Personality Development in Adulthood:
The Role of Life Transitions, Goals to Change Personality, and Momentary Processes

Inauguraldissertation
zur Erlangung des Akademischen Grades des

Doctor philosophiae (Dr. phil.)

Vorgelegt dem Fachbereich 02 – Sozialwissenschaften, Medien und Sport
der Johannes Gutenberg-Universität
Mainz

von

Martin Quintus
(M.Sc. Psychologie)

aus Kassel

Mainz
2019

Danksagung

Die Danksagung wurde aus Datenschutzgründen aus dieser elektronischen Fassung entfernt.

Table of Contents

List of Tables

List of Figures

Abstract

Although research on personality development has successfully determined patterns of both continuity and change across the life span, less is known about underlying factors and processes. To address these research gaps, the current dissertation examined two potentially relevant macro-analytical factors as well as a set of theoretically suggested micro-analytical processes. Regarding the first macro-analytical factor, previous research suggested that environmental factors and especially life transitions might substantially contribute to personality development. Less pronounced trait changes observed in older adults might consequently result from more stable environmental contexts (i.e., less life transitions). Accordingly, if younger and older adults experience a similar life transition, both age groups should exhibit comparable trait changes. However, such a strong test for the importance of environmental factors in personality development is still missing. Regarding the second macro-analytical factor, recent research has highlighted that people may volitionally contribute to their personality development by setting and pursuing goals to change traits. Yet, a comprehensive examination of factors that contribute to people's change goals is currently missing. In addition, previous research provided contradicting results on whether change goals indeed manifest in actual trait changes and hardly examined goal properties (e.g., importance or feasibility) that may foster a successful goal pursuit. Finally, the recently proposed TESSERA framework (Wrzus & Roberts, 2017) provides specific suggestions on micro-analytical processes of personality development. However, this framework is still awaiting a first empirical evaluation.

To tackle this comprehensive agenda, a multi-method measurement burst study was conducted. Across a total of two years, 382 younger (n = 255, M_{age} = 21.57 years) and older adults (n = 127, M_{age} = 67.76) who partly engaged in the transition to college, completed up to four comprehensive assessments of self-rated, other-rated and implicitly measured Big Five

traits as well as self-rated change goals. In addition, in-between the first three assessments, momentary processes were assessed in multiple daily diary waves across up to 50 days.

Results showed that, as expected, younger and older adults who experienced a similar life transition (i.e., the transition into college) hardly differed in the development of self-rated, other-rated or implicitly measured traits. In addition, findings indicated that older adults who engaged in college life experienced somewhat different patterns of personality development than people who did not engage in this transition. Moreover, trait changes were in part more pronounced at the beginning of a life transition (i.e., in freshmen). Regarding volitional personality development, results show that primarily current Big Five trait levels contributed to people's change goals and that change goals were strongest when both self- and other-ratings agreed on low current trait levels. Unexpectedly, findings suggested that change goals hardly manifest in actual changes in self-rated or implicitly measured traits. However, some support was found that higher importance and feasibility of change goals might indeed foster a successful goal pursuit. Finally, regarding micro-analytical processes of personality development, results showed that momentary processes can be generalized in terms of repeated sequences of triggering situations, expectancies, states, and reactions as suggested by the TESSERA framework (Wrzus & Roberts, 2017). In addition, self-rated and partly implicitly measured traits but hardly any change goals were linked with experiencing according momentary situations and states. Unexpectedly, merely momentary states but hardly any reflective or associative processes contributed to long-term trait development.

The current findings underline the importance of environmental factors for personality development across the life span. Specifically, by requiring people to invest in new or altered social roles, the experience of usually age-graded life transitions (e.g., experiencing college in young adulthood) may underlie different patterns of personality development in younger and older adults. Furthermore, although change goals seem to reflect more than a response bias or the mere desirability of higher trait levels, future research is needed to examine whether volitional personality development is possible without psychological assistance and which further conditions need to be met (e.g., goals specificity, goal commitment) for a successful goal pursuit. Finally, the current dissertation provides first but encouraging findings in support of central propositions of the TESSERA framework (Wrzus & Roberts, 2017). Yet future research is needed to further examine the relevance of reflective and associative processes in personality development.

Chapter I:

General Introduction

„Es gab keine, keine, keine Pflicht für erwachte Menschen als die eine: sich selbst zu suchen, in sich fest zu werden, den eigenen Weg vorwärts zu tasten, einerlei wohin er führte […] Ich war nicht da, um zu dichten, um zu predigen, um zu malen, weder ich noch sonst ein Mensch war dazu da. Das alles ergab sich nur nebenher. Wahrer Beruf für jeden war nur das eine: zu sich selbst zu kommen.“ (Hesse, 1919/1974, p. 150)

Already a brief glance at the world literature reveals that the question of why and under which circumstances people develop their personality has been discussed with large interest for hundreds of years, especially in coming-of-age novels (see Hesse, 1919/1974; Keller 1855/2008; Goethe, 1796/1986; Wieland, 1767/1986). For example, in Hermann Hesse's narrative “Demian”, the personality development of his first-person narrator Emil Sinclair is stimulated by repeated encounters with his mentor and friend Max Demian who inter alia encourages Sinclair to perceive various transitions in his life (e.g., transition to secondary school, a romantic relationship or military service) as an opportunity for his own development. Demian also challenges Sinclair to self-regulate his development by independently forming ethical standards and living by his own convictions. Moreover, in his short story “die unwürdige Greisin”, Bertolt Brecht (1949) illustrates that personality development is still possible in older age. Having lived the first part of her life merely in the roles of being a daughter, wife and mother, his main character, the 72-year-old Madam B., actively decides to give her last years a completely different direction by engaging in new social and cultural activities after the death of her husband.

