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Investigating the Properties of the General Factor (M) in Bifactor Models Applied to Big Five or HEXACO Data in Terms of Method or Meaning

Zhuo Chen[1], P. J. Watson[2], Michael Biderman[2], and Nima Ghorbani[3]

Abstract

This project applied a bifactor model, which specifies a general factor that accounts for the common variance among all scale items, and group factors that reflect additional common variance among clusters of items. This general factor is designated as "M" because of a presumption in the research literature that its origins are to be found in *method*. The model was applied in eight samples using nine datasets and across three different personality measures, including the Big Five and the HEXACO. Inclusion of M significantly increased model fit and increased the variance explained of items. Evidence showed that M did not reflect aspects of method such as random error or an acquiescent response bias. M correlated positively with variables suggesting psychological adjustment and negatively with variables pointing toward maladjustment. M showed unique relationships with constructs suggesting psychological adjustment over and beyond the Big Five. Data supported an interpretation of M as a

[1]University of Oregon, Eugene, OR, USA
[2]University of Tennessee at Chattanooga, TN, USA
[3]University of Tehran, Tehran, Iran

Corresponding Author:
Zhuo Chen, University of Oregon, 1227 University of Oregon, Eugene, OR 97405, USA.
Email: turquoisus@gmail.com

synthesizing function within the self and thus suggested that M was a construct revealing substantive psychological *meaning* rather than mere *method*.

Keywords
Big Five, bifactor model, psychological adjustment, metaperspective, valence

Measurement of personality traits has achieved an increasingly influential consolidation through articulation of five-factor theory and the accompanying development of relevant questionnaires (e.g., McCrae & John, 1992). Five-factor theory assumes that five broad trait dimensions involving extraversion (E), conscientiousness (C), agreeableness (A), emotional stability (S), and openness to experience (O) represent major domains of human personality and that an orthogonality in the organization of these dimensions means that they operate relatively independently of each other. Evidence, nevertheless, suggests that at least modest covariance exists among these Big Five factors (Digman, 1997). Many theories have attempted to account for this empirically reliable though conceptually problematic covariance, and among the most prominent are higher order approaches which group the five factors into more parsimonious clusters.

Higher Order Approaches

Higher order approaches rest upon the assumption that the factors are, in fact, correlated. Most influential of the higher order approaches are the Big Two (DeYoung, 2006; Digman, 1997) and the general factor personality (GFP, Rushton & Irwing, 2009) models. The Big Two model assumes that conscientiousness, agreeableness, and emotional stability are all influenced by a higher order factor named *alpha* or *stability*, and extroversion and openness to experience are influenced by another factor named *beta* or *plasticity*. The GFP approach assumes that all five factors are influenced by a single factor, called the GFP.

Higher order approaches have undoubtedly contributed to an expanded understanding of the complexity of personality; yet, important caveats unavoidably accompany their development. Higher order models require a covariance among the five factors. Five-factor theory, instead, presupposes orthogonality, and efforts to construct relevant questionnaires have operated from that assumption. This foundational theoretical incoherence and other drawbacks associated with higher order models (Ferguson, Chamorro-Premuzic, Pickering, & Weiss, 2011) suggest that alternative approaches might follow from attempts to explain the factor covariance by starting at the item level.

Bifactor Approach

In this article, we investigate a bifactor model approach. In contrast to higher order models, the bifactor approach does not require that the factors be correlated. Instead, the bifactor model assumes that

> the covariance among a set of item responses can be accounted for by a single general factor that reflects the common variance running among all scale items and group factors that reflect additional common variance among clusters of items, typically, with highly similar content. It is assumed that the general and group factors are all orthogonal. (Reise, 2012, p. 668)

In the bifactor approach, a general factor, therefore, accounts for common variance among items. Thus, in a bifactor model of Big Five, the empirically observed covariances among indicators of the Big Five factors are reflected in this common general factor. If the bifactor model is found to fit the data as well as higher order factor models, an advantage of a bifactor over a higher order approach lies in the opportunity it affords of simultaneously modeling the general and group factors, which then can be used in analyses of their relationships to external correlates (Chen, West, & Sousa, 2006). Figure 1 depicts the difference between bifactor and higher order factor approaches.

Although the two conceptualizations of a general factor—a higher order factor versus a general factor in a bifactor model—seem quite different, it has been known for some time that the two models are identical under certain conditions. This identity is exemplified by the Schmid-Leiman transformation, which shows that a model with a single higher order factor can be transformed into an equivalent bifactor model under two conditions: (a) Certain proportionality constraints must exist on the loadings of indicators in the resulting bifactor model and (b) the group factors—the Big Five factors in this case—must be estimated as being orthogonal to each other and to the bifactor (e.g., Yung, Thissen, & McLeod, 1999). Implied in this equivalence is the fact that the bifactor model without the restrictions is a more general model than the higher order factor model.

Recently, researchers have used the bifactor approach to model responses of research participants to various psychological scales. For instance, a bifactor model has been used to develop a measure of trait alexithymia in the multidimensional Toronto Alexithymia Scale (Reise, Moore, & Haviland, 2010), a measure of affective polarity in the orientation of individuals toward approach and withdrawal in the positive and negative affect scale (Leue & Beauducel, 2011), a measure of a psychopathy compound in the Psychopathy Checklist-Revised (Patrick, Hicks, Nichol, & Krueger, 2007), and a measure of general intelligence in the WAIS-III (Gignac, 2006).

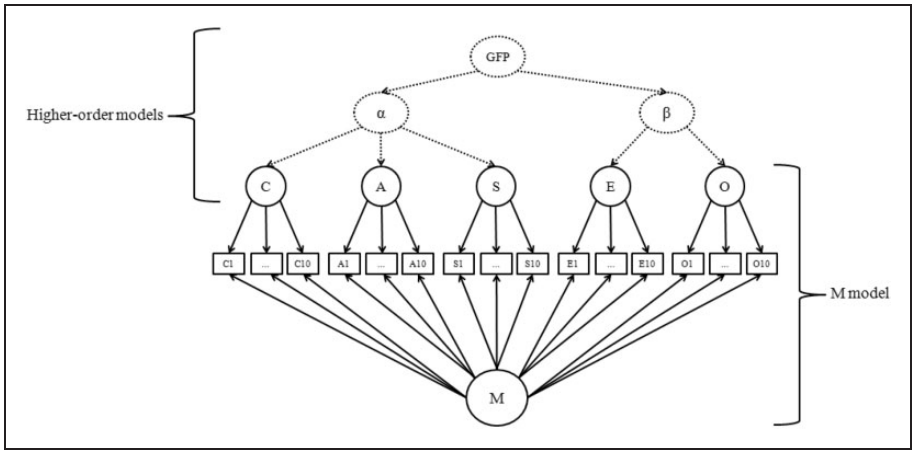

Figure 1. Higher order models and the bifactor model (M model).

