Is Happiness Good for Your Personality? Concurrent and Prospective

Relations of the Big Five with Subjective Well-Being

Christopher J. Soto

Colby College

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Abstract

Objective: The present research examined longitudinal relations of the Big Five personality traits with three core aspects of subjective well-being: life satisfaction, positive affect, and negative affect. **Method:** Latent growth models and autoregressive models were used to analyze data from a large, nationally representative sample of 16,367 Australian residents. **Results:** Concurrent and change correlations indicated that higher levels of subjective well-being were associated with higher levels of Extraversion, Agreeableness, and Conscientiousness, and with lower levels of Neuroticism. Moreover, personality traits prospectively predicted change in well-being, and well-being levels prospectively predicted personality change. Specifically, prospective trait effects indicated that individuals who were initially extraverted, agreeable, conscientious, and emotionally stable subsequently increased in well-being. Prospective well-being effects indicated that individuals with high initial levels of well-being subsequently became more agreeable, conscientious, emotionally stable, and introverted. **Conclusions:** These findings challenge the common assumption that associations of personality traits with subjective well-being 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.

Keywords: Big Five, Five-Factor Model, personality development, subjective well-being

Is Happiness Good for Your Personality? Concurrent and Prospective Relations of the Big Five with Subjective Well-Being

People with different personality traits tend to experience different degrees of subjective well-being. Specifically, in terms of the Big Five trait dimensions—Extraversion, Agreeableness, Conscientiousness, Neuroticism (vs. Emotional Stability), and Openness to Experience—individuals who are more extraverted, agreeable, conscientious, and emotionally stable tend to experience greater satisfaction with life, more frequent positive affect, and less frequent negative affect (DeNeve & Cooper, 1998; Steel, Schmidt, & Shultz, 2008). Do such associations between personality traits and well-being aspects indicate that traits influence subjective well-being, that well-being influences traits, or both? The present research was conducted to test these possibilities by examining concurrent and prospective relations of the Big Five with life satisfaction, positive affect, and negative affect, using longitudinal data from a large, nationally representative sample.

Why Might Personality Traits Influence Subjective Well-Being?

Personality traits might influence subjective well-being directly or indirectly. For example, highly extraverted individuals tend to experience higher baseline levels of positive affect, and have stronger affective responses to positive events, than do their introverted peers; similarly, highly neurotic individuals tend to experience more chronic negative affect, and have especially intense reactions to negative events (Bolger & Schilling, 1991; Gross, Sutton, & Ketelaar, 1998; Headey & Wearing, 1989; Luhmann & Eid, 2009). These direct effects of personality traits on positive and negative affect may help explain why extraverted and emotionally stable individuals generally experience greater well-being.

Personality traits may also influence subjective well-being indirectly, by way of behaviors and their resulting outcomes. For example, compared with their disagreeable peers, highly agreeable individuals tend to engage in more prosocial behaviors, such as cooperating with others, expressing compassion and support for others, and treating others with politeness and respect (Graziano & Tobin, 2009). Perhaps as a result, agreeable individuals tend to be better liked by their peers (Jensen-Campbell et al., 2002; Newcomb, Bukowski, & Pattee, 1993) and more successful in establishing stable and satisfying close relationships (Karney & Bradbury, 1995; Robins, Caspi, & Moffitt, 2002). These positive social outcomes may then bolster agreeable individuals' subjective well-being. Similarly, highly conscientious individuals tend to perform tasks efficiently, thoroughly, and reliably, which leads to success in school and the workplace (Barrick, Mount, & Judge, 2001; Berry, Ones, & Sackett, 2007; Noftle & Robins, 2007). Such success brings material (e.g., income) and psychological (e.g., sense of purpose) rewards, both of which may contribute to the positive association between conscientiousness and subjective well-being.

Why Might Subjective Well-Being Influence Personality Traits?

There are also plausible reasons to suspect that sustained high or low levels of subjective well-being might influence people's personality traits. For example, suppose that an individual leads a life that consistently generates high levels of life satisfaction and positive affect. Being in a good mood typically leads to sociable, generous, and exploratory behavior (George & Brief, 1992; Isen, 1987; Fredrickson, 1998). Over time, a consistent pattern of such behavior may become integrated into the individual's self-concept and other psychological systems, thereby leading to enduring increases in Extraversion, Agreeableness, and Openness to Experience. Conversely, life circumstances that consistently produce negative emotions may lead an

individual to internalize this unpleasant affect, as well as the pattern of socially withdrawn, self-focused, and cautious behavior that often accompanies negative moods (Loewenstein, Weber, Hsee, & Welch, 2001; Mor & Winquist, 2002; Rubin & Burgess, 2001). In terms of personality traits, this would manifest as an increase in Neuroticism, as well as decreases in Extraversion, Agreeableness, and Openness.

Subjective well-being may also influence personality traits by providing a psychological incentive for certain patterns of behavior. As discussed in the previous section, agreeable behavior generally increases the likelihood of social success, conscientious behavior promotes success in school and the workplace, and experiencing either kind of success can at least temporarily boost subjective well-being. The cycle need not end there: the individual's desire to maintain high well-being may motivate them to continue behaving agreeably and conscientiously in the future, leading to further success and well-being, and so on. If this positive feedback loop sustains itself over an extended period of time (e.g., through investment in an enduring close relationship or successful career; see Roberts & Wood, 2006), the individual may gradually internalize the behavioral pattern, thereby increasing their trait levels of Agreeableness and Conscientiousness.

Testing the Influences of Personality Traits and Subjective Well-Being

How can we determine whether personality traits influence subjective well-being, and whether well-being influences personality traits? Many previous studies have examined *concurrent correlations* between personality traits and well-being aspects: associations between trait and well-being measures administered at a single time point, or between stable trait and well-being levels estimated using information from multiple time points (DeNeve & Cooper, 1998; Steel et al., 2008). Some longitudinal studies have also reported *change correlations*:

associations of individual-level personality changes with changes in well-being (e.g., Boyce, Wood, & Powdthavee, 2013; Watson & Humrichouse, 2006). These studies have generally found positive concurrent and change correlations of subjective well-being with Extraversion, Agreeableness, and Conscientiousness, as well as negative correlations with Neuroticism.

Although concurrent and change correlations are often interpreted as evidence that personality traits influence well-being, such correlations are in fact perfectly ambiguous regarding causal direction. Finding a concurrent correlation between a trait and a well-being aspect establishes an empirical association, but does not indicate the causal source of that association: the trait, the well-being aspect, or a third variable. Similarly, finding a change correlation establishes that a trait and a well-being aspect tend to change in unison, but does not indicate whether changes in the trait lead to changes in well-being, or vice versa.

