Ethics-Relevant Values as Antecedents of Personality Change: Longitudinal Findings from the Life and Time Study

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Abstract

What leads personality to develop in adulthood? Values, guiding principles that apply across contexts, may capture motivation for growth and change. An essentialist trait perspective posits that personality changes only as a result of organic factors. But evidence suggests that psychosocial factors also influence personality change, especially during young adulthood. In the Life and Time study of sources of personality change in adulthood, we specifically explore ethically-relevant value priorities, those related to the relative prioritization of narrow self-interest over the concerns of a larger community. According to Rollo May (1967), "mature values", including aspects of both self-transcendence and self-determination, should serve to diminish or prevent neurotic anxiety. This is consistent with research on materialism, which is associated with lower well-being. An index based on May's proposal and several related constructs (materialism, unmitigated self-interest, collectivism and individualism) are tested longitudinally as possible antecedents of Big Five/Six personality trait change using bivariate LCMSR models in a national community sample (N = 864 at Time 1). Contrary to an essentialist trait perspective, these value priorities more often preceded change in personality traits than vice-versa. Somewhat consistent with May's theory, higher "mature" values preceded higher openness (statistically significant at the $p < .005$ level). Higher vertical individualism significantly preceded lower compassion, intellect and openness. At the suggestive ($p < .05$) level, higher unmitigated self-interest preceded lower conscientiousness, higher vertical individualism preceded higher volatility, higher mature values preceded higher honesty/propriety and politeness, higher horizontal collectivism preceded higher orderliness, agreeableness, and assertiveness and lower intellect, and higher horizontal individualism preceded lower

withdrawal. In two of three cases, suggestive personality-as-antecedent-of-values-change effects were reciprocal with the values-effects: higher conscientiousness scores reciprocally preceded lower unmitigated self-interest, and higher volatility higher vertical individualism. No significant or suggestive “stand-alone”, non-reciprocal personality on values effects were found.

Keywords: Values, Longitudinal Studies, Personality Change, Five Factor Personality Model, Personality Development

Ethics-Relevant Values as Antecedents of Personality Change: Longitudinal Findings from the Life and Time Study

What leads personality to develop in adulthood? Values, guiding principles that apply across contexts, may capture motivation for growth and change. Whether value priorities are defined by one's family and culture, or whether they reflect a later, individual choice, they reflect how we wish to be. For example, a devout Buddhist will likely value compassion and want to increase in such traits, whatever their initial level. Someone trying to advance in an American corporate setting, on the other hand, will likely value ambition and assertiveness, and will seek to increase those traits. A common-sense view is that our values will drive our behavior, and that we will seek to act in ways in accordance with our goals, more than the alternative, in which our behavior drives our values. This study explores the role of a set of ethically-relevant, broader-scope versus self-focused values as antecedents of personality trait change, providing a test of this common-sense, values-influence-behavior view. The converse, that personality tendencies precede and influence change in values, is also tested.

Broader-scope versus self-focused values

Value priorities have been defined as trans-situational goals that set out desirable end-states or behaviors, and guide how people choose and evaluate behaviors and situations (Schwartz, 1992). There are a variety of way to operationalize value priorities, for example the well-known Schwartz and Rokeach scales of basic human values, and Holland's (1985) model of work values, expressed as interests. Some value-priorities contrasts assess personal preferences, for example the preference for stimulation versus conformity in the Schwartz model, or artistic rather than investigative interests in Holland's model. But ethics and moral virtue are also related to value priorities, for example to the tension between the valuing of the concerns of a larger

community over narrow self-interest. The current study focuses on these kinds of values, described also by Thalmayer, Saucier, Srivastava, Flournoy, and Costello (2019). This contrast between broader-scope versus self-focused values is associated with cultural and moral socialization, which presumably continues throughout adulthood. In family life, religious and spiritual traditions, and many other contexts, social influence will encourage concern for others. This is therefore a sector of the values domain in which "maturation" seems especially likely to be ongoing.

Values are not commonly measured as a spectrum from broader-scope to self-focused values. To explore this less familiar domain, value priorities are tested in several ways in the current study. Firstly, they are measured in terms of an index derived from the theoretical writings of Rollo May (1967), who outlined the starting point for a values-driven theory of personality change. In May's view, optimal self-development should include a shift to "mature" values, and this shift would serve to diminish neurotic anxiety. "Mature values" include aspects of self-transcendence like empathy and generosity as well as aspects of self-determination like creativity and freedom. Self-knowledge, independence, and an ethical grounding in compassion and caring for others should come together in an optimally developed, non-neurotic, "mature" person.

This development would logically include broad-minded, compassionate worldview beliefs. A measure of worldview beliefs, capturing the self-focused pole, is also used in this study. The construct of unmitigated self-interest (Saucier, 2000, 2013) encompasses hedonism, materialism, and solipsism. These self-focused, small-minded priorities align with May's view of an undeveloped, immature individual. Relatedly, by May's standards, materialistic values are immature, and this specific aspect of self-focused values-priorities has been well studied. A

meta-analysis of 151 studies from around the globe confirms their consistent association with lower well-being (Dittmar, Bond, Hurst & Kasser, 2014). Longitudinal studies show similar associations (Kasser et al., 2014).

Finally, collectivism and individualism measures (Triandis & Gelfand, 1998) also concern value-priorities (Oyserman, Coon, & Kemmelmeier, 2002), though their association with personality development is not yet well explored. Individualists prioritize independence, personal freedom (from constraints placed by others), uniqueness, and self-determination. The relation with self-focus is clearest when these are further defined in terms of degree of hierarchy. Vertical individualism, the most self-focused component, indicates a focus on autonomy in an unequal world in which individuals compete for status, whereas horizontal individualism indicates a value for autonomy in a more equal world of unique, independent, and self-reliant individuals. Collectivists value duty, obligation, social harmony, and self-transcendence (Le & Levenson, 2005), and both components in terms of hierarchy would appear to capture broader-scoped values: Vertical collectivism indicates a focus on duties to family or other in-groups where some have more authority than others, whereas horizontal collectivism indicates s strong value for relationships with peers who are more or less one's equal (Triandis & Gelfand, 1998).

These values constructs – materialism, immature values, unmitigated self-interest, and individualism – overlap. All (with the exception of horizontal individualism) can indicate either moral engagement with a broader community or self-focused priorities. In terms of the well-known Schwartz values types, they represent prioritization of hedonism and power over benevolence, and more broadly of self-enhancement over self-transcendence.

Value change across the lifespan

In a previous study, this set of broader-scope versus self-focused values was largely

stable over a three-year period, with some age-normative shifts: People on average became less self-focused with increasing age, and women had slightly less self-focused values than men (Thalmayer et al., 2019). These findings are highly consistent with the substantial mean-level, rank-order, and longitudinal stability established for the popular Schwartz Values Scale (Bardi, Lee, Hofmann-Towfigh, & Soutar, 2009; Milfont, Milojev, & Sibley, 2016; Vecchione et al., 2016; Vecchione, Alessandri, Roccas, & Caprara, 2018), which considers relative priorities among 10 or 11 values proposed to derive from four universal requirements of human existence (Schwartz, 1992). Schwartz's model differs from the constructs explored in the current study by being a broader model of human motivations, less specifically focused on the contrast of ethically-relevant values, although results based on that model have been used to address such questions. For example, Silfver, Helkama, Lönnqvist, and Verkasalo (2008) reported that guilt-proneness and empathy were positively related to self-transcendence values (universalism, benevolence, tradition, and conformity), and negatively to self-enhancement values (power, hedonism, stimulation, and self-direction); much like the pattern found for associations with moral sensitivity (Myyry & Helkama, 2002). And Schwartz and Bardi (2001) found that values of benevolence and universalism, the most morally-relevant of the 10 Schwartz value types, were the most highly endorsed across diverse societies.