However, few studies have applied the bifactor model to the overall Big Five structure. One project that did so found that the bifactor model significantly increased model fit and reduced correlations among the Big Five factors (Biderman, Nguyen, Cunningham, & Ghorbani, 2011). One reason that the bifactor model has not been widely adopted, especially in the modeling of personality traits, is the long-standing view that this general factor reflects methodological issues as an index of common method variance (Williams, Hartman, & Cavazotte, 2010) or of bias in subjective measures (Bollen & Paxton, 1998). These characteristics in *method* or "M" can include, for example, random errors, systematic biases associated with the testing format, or personal attributes such as acquiescence response sets. In other words, interest in the common variance represented by the general factor in the bifactor model has not been strong because methodological interpretations of M suggest that it largely reflects procedural nuisances that have no substantive implications for understanding personality. The present project explored the alternative argument that M instead reflects a *meaning* rather than *method* that has a noteworthy potential for clarifying our understanding of personality.

M as Meaning

Central to the present project was an evaluation of the hypothesis that M empirically identifies a synthesizing function of the self within the personality. This hypothesis benefits from arguments associated with dialogical self theory (DST, Hermans & Kempen, 1993), but a noteworthy preliminary point is that DST and five-factor theory rest upon strikingly different conceptual foundations. In contrast to the nomothetic perspectives of five-factor theory, DST

advocates a largely ideographic approach that questions whether standardized assessments of traits can explain how the personality actually operates. DST, nevertheless, makes suggestions about the structure of the self that may usefully clarify how M in the measurement of the Big Five may offer substantive understandings of personality functioning.

DST critically rests upon the insights of two theorists, William James (1890) and Mikhail Bakhtin (1929/1973). Following James, this theory emphasizes that the structure of the self necessarily involves an I/me compound. The *me* of that compound represents something known about the self, whereas the *I* refers to the psychological process that does the knowing. Following Bakhtin, DST avoids a Cartesian reification of the *I* by arguing that a self is invariably the elicited product of dialog in which the actual or imagined interpersonal context calls for an accounting of the *me* by what Hermans and Kempen (1993) call an "I-position" (p. 47). Seen in this light, personality research procedures (e.g., the administration of a Big Five questionnaire) essentially operate as a "dialog" eliciting the specific I-position that allows a subject to self-report the *me* of a personality attribute. Actually, DST would argue that Big Five procedures elicit five different I-positions that culminate in the measurement of the *me* associated with each trait.

In the absence of additional processes, this vision of the self culminates in a centrifugal disintegration of the personality into a vast array of isolated I-position/me compounds that emerge across the diverse dialogical contexts of the self. DST, nevertheless, affirms the experience of a personal sense of identity as defined by a perception of "continuity, distinctness, and volition" (Hermans & Kempen, 1993, p. 44). DST addresses the problem of potential fragmentation by arguing for the existence of centripetal metaperspectives that help countervail the centrifugal influences that necessarily exist within the personality. As a special kind of I-position, a metaperspective "has the capacity to juxtapose and interrelate the other positions that neither apart nor in their incidental relationships can achieve any synthesis of the self as a whole" (Hermans & Kempen, 1993, p. 92). This synthesizing process "shows considerable differences between people and within one and the same person over time" (p. 101). In other words, a synthesizing metaperspective represents an individual difference variable that should be evident as a substantive personality process.

Most recently in a series of studies, Honeycutt, Pence, and Gearhart (2013) examined the association between the Big Five and mental imagery in the form of imagined interactions. They found that having a lot of imagined interactions was associated with neuroticism and openness. Additionally, having nondiscrepant imagined interactions was associated with conscientiousness and extraversion while catharsis and relational maintenance were associated with conscientiousness and neuroticism. Another study found that a narcissist appears to lack perspective taking, indulge in fantasies, is disagreeable, neurotic, and open to new experiences, ruminates about conflict, and does not compensate

for the lack of conversational partners (Honeycutt et al., 2013; Honeycutt, Pence, & Gearhart, 2014).

In summary, DST implies that measures of each Big Five trait reflect a specific *me* of the self. Each *me* is associated with self-reports from a specific I-position, and so Big Five data reveal the operation of five distinct (and potentially orthogonal) I-position/me compounds. Behind this process is a centripetal metaperspective called forth by the dialog of research procedures that unifies indicators of the *me* in a covariance of items that perhaps explains why Big Five factors are not always orthogonal. The most general assumption of the present project was that M as *meaning* rather than *method* can be conceptualized as an empirical marker of just such a synthesizing metaperspective. Synthesis is essential in limiting tendencies toward centrifugal fragmentation and thus should promote more adaptive self-functioning. In other words, M should broadly predict psychological adjustment. Given the dialogical dynamics of the self, evidence of that adjustment should perhaps be particularly obvious in variables assessing both the self and social knowledge that stands behind dialog. As an adaptive process, synthesis also supplements and is not reducible to the influence of traits, and so M should display incremental validity as well.

Hypotheses

In examining M as Meaning, this investigation tested six hypotheses that addressed three broad research questions:

The first question concerned the usefulness of modeling M.

Hypothesis 1 stated that measuring M could significantly increase model fit, and could increase the percentage of variance explained of items (i.e., communality in factor analysis).

The second question examined the method thesis by challenging the notion that M reflects random error or systematic bias.

Hypothesis 2 stated that M would be stable across time.

Hypothesis 3 stated that the sets of factor loadings on M would demonstrate high congruence across samples.

Hypothesis 4 assumed that M was not a bias such as acquiescence that emerged from self-reports. Thus, self-reported M would correlate with an estimate of M derived from the evaluation of a person's traits by another related individual (i.e., a spouse).

The third question examined the meaning thesis.

Hypothesis 5 stated that M would correlate positively with variables measuring self and social knowledge and adaptive aspects of self-construal and social functioning, and would correlate negatively with variables reflecting maladaptive functioning.

Hypothesis 6 stated that M would show incremental validity over and above the Big Five/Six that has M variance removed in predicting criterion variables that suggest adaptive personal and social functioning.

Method

Participants and Procedures

This study drew data from eight samples. All these studies have obtained institutional review board approvals. Participants of Samples 1 through 6 and Sample 8 were university students enrolled in introductory psychology classes at a State University in the southeastern United States. Sample 7 used Iranian adults recruited from the city of Tehran. Use of the Iranian sample provided some evidence for the cross-cultural generalization of the current model. Across the American student samples, about 80% identified themselves as European American and approximately 15% were African American, with the remainder reporting either other or no racial self-identification.

Sample 1 consisted of 421 individuals (286 female, age $M = 18.3$, $SD = 2.1$). Sample 2 included 431 individuals (245 female, age $M = 19.3$, $SD = 2.8$) examined at the beginning of an academic semester. Three months later at the end of that same semester, Sample 3 recruited 324 individuals who had previously been included in Sample 2, and 15 new participants are not present in Sample 2 (196 female, age $M = 19.1$, $SD = 2.1$). Sample 4 (Wrensen & Biderman, 2005) involved 166 individuals (110 female, age $M = 22.3$, $SD = 6.4$) with Sample 5 (Biderman & Nguyen, 2004) consisting of 202 individuals (146 female, age $M = 19.2$, $SD = 2.5$), Sample 6 contained 433 individuals (287 female, age $M = 18.7$, $SD = 2.3$), and Sample 8 included 376 individuals (162 female, age $M = 19.4$, $SD = 3.4$); 105 married Iranian couples (i.e., 210 individuals with age $M = 35.6$, $SD = 8.3$) constituted Sample 7. The median duration of their marriage was 6 years.

