how couples adapt to stressful experiences. The general idea is that personality attributes act as relatively distal factors that ultimately shape the day-to-day interactions and dyadic adaptations to external stressors that serve as the more proximal influences on relationship quality and stability.

Consistent with the underlying logic of the VSA model, a large body of literature has demonstrated associations between personality attributes and global measures of dyadic adjustment, relationship adjustment, and relationship satisfaction. The most commonly studied associations usually involve traits related to the disposition to more readily experience negative and aversive emotions such as anxiety, sadness, and hostility -- Negative Emotionality/Neuroticism. This element of personality is negatively related to relationship adjustment across a number of studies (e.g., Donnellan et al., 2007; Heller, Watson, & Ilies, 2004; Humbad, Donnellan, Iacono, & Burt, 2010; Karney & Bradbury, 1995; Malouff et al., 2010; Robins et al., 2000). In addition to Negative Emotionality, recent research has suggested that personality traits related to the tendency to experience positive emotions as a result of interpersonal interactions and affiliation (i.e., Communal Positive Emotionality), traits linked to self-control (i.e., Constraint), and traits associated with Agreeableness are positively related to relationship quality (e.g., Donnellan et al., 2007; Dyrenforth et al., 2010; Heller et al., 2004; Humbad, Donnellan, Iacono, & Burt, 2010; Robins et al., 2000).

Importantly, personality attributes have been associated with both an individual’s reports of relationship adjustment as well as his or her spouse’s level of relationship adjustment. These statistical effects are commonly referred to as *actor* and *partner* effects, respectively (see e.g., Kenny et al., 2006). Actor effects are defined as the statistical associations between a person’s characteristics and his/her experience of the relationship or behaviors in the relationship. Partner effects, by contrast, capture the statistical associations between a person’s characteristics and his or her partner’s experiences or behavior and therefore provide compelling evidence that individual differences are important in the study of close relationships. Quite simply, partner effects are thought to “capture the truly interpersonal nature of relationships” (Kenny & Cook, 1999, p. 434) and are typically uncontaminated with shared method variance in common research designs (see Donnellan et al., 2007).

Couple-Level Attributes: Profile Correlations of Similarity

In addition to evaluating the actor and partner effects associated with personality, researchers have evaluated whether personality similarity is related to relationship satisfaction and stability (e.g., Donnellan et al., 2007; Dyrenforth et al., 2010; Eysenck & Wakefield, 1981; Gattis, Berns, Simpson, & Christensen, 2004; Gonzaga et al., 2007; Gonzaga et al., 2010; Luo et al., 2008; Robins et al., 2000). It might be the case that relationships between individuals with very similar personalities (such as a relationship between two individuals who are both relatively high in Negative Emotionality, low in Constraint, and moderate in Positive Emotionality) are more satisfying than relationships comprised of individuals with very different personality profiles. One method of indexing this kind of similarity is through the calculation of a correlation coefficient for each couple that captures the association between the two partner's personality profiles.[1]

A concrete example will help illustrate the basic idea of a profile correlation and the potential challenges associated with their interpretations. Consider a couple, Mike and Susie, who each separately completed the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982) – an omnibus personality inventory consisting of 11 primary scales that more or less coalesce into the higher-order dimensions (or superfactors) of Negative Emotionality, Positive Emotionality, and Constraint. Personality similarity can be assessed by computing the correlation between Susie's scores on Negative Emotionality, Positive Emotionality, and Constraint with Mike's scores on those same traits (i.e., calculate a couple-level correlation based on the three pairs of personality traits). Higher positive scores would indicate a greater correspondence between the personality profiles for Mike and Susie. This profile correlation can then be used to test whether personality shape similarity or configural similarity (Luo et al., 2008) is related to relationship functioning.

There is some evidence suggesting that similar couples are happier couples when similarity is operationally defined as configural similarity and quantified with a profile correlation (Gonzaga et al., 2010; Luo et al. 2008). However, there are several methodological issues that make a clear interpretation of research with profile correlations difficult (see also Acitelli, Kenny, & Weiner, 2001; Dyrenforth et al., 2010; Furr, 2008; Kenny & Acitelli, 1994; 2001). One issue involves how researchers calculate profile correlations. Furr (2008) noted that researchers interested in configural similarity could calculate profile similarity using raw scores (i.e., to index overall similarity) or mean-centered scores (i.e., to index distinct similarity).

By returning to our example couple, these computational distinctions can be made more concrete. The MPQ scores for Mike and Susie are reported in Table 1 (these scores are from an actual couple in our de-identified dataset of over 1,600 married couples but the names are fictitious). In this example, we further divided Positive Emotionality into its agentic and communal components in light of previous findings about the utility of this distinction in the domain of romantic relationships (Donnellan et al., 2007; Humbad, Donnellan, Iacono, & Burt, 2010). As we noted, it is possible to calculate an overall similarity index by correlating Susie's scores on Communal Positive Emotionality, Agentic Positive Emotionality,

[1]Other approaches to assess similarity are possible such as taking the absolute value of the difference between each person's traits or using McCrae's (1993) index of profile agreement which weights similarity at extremely high (or low) levels of traits more strongly than similarity on less extreme values. As it stands, there is very little indication that these ways of assessing similarity are related to measures of relationship satisfaction (e.g., Dyrenforth et al., 2010; Luo et al., 2008). Using the current data, we examined McCrae's profile agreement index and found that at the scale level (i.e., calculating personality similarity based on all eleven scales of the MPQ), the coefficient was significantly related to marital adjustment even after controlling for actor and partner effects at the scale level ($b = 0.14$, $t(1613.4) = 2.2$, $p < .05$). However, this effect did not persist at the superfactor level of analysis so we are cautious about the robustness of the results (see also Dyrenforth et al., 2010). Full results are available upon request.