Although the emphasis is on normative changes rather than optimal development or personal growth, as in May's theory, the empirical evidence supports a general trend away from self-focus and toward broader-scoped value priorities with age. Milfont and colleagues (2016), who administered a measure of Schwartz values one year apart for three years to a sample of adults in New Zealand, reported greater endorsement of conservation and self-transcendence and less endorsement of openness and self-enhancement values for older participants. Gouveia and

colleagues (2015) reported higher interpersonal and normative scores and lower excitement and self-promotion for older participants on the Basic Values Survey (BVS) in a large cross-sectional Brazilian sample. Robinson (2013) reported higher tradition and conservative values and lower stimulation and openness to change values in older participants in a large pan-European sample. (Such studies, of course, cannot distinguish typical change with age from cohort effects.)

Personality change and development

The influential Five Factor Theory (e.g. McCrae & Allik, 2002) conceives personality as fixed, with the basic tendencies underlying phenotypic traits only changing as a result of organic factors, such as physical aging, brain injury, or medications. Substantial recent empirical evidence, however, indicates a degree of personality change across the lifespan, in addition to significant stability. Cross sectional studies of Big Five traits demonstrate predictable age differences – older people are, on average, more agreeable, conscientious and emotionally stable than younger ones (Soto, John, Gosling, & Potter, 2011). A meta-analysis of 92 longitudinal studies has similarly shown individuals to increase in conscientiousness, emotional stability and social dominance (extraversion) in young adulthood, then later to increase in agreeableness and decrease in social vitality (extraversion) and openness (Roberts, Walton, & Viechtbauer, 2006).

What leads individuals to change? Social investment theory posits that people develop more adaptive traits through commitment to and socialization into social roles, which are often age-normative (Lodi-Smith & Roberts, 2007), a theory supported by cross cultural evidence that normative personality differences appear at younger ages in cultures with an earlier onset of adult role-responsibilities, in particular earlier transition to the labor force (Bleidorn et al., 2013). Additionally, clinical interventions have also been seen to effectively change personality traits (Roberts et al., 2017 provide a meta-analysis of 207 studies).

Another possible source of personality change is an individual's values. A role for value priorities as an influence on personality is consistent with Dweck's (2017) integrative theory of motivation, personality, and development. In this theory, basic needs for acceptance, predictability, and competence drive behavior from early in life, by animating goals designed to meet basic needs. Pursuit of need-fulfilling goals leads to mental representations, which guide future goals and create characteristic, recurrent patterns of behavior i.e., personality traits. In contrast to Five Factor Theory, this theory posits that while temperament can impact social–cognitive processes, it is social–cognitive processes that play the leading role in affecting behavior patterns. Personality change and development is driven by mental representations, including value priorities as a form of motivation. For example, to meet the basic need for acceptance, a value priority of materialism could lead one to dress and live in a way that conveys status; the need for predictability is then met by having concrete, literal markers for self-worth and how rewards are achieved. Acceptance could instead be sought by someone who prioritizes "mature values" in terms of self-acceptance. Competence, control, self-esteem, and self-coherence could be sought by this person by pursuing self-actualization in a way that includes both personal autonomy and empathic concern for others.

In summary, while personality was once theorized to be static during adulthood, contemporary research suggests that some amount of change and development is to be expected. Two sources of change supported by empirical evidence are social-role investment and clinical interventions. Another possible source of change, explored here, is individuals' ethical-value priorities.

Values and Personality

The broader-scope versus self-focused values of interest in this project – materialism, immature values, unmitigated self-interest, and individualism – appear to be largely distinct from Big Five and Big Six personality traits. As reported by Thalmayer and colleagues (2019), the exceptions are moderate positive correlations between the mature values index and openness (around .43 on average), and between the moderately intercorrelated (magnitudes of .33 to .49) set of values measures – horizontal and vertical collectivism, and the mature value index, versus vertical individualism and materialism – with honesty/propriety and agreeableness (.19 to .56 in magnitude).

This is similar to correlational findings reported for the Schwartz values. In a meta-analysis of 60 studies using the Five-Factor Model of personality traits and Schwartz values, Parks-Leduc, Feldman and Bardi (2015) report consistent and theoretically meaningful relationships but with small to medium effect sizes. Overall, the traits that might be thought of as more cognitively based, especially openness to experience, followed by agreeableness, extraversion, and conscientiousness, were more strongly related to values than the arguably more emotionally based traits like emotional stability. Another meta-analysis of correlations between Big Five traits and Schwartz values from 14 countries again reported associations between Big Five higher openness and agreeableness and values scales (specifically with lower conservation and higher self-transcendence, respectively; Fischer & Boer, 2015). Trait-value associations, however, were seen to be stronger in countries with more democratic institutions and permissive social contexts, and weaker in those with greater financial, ecological, and social threats (Fischer & Boer, 2015).

The influence of personality traits and values variables on each other over time has only recently been examined. Fetvadjiev and He (2018) reported their mutual effects using a broader

set of values constructs than those selected for the current study, in a nationally representative panel from the Netherlands, tested five times over eight years. They found that Big Five traits measured by the 50-item IPIP measure predicted change in Rokeach values more strongly than vice versa; personality traits also predicted well-being and self-esteem more strongly than did the values. Similarily, Vecchione and colleagues (2018) tested the mutual effects of the 10 Schwartz values and Big Five personality traits among Italian young adults assessed three times over 12 years. They found that while this set of values (also much less specific than the value-priorities measured in the current study) did not affect trait development, high agreeableness predicted an increase in benevolence values, and high openness an increase in self-direction values.

Goals for the current study

Recent research indicates that personality change occurs throughout the lifespan, though the sources of such change are not yet fully understood. Here we test ethically-relevant, broader-scope versus self-focused values as antecedents of, and alternatively as potential outcomes of personality trait change, with four measurements over three years in a diverse national sample.

This study tests two competing hypotheses. The "null model" represented by Five Factor Theory (McCrae & Costa, 1999), is that effects of traits as antecedents to changes in values will tend to be larger than the effects of values as antecedents to changes in traits. This null model, in which traits are causes and not effects, was recently supported by findings with other types of value-priorities by Fetvadjiev and He (2018) and Vecchione and colleagues (2018). The other hypothesis, that indicators of immature values and worldviews (unmitigated self-interest, materialistic values) will precede and predict increased neuroticism, whereas broader-scoped, "mature" values would lead to decreased neuroticism, is based on May's theoretical proposal and on previous literature, primarily for materialism. We extend this hypothesis more broadly to

what might be argued as "unfavorable change" among other personality traits, specifically lower conscientiousness (like neuroticism, a trait targeted for clinical interventions; Roberts, Hill, & Davis, 2018), and pro-sociality in terms of lower agreeableness and honesty/propriety. Another logical expectation would be that collectivism would associate with higher scores on traits related to social self-regulation (conscientiousness, agreeableness, honesty/propriety), and individualism with traits related to dynamism (extraversion and openness).

Methods

The Life and Time study grant application, which details all hypotheses for the overall study, is available at https://osf.io/bdseu/, along with study materials, data, and code and output for all analyses. The Life and Time Study is a four-wave, three-year longitudinal study on values and social roles as sources of personality change, including three separate samples: a national sample recruited via Mechanical Turk, an e-mail marketing firm, Google Adwords, and Craigslist ads in communities around the United States whose demographic profile was favorable to enhancing minority representation; a student sample recruited on college campuses; and a sample of informants recruited by participants to provide peer-ratings on themselves. The study was reviewed by the Office for the Protection of Human Subjects of the University of Oregon in 2009.