All participants received a single questionnaire booklet. For Sample 7, questionnaire items were translated into Persian, then back-translated into English by an individual not previously involved in the translation procedures. Noteworthy, discrepancies between the original and back-translated English statements were rare and resolved through appropriate revision of the Persian translation.

Instrumentation

Sample 5 used a 7-point Likert scale, with response alternatives labeled from 1 (*completely inaccurate*) to 7 (*completely accurate*). Except otherwise noted, all other instruments used a 5-point Likert scale in which participants indicated

their level of agreement along response options ranging from 0 (*I strongly disagree*) to 4 (*I strongly agree*).

Participants responded to a self-report personality questionnaire that made it possible to examine the M general factor. Presented to Samples 1 through 3 were the International Personality Item Pool representations of the NEO PI-R (IPIP-NEO: Goldberg et al., 2006). The IPIP-NEO is a 50-item instrument that uses 10-items each to operationalize the five NEO-PI-R domains of conscientiousness, agreeableness, emotional stability, extraversion, and openness to experience. Sample 4 through 7 used the IPIP-50 scale (Goldberg et al., 2006), whose 50 items recorded the same Big Five factors. Sample 8 used a Big Six measure of personality called the HEXACO (Ashton & Lee, 2009). In addition to the Big Five factors, the HEXACO records an extra Honesty-Humility factor that refers to a general tendency to observe rules and to refrain from luxurious living and from seeking elevated social status. All subscales of these personality questionnaires displayed good internal reliability with Cronbach's α ranging from .70 to .89.

In addition to a personality trait scale, each sample received scales that measured aspects of self or social functioning, and these are included in the following sections.

Two variables measured self-knowledge. Integrative self knowledge (ISK) recorded efforts of an individual to integrate past, present, and desired future self-experience (Ghorbani, Watson, & Hargis, 2008). In American and Iranian samples, this scale has displayed associations with psychological adjustment (Ghorbani et al., 2008). An illustrative item says, "By thinking deeply about myself, I can discover what I really want in life." Administration of this measure occurred in four samples: Sample 2 ($\alpha = .83$, $M = 2.78$, $SD = 0.56$), Sample 3 ($\alpha = .79$, $M = 2.57$, $SD = 0.55$), Sample 6 ($\alpha = .83$, $M = 2.61$, $SD = 0.65$), and Sample 7 self-reports ($\alpha = .83$, $M = 2.58$, $SD = 0.75$). Alexithymia described a state of deficiency in understanding, processing, or describing emotions (Bagby, Parker, & Taylor, 1994). One item said, "I am often confused about what emotion I am feeling." This scale appeared in Sample 2 ($\alpha = .82$, $M = 1.51$, $SD = 0.52$).

Five variables tapped into aspects of adaptive self-construal. Self-control measured a capacity to manage the self in order to achieve optimal fit with the social environment (Tangney, Baumeister, & Boone, 2004). A representative item said, "I refuse things that are bad for me." This scale was used in Sample 2 ($\alpha = .83$, $M = 1.94$, $SD = 0.61$) and Sample 3 ($\alpha = .78$, $M = 1.95$, $SD = 0.58$). Constructive thinking measured a thinking process in which people accept self and others and interpret life events positively (Epstein & Meier, 1989). An item says, "I don't worry about things I can't do anything about." This scale appeared in Sample 2 ($\alpha = .81$, $M = 2.31$, $SD = 0.52$). Humility, administered in Sample 8 ($\alpha = .83$, $M = 2.58$, $SD = 0.42$), referred to recognition and appreciation of personal limitations and low self-focus (Exline & Hill, 2012). One item

said, "I see myself as a small part of the workings of the world." Satisfaction with life was measured in such statements as "I am satisfied with my life" (Diener, Emmons, Larsen, & Griffin, 1985). This scale appeared in Sample 3 ($\alpha = .81$, $M = 2.97$, $SD = 1.07$) and Sample 8 ($\alpha = .82$, $M = 2.55$, $SD = 0.80$). Rosenberg self-esteem, administered in Sample 8 ($\alpha = .82$, $M = 2.74$, $SD = 0.76$), included such statements as "I take a positive attitude toward myself" (Rosenberg, 1965).

Four variables measured social knowledge. Tromsø social intelligence assessed one's ability to understand others' behaviors and thought, social skills, and social awareness (Silvera, Martinussen, & Dahl, 2001). A representative item asserted, "I know how my actions make others feel." This scale was administered in Sample 6 ($\alpha = .82$, $M = 2.51$, $SD = 0.48$). Administered in Sample 3, social axiom defined five domains assessing "generalized beliefs about oneself, the social and physical environment, or the spiritual world" (Leung et al., 2002, p. 289). Relevant to social knowledge, the domain social complexity ($\alpha = .74$, $M = 2.92$, $SD = 0.54$) in particular suggested insight into the complex inconsistency common in human behaviors. An example item said, "People may have opposite behaviors on different occasions."

Valence refers to the intrinsic attractiveness or aversiveness of an individual. Rating the valence of each personality trait item indicates knowledge of the socially favored personality. Sample 6 procedures asked participants to rate the valence of each IPIP-50 item under the instruction: "Think about how people you care about would evaluate you if you had the characteristic mentioned in the statement." Participants indicated how other people would evaluate them by using options that ranged from 0 ("They would say that if I had this characteristic, it would make me look very bad") to 4 ("They would say that if I had this characteristic, it would make me look very good"). Statistics on the valence for each of the five factors were as follows: conscientiousness ($\alpha = .75$, $M = 2.83$, $SD = 0.53$), agreeableness ($\alpha = .77$, $M = 3.05$, $SD = 0.53$), emotional stability ($\alpha = .71$, $M = 2.64$, $SD = 0.52$), extroversion ($\alpha = .69$, $M = 2.47$, $SD = 0.46$), and openness ($\alpha = .74$, $M = 2.65$, $SD = 0.50$). Mean valence of positively worded items ($M = 3.77$, $SD = 0.45$) was greater than the mean valence of negatively worded items (not reverse scored, $M = 1.32$, $SD = 0.37$). This showed that participants were making appropriate judgments when judging the valence of items.

The balanced inventory of desirable responding (BIDR) was administered in Sample 5. The BIDR assesses the degree to which respondents misrepresent themselves in order to manage their self-presentation in two broad ways (Paulhus & Reid, 1991). Among other things, the capacity for positive self-presentation can serve as an indirect measure of a subject's knowledge of social norms in dialogical contexts. Self-deception ($\alpha = .62$, $M = 4.40$, $SD = .55$) measured a tendency to offer oneself a positively biased self-interpretation, for example, "I am a completely rational person." Impression management ($\alpha = .70$,

$M = 3.78$, $SD = 0.66$) recorded a deliberate attempt to present oneself positively to others, for example, "I rarely have sexual fantasies."