Stronger evidence of causal influence would come from testing prospective effects on change. For example, finding a prospective *trait effect*—that initial levels of a personality trait predict subsequent changes in subjective well-being—would suggest that the personality trait led to change in well-being, because the reverse causal pathway (from the later change in well-being to the earlier trait level) is chronologically impossible. Similarly, finding a prospective *well-being effect*—that initial levels of subjective well-being predict subsequent changes in personality traits—would suggest that well-being led to personality change.

A pair of longitudinal studies have examined whether levels of Extraversion and Neuroticism predict change in positive and negative affect over time (Charles, Reynolds, & Gatz, 2001; Griffin, Mroczek, & Spiro, 2006). Both studies found that highly neurotic individuals tend to increase in negative affect, relative to their emotionally stable peers, and one study (Charles et al., 2001) also found that highly extraverted individuals tend to show relative increases in

positive affect. These findings support the hypothesis that personality traits influence affective well-being. However, neither study tested for well-being effects on personality change.

Helping to address this asymmetry, a recent study used personality and life satisfaction data from the German Socio-Economic Panel (SOEP; see Haisken-Denew & Frick, 2005) to estimate both trait and well-being effects (Specht, Egloff, & Schmulke, 2013). Unexpectedly, this study found more evidence for life-satisfaction effects on personality change than for trait effects on change in life satisfaction. Specifically, individuals with higher stable levels of life satisfaction tended to become more agreeable, conscientious, and emotionally stable over time, relative to their dissatisfied peers. Conversely, there was only one significant trait effect: individuals with higher stable levels of Agreeableness tended to become relatively more satisfied over time. Unlike in Charles et al. (2001) and Griffin et al. (2006), neither Extraversion nor Neuroticism levels predicted change in well-being.

Taken together, these three studies suggest that personality traits influence change in subjective well-being (Charles et al., 2001; Griffin et al., 2006) and, surprisingly, that well-being may have an even stronger influence on personality change (Specht et al.., 2013). However, integrating their results is complicated by three issues. First, only one study tested for well-being effects (Specht et al., 2013). Second, each study found a different pattern of trait effects, and only one study assessed all of the Big Five traits (Specht et al., 2013). Third, different studies assessed different aspects of subjective well-being: two examined only positive and negative affect (Charles et al., 2001; Griffin et al., 2006), whereas the third examined only life satisfaction (Specht et al., 2013). Thus, the provocative—but incomplete and inconsistent—pattern of results from these studies highlights the need for longitudinal research that (a) assesses all of the Big Five personality traits, (b) assesses all three core aspects of subjective well-being: life

satisfaction, positive affect, and negative affect, and (c) tests for both trait and well-being effects. To our knowledge, no previous study has fulfilled all three of these design criteria.

Overview of the Present Research

The present research was conducted to test hypotheses about concurrent and prospective relations of personality traits with subjective well-being. We did this using longitudinal data from a large, nationally representative sample of Australians who completed measures of the Big Five personality traits, life satisfaction, positive affect, and negative affect during the 2005 through 2009 waves of the Household Income and Labour Dynamics in Australia Survey (HILDA; see Summerfield et al., 2012).

This design and sample allow us to test for all four types of relations between personality traits and subjective well-being described above—concurrent correlations, change correlations, prospective trait effects, and prospective well-being effects—with a high degree of statistical precision. Consistent with previous research, we expected to find that more-extraverted, agreeable, conscientious, and emotionally stable individuals would tend to experience higher levels of subjective well-being, and that changes on these traits would correlate with changes in well-being (cf. Boyce et al., 2013; DeNeve & Cooper, 1998; Steel et al., 2008; Watson & Humrichouse, 2006). As for the prospective trait and well-being effects, we suspected that they would generally parallel the concurrent and change correlations, and that trait effects on change in well-being might be stronger than well-being effects on personality change. However, as reviewed above, results from the few previous studies testing for such effects have been inconsistent, and raise the possibility that well-being effects may be as strong as, or even stronger than, trait effects (Charles et al., 2001; Griffin et al., 2006; Specht et al., 2013).

Method

Participants and Procedure

Participants were 16,367 Australian residents who provided data in at least one wave of the Household Income and Labour Dynamics in Australia Survey (HILDA; see Summerfield et al., 2012) between 2005 and 2009.[1] These participants were selected using multistage probability sampling to constitute a nationally representative sample, and were assessed annually using questionnaire and interview measures. On average, they participated in 3.94 waves (78.80% participation rate), and most (60.1%) participated in all five waves. Age at initial time of participation ranged from 15 to 93 years old ($M = 40.39$, $SD = 18.88$), and 52.07% were female.[2]

Measures

Big Five Mini-Makers. The Big Five personality traits were assessed in 2005 and 2009, using a total of 35 questionnaire items from the Big Five Mini-Markers (Saucier, 1994). Each Mini-Marker item is a trait-descriptive adjective (e.g., "talkative," "shy"), which participants rated on a seven-point scale (1 = *does not describe me at all*, 7 = *describes me very well*). In the 2005 assessment wave, the scales' alpha reliabilities were .77 for Extraversion (8 items), .77 for Agreeableness (7 items), .79 for Conscientiousness (7 items), .79 for Neuroticism, and .73 for

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[1] A previous study used HILDA data to examine concurrent associations between the Big Five and life satisfaction (Boyce et al., 2013). However, this study did not examine prospective trait and well-being effects, nor did it examine positive and negative affect.

[2] We conducted exploratory analyses to test whether longitudinal relations between the Big Five and subjective well-being differed by age. Specifically, we fit multi-group models with age groups corresponding to early adulthood (ages 16 to 35), middle age (ages 36 to 65), and late adulthood (ages 65 and over). We found that constraining concurrent and prospective effects to be equal these across age groups had only trivial effects on model fit (absolute $\Delta CFI \leq .002$, $\Delta TLI \leq .003$, $\Delta RMSEA \leq .002$). Moreover, allowing these effects to be freely estimated in each age group resulted in patterns of effects that were similar to those estimated in the full sample; no effects were significant in opposite directions in a particular age group versus in the full sample. Thus, longitudinal relations between the Big Five and subjective well-being appear to be reasonably consistent across the lifespan.

Openness to Experience (6 items).[3] Absolute cross-sectional correlations between the Big Five

ranged from .05 to .46, with a mean of .23.[4] To fit latent variable models, the items on each Big

Five scale were assigned to three parcels.

Subjective well-being. Life satisfaction was assessed annually, using eight interview

items. For each item, participants rated their degree of satisfaction with an aspect of life (e.g.,

"your financial situation," "your health", "all things considered") on an 11-point scale (0 =

lowest possible satisfaction, 10 = *highest possible satisfaction*). In 2005, this scale's alpha

reliability was .79. To fit latent variable models, these eight items were assigned to four parcels.

Positive and negative affect were assessed using a total of nine questionnaire items from

the Medical Outcomes Scale Short-Form Health Survey (SF-36; Ware & Sherbourne, 1992).