Participants

A total of 879 individuals representing all major geographical regions of the Unites States, joined the Life and Time Study national sample. From the full sample, 10 cases were dropped due to impossible age variations across the waves (beyond a typo that affected only one of three or four otherwise consistent responses) suggesting an insincere participant, and five because the participant did not report age (final sample $N = 864$; 66% female). Of these, 628

provided data at Time 2, 594 at Time 3, and 578 at Time 4. Some participants did not answer all scales at all waves; the minimum sample size for each wave is 862 (Time 1), 619 (Time 2), 590 (Time 3), 573 (Time 4). The age of participants at Time 1 (in the year 2010) ranged from 18 to 63 (M = 36, SD = 10.5). The ethnic composition of the sample was similar to that of the general United States population: 71% non-Hispanic White, Caucasian, or European-American; 12% Black or African-American; 8% Hispanic, Latino, or Spanish; 5% Asian or Asian-American; 2% American Indian or Alaska Native; 1% Native Hawaiian or other Pacific Islander. For more details, including geographical regions and education level, see Thalmayer et al. (2019).

Procedure

Recruitment is described in further detail in Thalmayer et al. (2019). At each wave, participants were emailed a link to a website to complete a battery of self-report questionnaires, including two personality scales, described below, and values, aspirations, worldviews, goals, life events, and relationship, work, and life satisfaction items. Participants were compensated with a gift card for $20-40 (increasing across waves) to an internet retailer after completing surveys. Participants could opt to receive a check in the mail instead. Analyses of Big Five and Big Six rank-order stability, mean-level change, and measurement invariance in the Life and Time national sample are reported in Costello, Srivastava, and Saucier (2017).

Materials

The Life and Time study focused on personality change during adulthood. Values-scales related to May's concept of mature values were included as hypothetical predictors of personality change. We report on the full set of values variables included in the study, detailed in Table 1. Note that personality traits were measured using both the Big Five and Big Six models of personality; although the Big Five is the most common way to measure normal-range

personality attributes, the Big Six has been proposed as an update to the model as it appears to be more replicable across lexical studies in diverse languages (Saucier, 2009). The most significant difference between the models is the addition of a dimension with content related to moral and ethical behavior and to adhering to prosocial norms. Whether the variable selection is relatively narrow (e.g., Ashton et al., 2004) or inclusive (e.g., Saucier, 2009), this sixth "honesty" dimension tends to arise in studies of the natural language, indicating social importance across diverse cultural settings. While the two models are highly similar, the Big Six has demonstrated an advantage in predictive and explanatory power in terms of grades in college (Thalmayer, Saucier, & Eigenhuis, 2011), political attitudes (Chirumbolo & Leone, 2010), vocational interests (McKay & Tokar, 2012), workplace delinquency (Lee, Ashton, & de Vries, 2005), and life aspirations and sexual well-being (Visser & Pozzebon, 2013).

Big Five Inventory (BFI)-Six. Personality traits were measured with the 44-item BFI (John, Naumann, & Soto, 2008) plus a 16-item addendum to create a six-factor version (as in Thalmayer et al., 2011). The addendum includes an honesty/propriety scale drawn largely from the Questionnaire Big Six (Saucier, 2009; Thalmayer et al., 2011), similar to the Honesty/Humility factor in the HEXACO (Ashton & Lee, 2007). Items on this scale included: "is not good at deceiving other people", "sticks to the rules", "uses others for my own ends", "takes risks that could cause trouble for me", "misrepresents the facts", "has bad manners", "uses flattery to get ahead," and "would never take things that aren't mine." The BFI-Six also includes an alternative agreeableness (B6) scale (as in Thalmayer et al., 2011), with more content related to lack of short-temperedness and irritability than typical Big Five agreeableness. Items were rated on a scale from 1 to 5, with higher numbers indicating greater agreement. Scale statistics are reported in Thalmayer et al. (2019; α = .79 to .88). To aid interpretation across scales, all

dependent measures were rescaled with a linear transformation, [observed score – minimum possible] / [maximum possible - minimum possible] x 100, to percent of maximum possible (POMP) scores to give them a range from 0 to 100 (Cohen, Cohen, Aiken, & West, 1999).

Big Five Aspect Scales (BFAS). The 100-item BFAS (DeYoung, Quilty, Peterson, & Carver, 2007; α = .78 to .91) includes two 10-items scales, capturing distinct but correlated aspects of each of the Big Five dimensions: industriousness and orderliness, compassion and politeness, volatility and withdrawal, assertiveness and enthusiasm, intellect and openness. Items are rated on a 5-point Likert-type scale as from extremely inaccurate to extremely accurate in terms of describing oneself.

Mature Values Index. A preliminary index of mature values was developed by the second author and a graduate assistant, both of whom scrutinized May's (1967) writings on mature values, and rated the relative suitability of items from the Schwartz (1992) or Rokeach (1973) values surveys. The consensus selection includes 10 forward-keyed (freedom, choosing own goals, meaning in life, creativity, a world of beauty, wisdom, being honest, being helpful, mature love, and unity with nature) and seven reverse-keyed items (pleasure, a comfortable life, wealth, social power, social recognition, preserving my public image, and being obedient), with a response scale as in Schwartz (1992), from -1 from "opposed to my values" to +7 "of supreme importance". Note that all items are found on the Schwartz scale, but only 10 of the 17 on Rokeach's. The forward-keyed and reverse-keyed items were averaged and POMP-scored as two subscales, which were then averaged for the final scale used in analyses. Correlations of all values scales with each other and with personality scales are reported in Thalmayer et al. (2019). Note that the mature values index is a composite, what some have termed a "formative" scale, meaning that it comprises a group of concepts chosen because all are theoretically associated

with the construct, thus there is no basis for any assumptions about their interrelations, or expectation for unidimensionality. Neither Rollo May nor existential psychology in general would propose that autonomy should be empirically positively correlated with self-transcendence; the spirit of May's proposal is instead that the two different qualities have a positive synergy together, such that mature values emerge from their combination. Measurement models for formative indices are more difficult to evaluate for measurement invariance and in this data-set we do not have the requisite instruments for testing invariance hypotheses (Diamantopoulos & Papadopoulos, 2010). For this reason we did not evaluate it for measurement invariance, and therefore cannot rule out the possibility that any differences across age reflect differences in the performance of the instrument across age groups.

Unmitigated Self-Interest. This 6-item scale (Saucier, 2000, 2013; Thalmayer et al., 2019; $\alpha = .67$), measures hedonism, materialism, and solipsism, using a 5-point Likert-type scale from strongly disagree to strongly agree, with half the items reverse-keyed. Example items include: "The pleasures of the senses are the highest good," and "People ought to be motivated by something beyond their own self-interest." Although these might be read as statements of beliefs, they involve strong valuations placed on pleasure, material possessions, and self-interest. As regards solipsism, if nothing outside the self exists, it follows that nothing outside the self has value.

Materialism. This 6-item scale is derived from items in Richins and Dawson's (1992) scale of materialistic values, based on item reduction efforts (Shen-Miller, 2009; Shen-Miller, Saucier & Pan, 2015), as described in Thalmayer and colleagues (2019; $\alpha = .80$). Half the items were reverse-keyed and all are answered on the same 5-point Likert-type scale as BFAS items, from extremely inaccurate to extremely accurate in terms of describing oneself. Example items

include “Would be happier if I could afford to buy more things” and “Don’t pay much attention to the material objects other people own.”

Financial Aspirations. Aspirations for Financial Success (Kasser & Ryan, 1993; $\alpha = .80$) is one of five scales on a 23-item inventory of aspirations. The scale includes five items worded in the second person (e.g. “You will buy things just because you want them”) rated on a 5-point Likert-type scale from “not at all important” to “very important”. This scale was mean-centered using the four scales administered.