However, taking a more systematic and empirical approach towards personality development, research nowadays has agreed that on average, personality development across the life-span follows somewhat universal patterns with changes in personality being most pronounced in younger age and less pronounced in older age (Lucas & Donnellan, 2011; Roberts, Walton, & Viechtbauer, 2006a). Yet, little is known about both macro-analytical factors and micro-analytical processes that contribute to these patterns of personality development. Within the current dissertation, macro-analytical factors are understood as more broad and long-term conditions under which personality development could be initiated or catalyzed (e.g., life transitions or goals to change one's traits). In turn, micro-analytical processes are understood as sequences of more specific, short-term experiences (e.g., the experience of certain situations or states) that may finally manifest in continuity or change of personality (for discussions regarding macro- and micro-analytical perspectives on personality development, see Baumert et al., 2017; Geukes, van Zalk, & Back, 2017; Levinson, 1986; Wrzus & Roberts, 2017). Specifically, as already suggested by Hermann Hesse and Bertolt Brecht, research on macro-analytical factors has repeatedly linked environmental factors and especially life transitions with personality development across the lifespan (for an overview, see Bleidorn, Hopwood, & Lucas, 2016). However, to determine whether the above described age differences in personality development result from a higher stability of context in older age (i.e., fewer experienced life transitions) or from a higher stability of personality per se, a similar life transition has to be compared in different age groups. In addition, just like Sinclair, people may want to actively take part in their own personality development, for example by setting goals to change themselves. With research on such volitional personality development being still in its infancy, it needs to be clarified why people want to change themselves and whether such change is indeed possible. Finally, it remains largely unclear which micro-analytical processes underlie personality development. Although theoretical models like the TESSERA framework (Wrzus & Roberts, 2017) provide sensible suggestions on momentary processes of personality development, empirical research that actually tests these suggestions remains scarce.

To provide an easier access to these different aspects of personality development, the following general introduction will first provide a brief introduction to personality traits and their assessment, and explain current knowledge on personality development across the lifespan. Then, the importance of environmental factors and volitional aspects for personality development will be highlighted. Thereafter, potentially relevant momentary processes of personality development as suggested by the TESSERA framework (Wrzus & Roberts, 2017) will be introduced. Finally, this dissertation's research questions will be briefly summarized.

1.1 Personality Traits and their Assessment

At the heart of personality psychology stands the idea that people differ systematically in terms of personality traits (Cattell, 1943, 1946; Stern, 1911). Personality traits refer to an individual's relatively enduring patterns of behavior, thoughts, and feelings (Allport, 1966; Kandler, Zimmermann, & McAdams, 2014; McCrae & Costa, 2008; Roberts, Wood, & Caspi, 2008). Although such patterns can cover more specific characteristic adaptations (e.g., attitudes, beliefs, values or self-concepts; DeYoung, 2015; Kandler et al., 2014; McAdams & Pals, 2006; McCrae & Costa, 2008), individual differences in personality are commonly described as more broad core characteristics like the Big Five traits (Costa & McCrae, 1985; Goldberg, 1990; John, Naumann, & Soto, 2008; McCrae & Costa, 2008). Thus, the Big Five taxonomy does not consider to cover all differences in personality, but suggests superordinate levels of a personality hierarchy that can be further subdivided into more narrow and specific traits (Costa & McCrae, 1992; DeYoung, 2015; DeYoung, Quilty, & Peterson, 2007). Resulting from lexical studies and factor analysis, the Big Five taxonomy organizes people's personality in terms of the five superordinate traits openness to experience (e.g., being inventive, widely interested), conscientiousness (e.g., being organized, efficient), extraversion (e.g., being outgoing, assertive), agreeableness (e.g., being empathic, cooperative) and emotional stability (i.e., the inverse of neuroticism, reflecting being calm, not easily upset; John et al., 2008, see also Costa & McCrae, 1992; John & Srivastava, 1999).

Importantly, Big Five traits are not directly observable, but have to be inferred from different data sources like self- and other-ratings, implicit measures, behavioral observation or biological functioning (Rauthmann, 2017; Roberts & Wood, 2006; Wrzus, Quintus, &

Baumert, 2017b). The most common way to assess Big Five traits is to simply ask people to rate themselves (Back & Nestler, 2016; Wrzus et al., 2017b). Although such self-ratings are easy to implement and provide valid and unique information about people's personalities (e.g., due to their access to many trait-relevant behavior, thoughts or feelings; McDonald, 2008; Paulhus & Vazire, 2007), they suffer from several drawbacks. For example, people's self-ratings may be biased by processes of self-enhancement, self-presentation or consistency seeking (Back & Vazire, 2012; Kwan, John, Kenny, Bond, & Robins, 2004; Paulhus & Vazire, 2007). Also, self-ratings may suffer from people's introspective limitations to access impulsive mental or behavioral facets of their personality (Back & Nestler, 2016; Rauthmann, 2017). Other-ratings (i.e., people's reputations) may now complement people's self-ratings with unique, accurate, and incrementally useful information (Vazire, 2006; Vazire & Carlson, 2011; Vazire & Mehl, 2008). However, other-ratings may be based on less information and may suffer from biases, too (e.g., enhancement bias, fundamental attribution error; McDonald, 2008). Yet, collectively, both self- and other-ratings provide complementary insights into people's explicit (i.e., conscious or controlled) representations of traits but they also suffer from similar drawbacks.

In turn, implicit measures assess people's automatic, impulsive, and less controlled representations of traits and should therefore be less prone to the above stated biases and blind spots (see also Back, Schmukle & Egloff, 2009; De Houwer, 2006; Greenwald, McGhee, & Schwartz, 1998; Strack & Deutsch, 2004). Nonetheless, implicit measures still suffer from theoretical (e.g., uncertainty about the assessed content; De Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009; Rothermund & Wentura, 2004; Rothermund, Wentura, & De Houwer, 2005) and methodological (e.g., low retest-reliability and low convergent validity of different implicit measures; Rauthmann, 2017; Schnabel, Asendorpf, & Greenwald, 2008) drawbacks. However, implicit measures have shown to be incrementally useful in the prediction of especially automatic or uncontrolled behavior (Back et al., 2009; Egloff & Schmukle, 2002; Steffens & Schulze König, 2006), suggesting that implicit and explicit trait measures assess similar but distinct aspects of traits (Back & Nestler, 2016; Rauthmann, 2017).

