



Within-Person Associations Between Subjective Well-Being and Big Five Personality Traits

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Abstract

This study examined the temporal within-person associations between subjective well-being (life satisfaction, positive affect, low negative affect) and the Big Five personality traits (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism). A representative American sample was used, collected over a period of approximately two decades and at 3 time points. To separate between-person and within-person levels, the random-intercept cross-lagged panel model was used. Results at the within-person level showed that higher-than-usual levels of subjective well-being were associated with higher-than-usual levels of extraversion, conscientiousness, and openness after about a decade. Higher-than-usual levels of openness were associated with higher-than-usual future levels of subjective well-being. Whereas neuroticism was the strongest correlate of subjective well-being at the between-person level, it had no association with subjective well-being at the within-person level. The results illustrate the importance of distinguishing within and between levels when examining associations between personality traits and well-being.

Keywords Subjective well-being · Big five · Personality traits · Within-person · Temporal · Longitudinal · MIDUS

Subjective well-being (SWB) is the hedonic aspect of mental well-being and consists of general life satisfaction, positive affect, and low negative affect (Diener et al., 2018). Together, these components reflect the individual's overall subjective evaluation of his or her life. A widely accepted view is that SWB is partly determined by personality traits. Personality traits are representative of a person's distinct cognitive, affective, and behavioral tendencies. These traits convey a sense of consistency and permanence over time (Diener & Lucas, 2023). For example, a person high in a trait such as openness is predicted to be curious in a variety of contexts and across time. The five-factor model of personality traits (McCrae & Costa, 1987) is considered the most commonly used system for classifying

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personality traits. This model proposes five fundamental traits: extraversion, neuroticism, openness to experience, conscientiousness, and agreeableness. Meta-analyses by Anglim et al. (2020), DeNeve and Cooper (1998), and Steel et al. (2008) have consistently concluded that the Big Five personality traits are linked to SWB. In particular, neuroticism and extraversion have the strongest associations with SWB, while agreeableness and conscientiousness have weaker associations. Openness to experience, on the other hand, is weakly or not at all associated with SWB and is generally not considered a robust predictor. These findings provide valuable insights into the cross-sectional links between personality and SWB, although they do not tell us much about the longitudinal associations between these variables and the direction of these associations.

Researchers are accustomed to interpreting cross-sectional correlations as evidence that personality predicts SWB rather than the other way around. Of course, personality structure and traits are critical to understanding how a person perceives, experiences, and lives his or her life, and thus affect his or her overall well-being (Lucas, 2018). However, studies suggest that long-term changes in behaviors, lifestyles, and perceptions can also lead to changes in personality traits (e.g., Joshanloo, 2022a, b). Is there evidence to support the possibility that personality changes in response to changes in SWB? To answer this question, we must turn to longitudinal studies.

1 Longitudinal Studies

Over the years, a number of studies have also examined the longitudinal associations between the Big Five traits and SWB. Of particular interest are those studies that have distinguished between within-person and between-person associations. Between-person associations are atemporal, meaning that they indicate that higher scores on one variable occur concurrently with higher scores on the other variable. A temporal within-person association, on the other hand, means that changes in one variable are associated with subsequent changes in the other variable. By focusing on within-person associations between personality traits and SWB, researchers can gain a more detailed understanding of the nature of the relationship between variables and go beyond findings from cross-sectional studies. For example, by disentangling the within-person and between-person levels, researchers can identify the directionality of the relationship between variables from the purely within-person estimates.

Some previous studies have taken a within-person approach. Specht et al. (2012) found that changes in life satisfaction were negatively associated with changes in neuroticism and positively associated with changes in the other four traits. Soto (2015) found that desirable changes in all personality traits were associated with desirable changes in life satisfaction and positive and negative affect. However, changes in openness were associated only with changes in positive affect. Kandler et al. (2015) found that changes in affect balance were associated with changes in neuroticism, extraversion, and conscientiousness, but not with changes in openness and agreeableness. These studies separated within-person changes from baseline levels of the variables, but because of the statistical method used (i.e., latent growth curve modeling), the directionality of within-person associations was not clarified. In a study that partitioned variance into within-person and between-person levels to examine the directionality of within-person associations, Fetvadjev and He (2019) found significant mutual within-person associations between all traits and SWB. Openness showed the weakest reciprocal associations with SWB. Another two-wave study examining personality

as the predictor of life satisfaction found that changes in neuroticism, extraversion, conscientiousness, and agreeableness preceded changes in life satisfaction in the expected directions (Magee et al., 2013). One study with a lag of 4–5 years between assessments focused on neuroticism and life satisfaction and found that increased neuroticism predicted decreased life satisfaction, but not vice versa (Schunk & Trommsdorff, 2022).