Individualism and Collectivism. In the scales provided by Triandis and Gelfand (1998), individualism is split into two components. Vertical individualism has a focus on autonomy in an unequal world in which individuals compete for status, whereas horizontal individualism focuses on autonomy in an implicitly equal world of unique, independent, and self-reliant individuals. Collectivism is similarly split: Vertical collectivism has a focus on duties to family or other in-groups where some have more authority than others, whereas horizontal collectivism focuses on enjoyment of relationships with peers who are more or less one’s equal (Triandis & Gelfand, 1998). Each of the four subscales was measured with four total items, all keyed in the same direction, and all answered on a 5-point Likert-type scale from strongly disagree to strongly agree ($\alpha = .56$ to $.71$).

Analyses

Reciprocal relations between personality and values scales were tested using bivariate latent curve models with structured residuals (LCM-SR; Curran, Howard, Bainter, Lane, & McGinley, 2014). The LCM-SR overcomes limitations of the traditional cross-lagged panel model (CLPM) that, as demonstrated by Hamaker, Kuiper, & Grasman (2015), confounds within- and between-person covariance because it does not account for trait-like stability. The

LCM-SR effectively decomposes covariance into between-person trait-like linear stability (as instantiated in the latent curve component of the model) and within-person wave-to-wave auto-regression as well as reciprocal, lagged influences from one construct to the other (which is accomplished by modeling the residuals from the LCM using the traditional CLPM structure). Each of the BFI-Six scales and ten BFAS scales was tested separately in relation to each of the eight values scales, in all tests accounting for age, using Mplus 7 (Muthén & Muthén, 2012), with robust maximum likelihood estimation (MLR). See Figure 1 for an example of the model. Interpretation focuses on cross-lagged coefficients for regression of subsequent personality score on previous values scores, and subsequent values on previous personality score, which indicate the extent to which values influence personality traits over time and vice versa. Within-wave (within-person) intercept correlations are also interpreted as a way to separate within- and between-person variance, a strength of LCM-SR (Curran et al., 2014; Hamaker, Kuiper, & Grasman, 2015). These residual correlations account for individual differences in trait-levels and linear trends in trait-levels, and for levels during previous waves. Non-zero correlations indicate within-person processes linking fluctuations in responses to personality and the values indicators, and provide a way to address state versus trait variation.

Per Benjamin and colleagues (2018) we define results with a false positive rate under the null hypothesis less than 5% (alpha = .05) as "suggestive", and only those with a false positive rate under the null hypothesis less than 0.5% (alpha = .005) as "statistically significant". We also provide supplementary tables with all within-person cross-lagged and contemporaneous coefficients and *p*-values corrected to control the family-wise error (FWE) rate across all tests within direction (e.g., lagged values-to-personality; $k = 128$) at $\alpha = .05$ (Holm, 1979), and to control the false discovery rate (FDR) at $q = .05$ (Benjamini & Hochberg, 1995).

The measurement invariance of the values scales (with the exception of the mature values index, as discussed above) across four age groups corresponding to decades, participants in their 20s (N = 304), 30s (N = 227), 40s (N = 199), and 50s (N = 132), is described in Thalmayer and colleagues (2019). The measurement invariance of the personality scales across the age groups is described in Costello and colleagues (2017). Because changes in McDonald's non-centrality fit index (MFI; McDonald, 1989) exceeded the threshold for assuming perfect measurement invariance for the values scales other than horizontal individualism, we used modified scales as in Thalmayer and colleagues (2019) to test the sensitivity of results to measurement issues. Comparisons of the results reported below and those found for the modified-to-be-invariant values scales (all available in supplemental materials) indicated that the directions and size of the cross-lag coefficients were generally highly similar, with a mean absolute difference of 0.017, *SD* = 0.014 (range from 0 to 0.085) and mean absolute coefficient estimate of 0.039, *SD* = 0.035. The mean absolute difference for significant ($p < .005$) cross-lag coefficients was 0.021, *SD* = 0.011 (range 0.010 to 0.033), with mean absolute coefficient estimate of 0.110, *SD* = 0.058. Finally, across all suggestive ($p < .05$) cross-lag coefficients, mean absolute differences was 0.021, *SD* = 0.015 (range 0.000 to 0.057), with mean absolute coefficient estimate of 0.11, SD = 0.046. Interpretation proceeds solely with the *a priori* scales, but direct comparison of all significant and suggestive coefficients can be found in the supplemental material.

Results

The Reciprocal Influence of Value Priorities and Personality Change

Coefficients for the cross-lagged effects are described below and are reported in Tables 2 to 9. Significant cross-lag coefficients indicate associations between values and personality scales from earlier to later waves over and above the average linear change across waves for each

scale, as well as over and above expectations due to an individual's previous-wave score. That is, a significant cross-lagged regression path of values on personality indicates that a deviation from these expectations on a values scale tends to precede an associated deviation in the personality scale in later waves. A significant cross-lagged path of a regression of personality on values indicates that a deviation from expectations on a values scale precedes a deviation on a personality scale. These cross-lagged effects are separate from the between-person intercept-to-intercept correlations that are also shown in the tables. These indicate between-person associations in mean level, separate from the cross-lagged associations due to within-person perturbations. Note that it is possible for a values scale to show positive intercept-to-intercept correlation with a personality scale while simultaneously showing a negative cross-lagged regression effect.

Results including all parameter estimates, including those for scales modified to achieve measurement invariance, are available in supplementary materials. These include within-person values-to-values and personality-to-personality auto-regressive associations between structured residuals (residuals after accounting for a linear growth curve mean structure), within-person, within-wave values to personality correlations between residuals of the structured residuals after accounting for the association between the previous wave's personality and values residuals, and between-person correlations between individual differences in the growth-curve slopes.

Unmitigated self-interest. Higher unmitigated self-interest scores preceded lower conscientiousness scores, and reciprocally, higher conscientiousness scores preceded lower unmitigated self-interest scores. These results were statistically suggestive, at $p < .05$, rather than significant, at $p < .005$ (see Table 2). Between-person growth-curve intercept correlations were significant and negative for honesty/propriety, agreeableness (B6), compassion, politeness,

openness, intellect and BFAS openness, while they were suggestive and positive for volatility and extraversion.

Vertical Individualism. Higher vertical individualism significantly preceded lower compassion and BFAS intellect and openness scores (see Table 3). At the statistically suggestive level, vertical individualism and volatility scores reciprocally preceded each other and higher vertical individualism preceded lower BFI openness. Between-person growth-curve intercept correlations were significant and negative for honesty/propriety, agreeableness (B6), compassion, politeness, neuroticism, and BFAS openness, significant and positive for assertiveness, and suggestive and positive for volatility and extraversion.

Materialism. Between-person growth-curve intercept correlations were significant and negative for honesty/propriety, agreeableness (B6), compassion, politeness, openness, intellect and BFAS openness, and significant and positive for orderliness, neuroticism, volatility, and withdrawal (see Table 4).

Financial Aspirations. Between-person growth-curve intercept correlations were significant and negative for honesty/propriety, agreeableness (B6), compassion, politeness, enthusiasm, openness, intellect and BFAS openness, significant and positive for volatility, and assertiveness, and suggestively positive for orderliness (see Table 5).

Mature Values Index. Higher mature values significantly preceded higher BFAS openness scores, and suggestively preceded higher honesty/propriety and politeness (see Table 6). Between-person growth-curve intercept correlations were significant and positive for honesty/propriety, agreeableness (B6), compassion, politeness, openness, intellect, and BFAS openness. They were significant and negative for orderliness, and suggestive and negative for volatility.

Vertical Collectivism. Between-person growth-curve intercept correlations were significant and positive with conscientiousness, industriousness, orderliness, honesty/propriety, agreeableness (B6), compassion, politeness, and enthusiasm (see Table 7).