Negative Emotionality, and Constraint with Mike's raw scores on these same broad traits. In this case, the correlation is .69. Researchers may also wish to calculate profile similarity using the eleven primary scales of the MPQ.[2] In this case, the overall similarity for Susie and Mike for the raw scores on the primary scales is .59. Both of these results could be interpreted as indicating that Mike and Susie are quite similar in their personalities to one another.

One concern with this interpretation is that profile correlations computed with raw scores (what we call overall profile similarity correlations) can be inflated by what is known as the "normativeness problem" (Furr, 2008). It may be that Mike and Susie appear to be a highly similar couple because both Mike and Susie are more or less typical people. For this reason, a conventional significance test on an overall profile correlation using the null hypothesis that the population similarity correlation is zero is usually inappropriate. The correlation between two unrelated profiles is unlikely to be zero in real data. It is often the case that two randomly paired strangers will have some degree of similarity when the strangers have personality profiles that approximate the normative pattern. To illustrate this fact, we picked five husbands at random from the rest of the husbands in the dataset and then sequentially paired them with Susie. The resulting overall similarity coefficients were .94, .88, .88, .87, and .92 at the superfactor level. Likewise, we picked five wives at random from the rest of the dataset and paired them with Mike. The resulting overall similarity coefficients were . 79, .90, .56, .81, .85 at the superfactor level. As seen in these correlations, both Susie and Mike are seemingly quite similar to random partners. In fact, Mike and Susie were sometimes more similar to random partners than they were to each other.

The random-pairing results for Mike and Susie raise a practical issue about how profile correlations should be interpreted using effect size conventions commonly used with correlations. There is no easy answer to this question, but it seems ill advised to assume that a similarity coefficient above .49 is necessarily "large." One possible way to evaluate Mike and Susie's actual degree of observed similarity is to compare their profile correlation of .69 with the distribution of overall profile correlations for all couples in our dataset. This distribution would allow us to draw some inferences about the relative degree of similarity for a given couple much like how computing a z-score aids in the interpretation of raw scores for scales. The sample mean for the overall profile correlations was .90 (Min = −.05, Max = 1.00) and the standard deviation was .11. Thus, Mike and Susie were actually over two standard deviations below the sample mean in terms of their overall similarity. This example illustrates why caution is required when trying to interpret the overall similarity coefficient. The reality is that the normativeness issue can produce high profile correlations for many couples.

Another way to get a sense of the scope of the normativeness issue is to compute how strongly Susie's and Mike's personality profiles approximate the typical personality profile by correlating their suite of trait scores with the vector of sample averages for those same traits for women and men, respectively. We used separate averages for women and men given that there are generally significant gender differences for many personality traits (see e.g., Feingold, 1994; Schmitt, Realo, Voracek, & Allik, 2008), even if any gender difference for a single trait is fairly modest when considering effect size estimates. For Susie, these coefficients were .98 for the 4 broad dimensions and .95 for the lower scales, and these coefficients were .89 and .75, respectively, for Mike. These results suggest that Susie and

[2]It might also be possible to compute profile similarity using all of the items of a personality inventory (Gonzaga et al., 2007); however, this approach may not be optimal given concerns about the inherent unreliability of personality items which will attenuate similarity. Likewise, concerns about redundancy are relevant considering that different items within the same scale should all assess the same fairly narrow element of personality. This issue was noted by Kenny et al. (2006, p. 321). Indeed, most applications of profile similarity in basic personality research are based on scales rather than items (e.g., McCrae, 2008).

Mike have fairly typical personality profiles. It is also informative to calculate what Furr (2008) calls generalized normative agreement, which is the correlation between the average profile for women and the average profile for men. This was .99 and .96 (superfactors/lower order scales), suggesting that husbands and wives with typical personality profiles are highly similar to one another in our dataset. All in all, the case of Mike and Susie illustrates the challenges of interpreting the meaning of the overall profile correlation with and without controlling for normativeness.

One way to address the normativeness problem is to calculate what is known as the index of distinctive similarity (see Furr, 2008; Kenny et al., 2006). Distinctive similarity is achieved by mean-centering Susie's trait scores and Mike's trait scores. Again, the scores are mean-centered within gender because women may have higher or lower mean levels of a given trait (Feingold, 1994; Schmitt et al., 2008). The point is to compute Susie's distinctiveness from the average woman and Mike's distinctiveness from the average man. To our minds, mean-centering scores alleviates some of the problems associated with computing similarity coefficients using raw scores.[3]

As seen in Table 1, for example, Susie is higher in Communal Positive Emotionality compared to typical levels for women whereas Mike is lower in this attribute when compared to typical levels for men. The mean-deviated individual profiles capture what is distinctive about each partner's personality relative to so-called normal levels. Thus, the index of distinctive similarity captures the correspondence in distinctive personality attributes for the dyad. In our example, this coefficient was −.72 for superfactors and −.28 for the lower-order scales for Mike and Susie. Thus, Mike and Susie seem to have opposite personality profiles in this metric. It is also possible to compute sample level statistics for these coefficients. In our dataset, we found the average levels of distinctive similarity were lower than overall similarity. The average correlation was .12 (Minimum = −1.0, Maximum = 1.0) and the standard deviation was .59. Accordingly, Mike and Susie had a distinctive similarity coefficient that was approximately one and a half standard deviations below the mean. It is also possible to standardize scores for wives and husbands using the gender-specific mean and standard deviation before computing the profile correlations. Although not listed in Table 1, the standardized profile correlation was −.73 at the superfactor level and −.30 at the scale level for Mike and Susie, thereby indicating that standardizing versus mean-centering had little impact on the degree of distinctive similarity for this couple.