In conclusion, as there is no single measure of people's "true" personality, researchers need to rely on various data sources (e.g., self-reports, other-reports, and implicit measures) to obtain a comprehensive picture of different manifestations of personality. Still, to date, research on personality and especially on personality development has primarily focused on self-rated Big Five traits. To allow for a better understanding of how personality develops across the lifespan, a brief overview on central conceptual ideas and the actual state of research will next be provided.

1.2 Personality Development across the Lifespan

For the conceptualization of personality development, a crucial point in the above stated definition of personality refers to one's interpretation of the "relatively enduring"-aspect of traits. In the past, research often considered personality traits as nearly perfectly enduring after the age of 30, so that development of personality across the entire lifespan was somewhat neglected (i.e., plaster hypothesis; Costa & McCrae, 1994; McCrae et al., 2000; Terracciano, Costa, & McCrae, 2006). Nowadays, there are strong theoretical (see for example Caspi & Moffitt, 1993; Hennecke, Bleidorn, Denissen, & Wood, 2014; Roberts & Wood, 2006) and empirical (see for example Lucas & Donnellan, 2011; Roberts et al., 2006a) arguments that point to a more sophisticated view on personality development and highlight the possibility for both change and continuity. In line with these research progresses, within this dissertation, personality development is understood as a comprehensive term covering both continuity and change (Allemand, Grunenfelder-Steiger, & Hill, 2013; Caspi & Roberts, 2001; Roberts et al., 2008; Wrzus & Lang, 2010; for a discussion of definitions, see Staudinger & Kunzmann, 2005).

At first sight, the idea that personality traits, sometimes even simultaneously, show continuity and change seems contradictory. However, a closer look at different research interests and strategies helps to clarify this idea. For example, researchers may want to investigate whether a population on average increases, decreases or maintains a certain trait-level across time (i.e., mean-level changes; Caspi & Roberts, 2001; Denissen, van Aken, & Roberts, 2011; Roberts et al., 2008). Obviously, not all individuals are perfectly in line with a population's average trait development, so that researchers may also be interested in the amount of individual differences within this trait development. Put differently, it is not only possible to examine a population's average personality development, but also to investigate continuity and change in terms of the relative standing of individuals within a population across time (i.e., rank-order stability; Caspi & Roberts, 2001; Denissen et al., 2011; Roberts et al., 2008). Importantly, continuity and change on the mean-level may be at least partly independent from continuity and change in the rank-order (Denissen et al., 2011; Roberts et al., 2008; Schwaba & Bleidorn, 2017). For example, on average, a populations' conscientiousness may not change across the observed time (i.e., negligible mean-level change across all individuals), but there may be varying trajectories for conscientiousness with some individuals increasing and some decreasing in this trait (i.e., low rank-order stability).

Mean-level changes in personality traits are commonly quantified in terms of standardized mean differences (e.g., Cohen's *d*), average latent slopes (Bollen & Curran, 2006; Duncan, Duncan, & Strycker, 2006) or average latent changes (i.e., latent difference scores; McArdle & Hamagami, 2001; McArdle & Nesselroade, 1994; Steyer, Eid, & Schwenkmezger, 1997) in longitudinal structural equation models (SEM; for advantages and non-technical comparisons of different SEMs, see Jackson & Allemand, 2014; Voelkle & Wagner, 2017). Meta-analytical findings suggest that, on average, conscientiousness, agreeableness and emotional stability increase across the lifespan (Lucas & Donnellan, 2011; Roberts et al., 2006a). In addition, these increases are more pronounced in younger adulthood (Roberts et al., 2006a). Such developmental patterns are often labeled as maturity principle, because increases in conscientiousness, agreeableness and emotional stability may be functional to master developmental tasks and increasing adult responsibilities (Roberts & Wood, 2006; Roberts et al., 2008; D. Wood & Denissen, 2015). However, in older adulthood, these traits seem to decrease again, for example due to physical constraints (Kandler, Kornadt, Hagemeyer, & Neyer, 2015; Mõttus, Johnson, & Deary, 2012; Wortman, Lucas, & Donnellan, 2012). Openness to experiences, however, exhibited a curvilinear pattern comprising increases in the emerging adulthood, followed by a period of stability and then decreases in older adulthood (Roberts et al., 2006a). Finally, two facets of extraversion seem to follow different trends. While social dominance (i.e., dominance and self-confidence in social contexts) increases until middle adulthood and stabilizes afterwards, social vitality (i.e., sociability, gregariousness, positive affect) increases in young adulthood and decreases in older adulthood (Berg & Johansson, 2014; Kandler et al., 2015; Mõttus et al., 2012; Roberts et al., 2006a).

Individual differences in change are usually quantified in terms of rank-order stability (e.g., test-retest correlation) or in terms of variances of latent slopes or latent changes (see for example Lucas & Donnellan, 2011; Roberts & DelVecchio, 2000; Schwaba & Bleidorn, 2017). Meta-analytical findings indicate that rank-order stabilities of Big Five traits follow an inverted U-shaped function (Lucas & Donnellan, 2011; Roberts & DelVecchio, 2000; Wortman et al., 2012). As such, rank-order stability increases across young and middle adulthood and peaks at the age of 40 to 60. This pattern of increasing continuity is often referred to as the cumulative continuity principle (Roberts & Wood, 2006; Roberts et al., 2008). However, in older adulthood, rank-order stability seems to decline again, indicating that in older age, individual differences in change are again comparable with those in younger age (Ardelt, 2000; Kandler et al., 2015). In addition, findings from longitudinal SEMs suggest that there are substantial individual differences (i.e., variances) in change across the entire life-span (Bleidorn, Kandler, Riemann, Angleitner, & Spinath, 2009; Schwaba & Bleidorn, 2017). Supporting results on rank-order stability, individual differences in change were however more pronounced in younger age and somewhat lessened with increasing age (Bleidorn et al., 2009; Schwaba & Bleidorn, 2017).

