



Big Five personality domains and relationship satisfaction: Direct effects and correlated change over time

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Abstract

Objective: The Big Five Model (BFM) of personality domains is significantly related to romantic relationship outcomes, particularly marital satisfaction. Few studies to date, however, have examined the BFM domains and relationship outcomes longitudinally.

Method: We used latent growth curve modeling to estimate the initial levels (intercept) and the rate of change (slope) in the BFM domains and marital satisfaction and determine if change in one construct was associated with change in the other. All available data were retained from participants who remained married to the same individual, as well as early waves for participants who divorced or were widowed, in the Midlife in the United States study ($N = 1,965$). We expected negative associations between (a) intercepts of Neuroticism and relationship satisfaction and (b) the intercept/slope of Neuroticism with change in marital satisfaction. The other BFM domains were expected to have positive effects on change in satisfaction.

Results: The results suggested that change over time in Neuroticism and Conscientiousness is detrimental to satisfaction, while initial levels of Conscientiousness may predict declining marital satisfaction.

Conclusions: Changes in Neuroticism accompany parallel changes in relationship satisfaction in a large sample of married U.S. adults, suggesting an ongoing bidirectional influence between these constructs in enduring marriages.

KEYWORDS

Big Five Model, longitudinal, marital satisfaction, midlife

1 | INTRODUCTION

The Big Five Model (BFM)/Five-Factor Model (FFM) domains have been associated with a myriad of intimate relationship functioning outcomes (e.g., marital satisfaction and quality, sexual satisfaction, negative interactions; Banerjee & Basu, 2014; Botwin, Buss, & Shackelford, 1997; Bouchard, Lussier, & Sabourin, 1999; Donnellan, Conger, & Bryant, 2004; Dyrenforth, Kashy, Donnellan, & Lucas, 2010; Fisher & McNulty, 2008; Razeghi, Nikiju, Mujembari, & Masihi, 2011; Rosowsky, King, Coolidge, Rhoades, & Segal, 2012;

Schaffhuser, Allemand, & Martin, 2014; Watson, Hubbard, & Wiese, 2000). There is now substantial research linking the domains of Neuroticism, Conscientiousness, Extraversion, Agreeableness, and Openness (hereafter referred to as the BFM domains) to romantic relationship satisfaction in dating or married partners. One meta-analysis found small (0.08–0.26 absolute r value) but significant associations between all BFM domains and own relationship satisfaction (Heller, Watson, & Ilies, 2004). A later meta-analysis that combined results across dating and married samples found that low Neuroticism, high Agreeableness, high Conscientiousness,

and high Extraversion were associated with higher levels of relationship satisfaction (r s ranged from 0.06 to 0.22 absolute value; Malouff, Thorsteinsson, Schutte, Bhullar, & Rooke, 2010).

Much of this work to date has been cross-sectional, leading to questions as to the direction of effect. An individual's personality may play a determining role in establishing and maintaining patterns of communicating and interacting with one's spouse that will ultimately affect the success of that relationship (as proposed by the Vulnerability-Stress-Adaptation (VSA) model of marital satisfaction; Karney & Bradbury, 1995). In comparison, the nature of one's romantic relationship may in fact play a role in shaping a person's personality. There is now robust evidence that life events may lead to changes in personality traits (e.g., Lehnart, Neyer, & Eccles, 2010; Leikas & Salmela-Aro, 2015; Specht, Egloff, & Schmukle, 2011), and it is reasonable to theorize that how we subjectively experience (either good or bad) our relationship with a current, committed romantic partner may lead to subsequent changes in how we think, feel, and behave. In the current study, we examine both of these possibilities as well as a third alternative—that changes in personality occur commensurate with changes in romantic relationship satisfaction.

2 | THE INFLUENCE OF PERSONALITY ON RELATIONSHIP SATISFACTION

The VSA model of marital satisfaction (Karney & Bradbury, 1995) posited an important role for each partner's personality; enduring vulnerabilities that each person brings to the relationship, including personality traits, impact the adaptive processes by which couples interact and how the couple handles stressful events (both of which are in turn connected). Note the specific direction posited for personality, from personality to adaptive processes and stressful events. In order to test this appropriately, it would be necessary to collect longitudinal data on personality traits (either antecedent to the relationship or roughly commensurate with its beginning) and subsequent relationship satisfaction. In fact, seminal research followed 300 couples over the course of 45 years and found a significant association between Neuroticism (as measured by acquaintance ratings in the 1930s) and self-reported marital satisfaction (measured in 1936–1941, 1955 and 1980; Kelly & Conley, 1987). There have been only a handful of studies since, however, which have examined personality and relationship outcomes longitudinally. Using the Dunedin sample, researchers examined the longitudinal effects of antecedent personality traits at age 18 on relationship outcomes measured at age 21 and 26 (Robins, Caspi, & Moffitt, 2002). Individuals higher in negative emotionality (NEM, a personality trait similar to BFM Neuroticism) at age 18 tended

to have more negative relationship outcomes (lower quality and higher conflict and abuse) at both 18 and 26, whereas those higher in positive emotionality (PEM) and constraint (CN) tended to have happier and less abusive intimate relationships (Robins et al., 2002). Of note, NEM was related to progressive worsening of relationships over time, and PEM and CN predicted increases in quality.

With regard to the BFM domains, there are mixed findings on the longitudinal impact of personality on satisfaction. These inconsistent results may be due to the different study designs (e.g., number and length of follow-up periods) and statistical analyses utilized. In one study, Neuroticism as measured by the Eysenck Personality Questionnaire (Eysenck, Eysenck, & Barrett, 1985) concurrently predicted a lower degree of relationship satisfaction at age 37, but Neuroticism as measured using the High School Personality Questionnaire (Cattell, 1962) administered in adolescence was not significantly correlated with intimate relationship satisfaction in adulthood (Möller, 2004). A later study, however, found that Neuroticism measured in adolescence directly predicted relationship satisfaction in young adulthood as indicated by a significant direct path between the two variables in a structural equation model (Masarik et al., 2013). Using a sample of adults who completed measures online, researchers found that baseline Neuroticism predicted relationship satisfaction one year later, and higher levels of Conscientiousness and lower levels of Neuroticism were correlated with increasing satisfaction (Study 1; Slatcher & Vazire, 2009). In a sample of German adult romantic partners, researchers collected data on the BFM domains and relationship satisfaction at baseline and two years later. Using correlations and actor-partner interdependence regression modeling, they found that only higher Agreeableness was longitudinally related to higher levels of own relationship satisfaction (Weidmann, Schönbrodt, Ledermann, & Grob, 2017). Caughlin, Huston, and Houts (2000) reported significant direct effects in a path model between trait anxiety (i.e., Neuroticism) measured in the newlywed phase and partner's subsequent relationship satisfaction. They also found that wives' trait anxiety predicted *declines* in husbands' satisfaction over the 13-year study period, but did not find the same effect for husbands or for either spouse when examining changes earlier in the relationship; the authors concluded that personality traits have little subsequent effect on change in marriage. Karney and Bradbury (1997) also concluded that Neuroticism has little effect on change in satisfaction. Using multilevel modeling, they demonstrated that baseline Neuroticism had negative effects on the initial levels (i.e., intercepts) of satisfaction but no impact on change (i.e., slopes) in satisfaction across the first four years of marriage. In a large ($N = 8,206$) sample of Australian romantic couples (both same-sex and opposite-sex), higher levels of Extraversion, Agreeableness, and Conscientiousness, and lower Neuroticism and Openness