Twelve variables tapped into various aspects of social functioning. One subscale of the Interpersonal Reactivity Index, *perspective taking*, assessed cognitive attempts to adopt the perspectives of other people (Davis, 1983). A sample items said, "I try to look at everybody's side of a disagreement before I make a decision." This scale appeared in Sample 2 ($\alpha = .75$, $M = 2.36$, $SD = 0.65$). The inventory of interpersonal problems measured, in Sample 7, aspects of personality disorders that hamper relationships with others (Pilkonis, Kim, Proietti, & Barkham, 1996) and included two subscales: interpersonal ambivalence ($\alpha = .74$, $M = 1.45$, $SD = 0.66$, e.g., "It is hard for me to do what another person wants me to do.") and aggression ($\alpha = .79$, $M = 1.30$, $SD = 0.84$, e.g., "I fight with other people too much."). Assessment of marital satisfaction ($\alpha = .95$, $M = 5.59$, $SD = 1.08$) involved use of the Hudson (1982) inventory. Participants rated how frequently his or her spouse behaved as described (1 = *none of the time*, 7 = *all of the time*), for example, "My partner is affectionate enough."

Two domains of social axiom, administered in Sample 3, represent positive and active perspectives about the functioning of the world (Leung et al., 2002). Reward for application ($\alpha = .67$, $M = 2.64$, $SD = 0.51$) represents a belief that effort and careful planning lead to positive results. An example item was, "Hard working people will achieve more in the end." Religiosity ($\alpha = .79$, $M = 2.40$, $SD = 0.75$) asserted the beneficial functions of religious belief. An example item says, "Belief in a religion helps one understand the meaning of life." Two other domains connote a passive tone regarding the society. Social cynicism ($\alpha = .73$, $M = 1.90$, $SD = 0.52$) represented a Machiavellian view of human nature. A representative item was, "Powerful people tend to exploit others." Fate control ($\alpha = .64$, $M = 1.44$, $SD = 0.61$) involves a belief that life events are predetermined. An example item claimed, "Fate determines one's successes and failures."

Intrinsic religious orientation measured a motivation in which religion supplied the ultimate end in a person's life (Gorsuch & McPherson, 1989). A sample item said, "My whole approach to life is based upon my religion." This scale appeared in Sample 1 ($\alpha = .87$, $M = 2.43$, $SD = 0.89$) and Sample 8 ($\alpha = .85$, $M = 2.39$, $SD = 0.89$). Quest captured religious doubts and openness to change in one's religious views (Batson & Schoenrade, 1991) and can predict psychological maladjustment (Watson, Morris, & Hood, 1989). A sample item says, "I am constantly questioning my religious beliefs." This scale appeared in procedures for Sample 1 ($\alpha = .80$, $M = 1.72$, $SD = 0.67$). Two behavioral outcomes assessed in Sample 3 documented behavioral adjustment in an introductory psychology classroom. Total extra credit points earned operated as a behavioral criterion for assessing motivation to excel in class (range 3–29, $M = 12.3$, $SD = 6.5$). Number of class absences instead indicated a lack of motivation to participate in class (range 0–21, $M = 4.5$, $SD = 4.1$).

Two variables measured cognitive ability. The Wonderlic Personnel Test served as a useful measure of intelligence (Wonderlic, 2004). It appeared in Sample 4 ($\alpha = .90$, $M = 24.14$, $SD = 6.40$) and Sample 5 ($\alpha = .99$, $M = 21.76$, $SD = 5.23$). In Sample 3, the *total grade* a student received from the introductory psychology class served as an index of academic performance (80–294 out of 300 total possible points, $M = 226.7$, $SD = 37.7$).

Assessment of spouse-reported personality occurred with Sample 7 from Iran. In this sample, after obtaining self-reports in response to all measures, procedures asked each subject to rate their spouse on their personality. Instructions stated, "Please choose the best response honestly which shows your husband or wife's behavior at the present time. Do not consider your husband or wife's characteristics as you would like them to be in future." The IPIP-50 rating spouse data displayed the following statistics: conscientiousness ($\alpha = .81$, $M = 2.66$, $SD = 0.73$), agreeableness ($\alpha = .82$, $M = 2.63$, $SD = 0.69$), emotional stability ($\alpha = .78$, $M = 2.00$, $SD = 0.72$), extroversion ($\alpha = .81$, $M = 2.11$, $SD = 0.75$), and openness ($\alpha = .77$, $M = 2.35$, $SD = 0.65$).

Data Analysis

Confirmatory factor analysis (CFA) models necessary for tests of the above hypotheses involving M were estimated using Mplus 7. Reverse scoring of all negatively worded items occurred prior to these analyses. Neuroticism items were reverse scored as well in order to operationalize this factor as an index of emotional stability. Two CFA models were applied to each dataset. The first model was a simple correlated factor CFA—forthwith called the oblique model. The second model was a bifactor CFA that included M and the five or six factors constrained to be orthogonal—referred to as the M model from this point forwards. All models converged to interior solutions with no negative variances or other parameters out of range. Measures of goodness-of-fit reported here include the chi-square, Bayesian information criterion (BIC), comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Conventional criteria suggested adequate fit by RMSEA less than .080, CFI greater than .900, and SRMR less than .080 (Hu & Bentler, 1998). As these two models are not nested, models were compared using BIC, with a lower value suggesting better fit.

Computation of factor scores for the personality factors and for M used the regression method in the M models. Calculation of all psychological scale scores other than the Wonderlic focused on the mean of all items for each scale. Correlation and regression procedures involving M and all the other constructs involved use of the M factor scores with the scale scores of other variables. Completely standardized loadings of the personality items on traits (Big Five or Six) and on M were recorded. Evaluation of the consistency of the factor M across samples involved an examination of Tucker's congruence coefficients

among these factor loadings (Lorenzo-Seva & ten Berge, 2006). A value higher than .85 indicates fair similarity, while a value higher than .95 means that the two factors compared can be considered equal.

When considering the importance of a general factor accounting for item variance, one suggested approach is to examine the proportion of variance in the scale scores accounted for by the general factor. This is the approach used when estimating ω_h (Zinbarg, Revelle, Yovel, & Li, 2005). This approach computes the ratio of the general factor variance to the total variance of the scores formed by summing the items. Ranging from 0 to 1, the larger ω_h is, the more strongly scale scores are influenced by a general factor common to all the indicators. The *omega* function in *R* is used to estimate ω_h.

Results

Organization of results followed the attempt to answer the three basic research questions of this project and the hypotheses testing associated each question. All correlations were significant at $p < .01$ unless otherwise noted.

Question 1: Usefulness of M

Tested first was the usefulness of modeling M. Hypothesis 1 stated that measuring M could significantly increase model fit and could increase the percentage of variance explained of items. The first five columns of Table 1 demonstrate that Big Five and HEXACO models with M fit better than those without M (labeled as "obl"). The uniform decrease in BIC ($M = 123$, $SD = 150$) suggested a greater goodness-of-fit with M added to the model. Conventional indices also preferred the M model: chi-square decreased by an average of 503 ($SD = 440$), CFI increased ($M = .065$, $SD = .029$), RMSEA decreased ($M = .006$, $SD = .003$), with an average standard error equal to .003, and SRMR decreased ($M = .012$, $SD = .006$).

