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Gender differences in the structure of marital quality

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Abstract

Marriages consist of shared experiences and interactions between husbands and wives that may lead to different impressions of the quality of the relationship. Few studies, unfortunately, have tested gender differences in the structure of marital quality, and even fewer studies have evaluated whether genetic and environmental influences on marital quality differ across gender. In this study, we evaluated gender differences in the structure of marital quality using independent samples of married male (n = 2,406) and married female (n = 2,215) participants from the National Survey of Midlife Development in the United States who provided ratings on twenty-eight marital quality items encompassing six marital quality constructs. We further explored gender differences in genetic and environmental influences on marital quality constructs in a subsample of 491 pairs of twins. Results suggest partial metric invariance across gender but structural variability in marital quality constructs. Notably, correlations between constructs were stronger in women than men. Results also support gender differences in the genetic and environmental influences on different aspects of marital quality. We discuss that men and women may approach and react to marriage differently as the primary reason why we observed differences in the structure of marital quality.

Keywords

marital quality; gender differences; psychometric; structural equation modeling; behavioral genetics

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Marital dissolution occurs in nearly half of all heterosexual marriages (Brown and Lin 2012), but disproportionately affects women's lives compared to men's. Although husbands and wives with low marital satisfaction and worse marital adjustment have higher risk of separation and divorce (Amato et al. 2003), low quality marriages have worse effects on women's health (Levenson et al. 1993; Kiecolt-Glaser and Newton 2001), women have been found to remarry less often than men (Bulanda 2011), and when they do remarry, obtain fewer health benefits than men (Williams and Umberson 2004). Marital functioning, it seems, may have greater consequences for women's marital quality than men's. For this reason, maintenance of good marital quality in first marriages, thus, may improve the physical and psychological health in all who choose to marry, particularly for women.

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Research, unfortunately, has not converged on whether the structure of marital quality is the same or different across gender.

Theoretical Framework

We take the viewpoint that marital quality is the product of marital interactions, and marital interactions depend on each spouses' characteristics (Jacobson and Margolin 1979; Heavey et al. 1993; Gottman and Notarius 2000). Gender differences in personality (e.g., agreeableness), attitudes (e.g., adoption of gender roles in marital relationships), and beliefs (e.g., social schemas about marital relationships) may lead to marital interactions that have gender-specific consequences on marital quality. For example, differences in a personality trait like neuroticism or differences in a belief like "all husbands should head households" may affect marital interactions in ways that uniquely influence husbands' and wives' perceptions of the relationship. Gender differences in the structure of marital quality, thus, may emerge. Different structures, we propose, imply that marital interactions have gender-specific consequences whereas similar structures imply that interactions have universal consequences for men and women.

Further, spouses' interactions with one another inevitably are the product of their genetic and environmentally influenced personalities, attitudes, and beliefs. If inheritance of neuroticism and egalitarianism disproportionately falls unevenly across gender and bear on marital interactions, for example, one would expect greater genetic influence on that gender's perceptions of communication, criticism, and support in the marriage than environmental sources of variability. The downstream would result in gender-specific etiologies of marital quality. Behavioral genetic studies of marital quality, thus, hint at potential differences in traits and attitudes men and women bring to marriage, albeit indirectly.

In this paper, we use multigroup confirmatory factor analysis to test whether the latent structure of marital quality differs between men and women. We further use genetic covariance structure modeling to quantify genetic and environmental influences on marital quality constructs. As the marital quality literature is complex, we first summarize the psychometric literature related to gender differences in marital quality and then review the relevant behavior genetic literature on gender differences in marital quality.

Gender Differences in Marital Quality Structure

Despite numerous reviews of the marital quality literature (Spanier and Lewis 1980; Glenn 1990; Bradbury et al. 2000; Amato et al. 2003), there are relatively few formal investigations of gender differences in the structure of marital quality. While the psychometric literature on marital quality – mainly conducted on the Dyadic Adjustment Scale (DAS; Spanier 1976) – compares differences in the structure of marital quality across gender (Fincham and Bradbury 1987; Glenn 1990; Graham et al. 2006; South et al. 2009), they do so informally rather than statistically (Antill and Cotton 1982; Johnson et al. 1986; Sabourin et al. 1988). Studies typically show greater variance of marital quality constructs in women than men, gender differences in patterns of correlations between constructs, and significant mean differences between men and women. Additionally, the number of extracted constructs in men versus women also has been observed to vary (Antill and Cotton 1982; Kazak et al. 1988), as do the number of items that define each construct (Antill and Cotton 1982; Spanier and Thompson 1982), and whether a second-order common factor accounts for variability across constructs (Kazak et al. 1988; Busby et al. 1995; South et al. 2009; Cuenca Montesino et al. 2013). Despite this lack of convergence in the literature, some presume that marital quality is universal rather than gender-specific (Impett and Peplau 2006; Jackson et al. 2014). The psychometric literature, as of now, does not support conclusions that marital quality (both satisfaction and adjustment) is gender invariant.

Formal psychometric evaluations support quantitative differences but not qualitative differences over qualitative differences in marital quality across gender (Rhyne 1981; Johnson et al. 1986; South et al. 2009; Turliuc and Muraru 2013; Whisman and Li 2015). Available research focuses on whether marital quality assessments are measurement invariant (i.e., assessments measure the same constructs in husbands and wives), which findings support. Gender differences in structural components of marital quality constructs, however, have received less attention. Structural differences matter for the reason that marital interactions may have gender-specific consequences for marital quality despite measurement equivalence. The lack of consensus about whether and how the structure of marital quality varies between men and women is our primary focus of inquiry.

Structural invariance establishes that variability of the latent marital quality constructs and the correlations between constructs are identical across gender. Differences in the structure of marital quality would strengthen the hypothesis that marital interactions have gender-specific consequences for spouses. Conversely, structural invariance would strengthen the hypothesis that marital interactions, even if approached differently according to gender, have similar impact on marital quality for spouses. The latter would be consistent with arguments that marital relationships are a communal space that engender shared meaning and values that affect spouses equally (Rhyne 1981; Beck and Clark 2010).

Gender Differences in the Genetic and Environmental Influences on Marital Quality

Gender differences in the structure of marital quality also might emerge because of differences in genetic and environmental influences on marital quality. For example, individual (i.e., genetic) and contextual (i.e., environmental) influences occur within sociocultural contexts that potentially shape gendered responses in ways spouses behave toward each other, interpret spouses’ behavior, and assess impact on the relationship (Wood and Eagly 2012). Prior research has shown that men and women approach arguments and respond to withdrawal differently (Heavey et al. 1993; Ball et al. 1995). Differences in genetic and environmental influences on marital quality, thus, may provide clues for further investigation to explain why men and women experience marriage differently.