In sum, there is broad evidence for both continuity and change in personality across the lifespan. However, both mean-level changes and individual differences in changes seem to be more pronounced in younger and older adulthood. Yet, less is known about more macro-analytical factors that contribute to the observed patterns of personality development. Thus, two potentially relevant macro-analytical factors that are currently discussed to contribute to personality development will be outlined next. First, an explanation of the role of environmental factors and especially life transitions for personality development will be given followed by an illustration of the importance of volitional aspects for personality development and a brief review of recent findings therein.

1.3 Environmental Factors may Contribute to Personality Development

As outlined above, in the past, researchers gave little leeway for personality development after the age of 30 (Costa & McCrae, 1994; Terracciano et al., 2006). Within this research tradition, personality development was thought to primarily result from intrinsic, biological maturation (Costa & McCrae, 1994; McCrae & Costa, 2008; McCrae et al., 2000). By now, however, there is a broad consensus in theory and empirical research that both biological and environmental factors contribute to continuity and change in personality (Bleidorn et al., 2016; Bleidorn, Kandler, & Caspi, 2014; Roberts & Wood, 2006; Wrzus & Roberts, 2017). Put simply, biological factors (e.g., genes) seem to be most important in childhood and early adulthood, while the influence of environmental factors increases with age (Bleidorn et al., 2014; Kandler, Bleidorn, Riemann, Angleitner, & Spinath, 2012; Viken, Rose, Kaprio, & Koskenvuo, 1994). Hence, to better understand personality development in adulthood, a closer look at environmental factors provides a promising perspective.

Although environmental factors cover a broad range of potentially relevant variables like cultural (Bleidorn et al., 2013; Ward, Leong, & Low, 2004) or social contexts (Gerstorf et al., 2010; Hartup & Van Lieshout, 1995), especially life transitions seem to contribute to personality development (Bleidorn, 2015; Bleidorn et al., 2016; Hutteman, Hennecke, Orth, Reitz, & Specht, 2014; Roberts, Wood, & Smith, 2005). As such, life transitions refer to time-discrete, but somewhat prolonged transitions that involve major changes in status and/or social roles and require new patterns of behavior, thoughts or feelings (Hopson & Adams, 1976; Luhmann, Hofmann, Eid, & Lucas, 2012; Luhmann, Orth, Specht, Kandler, & Lucas, 2014).[1] In addition, life transitions may offer benchmarks that shape and direct different aspects of people's life (Danish, Smyer, & Nowak, 1980; see also Levinson, 1978). Specifically, life transitions often require people to invest in new social roles that are themselves associated with specific social expectations and behavioral demands (i.e., social investment principle; Roberts et al., 2008; Roberts et al., 2005). Thus, such new social roles may provide a reward structure boosting increases in those traits that help to meet new requirements in people's life (Roberts & Wood, 2006; D. Wood & Roberts, 2006). Consider, for example, the transition into college: To meet both social expectations (e.g., achieving good grades, and new behavioral demands (e.g., preparing courses and exams) linked with the new role of being a student, people may invest in conscientiousness-related behavior (e.g., preparing a work schedule, learn in the library) that in turn may condense in increases in conscientiousness.

Yet, due to biological and/or social constraints, people may not engage in the same life transitions across different ages (J. Heckhausen, 2000; Roberts et al., 2005). Instead, most life

[1] Unfortunately, research does not clearly disentangle the terms life transitions and life events. However, within this dissertation, life transitions are understood as also covering life events but need somewhat longer time periods to unfold (but see, Bleidorn, 2012; Bleidorn et al., 2016; Luhmann et al., 2012).

transitions are tailored to be met within specific ages, requiring people to engage in age-graded social roles (J. Heckhausen, 2000; Roberts et al., 2005). For example, the life transition of entering the first job is expected to be done until the late twenties while people usually become parents before their forties (J. Heckhausen, 2000). Engaging in such normative life transitions and associated age-graded social roles may be one of the driving forces for the development of a mature personality (Bleidorn et al., 2013; Denissen, Ulferts, Lüdtke, Muck, & Gerstorf, 2014; Helson, Mitchell, & Moane, 1984; Roberts et al., 2005). Keeping these social roles may now contribute to continuity in personality in middle and older adulthood (i.e., role continuity principle; Roberts & Wood, 2006; Roberts et al., 2008). As especially normative life transitions are less prevalent in middle and older adulthood, people may more strongly invest in maintaining or deepening their prevailing traits (i.e., identity development principle, see also corresponsive principle; Roberts & Wood, 2006; Roberts et al., 2008).

Since changes in personality traits seem to be more pronounced in younger adulthood (i.e., larger mean-level changes, lower rank-order stability; see for example Lucas & Donnellan, 2011), research focused on life transitions during this life period to identify factors contributing to trait change (for a recent review, see Bleidorn et al., 2016). Thus, research for example showed that the transition to the first romantic partnership was associated with increases in emotional stability, extraversion, and, partly, conscientiousness (Lehnart, Neyer, & Eccles, 2010; Neyer & Lehnart, 2007; Wagner, Becker, Lüdtke, & Trautwein, 2015). Furthermore, when graduating from school or transitioning to college, young adults showed increases in openness, conscientiousness, agreeableness, and emotional stability (Bleidorn, 2012; Lüdtke, Roberts, Trautwein, & Nagy, 2011). Entering vocational training or the first job was in turn associated with increases in conscientiousness (Lüdtke et al., 2011; Specht, Egloff, & Schmukle, 2011). Research on life transitions in middle and older adulthood is less prominent, but indicates that life transitions still contribute to personality change (Bleidorn et al., 2016). For example, research showed that retirement was associated with decreases in conscientiousness and extraversion as well as increases in agreeableness (Löckenhoff, Terracciano, & Costa, 2009; Specht et al., 2011). Taken together, these findings suggest that environmental factors, and especially life transitions, may indeed contribute to personality development across the entire lifespan (i.e., plasticity principle; Caspi & Roberts, 2001; Roberts & Wood, 2006; Roberts et al., 2008; see also Baltes, 1987). Certainly, life transitions seem to be not associated with changes in random traits, but indeed contribute to changes in traits that are helpful or functional to successfully master a life transition (e.g., conscientiousness is needed to master challenges at college; Denissen, van Aken, Penke, & Wood, 2013; D. Wood & Denissen, 2015).