The M model increased the percentage of variance explained of items, and a sizable portion of item variance could be attributed to M, as shown in the last three columns of Table 1. The average communality across nine datasets was .294 in the oblique model, which increased to .331 in the M model, an increase of 12.6% ($SD = 4.0\%$). As M was orthogonal to the trait variables, the total communality was simply calculated as the sum of communality due to M and communality due to traits. The right panel of the seventh column shows communality due to M. Dividing it by the average communality in the M model in column 6, we find that the M factor accounted for an average of 31.7% of total communality ($SD = 6.8\%$). As an alternative estimate of the proportion of scale score variance due to M, the last column of Table 1 reports ω_h for each sample. M accounted for an average of 40% of scale score variance ($SD = 23\%$). As shown in the left panel of the seventh column, items had modest loadings on M

Table 1. Fit Indices, Loadings and Communality of Oblique and M Models in Nine Personality Datasets.

	BIC		χ^2/df		CFI		RMSEA		SRMR		Avg Com		M		
Sample	Obl	M	Obl	M	Obl	M	Obl	M	Obl	M	Obl	M	Load	Com	ω_h
S1	56,345	56,306	2,936	2,655	.698	.739	.060	.057	.077	.071	.284	.310	.277	.102	.74
S2	55,664	55,495	3,111	2,700	.690	.749	.062	.057	.082	.066	.290	.320	.283	.109	.73
S3	44,927	44,437	3,447	2,724	.632	.742	.076	.065	.102	.078	.310	.365	.305	.137	.40
S4	23,309	23,282	2,316	2,084	.637	.697	.077	.072	.102	.094	.317	.346	.245	.085	.19
S5	34,217	34,155	2,461	2,187	.644	.709	.074	.068	.096	.085	.323	.358	.269	.104	.29
S6	60,066	59,888	3,030	2,610	.717	.775	.061	.055	.080	.068	.377	.424	.478	.267	.23
S7 self	32,259	32,178	2,152	1,857	.582	.690	.064	.056	.089	.074	.223	.268	.233	.106	.11
S7 spouse	30,723	30,670	2,261	1,995	.636	.712	.067	.061	.094	.080	.286	.326	.309	.132	.54
S8	70,727	70,716	3,496	3,218	.632	.680	.053	.050	.070	.066	.237	.263	.174	.061	.35
M	45,360	45,236	2,801	2,448	.652	.721	.066	.060	.088	.076	.294	.331	.286	.123	.40
SD	16,136	16,124	516	441	.042	.031	.008	.007	.011	.009	.046	.050	.083	.059	.23

Note. BIC = Bayesian information criterion; CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. Obl (oblique) refers to the model in which there are five/six latent factors and their covariances are estimated. M refers to the model where an additional general factor M is added to the Big Five (or HEXACO), and the covariances among these six/seven latent variables are fixed to be zero. Degrees of freedom are 1,165 (1,695 for S8) for oblique and 1,125(1,650 for S8) for M. The first five columns are fit indices. The sixth column reports average communality (Avg Com) in oblique and M models. The seventh columns report the loadings on M (Load) and communality due to M (Com) in the M model. The last column reports ω_h as an estimate of general factor. The last two rows are means and standard deviations of the statistics presented in their respective column.

($M = .286$, $SD = .083$). Table 2 presents 15 items that had the strongest loadings on M and their average loadings across samples in two versions of Big Five measures. Observations from this table showed at least that the variance in M influenced items from all five factors.

Question 2: M as Random Error or Systematic Bias

Question 2 challenged the notion that M reflected random error or systematic bias. Hypothesis 2 stated that M would be stable across time intervals and thus could not be random error. The M factor scores estimated from responses to IPIP-NEO by the same participants, across a 3-month span in Sample 2 and Sample 3, correlated at $r = .62$. In the same datasets, the average cross-time correlation of factor scores of Big Five traits was .71. Relative to an interpretation of M as a substantive personality process, such an outcome suggests the existence of acceptable test–retest reliability.

Hypothesis 3 stated that factor loadings on M would demonstrate high congruence across samples. In Table 3, the upper entries above the diagonal are congruence coefficients of M loadings from different samples. They showed that M was estimated as a fairly similar construct across samples. For instance, item loadings on M from the IPIP-NEO data had congruence coefficients above .90 from Sample 1 to Sample 3. Item loadings from the IPIP-50 data demonstrated acceptable congruence except for those between Sample 4 and Sample 7. The entries below the diagonal were congruence coefficients of Big Five traits estimated in the M model, included to provide points of reference for the congruence coefficients associated with M. Entries in the diagonal of Table 3 were congruence coefficients of loadings on traits in the oblique model and the same traits in the M model. These coefficients demonstrated the similarity of the traits before and after removing the M variance.

Hypothesis 4 stated that M was not a bias that emerged as a methodological artifact associated with self-report, such as acquiescence. Acquiescence assumes indiscriminant endorsement of all items, regardless of how each item is worded. If M reflected acquiescence, then loadings on M should be positive for positively worded items and negative for negatively worded items because negatively worded items previously had been reverse scored. However, all significant item loadings on M were positive.

If M merely reflected bias associated with reporting the self, then M from an individual's self-report should not be related to the M derived from another's rating of that same person. However, in Sample 7, the M of a husband's self-report correlated with the M of a wife's rating of her husband at $r = .29$, and the M of a wife's self-report correlated with the M of husband's rating his wife at $r = .36$. As the M of husband and wife self-reports and of rating by spouse correlated positively, M could not be simply a bias associated with reporting oneself.

Table 2. Top 15 Items and Their Across-Sample Average Loadings on M in IPIP-NEO and IPIP-50.

	IPIP-NEO in Samples 1 to 3	Loadings
S05	Feel comfortable with myself	0.594
E05	Am skilled in handling social situations	0.585
E04	Make friends easily	0.563
S09	Am very pleased with myself	0.548
A04	Respect others	0.507
C08	Carry out my plans	0.500
S03	Dislike myself	0.495
E06	Would describe my experiences as somewhat dull	0.469
E01	Feel comfortable around people	0.456
A10	Make people feel at ease	0.452
A07	Accept people as they are	0.437
S06	Am often down in the dumps	0.414
O08	Carry the conversation to a higher level	0.414
O09	Enjoy hearing new ideas	0.412
E10	Know how to captivate people	0.399
	IPIP-50 in Samples 4 to 7	Loadings
A10	Make people feel at ease	0.586
A04	Sympathize with others' feelings	0.466
A07	Am not really interested in others	0.455
O10	Am full of ideas	0.454
A06	Have a soft heart	0.446
A02	Am interested in people	0.441
O05	Have excellent ideas	0.440
A09	Feel others' emotions	0.437
E05	Start conversations	0.411
C10	Am exacting in my work	0.403
A08	Take time out for others	0.397
E03	Feel comfortable around people	0.385
C07	Like order	0.384
C09	Follow a schedule	0.382
O06	Do not have a good imagination	0.377

In addition, results from the marriage data essentially argued that M can operate as a dialogical nexus around which individuals could discern desirable similarities in a spouse. M of the husband's self-report correlated with M of the wife's self-report at $r = .43$. By way of comparison, husband and wife's

Table 3. Congruence Coefficients for Trait Factors (Below Diagonal) and the M Factor (Above Diagonal) in the M Model Across Samples, and Correlations of Loadings on M With Item Valence.