Calculating and reporting the distinctive similarity index in addition to the overall similarity index has advantages. First, distinctive similarity allows researchers to quantify similarity without concerns about normativeness. Second, it is much more direct and simpler method to implement and understand than the pseudo-couple analyses (i.e., pairing each individual in the sample with random partners and using the resulting correlations between the pairs as a measure of stereotype accuracy) that are sometimes used to address this issue (see e.g., Corsini, 1956; Gonzaga et al, 2010). Third and perhaps most importantly, it can prevent normativeness of the overall similarity index from potentially confounding associations with criterion variables like relationship quality and satisfaction (see e.g., Kenny & Acitelli, 1994). The concern is that couples who are typical in terms of their personality may also be more likely to "say that they are satisfied in their relationship" (Kenny & Acitelli, 1994, p. 420). Indeed, it is our experience that many of the positive findings in the existing literature

[3]Mean-centering profiles cannot completely prevent problems stemming from the direction of a given scale. Raw profile correlations are most sensitive to the direction of keying in scales, but centered or standardized scores can also be susceptible to this issue. Cohen's r_C (1969) is a profile similarity coefficient that accounts for differences in scale keying by using both direct and reflected scales in its calculation. Given that the majority of the research on personality profile similarity and its relationship to marital adjustment has relied on standard profile correlations, r_C was not examined in the current report.

do not address this particular concern with overall similarity coefficients (see also Dyrenforth et al., 2010).

We can anticipate some resistance to centering scores and we note that a preference for raw scores versus mean-centered or standardized scores may reflect different disciplinary traditions within psychology. Virtually all personality measures use arbitrary metrics (Blanton & Jaccard, 2006), and this makes it challenging to interpret raw scores. Raw scores on personality measures usually do not have an inherent psychological interpretation. For example, knowing that a person's raw score on a measure of Negative Emotionality was 58 (or 5.8 or .58) is usually uninformative. A transformation of the raw score is one way to infuse raw scores with some meaning. This reason is why it is common to standardize the score or otherwise compare the raw score with normative data, a practice common in clinical psychology. This kind of transformation makes it possible to ascertain how a score of 58 ranks with respect to a distribution of scores. To researchers who adopt this perspective on scores, there is nothing misguided or "wrong" about centering scores.

On the other hand, some researchers would like to offer a literal interpretation of raw personality test scores. For example, if an individual rates himself as a "3" on a 5-point scale ranging from "Depressed" (1) to "Elated" (5) where (3) refers to "Average", some researchers may argue that this individual is average in terms of mood. This perspective has the practical advantage of permitting an absolute interpretation of a raw test score. Researchers who adopt this perspective might therefore object that centering scores effectively discards or even distorts useful information. Standardizing or mean-centering scores may seem unnecessary or even unwise. However, such a literal interpretation of scores is not well justified on psychometric grounds. Thus, we adopt the former perspective on personality test scores rather than this literalist viewpoint.

The Current Study

Recent investigations concerning the associations between personality traits and relationships are moving beyond main effects for personality to evaluate how personality profile similarity is associated with relationship processes and outcomes. Existing research examining this question using profile correlations has produced mixed results (e.g., Dyrenforth et al., 2010 versus Gonzaga et al., 2007). Moreover, there is an overarching need for studies with considerable statistical power to detect effects (i.e., large samples with reliable measures of personality) given that effect sizes are often small. Accordingly, the objective of the current study is to revisit our previous personality analyses on a large dataset of married couples (Humbad, Donnellan, Iacono, & Burt, 2010) to evaluate connections between profile correlations and marital adjustment. One advantage of the present study over Dyrenforth et al. (2010) is that we used a longer personality measure than the relatively brief personality assessments available in national panel studies.

Although Humbad and colleagues examined whether spousal similarity for personality traits is a function of convergence (i.e., spouses becoming more similar over time) or selection processes (Humbad, Donnellan, Iacono, McGue, & Burt, 2010), the goal of the current study is to illustrate the various ways that profile correlations can be computed to address the question of whether similar couples are better functioning couples. Furr (2008) pointed out that different approaches of quantifying configural similarity can significantly alter the interpretation of results.

The current report will therefore calculate different profile correlations to demonstrate potential changes in interpretation when attempting to answer questions about profile similarity and relationship outcomes. This is important because some positive findings in the literature might be based on particular ways of computing similarity coefficients whereas a

different approach would have produce a null result or much smaller effect size. This kind of situation provides increased opportunity for false-positives to be introduced into the literature (see Simmons, Nelson, & Simonsohn, 2011). We will also evaluate whether effects of profile correlations persist above and beyond actor and partner effects of personality traits. Returning to our example involving Mike and Susie, it may be the case that their individual personality traits are the more critical consideration for their relationship than any dyadic combination of their personalities. Put differently, the combination of their personality may not matter above and beyond their individual traits. This finding would be a more parsimonious perspective on personality and relationships, so it is important to examine actor and partner effects in conjunction with personality profile correlations.

Method

Participants

The current sample consisted of 1,643 married couples with complete personality data taken from a sample of 1,805 couples from Minnesota that were used in Humbad, Donnellan, Iacono, and Burt (2010). The actor and partner personality effects were the focus of the previous investigation whereas these data are used to illustrate methodological issues in similarity research in the current study. Participants ranged in age from 29–66 years, averaging 43.0 for wives (SD = 5.2) and 44.9 for husbands (SD = 5.6). Couples had been married for an average of 19.7 years (SD = 5.4). Participants were predominantly Caucasian (>95%). Complete details about sample recruitment can be found in Humbad, Donnellan, Iacono, and Burt (2010) and are therefore only briefly summarized here.

The majority of couples (63%) came from the Minnesota Twin Family Study (MTFS). The MTFS is an epidemiologically-based, longitudinal study of same-sex twins and their parents. Detailed information regarding the design, recruitment procedures, and participation rates of the MTFS can be found in Iacono, Carlson, Taylor, Elkins, and McGue (1999). In addition to the population-based twins in the MTFS, a “high-risk enrichment” sample (ES; 8% of the current study) was also used (for additional details about this sub-sample, see Keyes, Malone, Elkins, Legrand, McGue, & Iacono, 2009). These families were selected if either twin showed more than the usual amount of externalizing psychopathology (i.e., a score of 5 or more for Attention Deficit Hyperactivity Disorder or Conduct Disorder on a phone screen structured interview, the Diagnostic Interview for Children and Adolescents, or DICA; Reich, 2000). Last, the present sample includes parents from the Sibling Interaction and Behavior Study (SIBS; 28% of the current sample). The SIBS is a population-based, longitudinal study of adoptive and non-adoptive adolescent siblings and their parents. Detailed information regarding the design, recruitment procedures, and participation rates of the SIBS can be found in McGue et al. (2007). Evidence for the general comparability of the three sub-samples is in Humbad, Donnellan, Iacono, and Burt (2010).