Gender differences in genetic and environmental influences on marital quality rarely have been studied. Genetic influences may contribute indirectly to differences in marital quality between men and women via the personalities, attitudes, and beliefs brought to marital interactions (Spotts et al. 2004; Kendler and Baker 2007). Prior research has shown that genetic and environmental influences have been found to differentially influence marital warmth and marital conflict in a sample of American-born married men and married women (Spotts et al. 2006). Genetic effects were stronger for marital warmth in women than in men but were stronger for marital conflict in men than in women. Genetic differences also have been found for constructs related to marital quality, like social support (Agrawal et al. 2002; Kendler and Baker 2007).

Gender differences in marital quality largely are attributed to environmental influences on marital quality constructs. Nonshared environmental factors accounted for the majority of the variability in marital quality for both men and women (Spotts et al. 2004, 2006). Shared environmental influences that equally affect twins reared together may also be important, like effects of gender-specific social modeling that takes place in families. Yet, nonshared environmental influences that uniquely affect twins are the most probable explanation for the reason that spouses constitute a primary source of influence unique to twins. Daily interactions and changes that occur in the marital relationship due to role changes (e.g., child rearing, spousal entry and exit from the workforce) likely affect marital quality. We note, however, that twin studies ultimately cannot describe the process that produces greater genetic and environmental variability in one population versus another (Rutter et al. 2001; Gottlieb 2003).

In this study, we consider two different models to explore the genetic and environmental influences underlying marital quality constructs. The first is the psychometric factor model (McArdle and Goldsmith 1990), also referred to as the common pathway model (Kendler et al. 1987), while the second is the biometric factor model (McArdle and Goldsmith 1990), also referred to as the independent pathway model (Kendler et al., 1987). The psychometric factor model (top panel of Figure 1) assumes that a second-order common factor (MQ) mediates genetic and environmental influences on marital quality constructs. The biometric factor model (bottom panel of Figure 1) assumes that genetic and environmental factors have direct influence on marital quality constructs. The distinguishing quantitative feature between the two models is that the second-order common factor in the psychometric factor model scales the genetic and environmental influences on all constructs according to their respective factor loading (Franić et al. 2013). Substantively, the psychometric factor model assumes spouses' personal and contextual characteristics that affect individual marital quality constructs do so only through a common intermediary variable or process (e.g., routine marital interaction patterns, stable personality traits, or generalized attitude(s) about the marriage).

The Current Study

In the current study, we evaluate gender differences in the structure of marital quality in a large, nationally representative sample of married men and married women in the National Survey of Midlife Development in the United States. While the marital quality constructs studied below overlap with the four constructs in the DAS (satisfaction, consensus, cohesion, and affectional expression), they are not identical and encompass a broader set of marital domains.

The first objective of the current study is to report the results of a factor analysis comparing the latent structure of marital quality between independent samples of married male and married female participants (no spouses were measured). Based on prior research, we hypothesized that measurement of the marital quality constructs would be gender invariant, but that structural invariance would not be observed. We also predicted that a second-order common factor would account for significant proportion of variance in the marital quality constructs. When latent constructs are highly correlated, as is expected with different but correlated aspects of marital quality, fitting higher-order factors is appropriate (Chen et al. 2005).

The second objective of the current study is to evaluate and report gender differences in the genetic and environmental influences on marital quality constructs. For this part of the study, we fit the best fitting model observed in the main MIDUS sample to a subset of married male and married female twins and then fit either the psychometric factor model or the biometric factor model. Given the above hypothesis that a second-order common factor would provide the best fit to the data, we expected to fit a psychometric factor model to the twin data. If the hypothesis that a second-order common factor was not supported, we fit the biometric factor model. Based on prior twin studies (Spotts et al. 2004, 2006), we hypothesized that common and construct-specific nonshared environmental factors would account for the majority of the variability in each marital quality construct for both men and women. We further hypothesized that genetic influences would have greater influence on marital quality in women than men.

Method

Participants

Samples in the current study were drawn from the National Survey of Midlife Development in the United States (MIDUS), which is a longitudinal study of midlife and older adult development encompassing physical health, psychological well-being, social responsibility, and cognitive ability (Brim et al. 2004). MIDUS is a three-wave panel design that consists of a nationally representative sample of non-institutionalized, English-speaking Americans obtained using random digit dialing. Wave I data collection began in 1994–1996 when the sample age ranged from 25 to 74. Two follow-up waves of measurement were conducted between 2004–2006 and in 2013. MIDUS data are publicly available at the Inter-University Consortium for Political and Social Research (www.icpsr.umich.edu).

For the first objective, we used marital quality data from all married male participants (n = 2,406) and all married female participants (n = 2,215) at wave I. Of the married men, 90.40% had partial or complete marital quality data and of the married women, 93.18% had partial or complete marital quality data. Table 1 presents sample demographics. Overall, men and women were approximately same aged, men were more highly educated, and men reported higher household income than women. Men and women reported similar number of times married and similar number of children (including biological and nonbiological children) while women reported slightly longer marriages than men. The overall sample consisted of 84.38% (n = 3,899) of European Americans, 3.35% (n = 155) African

Americans, 0.45% (n = 21) Native Americans, 0.69% (n = 32) Asian Americans, 1.47% (n = 68) undisclosed (other), 0.41% (n = 19) multiracial, and 9.24% (n = 427) did not report race.

For the second objective, a subsample of twins pairs in which both twins reported being currently married (or remarried) at the time of measurement ($N = 491$ pairs) were included. Complete pairs included cases where both members of the pair provided marital quality data ($n = 395$) and incomplete pairs included cases where one member in the pair provided partial data ($n = 96$). Zygosity was determined using a brief screening measure and a classification system using molecular genetic analysis (Kessler et al. 2004). There were 172 married male twin pairs (MZM = 97; DZM = 80), 195 married female twin pairs (MZF = 102; DZF = 94), and 118 opposite-sex dizygotic (DZOS) twin pairs. Sample demographics of the twin subsamples are presented in the supplemental appendix (Table S1) and are comparable to the total MIDUS sample.

Measures

Six marital quality constructs were measured using twenty-eight items (Grzywacz and Marks 2000; Walen and Lachman 2000). These measures have been used in other MIDUS studies on marital quality (Donoho et al. 2013; South and Krueger 2013; Lyu and Agrigoroaei 2017).

Marital satisfaction was measured with six items that approximate the content of the marital satisfaction scale in the DAS (Spanier, 1976): “current state of marital quality”, “perceived control in the marriage”, “thought and effort put into the marriage”, “subjective description of the marriage”, “frequency marriage thought to be in trouble”, and “chance of marital separation”. The first 3 items are continuous variables and rated on a scale of 1–10, and the last 3 items are ordinal variables. Two ordinal items (“subjective description of the marriage” and “frequency marriage thought to be in trouble”) consisted of 5 response categories and while the third item (“chance of marital separation”) consisted of 4 response categories. All items were scored so that higher values indicate higher overall satisfaction. Reliability of the six marital satisfaction items was substantial for male ($\omega = 0.88$) and female ($\omega = 0.90$) participants (McDonald 1999; Shrout 2002).