These items ask the respondent to rate how they have felt during the past four weeks (e.g., "Have

you been a happy person?", "Have you felt down?") on a six-point scale (which we coded to

range from 1 = *none of the time* to 6 = *all of the time*). In 2005, the scales' alpha reliabilities were

.84 for both positive affect (3 items) and negative affect (6 items). To fit latent variable models,

the six negative affect items were assigned to three parcels. Absolute cross-sectional correlations

between life satisfaction, positive affect, and negative affect ranged from .43 to .71, with a mean

of .53.[5]

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[3] A seventh intended Openness item, *traditional*, was not scored on the Openness scale, due to its
weak item-total correlation.

[4] In view of the intercorrelations between the Big Five, we conducted analyses to examine the
longitudinal relations of subjective well-being with each Big Five trait individually, as well as
analyses that simultaneously included all of the Big Five. Results were similar across the two
sets of analyses. Therefore, to simplify interpretation of the findings and comparisons with
similar previous studies (e.g., Charles et al., 2001; Griffin et al., 2006; Specht et al., 2013), we
present analyses of the individual Big Five traits.

[5] In view of the intercorrelations between the well-being aspects, we conducted analyses to
examine longitudinal relations of the Big Five with each well-being aspect individually, as well
as analyses that modeled overall well-being as a latent variable defined by its three aspects.
Results were generally similar across the two sets of analyses. However, consistent with previous

Results

We tested for longitudinal relations between personality traits and aspects of subjective well-being using two modeling approaches. First, to estimate change trajectories using data from all available assessment waves, we fit latent growth models. Then, to test for fully prospective trait and well-being effects, we fit latent autoregressive models. We fit all models using Mplus 7 (Muthén & Muthén, 2012).

Latent Growth Models

Latent growth models (LGMs) use two or more latent variables to estimate developmental trajectories across multiple assessment waves. In the present research, we fit a series of 15 bivariate, linear LGMs: one for each possible combination of a Big Five trait (Extraversion, Agreeableness, Conscientiousness, Neuroticism, or Openness to Experience) with an aspect of subjective well-being (life satisfaction, positive affect, or negative affect). Figure 1 illustrates how these models were specified. At each assessment wave, the personality trait and well-being aspect (e.g., WB_{2005}) were each represented by a latent variable with three or four observed indicators (either individual items or item parcels; e.g., $WB1_{2005}$, $WB2_{2005}$, and $WB3_{2005}$). Developmental trajectories for the trait or well-being aspect were then estimated using two additional latent variables: a level (sometimes referred to as an intercept; e.g., WB LEVEL) and a slope (e.g., WB SLOPE). The level variable represents individual differences in the trait or well-being aspect that remain stable across assessment waves, while the slope represents linear change over time. In addition to the features shown in Figure 1, each model also included (a) effects of sex (coded -1 = *male*, 1 = *female*), age (centered at 40), age^2, and age^3 on the latent

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research (e.g., DeNeve & Cooper, 1998; Steel et al., 2008), the relations of individual Big Five traits with well-being sometimes differed across the three well-being three aspects in conceptually meaningful ways. We therefore present analyses of the individual well-being aspects.

levels and slopes, (b) residual variances for all variables except sex, age, age^2, age^3, $TRAIT_{2005}$,

and $TRAIT_{2009}$, and (c) correlated residuals for each observed indicator across assessment waves

(e.g., $WB1_{2005}$ with $WB1_{2006}$, $WB1_{2007}$, $WB1_{2008}$, and $WB1_{2009}$).

As shown in Figure 1, each bivariate LGM provides information about four key types of

relations between personality traits and well-being aspects. In these models, a significant

concurrent correlation would indicate that stable individual differences on the trait are

associated with stable individual differences in the well-being aspect. A significant *change*

correlation would indicate that the trait and well-being aspect tend to change in unison. A

significant *trait effect* would indicate that stable individual differences on the trait are associated

with change in well-being; similarly, a significant *well-being effect* would indicate that stable

differences in the well-being aspect are associated with personality change.

In addition to these four key relations between personality traits and well-being aspects,

each LGM also estimates the relation between the trait level and slope (the *trait level-slope effect*

in Figure 1), as well as between the well-being level and slope (the *well-being level-slope effect*).

Conceptually, these effects test whether individual differences on a trait (or well-being aspect)

predict change on that same trait (or well-being aspect). In practice, these effects often have a

negative sign, reflecting longitudinal floor and ceiling effects (Wang, Zhang, McArdle, &

Salthouse, 2008). For example, an individual who scores near the maximum value of life

satisfaction could become much less satisfied, but not much more satisfied, over time.

Fit statistics indicated that all 15 models fit the data well (all CFIs $\geq$ .972; TLIs $\geq$ .968;

RMSEAs $\leq$ .032). The key standardized effects from these models are presented in Table 1. The

top two sections of this table show that the concurrent and change correlations followed our

expected pattern. Higher stable levels of well-being correlated positively with Extraversion,

Agreeableness, and Conscientiousness, and negatively with Neuroticism. Similarly, increases in

well-being were associated with increases in Extraversion, Agreeableness, and

Conscientiousness, as well as decreases in Neuroticism.[6] The relative sizes of these correlations

indicate that, in general, well-being was most strongly associated with Extraversion (especially

for positive affect) and Neuroticism (especially for negative affect).

The two middle sections of Table 1 present the well-being and trait effects. Several well-

being effects were statistically significant, with the overall pattern indicating that high stable

levels of well-being were associated with increases in Conscientiousness and Agreeableness over

time, and with decreases in Neuroticism and (surprisingly) Extraversion. As for the trait effects,

only two were statistically significant, and their signs were both opposite our expectations: low

stable levels of Extraversion and high stable levels of Neuroticism predicted increases in positive

affect over time. Taken together, and consistent with the findings of another recent study (Specht

et al., 2013), these trait and well-being effects appear to suggest that subjective well-being

influences personality change more often than personality traits influence change in well-being.

Finally, the two bottom sections of Table 1 present the level-slope effects. As expected,

all of these were negative, likely reflecting longitudinal floor and ceiling effects.

Latent Autoregressive Models

An important strength of LGMs is that they estimate latent levels and slopes using

information from all available assessment waves, and thereby provide robust estimates of

developmental trajectories. However, this strength is also the source of a key limitation: causal

interpretation of the trait and well-being effects illustrated in Figure 1 is complicated by the fact

that they are not fully prospective. LGMs estimate latent levels using information not only from

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[6] When interpreting all results from the present research, the terms "increase" and "decrease" should be interpreted in relative terms (i.e., relative to the average change trajectory).

the first assessment wave (e.g., WB_{2005}), but also from all subsequent waves (WB_{2006}, WB_{2007}, WB_{2008}, and WB_{2009}), the same waves that are used to estimate latent slopes. Because levels and slopes are estimated using overlapping information, levels do not fully precede slopes in time. Therefore, a significant trait or well-being effect does not necessarily indicate that antecedent trait or well-being levels predict subsequent change.