predicted one's own satisfaction over the four-year study period; further, all effects held for partner's level of satisfaction as well, with the exception of Extraversion (Solomon & Jackson, 2014). But personality traits were largely unrelated to *changes* in relationship satisfaction over time in this study, with the exception of higher Openness predicting greater declines in satisfaction (Solomon & Jackson, 2014).

Thus, while there is both theoretical and empirical evidence to suggest that antecedent personality traits would impact the quality and functioning of the romantic relationship at a later point in time, there have been few studies that had the appropriate data to model statistical *change* over time as a function of initial levels of personality traits; moreover, authors have interpreted the findings of these as largely un-supportive of personality impacting satisfaction change. One possibility that has been expounded is that of *enduring dynamics*, the idea that whatever impact personality has on how couples interact is set early in marriage, and that dynamic persists over time (Huston, Caughlin, Houts, Smith, & George, 2001). Another possibility, however, is that the nature of the relationship itself may have an impact on personality, a topic we turn to next.

3 | RELATIONSHIP EXPERIENCES AND EFFECTS ON PERSONALITY

Personality evidences a great deal of stability in adulthood (Roberts & DelVecchio, 2000), but even with this consistency there is still room for intraindividual change (e.g., Bleidorn, Kandler, Riemann, Angleitner, & Spinath, 2009; Hopwood et al., 2011). There is now a robust literature showing that personality traits are sensitive to change in response to life events, ranging from relationships to employment to death of a loved one (e.g., Bleidorn, Hopwood, & Lucas, 2018; Leikas & Salmela-Aro, 2015; Specht et al., 2011). In this work, the authors have focused efforts on life events that are relatively common and putatively consequential, and not surprisingly many outcomes that personality psychologists have thought important were social in nature (Back & Vazire, 2015). Indeed, Roberts, Wood, and Smith (2005) suggest that the "universal tasks of social living," including finding and keeping a mate, play substantial roles in personality change.

Evidence supports that the experience of getting into or out of a relationship may in fact have a significant impact on subsequent personality. A 25-year follow-up study (Specht et al., 2011) of German households (assessed on a yearly basis) found that individuals who married during the course of the study became less open and extroverted, while those who separated from a spouse became more agreeable and more conscientious (death of a spouse also showed significant effects for personality change). Entrance into a person's first

romantic relationship tends to hold particular consequence. In one study that assessed personality traits and subsequent relationship transitions over the course of eight years in a sample of German adults followed from their 20s to early 30s, singletons showed stable trajectories of Neuroticism and Extraversion, whereas those who entered into a relationship at any point showed significant increases in Extraversion and decreases in Neuroticism (Neyer & Lehnart, 2007); this effect was later replicated in a sample of young adults in the United States (Lehnart et al., 2010), primarily for Neuroticism facets related to negative affect (i.e., depression, social anxiety). Most recently, Lavner, Weiss, Miller, and Karney (2018) found that newlyweds tend to decrease in Agreeableness (husbands and wives), Extraversion (husbands), and Openness and Neuroticism (wives) and increase in Conscientiousness (husbands).

Beyond simply entering or exiting a relationship, the quality of that relationship may have an impact on subsequent personality development. Supportive of this idea, in the same study utilizing the Dunedin sample that examined personality effects on relationship quality, the authors were able to examine how relationship experiences at age 21 predicted personality change from 18 to 26 (Robins et al., 2002). Individuals in low quality, high conflict, and high abuse relationships increased in NEM; relationship quality, however, was not related to changes in PEM or CN. To our knowledge, only one study has examined this question across the BFM domains. In the same German sample of young adults described above, the authors used cross-lagged panel analyses to examine the effects of relationship satisfaction on personality change and found no effects for BFM traits (Lehnart & Neyer, 2006).

4 | CORRELATED CHANGES IN PERSONALITY AND RELATIONSHIP OUTCOMES

Studies that examine antecedent personality traits on later relationship satisfaction, or alternatively the impact of relationship status change or satisfaction on personality traits measured subsequently are informative; however, a more complete picture emerges of the relative influence of each when both constructs are measured at multiple points in time. For example, using a sample of adult romantic partners (dating, cohabiting or married, $M_{\text{age}} = 50$), researchers found a significant negative effect of Neuroticism on own relationship satisfaction measured two years later, but no effect of relationship satisfaction on Neuroticism (Schaffhuser, Wagner, Lütke, & Allemand, 2014). In contrast to the largely null findings of personality on subsequent relationship change, or relationship quality on subsequent personality change, researchers using the German longitudinal sample reported evidence of correlated change (of residuals) between

relationship satisfaction and BFM domains. Specifically, they found evidence of correlated change for Neuroticism (decreasing levels of the trait related to increasing satisfaction) in individuals who remained in the same relationship over time, and for Agreeableness (increasing Agreeableness and increasing satisfaction) in those who did and did not change partners, but only at the earlier time interval (Lehnart & Neyer, 2006). Most recently, Lavner and colleagues (2018) found that the initial levels of relationship satisfaction did not predict change in personality over the first 18 months of marriage. They did find one effect of personality at baseline predicting change in satisfaction—husbands who were initially higher in Openness were buffered against declines in satisfaction over time. Of particular interest, the authors reported that wives who increased in Neuroticism over the 18-month study period showed steeper declines in own- and husband-reported satisfaction; satisfaction also decreased less steeply for wives who increased in Openness.