Marital agreement was measured with 3 items: “agreement over financial matters in the marriage”, “agreement regarding the division of household tasks”, and “agreement over leisure time and activities”. All items consisted of 4 response categories. Higher scores indicated better marital adjustment with respect to agreement with one’s spouse. Reliability of the agreement items was moderate for male ($\omega = 0.75$) and female ($\omega = 0.71$) participants.

Marital sexual intimacy was measured with 3 items: “overall satisfaction with sexual intimacy”, “perceived control over sexually intimate aspects of the marital relationship”, and “thought and effort put into the sexual component of the marriage”. All items are continuous variables and rated on a scale of 1–10. Higher scores indicate higher overall satisfaction with sexual intimacy. Reliability of the items was substantial for male ($\omega = 0.83$) and female ($\omega = 0.85$) participants.

Marital decision making was measured with 4 items: "my partner and I are a team when it comes to making decisions", "Things turn out better when I talk things over with my partner", "I don't make plans for the future without talking it over with my partner", and "When I have to make decisions about medical, financial, or family issues, I ask my partner for advice." All items consisted of 7 response categories. Higher scores indicate better marital adjustment with respect to decision making with one's spouse. Reliability of the items was substantial for male (ω = 0.87) and female (ω = 0.89) participants.

Marital support was measured with 6 items: "How much does your spouse or partner really care about you?", "How much does he or she understand the way you feel about things?", "How much does your spouse appreciate you?", "How much do you rely on your spouse for help if you have a serious problem?", "How much can you open up to your spouse if you need to talk about your worries?", and "How much can you relax and be yourself around him or her?" All items consisted of 4 response categories. Higher scores indicate better marital adjustment with respect to feeling supported by one's spouse. Reliability of the items was substantial for male (ω = 0.90) and female (ω = 0.92) participants.

Marital harmony was measured with 6 items: "How often does your spouse or partner make too many demands on you?", "How often does your spouse argue with you?", "How often does your spouse make you feel tense?", "How often does he or she criticize you?", "How often does he or she let you down when you are counting on him or her?", and "How often does your spouse get on your nerves?" All items consisted of 4 response categories and were reverse scored to indicate better marital adjustment with respect to attunement with one's spouse. Reliability of the items was substantial for male (ω = 0.87) and female (ω = 0.87) participants.

Data Analysis

Means and standard deviations of the marital quality items were computed separately for men and women, and *t*-tests were performed using linear mixed effects regression models to include the full MIDUS sample (i.e., twin and sibling subsamples). We then used multivariate analysis of variance (MANOVA) to test whether the covariance matrices of the item correlations within each of the six marital quality constructs statistically differed across gender. Significant differences constituted grounds for testing factorial and structural invariance across gender.

Preliminary exploratory factor analyses of the male and female samples confirmed that a six-factor solution was appropriate (see supplemental appendix Table S2). Eleven items are simple indicators (i.e., items that indicate only one latent construct) and seventeen items are complex indicators (i.e., items that indicate two or more latent construct) (Kline 2016). The acceptable value for cross-loadings of complex items was set at 0.15 to capture subtle aspects of marital quality that potentially contribute to gender differences in the structure of marital quality while ensuring that the confirmatory factor model was identified (Millsap 2011).

Confirmatory factor model comparison procedures outlined by Millsap (2011) were used to test whether the latent structure of marital quality is gender invariant in the total MIDUS sample and the twin subsample. The model fitting sequence is described in the Results section.

For the twin analysis, the best fitting model observed in the full sample served as the phenotypic model in the twin sample. MZ and DZ intraclass correlation coefficients (ICCs) of the latent marital quality constructs were estimated for same-sex male and female twin pairs and opposite-sex twin pairs. Differences between MZ and DZ ICCs are used to infer underlying genetic and environmental influences on each marital quality construct.

We then employed genetic covariance structure (twin) modeling (Martin and Eaves 1977) in the subsample of twins to explore genetic and environmental influences on marital quality constructs. In the classical twin modeling approach, the variance in phenotypes can be decomposed into three components: an additive genetic (A) component, a shared environmental (C) component, and a unique (nonshared) environmental (E) component. The additive genetic (A) component represents the cumulative effect of all shared genes between twins wherein identical (or monozygotic, MZ) twins share 100% of their genome, whereas fraternal (or dizygotic, DZ) twins share 50% of their genes, on average. The correlation between Twin 1's A component and Twin 2's A component is correlated 1.0 for MZ twins and 0.5 for DZ twins. The shared environmental (C) component represents the cumulative effect of any environment that makes twins reared in the same family more similar to one another (e.g., parent socioeconomic status and neighborhood environment). Shared environmental influences affect twins similarly regardless of genetic relatedness, so Twin 1's C component and Twin 2's C component is correlated 1.0 for both MZ and DZ twins. The nonshared environmental (E) component represents any environmental factor that makes twins different from one another. These components are uncorrelated in both MZ and DZ twins. Latent marital quality constructs are unbiased by measurement error, so nonshared environmental effects do not consist of measurement error.

Depending on the best fitting confirmatory factor model observed in the total MIDUS sample, we fit either the psychometric factor model (top panel of Figure 1) or the biometric factor model (bottom panel of figure 1) as described in the Introduction to estimate the genetic and environmental covariance structure of the marital quality constructs.

Latent variable models were estimated with the M*plus* 8.0 software program (Muthén and Muthén 2017). The selection of an estimator was not straightforward in the current study for the reason that twenty-two of the twenty-eight items are ordinal scaled, all items are skewed, and there are modest amounts of missing data (up to 15%) in both the full sample and twin subsample. We chose to use full information maximum likelihood (FIML) with robust standard errors (MLR) for the reason that MLR is robust to violations of multivariate normality (Raykov 2005), recovers parameter estimates comparable to weighted least squares estimators with ordinal and categorical variables when sample sizes are large (Rhemtulla et al. 2012), and produces unbiased parameter estimates even under conditions where missingness may not be ignorable (Enders 2010). Missing data analysis suggested that missing data were not missing at random (MAR) for the full sample; age and total household income differences were observed between participants with complete data and participants with incomplete or completely missing data. Although the covariates used to test MAR assumptions were not highly correlated with marital quality items (< .40), suggesting that missingness may not have a strong influence on parameter estimates, we still included age and total household income as auxiliary variables to aid estimation of unbiased parameter estimates (Enders 2010).