The studies reviewed suggest that changes in personality traits are associated with subsequent changes in the dimensions of SWB and vice versa. These studies are admittedly sparse with mixed results, but they do show that SWB may serve as a predictor of future personality change, challenging the conventional interpretation of cross-sectional correlations that only personality precedes well-being. Extraversion and neuroticism tend to be more consistently associated with changes in SWB across studies, whereas the association between changes in openness and SWB is weaker in general and more mixed. These findings underscore the importance of a temporal within-person approach that accounts for individuals' unique variability over time to advance our understanding of the complex interplay between personality and SWB. However, despite their potential, these studies are scarce, and further research is needed to draw more definitive conclusions and expand our knowledge on this topic.

2 The Present Study

The present study sought to further investigate the temporal within-person associations between the Big Five traits and SWB. This study benefits from a large data set collected at three time points over a period of approximately two decades, and therefore can provide fresh insight into long-term within-person relationships between these variables. The random intercept cross-lagged panel model (RI-CLPM; Hamaker et al., 2015) was used to disentangle the between-person and within-person sources of variation. With this method, it is possible to determine the direction of within-person associations, which is the main goal of this study. Defining change as deviations from the typical level of a variable for a certain person, the RI-CLPM can answer the question of whether a change in one variable is associated with a future change in another variable.

Previous longitudinal research has typically used latent growth models to examine the relationships between personality traits and subjective well-being. This method does not provide much information about the directionality of the associations. The RI-CLPM offers a unique perspective on the direction of the within-person links between variables. In this area of research, only one previous study by Fetvadjev and He (2019) has used the RI-CLPM with a Dutch sample spanning five time points across eight years. The current study extends this line of research by using an American dataset with longer lags between assessments. This allows for new insights into the long-term mutual associations between personality traits and SWB. This long-term approach is particularly relevant given the considerable stability of both subjective well-being and personality traits over time (Anusic & Schimmack, 2016; Hudson et al., 2017). Therefore, this study sought to provide a significant contribution to the literature on this topic, with implications for understanding the dynamic interactions between variables over longer periods. Specifically, the study aims to investigate whether within-person changes in SWB are linked to within-person changes in the Big Five traits after about a decade, and whether changes in the Big Five traits are associated with future changes in SWB.

The above review of longitudinal studies suggests that SWB is likely to be both predicted by and predictive of all five personality traits. Moreover, the paucity of within-person studies and the unprecedented length of the lag in the present study preclude the formulation of specific hypotheses. Therefore, this study is essentially exploratory in nature and aims to examine all possible between-person and within-person associations between variables.

3 Methods

3.1 Participants

The data utilized in this study were sourced from the Midlife in the United States (MIDUS) project (midus.wisc.edu). The study has been conducted by an interdisciplinary team of researchers with backgrounds in psychology, sociology, epidemiology, demography, anthropology, medicine, and health policy. The primary goal of the project is to examine the relationship between health and well-being and behavioral, psychological, and social factors as people age in a representative sample of Americans. The study has been conducted in three waves from 1995 to 2014. The first wave took place between 1995 and 1996, followed by the second wave from 2004 to 2006, and the third wave from 2013 to 2014. The study recruited 7189 American adults in its first wave, making it a representative sample of the entire nation. Participants between the ages of 25 and 74 were invited to participate by telephone, resulting in a response rate of 70%, which is considered adequate for a nationwide study (Brim et al., 2004). The study protocol required participants to complete a 45-min telephone interview and a self-administered questionnaire, which typically took approximately two hours to complete (Ryff & Krueger, 2018).