Measures

Marital Adjustment—The Dyadic Adjustment Scale (Spanier, 1976) was used to assess marital adjustment. Of the 3,286 participants, only 66 (2%) were missing data on marital adjustment. The Dyadic Adjustment scale is a 32-item scale that assesses four aspects of adjustment: marital satisfaction, consensus, cohesion, and affective expression. Although these subscales may be useful to examine particular facets of close relationships, the total Dyadic Adjustment Scale score was used in the current study. The total score provides an overall measurement of dyadic adjustment that has been found to show stronger associations with other variables than the individual subscales (Graham, Liu, & Jeziorski, 2006). In addition to the original 32 items of the Dyadic Adjustment Scale, two items were added to

assess the extent of agreement between spouses regarding their parenting: how to raise the children and how to discipline the children. Total Dyadic Adjustment Scale scores demonstrated good internal consistency reliabilities for men and women across all subsamples (α = .71–.84).

Personality—A 198-item version of the Multidimensional Personality Questionnaire (MPQ; Tellegen, 1982) was used to assess personality. The MPQ consists of 11 primary scales, 10 of which coalesce into higher-order "superfactors": Positive Emotionality (the tendency to experience positive emotions), Negative Emotionality (the tendency to experience negative emotions), and Constraint (reverse-scored impulsivity and behavioral restraint). Positive Emotionality includes the scales of Well-being (e.g., optimistic, happy disposition), Social Potency (e.g., likes being in charge), Achievement (e.g., ambitious, persistent), and Social Closeness (e.g., sociable, affectionate). Negative Emotionality consists of the Stress Reaction (e.g., unaccountable mood changes, easily upset), Aggression (e.g., physically violent), and Alienation (e.g., estrangement) scales. Finally, Constraint scales include Control (e.g., cautious, plans ahead), Harm Avoidance (e.g., avoids risk), and Traditionalism (e.g., conventionality). The current study made use of further sub-factors of Positive Emotionality, the agentic (high scorers are ambitious, socially dominant, and express positive emotional responsiveness; includes the Achievement and Social Potency scales) and communal (high scorers have higher interpersonal connectedness and experience positive emotions from their close relationships; includes the Well-Being and Social Closeness scales) superfactors. As we noted earlier, prior research has demonstrated that the associations between these domains and marital adjustment differ, such that Communal Positive Emotionality was found to be more closely associated with intimate relationships in three separate studies with different samples (e.g., Donnellan et al., 2007; Humbad et al., 2010; Robins et al., 2000). The MPQ shows good internal consistency within college and community samples with alphas ranging from .76–.90 for the primary traits, and a 30-day test-retest reliability ranging from .82–.92 (Tellegen, 1982). In the current study, alphas ranged from .81 to .85 for all eleven traits.

Analytic Plan

We first calculated different indexes of profile similarity using correlations following steps outlined in Furr (2008). We next tested the effects of these indexes of similarity on marital adjustment by using the Actor-Partner Interdependence Model (APIM; Kenny et al., 2006). In particular, the APIM allowed us to examine associations between the indexes and marital adjustment with and without controlling for actor and partner main effects. Luo et al. (2008) provide a compelling justification for using the APIM in such an integrated fashion.

APIM models were estimated using a Multilevel Modeling (MLM) approach as instantiated in SPSS 15.0. This paper will not focus on actor and partner effects in the data given that they were already reported in Humbad, Donnellan, Iacono, and Burt (2010). In the previous paper, a detailed description of tests for distinguishability (i.e., determining whether or not men and women are systematically different in terms of means, variances, and covariances), subsample differences, and APIM estimates for actor and partner personality effects using a structural equation modeling procedure can be found. The current paper will focus on the addition of the profile correlations to existing actor and partner effects as a predictor in the APIM.

Calculation of Profile Correlations

We calculated a Pearson product moment coefficient across the two vectors of MPQ scores for each couple (following Gonzaga et al., 2007 and Luo et al., 2008). This coefficient was calculated across the four MPQ superfactors (i.e., husband's scores on Communal Positive

Emotionality, Agentic Positive Emotionality, Negative Emotionality, and Constraint correlated with wife's scores on these traits) as well as across all eleven MPQ scales (i.e., husband's scores on all 11 primary traits correlated with wife's scores on those 11 traits). All of the profile similarity coefficients were calculated first using the raw scores, then the mean-centered scores (i.e., distinctive scores), and finally using the standardized scores. Distinctive scores were based on mean-centered scores using separate averages for husbands and wives, given that men and women significantly differed across nearly all personality traits, even if this difference was modest in size.[4]

As stated earlier, using mean-centered or standardized scores removes agreement that occurs due to normative response patterns (e.g., most women and men report relatively low levels of Negative Emotionality and relatively high levels of Positive Emotionality) that may inflate couple similarity (see Acitelli et al., 2001; Kenny et al., 2006, p. 332–333). As we described in the Introduction, this approach usually reduces the magnitude of the average profile similarity coefficient for a sample given that profile similarity is often increased by normativeness. More importantly, Kenny et al. note that these sorts of adjustment can remove "artifacts that lead to spurious correlation" (p. 333) and Kenny and Acitelli (1994) stressed that "stereotype effects need to be considered because of their possible influence on the correlation between marital quality and similarity" (p. 419). As we previously explained, participants who provide a "typical" personality response may also provide a typical response to measures of marital adjustment. As a consequence, there may be inflated associations between the uncorrected profile correlation and marital adjustment coefficients (see also Dyrenforth et al., 2010). For all of our analyses, we used profile correlations based on Fisher's *r* to *z* transformations in order to better approximate normal distributions. That is, we z-transformed each profile correlation (*r*) prior to any of the analyses with marital adjustment.