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5	Sample 6	Sample 7 self report	Sample 7 rate spouse	Valence
Sample 1	.974	.965	.942						
Sample 2	.986	.972	.965						
Sample 3	.988	.989	.953						
Sample 4				.980	.876	.856	.716	.791	.371**
Sample 5				.962	.954	.936	.823	.878	.513**
Sample 6				.972	.967	.980	.878	.909	.537**
Sample 7 self report				.891	.900	.896	.895	.902	.474**
Sample 7 rate spouse				.898	.899	.921	.933	.911	.483**

Note. Completely standardized loadings (standardized loadings with respect to continuous covariates) used to compute congruence coefficients. Above the diagonal are congruence coefficients for M, and below the diagonal are congruence coefficients for traits removing variance associated with M. Studies 1 to 3 used the IPIP-NEO, and Study 4 to Study 7 used the IPIP-50. On the diagonal are the congruence coefficients that represent the similarity between the traits and the traits removing M variance within each sample. The last column contains correlations of item loadings on M with valence of each item.

**$p < .01$.

self-reported personality traits correlated to a lesser degree, being significant for conscientiousness ($r = .25$) and agreeableness ($r = .19$) but not for emotional stability ($r = -.19$), extraversion ($r = .04$), and openness ($r = .03$). In other words, spouses were more alike in their M than in their Big Five traits. More generally, these data suggested a tendency of people to marry someone like themselves with whom they presumably would be more compatible. And more importantly, this similarity seemed more noteworthy at the "deeper" metaperspectival level of M than in terms of the more limited perspectives on the *me* associated with the Big Five.

Question 3: M as Meaningful

The final question asked whether M reflected a meaningful personality process. Hypothesis 5 stated that M would correlate positively with variables measuring self and social knowledge and with variables operationalizing adaptive self-construal and social functioning and would correlate negatively with variables measuring maladaptive functioning. Patterns of M correlations from the eight samples proved to be consistent with this hypothesis.

First, M correlated predictably with variables indicating self-knowledge or a lack thereof. M correlated with ISK at $r = .45$ in Sample 2, $r = .43$ in Sample 3, $r = .42$ in Sample 6, and $r = .35$ in the Sample 7 self-report condition. M also correlated negatively with alexithymia, $r = -.42$.

Second, M correlated positively with variables indicating adaptive self-construal. M correlated with self-control at $r = .40$ in Sample 2 and $r = .18$ in Sample 3, with constructive thinking at $r = .48$, and with humility at $r = .52$. Correlations with satisfaction with life were $r = .31$ in Sample 2 and $r = .48$ in Sample 8, and with self-esteem at $r = .64$.

Third, M correlated as predicted with variables denoting social knowledge. M correlated with social intelligence at $r = .50$ and with social complexity at $r = .56$. M also displayed a linkage with the mean valence score at $r = .47$ in Sample 6. Recall that valence assessed the social favorability of items. The last column of Table 3 shows that item loadings on M correlated moderately positively with item valence with an average $r = .48$. In addition, M correlated with BIDR self-deception at $r = .39$ and with BIDR impression management at $r = .26$.

Fourth, M exhibited expected associations with variables relevant to adaptive social functioning. M correlated with perspective taking at $r = .19$, with interpersonal ambivalence at $r = -.25$, with aggression at $r = -.27$, and with marital satisfaction at $r = .30$. In terms of the social axiom construct, M correlated positively with reward for application at $r = .48$, with religiosity at $r = .25$, and negatively with fate control at $r = -.19$, but not with social cynicism, $r = -.01$ (*ns*). Correlations with the intrinsic religious orientation were $r = .22$ in Sample 1 and $r = .30$ in Sample 8, and with religious quest, the relationship was $r = -.20$.

M was also associated with earning more total extra credits, $r = .17$, and fewer absences, $r = -.12$ ($p < .05$) in an introductory psychology class.

Fifth, M did not correlate with variables indicating cognitive ability. Correlations with the Wonderlic intelligence test were $r = -.01$ in Sample 4 and $r = -.05$ in Sample 5, and with total grade earned from the psychology class, the linkage was only $-.01$ (*ns*). In other words, M appeared as a substantive personality process that seemed largely unrelated to cognitive functioning.

Hypothesis 6 stated that M would show incremental validity over and above the Big Five/Six that has M variance removed in predicting certain criterion variables, specifically those criteria that measure adaptive personal and social functioning. This hypothesis stems from the assumption that estimating Big Five/Six factor scores from the M model will yield measures of the Big Five/Six traits that are free from the effects of M. M will exist in such an analysis as a separate factor score variable in addition to the "purified" Big Five/Six factor scores. Support for this hypothesis will show the extent to which measures of adaptive personal and social functioning are related to M, as opposed to the Big Five/Six.

Incremental validity of M was examined for those variables that appeared in the previous correlation analyses. Tables 4 and 5 report these results. An attached symbol "|M" to a trait (e.g., C|M) refers to estimates of the trait factors after removing variances associated with M. The left panel of each table reviews standardized regression coefficients β of the Big Five scale scores and total R^2 of the model predicting a criterion. The right panel of the tables reports standardized regression coefficients of Big Five (with common variance removed) factor scores and M factor scores entered on the second step. Also reported were total R^2 (i.e., R^2 tot) and R^2 associated with M (i.e., R^2M) of the model. Significant R^2M and β associated with M indicated significant incremental validity of M. In general, the pattern of these results showed that the values of Big Five βs in the left and right panels were comparable with some variation in magnitude. This suggested that removing common variance associated with M, in this instance, did not radically change the meaning of Big Five traits. The direction of M coefficients was consistent with correlational results.

Table 4 reports incremental validity of M in predicting variables denoting self-knowledge and adaptive self-construal. M explained more than half of the variance in predicting ISK in Sample 2 (61%, percentage of explained variance due to M = R^2M/R^2 tot) and in Sample 3 (65%) and in predicting alexithymia (51%). M was stronger than all personality traits combined in predicting life satisfaction (77%) in Sample 3 and in Sample 8 (60%) and in predicting self-esteem (89%).

Table 5 reviews the incremental validity data of M in predicting social knowledge and adaptive social functioning. In particular, M predicted the majority of variance in social complexity (85%) and reward for application (96%).

Table 4. Incremental Validity of M Predicting Self-Knowledge and Adaptive Self-Construal Over Big Five Removing M-variance.