However, previous studies on life transitions suffer from at least two drawbacks. First, it remains unclear whether life transitions do indeed trigger the observed personality changes or merely accompany them. For example, in young adulthood, the transition to college was linked with changes towards a more mature personality (see for example Lüdtke et al., 2011). But does personality really change due to new experiences and investment in new social roles made within the transition to college (e.g., due to responsible studying, cooperating with fellow students) or does this transition simply co-occur with normative personality changes (e.g., due to other experiences or age)? Put differently, if personality indeed changes in reaction to life transitions, one way to explain the above described more pronounced trait changes in younger adults (Lucas & Donnellan, 2011; Roberts et al., 2006a) would be that young adulthood reflects a life stage with an increased occurrence of life transitions (e.g., into college, a serious partnership). Consequently, if older adults experienced similar life transitions, they should again show more pronounced trait changes. One way to address this issue would be to investigate personality development within a similar life transition (i.e., the transition to college) in different age groups (for similar arguments, see Hutteman et al., 2014;

Luhmann et al., 2014). Second, preceding research on life transitions solely relied on self-ratings and did not consider other-ratings or implicit measures. As first tentative evidence suggests that these three manifestations may change separately (Gawronski & Bodenhausen, 2006; Göllner et al., 2017), it is necessary to examine life transitions in more than just self-ratings to gain a more comprehensive picture on the circumstances of personality development (but see also Baumert et al., 2017).

1.4 Volitional Aspects of Personality Development

Although life transitions often already include some volitional aspects of personality development (e.g., by actively choosing a transition like university studies or a vocational training; see also Hennecke & Freund, 2017), they do not fully cover the direct influence people may have on their own personality development. That is, within biological, cultural and social restrictions, people may want to actively form various aspects of their personalities (Higgins, 1987; Hudson & Roberts, 2014; Markus & Nurius, 1986; R. M. Ryan & Deci, 2000) and thus become agents of their own development (McAdams & Olson, 2010). A crucial means to achieve such volitional personality development may be to set and pursue goals to change or maintain one's personality traits (Hudson & Roberts, 2014; Robinson, Noftle, Guo, Asadi, & Zhang, 2015).[2] Broadly spoken, goals refer to "desired states that people seek to obtain, maintain, or avoid" (Emmons, 1996, p. 314; but see also R. M. Ryan, Sheldon, Kasser, & Deci, 1996), albeit researchers interested in volitional personality development may put different emphasis on their conceptualization of goals to change traits (see for example Gollwitzer, 1987; Markus & Nurius, 1986). However, they converge on the idea that change goals should stimulate and guide people's actions (see for example Hudson & Fraley, 2015;

[2] In this dissertation, the terms *change goals* and *goals to change* are used interchangeably and refer to goals to change or maintain one's personality traits.

Markus & Nurius, 1986; Pervin, 1982), thereby providing a meaningful framework to their lives (Carver & Scheier, 1998; Klinger, 1977).

Yet, the idea that people may volitionally contribute to their own development received first reception not in personality but in developmental psychology (Brandtstädter, Wentura, & Rothermund, 1999; J. Heckhausen, Wrosch, & Schulz, 2010; Lerner & Busch-Rossnagel, 1981; Lewin, 1934, 1943). However, this research primarily focused on more narrow developmental goals that aimed at developmental processes (e.g., establishing a successful career) or developmental tasks (e.g., getting married; J. Heckhausen et al., 2010; see also Havighurst, 1953) but not on broader goals to change traits. Although already early research on personal strivings (Emmons, 1986), possible selves (Cross & Markus, 1991; King & Hicks, 2007; Markus & Nurius, 1986), identity intentions (Gollwitzer, 1987) or self-discrepancies (Higgins, 1987) acknowledged aspects of volitional development in personality, only very recent approaches based on the Big Five taxonomy allowed for a more systematic investigation of such change goals (Baranski, Morse, & Dunlop, 2017; Hudson & Roberts, 2014; Robinson et al., 2015). In general, studies using both questionnaires and open-ended answers demonstrated that change goals could be organized in terms of the broad Big Five domains (Baranski et al., 2017; Hudson & Roberts, 2014). Accordingly, people who, for example, wanted to increase their reliability were also likely to express change goals for other conscientiousness related attributes like perseverance or efficiency (Hudson & Roberts, 2014). This finding is in line with previous research on goal hierarchy (Carver & Scheier, 1998; Powers, 1973; Roberts & Wood, 2006), indicating that goals to change traits can be conceptualized as higher-order goals. Such higher-order goals on how to be (i.e., "be" goals; Powers, 1973) may in turn provide reference values for subordinate, smaller-scale goals on what to do in everyday life (i.e., "do" goals; Powers, 1973; see also Gollwitzer, 1996; Hoyle & Sherrill, 2006; Hudson & Fraley, 2015).

Note, however, that change goals can be both goals at the highest level in people's goal hierarchy (e.g., forming an identity as part of the individuation process; Koepke & Denissen, 2012) and means to even superordinate goals (e.g., becoming conscientious to graduate from university; Austin & Vancouver, 1996; Hennecke et al., 2014). In line with the latter suggestion, recent research takes a more functional perspective on volitional personality development (Denissen et al., 2013; Hennecke et al., 2014; D. Wood & Denissen, 2015). Specifically, as traits could serve as "useful means to desired ends" (D. Wood & Denissen, 2015, p. 97) people may want to change their traits to meet superordinate goals like fulfilling their life goals (Bleidorn et al., 2010; Peters, 2015), social role expectations (D. Wood & Roberts, 2006) or broader needs (e.g., need for trust or status; Dweck, 2017).