Horizontal Collectivism. Higher horizontal collectivism scores suggestively preceded higher orderliness, agreeableness (B6), and assertiveness, and lower intellect (see Table 8). Between-person growth-curve intercept correlations were significant and positive for conscientiousness, industriousness, honesty/propriety, agreeableness (B6), compassion, politeness, extraversion, enthusiasm, and BFAS openness. They were significant and negative for neuroticism, volatility, and withdrawal. They were suggestive and positive for orderliness, assertiveness, openness, and intellect.

Horizontal Individualism. Higher horizontal individualism scores suggestively preceded lower withdrawal scores (see Table 9). Between-person growth-curve intercept correlations were significant and negative for agreeableness (B6) and significant and positive for assertiveness, openness, intellect and BFAS openness. They were suggestive and positive for conscientiousness and industriousness, and suggestive and negative for compassion, politeness, and enthusiasm.

In sum, for the combined sample Tables 2 through 9 show no statistically significant but three suggestive personality-as-antecedent-to-values change cross-lag coefficients. These tables show four statistically significant and ten suggestive values-antecedent-to-personality-change coefficients. One coefficient survives FWE-correction ($\alpha = .05$; vertical individualism proceeding compassion), and three coefficients survive FDR-correction ($q = .05$; vertical individualism proceeding compassion, intellect, and the BFAS openness; see supplementary materials). It would thus be difficult to conclude that changes in values are systematically

downstream of personality attributes (rather than the other way around) as an essentialist trait theory would predict.

Discussion

The current study explored the reciprocal contributions of Big Five/Six personality traits and value-priorities that contrast self-interest with broader concerns in a longitudinal sample tested annually on four occasions. These analyses allow us to explore this type of value priorities as a source[4] of personality change in adulthood. Theories involving essentialist trait concepts such as Five Factor Theory would posit that personality will affect values over time, but values cannot influence personality. Our results present a different picture, with more significant or suggestive effects for values impacting downstream personality scores, as compared to personality traits preceding change in values scores. These results match a common-sense view of motivation and behavior, in which value-priorities should be upstream, influencing the behavioral patterns captured by personality trait measures. They are also consistent with Dweck (2017), with value priorities, as a form of motivation, influencing behavior by shaping goals and mental representations. However, the results do not provide a strong counter claim to Five Factor Theory, as overall the cross-lagged associations were small, and a trait essentialist could argue that the influence of traits on values will have already been solidified and thus would not be apparent in a relatively short longitudinal design.

The specific influences of values on personality were consistent with our expectations

[4] This research was motivated by a causal theory, and we attempt in this discussion to be transparent about that. Although the study was not a randomized trial, longitudinal observational designs and analyses like that presented here are intended to draw inferences about causality, with awareness of assumptions and limitations. As Hernán (2018) argues, avoiding causal language entirely forces authors of observational studies to be euphemistic or roundabout about their goals, which generates confusion.

that higher scores on self-focused (immature, materialistic) values would precede and predict unfavorable change in personality traits. Our most robust effects, those that achieved statistical significance at the $p < .005$ level, included vertical individualism preceding lower compassion, intellect and BFAS openness, and higher mature values index scores preceding higher BFAS openness. At the suggestive ($p < .05$) level, higher unmitigated self-interest preceded lower conscientiousness, higher vertical individualism preceded higher volatility, higher mature values preceded higher honesty/propriety and politeness, higher horizontal collectivism preceded higher orderliness, agreeableness (B6), and assertiveness and lower intellect, and higher horizontal individualism preceded lower withdrawal. In two of three cases, suggestive personality-as-antecedent-of-values-change effects were reciprocal with the above noted values-effects: higher conscientiousness scores reciprocally preceded lower unmitigated self-interest, and higher volatility higher vertical individualism. No significant or suggestive "stand-alone", non-reciprocal personality on values effects were found.

The relation between mature values and openness is unsurprising, given May's emphasis on creativity and broad-mindedness. That higher mature values scores preceded higher honesty/propriety and politeness is also consistent, given the emphasis on generosity, empathy, and unselfishness. However, contrary to May's theoretical formulation forged from a career as a psychotherapist, there were not strong associations with neuroticism and its aspects. This is consistent with meta-analytic results indicating a lack of association between neuroticism and the Schwartz values (Fischer & Boer, 2015; Parks-Leduc et al., 2015), from which stimuli our mature values index was scored. While the cross-lag associations were in the expected directions, they were only large enough to reach thresholds for statistical significance in the case of vertical individualism with volatility. It is conceivable that early psychologists, like May and

others of the existentialist-humanist tradition sometimes valued openness to the extent that they took it to indicate psychological health (e.g., Miller, 1991). However, while this trait is related to interest in psychotherapy (Miller, Pilkonis, & Mulvey, 2006; Soldz & Vaillant, 1999) and personal development and growth generally (DeYoung, Peterson & Higgins, 2005) it does not appear to be related to psychological disorders (e.g., Kotov et al., 2010; Malouff, Thorsteinsson, & Schutte, 2005).

An additional expectation was that collectivism would lead to downstream effects on traits related to social self-regulation, and individualism with traits related to dynamism. Consistent with this, vertical individualism preceded lower compassion and higher volatility, but it also predicted lower openness and intellect, suggesting that these aspects of dynamism are not increased by a competitive, individualistic point of view. Interest in being an original, curious, inventive deep thinker, with aesthetic and artistic aspirations, may be crowded out when one is focused on out-competing others. And while horizontal collectivism preceded higher social self-regulation-related traits like orderliness and agreeableness (B6) and lower dynamism-related intellect, it also, more surprisingly preceded the dynamic trait of assertiveness.

It is of interest that mature values – a composite variable lacking standard psychometric strengths – plays a salient role in these results, as a predictor of personality change and one that captures some variation in effects across the adult lifespan. This suggests the utility of composite measures in prediction. It also underlines the potential of hypotheses drawn from existential psychology.

Note that the strongest relations in Tables 2 to 9 are those between the latent intercepts. This implies that the relations between values and personality traits were in many ways pre-existing, rather than being reciprocally caused by each other's dynamic perturbations. This is

consistent with the idea that though there is some change over the lifespan, personality traits and values are characteristics that spring from similar, early developmental sources. The most robust of these (significant at the $p < .005$ level) included positive associations between the conscientiousness scales, including industriousness and in one case orderliness, with collectivism scales. Orderliness was also positively associated with higher materialism and lower mature values. Higher honesty/propriety, agreeableness (B6), compassion, and politeness were all associated with lower unmitigated self-interest, vertical individualism, materialism, and financial aspirations (plus horizontal individualism in the case of agreeableness) and with higher mature values and collectivism. Neuroticism, volatility and/or withdrawal were positively associated with financial aspirations and materialism but negatively with vertical individualism and horizontal collectivism. Higher openness, intellect and/or BFAS openness were associated with lower unmitigated self-interest, vertical individualism, financial aspirations, and materialism, and higher mature values, horizontal collectivism and horizontal individualism. Extraversion was positively associated with horizontal collectivism and financial aspirations, assertiveness with both individualism scales, and enthusiasm with financial aspirations and both collectivism scales.

It is important to consider how our results, especially our finding that values variables had a stronger downstream impact on personality traits than vice versa, have to do with the specific type of ethically-relevant values we measured, rather than to values as a general class. Fetvadjiev and He (2018) and Vecchione and colleagues (2018) both instead reported greater longitudinal impacts of traits on values. However, both these studies used broad measures of values, Rokeach's in the former and the Schwartz scale in the latter. While the mature values index is made of items from these scales (though seven of its 17 items are not in the Rokeach survey), this index intentionally includes content from the two dimensions these broader scales

contrast: both self-determination and self-transcendence. May's theory suggested the benefits, though not the typicality, of embracing elements of both domains. It is even harder to compare the broad Rokeach and Schwartz values scales to the other indicators used in the current study. Unlike these recent European studies, we did not plan this project as a comprehensive assessment of the relation of all values to personality change; we instead sought to test a more specific hypothesis about the role of ethics-relevant values, a hypothesis which received some support from the findings reported here. Morally relevant values may reflect a channel of cultural socialization toward what society considers proper behavior well into adulthood. This may not be true for other types of values, some of which simply contrast different interests.