This study used data from Wave 1 (mean age = 46.827, SD = 12.929, women = 52.5%), Wave 2 (mean age = 55.628, SD = 12.426, women = 53.7%), and Wave 3 (mean age = 63.696, SD = 11.344, women = 55.1%). Of the participants, 664 individuals (9.1%) were excluded from the analyses because they did not have data for SWB and personality variables in any of the survey waves. The final sample used in this study included 6464 individuals who had data for at least one variable during the period of the study (age at wave 1, mean = 46.833, SD = 12.926, women = 52.490%).

3.2 Analysis Codes

Mplus scripts are available at https://osf.io/68jsw/?view_only=bc6bce0cc7e24ea994ff5d4a56091e22.

3.3 Preregistration

The study and analysis were not preregistered.

3.3.1 Measures

3.3.1.1 Personality Traits The Midlife Development Inventory (MIDI) personality scale (Lachman & Weaver, 2005) was used to measure personality traits. Respondents were asked

to indicate how well 25 adjectives described them on a scale from 1 = *a lot* to 4 = *not at all*. The neuroticism scale has four items (e.g., worrying), the extraversion scale has five items (e.g., talkative), the openness scale has seven items (e.g., curious), the conscientiousness scale has four items (e.g., organized), and the agreeableness scale has five items (e.g., sympathetic).

3.3.1.2 Subjective Well-Being Respondents indicated how often they had six positive (e.g., cheerful) and six negative (e.g., nervous) affective experiences in the past 30 days, using a 5-point scale from 1 = *all the time* to 5 = *none of the time* (Joshanloo, 2017; Mroczek & Kolarz, 1998). Life satisfaction was assessed using five items on satisfaction with overall life, work, health, relationship with spouse/partner, and relationship with children. Each item was rated from 0 = *worst possible* to 10 = *best possible*.

Items were reverse scored when necessary, so that a higher score indicated a higher level of the variable. Internal consistencies are reported in Table S4.

3.4 Statistical Analysis

3.4.1 Model Estimation and Fit Evaluation

Descriptive information on the study variables is presented in Table S4. Based on the guidelines of Finney and DiStefano (2013), the variables exhibited moderate deviations from normality (skewness < 2, kurtosis < 7). To account for this, a robust Maximum Likelihood (MLR) estimator was used in Mplus version 8.8. Thresholds for adequate fit used in this study were a Comparative Fit Index (CFI) of 0.90, a Root Mean Square Error of Approximation (RMSEA) of 0.07, and a Standard Root Mean Square Residual (SRMR) of 0.08 (e.g., Kline, 2015). Considering that the satisfaction and affect scales used in this project have considerable shared variance and can be well represented with a single latent variable (Gallagher et al., 2009; Joshanloo, 2019), SWB was modeled as one latent variable in this study rather than three separate variables. Studies have established that a first-order latent-variable model is a reliable conceptualization for the tripartite structure of SWB (e.g., Metler & Busseri, 2015).

3.4.2 RI-CLPM

An RI-CLPM was tested for each personality trait. The five personality traits were included as observed variables, while SWB was included as a first-order latent variable indicated by life satisfaction, positive affect, and negative affect. Baseline age and gender were included as time-invariant covariates of all observed personality variables and the latent factors of SWB across waves. The auto-regressive and cross-lagged effects were constrained to equality over time. A sample RI-CLPM is shown in Fig. 1.

3.4.3 Measurement Invariance

While traits were used as observed variables, SWB was modeled as a latent variable, enabling the examination of its temporal measurement invariance. Longitudinal measurement invariance is critical to ensure that the latent variables maintain the same meaning and statistical properties over time. Because the focus of the study is on regressive effects that concern only the covariance structure and not the mean structure, only metric (and not