Models were compared using chi-square difference testing of nested models. FIML with robust standard errors requires use of the Satorra-Bentler scaled chi-square difference test (S-Bχ2), which corrects the chi-square distributed test statistic in cases of multivariate normality assumption violations (Satorra and Bentler 2001). Additionally, the Root Mean Square Error of Approximation was used to evaluate absolute model fit (RMSEA; Browne and Cudeck 1992). Estimates lower than .05 indicate "good" fit while estimates lower than .08 indicate "adequate" model fit. The Tucker Lewis Index (TLI) was used to evaluate incremental improvement in model fit between nested models and is preferred over the comparative fit index; values range from 0 to 1 with values greater than .90 considered "good" (Hu and Bentler 1995). Differences in RMSEA of at least .01 and in TLI of at least .005 are recommended when testing for invariance across groups (Chen 2007), as these values lead to fewer false conclusions of measurement invariance across groups. Relative model fit was assessed using the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC). Both indexes are computed to balance model parsimony and model complexity (Kline 2016), but the BIC penalizes models with greater parameters more than the AIC. Lower AIC and BIC values indicate better model fit.

Results

Descriptive Results

Mean differences between men and women were observed only for marital agreement (Table 1). MANOVA results indicate significant differences in the male and female covariance matrices of items used to measure overall marital satisfaction (Pillai-Bartlett = 0.03, $F(6, 1904) = 9.64$, $p < .001$), agreement (Pillai-Bartlett = 0.01, $F(3, 1919) = 4.47$, $p = .004$), overall satisfaction with sexual intimacy (Pillai-Bartlett = 0.05, $F(3, 1890) = 35.972$, $p < .001$), decision making (Pillai-Bartlett = 0.02, $F(4, 1907) = 7.37$, $p < .001$), support (Pillai-Bartlett = 0.03, $F(6, 1899) = 10.87$, $p < .001$) and harmony (Pillai-Bartlett = 0.08, $F(6, 1899) = 28.82$, $p < .001$). The pattern of effects suggested that women were predicted to have lower ratings on all items except four: "Thought & effort put in the marriage" (satisfaction), "agreement over how to spend leisure time" (agreement), "perceived control over sexual intimacy" (sexual intimacy), and "spouse criticizes you" (harmony). As the significant results suggest sex differences in the variance-covariance matrices whereby they differ on at least one of their variances or covariances, we proceeded with fitting confirmatory factor models to test for structural invariance.

Multivariate Modeling Results

We began the model fitting sequence by first fitting a baseline model (Model 1), also known as a configural invariant model (Meredith 1993), which assumed the same factor structure in the male and female groups but allowed all parameters to be freely estimated across gender

(Table 2). The baseline model was favored when compared to a weak metric invariance model (Model 2) that set only the factor-loading patterns to be gender invariant.

In the next model (Model 3), we used an alternative model, known as the idiographic filter model (Nesselroade et al. 2007), to test structural invariance between married men and married women. Under conditions where traditional measurement invariance cannot be established, the idiographic filter defines invariance in terms of the interrelations between latent constructs across individuals (Nesselroade and Molenaar 2016) and groups (Nesselroade and Estabrook 2010). The latent variances and covariances are set equal across gender while the factor loadings, intercepts, and residuals are estimated separately across gender. When compared to the baseline model, this model also was rejected (Model 3 in Table 2), leaving the baseline model favored.

Next, we tested for partial metric invariance across gender (Millsap 2011). We adopted a backward elimination procedure to identify which factor loadings varied between men and women (Yoon and Millsap 2007) using modification indices to identify factor loadings that significantly differed between men and women until no further factor loadings were identified that significantly improved model fit. In accordance with this approach, we estimated a weak metric invariance model (Model 4) in which the latent variances in the female group were freely estimated to use for subsequent model comparison. Model 4, thus, is conceptually identical to Model 2. All but five of the factor loadings were invariant across gender (Models 4a–4e in Table 2), based on significant results of Satorra-Bentler chi-square difference tests of nested models ($p < .01$).

Given partial metric invariance, we proceeded to fit a structural invariant model that constrained the variances and covariances of the latent marital quality constructs to be the same across gender (Model 5). This model and a submodel that only constrained the latent variances to be equal across gender (Model 5a) were rejected in favor of Model 4e. Finally, we tested whether a second-order common factor accounted for common variability in the six marital quality constructs in men and women (Model 6), which was rejected in favor of Model 4e. We, thus, settled on a partial metric invariant model (Model 4e) as the best fitting model in the total MIDUS sample. Overall model fitting results were replicated in the twin subsample with the exception that only one factor loading varied across gender (see supplemental appendix Table S3).

The majority of items – both simple and complex item indicators – had factor loadings invariant across gender, suggesting that the items can be used to measure the same marital constructs in married men as in married women (Table 3). One simple indicator (INT --> int3) and four complex indicators (SAT --> har5; DM --> dm2; DM --> sup4; and SUP --> sup5) varied across gender. Each factor loading was greater in the female group than the male group. Structurally, the intercorrelations between the marital quality constructs were significantly greater in married women than in married men, ranging from .37 to 87 compared to .29 to .80 in married men (Table 4).

Genetic Covariance Structure Modeling

Twin correlations of the six latent marital quality construct for each zygosity group were small to moderate in magnitude (Table 5). Genetic influences contribute to most marital quality constructs, with the exception of sexual intimacy in female twins and agreement in male twins. Shared environmental influences accounted for variability in sexual intimacy and decision making in female twins, but only agreement for male twins. Nonshared environmental influences accounted for most of the variability in all constructs for both male and female twins.

The second-order marital quality factor model (Model 6, Table 2) was rejected, so the biometric factor model was fit to the twin data. All model fit indices were below conventional standards of acceptability ($\chi^2 = 15913.89$, $df = 8712$, TLI = .68, RMSEA = .092), likely attributed to the small number of twin pairs. Table 6 presents the proportions of variability in each marital quality construct attributed to common and construct-specific genetic and environmental influences. For female twins, significant common genetic influences were observed for marital harmony whereas common shared environmental influences were observed for overall marital satisfaction and sexual intimacy. For male twins, common genetic influences were observed for overall marital satisfaction and common shared environmental influences were observed for marital harmony. For male and female twins, common and construct-specific nonshared environmental influences accounted for the majority of variability in each marital construct.

Total genetic influences differed for agreement (21% in female twins and 1% for male twins), support (3% in female twins and 15% for male twins), and harmony (41% in female twins and 12% in male twins). Total shared environmental influences on sexual intimacy were larger in female twins than male twins (33% compared to < 1% of the phenotypic variability, respectively). Total nonshared environmental influences generally were greater for male twins than female twins, although the proportion of variability was greater than 50% in each construct regardless of gender.