To address this issue, we fit a series of latent autoregressive models; Figure 2 illustrates how these models were specified. As with the LGMs, we fit one autoregressive model for each combination of a Big Five trait with an aspect of subjective well-being. The key advantage of these models over the LGMs is that their trait and well-being effects are fully prospective: trait and well-being levels from the first assessment wave are used to predict subsequent change. A significant trait or well-being effect would therefore constitute evidence of prospective influence. However, this advantage comes at a cost: because personality traits were only assessed at two time points (2005 and 2009), the autoregressive models can only incorporate well-being information from these same two waves.

Beyond prospective trait and well-being effects, the autoregressive models also estimate concurrent and change correlations. These can be interpreted similarly to the corresponding LGM effects, except that, in the autoregressive models, concurrent correlations are only estimated using information from the first assessment wave (rather than all available waves). Finally, the autoregressive models estimate the rank-order stability of personality traits (the *trait stability* effect in Figure 2) and well-being aspects (the *well-being stability* effect).

Fit statistics indicated that all 15 autoregressive models fit the data well (all CFIs ≥ .947; TLIs ≥ .937; RMSEAs ≤ .047). These models' key standardized effects are presented in Table 2. The concurrent and change correlations paralleled the LGM results: the same 27 correlations

were statistically significant in both types of models. The prospective well-being effects were also quite similar across the two modeling approaches. All nine of the significant well-being effects from the LGMs were also significant in the autoregressive models, and one additional well-being effect was significant in the autoregressive models only: high initial negative affect predicted subsequent decreases in Agreeableness.

However, the pattern of trait effects differed dramatically between the LGMs and the autoregressive models. In the autoregressive models, 13 of the 15 prospective trait effects were statistically significant, compared with only 2 of the LGM-estimated trait effects. Supporting our initial hypotheses, and paralleling the concurrent and change correlations, the pattern of trait effects from the autoregressive models indicated that high initial levels of Extraversion, Agreeableness, and Conscientiousness, as well as low levels of Neuroticism, predicted subsequent increases in well-being.

Finally, all of the well-being and trait stability effects were positive and statistically significant. These effects indicate considerable, but not perfect, rank-order stability, with greater stability for personality traits (effects ranging from .711 to .844) than for well-being aspects (effects ranging from .563 to .670).

Explaining Differences the between LGM and Autoregressive Results

Results from the LGMs and latent autoregressive models converged in their patterns of concurrent correlations, change correlations, and well-being effects on personality change. However, results concerning trait effects on change in well-being differed markedly between the two modeling approaches. As in a previous study (Specht et al., 2013), the present LGM results counterintuitively appear to suggest that well-being levels influence personality change more often than personality traits influence change in well-being (see Table 1). In contrast, our

autoregressive results suggest that personality traits and well-being aspects influence each other with approximately equal frequency (see Table 2).

What explains this difference between the LGM and autoregressive results? One possibility concerns the fact that, in both the present research and the previous study conducted by Specht et al. (2013), subjective well-being was assessed more frequently (five assessment waves) than were personality traits (two waves). This asymmetry may have made it easier, empirically, for well-being levels to predict personality change than for trait levels to predict change in well-being.

To test this hypothesis, we reduced and refit our bivariate LGMs so that they only used data from the 2005 and 2009 assessment waves, thereby putting estimates of personality traits and well-being aspects on more-equal footing.[7] The results of these balanced LGMs paralleled those of the autoregressive models: the same 13 trait effects and 10 well-being effects (cf. Table 2) were statistically significant in both sets of models. This finding suggests that the preponderance of well-being effects over trait effects reported in Table 1, and also found by Specht et al. (2013), may be at least partly due to the use of unbalanced longitudinal designs that assessed well-being more frequently than personality traits.[8] When placed on equal footing using balanced data, it appears that personality traits predict change in well-being at least as much as well-being levels predict personality change.

Discussion

The present findings support several key conclusions about relations between personality traits and subjective well-being. The pattern of concurrent correlations indicates that individuals

[7] To identify these models, the residual variances for WB_{2005}, WB_{2009}, $TRAIT_{2005}$, and $TRAIT_{2009}$ were constrained to zero.

[8] This hypothesis is further supported by secondary analyses that we conducted using personality and life-satisfaction data from the German SOEP. Fitting latent autoregressive models, rather than LGMs, again resulted in a more-even balance between trait and well-being effects.

with more-extraverted, agreeable, conscientious, and emotionally stable personalities tend to experience higher life satisfaction, more-frequent positive affect, and less-frequent negative affect. Moreover, change correlations indicate that increases and decreases on these same traits are associated with parallel changes in well-being. Both sets of findings are consistent with previous research establishing concurrent associations of personality traits with subjective well-being (Boyce et al., 2013; DeNeve & Cooper, 1998; Steel et al., 2008; Watson & Humrichouse, 2006).

The present research goes beyond such concurrent associations by also establishing prospective effects: personality traits predict subsequent change in subjective well-being, and well-being predicts subsequent personality change. Specifically, the pattern of trait effects indicates that people who initially have extraverted, agreeable, conscientious, and emotionally stable personalities tend to increase in life satisfaction and positive affect, and to decrease in negative affect, over time. Conversely, the well-being effects indicate that people who initially experience high well-being tend to subsequently become more agreeable, conscientious, emotionally stable, and introverted.

These prospective findings substantially advance our understanding of whether and how personality traits and subjective well-being influence each other. Methodologically, they extend the small handful of previous studies that have tested for trait or well-being effects (Charles et al., 2001; Griffin et al., 2006; Specht et al., 2013), most notably by assessing all of the Big Five traits, by assessing three core aspects of subjective well-being, by testing for both trait and well-being effects, and by comparing two different methods for modeling these effects. Conceptually, our findings suggest that the well-established concurrent associations of personality traits with well-being aspects reflect not only the fact that personality traits influence well-being, but also

the fact that well-being influences personality traits. Thus, life satisfaction, positive affect, and negative affect can be added to the small but growing list of biological and social factors that have been shown to prospectively predict personality change (for other examples, see Bogg & Roberts, 2004; Helson & Soto, 2005; Jackson, Thoemmes, Jonkmann, Lüdtke, & Trautwein, 2012). More broadly, our results indicate that a complete theoretical account of the relations between personality traits and subjective well-being must account for their reciprocal influences.