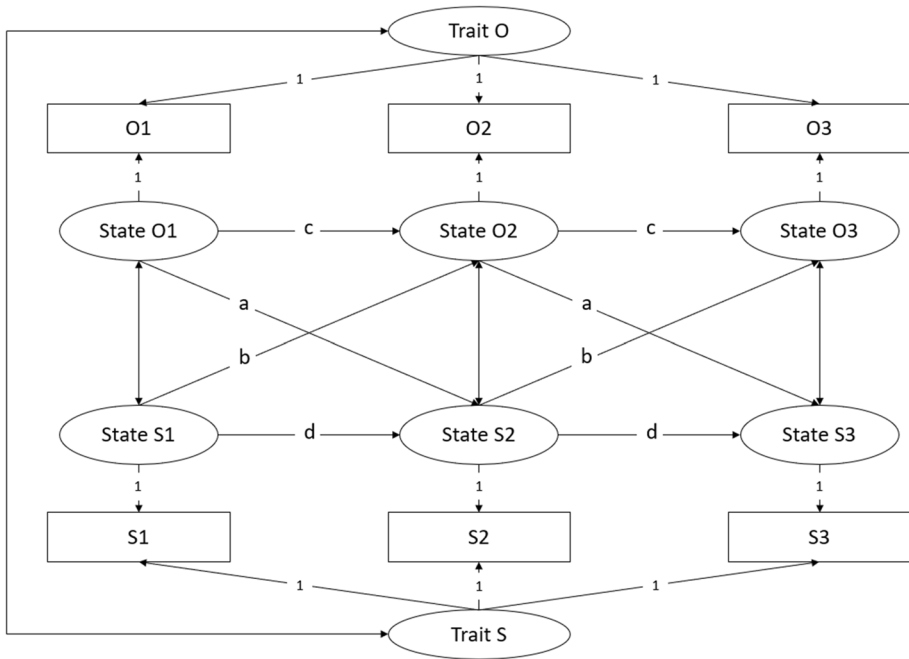


Fig. 1 The RI-CLPM for openness and subjective well-being across three waves *O* openness. *S* Subjective well-being. For simplicity, residual terms for state variables are not shown

scalar) invariance was tested in this study (Newsom, 2015). Metric invariance means that factor loadings do not change over time. The models with and without equality constraints on factor loadings are compared to determine whether or not the addition of longitudinal equality constraints on the loadings significantly worsens the fit. Metric invariance is supported if the fit of the non-constrained model and the model with equality constraints are similar.

3.4.4 Strategies for Addressing Missing Data and Attrition

Only participants who did not respond to any of the variables across all waves were excluded from this study. Thus, the study included individuals with incomplete data. This study used Full Information Maximum Likelihood (FIML) as the main strategy for handling missing data. This approach is preferred over some other methods because it can use all available data to estimate model parameters. This allows researchers to avoid excluding individuals with incomplete data, thereby increasing the statistical power of the analysis. Overall, FIML is considered a powerful tool for dealing with missing data in longitudinal studies (Geiser, 2020; Newsom, 2015). Of the included participants, some participated in all three waves, and some skipped at least one wave. The results of the t-tests (reported in the supplementary material Tables S1-S3) show that these two groups are significantly different on some of the study variables, with effect sizes ranging from 0.004 to 0.246. Although the effect sizes are not large, to account for the differences associated with missingness, a longitudinal missing data indicator was added to all models as an auxiliary

Table 1 Intercorrelations at Wave 1

	1	2	3	4	5	6	7	8
1. Neuroticism	–							
2. Extraversion	–.158	–						
3. Agreeableness	–.049	.528	–					
4. Conscientiousness	–.201	.275	.289	–				
5. Openness	–.166	.513	.343	.267	–			
6. Life satisfaction	–.355	.287	.203	.298	.155	–		
7. Positive affect	–.488	.369	.199	.239	.213	.552	–	
8. Negative affect	.547	–.205	–.051	–.214	–.116	–.490	–.629	–

All coefficients are significant at $p < .001$

Table 2 Fit indices

Model	χ^2	<i>df</i>	<i>p</i>	RMSEA [90% CI]	CFI	SRMR
Invariance (SWB)						
Configural	56.667	15	<0.001	0.021 [0.015–0.027]	0.997	0.024
Metric	66.957	19	<0.001	0.020 [0.015–0.025]	0.996	0.038
RI-CLPM						
Neuroticism	506.421	54	<0.001	0.036 [0.033–0.039]	0.980	0.044
Extraversion	467.056	54	<0.001	0.034 [0.032–0.037]	0.979	0.047
Agreeableness	460.142	54	<0.001	0.034 [0.031–0.037]	0.978	0.049
Conscientiousness	360.317	54	<0.001	0.030 [0.027–0.033]	0.983	0.048
Openness	309.201	54	<0.001	0.027 [0.024–0.030]	0.986	0.040

variable (a dummy variable with 0 = individuals with no missing wave and 1 = individuals with at least one missing wave). Missing data and attrition can introduce biases in statistical models. The auxiliary variables are not part of the main model, they are used in statistical models to reduce these biases in the estimation of parameters (Asparouhov & Muthén, 2008; Kline, 2015; Newsom, 2015).