One interesting point of convergence between our studies involves the personality traits that Vecchione and colleagues (2018) observed as being predictors of values change. In their results, high agreeableness predicted an increase in benevolence values, and high openness an increase in self-direction values. Our findings were that aspects of personality related to agreeableness and openness were the ones most affected downstream by the ethically-relevant values variables we studied. These two personality dimensions may be more values-related or values-responsive than other Big Five dimensions.

A limitation of the current study true to most observational research, is the possibility that both contemporaneous and lagged effects are driven by unobserved variables, for example, changes in income. In the case of lagged effects, it is possible that a change in an unobserved variable first has consequences for a more malleable variable (e.g., a value) and also, later on, for a less malleable variable (e.g., a personality dimension). Another limitation was the short time-frame. Although the study covered the full range of adulthood, each subject was only followed for three years. A longer period would be ideal to capture the small but potentially steady change

and development that occurs in both value priorities and personality traits over the life course. A longer study period would also better allow for the disentangling of cohort from age effects.

Conclusion

This study explored a set of value priorities relevant to ethical behavior as predictors of change in Big Five and Big Six personality traits in a national sample of adults. Contrary to an essentialist trait perspective, personality attributes did not have more downstream influence on values than vice-versa. Instead higher scores on broader-scoped, as opposed to self-focused (immature, materialistic), values preceded and predicted favorable change in personality traits in terms of increased openness, honesty/propriety, conscientiousness and agreeableness and its aspects, and decreased volatility and withdrawal.

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Table 1

Values Scales Items, Descriptive Statistics, Retest Correlations, and Correlations with Age and Gender at Time 1

	Min	Max	*M*	*SD*	α	r_{retest}	$r_{t1,t4}$	r_{age}	r_{female}
Unmitigated Self-Interest	0	87.5	28.9	16.2	.67	.78	.73	**-.19**	-.07
The pleasures of the senses are the highest good									
People ought to be motivated by something beyond their own self-interest									
Nonmaterial attributes are more important than outward beauty									
Worldly possessions are the greatest good and the highest value in life									
There is a higher good than the pleasures of the senses									
The self is the only reality									
Materialism	0	100	39.8	2.1	.80	.78	.70	**-.16**	-.03
I would be happier if I could afford to buy more things									
I believe that one of the most important achievements in life involves acquiring material possessions									
I believe that the things I own say a lot about how well I'm doing in life									
I don't pay much attention to the material objects other people own									
I put less emphasis on material objects than most people									
I don't place much emphasis on the amount of material objects that people own as a sign of their success									
Financial Aspirations	0	100	48.5	22.2	.80	.79	.73	-.06	-.05
You will buy things just because you want them									
You will be financially successful									
You will be your own boss									
You will have a job with high social status									
You will have a job that pays well									
Mature Values[1]	3.45	91.9	61.7	8.4	-	.81	.75	**.10**	**.17**
Self- Transcendence									
Mature love (deep emotional and spiritual intimacy)									
A world of beauty (beauty of nature and the arts)									
Wisdom (a mature understanding of life)									
Unity with nature (fitting into nature)									
Being honest (genuine, sincere)									
Being helpful (working for the welfare of others)									
(-) Social power (control over others, dominance)									
(-) Pleasure (gratification of desires)									

(-) Wealth (material possessions, money)									
(-) A comfortable life (a prosperous life)									
Self-determination									
Creativity (uniqueness, imagination)									
Freedom (freedom of action and thought)									
Meaning in life (a purpose in life)									
Choosing own goals (selecting own purposes)									
(-) Preserving my public image (protecting my face)									
(-) Social recognition (respect, approval by others)									
(-) Being obedient (dutiful, meeting obligations)									
Vertical Individualism	0	100	47.2	19.3	.65	.71	.64	**-.15**	**-.16**
It is important that I do my job better than others									
Winning is everything									
Competition is the law of nature									
When another person does better than I do, I get tense and aroused									
Vertical Collectivism	6.25	100	71.5	18.1	.67	.72	.70	**.12**	.03
Parents and children must stay together as much as possible									
It is my duty to take care of my family, even when I have to sacrifice what I want									
Family members should stick together, no matter what sacrifices are required									
It is important to me that I respect the decisions made by my groups									
Horizontal Collectivism	6.25	100	72.2	17.1	.71	.73	.68	**.20**	**.09**
If a coworker got a prize, I would feel proud									
The well-being of my coworkers is important to me									
To me, pleasure is spending time with others									
I feel good when I cooperate with others									
Horizontal Individualism	18.75	100	74.5	15.8	.56	.59	.54	-.06	.01
I'd rather depend on myself than others									
I rely on myself most of the time; I rarely rely on others									
I often do my own thing									
My personal identity, independent of others, is important to me									

Note. *N*=862-864. All scales were rescaled to percent of maximum possible (POMP), giving scores a possible range of 0 to 100 (Cohen, Cohen, Aiken, & West, 1999). Minimum, maximum, mean, standard deviation, and age and gender correlations are at Time 1. mir = mean inter-item correlation, vir = variance of inter-item correlations, both are measures of unidimensionality (Clark &

Watson, 1995). r_{retest} is an average of retest correlations between years 1 and 2, 2 and 3, and 3 and 4. $r_{t1,t4}$ is the Time 1 to Time 4 retest correlation. For correlations with age and gender, bolding indicates $p < .01$.

[1] This scale was scored by averaging the 10 forward-keyed and the 7 reverse-keyed items separately, then transforming each into percent of maximum possible (POMP) scores. These two subscales were then averaged for the final scale. The alpha and mean and variance of inter item correlation values, however, were calculated on the full set of items entered as a single group. Note also that alpha is not a valid measure of reliability if the scale is not unidimensional.

Table 2
*Cross-Lagged Associations and Growth-Curve Intercept Correlations Between **Unmitigated Self-Interest** and Personality scales*

Scale	P→ V	SE	V → P	SE	$r_{Iv,Ip}$
Conscientiousness [BFI]	**-.10**	.04	**-.09**	.04	.06
Industriousness [BFAS]	-.03	.04	.01	.04	.10
Orderliness [BFAS]	-.04	.04	-.07	.04	.11
Honesty/Propriety [BFI]	-.03	.04	-.07	.04	**-.34***
Agreeableness(B6) [BFI]	.06	.03	-.05	.04	**-.26***
Compassion [BFAS]	.00	.04	-.02	.04	**-.47***
Politeness [BFAS]	.04	.04	-.03	.03	**-.33***
Neuroticism [BFI]	-.05	.03	.05	.04	.03
Volatility [BFAS]	-.03	.05	.08	.05	**.12**
Withdrawal [BFAS]	-.03	.03	-.01	.04	.04
Extraversion [BFI]	.01	.04	.01	.04	**.14**
Assertiveness [BFAS]	-.03	.04	-.03	.04	.11
Enthusiasm [BFAS]	.03	.04	.01	.03	-.01
Openness [BFI]	-.04	.06	-.04	.03	**-.25***
Intellect [BFAS]	-.01	.04	-.05	.03	**-.25***
Openness [BFAS]	-.02	.05	-.06	.04	**-.27***

Note. Time 1 *N* =853-856. Subsequent waves include fewer observations; exact *N*s detailed in supplement. P→V = coefficient for regression of values score on previous wave personality score; V→P = coefficient for regression of personality score on previous wave values score. $r_{Iv,Ip}$ = between person intercept correlation. Bolding indicates $p < .05$. *$p < .005$.