The Absolute and Relative Importance of Trait and Well-Being Effects

How important are personality traits for predicting change in well-being? How important are well-being effects for predicting personality change? At first glance, the purely prospective trait and well-being effects reported in Table 2 appear quite modest: all are less than .15 in strength. However, these effect sizes should be interpreted with three key points in mind. First, they represent very conservative tests of prospective influence. Any influence that personality traits have already had on well-being, or that well-being aspects have already had on traits, prior to the first assessment wave in 2005 would contribute to the concurrent correlations rather than the prospective effects. Similarly, any effects that personality change occurring after the 2005 assessment wave had on well-being, or that well-being change occurring after 2005 had on traits, would contribute to the change correlations rather than the prospective effects.

A second key point is that each prospective effect is potentially cumulative over time. For example, imagine two individuals: Amanda and Brenda. In 2005, both are 20 years old and experience a perfectly average (50th percentile) degree of life satisfaction, but Amanda is quite conscientious (90th percentile of Conscientiousness) while Brenda is quite unconscientious (10th percentile). The prospective effect of Conscientiousness on life satisfaction ($\beta = .065$) predicts that, at age 24, Amanda will be a bit more satisfied than Brenda (53rd percentile versus 47th

percentile, a difference of 0.13 standard-deviation units). However, if the original difference in Conscientiousness persists over time, then by age 40 Amanda will be considerably more satisfied than Brenda (63rd percentile versus 37th percentile, a difference of 0.65 SD units), and by age 60 the difference will be quite large (74th percentile versus 26th percentile, a difference of 1.30 SD units). Thus, the prospective effects of personality traits and subjective well-being on each other appear modest over the course of a few years, but could grow much larger when allowed to accumulate across longer intervals.

A third and final point is that personality traits and subjective well-being are tremendously important personal characteristics, and so even small changes to them can be meaningful. Subjective well-being, by its very definition, represents a fundamental component of human experience: whether a person experiences their life as basically satisfying or dissatisfying, pleasant or unpleasant (Diener, Suh, Lucas, & Smith, 1999). Moreover, both personality traits and well-being aspects have been shown to predict a host of other outcomes, from physical health and longevity to relationship quality and stability to occupational choice and performance to mental health and psychopathology (Luhmann, Lucas, Eid, & Diener, 2013; Lyubomirsky, King, & Diener, 2005; Ozer & Benet-Martínez, 2006). Therefore, even small changes to an individual's personality traits or subjective well-being can have important consequences for the course of their life.

As for relative importance, which is more pronounced: the prospective influence of personality traits on subjective well-being, or the influence of well-being on traits? Consistent with another recent study (Specht et al., 2013), our initial LGM results suggested a preponderance of well-being effects over trait effects (see Table 1). However, when traits and well-being aspects were placed on equal footing (i.e., estimated using an equal number of

assessment waves; see Table 2), significant trait effects were somewhat more common (13 vs. 10) and larger (mean absolute value of 0.059 vs. 0.034) than well-being effects. We therefore conclude that, in general, trait influences on well-being are somewhat stronger than well-being influences on traits, but that both types of influence are pervasive and important.

Another question concerns the relative importance of the Big Five themselves: which traits relate most strongly with subjective well-being over time? The present results highlight three key patterns. First, Neuroticism generally showed the strongest relations with well-being, both concurrently and prospectively: for all three aspects of well-being, the strongest prospective trait and well-being effects involved Neuroticism (see Table 2). Second, Neuroticism had particularly strong relations with negative affect, whereas Extraversion rivaled Neuroticism as a correlate and predictor of positive affect; these findings highlight the specific connections of Neuroticism and Extraversion with negative and positive emotional states, respectively (cf. Gross et al., 1998; Headey & Wearing, 1989). The final pattern concerned Agreeableness and Conscientiousness. Historically, these two traits have received less attention than Extraversion and Neuroticism in connection with subjective well-being. In the present research, however, their concurrent and prospective relations with well-being, especially with life satisfaction and negative affect, were comparable to those involving Extraversion. Thus, at least four of the Big Five—not only Extraversion and Neuroticism, but also Agreeableness and Conscientiousness—should be included in any comprehensive theory or empirical investigation of the relations between personality traits and subjective well-being (cf. DeNeve & Cooper, 1998; Steel et al., 2008).

Limitations and Future Directions

The present research analyzed data from the HILDA Survey. This survey has a number of important design strengths, including its large, nationally representative sample and annual assessments of well-being. However, it also has some important limitations. For example, personality traits have only been assessed in two HILDA waves so far, which limits the amount of information available to model personality change. Future research with a greater number of personality assessment waves could provide more-robust estimates of change, and could further compare LGM and autoregressive approaches to modeling prospective trait and well-being effects. The present results suggest that when bivariate LGMs are fit to data from an unbalanced longitudinal design, it is especially difficult for variables assessed fewer times (in this case, personality traits) to predict change on variables assessed more times (in this case, well-being aspects). However, studies with more than two balanced assessment waves are needed to further investigate this phenomenon.

A second limitation is that the HILDA assesses both personality traits and subjective well-being through self-reports. The inherently phenomenological nature of subjective well-being suggests that, in general, self-reports are the best method for measuring this construct. However, a considerable body of research has established that both self-reports and peer-reports provide unique and valid information about personality traits (Connelly & Ones, 2010; Vazire, 2010). Therefore, future research with multi-method designs—especially studies that obtain both self-report and peer-report personality data—could help disentangle substantive relations between personality traits and well-being from self-perception biases and other method effects.

A third limitation concerns drawing causal inferences from correlational data. As discussed above, prospective trait and well-being effects like those reported in Table 2 provide stronger tests of causal influence than do concurrent or change correlations. However, even the

present prospective effects were computed using correlational rather than experimental data, and therefore cannot provide conclusive proof of causality. Studies that conduct interventions to change people's well-being levels (or personality traits), and then observe subsequent effects on personality traits (or well-being levels), could provide stronger evidence of causal influence.

Beyond these design limitations, the present results also raise additional issues that can be investigated by future research. For example, one surprising finding involved the relations between Extraversion and subjective well-being. As shown in Table 2, individuals with high initial levels of Extraversion tended to increase in well-being over time. However, contrary to expectations, individuals with high initial levels of affective well-being (i.e., high positive affect and low negative affect) tended to subsequently become *less* extraverted. What might explain this negative effect of well-being on change in Extraversion? One possibility is that individuals who are already leading emotionally fulfilling lives may focus on maintaining the rewarding relationships and social roles that they already have, rather than seeking out new ones (cf. Lang & Carstensen, 2002); conversely, leading an emotionally unpleasant life may motivate an individual to seek out new, potentially rewarding relationships. Future research can further investigate the prospective effects of affective well-being on change in Extraversion.