In the wake of growing interest in volitional personality development, current research showed that the vast majority of people wanted to increase in their traits, especially in conscientiousness and emotional stability (e.g., 92% of younger adults wanted to increase in conscientiousness; Hudson & Fraley, 2016b; see also Hudson & Roberts, 2014). Importantly, goals to increase in traits were evident across the life-span with change goals being strongest in magnitude and prevalence in younger adults and, in general, somewhat weaker but still of considerable amount in older adults (Hudson & Fraley, 2016b). These findings highlight that people may want to actively take part in developing their personality, and especially want to increase in those traits that are socially desirable (Dunlop, Telford, & Morrison, 2012) and reflect maturity (Roberts & Wood, 2006; Roberts et al., 2008). In addition, this research provides first hints on the importance of volitional aspects in the bigger picture of personality development across the entire life-span (for similar arguments on developmental goals, see Brandtstädter & Rothermund, 2002; Freund & Baltes, 2000; J. Heckhausen et al., 2010).

However, by now, little is known on why people set such change goals. As already indicated by the above stated broad definition of goals, setting a goal to change requires that such a change is considered desirable or necessary (Emmons, 1996; Hennecke et al., 2014; R. M. Ryan et al., 1996). Thus, in a first step, previous research examined whether people's current standing in a trait is linked with their goals to change. As expected, change goals were stronger the lower people rated themselves in the corresponding trait (Hudson & Fraley, 2015, 2016b; Hudson & Roberts, 2014). However, this research primarily investigated young college students, inviting the criticism that, especially in old age, this association could be weakened for example due to a more elaborated identity structure (for first hints in this direction, see Hudson & Fraley, 2016b). In addition, prior studies solely focused on self-rated traits. Hence, it remains an open question whether only people's own trait ratings contribute to their change goals, or whether, for example, trait ratings of others play a role as well (e.g., by providing direct or indirect feedback on people's trait levels). Furthermore, there is scarce knowledge on factors beyond the Big Five traits to predict change goals. First evidence merely indicated that change goals could additionally result from reduced satisfaction with life (Hudson & Fraley, 2016a; Hudson & Roberts, 2014; Kiecolt, 1994). Accordingly, a closer look at other characteristic adaptions (e.g., self-esteem, loneliness) could provide fruitful insights into why people set goals to change.

If change goals do indeed contribute to personality development across the life-span, they need to be translated into actual trait changes (Denissen et al., 2013; Hennecke et al., 2014). However, this translation may pose a particular challenge because change goals can be conceptualized as dynamic goals that imply no fixed end-point but require people to maintain certain trait related actions to keep up with their reference values as implied by their change goals (Carver & Scheier, 1998; Powers, 1973). Put differently, change goals do not only need to be implemented in one-time behavioral changes, but even more difficult, these changes have to become habitual (Hennecke et al., 2014; Magidson, Roberts, Collado-Rodriguez, & Lejuez, 2014; W. Wood, 2017; W. Wood & Neal, 2007; for a more detailed introduction into relevant processes, see section "1.5 Processes of Personality Development"). Nonetheless, there is first evidence that change goals may indeed boost trait development in the desired direction (Hudson & Fraley, 2015, 2016a; see also Allan, Leeson & Martin, 2018; Martin, Oades, & Caputi, 2014). On the other hand, a more long-term study demonstrated that change goals did not foster trait changes, but even partly hindered such changes (Robinson et al., 2015). Thus, clarification on these mixed findings is needed. In addition, these first studies solely relied on student samples and self-rated traits, strongly limiting their generalizability. For example, it remains an open question whether goals to change can also be translated into changes in implicitly measured traits.

Importantly, people may not pursue all of their change goals in equal measures. Instead, as already noted in classical models of motivation and planned action, people may assign different values and expectancies to their change goals (Atkinson, 1964; Eccles et al., 1983; Fishbein & Ajzen, 1975; Gollwitzer & Moskowitz, 1996; H. Heckhausen, 1977; Vroom, 1964). In line with these models, a recent framework on self-regulated personality development suggests that change needs to be considered both desirable (i.e., higher valued) and feasible (i.e., expected to be within reach) to be successfully implemented (Hennecke et al., 2014; see also Peters, 2015). Thus, change goals with a higher importance (i.e., higher desirability) should benefit from a higher goal commitment and increased efforts for behavioral change (Hennecke et al., 2014; Locke & Latham, 1990, 2002, 2006), leading to more pronounced trait changes (for empirical research in favor of this idea, see Beattie, Hardy, & Woodman, 2015; Maier & Brunstein, 2001). In turn, change needs to be considered feasible (i.e., being not too difficult; Hennecke et al., 2014) so that people feel certain that success is possible (Eccles, 2009; Gollwitzer, 1990; Wigfield & Eccles, 1992). Too difficult goals may exceed people’s capabilities and undermine their motivation to take concrete steps in the desired direction (Hirst, 1988; Senko & Harackiewicz, 2005; see also Huber, 1985). Note, however, that previous research has also shown that more difficult (i.e., less feasible) goals were linked with better performance, yet this research focused on maximal performance (Locke & Latham, 1990, 2002, 2006). As outlined above, change goals reflect dynamic goals that require to maintain performance (e.g., behavior) so that higher difficulty may indeed be obstructive (Carver & Scheier, 1998).[3] Still, to date there is scarce empirical research to investigate the role of importance and feasibility for the successful implementation of change goals (for a recent exception focusing on the effects of an intervention, see Peters, 2015).