Results

Descriptive Statistics

Means and standard deviations for all raw study variables are presented in Table 2 by gender. As can be seen, there were expected gender differences for various personality superfactor traits. These were quantified using *d*-metric effect size estimates such that positive scores indicated that women scored higher than men. A common convention offered by Jacob Cohen (e.g., McCartney & Rosenthal, 2000) is that *d*s around |.20| are small, *d*s around |.50| are medium, and *d*s at or above |.80| are large. Gender difference ranged from largely trivial (e.g., Negative Emotionality) to moderate (e.g., Communal Positive Emotionality and Constraint) to even large (Harm Avoidance) using Cohen's conventions for interpreting *d*-metric coefficients. Women also reported trivially higher levels of marital adjustment than men, though this difference was statistically significant.

We also examined gender differences for the eleven MPQ scales. All of these scales demonstrated significant gender differences with the exception of Traditionalism. These scale gender differences were consistent with their respective superfactor's gender

[4]We also examined distinctive profile correlations based on mean-centered scores using the averages for traits across both men and women for comparison purposes (i.e., we mean-centered scores using the same average value for both women and men). This distinctive profile correlation using overall averages was correlated .85 and .91 (both *p*s < .01) with the distinctive profile correlation using separate averages for men and women at the superfactor and scale levels, respectively, suggesting that both methods of calculation the profile correlation are relatively similar. The distinctive profile correlation using the overall averages was correlated .01 (*p* = ns) and .07 (*p* < .05) with overall marital adjustment at the superfactor and scale levels, respectively. Importantly, however, the significant correlation between the distinctive profile correlation at the scale level with marital adjustment (.07, *p* < .05) was not significantly different from the correlation between the profile correlation calculated using distinctive scores based on separate averages for husbands and wives at the scale level and marital adjustment (.04, *p* = ns).

differences with the exception of Stress Reaction, a scale for which women reported higher levels than men. Table 2 also presents raw correlations between husbands and wives on all variables of interest for comparison purposes. There were significant associations between spouses for the majority of the traits (as originally seen in Humbad, Donnellan, Iacono, McGue, & Burt, 2010). The highest correlation was reported for marital adjustment and Traditionalism as (rs = .61 and .49, respectively). Correlations between all of the dyadic indexes that were examined are presented in Table 3. As seen there, the various indexes are correlated positively with each other and the distinctive and standardized profile correlations are most strongly related to one another.

Are Profile Similarity Coefficients Related to Marital Adjustment?

We first tested whether the Pearson profile correlation calculated across the four raw superfactor trait scores were associated with the average marital adjustment score between husbands and wives. In other words, we simply calculated a couple's average for the DAS and correlated that score with the various profile similarity measures we constructed. Note that our sample size was slightly smaller than the 1,643 couples in this calculation, given some missing data on the DAS. This very simple approach is similar to the method used by Gonzaga et al. (2007). As shown in Table 4, we found a significant association at the superfactor (r = .08, p < .05) level which was quite small, whereas we observed a significant and larger association when the Pearson profile correlation was calculated using raw scores across all eleven MPQ scales (r = .21, p < .05). This simple approach seems to suggest that similar couples have higher marital adjustment scores.

We next tested the raw overall similarity profile correlations using a Multilevel Modeling framework. Specifically, we tested whether the overall profile correlation using the superfactor raw scores (and also the profile correlation based on the scale scores) was a significant predictor of marital adjustment. Again, we found that overall similarity was positively related to marital adjustment at both the superfactor (b = 2.0, t(1628.2) = 3.5, p < .05) and scale (b = 8.6, t(1632.7) = 8.8, p < .05) level. The superfactor and scale terms, however, only explained 1 and 4 percent of the variance, respectively (Pseudo-r-square = .01, $\chi(1) = 12.0$, p < .01 at the superfactor level and Pseudo-r-square = .04, $\chi(1) = 76.2$, p < .01 at the scale level).[5]

After controlling for both actor and partner main effects (i.e., husband and wife raw scores for each personality variable) in the analyses, the superfactor and scale profile correlations remained significantly related to marital adjustment (b = 1.4, t(1622.6) = 2.5, p < .05 and b = 4.1, t(1617.8) = 3.7, p < .05, respectively). The addition of the actor and partner effects also increased the amount of variance explained to 12% and 13% at the superfactor and scale levels, respectively (Pseudo-r-square = .12, $\chi(8) = 352.1$, p < .01 at the superfactor level and Pseudo-r-square = .13, $\chi(8) = 393.7$, p < .01 at the scale level), suggesting that the actor and partner effects account for greater variance in marital adjustment than similarity coefficients. In short, greater personality similarity is related to greater marital adjustment when using raw scores to calculate profile correlations.

[5]To calculate the pseudo-r-square, we compared three models to one another. We first entered a model with no predictors for marital adjustment. We then added in the profile correlation to compute the proportion of variance explained by the profile correlation alone. We finally added in the actor and partner effects, which would demonstrate the additional proportion of variance explained by the actor and partner effects, over and above the profile correlation. Importantly, one can also examine these models in a different order, such that a model with actor and partner effects alone is compared to a baseline (i.e., no predictors) model in order to examine the proportion of variance explained by the actor and partner effects alone. Then, the profile correlation can be added in to examine the proportion of additional variance explained by the profile correlation. We examined these latter analyses and the results were consistent with the results of the analyses presented in the current paper, such that the majority of the variance explained in marital adjustment was accounted for by the actor and partner effects and not the profile correlation.