More broadly, future research can clarify the general mechanisms that underlie prospective trait and well-being effects. In the Introduction, we described several mechanisms by which personality traits might influence subjective well-being, and by which well-being might influence traits. These mechanisms include (a) effects of personality traits on baseline affect and affective reactions, (b) effects of traits on behaviors that tend to increase or reduce well-being, (c) effects of consistently experiencing positive or negative affect on behavior, and (d) effects of well-being as an incentive for behavior. Overall, the plausibility of these mechanisms is

supported by the present trait and well-being effects. However, additional research is needed to directly test these and other possible mechanisms.

Conclusion

The present findings highlight several concurrent and prospective effects connecting the Big Five personality traits with three core aspects of subjective well-being: life satisfaction, positive affect, and negative affect. Most interestingly, our results indicate that individuals with extraverted, agreeable, conscientious, and emotionally stable personalities tend to become happier over time, and that individuals with higher initial levels of well-being tend to become more agreeable, conscientious, emotionally stable, and introverted. These findings challenge the common assumption that associations of personality traits with subjective well-being 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.

References

Barrick, M. R., Mount, M. K., & Judge, T. A. (2001). Personality and performance at the

    beginning of the new millennium: What do we know and where do we go next?

    International Journal of Selection and Assessment, 9, 9-30.

Berry, C. M., Ones, D. S., & Sackett, P. R. (2007). Interpersonal deviance, organizational

    deviance, and their common correlates: A review and meta-analysis. *Journal of Applied*

    Psychology, 92, 410-424.

Bogg, T., & Roberts, B. W. (2004). Conscientiousness and health-related behaviors: A meta-

    analysis of the leading behavioral contributors to morality. *Psychological Bulletin, 130,*

    887-919.

Bolger, N., & Schilling, E. (1991). Personality and the problems of everyday life: The roles of

    neuroticism in exposure and reactivity to daily stressors. *Journal of Personality, 59,* 355-

    386.

Boyce, C. J., Wood, A. M., & Powdthavee, N. (2013). Is personality fixed? Personality changes

    as much as "variable" economic factors and more strongly predicts changes to life

    satisfaction. *Social Indicators Research, 111,* 287-305.

Charles, S. T., Reynolds, C. A., & Gatz, M. (2001). Age-related differences and change in

    positive and negative affect over 23 years. *Journal of Personality and Social Psychology,*

    80, 136-151.

Connelly, B. S., & Ones, D. S. (2010). An other perspective of personality: Meta-analytic

    integration of observers' accuracy and predictive validity. *Psychological Bulletin, 136,*

    1092-1122.

DeNeve, K. M., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin, 124,* 197-229.

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective well-being: Three decades of progress. *Psychological Bulletin, 125,* 276-302.

Fredrickson, B. L. (1998). What good are positive emotions? *Review of General Psychology, 2,* 300-319.

George, J. M., & Brief, A. P. 1992. Feeling good–doing good: A conceptual analysis of the mood at work–organizational spontaneity relationship. *Psychological Bulletin, 112,* 310–329.

Graziano, W. G., & Tobin, R. M. (2009). Agreeableness. In M. R. Leary & R. H. Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp. 46-61). New York, NY: Guilford.

Griffin, P. W., Mroczek, D. K., & Spiro, A. (2006). Variability in affective change among aging men: Longitudinal findings from the VA Normative Aging Study. *Journal of Research in Personality, 40,* 942-965.

Gross, J. J., Sutton, S. K., & Ketelaar, T. (1998). Relations between affect and personality: Support for the affect-level and affective reactivity views. *Personality and Social Psychology Bulletin, 24,* 279-288.

Haisken-DeNew, J. P., & Frick, J. R. (2005). *Desktop Companion to the German Socio-Economic Panel (SOEP), Version 8.0.* Berlin, Germany: DIW Berlin.

Headey, B., & Wearing, A. (1989). Personality, life events, and subjective well-being: Toward a dynamic equilibrium model. *Social Psychology, 57,* 731-739.

Helson, R., & Soto, C. J. (2005). Up and down in middle age: Monotonic and nonmonotonic

changes in roles, status, and personality. *Journal of Personality and Social Psychology,*
89, 194-204.

Isen, A. M. (1987). Positive affect, cognitive processes, and social behavior. In L. Berkowitz

(Ed.), *Advances in experimental social psychology* (Vol. 20, pp. 203–253). New York,

NY: Academic Press.

Jackson, J. J., Thoemmes, F., Jonkmann, K., Lüdtke, O., & Trautwein, U. (2012). Military

training and personality trait development: Does the military make the man, or does the

man make the military? *Psychological Science, 23,* 270-277.

Jensen-Campbell, L. A., Adams, R., Perry, D. G., Workman, K. A., & Furdella, J. Q. (2002).

Agreeableness, extraversion, and peer relations in early adolescence: Winning friends and

deflecting aggression. *Journal of Research in Personality, 36,* 224-251.

Karney, B. R., & Bradbury, T. N. (1995). The longitudinal course of marital quality and stability:

A review of theory, method, and research. *Psychological Bulletin, 118,* 3-34.

Lang, F. R., & Carstensen, L. L. (2002). Time counts: Future time perspective, goals, and social

relationships. *Psychology and Aging, 17,* 125-139.

Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings.

Psychological Bulletin, 127, 267-286.

Luhmann, M., & Eid, M. (2009). Does it really feel the same? Changes in life satisfaction

following repeated life events. *Journal of Personality and Social Psychology, 97,* 363-

381.

Luhmann, M., Lucas, R. E., Eid, M., & Diener, E. (2013). The prospective effect of life

satisfaction on life events. *Social Psychological and Personality Science, 4,* 39-45.

Lyubomirsky, S., King, L., & Diener, E. (2005). The benefits of frequent positive affect: Does

happiness lead to success? *Psychological Bulletin, 131,* 803-855.

Mor, N., & Winquist, J. (2002). Self-focused attention and negative affect: A meta-analysis.

Psychological Bulletin, 128, 638-662.

Muthén, L. K., & Muthén, B. O. (2012). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén

& Muthén.

Newcomb, A. F., Bukowski, W. M., & Pattee, L. (1993). Children's peer relations: A meta-

analytic review of popular, rejected, neglected, controversial, and average sociometric

status. *Psychological Bulletin, 113,* 99-128.

Noftle, E. E., & Robins, R. W. (2007). Personality predictors of academic outcomes: Big Five

correlates of GPA and SAT scores. *Journal of Personality and Social Psychology, 93,*

116-130.

Ozer, D. J., & Benet-Martínez, V. (2006). Personality and the prediction of consequential

outcomes. *Annual review of psychology, 57,* 401-421.

Roberts, B. W., & Wood, D. (2006). Personality development in the context of the neo-

socioanalytic model of personality. In D. K. Mroczek & T. D. Little (Eds.), *Handbook of

Personality Development* (pp. 11-39). Mahwah, NJ: Erlbaum.