4 Results

Table 1 shows the intercorrelations between all variables at Wave 1. A longitudinal confirmatory factor analysis model was tested with three indicators of SWB. As shown in Table 2 (the configural model), the model fitted the data well. Factor loadings were satisfactory, as shown in Table S5. To establish metric invariance, models with and without equality constraints on factor loadings are compared to determine whether or not the addition of longitudinal equality constraints on the loadings significantly worsens the fit. Metric invariance is supported if the fit of the non-constrained model and the model with equality constraints are similar. Equality constraints were imposed on the factor loadings over time. As shown in Table 2, the detriment in model fit was trivial (Δ RMSEA = -0.001 ; Δ CFI = -0.001), so metric invariance was supported. These factor-loading constraints were retained in the RI-CLPMs. Five RI-CLPMs were tested, one for each of the Big Five

traits. All five models fitted the data well (Table 2). The autoregressive effects between the state components are shown in Table 3. The autoregressive effects for the personality traits were all significant. The autoregressive effect for SWB was significant in the extraversion and conscientiousness models. Autoregressive effects capture the stability of deviations from the expected mean of a variable over time. A significant autoregressive effect indicates that a higher (or lower) than usual value is followed by a higher (or lower) than usual value of the same variable at the next time point.

The focus of the present study is on the cross-lagged effects, which reflect temporal within-person associations between variables. They are shown in Table 4. The cross-lagged effects of SWB on extraversion, conscientiousness, and openness were positive and significant. The cross-lagged effect of openness on SWB was also significant. A significant cross-lagged effect means that a higher (or lower) than typical level of one variable is associated with a higher (or lower) than typical level of the other variable at the next time point. Effect sizes related to the cross-lagged effects are medium or large (Orth et al., 2022). Within-person R^2 values are presented in Table 5.

Table 3 Auto-regressive coefficients

	Predictor	Outcome	Unstandardized coefficient	<i>p</i>	95% CI		Standardized coefficient
					Low	Up	
Neuroticism							
	N1	N2	0.115	0.003	0.039	0.191	0.132
	N2	N3					0.114
	SWB1	SWB2	0.139	0.197	-0.072	0.350	0.158
	SWB2	SWB3					0.145
Extraversion							
	E1	E2	0.144	0.001	0.058	0.230	0.131
	E2	E3					0.148
	SWB1	SWB2	0.224	0.026	0.027	0.422	0.242
	SWB2	SWB3					0.239
Agreeableness							
	A1	A2	0.134	0.001	0.053	0.216	0.129
	A2	A3					0.137
	SWB1	SWB2	0.173	0.101	-0.034	0.380	0.194
	SWB2	SWB3					0.181
Conscientiousness							
	C1	C2	0.168	<0.001	0.080	0.255	0.156
	C2	C3					0.164
	SWB1	SWB2	0.193	0.040	0.008	0.378	0.213
	SWB2	SWB3					0.204
Openness							
	O1	O2	0.225	<0.001	0.136	0.313	0.205
	O2	O3					0.226
	SWB1	SWB2	0.160	0.067	-0.011	0.332	0.179
	SWB2	SWB3					0.166