We then tested whether the distinctive personality profile correlation was related to marital adjustment. The distinctive profile correlation was calculated using the mean-centered scores. As seen in Table 4, the correlation between distinctive profile similarity and marital adjustment was no longer significant at either the superfactor ($r = .02$, $p > .05$) or scale ($r = .04$, $p > .05$) level. Moreover, these terms did not explain significant variance in marital adjustment in the multilevel modeling analyses (Pseudo-r-square = .0003, $\chi(1) = 0.63$, $p > .05$ at the superfactor level and Pseudo-r-square = .001, $\chi(1) = 2.3$, $p > .05$ at the scale level). Thus, it seems that addressing normativeness reduces the association between profile similarity and marital adjustment. When the distinctive profile correlation was entered into a multilevel model with actor and partner effects, there was no evidence of an effect. Neither the superfactor profile correlation nor the scale profile correlation was related to marital adjustment ($b = .33$, $t(1628.0) = .79$, $p > .05$ and $b = 1.3$, $t(1617.3) = 1.5$, $p > .05$, respectively). The addition of the actor and partner effects to these models resulted in an increase in percentage of variance explained, suggesting again that the actor and partner effects explain a greater proportion of variance in marital adjustment than the profile correlation (Pseudo-r-square = 0.12, $\chi(8) = 357.3$, $p < .01$ at the superfactor level and Pseudo-r-square = .16, $\chi(8) = 454.25$, $p < .01$ at the scale level). We obtained the same results when we used profile correlations based on standardized scores instead of mean-centered scores such that there was no significant association between the standardized profile correlation and marital adjustment at both the superfactor and scale levels (see Table 4). All in all, these results demonstrate that addressing normativeness in similarity coefficients largely eliminated associations with marital adjustment.

Does the Level and Type of Control Matter?

All in all, the present analyses suggested that personality profile similarity effects were most likely to be detected when using the raw score approaches to calculating the index. We also wanted to evaluate the effects of personality similarity using different levels of controls to further illustrate concerns with the existing literature. For example, previous studies (e.g., Gonzaga et al., 2007) have found profile similarity effects using Pearson profile correlations. To increase the statistical rigor of the analyses, those researchers also conducted a series of analyses to test whether additional controls for the main effects of personality affected their interpretations. However, existing studies have used several methods for conducting these control variable analyses and we were concerned that these different approaches can produce substantively different results. Accordingly, we attempted an analogous set of analyses in the present study to examine the effects that different levels of “control” have on the conclusions drawn from research using raw scores.

As seen in Table 5, under both of our analyses, we first report the association between the profile correlation based on the raw scale data (i.e., based on all eleven scales of the MPQ) and the couple average of marital adjustment ($r = .21$). In Analysis 1, we introduced controls for the average of husband and wife score for each of the four superfactors on a trait by trait basis. This analysis basically mirrors the approach used by Gonzaga et al. (2007) who controlled for the couple averages of each of the Big Five domains when evaluating whether their similarity profile correlation based on the individual items was still associated with relationship quality. As seen in Table 5, the overall similarity effect was mostly unchanged using this approach although we observed slight reductions controlling for Communal Positive Emotionality and Negative Emotionality (rs range from .13 to .15). Thus, we were able to replicate (albeit with weaker effect sizes) the basic effects reported by Gonzaga et al. (2007).

These effects, however, were substantially reduced when we introduced more stringent controls. For example, as seen in the last column of Analysis 1, we observed a notable reduction in the profile similarity effect size while controlling for all 4 superfactor traits

using the averages of husbands and wives within a single analysis (the similarity coefficient reduced to .07). This step was not taken by Gonzaga et al. (i.e., they did not report an analysis controlling for all five Big Five trait domains simultaneously despite the fact that the profile correlation is drawn from across all five trait domains; see also Dyrenforth et al., 2010, footnote #2). In Analysis 2, we used controls for all eleven scales (averages between husbands and wives) and the reduction in the size of the similarity coefficient was also observed (i.e., the effect went from .21 to .07). This analysis was meant to illustrate the reduction in effects when controls at the same level are used (i.e., our profile correlation was calculated at the scale level and we controlled for main effects from all eleven scales rather than controlling for superfactors). Gonzaga et al. calculated their profile correlation at the item-level and controlled for main effects at the trait level, and we wanted to demonstrate the impact of controlling at the same level of analysis. These results suggest that the same reduction in effect size is seen (i.e., .21 to .07) when controlling for all scales at the superfactor level and at the scale level. This indicates that perhaps the level of analysis (superfactors versus scales) may not impact the association between similarity and marital adjustment as greatly as controlling for each domain individually in separate analyses versus controlling for all domains simultaneously. Nonetheless, we observed fairly substantial (66%) effect size reductions when using more conservative methodological practices (see also Dyrenforth et al., 2010).[6]

We should emphasize, however, that Gonzaga et al. (2007) calculated the Pearson coefficient using raw scores rather than the more conservative approaches recommended by Kenny and Acitelli (1994; see also Acitelli et al., 2001). As we noted earlier, there is no evidence that personality similarity matters when using mean-deviated and standardized scores to calculate the profile correlation. Indeed, we suspect that many of the positive findings reported in the literature for personality profile similarity are likely to be diminished when researchers implement alternative ways of computing profile correlations that address the normativeness issue.

Discussion

The objective of this paper was to describe various methods of calculating personality profile similarity and evaluate how these coefficients are associated with marital adjustment using a very large sample of married couples. We first illustrated how removing normativeness from profile similarity scores (i.e., mean-centering or standardizing them) can significantly affect the interpretation of the degree of similarity evident in couples. Using data from a single couple from our sample, we observed that accounting for normativeness can reverse the interpretation of the level of couple similarity (by switching the sign of coefficient from a positive to a negative). Given such a possibility, Furr (2008) argues that researchers need to carefully examine profile similarity measures by attending to the effects of normativeness and distinctiveness.