Discussion

Previous studies of gender differences in marital quality are mixed. Our findings in MIDUS suggest marital quality constructs are measured equally across gender, but differ in structure and differ in their underlying genetic and environmental influences. As in previous psychometric studies of marital quality (Johnson et al. 1986; Fletcher et al. 2000; Graham et al. 2006; South et al. 2009; Turliuc and Muraru 2013; Whisman and Li 2015), we found that the same marital quality constructs can be measured similarly across gender in MIDUS. Partial measurement invariance across gender was observed for all marital quality constructs with only a small number of items varying. Thus, comparison of the factor structure of marital quality across gender can be made safely in MIDUS, at least for Wave I measures (Cheung and Rensvold 1999). A marital interaction framework is used to discuss similarities and differences across gender observed in the current study.

In the current study, all marital quality constructs are more strongly correlated in women than men. Notably, decision making correlated more strongly with overall satisfaction constructs (i.e., marital satisfaction and sexual intimacy) and marital adjustment constructs (i.e., agreement, support, and harmony) in women than men. Women's overall perceptions of marital quality – both overall satisfaction and adjustment constructs – may depend more strongly on the quality of marital interactions (e.g., problem-solving approaches) than men's overall perceptions of marital quality. As noted in the introduction, spouses' interactions are the basis for all aspects of marital quality (Jacobson and Margolin 1979). Thus, spousal interactions, like resolving marital arguments and making decisions, may equally influence satisfaction and adjustment processes in women whereas similar interactions may influence adjustment processes more strongly than satisfaction in men. Gender-specific communication patterns in marriage, for example, have been observed in older cohorts demographically similar to the MIDUS cohort studied here (Baucom et al. 1990). Women's preference for collaboration in problem solving may influence multiple adjustment processes (agreement, support and harmony) whereas the male preference for taking command and offering solutions to problems may influence only one (e.g., support) (Ball et al. 1995). In support of this interpretation, collaborative problem-solving significantly correlated with women's marital satisfaction but not men's.

Gender differences emerged in the five items with different factor loadings. The decision making construct accounted for more of the variability in one measure of decision making ("talk to spouse to make things better") and one measure of support ("spouse can be relied on") in women than men. The marital support construct also accounted for more of the variability in one measure of support ("spouse is there when I need to talk") in women than men. These three items potentially encompass aspects of marital interactions correlated with gendered approaches to problem-solving (Heavey et al. 1993; Ball et al. 1995). Women's greater value of marital communication, stronger emphasis on shared power in relationships, and stronger preference for expressed emotional support compared to men (Rhyne 1981; Impett and Peplau 2006) may further explain why overall marital satisfaction accounted for more variability in a marital harmony item ("spouse lets you down") and overall satisfaction with sexual intimacy accounted for more variability in the item measuring "thought and effort put into sexual intimacy" than in men. Overall, spousal exchanges that support wives' perception that husbands are reliable may be more likely to serve as the basis for wives' overall satisfaction, decision making, support, and harmony constructs.

Although there was low power to detect small genetic influences (power ranged from .09 to .22 to detect common influence on the marital quality constructs) and medium to high power to detect medium true nonshared environmental influences (power ranged from .30 to 1.00 to detect common influences) with the available sample size, the genetic and environmental findings in MIDUS are similar to what has been found in previous research (Spotts et al. 2006). The results of the biometric factor model are consistent with previous findings suggesting that husbands' and wives' genetically and environmentally influenced background characteristics may influence marital interactions (Karney and Bradbury 1995) that in turn influence marital quality. Genetic influences encompass individual characteristics (e.g., personality traits, attitudes, and beliefs) that might influence overall satisfaction and adjustment constructs differently between men and women – possibly along gender lines as previously hypothesized (Spotts et al. 2006). In the female twins, genetically influenced characteristics common to all aspects of the marital relationship may be most strongly related to dimensions of marital adjustment (e.g., harmony). In men, conversely, genetically influenced characteristics common to all aspects of the marital relationship may be strongly related to overall satisfaction.

Individual traits and developmental processes through which genotype influences complex traits like marital quality are many, and unfortunately the MIDUS study design can only broadly outline genetic (and for that matter environmental) influences on marital quality. We, thus, consider the following interpretations as areas of further inquiry. First, gender differences in genetic influences on marital quality constructs may suggest different interactional styles men and women approach in their marital interactions. Women, for example, may be more predisposed to approach marital interactions with a focus on attunement whereas men may be more predisposed to marital interactions that lead to satisfaction irrespective of feeling attuned with their spouses. This interpretation is consistent with the suggestion that the burden of emotional work typically falls to women in heterosexual marriages and partnerships compared to men (Loscocco and Walzer 2013).

Second, differences in the heritability of marital quality may indicate differences in genetically influenced characteristics and personality traits men and women bring to marriage within their broader social contexts (Bronfenbrenner 1986; Kendler and Baker 2007). Women, for example, may take into consideration extended family friend networks when they engage with their spouses in arguments over whether to schedule leisure activities with friends or in-laws. As a result, they may approach arguments with an openness that maintains harmony, support, and satisfaction in addition to the goal of winning arguments. Men, however, may not consider their broader social networks, approaching arguments without a sense of openness geared toward maintaining harmony and support. Instead, they may approach arguments with the single objective of maintaining control of the marriage (i.e., an index of satisfaction).

Gender differences in family-level environmental characteristics also were observed, with significant common influence on women's overall marital satisfaction and overall satisfaction with sexual intimacy but not men's. Family-level socialization processes shape siblings' development via social learning (Bronfenbrenner 1986), which may contribute to their similarity in expectations about marital interactions. This gender difference suggests that married female twins raised to value equality and mutual respect between spouses may report better overall marital and sexual satisfaction compared to married female twins who were not raised with these same values. Similar social learning processes may influence men's efforts to be attuned with their spouses in ways that lead to more harmony and less tension with their spouses, possibly by witnessing male family members who are reliable and supportive to their spouses.

Nonshared environmental influences accounted for the largest proportion of variability in marital quality, as found in other studies (Kendler and Baker 2007; Spotts et al., 2004; Spotts et al. 2006), but are lower compared to measures related to marital quality, like social support (Agrawal et al. 2002). Spouses constitute the most obvious nonshared environmental influence and are not selected randomly (Horwitz et al. 2011), so marital interactions that trigger gene-environment correlative processes could lead to increasingly large nonshared environmental effects on marital quality, a general process we have simulated elsewhere (Beam and Turkheimer 2013). Multiple developmental processes (e.g., gender differences in sociocultural expectations, daily stressors placed on partners, and maintaining a household) also may lead to environmental differences in marital quality, potentially operating in tandem though independent of gene-environment correlative processes. We only can speculate about what processes contribute to large nonshared environmental influences on marital quality constructs, as the findings are based on data that are 1) cross-sectional, and 2) twin studies, unfortunately, are uninformative about specific genetic and environmental factors that account for variability (Gottlieb, 2003; Rutter et al. 2000). Delineating specific environmental processes that account for differences in marital quality outcomes must be left to future research.