Table 3

*Cross-Lagged Associations and Growth-Curve Intercept Correlations Between **Vertical Individualism** and Personality scales*

Scale	P→ V	SE	V → P	SE	$r_{Iv,Ip}$
Conscientiousness [BFI]	.04	.06	.02	.03	.00
Industriousness [BFAS]	.01	.05	.03	.03	.02
Orderliness [BFAS]	.04	.06	-.01	.03	.06
Honesty/Propriety [BFI]	.02	.06	-.02	.03	**-.39***
Agreeableness(B6) [BFI]	-.01	.05	.00	.03	**-.35***
Compassion [BFAS]	.00	.06	**-.08***	.02	**-.38***
Politeness [BFAS]	-.01	.06	**-.09***	.03	**-.50***
Neuroticism [BFI]	.03	.05	.05	.03	**.05***
Volatility [BFAS]	**.11**	.05	**.10**	.04	**.17**
Withdrawal [BFAS]	.00	.04	-.02	.03	.09
Extraversion [BFI]	.03	.06	.01	.03	**.11**
Assertiveness [BFAS]	.02	.05	.00	.03	**.18***
Enthusiasm [BFAS]	.05	.06	.01	.03	-.10
Openness [BFI]	-.03	.07	**-.06**	.03	-.10
Intellect [BFAS]	-.10	.06	**-.08***	.02	-.06
Openness [BFAS]	**-.17**	.06	**-.09***	.03	**-.21***

Note. Time 1 N =853-856. Subsequent waves include fewer observations; exact Ns detailed in supplement. P→V = coefficient for regression of values score on previous wave personality score; V→P = coefficient for regression of personality score on previous wave values score. $r_{Iv,Ip}$ = between person intercept correlation. Bolding indicates $p < .05$. *$p < .005$.

Table 4

*Cross-Lagged Associations and Growth-Curve Intercept Correlations Between **Materialism** and Personality scales*

Scale	P→ V	SE	V → P	SE	$r_{Iv,Ip}$
Conscientiousness [BFI]	-.01	.05	-.01	.03	-.08
Industriousness [BFAS]	.07	.05	.03	.03	-.07
Orderliness [BFAS]	-.06	.06	-.04	.03	**.17***
Honesty/Propriety [BFI]	-.05	.05	-.06	.03	**-.35***
Agreeableness(B6) [BFI]	-.04	.05	-.05	.04	**-.36***
Compassion [BFAS]	-.02	.06	-.03	.03	**-.35***
Politeness [BFAS]	-.01	.05	-.02	.03	**-.34***
Neuroticism [BFI]	-.02	.04	.03	.03	**.18***
Volatility [BFAS]	-.03	.04	.06	.03	**.27***
Withdrawal [BFAS]	-.01	.05	.00	.03	**.23***
Extraversion [BFI]	-.06	.07	-.02	.03	.06
Assertiveness [BFAS]	-.01	.06	-.02	.03	-.01
Enthusiasm [BFAS]	-.01	.06	-.01	.03	-.04
Openness [BFI]	.10	.07	-.03	.03	**-.23***
Intellect [BFAS]	-.03	.06	-.01	.03	**-.26***
Openness [BFAS]	-.10	.06	-.01	.03	**-.25***

Note. Time 1 N =853-856. Subsequent waves include fewer observations; exact Ns detailed in supplement. P→V = coefficient for regression of values score on previous wave personality score; V→P = coefficient for regression of personality score on previous wave values score. $r_{Iv,Ip}$ = between person intercept correlation. Bolding indicates $p < .05$. *$p < .005$.

Table 5

*Cross-Lagged Associations and Growth-Curve Intercept Correlations Between **Financial Aspirations** and Personality scales*

Scale	P→ V	SE	V → P	SE	$r_{Iv,Ip}$
Conscientiousness [BFI]	.02	.04	-.05	.04	-.05
Industriousness [BFAS]	.05	.04	-.06	.05	-.02
Orderliness [BFAS]	.01	.04	-.04	.04	.11
Honesty/Propriety [BFI]	-.05	.03	-.05	.05	**-.40[a]**
Agreeableness(B6) [BFI]	-.02	.03	-.04	.06	**-.39[a]**
Compassion [BFAS]	.02	.03	-.07	.04	**-.58[a]**
Politeness [BFAS]	0	.04	-.06	.04	**-.43[a]**
Neuroticism [BFI]	0	.03	.09	.05	.01
Volatility [BFAS]	-.01	.03	.08	.06	**.17[a]**
Withdrawal [BFAS]	0	.03	.01	.05	.09
Extraversion [BFI]	.01	.04	-.03	.05	.05
Assertiveness [BFAS]	.04	.04	-.09	.05	.08
Enthusiasm [BFAS]	.01	.04	-.03	.05	**-.18[a]**
Openness [BFI]	.04	.05	-.04	.04	**-.17[a]**
Intellect [BFAS]	.01	.04	-.02	.04	**-.18[a]**
Openness [BFAS]	.01	.04	-.06	.04	**-.27[a]**

Note. Time 1 N =853-856. Subsequent waves include fewer observations; exact Ns detailed in supplement. P→V = coefficient for regression of values score on previous wave personality score; V→P = coefficient for regression of personality score on previous wave values score. $r_{Iv,Ip}$ = between person intercept correlation. Bolding indicates $p < .05$. *$p < .005$.

Table 6

*Cross-Lagged Associations and Growth-Curve Intercept Correlations Between **Mature Values Index** and Personality scales*

Scale	P→ V	SE	V → P	SE	$r_{Iv,Ip}$
Conscientiousness [BFI]	.03	.02	.13	.08	-.05
Industriousness [BFAS]	.00	.02	.10	.08	-.02
Orderliness [BFAS]	.01	.02	.01	.08	**-.19***
Honesty/Propriety [BFI]	.01	.02	**.21**	.09	**.34***
Agreeableness(B6) [BFI]	.01	.02	.17	.09	**.30***
Compassion [BFAS]	-.01	.02	.16	.08	**.54***
Politeness [BFAS]	-.01	.02	**.16**	.08	**.38***
Neuroticism [BFI]	.02	.01	-.14	.09	-.02
Volatility [BFAS]	-.01	.02	-.11	.10	**-.12**
Withdrawal [BFAS]	-.01	.02	.04	.08	-.06
Extraversion [BFI]	-.02	.02	.03	.08	-.08
Assertiveness [BFAS]	.01	.02	.09	.08	-.00
Enthusiasm [BFAS]	.02	.02	.12	.08	-.06
Openness [BFI]	.00	.03	.09	.07	**.48***
Intellect [BFAS]	.04	.02	.09	.07	**.30***
Openness [BFAS]	.02	.02	**.21***	.07	**.61***

Note. Time 1 N =853-856. Subsequent waves include fewer observations; exact Ns detailed in supplement. P→V = coefficient for regression of values score on previous wave personality score; V→P = coefficient for regression of personality score on previous wave values score. $r_{Iv,Ip}$ = between person intercept correlation. Bolding indicates $p < .05$. *$p < .005$.