Robins, R. W., Caspi, A., & Moffitt, T. E. (2002). It's not just who you're with, it's who you are:

Personality and relationship experiences across multiple relationships. *Journal of

Personality, 70,* 925-964.

Rubin, K. H., & Burgess, K. B. (2001). Social withdrawal and anxiety. In M. W. Vasey & M. R.

Dadds (Eds.), *The developmental psychopathology of anxiety* (pp. 407-434). New York,

NY: Oxford University Press.

Saucier, G. (1994). Mini-markers: A brief version of Goldberg's unipolar Big-Five markers. *Journal of Personality Assessment, 63,* 506-516.

Specht, J., Egloff, B., & Schmulke, S. C. (2013). Examining mechanisms of personality maturation: The impact of life satisfaction on the development of the Big Five personality traits. *Social Psychological and Personality Science, 4,* 181-189.

Steel, P., Schmidt, J., & Shultz, J. (2008). Refining the relationship between personality and subjective well-being. *Psycholgoical Bulletin, 134,* 138-161.

Summerfield, M., Freidin, S., Hahn, M., Ittak, P., Li, N., Macalalad, N., Watson, N., Wilkins, R. and Wooden, M. (2012). *HILDA User Manual – Release 11.* Melbourne, Australia: Melbourne Institute of Applied Economic and Social Research, University of Melbourne.

Vazire, S. (2010). Who knows what about a person? The self-other knowledge asymmetry (SOKA) model. *Journal of Personality and Social Psychology, 98,* 281-300.

Wang, L., Zhang, Z., McArdle, J. J., & Salthouse, T. A. (2008). Investigating ceiling effects in longitudinal data analysis. *Multivariate Behavioral Research, 43,* 476-496.

Ware, J. E., & Sherbourne, C. D. (1992). The MOS 36-item short-form health survey (SF-36): I. Conceptual framework and item selection. *Medical Care, 30,* 473-483.

Watson, D., & Humrichouse, J. (2006). Personality development in emerging adulthood: Integrating evidence from self-ratings and spouse ratings. *Journal of Personality and Social Psychology, 91,* 959-974.

Table 1

Trait and Well-Being Effects from the Latent Growth Models

	Ext.	Agr.	Con.	Neu.	Ope.
	β (S.E.)	*β* (S.E.)	*β* (S.E.)	*β* (S.E.)	*β* (S.E.)
Concurrent correlations (Trait level ↔ Well-being level)					
Life satisfaction	.265(.012)*	.310(.012)*	.278(.012)*	-.381(.012)*	-.065(.013)*
Positive affect	.377(.011)*	.259(.012)*	.265(.011)*	-.427(.011)*	-.021(.012)
Negative affect	-.305(.011)*	-.242(.012)*	-.266(.011)*	.562(.010)*	.081(.013)*
Change correlations (Trait slope ↔ Well-being slope)					
Life satisfaction	.313(.027)*	.258(.026)*	.253(.026)*	-.303(.026)*	.045(.027)
Positive affect	.530(.029)*	.326(.027)*	.317(.027)*	-.459(.027)*	.065(.028)*
Negative affect	-.460(.027)*	-.267(.025)*	-.303(.025)*	.550(.023)*	.012(.026)
Well-being effects (Well-being level → Trait slope)					
Life satisfaction	-.015(.019)	.044(.018)*	.044(.018)*	-.085(.018)*	-.015(.018)
Positive affect	-.042(.018)*	.011(.016)	.059(.016)*	-.055(.018)*	-.020(.016)
Negative affect	.069(.017)*	-.030(.016)	-.059(.016)*	.087(.020)*	.001(.016)
Trait effects (Trait level → Well-being slope)					
Life satisfaction	.001(.020)	.003(.022)	.024(.021)	-.026(.023)	.003(.020)
Positive affect	-.054(.025)*	-.037(.025)	-.035(.024)	.062(.028)*	-.028(.022)
Negative affect	.021(.021)	.000(.022)	.005(.022)	-.002(.029)	.022(.021)
Well-being level-slope effects (Well-being level → Well-being slope)					
Life satisfaction	-.343(.020)*	-.343(.021)*	-.349(.020)*	-.352(.022)*	-.341(.019)*
Positive affect	-.213(.026)*	-.221(.025)*	-.221(.025)*	-.207(.028)*	-.228(.023)*
Negative affect	-.283(.022)*	-.286(.021)*	-.285(.021)*	-.294(.028)*	-.286(.020)*
Trait level-slope effects (Trait level → Trait slope)					
Life satisfaction	-.279(.014)*	-.419(.014)*	-.375(.014)*	-.438(.015)*	-.304(.014)*
Positive affect	-.268(.016)*	-.409(.014)*	-.379(.014)*	-.430(.015)*	-.304(.014)*
Negative affect	-.261(.015)*	-.413(.014)*	-.379(.014)*	-.457(.018)*	-.303(.014)*

Note. * *p* < .05. Ext. = Extraversion. Agr. = Agreeableness. Con. = Conscientiousness. Neu. = Neuroticism. Ope. = Openness to Experience. *β* = Coefficient standardized in terms of both the predictor and outcome latent variables. S.E. = Standard error of the coefficient.

Table 2

Trait and Well-Being Effects from the Latent Autoregressive Models

	Ext.	Agr.	Con.	Neu.	Ope.
	β (S.E.)	β (S.E.)	β (S.E.)	β (S.E.)	β (S.E.)
Concurrent correlations (Trait$_{2005}$ ↔ Well-being$_{2005}$)					
Life satisfaction	.246(.011)*	.281(.011)*	.255(.011)*	-.344(.011)*	-.056(.012)*
Positive affect	.342(.010)*	.249(.011)*	.242(.010)*	-.391(.010)*	-.018(.011)
Negative affect	-.284(.010)*	-.228(.011)*	-.243(.010)*	.519(.009)*	.076(.012)*
Change correlations (Trait$_{2009}$ ↔ Well-being$_{2009}$)					
Life satisfaction	.198(.017)*	.177(.016)*	.174(.016)*	-.235(.016)*	.018(.017)
Positive affect	.331(.015)*	.210(.015)*	.215(.015)*	-.302(.015)*	.055(.016)*
Negative affect	-.286(.015)*	-.177(.015)*	-.209(.015)*	.386(.014)*	.010(.016)
Well-being effects (Well-being$_{2005}$ → Trait$_{2009}$)					
Life satisfaction	-.007(.010)	.028(.011)*	.021(.010)*	-.056(.012)*	-.006(.010)
Positive affect	-.025(.009)*	.010(.010)	.034(.010)*	-.036(.011)*	-.018(.009)
Negative affect	.039(.009)*	-.021(.010)*	-.034(.010)*	.047(.013)*	-.003(.010)
Trait effects (Trait$_{2005}$ → Well-being$_{2009}$)					
Life satisfaction	.045(.010)*	.059(.012)*	.065(.011)*	-.084(.012)*	-.007(.010)
Positive affect	.062(.010)*	.029(.011)*	.040(.011)*	-.068(.012)*	-.018(.010)
Negative affect	-.053(.010)*	-.045(.011)*	-.050(.011)*	.137(.013)*	.024(.011)*
Well-being stability (Well-being$_{2005}$ → Well-being$_{2009}$)					
Life satisfaction	.641(.009)*	.636(.009)*	.636(.009)*	.623(.009)*	.651(.008)*
Positive affect	.649(.009)*	.664(.008)*	.661(.008)*	.644(.009)*	.670(.008)*
Negative affect	.617(.009)*	.622(.008)*	.621(.008)*	.563(.011)*	.630(.008)*
Trait stability (Trait$_{2005}$ → Trait$_{2009}$)					
Life satisfaction	.833(.006)*	.734(.009)*	.799(.008)*	.711(.010)*	.775(.007)*
Positive affect	.840(.007)*	.740(.008)*	.796(.008)*	.715(.010)*	.776(.007)*
Negative affect	.844(.006)*	.738(.008)*	.796(.008)*	.706(.012)*	.776(.007)*