Based on the current findings, we also make recommendations for using marital quality scales in MIDUS for further research studies. First, given partial metric invariance, summary scores for each factor can be computed and used as outcomes and predictors of other phenomena (e.g., depressive symptoms and physical health). Summing scores within each domain, however, have a trade-off. On the one hand, summary scores will not include significant cross loadings on domains like satisfaction and decision making, which may lower the construct validity and reliability of these domains in women. On the other hand, leaving out significant cross-loaded items will not induce high correlations between constructs that share items. The latter, in our opinion, is preferred over the former in part because of the relatively good face validity of marital quality measures. Second, we do not recommend summing marital quality items across domains. The items measure conceptually distinct marital quality constructs that should not be conflated (Glenn 1990), have different variances, and have different genetic and environmental causes. Third, scale scores should be constructed and used separately by gender. Given gender differences in total variances as well as differences in genetic and environmental influences, pooling men and women in the same analysis assumes homogeneity of variances, covariances, and etiologies that are not supported in the current analysis.

There were several limitations in the current study. First, although the full MIDUS sample represents the U.S. population of middle-aged and older adults, positive selection still can occur despite random-digit dialing. A potential sampling issue is that unhappy marital partners might have divorced prior to data collection or were less likely to respond. Second, marital quality research has demonstrated that measurement procedures are more alike in dyadic samples of husbands and wives than in independent samples of married men and married women where spouses and partners did not participate in the study (Jackson et al. 2014). Marital quality constructs might be viewed more similarly in dyads given that marital interactions engender a shared reality between partners (Rhyne 1981). Third, the subsample of twins was small and may not be representative of the overall MIDUS sample. While the genetic covariance analysis findings in the biometric factor model replicate previous results (Spotts et al. 2006), further replication is needed in larger samples of American-born married men and married women prior to trusting the estimates presented in the current study. Fourth, the sample of married twins mainly consisted of middle-aged European Americans in the mid-1990s, so the results should be carefully generalized to other groups in the United States (e.g., ethnic and minority status groups), as well as younger cohorts of married adults.

Despite these limitations, the current study adds to a relatively limited body of psychometric and behavioral genetic literature on gender differences in marital quality. Finally, we urge replication of our findings in other twin and sibling samples and hope that future research focuses on how marital interactions might contribute to gender differences in marital quality.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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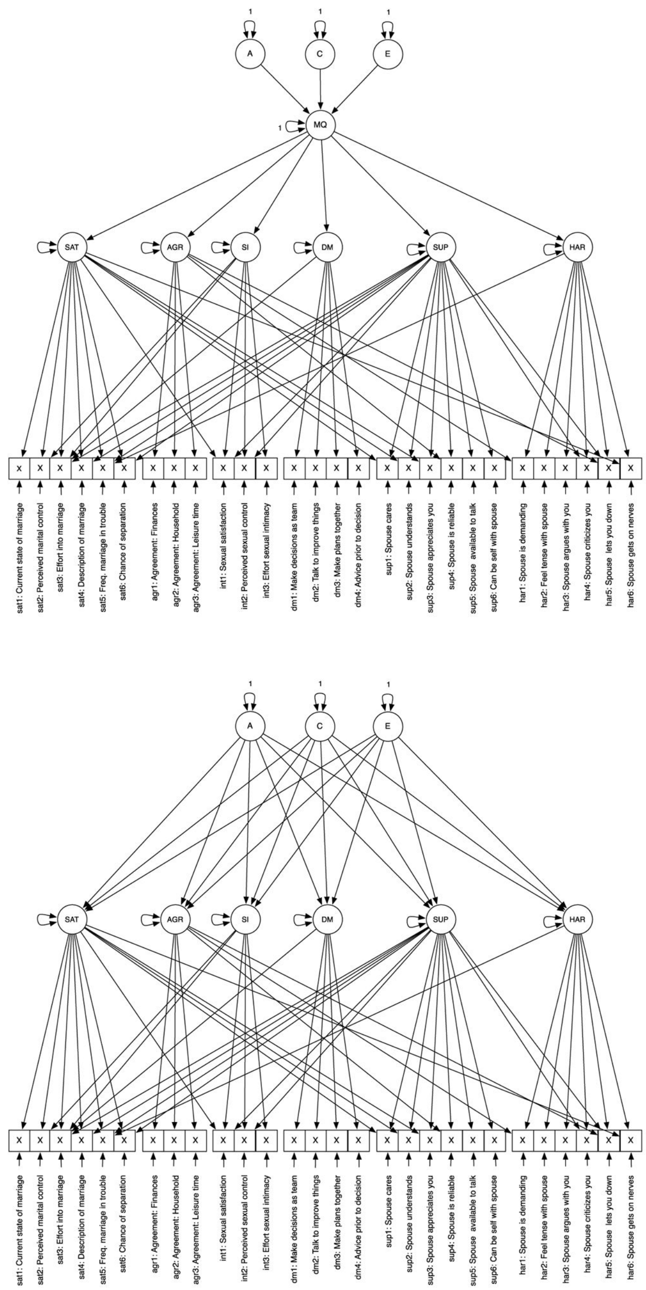

Figure 1.

Psychometric factor model (top panel) and biometric factor model (bottom panel). Construct specific ACE components are not depicted but are estimated in each model. Item residuals indicated by individual arrows projecting from the item description. SAT = overall marital satisfaction; AGR = agreement; INT = overall satisfaction with marital sexual intimacy; DM = decision making; SUP = support; HAR = harmony; A = additive genetic factor; C = common environmental factor; E = nonshared environmental factor; e = item residual variance; Paths without loadings were estimated in the model. Only 1 twin is presented for simplicity.