Accordingly, we evaluated the association between profile correlations and marital adjustment using various approaches and control variables. In general, we found several cases in which the statistically significant “zero-order” effect for the dyadic index was reduced in alternative analyses and in ones that included additional controls. Indeed, we found that Pearson profile coefficients did not statistically predict marital satisfaction when

[6]We also observed a significant reduction in the association between personality similarity and marital adjustment when controlling for all four superfactor traits *separately* from husbands and wives (i.e., instead of couple averages as used in the current paper and by Gonzaga et al., 2007). Indeed, the similarity coefficient was reduced to $r = .07$ again after controlling for all four superfactor traits from husbands and wives separately. These results also persisted to the scale level, such that controlling for all eleven scales separately from husbands and wives also resulted in a reduction in the similarity coefficient to $r = .07$. The use of separate scores for husbands and wives is probably a more optimal control strategy but it did not seem to matter for this illustration.

they were calculated using a conservative approach (i.e., using standardized instead of raw scores in the analyses) and in analyses controlling for their constituent elements. Although some researchers may argue that removing normativeness will remove important variance in similarity, we would argue that it is essential to present results with and without controls for normativeness when examining similarity in relation to an outcome (e.g., marital adjustment). Debating whether removing normativeness is too conservative of a research practice is probably futile. Thus, our best practice recommendation is to present results from both raw similarity correlations as well as distinctive similarity correlations. This way it is possible for consumers of the research to evaluate the findings if there are differences. If researchers fail to account for normativeness, however, it is unclear which aspects of similarity are "driving" the statistical effects.

Moreover, as with any interaction in a regression context, it is necessary to control for "main" effects when testing the similarity index in order to examine whether this combinatorial element has effects above and beyond the effects of the constituent elements. Accordingly, it is important to control for main effects of personality when testing the effects of similarity on marital adjustment. Without doing so, it is unclear whether the overall association is being driven by the main effects of personality or the similarity term. Indeed, in our data, we found that much of the "action" in predicting marital adjustment was in the actor and partner effects for personality attributes, which is consistent with our interpretation of the existing literature for personality traits (Dyrenforth et al., 2010).

Although the current study examined several profile similarity indexes, it also has a main limitation. Specifically, the current study was comprised of predominantly European Americans across a wide age-range in lengthy marriages. Therefore, we cannot generalize these findings with confidence to other sorts of couples. Instead, we hope to have provided a framework for future researchers to evaluate issues of personality similarity with couples from more diverse ethnic groups or couples married for different durations of time.

We urge researchers to exercise caution when deciding on which personality similarity correlation coefficient to use in a given research context. The interpretation of the result may change depending on how the profile correlations are calculated. Beyond methodological considerations, we are also concerned about the problems inherent in attaching psychological (as opposed to statistical) meaning to profile correlations. Is it really theoretically meaningful to expect a couple comprised of two individuals with high levels of Negative Emotionality, low levels of Positive Emotionality, and low levels of Constraint to have a relatively happy relationship just because their personality profiles have the same shape? Is this what lay people and theorists really mean when they contemplate whether similar couples are happier couples? Just how does a couple with a profile similarity coefficient of .40 differ from a couple with a coefficient of .80? The respective coefficients point to a difference in the similarity of the shape of the profile, but what does that mean in conceptual terms? Does this sort of difference have an instantiation that is clinically detectable or meaningful? Is such a difference noticeable in practical terms? These are difficult questions to answer, and this challenge makes it difficult to generate theories and process models that could explain why more positive profile correlations should be positively linked to marital adjustment and relationship quality.

In sum, we stress the importance of presenting results of profile correlations based on raw scores, distinctive scores, and controlling for main effects of *all* traits simultaneously, given the magnitude of change in interpretation seen across the different approaches. We believe this is the most rigorous way to evaluate whether personality trait similarity is related to relationship outcomes. Researchers should continue to evaluate the connection between personality trait similarity and relationship outcomes given the interest and importance of

this topic.. At this point, however, we suggest that caution is required when interpreting the existing literature concerning the association between personality trait similarity and relationships based on profile correlations.

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Table 1

Example of Various Dyadic Indexes of Similarity Using a Random Couple (Mike and Susie)

Variable	Raw Score		Sample Average with SD (Normative)		Mean-Centered (Distinctive)	
	Susie	Mike	Wife	Husband	Susie	Mike
PEM-C	96	73	84.6 (11.1)	78.2 (11.1)	11.4	−5.2
PEM-A	93	110	90.4 (13.6)	95.4 (13.6)	2.6	14.6
NEM	69.7	96.2	78.9 (12.6)	80.7 (13.2)	−9.2	15.5
CON	157.2	130.7	151.5 (13.4)	144.1 (14.1)	5.7	−13.4
Profile Correlations	.69		.98	.89	−.72	
WB	29	31	30.1 (4.7)	29.4 (4.6)	−1.1	1.6
SC	67	42	54.4 (8.6)	48.9 (8.6)	12.6	−6.9
AC	46	54	49.2 (7.5)	51.2 (7.8)	−3.2	2.8
SP	47	56	41.2 (9.0)	44.3 (9.0)	5.8	11.7
AG	27	42	27.1 (5.5)	31.4 (13.2)	−.1	10.6
AL	23	36	27.7 (7.3)	29.7 (7.8)	−4.7	6.3
SR	26	33	28.8 (6.3)	26.5 (6.3)	−2.8	6.6
CN	63	51	53.8 (6.8)	52.2 (7.3)	9.2	−1.2
HA	64	46	60.0 (8.1)	51.1 (9.7)	4.0	−5.1
TR	51	44	54.4 (7.3)	54.3 (7.4)	−3.4	−10.3
AB	38	44	40.9 (8.9)	38.6 (8.4)	−2.9	5.4
Profile Correlations	.59		.95	.75	−.28	