Dependent Variables	R^2	β for oblique model					R^2 tot	R^2M	β for M model					
		C	*A*	*S*	*E*	*O*			C|M	A|M	S|M	E|M	O|M	M
Self-knowledge														
ISK (2)	.268**	.22**	.06	.30**	.06	.16**	.253**	.154**	.14**	.02	.14**	−.03	.12**	.41**
ISK (3)	.274**	.22**	.02	.35**	−.04	.20**	.248**	.161**	.11*	.00	.19**	−.08	.14**	.41**
ISK (6)	.358**	.13**	.18**	.36**	.02	.26**	.360**	.108**	.11**	.12**	.35**	.00	.22**	.34**
ISK (7)	.485**	.14*	.10	.53**	−.06	.25**	.499**	.102**	.07	.01	.57**	−.05	.16**	.32**
Alexithymia	.239**	−.24**	.03	−.23**	−.17**	−.12**	.242**	.124**	−.17**	.04	−.17**	−.09*	−.10*	−.36**
Adaptive self-construal														
Self-Con (2)	.449**	.54**	.12**	.23**	−.10*	−.04	.447**	.095**	.48**	.15**	.16**	−.07	−.01	.32**
Self-Con (3)	.315**	.53**	.07	.08	−.16**	−.01	.341**	.018**	.50**	.12*	.06	−.08**	.03	.14**
Con Think	.451**	.13**	.14**	.53**	.02	.07	.415**	.142**	.10**	.13**	.38**	.00	.08*	.39**
Life Sat (3)	.187**	.10	.08	.29**	.10	−.08	.218**	.130**	.02	.02	.25**	−.01	−.05	.36**
Life Sat (8)[a]	.268**	.14**	.03	.04	.43**	−.04	.268**	.205**	.04	−.05	.07	.16**	−.05	.46**
Self-esteem[a]	.360**	.16**	.09	.06	.45**	.06	.425**	.377**	.01	−.02	.11**	.06	.03	.63**
Humility[a]	.391**	.16**	.09	−.05	.15**	.25**	.416**	.204**	.07	.05	−.02	−.00	.23**	.46**

Note. Regression coefficients for H were: for life satisfaction, β for oblique model = .12* and β for M model = .05. For self-esteem, β for oblique model = .13* and β for M model = .02. For humility, β for oblique model = .35** and β for M model = .25**. Numbers in parenthesis following a variable indicate the sample where this variable was measured. Dependent variables include integrative self-knowledge (ISK), self-control (Self-Con), and life satisfaction (Life Sat). Samples are given in parentheses.

[a]These variables were modeled in HEXACO where an additional H factor was in the equation but not printed in the table.

Table 5. Incremental Validity of M Predicting Social-Knowledge and Social Functioning Over Big Five Removing M-Variance.

Dependent Variables	β for oblique model								β for M model					
	R^2	*C*	*A*	*S*	*E*	*O*	R^2 tot	R^2 M	C|M	A|M	S|M	E|M	O|M	M
Social knowledge														
Social Intel	.379**	.11**	.22**	.24**	.29**	.21**	.387**	.177**	.04	.10*	.22**	.25**	.14**	.44**
Social Cmp	.188**	.14*	.06	−.02	.17**	.30**	.390**	.333**	−.07	−.09*	−.15**	−.06	.16**	.58**
Valence	.297**	.22**	.25**	.13**	.04	.24**	.308**	.146**	.15**	.17**	.11**	.01	.20**	.40**
Self-Decept	.296**	.18**	−.04	.29**	.17**	.27**	.299**	.129**	.11	−.10	.21**	.11	.22**	.37**
Impr Mngmt	.273**	.36**	.12	.26**	−.17**	.04	.259**	.053**	.32**	.05	.25**	−.17**	.04	.23**
Adaptive social functioning														
Pers Taking	.204**	.01	.31**	.02	−.07	.30**	.243**	.097**	−.06	.21**	−.08	−.12*	.25**	.31**
Reward App	.119**	.12*	.04	.19**	.09	.05	.243**	.232**	−.04	−.05	.04	−.11*	−.05	.49**
Religiosity	.189**	.07	.23**	.09	.16**	−.27**	.158**	.049**	.05	.21**	.12*	.07	−.15**	.22**
Intrinsic (I)	.152**	.13*	.33**	−.03	.01	−.16**	.134**	.032**	.08	.26**	−.01	−.04	−.02	.19**
Intrinsic (8)[a]	.185**	.13**	.06	−.13**	.18**	−.16**	.193**	.062**	.08	.05	−.12*	.13**	−.16**	.26**
Quest	.114**	−.12*	−.20**	−.07	−.01	.21**	.099**	.025**	−.08	−.14*	−.08	−.04	−.13**	−.16**
Interp Amb	.301**	−.11	−.31**	−.38**	−.08	.08	.324**	.049**	−.03	−.26**	−.41**	−.07	.11	−.22**
Aggression	.400**	−.11	−.33**	−.48**	.08	.04	.391**	.057**	−.09	−.24**	−.48**	−.07	.06	−.24**
Marital Satis	.168**	.10	.20**	.28**	−.06	.02	.183**	.081**	.04	.06	.27**	−.12	−.03	.29**
Extra credit	.073**	.23**	.06	.03	−.01	−.05	.076**	.013*	.21**	.06	.05	−.00	−.05	.12*

Note. Regression coefficients for H were: β for oblique model = .23** and β for M model = .22**. Dependent variables include Social Intelligence (Social Intel), Social Complexity (Social Cmp), Self-Deception (Self-Decept), Impression Management (Impr Mngmt), Perspective Taking (PersTaking), Reward for Application (Reward App), Intrinsic Religious Orientation (Intrinsic), Interpersonal Ambivalence (Inter Amb), and Marital Satisfaction (Marital Satis). Samples are given in parentheses.

[a]This variable was modeled in HEXACO where an additional H|M factor was in the equation but not printed in the table.

*$p < .05$. **$p < .01$.

Discussion

Results of this investigation supported the argument that M represents a meaningful personality characteristic. M improved the modeling efficiency of personality traits, did not reflect a methodological artifact, and had implications for understanding personality functioning that made sense within the conceptual frameworks of DST. Such results held true for two versions of the Big Five personality questionnaire as well as for the six-factor HEXACO. Data obtained from Iranian married couples supported conclusions based upon findings observed with American university students. The claim that M represents a substantive personality process, therefore, appeared to have a broad generalizability.

Usefulness of M

In all nine datasets, the M model significantly increased the goodness-of-fit over the oblique model, as reported elsewhere (Biderman et al., 2011). However, the M models did not fully meet the predetermined criteria for acceptable fit: All CFI values were below .90, and two SRMR values were greater than .08. However, this should not prevent appreciation of the usefulness of the M model. First, the M model significantly increased model fit over the oblique Big Five model. Second, the current approach directly modeled items, for which there may be many idiosyncratic relationships that are left unmodeled. Better fit personality models have often used parcels that can cancel out these idiosyncrasies (Little, Cunningham, Shahar, & Widaman, 2002).

Modeling M also increased the overall variance explained of items, which revealed that M was able to account for item variances and covariances not accounted for in the oblique model. The measure of ω_h suggested an average of 40% (ranging from 11% to 74%) of total score variance can be attributed to M. As the personality questionnaires were not designed to measure a single overriding factor—they were designed to measure five or six orthogonal factors—this portion of variance due to M is surprisingly large. Some variance in personality trait scale scores was attributable to M. Accounting for this M-related variance, therefore, purified personality trait estimates and reduced their covariance (see also Biderman, Cunningham, Nguyen, & Chen, 2013).