Table 1

Means and standard deviations of the 6 marital quality constructs and demographic variables for all male and female participants in the full MIDUS sample

	Men			Women					
Marital Quality Construct	**Mean**	***SD***	***n***	**Mean**	***SD***	***n***	t/χ^2	***df***	***p***
Satisfaction	32.86	12.44	2406	33.22	11.52	2215	0.75	3555	0.227
Agreement	7.93	3.33	2406	8.19	3.14	2215	2.54	3555	0.006
Sexual Intimacy	16.92	8.61	2406	17.30	8.82	2215	1.19	3555	0.117
Decision Making	22.56	8.46	2406	22.84	7.86	2215	0.81	3555	0.209
Support	19.74	7.17	2406	19.61	6.54	2215	−0.99	3555	0.161
Harmony	15.25	6.05	2406	15.13	5.68	2215	−0.91	3555	0.181
MIDUS Sample Characteristic Variables									
Age	47.58	12.61	2401	46.39	12.47	2215	−0.80	3550	0.213
Education level	7.12	2.43	2402	6.64	2.28	2213	104.43	11	0.000
Total household income	89,557.98	64,267.23	2130	79,924.21	62,155.53	1999	−5.25	3149	0.000
Number of times married	1.26	0.55	2405	1.27	0.56	2215	0.22	3554	0.413
Duration of current marriage	23.62	13.41	2374	24.73	13.73	2196	4.89	3518	0.000
Number of children	2.55	1.66	2406	2.61	1.68	2215	1.18	3555	0.120

Note. t-tests are based on linear mixed effects regression parameters so that the full MIDUS sample (i.e., twins and siblings) was included. χ^2 tests of independence were used to test for gender differences in education level.

Table 2

Model fitting results of full MIDUS sample

Model	χ^2	*df*	Model Comparison	S-B $\Delta\chi^2$	Δ *df*	*p*	TLI	RMSEA	AIC	BIC
1. Configural invariance (factor loadings & thresholds free)	3064.39	630	-	-	-	-	0.941	0.041	319464.49	321781.99
2. Weak metric invariance (factor loadings equal)	3293.53	680	2 vs. 1	232.48	50	0.000	0.941	0.041	319764.62	321760.24
3. Idiographic filter (latent variances and correlations equal)	3089.15	645	3 vs. 1	31.11	15	0.008	0.942	0.041	319480.79	321701.73
4. Weak metric invariance (factor variances in female group free)	3226.69	674	4 vs. 1	174.04	44	0.000	0.942	0.041	319672.31	321706.56
4a. INT → int3 free	3164.83	673	4a vs. 4	56.88	1	0.000	0.943	0.040	319592.55	321633.24
4b. DM → sup4 free	3138.29	672	4b vs. 4a	17.22	1	0.000	0.944	0.040	319555.01	321602.14
4c. SAT → har5 free	3121.26	671	4c vs. 4b	22.10	1	0.000	0.944	0.040	319536.48	321590.04
4d. SUP → sup5 free	3109.17	670	4d vs. 4c	10.66	1	0.001	0.944	0.040	319521.12	321581.12
4e. DM → dm2 free	3100.63	669	4e vs. 4d	6.87	1	0.009	0.944	0.040	319503.87	321570.30
5. Structural invariance (variances and covariances equal)	3156.14	690	5 vs 4e	67.68	21	0.000	0.945	0.039	319561.67	321492.92
5a. Structural invariance (latent variances equal)	3144.25	675	5a vs. 4e	39.09	6	0.000	0.944	0.040	319563.90	321591.71
6. Single second-order latent factor	3441.20	687	6 vs. 4e	183.75	18	0.000	0.939	0.042	319908.17	321858.73

Note. S-B $\Delta\chi^2$ = difference in Satorra-Bentler scaled chi-square test statistic; Δdf = difference in degrees of freedom; TLI = Tucker Lewis Index; RMSEA = Root Mean Square Error of Approximation; AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion. INT = overall satisfaction with marital sexual intimacy, DM = decision making; SAT = overall marital satisfaction; SUP = support. Items that varied included: int3 (“thought and effort put into sexual intimacy”), sup4 (“spouse can be relied on”), har5 (“spouse lets you down”), sup5 (“spouse is there when I need to talk”), and dm2 (“talk to spouse to make things better”).

Table 3

Factor loading pattern of best fitting model

Item	SAT_{Female}	SAT_{Male}	AGR_{Female}	AGR_{Male}	INT_{Female}	INT_{Male}	DM_{Female}	DM_{Male}	SUP_{Female}	SUP_{Male}	HAR_{Female}	HAR_{Male}
Satisfaction (SAT)												
sat1: Current state of marriage	1.54 (.04)	1.54 (.04)	-	-	-	-	-	-	-	-	-	-
sat2: Perceived marital control	1.34 (.04)	1.34 (.04)	-	-	-	-	-	-	-	-	-	-
sat3: Thought/effort put into marriage	0.96 (.07)	0.96 (.07)	-	-	0.26 (.04)	0.26 (.04)	0.23 (.04)	0.23 (.04)	−0.23 (.06)	−0.23 (.06)	−0.19 (.04)	−0.19 (.04)
sat4: Subjective description of marriage	0.83 (.02)	0.83 (.02)	-	-	-	-	-	-	-	-	-	-
sat5: Frequency marriage is in trouble	0.59 (.02)	0.59 (.02)	-	-	-	-	-	-	-	-	0.15 (.02)	0.15 (.02)
sat6: Chance of marital separation	0.32 (.03)	0.32 (.03)	-	-	-	-	-	-	0.12 (.03)	0.12 (.03)	-	-
Agreement (AGR)												
agr1: Financial matters	-	-	0.59 (.02)	0.59 (.02)	-	-	-	-	-	-	-	-
agr2: Household tasks	-	-	0.62 (.02)	0.62 (.02)	-	-	-	-	-	-	-	-
agr3: Leisure time/activities	-	-	0.59 (.02)	0.59 (.02)	-	-	-	-	-	-	-	-
Sexual Intimacy (INT)												
int1: Overall sexual satisfaction	0.27 (.05)	0.27 (.05)	-	-	2.24 (.06)	2.24 (.06)	-	-	-	-	-	-
int2: Perceived control of sexual intimacy	-	-	-	-	2.07 (.05)	2.07 (.05)	-	-	-	-	-	-
int3: Thought/effort put into sexual intimacy	-	-	-	-	2.06 (.09)	1.43 (.06)	-	-	-	-	-	-
Decision Making (DM)												
dm1: Make decisions as team	-	-	-	-	-	-	0.74 (.05)	0.74 (.05)	0.32 (.04)	0.32 (.04)	-	-
dm2: Talk to spouse to make things better	-	-	-	-	-	-	0.79 (.05)	0.69 (.05)	0.21 (.04)	0.21 (.04)	-	-
dm3: Talk to spouse before making plans	-	-	-	-	-	-	0.90 (.04)	0.90 (.04)	-	-	-	-
dm4: Ask spouse advice before making a decision	-	-	-	-	-	-	0.87 (.04)	0.87 (.04)	-	-	-	-
Support (SUP)												
sup1: Spouse really cares about you	0.01 (.02)	0.01 (.02)	-	-	-	-	-	-	0.33 (.03)	0.33 (.03)	-	-
sup2: Spouse understands feelings	0.18 (.02)	0.18 (.02)	-	-	-	-	-	-	0.40 (.03)	0.40 (.03)	-	-
sup3; Spouse appreciates you	0.08 (.03)	0.08 (.03)	-	-	-	-	-	-	0.44 (.03)	0.44 (.03)	-	-