In the current study, we extend on this previous work by modeling personality and relationship satisfaction using latent growth curve models (LGCs). A schematic of the LGC used in the analyses is presented in Figure 1. These models are ideal for examining our study goals. In a LGC, latent variables are estimated for baseline levels (intercepts) and change over time (slopes) in the observed variables (here, personality traits and relationship satisfaction). The basic

univariate LGC can be extended to a parallel process model that includes two constructs. In a parallel process model, direct paths from the intercepts of two different constructs to the opposite respective slopes can be estimated. These paths test if the initial levels of one construct (e.g., personality) predict increases or decreases in the second construct (e.g., marital quality). Covariances between the intercept/slope factors of the same construct can be freely estimated to determine if the initial levels of a construct are associated with subsequent change in that construct. Finally, covariances can be specified between the two intercept factors and between the two slope factors. The significance of these covariances tests if the initial levels covary, and most importantly for the current analyses, if the trajectory of change in personality covaries with the trajectory of change in marital satisfaction.

LGCs are superior to other models of change for the current study (such as cross-lagged models) due to our primary interest in (a) initial levels predicting change over time and (b) if change over time in both constructs is related. Cross-lagged models are best suited for when there is a significant expectation of autocorrelation and/or the time points are relatively closely spaced. LGCs lack autoregressive parameters, suggesting that each observation is independent from all others (Pakpahan, Hoffmann, & Kröger, 2017). Given that there are approximately nine years between subsequent assessments in the Midlife in the United States (MIDUS) data

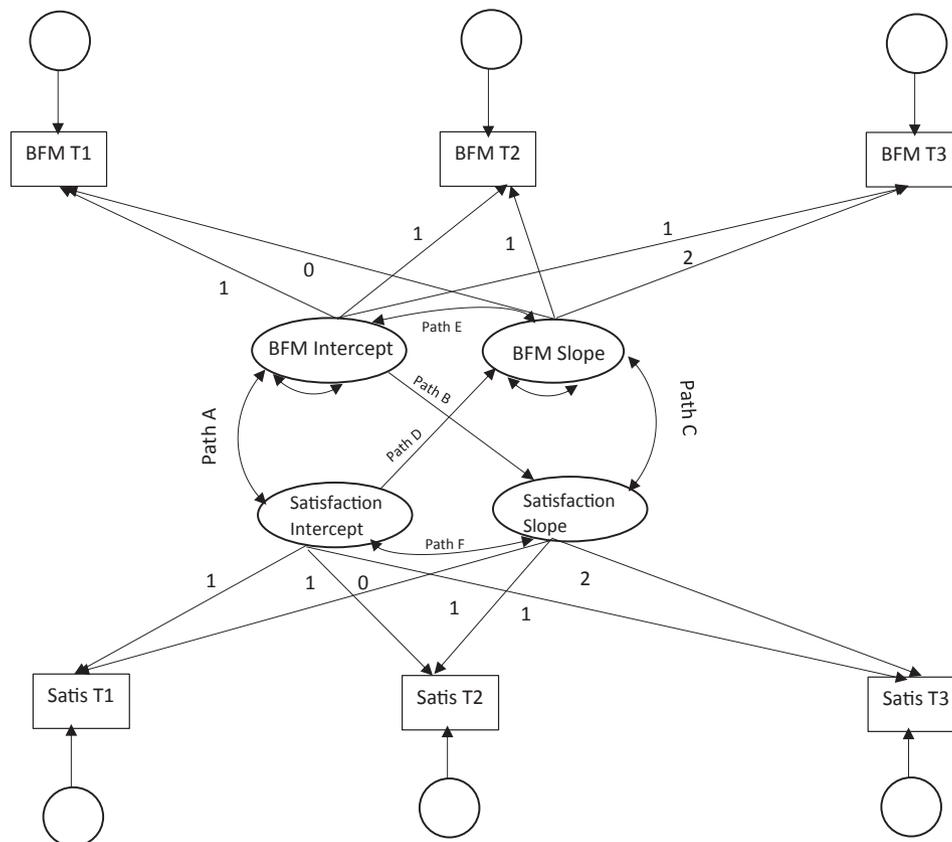


FIGURE 1 Schematic diagrams for the final parallel process models

set, and because LGCMs have been recommended for lifespan research, we believe that they are well suited for the purposes of the current study (Pakpahan et al., 2017). LGCMs also have the advantages of all forms of structural equation modeling, including the ability to appropriately model missing data, to directly model residual error, and to obtain the overall indices of model fit and thus allow for a comparison of alternative models (Kline, 2011; South & Jarnecke, 2017; Westland, 2015).

To our knowledge, there has been only one attempt in the literature to examine personality and relationship satisfaction using LGCMs in a structural equation modeling framework. In that study, Donnellan and colleagues (2004) attempted to fit models in which BFM traits predicted change (i.e., the latent slope factors) in several marital variables measured over several years. Unfortunately, the authors were unable to estimate well-fitting unconditional growth models to many of the marital quality variables, limiting the ability to predict the slopes from personality traits.

5 | CURRENT STUDY

The current investigation adds to the existing literature in a number of crucial ways. First, because we had measures of both personality and relationship satisfaction over the three waves of the study, it was possible to examine multiple ways these two constructs could be related. That is, it was possible to directly test and compare the strength of the effect of baseline personality to change in satisfaction, baseline satisfaction to change in personality, and, most importantly, how *change* in BFM personality traits can covary with *change* in marital satisfaction over time. Second, our study followed individuals for approximately 18 years, one of the longest follow-up periods in the field of relationships research. Third, we utilized a sample of individuals who ranged in age from young adult to senior citizen at baseline assessment.

6 | HYPOTHESES

6.1 | Hypothesis 1

Initial levels of Neuroticism (i.e., the intercept) will be negatively correlated with initial levels of marital satisfaction, whereas initial levels of Conscientiousness, Agreeableness, Extraversion, and Openness will be positively correlated with initial levels of marital satisfaction (Path A).

6.2 | Hypothesis 2

Initial levels of Neuroticism will have a direct, negative effect on the slope of marital satisfaction; in other words, greater levels of Neuroticism at baseline will predict declining

marital satisfaction over the study period. Further, initial levels of Conscientiousness, Agreeableness, Extraversion, and Openness will predict stable or increasing marital satisfaction (Path B).

6.3 | Hypothesis 3

The personality growth curve slope factor and the satisfaction slope factor will be correlated. Increases in levels of Neuroticism will correlate with declines in marital satisfaction over the study period, while increases in levels of Conscientiousness, Agreeableness, Extraversion, and Openness will correlate with increasing marital satisfaction (Path C).