SWB Subjective well-being

Table 4 Cross-lagged coefficients

	Predictor	Outcome	Unstandardized coefficient	<i>p</i>	95% CI		Standardized coefficient
					Low	Up	
Neuroticism							
	SWB1	N2	-0.044	0.262	-0.120	0.033	-0.063
	SWB2	N3					-0.055
	N1	SWB2	-0.062	0.259	-0.170	0.046	-0.056
	N2	SWB3					-0.051
Extraversion							
	SWB1	E2	0.089	0.001	0.035	0.144	0.146
	SWB2	E3					0.140
	E1	SWB2	0.062	0.403	-0.084	0.208	0.037
	E2	SWB3					0.043
Agreeableness							
	SWB1	A2	0.039	0.101	-0.008	0.086	0.070
	SWB2	A3					0.064
	A1	SWB2	0.010	0.894	-0.133	0.152	0.006
	A2	SWB3					0.006
Conscientiousness							
	SWB1	C2	0.054	0.021	0.008	0.100	0.104
	SWB2	C3					0.093
	C1	SWB2	0.098	0.211	-0.055	0.250	0.052
	C2	SWB3					0.059
Openness							
	SWB1	O2	0.083	0.001	0.035	0.132	0.140
	SWB2	O3					0.126
	O1	SWB2	0.242	0.001	0.095	0.388	0.146
	O2	SWB3					0.166

SWB Subjective well-being

Table 5 R² values, between-person correlations, and within-person correlations

Model	R ²				Between-person correlation with SWB	Within-person correlations with SWB		
	SWB		Personality			W1	W2	W3
	W2	W3	W2	W3				
Neuroticism	0.037	0.031	0.030	0.022	-0.720	-0.513	-0.463	-0.404
Extraversion	0.066	0.069	0.052	0.062	0.449	0.342	0.474	0.353
Agreeableness	0.038	0.033	0.025	0.027	0.243	0.183	0.224	0.163
Conscientiousness	0.052	0.053	0.041	0.045	0.436	0.188	0.289	0.260
Openness	0.067	0.080	0.077	0.093	0.200	0.268	0.408	0.286

SWB Subjective well-being. W wave. R² values are only reported for the structural part of the RI-CLPMs. Between-person and within-person correlations in the table are standardized covariances, all significant at *p* < .001. Within-person correlations are concurrent correlations between state components of SWB and Big Five within each wave. Between-person correlations are between the trait components of SWB and the Big Five

Apart from the temporal (lagged) associations reported above, there are two types of non-temporal associations between personality traits and SWB: between-person correlations and synchronous within-person correlations, presented in Table 5. Between-person correlations ranged from 0.200 (openness) to -0.720 (neuroticism). These correlations suggest that people who are generally high or low on one variable tend to be high or low on the other variable as well. Synchronous within-person correlations are also reported in Table 5. They are all significant. These correlations suggest that if a person is high or low in a variable at a certain time point, they also tend to be high or low on the other variable at the same time point. The non-temporal correlations exhibited a range of strengths from weak to strong (Sullivan & Feinn, 2012).

5 Discussion

This study sought to investigate the longitudinal associations between the Big Five traits and SWB using a large dataset collected at three time points over approximately two decades. The study utilized the RI-CLPM to disentangle between-person and within-person sources of variation and determine the direction of the temporal within-person associations.

5.1 Temporal Within-Person Associations

The results of this study provide new insights into the temporal within-person relationships between SWB and personality traits over the long term. It was found that an increase in SWB predicted future increases in extraversion, conscientiousness, and openness. Increases in openness predicted future increases in SWB. Thus, the temporal relationship between openness and SWB is reciprocal. Neuroticism and agreeableness showed no within-person temporal associations with SWB. The most surprising finding seems to be the absence of a within-person temporal relationship between neuroticism and SWB. This trait has been found to be a robust predictor of SWB in previous cross-sectional and longitudinal studies (Anglim et al., 2020; Womick & King, 2020). Yet, most of the previous longitudinal studies had shorter time intervals between assessment points. In two recent long-term studies using the RI-CLPM, neuroticism also showed no temporal within-person association with psychological and social well-being (Joshanloo, 2022a, b). An emerging insight from recent long-term within-person studies is that while neuroticism is related to baseline levels of well-being interpersonally, changes in neuroticism are not as related to future changes in well-being as previously thought. Changes in well-being are also not related to future changes in neuroticism. The between-person association between neuroticism and SWB reflects stable common genetic and environmental causes (Okbay et al., 2016; Pelt et al., 2022). Of most relevance to interventional studies would be that neuroticism and aspects of well-being do not seem to interact intra-individually/temporally, at least over the long term.