Item	SAT_{Female}	SAT_{Male}	AGR_{Female}	AGR_{Male}	INT_{Female}	INT_{Male}	DM_{Female}	DM_{Male}	SUP_{Female}	SUP_{Male}	HAR_{Female}	HAR_{Male}
sup4: Spouse can be relied on	-	-	-	-	-	-	0.10 (.02)	0.01 (.02)	0.37 (.02)	0.37 (.02)	-	-
sup5: Spouse is there when need to talk	-	-	-	-	-	-	0.08 (.02)	0.08 (.02)	0.54 (.03)	0.47 (.02)	-	-
sup6: Can be self around spouse	-	-	-	-	-	-	-	-	0.43 (.02)	0.43 (.02)	-	-
Harmony (HAR)												
har1: Spouse makes too many demands	-	-	0.14 (.02)	0.14 (.02)	-	-	-	-	-	-	0.39 (.02)	0.39 (.02)
har2: Spouse makes you feel tense	0.14 (.02)	0.14 (.02)	-	-	-	-	-	-	-	-	0.51 (.02)	0.51 (.02)
har3: Spouse argues with you	0.04 (.02)	0.04 (.02)	-	-	-	-	-	-	-	-	0.48 (.02)	0.48 (.02)
har4: Spouse criticizes you	-	-	-	-	-	-	-	-	0.10 (.02)	0.10 (.02)	0.50 (.02)	0.50 (.02)
har5: Spouse lets you down	0.13 (.03)	0.05 (.03)	0.10 (.02)	0.10 (.02)	-	-	-	-	0.14 (.02)	0.14 (.02)	0.24 (.02)	0.24 (.02)
har6: Spouse gets on your nerves	0.14 (.02)	0.14 (.02)	-	-	-	-	-	-	-	-	0.45 (.02)	0.45 (.02)

Note. Standard errors provided in parentheses. SAT = overall marital satisfaction; AGR = agreement; INT = overall satisfaction with marital sexual intimacy, DM = decision making; SUP = support; HAR = harmony.

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Table 4

Correlations between latent marital constructs for male and female MIDUS participants

		Female					
		SAT	**AGR**	**INT**	**DM**	**SUP**	**HAR**
Male	SAT	1.00	.62 (.03)	.57 (.02)	.69 (.02)	.87 (.01)	.68 (.02)
	AGR	.59 (.02)	1.00	.37 (.03)	.50 (.03)	.61 (.03)	.70 (.02)
	INT	.53 (.02)	.32 (.03)	1.00	.38 (.03)	.49 (.02)	.41 (.03)
	DM	.60 (.03)	.43 (.03)	.29 (.03)	1.00	.72 (.02)	.51 (.03)
	SUP	.80 (.02)	.51 (.03)	.43 (.02)	.59 (.03)	1.00	.66 (.02)
	HAR	.61 (.03)	.68 (.02)	.37 (.03)	.38 (.03)	.56 (.03)	1.00

Note. Male participant values provided above the diagonal and female participant values below the diagonal. Standard errors provided in parentheses. SAT = overall marital satisfaction; AGR = agreement; INT = overall satisfaction with marital sexual intimacy, DM = decision making; SUP = support; HAR = harmony.

Table 5

Biometric factor model results: Proportions of factor variance attributed to common (λ_A, λ_C, & λ_E) and residual A, C, and E (λ_{resA}, λ_{resC}, & λ_{resE}) components for female and male twins

Female Twins												
Factor	**σ^2_T (SE)**	**λ^2_A**	**λ^2_C**	**λ^2_E**	**λ^2_{resA}**	**λ^2_{resC}**	**λ^2_{resE}**	**λ^2_{common}**	**$\lambda^2_{residual}$**	**Total λ^2_A**	**Total λ^2_C**	**Total λ^2_E**
SAT	3.15 (0.34)	0.01	**0.03**	**0.12**	0.04	0.12	**0.68**	0.16	0.84	0.05	0.15	0.79
AGR	0.31 (0.05)	0.00	0.00	**0.44**	0.21	0.01	**0.33**	0.44	0.56	0.21	0.01	0.77
INT	4.78 (0.65)	0.00	**0.33**	**0.17**	0.00	0.00	**0.49**	0.51	0.49	0.00	0.33	0.67
DM	0.66 (0.20)	0.00	0.04	**0.52**	0.12	0.02	**0.31**	0.56	0.44	0.12	0.06	0.83
SUP	0.11 (0.03)	0.00	0.00	**0.09**	0.03	0.03	**0.85**	0.09	0.91	0.03	0.03	0.94
HAR	0.08 (0.02)	**0.39**	0.06	0.26	0.01	0.00	**0.28**	0.72	0.29	0.41	0.06	0.54

Male Twins												
Factor	**σ^2_T (SE)**	**λ^2_A**	**λ^2_C**	**λ^2_E**	**λ^2_{resA}**	**λ^2_{resC}**	**λ^2_{resE}**	**λ^2_{common}**	**$\lambda^2_{residual}$**	**Total λ^2_A**	**Total λ^2_C**	**Total λ^2_E**
SAT	2.17 (0.28)	**0.10**	0.00	**0.75**	0.00	0.01	**0.14**	0.86	0.14	0.10	0.01	0.89
AGR	0.29 (0.04)	0.01	0.03	**0.50**	0.00	0.00	**0.46**	0.54	0.46	0.01	0.03	0.96
INT	4.43 (0.52)	0.05	0.00	**0.26**	0.06	0.00	**0.63**	0.31	0.69	0.11	0.00	0.89
DM	0.59 (0.17)	0.08	0.03	**0.31**	0.01	0.03	**0.54**	0.42	0.59	0.09	0.07	0.84
SUP	0.07 (0.02)	0.15	0.04	**0.59**	0.00	0.01	**0.21**	0.78	0.23	0.15	0.05	0.80
HAR	0.08 (0.02)	0.00	**0.10**	**0.38**	0.12	0.00	**0.41**	0.48	0.53	0.12	0.10	0.79

Note. Bolded values indicate factor loadings with p-values < .05. σ^2_T = total variance of each latent marital quality construct. λ_{common} is the total variability in each latent marital quality construct attributed to the common ACE factors ($\lambda_{common} = \lambda_A + \lambda_C + \lambda_E$). $\lambda_{residual}$ is the total variability in each latent marital construct attributed to the residual (construct specific) ACE factors ($\lambda_{residual} = \lambda_{resA} + \lambda_{resC} + \lambda_{resE}$). SAT = overall marital satisfaction; AGR = agreement; INT = overall satisfaction with marital sexual intimacy, DM = decision making; SUP = support; HAR = harmony.