7 | METHOD

7.1 | Participants and procedure

Participants were drawn from the larger, nationally representative random digit dial main sample collected as part of the MIDUS project (Brim et al., 2016; Ryff et al., 2012, 2016). MIDUS I, the first wave of data collection, lasted from 1995 to 1996; approximately nine years later, participants were contacted again to complete the second follow-up (MIDUS II); the most recent follow-up was conducted in 2013 (MIDUS III). For the current study, we used a subsample of participants who reported being married at MIDUS I. Participants ($N = 1,965$)¹ were included in our sample for data analysis if they remained in the same marital relationship at all waves of data provided over the 18-year study period.² If participants failed to complete the second or third MIDUS assessment waves, or if they divorced after the first wave, only data at waves where they reported being married (to the same person) were retained for the current analyses. For example, if a person was married to the same person at MIDUS I and II but divorced at MIDUS III, we only used data from MIDUS I and II in the current study. At MIDUS I, the sample included in our analyses was 53.8% male, 86.7% Caucasian, well-distributed regarding age ($M = 47.42$ years, $SD = 12.73$), and had been married an average of 11.61 years ($SD = 9.53$). First marriages comprised 75.8% of the sample at MIDUS I, and the modal number of biological children that respondents had was 2. Average household income was \$48,999.46 at MIDUS I and 59.5% of the sample had some college or greater education.

MIDUS was initiated with an English-fluent main sample of 4,244 random digit dial participants between the ages of 25 and 75. MIDUS II began approximately nine years later in 2004, and retained 64.7% of the original sample. MIDUS III data were collected in 2013–2014, approximately 18 years following the original MIDUS study initiation, retaining 63.1% of eligible participants. At all waves of data collection,

participants completed a computer-assisted phone interview, then were sent questionnaires which they answered independently that took approximately an hour and a half to complete. Questionnaire response rates at each wave were 89%, 80%, and 83% for MIDUS I-III, respectively. Measures for the current study were derived from the questionnaire portion of the MIDUS I-III assessments. Participants were compensated \$20 for completing MIDUS I and \$60 for completing MIDUS II.

7.2 | Measures

7.2.1 | BFM personality traits

BFM traits were assessed using 25 adjective descriptors on which participants rated their level of agreement on a 1 (a lot) to 4 (not at all) scale (Lachman & Weaver, 1997). Each domain of the BFM was assessed using four to seven adjective descriptors: Openness to Experience (creative, imaginative, intelligent, curious, broadminded, sophisticated, adventurous); Conscientiousness (organized, responsible, hardworking, careless—reverse scored); Neuroticism (moody, worrying, nervous, calm—reverse scored); Extraversion (outgoing, friendly, lively, active, talkative); and Agreeableness (helpful, warm, caring, softhearted, sympathetic). We used the calculated scores provided in the MIDUS data set; for these scores, items were recoded so that higher scores reflected a higher standing on that trait (i.e., greater Neuroticism, Extraversion, Agreeableness, Openness, and Conscientiousness) and then averaged.

7.2.2 | Relationship satisfaction

The MIDUS survey included several items assessing aspects of the participant's romantic relationship. For the current study, we used a scale (South & Krueger, 2008) composed of 21 items measuring relationship disagreement (3 items on a 1–4 scale; e.g., “How much do you and your spouse or partner disagree on the following issues—household tasks, such as what needs doing and who does it?”), spousal support/strain (12 items on a 1–4 scale; e.g., “How much does your spouse or partner really care about you?” “How often does your spouse or partner make too many demands on you?”), relationship risk (2 items on a 1–5 scale; e.g., “During the past year, how often have you thought your relationship might be in trouble?”), and relationship decision-making (4 items on a 1–7 scale; e.g., “Things turn out better when I talk things over with my partner”). Due to different item scaling, a sum score was calculated (for those missing less than three items) to create a total score. Higher scores indicated greater relationship satisfaction, and the maximum possible score was 97 (reliabilities are reported in Supplemental Table 1).

7.3 | Statistical analyses

Figure 1 provides a general path diagram for all models tested. All data were analyzed using LGCM in Mplus software, v. 8 using the full information maximum likelihood estimator to account for data missingness (see Supplemental Table 1). LGCMs require a minimum of three assessment points, but are only able to estimate linear change with three time points. Parallel process models are an extension of LGCM that allow for the simultaneous estimation of change over time and baseline levels of two or more constructs (here, BFM traits and marital satisfaction).

Unconditional (measurement) models were run first to establish a basic model fit and examine how each of the two constructs separately changed over time. The unconditional models were run with three indicator variables (i.e., BFM trait or marital satisfaction at all three time points) and two latent factors for the slope and intercept, respectively. The factor loadings for each of the three indicators on the intercept growth factor were fixed to 1.0. Loadings for the slopes were fixed to the time scores 0, 1, and 2, with 0 representing the MIDUS I assessment and 1 and 2 representing the MIDUS II and III assessments, respectively. In the baseline model, all parameters (i.e., means and variance of the growth factors) were freely estimated, except for the residual variances which were constrained to equivalence. In the next model, age, education, and gender from MIDUS I were added as exogenous covariates on the latent factors.³ Age was included as a covariate because previous work has cited changes in personality and relationship satisfaction over time (Bleidorn et al., 2009; Kurdek, 1998; Lucas & Donnellan, 2011; Roberts & DelVecchio, 2000; Robins, Fraley, Roberts, & Trzesniewski, 2001; Wortman, Lucas, & Donnellan, 2012), and age has a wide range in the current sample. Education (which is measured on a 1–12 scale, with 1 reflecting no schooling and 12 reflecting doctorate-level education), a proxy for socioeconomic status (Boyce, Wood, Delaney, & Ferguson, 2017; Kajonius & Carlander, 2017; Mosca & McCrory, 2016), and gender (Lippa, 2010) are also well-known correlates of the BFM traits. Given the strong theoretical and empirical rationale, we chose to include these covariates.

After fitting the measurement models, we proceeded to fit parallel process models between each BFM domain and marital satisfaction. Direct paths were specified from the intercept factor of the BFM to the slope factor of marital satisfaction (Path B), and from the intercept factor of marital satisfaction to the slope factor of the BFM domain (Path D). Covariances were allowed between the intercept factors of the BFM domain and marital satisfaction (Path A) and the slope factors of the BFM domain and marital satisfaction (Path C). Covariances were also allowed between the intercept factor and the slope factor of the BFM domain (Path E) and the intercept and slope factors for satisfaction (Path F).