In conclusion, although first evidence suggests that volitional aspects contribute to personality development across the life-span, at least two open questions need to be addressed. First, it remains largely unclear why people set goals to change. In particular, research needs to know whether setting goals to change is a purely subjective phenomenon and what factors beyond the Big Five traits contribute to people's change goals. Second, clarification is needed on whether change goals do indeed affect change in different manifestations of traits (e.g., self-ratings and implicit measures) and which goal dimensions (e.g., importance, feasibility) foster or hinder the realization of change goals. Yet, these questions only address macro-analytical factors of volitional personality development that are hardly able to provide in-depth explanations on how such development comes about. To provide a more fine-grained, micro-analytical perspective, potential momentary processes that could contribute to both long-term personality development in general and volitional personality development in particular will be outlined next.

[3] It is also possible that associations of feasibility and effective goal implementation are best described in terms of an inverted U-shaped function with a moderate feasibility providing the best success. However, in line with previous research (Hennecke et al., 2014) and for the sake of clarity, this dissertation assumes a linear association of higher feasibility and a more successful goal implementation.

1.5 Processes of Personality Development

As portrayed above, personality develops across the life-span and, in part, people may want to actively contribute to this development by setting change goals. However, the exact processes that underlie long-term personality development in general and volitional personality development in particular remain largely unclear. Basically, such processes refer to “a series of steps (elements, components, and actions) through which some phenomenon takes place or emerges” (Baumert et al., 2017, p. 527). In addition, processes imply a temporal perspective inasmuch as they require to classify development within a given referenced time-period (Baumert et al., 2017). Thus, to explain personality development (i.e., the phenomenon taking place) on a micro-analytical level, research needs to determine short-term or smaller scaled (i.e., momentary) series of steps (i.e., processes) through which people’s trait-levels develop within a given time period. To address this complex task, a closer look at momentary manifestations of traits provides a promising starting point.

Although the Big Five taxonomy provides an elaborated and useful structural model of inter-individual differences, it has often been criticized to remain rather descriptive in explaining how these differences come into being and consequently, lack in-depth clarifications on how personality development may take place (Baumert et al., 2017; J. Block, 1995; Denissen & Penke, 2008; Roberts, 2009). To move beyond merely describing inter-individual differences on a superordinate trait level, more process-oriented models of personality emphasize that different trait levels manifest in different levels of trait-relevant momentary behaviors, thoughts, and feelings (i.e., momentary states; Cervone, 2005; Denissen & Penke, 2008; DeYoung, 2015; Fleeson, 2001; Fleeson & Jayawickreme, 2015). Put differently, momentary states can be understood as occurrences of behavioral, cognitive and affective components (e.g., preparing a to-do list, staying focused on a paper) that closely correspond to underlying dispositions (i.e., traits like conscientiousness), but refer to a shorter time period (e.g., minutes or hours; Fleeson, Malanos, & Achille, 2002; Fridhandler, 1986).

Importantly, however, the association of traits and momentary states is frequently assumed to be bidirectional inasmuch as people may rely on their experienced momentary states to infer their latent trait levels (Back & Vazire, 2012; Buss & Craik, 1983; Fleeson & Gallagher, 2009). Hence, the vast majority of current frameworks conceptualizes repeated momentary states as the building blocks of long-term personality development (Back et al., 2011; Dweck, 2017; Geukes et al., 2017; Hennecke et al., 2014; Roberts, 2017; Roberts & Jackson, 2008; Wrzus & Roberts, 2017). Although these frameworks differ in scope and focus, they generally agree that trait changes come about due to prolonged changes in momentary states that become habitual and, consequently, get ingrained into people's underlying trait-levels (Back et al., 2011; Dweck, 2017; Geukes et al., 2017; Hennecke et al., 2014; Roberts, 2017; Roberts & Jackson, 2008; Wrzus & Roberts, 2017).

Albeit repeated momentary states hold a key position in the above stated frameworks on personality development, they only qualify as single components of personality development (i.e., a step; Baumert et al., 2017), but not as processes per se. To form a series of steps (i.e., processes; Baumert et al., 2017) through which personality development may finally emerge, momentary states need to be further embedded into preceding and subsequent momentary experiences. Yet, most of the above-cited frameworks do not provide such an in-depth consideration of the organization of momentary processes.

The generic TESSERA model (Wrzus & Roberts, 2017), however, addresses this issue by suggesting that momentary processes can be generalized as recursive sequences of **T**riggering situations, **E**xpectancies, **S**tates & **S**tate **E**xpressions (i.e., momentary states), and **R**e**A**ctions (i.e., TESSERA sequences, for a detailed description of TESSERA components and their associations, see Chapter IV). For example, due to the TESSERA framework, experiencing a triggering situation (e.g., entering one's office in the morning) may elicit a clear expectation on one's behavior (e.g., need to organize one's daily tasks) that is succeeded by a specific state or state expression (e.g., preparing a to-to list) finally leading to a reaction (e.g., starting the day with confidence; Wrzus & Roberts, 2017). Thus, within the TESSERA framework, momentary states do not simply stand for themselves, but are conceptualized to be embedded in cascades of further momentary experiences (Wrzus & Roberts, 2017). Moreover, environmental (e.g., physical surroundings, cultural contexts) or individual factors (e.g., traits, goals) should foster but also constrain the experience of both triggering situations and states and state expressions (Wrzus & Roberts, 2017). In turn, long-term personality development is conceptualized to be the result of the repeated experience of TESSERA sequences (Wrzus & Roberts, 2017). Importantly, the TESSERA framework accounts in a unique way for development in different manifestations of traits with reflective processes (e.g., conscious remembering or reappraising) translating TESSERA sequences into long-term development of explicit representations of traits whereas associative processes (e.g., implicit or reinforcement learning) underlie the development of implicit representations of traits (Wrzus & Roberts, 2017, see Chapter IV). Due to its explicitness, the TESSERA framework is also able to specify barriers of personality change (e.g., TESSERA sequences are not repeated, TESSERA sequences are reinterpreted to fit existing trait perceptions; Wrzus & Roberts, 2017).