Another finding worth highlighting is that openness was the only trait with a reciprocal interpersonal relationship with SWB, making this trait a key player in the temporal interplay between personality and SWB. Openness tends to have the weakest correlations with SWB compared to the other traits in cross-sectional studies (Anglim et al., 2020; Womick & King, 2020). The longitudinal relationship between openness and SWB also varies across studies. While openness had a mutual within-person association with psychological well-being (Joshanloo, 2022b), it was not related to social well-being at the within-person level (Joshanloo, 2022a). Openness is related to having more new experiences and more

intense emotional reactions, both positive and negative (Diener, 1998). This may explain why it is weakly associated with SWB in cross-sectional studies. The present study contributes the supplementary insight that although having an open mind and potentially diverse new experiences are not associated with current SWB, they have a positive long-term effect on future SWB. These results are consistent with the broaden-and-build theory of positive emotions (Fredrickson, 2004). This theory states that positive emotions expand a person's awareness and encourage new, exploratory thoughts and actions. Over time, an expanded behavioral repertoire contributes to the building of new psychological resources and skills. Openness also leads to increased positivity over time (Fredrickson, 2008). In any case, a long-term and within-person approach reveals that openness should no longer be dismissed as irrelevant to SWB. The results are also consistent with the predictions of the cybernetic Big Five theory (DeYoung, 2015). This theory states that openness, along with extraversion, forms a meta-trait of plasticity or exploration that is a crucial prerequisite for being human and facilitates the assimilation of new information as the internal and external situation changes. From this perspective, the long-term adaptive value of openness is evident.

In addition to openness, changes in SWB preceded future changes in extraversion and conscientiousness at the within-person level. Extraversion and conscientiousness have been shown to be robust predictors of SWB in cross-sectional and many longitudinal studies (Anglim et al., 2020; Womick & King, 2020), but we learn that SWB exerts an influence on these traits at the within-person level and not vice versa. As Soto (2015) pointed out, these results "challenge the common assumption that associations of personality traits with SWB are entirely, or almost entirely, due to trait influences on well-being. They support the alternative hypothesis that personality traits and well-being aspects reciprocally influence each other over time" (p. 45). Indeed, the current results suggest that SWB is more predictive of future changes in personality traits than personality traits are of future changes in SWB, at least in the long run.

Why would an increase in SWB lead to a change in traits toward maturity? Although an obsession with hedonistic values in life is not conducive to well-being (Joshani, 2021), the wealth of available empirical evidence suggests that the experience of life satisfaction and a positive affect balance contributes to future positive outcomes. For example, a meta-analysis of longitudinal and experimental studies has shown that SWB is associated with desirable outcomes in friendship, income, job performance, and health domains (Lyubomirsky et al., 2005). These positive changes in various areas of life are associated with and reflect a successful social life that includes the fulfillment of age-appropriate social roles and responsibilities. It is the fulfillment of these role experiences that leads to changes in personality traits over time (Roberts et al., 2006). Therefore, by contributing to a more successful social life, SWB may contribute to future changes in personality traits.

5.2 Between-Person and Synchronous Associations

This study focused on the temporal (lagged) associations between personality traits and subjective well-being (SWB) to shed light on the direction of the links between variables. Yet, significant non-temporal associations were also observed. Specifically, two types of non-temporal associations are revealed in the RI-CLPM: between-person correlations and synchronous within-person correlations. The between-person correlations observed in this study are consistent with typical patterns observed in cross-sectional studies (Anglim et al., 2020), suggesting that individuals who consistently show high or low levels of a trait tend to show high or low levels of SWB throughout the study. These correlations suggest that

personality traits and SWB are related in a general sense, and that individuals who experience high or low SWB also tend to exhibit certain personality traits. In addition, the synchronous within-person correlations observed in this study suggest that if an individual is experiencing high or low levels of one variable (relative to their set point) at a given point in time, he or she will tend to experience correspondingly high or low levels of the other variable at the same point in time.

These correlations are non-temporal, and do not reflect directionality. The between-person correlations are most likely caused by stable genetic or environmental factors that affect both personality and well-being. The synchronous state correlations are also most likely caused by situational factors that affect both personality and well-being within each assessment time (Røysamb & Nes, 2018; Steyer et al., 1999). Overall, these findings suggest that personality traits and SWB are related both in a non-temporal and temporal sense. Understanding the complex relationship between these traits and SWB requires consideration of both types of associations along with cross-lagged relationships.