There were six residual variances, corresponding to the marital satisfaction and BFM measurements at the three assessments, and these were assumed to be uncorrelated within constructs (i.e., the residuals of the three satisfaction indicators were uncorrelated) and across constructs (e.g., the residuals for satisfaction at MIDUS I and the residual for the BFM indicator at MIDUS I were not correlated). From this baseline parallel process model, exogenous covariates (i.e., age, gender, education) were added in a subsequent model. The fit of all unconditional and parallel process models was evaluated according to root mean square error of approximation (RMSEA), comparative fit index (CFI), and chi-square values. Per convention, CFI values above 0.95, RMSEA below 0.06, and nonsignificant chi-square values indicated a well-fitting model (Hu & Bentler, 1998, 1999).

8 | RESULTS

Descriptive statistics and correlations for all study variables are reported in Table 1. Reliabilities for all indicator variables were in the acceptable to very good range.⁴ Marital satisfaction demonstrated significant and large correlations across time. In general, the BFM domains were significantly and positively correlated across time within domain (e.g., MIDUS I Extraversion correlated with Extraversion at MIDUS II and MIDUS III). Bivariate associations showed that all personality scale scores at MIDUS I correlated modestly (r s ranging from 0.04 to 0.55 absolute value). Neuroticism was significantly, negatively correlated with satisfaction at all three time points. Extraversion and Openness demonstrated small, positive but significant correlations with satisfaction at all time points, whereas Conscientiousness and Agreeableness were only significantly positively correlated with satisfaction at MIDUS I and MIDUS II. All scales correlated in the expected direction with marital satisfaction at MIDUS II, but Extraversion ($r = 0.11, p < 0.01$), Openness ($r = 0.11, p < 0.01$), and Neuroticism ($r = -0.26, p < 0.01$) at MIDUS III were the only significant correlations with MIDUS III marital satisfaction.

8.1 | Unconditional LGCMs

8.1.1 | Marital satisfaction

The unconditional model for marital satisfaction was specified and estimated as described above (see top half of Figure 1). The final, best-fitting model fit well according to the RMSEA and CFI values (see Table 2). No significant covariance was observed between the intercept and slope in the baseline model, indicating that the initial levels of marital satisfaction did not correspond to changes in marital satisfaction over time. Prior to adding covariates, variances for the

intercept and slope were significant, indicating that individuals in this sample tended to vary in the levels of satisfaction at MIDUS I as well as in their trajectories of satisfaction over time. The mean of the slope factor was also significant prior to adding covariates, and it showed that the sample tended to increase in satisfaction over time.

8.1.2 | Big 5 domains

The final, best-fitting unconditional models for Extraversion and Agreeableness fit well according to all three fit indices (see Table 2 for more detailed information). No significant covariance between the intercept and slope was observed in the initial baseline models, suggesting that the trajectory of change in these domains in this sample (on average, during midlife) did not covary with initial levels. Mean levels for the slopes for these two domains were significantly negative, indicating that the sample tended to decrease in Extraversion and Agreeableness over time. Both models did reveal significant variance around the intercept (i.e., people differed in their levels of these domains at baseline), but not significant variance around the slopes.⁵

The baseline Neuroticism model fit well according to the RMSEA and CFI values. A significant negative covariance was observed between the intercept and slope (unstandardized [UNSTD] = $-0.03, p < 0.01$). Those who were higher in Neuroticism at MIDUS I were more likely to decrease in their levels of Neuroticism over the course of the study period. Even after the addition of covariates, there was significant residual variance around the intercept and slope latent factors, indicating that at MIDUS I participants tended to significantly differ from one another in terms of their level of Neuroticism, and that participants also showed individual variation in patterns of change in Neuroticism over time. The slope was significantly negative in the baseline model and trending in the covariates model ($p = 0.051$), indicating that participants tended to decrease in Neuroticism over the course of the study.

The baseline models for Openness and Conscientiousness were well fitting based on the CFI and RMSEA values (see Table 2). The covariance between the intercept and slope of Conscientiousness was nonsignificant. The intercept and slope of Openness exhibited significant variance even after the addition of covariates, while the slope of Conscientiousness no longer contained significant variance around the slope after the addition of covariates. Openness also decreased over the study period as evidenced by the mean of the slope factor, which was significant in the baseline but not the covariates model. Conscientiousness increased nonsignificantly in the baseline model, although the addition of covariates resulted in a significant slope factor mean. For Openness, there was not a significant covariance between the intercept and slope, suggesting that higher levels of Openness at the first

TABLE 1 Bivariate correlations, means, and standard deviations for all study variables

	T1S	T1A	T1E	T1N	T1C	T1O	T2S	T2A	T2E	T2N	T2C	T2O	T3S	T3A	T3E	T3N	T3C	T3O		
T1S	1.00																			
T1A	0.14**	1.00																		
T1E	0.16**	0.55**	1.00																	
T1N	-0.22**	-0.04	-0.16**	1.00																
T1C	0.18**	0.28**	0.27**	-0.16**	1.00															
T1O	0.11**	0.37**	0.51**	-0.17**	0.28**	1.00														
T2S	0.65**	0.11**	0.14**	-0.16**	0.12**	0.10**	1.00													
T2A	0.15**	0.64**	0.37**	-0.03	0.22**	0.22**	0.19**	1.00												
T2E	0.17**	0.36**	0.67**	-0.11**	0.20**	0.34**	0.19**	0.50**	1.00											
T2N	-0.18**	-0.03	-0.11**	0.64**	-0.09**	-0.13**	-0.22**	-0.13**	-0.19**	1.00										
T2C	0.16**	0.18**	0.16**	-0.07*	0.62**	0.21**	0.15**	0.27**	0.26**	-0.13**	1.00									
T2O	0.12**	0.26**	0.36**	-0.15**	0.26**	0.69**	0.14**	0.35**	0.50**	-0.20**	0.33**	1.00								
T3S	0.53**	0.06	0.11*	-0.15**	0.05	0.06	0.64**	0.04	0.09*	-0.21**	0.02	0.09*	1.00							
T3A	0.09*	0.64**	0.34**	-0.04	0.22**	0.19**	0.05	0.64**	0.32**	-0.10*	0.20**	0.28**	0.05	1.00						
T3E	0.15**	0.32**	0.67**	-0.07	0.17**	0.32**	0.13**	0.33**	0.71**	-0.13**	0.16**	0.39**	0.11**	0.50**	1.00					
T3N	-0.16**	-0.02	-0.10*	0.57**	-0.05	-0.18**	-0.18**	-0.02	-0.10*	0.66**	-0.07	-0.15**	-0.26**	-0.08*	-0.08	1.00				
T3C	0.07	0.16**	0.15**	-0.10*	0.57**	0.19**	0.06	0.15**	0.14**	-0.11**	0.65**	0.25**	0.05	0.27**	0.24**	-0.17**	1.00			
T3O	0.11*	0.25**	0.30**	-0.11*	0.18**	0.59**	0.12**	0.23**	0.33**	-0.16**	0.18**	0.71**	0.11**	0.39**	0.49**	-0.17**	0.31**	1.00		
<i>M</i>	79.45	3.47	3.19	2.23	3.42	3.01	81.16	3.41	3.09	2.08	3.45	2.87	81.96	3.42	3.09	2.10	3.47	2.88		
<i>SD</i>	12.26	0.49	0.56	0.65	0.44	0.51	11.60	0.50	0.57	0.63	0.45	0.52	11.84	0.50	0.58	0.62	0.45	0.52		

Note. T1 = Time 1, T2 = Time 2, T3 = Time 3, S = Satisfaction, A = Agreeableness, E = Extraversion, N = Neuroticism, C = Conscientiousness, O = Openness to Experience, *M* = mean, *SD* = standard deviation. * $p < 0.05$; ** $p < 0.01$.