It was clear that M contributed variance to items of all Big Five factors, so that M was not reducible to any one of the Big Five. However, not all items loaded significantly on the M factor. Particularly, emotional stability items were not as strong contributors to M as were items from other factors. Loadings on M are determined to some extent by item valence. Research recently showed that near zero loadings were often associated with valence estimates near the midpoint (Biderman, McAbee, & Chen, 2015). Low valence indicates a lack of social preference for the behaviors or attributes described in the items. The failure for

M to pick up variances from this type of items is consistent with our suggestion that M captures a type of social knowledge.

Partialling out M did not radically change the meaning of personality trait factors. Congruence coefficients in the diagonal of Table 2 essentially showed that the trait factors remained relatively unchanged after removing variance associated with M. Incremental validity procedures further revealed that personality trait linkages with criterion variables generally remained in the same direction after removing variance associated with M.

M as Not Attributable to Method

Numerous findings argued against any attempt to explain M in terms of mere method. First, M clearly was not a product of random error. The random error assumption implies that estimation of M should be inherently unpredictable. However, results showed that M was stable across time. This cross-time consistency suggested that M was a substantive personality construct that displayed test–retest reliability. Strong congruence coefficients across samples also buttressed the idea that M was not a random phenomenon, nor was it a phenomenon specific to a given research situation, but rather the reflection of a meaningful psychological construct that could be estimated reliably from different samples.

Second, M apparently did not manifest a tendency to systematically bias reactions as would an acquiescence response set. Acquiescence assumes indiscriminant endorsement of all items, regardless of how each item is worded. If M reflected acquiescence, then loadings on M should be positive for positively worded items and negative for negatively worded items because negatively worded items previously had been reverse scored. However, all significant item loadings on M were positive, which demonstrated that respondents were not merely acquiescing to items.

Finally, any notion that M might merely reflect a social desirability response set seemed contradicted by the observation that self-reported and spouse-rated M correlated positively. Such a relationship made it clear that M operated as an interpersonal behavioral reality that could not be dismissed as a self-reported pretense of social desirability. More generally, McCrae and Costa (1986) used positive correlations between self-reported and spouse-rated personality traits to demonstrate that social desirability scales seemed to record more substance than style in personality functioning. Uziel (2010) more recently reviewed an extensive research literature and concluded that so-called social desirability scales actually operationalize a largely adaptive interpersonally oriented form of self-control. DST also assumes that a self always manifests itself in dialog with actual or imagined others. Any adaptive synthesis of this invariably dialogical self would presumably require its desirable and interpersonally sensitive metaperspectival I-positioning in relationship to itself and to others. Direct

linkages of M with self-deception and impression management seemed congruent with that possibility.

M as Meaning

The nomological network established through correlational data revealed that M appeared to be an adaptive personality process. First, M indicated a high level of self-knowledge. Self-report data from four independent samples gave a reliable estimate of the correlation of M with ISK averaging .41. In the opposite direction, alexithymia as a measure of diminished self-insight correlated negatively with M. Incremental validity analyses yielded associations of M with these two variables that were stronger than the Big Five traits combined. In other words, M was a better predictor of how well one knows one's own personality than were specific aspects of one's personality.

Second, M exhibited linkages with adaptive self-construal and a general expression of good feelings about one's own self. M correlated positively and consistently with self-control, constructive thinking, and humility. M also displayed associations with higher self-esteem and life satisfaction. In terms of their broader conceptual implications, these results paralleled previous findings that M correlated positively with positive affect as measured by the positive and negative affect schedule and negatively with negative affect and depression (Biderman et al., 2011).

Third, M seemed indicative of higher levels of social knowledge. In particular, M displayed a robust positive association with social intelligence and also predicted greater self-reported social complexity, a result demonstrating insight into complex patterns in human behavior. The magnitude of these associations was again greater than the Big Five combined. M also correlated positively with the two BIDR factors and also with valence ratings of the Big Five items. Again, valence assessed how socially favorable Big Five items seemed to be to research participants. All of these outcomes seemed interpretable in terms of processes that would enable the adaptive dialogical I-positioning of the self in relationship to others that M theoretically represents.

Fourth, M also predicted more adaptive social functioning. Evidence supporting that conclusion appeared in positive correlations with perspective taking and negative linkages with interpersonal ambivalence and aggression. A direct association with reward for application revealed that individuals high in M believe that effort pays off and engage in socially sanctioned behaviors. The intrinsic religious orientation with which M displayed a direct connection can be interpreted as a largely adaptive form of religious commitment (Donahue, 1985), and religious quest with which M correlated negatively can broadly predict maladjustment (Watson et al., 1989). Although weak, correlations of M with the academically relevant behaviors involved in earning extra credit and attending class more frequently also pointed toward more adaptive

social functioning. Finally, correlations among husband and wife self-reported and spouse-rated M suggested, in very general terms, that M reflected an adaptive dialogical foundation for social functioning within a marriage.

Finally, as demonstrated in two samples, M did not display a significant relationship with intelligence. In another sample, M also failed to predict different variable related to cognitive functioning, grades earned by students in a university class. In other words, M seemed broadly relevant to personality but not to cognitive functioning and thus displayed discriminate validity.

In short, data have shown that M was an adaptive personality process, indicating a high level of self-knowledge, and a general expression of good feelings about one's own self. M was also indicative of an adaptive social functioning combined with a high level of social knowledge.

Conclusion

In summary, this investigation offered strong support for the conclusion that M reflects *meaning* rather than mere *method*. Data indicated that M may mirror the synthesizing and centripetal I-positioning of the self in dialog with itself and with others that is a presumption of DST (Hermans & Kempen, 1993).

Conceptualizing M as a substantive personality process may have noteworthy advantages for personality researchers. The orthogonality assumption of five-factor theory can be defended, and attention to the conceptually problematic higher order factors can be avoided. Researchers may also be able to increase the predictive ability of personality questionnaires because adding M to the analysis may account for greater variance in psychological and social functioning. Of course, interpretative frameworks other than DST may eventually prove to be more useful in conceptualizing M. The present results, nevertheless, suggest that any viable approach to understanding M will need to focus more on meaning than on method.

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Author Biographies

Zhuo Chen is a doctoral candidate in the psychology department at the University of Oregon. His research area is in personality and social psychology. He also has a master's degree in mathematics.

P. J. Watson is U. C. Foundation professor of psychology at the University of Tennessee at Chattanooga. His current research interests center on the psychology of religion and on personality functioning related to the self.

Michael Biderman is a professor in the psychology department at the University of Tennessee at Chattanooga. He has been with the university since 1972. He teaches undergraduate sensation and perception and undergraduate and graduate statistics and research methods. He has conducted research on general personality questionnaires, such as Big Five questionnaires, using bifactor models to assess propensity to fake and other personality characteristics.

Nima Ghorbani, PhD, is a psychologist at the University of Tehran. He is a licensed practitioner of intensive short-term dynamic psychotherapy, and his research interests are cross-cultural perspective on self, emotion, and the psychology of religion.