5.3 Limitations and Future Directions

Several limitations should be considered. First, the personality scales used in the MIDUS project are brief and do not provide an in-depth assessment of facets of personality traits. Research has shown that different facets of a trait may have unique relationships with SWB (Sun et al., 2018), suggesting that a more in-depth assessment of personality may be needed for a comprehensive understanding of the relationship between personality and SWB. Second, the stability of personality traits and well-being dimensions varies across the lifespan (Bleidorn et al., 2022; Joshanloo, 2023), which may influence within-person dynamics. Because the MIDUS sample is largely composed of older adults, the results may not be representative of younger adults, who may exhibit greater instability in personality traits and dimensions of well-being and different dynamics. Therefore, future studies should aim to replicate these findings in younger age groups to determine the generalizability of the results. Although within-person longitudinal techniques are more appropriate than between-person techniques for examining the direction of the relationship between two variables, it is important to note that they do not provide a definitive answer to the question of causality. The present study is observational and non-interventional, which means that it is impossible to establish causality between personality traits and SWB with certainty. The lagged effects found in the present study may to some extent reflect the influence of unmeasured extraneous variables. Thus, one should be cautious in drawing definitive conclusions about causality from these findings.

The time interval between assessments in this study was long, so the results provide unprecedented insight into the long-term relationships between these variables. This is particularly important in applied and policy contexts, where understanding interactions between variables over the long term might be of interest. However, it is important to recognize that studies with shorter time intervals can also provide important insights into the relationship between variables. The influence of lag length on the estimated effects has been documented in the literature. Shorter time intervals may lead to different effects than longer time intervals, and this is an important consideration when interpreting findings (Dormann & Griffin, 2015). For example, using a much shorter time interval, Fetvadjev and He (2019) found significant within-person associations between SWB and all personality traits in both directions. The present study provides additional insight into the interaction between SWB and personality traits by showing that the within-person temporal

effects decay to zero with longer lags for some trait-SWB combinations, but not for others. In summary, the longer time interval used in this study allowed for a more in-depth examination of long-term relationships between variables. Future research would benefit from examining different time intervals until a more complete understanding of the relationships between variables as a function of time emerges.

The objective of this study was to shed light on the basic temporal relationships between traits and SWB. Accordingly, this study only focused on personality traits and subjective well-being as the main variables of interest, without taking into account other potential factors that could influence these variables or their relationships. For instance, changes in the individual's context, health status, or life events could play a significant role in shaping personality and well-being outcomes. Investigating factors that accelerate change in well-being and personality, or moderate or mediate the associations between them, is a complex and challenging task, and falls beyond the scope of this study. However, future research must further our understanding of the underlying mechanisms that drive the observed relationships. In this regard, future studies should adopt a more comprehensive approach, by including a broader range of variables that may contribute to changes in personality and subjective well-being and their interactions. For instance, examining the role of physical health, aging perceptions, social support, coping strategies, resilience, and cultural factors in shaping personality and well-being outcomes could provide a more nuanced understanding of the complex interplay between these variables.

6 Conclusion

The study provided new insights into the long-term, within-person relationships between SWB and personality traits by disentangling the sources of variation between and within individuals. Overall, the study challenges the widespread assumption in cross-sectional studies that the associations between personality traits and SWB are solely due to trait influences on well-being. Instead, the results support the alternative notion that personality traits and aspects of well-being influence each other over time. The study showed that openness should no longer be dismissed as irrelevant to SWB, as it has a positive long-term effect on future SWB. Finally, the study highlights that experiencing life satisfaction and positive affect balance contributes to positive personality development, underscoring the importance of enhancing SWB. There is a need for further research to explore the underlying mechanisms that drive these relationships and the potential moderators and mediators that shape them.

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Data Availability All data and study materials are publicly available. More information can be found at <http://midus.wisc.edu/data/index.php>.

Declarations

Conflict of interest The authors report there are no competing interests to declare.

Informed Consent Informed consent was obtained from all participants.

Ethical Approval MIDUS data collection is reviewed and approved by the Education and Social/Behavioral Sciences and the Health Sciences IRBs at the University of Wisconsin-Madison. For more information see <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4280664>.

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