TABLE 2 Fit statistics and factor means and variances for best-fitting unconditional latent growth curve models

Domain	Model	N	χ^2	df	RMSEA	CFI	Intercept factor mean (variance)	Slope factor mean (variance)	Intercept/slope covariance
Satisfaction	Baseline	1,928	1.24	3	0.000	1.000	79.48 (110.53 ^{***})	0.57 (11.14 ^{**})	-5.97
	Covariates	1,965	27.73 ^{**}	9	0.03	0.97	78.69 (107.003 ^{***})	0.58 (10.46 ^{**})	-6.78
Agreeableness	Baseline	1,953	2.76	3	0.00	1.000	3.46 (0.15 ^{***})	-0.02 (0.000)	0.002
	Covariates	1,965	28.58 ^{**}	11	0.03	0.98	3.09 (0.13 ^{***})	-0.13 (-)	-
Extraversion	Baseline	1,953	10.40 [*]	3	0.04	0.99	3.19 (0.22 ^{***})	-0.07 (0.01)	-0.001
	Covariates	1,965	36.55 ^{***}	9	0.04	0.97	3.25 (0.22 ^{***})	-0.07 (0.01)	0.000
Neuroticism	Baseline	1,952	25.39 ^{***}	3	0.06	0.97	2.22 (0.29 ^{***})	-0.08 (0.02 ^{**})	-0.03 ^{**}
	Covariates	1,965	61.02 ^{***}	9	0.05	0.94	2.55 (0.02 ^{**})	-0.14 (0.02 ^{**})	-0.02 ^{**}
Conscientiousness	Baseline	1,952	4.78	3	0.02	0.997	3.42 (0.12 ^{***})	0.008 (0.01 [*])	-0.001
	Covariates	1,965	33.60 ^{***}	9	0.04	0.97	3.09 (0.12 ^{***})	0.22 (0.006)	0.001
Openness	Baseline	1,952	24.92 ^{***}	3	0.06	0.97	3.00 (0.19 ^{***})	-0.09 (0.02 ^{***})	-0.01
	Covariates	1,965	52.72 ^{***}	9	0.05	0.96	2.96 (0.18 ^{***})	-0.08 (0.02 ^{***})	-0.008

Note. N = Final N used for the model using full information maximum likelihood. All estimates are unstandardized.
^{*} $p < 0.05$; ^{**} $p < 0.01$; ^{***} $p < 0.001$.

measurement occasion were unrelated to changes in scores on this domain over time (UNSTD = -0.01, *ns*).

8.2 | Parallel process models

The parallel process models for marital satisfaction and the three BFM domains with significant variance in the slope factor (Neuroticism, Conscientiousness, and Openness) were run as specified above (see Figure 1) with all paths freely estimated. Next, models were run that added paths from exogenous covariates to the latent factors, and all paths were freely estimated for this as well. Estimates from all parallel process models are found in Table 3. The covariance between the intercept and slope factors for satisfaction was not significant in any model and is not discussed further.

The final model for Neuroticism containing covariates fit well (CFI = 0.97; RMSEA = 0.04; $\chi^2 = 70.62$, $p < 0.001$, $df = 20$). There was a significant negative covariance between the intercepts of Neuroticism and satisfaction (Path A = -1.43, $p < 0.001$), indicating that those who were higher in Neuroticism at MIDUS I had lower marital satisfaction at MIDUS I. The covariance between the intercept and slope of Neuroticism was also negative (Path E = -0.02, $p < 0.01$), as in the unconditional model, suggesting that those who were higher on Neuroticism at the initial assessment tended to decline in their levels of this trait over time. Finally, there was a significant negative covariance between the slopes (Path C = -0.37, $p < 0.001$); those who increased in Neuroticism over the 18 years of the study period tended to experience declines in marital satisfaction. Satisfaction predicting changes in Neuroticism (Path D = 0.003, $p < 0.05$) was significant only in the baseline model, while the slope of satisfaction regressed on baseline Neuroticism (Path B = 1.15, $p < 0.05$) was significant only in the covariates model. These results suggest that higher Neuroticism predicts *increases* in satisfaction over time, and higher satisfaction predicts *increases* in Neuroticism over time; however, because they are only significant upon the removal and addition of covariates (respectively), these should be interpreted with caution.

The final model for Openness fit well (CFI = 0.98; RMSEA = 0.03; $\chi^2 = 58.80$, $p < 0.001$, $df = 20$). There was a significant covariance between the intercepts (Path A = 0.67, $p < 0.001$), such that higher levels of Openness at baseline were associated with higher marital satisfaction at the same measurement occasion. No other direct paths or covariances between the latent intercept or slope factors were significant.