Table 7

*Cross-Lagged Associations and Growth-Curve Intercept Correlations Between **Vertical Collectivism** and Personality scales*

Scale	P→ V	SE	V → P	SE	$r_{Iv,Ip}$
Conscientiousness [BFI]	.00	.06	.05	.03	**.21***
Industriousness [BFAS]	.05	.06	.03	.03	**.24***
Orderliness [BFAS]	.07	.07	.01	.03	**.20***
Honesty/Propriety [BFI]	.01	.06	.02	.03	**.26***
Agreeableness(B6) [BFI]	.07	.05	.03	.03	**.25***
Compassion [BFAS]	.03	.06	.00	.03	**.30***
Politeness [BFAS]	-.02	.06	.02	.03	**.38***
Neuroticism [BFI]	-.01	.05	.00	.04	-.08
Volatility [BFAS]	.03	.05	.04	.04	-.11
Withdrawal [BFAS]	-.03	.05	-.03	.03	-.05
Extraversion [BFI]	-.06	.06	.00	.04	.12
Assertiveness [BFAS]	-.03	.06	.02	.03	.06
Enthusiasm [BFAS]	.06	.06	.05	.03	**.25***
Openness [BFI]	-.02	.06	.02	.03	-.04
Intellect [BFAS]	.00	.06	-.01	.03	-.01
Openness [BFAS]	.00	.07	.00	.03	.05

Note. Time 1 N =853-856. Subsequent waves include fewer observations; exact Ns detailed in supplement. P→V = coefficient for regression of values score on previous wave personality score; V→P = coefficient for regression of personality score on previous wave values score. $r_{Iv,Ip}$ = between person intercept correlation. Bolding indicates $p < .05$. *$p < .005$.

Table 8

*Cross-Lagged Associations and Growth-Curve Intercept Correlations Between **Horizontal Collectivism** and Personality scales*

Scale	P→ V	SE	V → P	SE	$r_{Iv,Ip}$
Conscientiousness [BFI]	.04	.05	.07	.04	**.30***
Industriousness [BFAS]	.02	.04	.04	.04	**.32***
Orderliness [BFAS]	.08	.05	**.08**	.03	**.14**
Honesty/Propriety [BFI]	.02	.05	.06	.04	**.40***
Agreeableness(B6) [BFI]	.06	.04	**.08**	.04	**.58***
Compassion [BFAS]	.08	.05	.03	.04	**.61***
Politeness [BFAS]	.05	.05	-.01	.04	**.51***
Neuroticism [BFI]	-.04	.04	-.06	.04	**-.26***
Volatility [BFAS]	.03	.04	.00	.04	**-.36***
Withdrawal [BFAS]	-.03	.04	-.04	.04	**-.30***
Extraversion [BFI]	.03	.05	.05	.04	**.31***
Assertiveness [BFAS]	.06	.05	**.08**	.04	**.13**
Enthusiasm [BFAS]	.05	.05	.05	.04	**.53***
Openness [BFI]	.02	.06	.07	.04	**.15**
Intellect [BFAS]	-.09	.05	**-.06**	.03	**.13**
Openness [BFAS]	-.01	.05	.04	.03	**.24***

Note. Time 1 N =853-856. Subsequent waves include fewer observations; exact Ns detailed in supplement. P→V = coefficient for regression of values score on previous wave personality score; V→P = coefficient for regression of personality score on previous wave values score. $r_{Iv,Ip}$ = between person intercept correlation. ΔAIC = difference in AIC between constrained (across age) and unconstrained (for two age groups) models. Bolding indicates $p < .05$. *$p < .005$.

Table 9

*Cross-Lagged Associations and Growth-Curve Intercept Correlations Between **Horizontal Individualism** and Personality scales*

Scale	P→ V	SE	V → P	SE	$r_{Iv,Ip}$
Conscientiousness [BFI]	.02	.05	.06	.03	**.16**
Industriousness [BFAS]	.03	.05	.04	.03	**.16**
Orderliness [BFAS]	.06	.05	-.01	.03	.12
Honesty/Propriety [BFI]	-.04	.05	-.01	.03	-.06
Agreeableness(B6) [BFI]	-.01	.04	-.00	.03	**-.21***
Compassion [BFAS]	-.04	.05	.03	.03	**-.12**
Politeness [BFAS]	.03	.05	-.03	.03	**-.14**
Neuroticism [BFI]	-.05	.04	-.05	.03	-.01
Volatility [BFAS]	-.00	.04	.01	.04	.03
Withdrawal [BFAS]	-.05	.04	**-.06**	.03	-.04
Extraversion [BFI]	.03	.05	-.01	.03	.07
Assertiveness [BFAS]	.06	.05	.02	.03	**.20***
Enthusiasm [BFAS]	.06	.05	.01	.03	**-.15**
Openness [BFI]	-.02	.06	-.00	.03	**.22***
Intellect [BFAS]	.00	.06	.02	.03	**.24***
Openness [BFAS]	-.05	.06	-.02	.02	**.17***

Note. Time 1 N =853-856. Subsequent waves include fewer observations; exact Ns detailed in supplement. P→V = coefficient for regression of values score on previous wave personality score; V→P = coefficient for regression of personality score on previous wave values score. $r_{Iv,Ip}$ = between person intercept correlation. Bolding indicates $p < .05$. *$p < .005$.

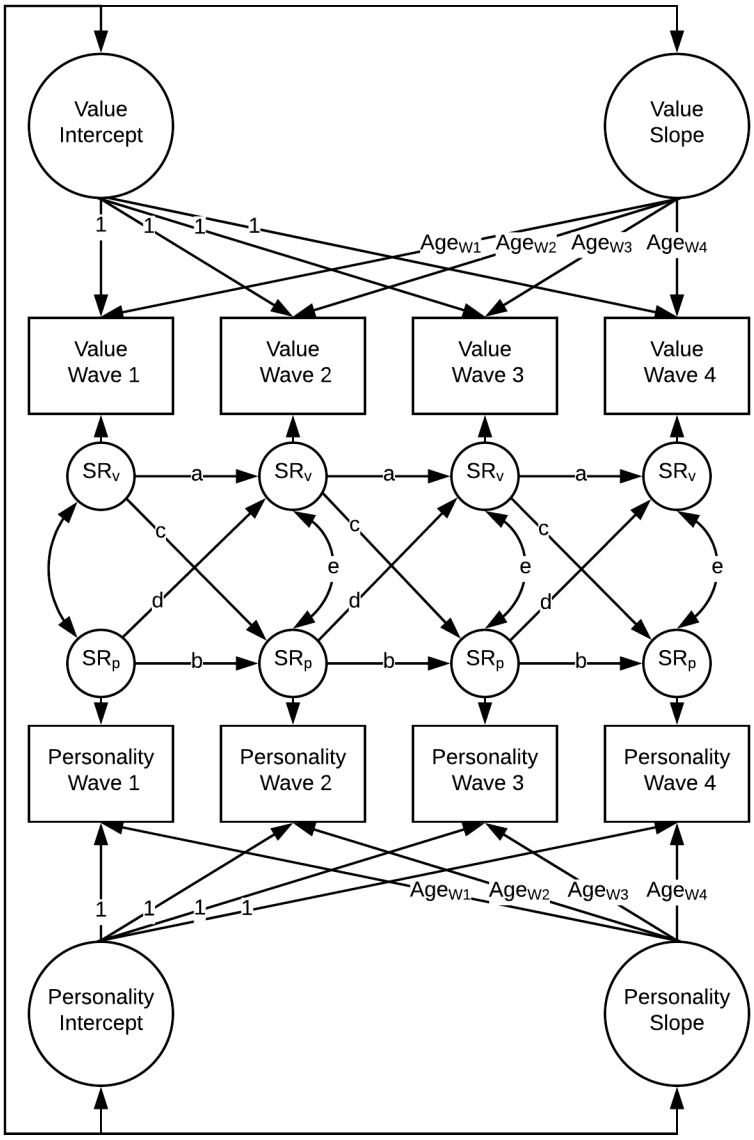

Figure 1. Diagram representing the Latent Curve Model with Structured Residuals. Manifest variables are computed scale scores for each value and personality variable. Latent structured residual factors (SR) have loadings fixed to 1. Autoregressive paths are fixed to be equal between waves for the value (a) and personality (b) variables. Cross lagged paths are also fixed to equality both for personality SRs regressed on value SRs (c) and value SRs regressed on personality SRs (d). The within-wave correlations of SR residuals are fixed to equality for the last three waves (e).