Note: These data represent an actual, random couple from the dataset that has been de -identified and given the fictitious names of Mike and Susie. PEM-A, PEM-C, NEM, and CON represent Agentic Positive Emotionality, Communal Positive Emotionality, Negative Emotionality, and Constraint, respectively. WB, SP, AC, SC, SR, AL, AG, CN, HA, TR, and AB represent Well-Being, Social Potency, Achievement, Social-Closeness, Stress Reaction, Alienation, Aggression, Control, Harm-Avoidance, Traditionalism, and Absorption, respectively. The profile correlation listed under “Raw Scores” represents the raw profile *r*, which is the profile correlation between husbands and wives using the raw scores. The profile correlation listed under “Normative Wife” is the profile correlation between the raw scores and normative scores for wives (i.e., the degree to which a wife is similar to the “average” profile for wives). The profile correlation listed under “Normative Husband” is the profile correlation between the raw scores and normative scores for husbands. Finally, the profile correlation under “Distinctive” is the distinctive profile *r*, which represents the profile correlation between husbands and wives using the mean-centered, or distinctive, scores.

Table 2

Gender Comparisons for All Personality Superfactor and Scale Scores and Marital Adjustment

Variable	Women Mean (SD)	Men Mean (SD)	Gender Differences Effect Size (*d*)	Raw Spousal Correlations
Communal Positive	84.6 (11.1)	78.2 (11.1)	0.58	.06
Emotionality				
Well-Being	30.1 (4.7)	29.4 (4.6)	0.15	.17
Social-Closeness	54.4 (8.6)	48.9 (8.6)	0.64	.02
Agentic Positive	90.4 (13.6)	95.4 (13.7)	−0.37	.10
Emotionality				
Achievement	49.2 (7.5)	51.2 (7.8)	−0.26	.03
Social Potency	41.2 (9.0)	44.3 (9.0)	−0.34	.10
Negative Emotionality	78.9 (12.6)	80.7 (13.2)	−0.14	.21
Aggression	27.1 (5.5)	31.4 (7.0)	−0.68	.15
Alienation	27.7 (7.3)	29.7 (7.8)	−0.26	.29
Stress Reaction	28.8 (6.3)	26.4 (6.3)	0.38	.04
Constraint	151.5 (13.4)	144.1 (14.1)	0.54	.21
Control	53.8 (6.8)	52.2 (7.3)	0.23	.00
Harm Avoidance	60.0 (8.1)	51.1 (9.7)	1.1	.09
Traditionalism	54.4 (7.3)	54.3 (7.4)	0.01	.49
Absorption	40.9 (8.9)	38.6 (8.4)	0.27	.20
Marital Adjustment	159.2 (17.7)	157.8 (16.8)	0.08	.61

Note: N = 1,577–1,643 couples. Means and standard deviations are reported based on raw data. All personality trait and marital adjustment gender differences were statistically significant except for Traditionalism ($p < .05$). Negative effect sizes indicate that men scored higher than women. Raw spousal correlations represent the zero-order correlations between both spouses for each variable. All personality trait and marital adjustment spousal correlations were statistically significant ($p < .05$) except for Social Closeness, Achievement, Stress Reaction, and Control.

Table 3

Bivariate Correlations between the Various Profile Correlations

	Raw Similarity	Distinctive Similarity	Standardized Similarity
Raw Similarity	--	.43	.44
Distinctive Similarity	.54	--	.99
Standardized Similarity	.53	.97	--

Note. N = 1,643 couples. Superfactor level profile correlations are presented above the diagonal and scale level profile correlations are presented below the diagonal. Raw Similarity represents the profile correlation between husbands and wives using the raw scores at the superfactor and scale level. Distinctive Similarity represents the profile correlation between husbands and wives using the mean-centered, or distinctive, scores at the superfactor and scale level. Standardized Similarity represents the profile correlation between husbands and wives using standardized scores. All correlations were significant at the $p < .05$ level.

Table 4

Zero-order Correlations between the Various Profile Correlations and Average Marital Adjustment

Type of Profile Correlation	Average Marital Adjustment
Superfactor	
Raw Similarity	.08*
Distinctive Similarity	.02
Standardized Similarity	.02
Scale	
Raw Similarity	.21*
Distinctive Similarity	.04
Standardized Similarity	.04

Note. N = 1, 577 couples. Raw Similarity represents the profile correlation between husbands and wives using the raw scores at the superfactor and scale level. Distinctive Similarity represents the profile correlation between husbands and wives using the mean-centered, or distinctive, scores at the superfactor and scale level. Standardized Similarity represents the profile correlation between husbands and wives using standardized scores.

Table 5

Associations between the Pearson Profile Correlation (Raw Scores) and Marital Adjustment Controlling for Individual Personality Scales

Analysis 1:		Personality Control – Average of Husband and Wife Superfactor Scores				
Predictor	Zero Order	PEM-A	PEM-C	NEM	CON	All
Personality similarity	.21	.21	.15	.13	.19	.07

Analysis 2:		Personality Control – Average of Husband and Wife Scale Scores											
Predictor	Zero Order	WB	SC	SP	AC	SR	AL	AG	CN	HA	TR	AB	All
Personality similarity	.21	.20	.16	.22	.21	.14	.16	.14	.18	.21	.20	.22	.07

Note: N = 1, 553–1,573 couples. WB, SP, AC, SC, SR, AL, AG, CN, HA, TR, and AB represent Well-Being, Social Potency, Achievement, Social-Closeness, Stress Reaction, Alienation, Aggression, Control, Harm-Avoidance, Traditionalism, and Absorption, respectively. PEM-A, PEM-C, NEM, and CON represent Agentic Positive Emotionality, Communal Positive Emotionality, Negative Emotionality, and Constraint, respectively. Partial correlations are presented for the relationship between the profile correlation and marital adjustment, controlling for several different scales or superfactors. The Profile Correlation was calculated at the scale level using raw score variables (i.e., correlating husbands' and wives' raw scores on all eleven scale scores listed). All correlations are significant at the $p < .05$ level.