The final model for Conscientiousness fit well (CFI = 0.98; RMSEA = 0.03; $\chi^2 = 45.28$, $p < 0.01$, $df = 20$). The covariates-added parallel process model resulted in non-significant parameter estimates for the Conscientiousness intercept/slope covariance (Path E) and the direct effect of satisfaction intercept on Conscientiousness slope (Path D). The final model did result in significant and positive

TABLE 3 Parameter estimates for parallel process models of Big Five Model domains and relationship satisfaction

		<i>N</i>	χ^2 (sig, <i>df</i>)	RMSEA	CFI	Path A	Path B	Path C	Path D	Path E	Path F
Neuroticism	Baseline	1,959	30.64 (0.001, 11)	0.03	0.99	-1.71***	0.66	-0.37***	0.003*	-0.02**	-5.15
	Covariates	1,965	70.62 (<0.001, 20)	0.04	0.97	-1.43***	1.15*	-0.37***	0.003	-0.02**	-5.41
Openness	Baseline	1,959	23.03 (0.02, 11)	0.02	0.99	0.72***	-0.33	0.07	0.001	-0.01	-5.72
	Covariates	1,965	58.80 (<0.001, 20)	0.03	0.98	0.67***	-0.58	0.08	0.001	-0.01	-6.36
Conscientiousness	Baseline	1,959	8.84 (0.64, 11)	0.000	1.00	0.98***	-1.76*	0.10*	-0.001	0.000	-4.26
	Covariates	1,965	45.28 (0.001, 20)	0.03	0.98	1.04***	-1.58*	0.10*	0.000	0.001	-5.17

Note. All estimates are unstandardized and refer to the paths labeled in Figure 1.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

covariances between the intercept factors (Path A = 1.04, $p < 0.001$) and between the slope factors (Path C = 0.10, $p < 0.05$). Thus, those higher in Conscientiousness at MIDUS I had higher levels of marital satisfaction at MIDUS I. Additionally, those who increased in Conscientiousness over the study period were more likely to increase in marital satisfaction over time. Notably, a significant and *negative* estimate was found for the direct effect from the Conscientiousness intercept factor to the satisfaction slope factor (Path B = -1.58, $p < 0.05$), such that higher levels of Conscientiousness at baseline predicted steeper *decreases* in marital satisfaction over time.⁶

9 | DISCUSSION

The current study sought to investigate changes in marital satisfaction and BFM traits over time. Links between BFM traits and relationship satisfaction have been consistently replicated in the literature, suggesting that Agreeableness, Conscientiousness, and Extraversion are beneficial for relationships (Donnellan et al., 2004; Watson et al., 2000), whereas higher levels of Neuroticism are consistently related to lower relationship quality in married individuals (Fisher & McNulty, 2008; Goodboy & Booth-Butterfield, 2009) and increase the likelihood of relationship dissolution (Solomon & Jackson, 2014). There is also a robust area of literature suggesting that life events (e.g., marriage) and environmental contexts (e.g., marital satisfaction) are associated with changes in personality traits (Bleidorn et al., 2018; Lehnart et al., 2010). These effects have been demonstrated using different samples, designs, and operational outcomes; there are, however, limitations to previous literature on this topic as few studies have leveraged change processes to study these effects. Since previous work has identified significant change in both marital satisfaction (e.g., Gorchoff, John, & Helson, 2008) and BFM traits (e.g., Lucas & Donnellan, 2011; Roberts & DelVecchio, 2000) when studied separately, it is reasonable to suspect that these constructs are not static or isolated from one another and likely unfold and covary over time in significant ways.

The primary goal of the current study was to investigate how initial levels and change over time in these two constructs may influence one another. We drew from a sample of married adults who were assessed at three occasions over 18 years as part of their participation in a large, nationwide study of health and well-being. We examined single-construct LGCMs for BFM traits and marital satisfaction as well as parallel process LGCMs which allowed for the estimation of covariances and direct effects between the two constructs over time. Before turning to our main findings, we first briefly discuss the results of the univariate LGCM analyses for personality and relationship satisfaction separately.

Both descriptive statistics and growth curve analyses showed that relationship satisfaction increased over the study period. These findings fit with similar trends found in the literature on longitudinal change in satisfaction beyond the honeymoon years, which was the majority of our sample. One previous study longitudinally investigated midlife change in marital satisfaction in a small sample ($N = 72$ for satisfaction analyses) of married women (Gorchoff et al., 2008). They found that satisfaction increased from age 43 to 61, which they largely attributed to the "empty nest" phenomenon. In a sample of older married adults (between ages 55 and 64 at enrollment), researchers found that relationship satisfaction demonstrated a nonsignificant increase over a 2.5-year study period (South, Boudreaux, & Oltmanns, in press). The current study was the first, to our knowledge, to investigate how marital satisfaction changes in a large sample of population-representative men and women from the United States. Our findings suggest that, unlike the decrease in satisfaction that commonly occurs following marriage (e.g., Kurdek, 1998), there may be an increase in marital quality in long-term, middle-aged (on average) couples. We caution that our findings may partly reflect the time frame of the study; perhaps there was something about life in the United States in the mid-90s through the first decade of the 21st century that lent itself to increases in satisfaction. Of course, having only three time points of data precluded the study of nonlinear change in satisfaction, a fruitful area for future research.

Over the course of the study period, on average, participants became more emotionally stable and conscientious, but also less agreeable, less open, and more introverted. Previous research using large samples (e.g., in two of the studies, samples included more than 13,000 individuals) has demonstrated that while personality is relatively stable, there are mean-level changes in BFM personality traits over time (Bleidorn et al., 2009; Lucas & Donnellan, 2011; Roberts & DelVecchio, 2000; Robins et al., 2001; Wortman et al., 2012). In general, people decline in Neuroticism but increase in the other domains (or at least some facets of Extraversion). Interestingly, Agreeableness declined in the current study; this is contrary to previous work showing increases in Agreeableness over the lifespan (Lucas & Donnellan, 2011) but is likely impacted by the length of the assessment and cultural composition (i.e., German adults over 4 years vs. U.S. adults over a period of 18 years in the current study). Although we controlled for age in our analyses, future research in this area may wish to examine possible cohort differences in trajectories of personality change.

Questions regarding how these change processes in satisfaction and personality were associated were organized around three main hypotheses. First, we predicted that the initial levels of BFM traits would covary positively with the initial levels of marital satisfaction (excepting Neuroticism, which was expected to covary negatively). This followed

from an abundance of cross-sectional research demonstrating correlations between BFM domains and relationship satisfaction (Heller et al., 2004; Malouff et al., 2010). The results were largely consistent with expectations for the current investigation. Conscientiousness and Openness covaried robustly and positively with marital satisfaction at MIDUS I, whereas Neuroticism evinced a significant negative relationship. Openness has consistently been the domain most weakly related to satisfaction, but here we did find a significant association with satisfaction at baseline. We do not interpret the results of the parallel process models for Extraversion and Agreeableness, but even in these models we found significant covariances between the intercept factor of the domains and the intercept factor of satisfaction. Thus, even among the sample that varied widely in age and even marital duration at the start of the study, personality traits were important correlates of how happy individuals were in their relationship at a given point in time, with more satisfied individuals showing higher levels of Conscientiousness, Openness, emotional stability, and Agreeableness.