Note. * *p* < .05. Ext. = Extraversion. Agr. = Agreeableness. Con. = Conscientiousness. Neu. = Neuroticism. Ope. = Openness to Experience. β = Coefficient standardized in terms of both the predictor and outcome latent variables. S.E. = Standard error of the coefficient.

Figure 1. Bivariate latent growth model. TRAIT is Extraversion, Agreeableness, Conscientiousness, Neuroticism, or Openness to Experience. WB is life satisfaction, positive affect, or negative affect. To facilitate interpretation, the figure omits (c) effects of sex, age, age^2, and age^3 on the latent growth variables (i.e., levels and slopes), (b) residual variances, and (c) correlated residuals for observed indicators (e.g., WB1$_{2005}$ with WB1$_{2006}$, WB1$_{2007}$, WB1$_{2008}$, and WB1$_{2009}$). To ensure measurement invariance, observed indicators' loadings, intercepts, and residual variances were constrained to be equal across assessment waves. Life satisfaction was defined by four indicators; positive affect, negative affect, and all personality traits were defined by three indicators.
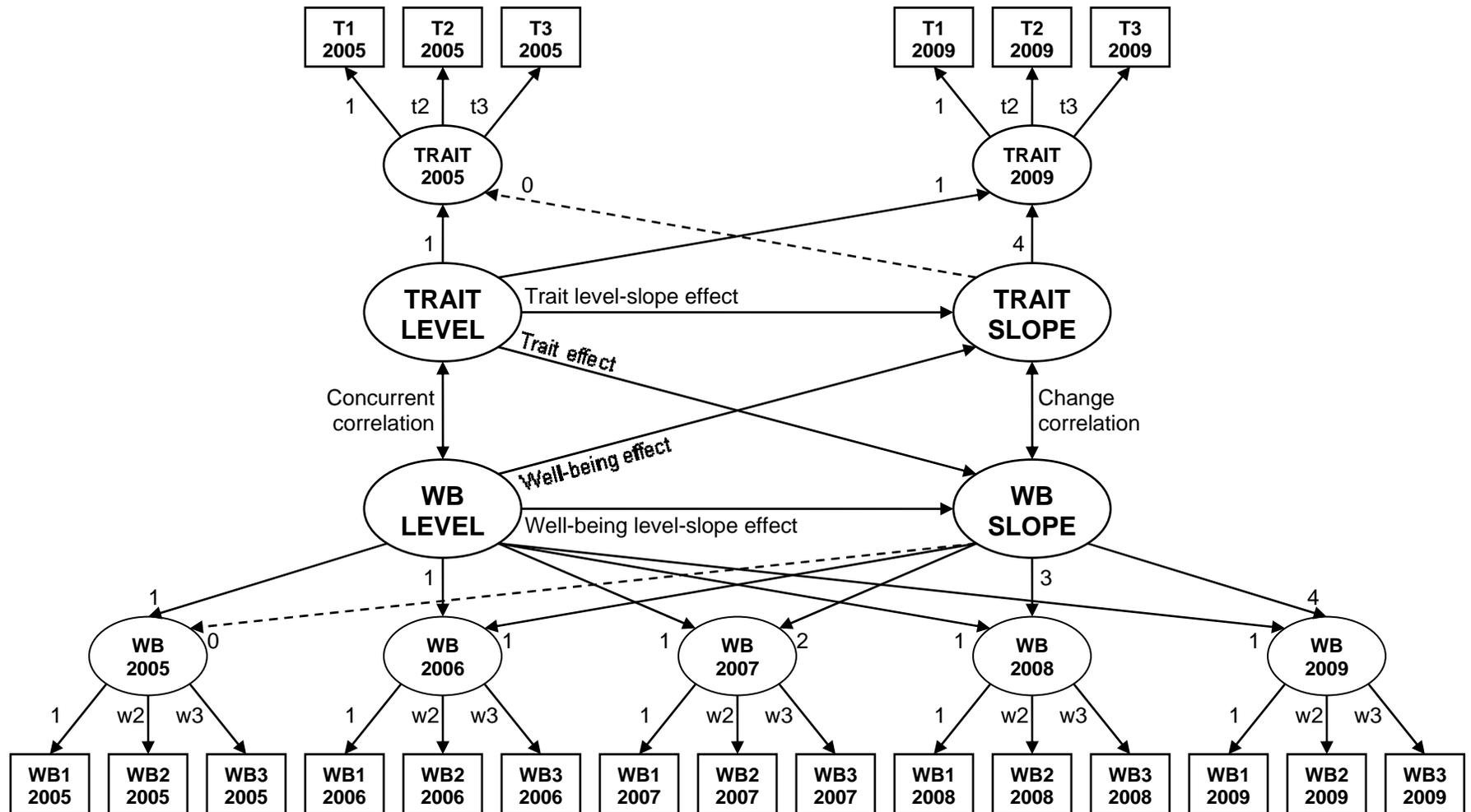
Figure 2. Latent autoregressive model. TRAIT is Extraversion, Agreeableness, Conscientiousness, Neuroticism, or Openness to Experience. WB is life satisfaction, positive affect, or negative affect. To facilitate interpretation, the figure omits (a) effects of sex, age, age^2, and age^3 on the latent variables, (b) residual variances, and (c) correlated residuals for observed indicators (e.g., $WB1_{2005}$ with $WB1_{2006}$, $WB1_{2007}$, $WB1_{2008}$, and $WB1_{2009}$). To ensure measurement invariance, observed indicators' loadings, intercepts, and residual variances were constrained to be equal across assessment waves. Life satisfaction was defined by four indicators; positive affect, negative affect, and all personality traits were defined by three indicators.