Second, we hypothesized that the initial levels of BFM traits would be associated with changes in relationship satisfaction over time (i.e., slopes of marital satisfaction). The results for our second hypothesis were somewhat contrary to predictions based on previous literature. We found a significant effect of Neuroticism on change in satisfaction, although this only appeared in the covariates model and should be interpreted with caution; there was no effect for Openness on change in satisfaction. The one significant finding, for Conscientiousness, was in the opposite direction than hypothesized. Specifically, higher initial levels of Conscientiousness were associated with steeper *declines* in marital satisfaction over time. This is contrary to other findings that suggest higher Conscientiousness is beneficial for relationship quality (e.g., Heller et al., 2004). We speculated that this finding may have something to do with intra-sample differences in age or cohort. Indeed, in an exploratory manner, we performed additional analyses using subsamples split on age and level of Conscientiousness and found that satisfaction only decreased in younger adults who were higher on Conscientiousness. It is possible this finding reflects either age or generational differences in how Conscientiousness plays out in perceptions of one's partner and the quality of the relationship. Indeed, the impact of personality traits on subsequent changes in relationship quality may depend on the length of the relationship, the age of the partners, or the context (e.g., year and country) from which participants are sampled. For example, researchers have found that Openness either leads to decreases in satisfaction (Solomon & Jackson, 2014) or buffers against declines (Lavner et al., 2018). Certainly, our finding will need to be replicated in future work.

Finally, we hypothesized that changes in BFM traits would covary significantly with changes in marital

satisfaction over time. The results demonstrated that growth in Conscientiousness was related to increasing marital satisfaction over time, whereas increasing Neuroticism was related to decreasing slopes of marital satisfaction. This suggests that regardless of where an individual “started” on Conscientiousness or Neuroticism at the beginning of the study, *change* in these constructs was also relevant to the course of marital satisfaction. As predicted, Neuroticism was detrimental for the trajectory of marital satisfaction; in contrast to the finding described above, increasing levels of Conscientiousness were beneficial for satisfaction levels over time. Importantly, these results were independent of any gender or age effects as they were included as covariates in final models. Neuroticism, a prominent component of both personality pathology (American Psychiatric Association [APA], 2013; Samuel & Widiger, 2008) and common forms of clinical disorders (Ormel et al., 2013), is therefore central to the quality of one of the most important social relationships in a person's life. It may be that individuals with high levels of Neuroticism engage in behaviors that lead to reduced marital quality (e.g., self-defeating statements, disinterest in shared activities; Donnellan, Assad, Robins, & Conger, 2007), and that this decline in marital quality increases the prevalence of self-defeating thoughts, feelings, and behaviors characteristic of Neuroticism (Costa & McCrae, 1992; Robins et al., 2002). Given the significant slope covariances in this study, this bidirectional interplay of the two may even play out over the life course, leading to a “spiral down” effect. This cyclical effect is consistent with the VSA model of marriage (Karney & Bradbury, 1995), whereby enduring vulnerabilities impact marital interactions, which leads to a change in satisfaction. Furthermore, the slope covariance implies a possible additional path in the VSA, from satisfaction back to enduring vulnerabilities (e.g., personality).

The current study is not without limitations. Although the leverage that the current sample provides in terms of both the sample size and follow-up length of the assessments benefitted the current study, the longer period between follow-up assessments (nine years) may have precluded the examination of short-term dynamics between BFM traits and marital satisfaction. Importantly, estimates in LGCMs increase in precision as the number of assessment occasions increases (Willett, 1989). In the current sample, although the study period was sufficiently long enough to allow for change processes to take place, only three time points were available (the minimum needed to estimate a LGCM) which may contribute to less precise estimates. Also, time points were spaced nine years apart in the current study, which may have precluded the examination of more short-term correlational dynamics in marital satisfaction and personality. Finally, previous literature has suggested that self-reports and spouse reports both have incremental utility for predicting relationship outcomes

(e.g., South, Turkheimer, & Oltmanns, 2008). Thus, a fruitful area for further research is investigating longitudinal change processes in BFM traits and marital satisfaction using reports from both members of a couple.

In sum, the current study demonstrated the results for dynamic change processes in marital satisfaction as they relate to personality traits using a large sample of adults (primarily in midlife) assessed over a lengthy follow-up period. The results demonstrated that positive change occurred in marital satisfaction and the personality trait of Conscientiousness, while other domains of personality decreased over midlife. Higher levels of Conscientiousness at the start of the study may have negatively impacted satisfaction over time, although increases in Conscientiousness over the study period were related to increasing satisfaction. Neuroticism was consistently negatively associated with satisfaction, both initially and over time, which represents a longitudinal extension of previous cross-sectional work. Overall, the results support the utility of longitudinal designs for studying change processes within marital relationships.

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ENDNOTES

¹Of these 1,965 individuals, participants were missing various amounts of data on all study variables (see Supplemental Table 1). Full information maximum likelihood was used to account for these missing data, although LGC models in Mplus can only use participants who have data available for at least one variable at one time point. Final *N*s for all LGC models are listed in Tables 2 and 3.

²Individuals were determined to be in the same marital relationship at waves subsequent to Wave 1 if they: (a) listed their relationship status as married and (b) endorsed the same number of total marriages.

³*T* tests revealed that those who remained married to the same individual over the 18-year study period were more likely to have higher

education levels ($t(1,407.75) = -8.47, p = 0.000$) and higher scores on conscientiousness ($t(1,919) = -2.07, p = 0.04$) compared to those who were widowed, divorced, remarried, or attrited by wave 3.

⁴Missingness, ranges, and reliabilities are in Supplemental Table 1.

⁵Significant heterogeneity in individual rates of change (i.e., slopes) is usually a precondition for moving on to parallel process models. In response to a request from an anonymous reviewer, the models with Extraversion and Agreeableness were run in a parallel process framework and are reported in supplemental materials but are not discussed in the text.

⁶We searched for variables that might explain this somewhat counterintuitive result. Age was chosen based on evidence that (a) conscientiousness increases with age (Roberts & DelVecchio, 2000) and (b) marital satisfaction decreases in newlyweds, who are typically younger (Kurdek, 1999), but may increase in midlife (Gorchoff et al., 2008). Two median splits were performed on the sample, by age and conscientiousness, resulting in four groups: older/high conscientiousness, older/low conscientiousness, younger/high conscientiousness, and younger/low conscientiousness. We ran unconditional models for satisfaction, as described in the analysis section, separately in each group. Results showed only younger, highly conscientious individuals decreased in marital satisfaction over time. Older individuals who were lower in conscientiousness *increased* most steeply in satisfaction over time. The trajectory of marital satisfaction was slightly positive for younger, low conscientiousness and older, low conscientiousness individuals. Full results for these analyses are available in supplementary materials.

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SUPPORTING INFORMATION

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