Yet, the TESSERA framework (Wrzus & Roberts, 2017) still lacks empirical investigation, especially regarding the generalizability of momentary processes within TESSERA sequences. In addition, although there is sophisticated evidence that people's trait levels are indeed linked with subsequent experiences of trait-relevant situations (e.g., Rauthmann, Sherman, Nave, & Funder, 2015b; Wrzus, Wagner, & Riediger, 2016) and states (e.g., Back et al., 2009; Mehl, Gosling, & Pennebaker, 2006), there are only scarce hints on the importance of states for subsequent trait changes (Hutteman, Nestler, Wagner, Egloff, & Back, 2015; Wrzus, Luong, Wagner, & Riediger, 2018a). It also needs to be clarified whether reflective processes do indeed translate TESSERA sequences into development of explicit representations of traits (but see Pals, 2006). Furthermore, previous research exclusively focused on development of explicit representations of traits, so that knowledge on the development of implicit representations of traits and its underlying processes is still lacking.

Importantly, the TESSERA framework (Wrzus & Roberts, 2017) also acknowledges volitional aspects of personality development by specifying how people’s change goals may affect their experiences of specific TESSERA components. In particular, the TESSERA framework (Wrzus & Roberts, 2017) assumes that change goals foster the selection of such situations that facilitate the experience of goal-relevant states. In addition, change goals should directly encourage people to show goal-relevant behavior, thoughts and feelings (Wrzus & Roberts, 2017; but see also Carver & Scheier, 2014; T. A. Ryan, 1970). Both pathways are consistent with a self-regulatory perspective on personality development suggesting that, to achieve self-regulated (i.e., volitional) trait change, people need to invest self-control or willpower to engage in goal relevant situations in which they replace their now unwanted behavior, thoughts and feelings with more desired states (Denissen et al., 2013; Hennecke et al., 2014; Hoyle & Sherrill, 2006; Morf, 2006). In this sense, change goals (e.g., becoming more reliable) may offer reference values for subordinate goals that cover situation selection and desired behavior (e.g., “do”- goals like not joining a party in order to finish a seminar paper before a due date; Gollwitzer & Brandstätter, 1997; Gollwitzer & Schaal, 1998; Pervin, 1982; Carver & Scheier, 1998). These reference values may then be recursively compared to inputs (e.g., perceived progress of a seminar paper; Carver & Scheier, 1998, 2003). As long as this comparison indicates discrepancy between the reference value and the input, people should invest behavioral resources, time and skill (e.g., hitting the library to accelerate one’s progress) to get closer to this reference value (Brandtstädter & Rothermund, 2002; Carver & Scheier, 1998, 2003; J. Heckhausen et al., 2010).

However, there is still little research that links change goals with the experience of goal relevant situations (but see Stevenson & Clegg, 2011) or states (for somewhat inconclusive findings compare Hudson & Fraley, 2015; Hudson & Roberts, 2014; for research focusing on effects of an intervention, see Peters, 2015) as proposed by the TESSERA framework (Wrzus & Roberts, 2017). In addition, it remains an open question whether more important and more feasible change goals are accompanied by increased efforts for their implementation (e.g., by experiencing goal relevant situations and states; Hennecke et al., 2014; D. Wood & Denissen, 2015).

1.6 Research Questions and Dissertation Outline

Broadly spoken, this dissertation aims to fill research gaps regarding both macro-analytical factors (i.e., environmental factors and volitional aspects) and micro-analytical processes of personality development. As outlined above, research on macro-analytical factors of personality development needs to be extended in at least three domains.

First, it remains unclear whether age differences in personality development diminish under similar contextual (i.e., environmental) conditions. To tackle this question, Chapter II examines developmental trajectories in younger and older adults who engaged in a comparable life transition, namely academic studies. In addition, students who have just started to engage in this life transition (i.e., freshmen) are expected to show stronger trait changes than more advanced students. Furthermore, trait changes in general are suggested to be more pronounced in students compared to non-students. Finally, previous research on life transitions merely relied on self-rated traits, leaving open the question how other manifestations of personality (e.g., other-rated or implicitly measured traits) develop over the course of a life transition.

Second, a comprehensive examination of factors that contribute to people's engagement in volitional personality development is still missing. Specifically and in line with previous research, Chapter III investigates whether lower current trait levels would be associated with stronger change goals in both younger and older adults. In addition, clarification is needed on whether people's change goals also depend on whether their self-rated traits agree with ratings provided by meaningful others (i.e., their reputation), and particularly if change goals are strongest when both perspectives agree on lower current trait levels. Finally, this dissertation extends previous research by examining characteristic adaptations beyond the Big Five traits (e.g., self-esteem, loneliness) to predict change goals.

Third, in the light of previous inconsistent findings, research needs to know if people are indeed able to change their personality as desired, if potential changes can be observed in different manifestations of traits (e.g., self-ratings, implicitly measured traits) and what factors (e.g., importance, feasibility) foster the implementation of such change goals (see Chapter IV).

As empirical research on micro-analytical processes of personality development is yet at an early stage, recent theoretical suggestions still await empirical examination. As such, in line with suggestions made by the TESSERA framework (Wrzus & Roberts, 2017), Chapter IV first investigates whether momentary processes can be generalized as TESSERA sequences. Moreover, both people's current traits and change goals should be linked with experiencing trait-relevant momentary situations and states. Finally, research has yet to clarify whether momentary experiences (e.g., states) contribute to subsequent trait development and how these experiences are translated into development in different representations of traits (e.g., self-rated or implicitly measured traits).

To investigate the outlined research questions, a multi-method, longitudinal measurement burst study was conducted that included two age groups of education-matched younger and older adults who partly engaged in the transition to college. Over a period of two years, participants answered four extensive personality assessments (T1-T4) with T1, T2 and T3 being placed six months apart, and T3 and T4 being placed twelve months apart. Momentary processes of personality development were assessed by five daily diary phases of 10 days each (D1-D5).

In line with the above stated research questions, the remainder of this dissertation comprises four chapters with Chapter II and III focusing on macro-analytical factors of personality development. Specifically, Chapter II investigates personality development in similar contextual conditions (i.e., environments) while Chapter III comprehensively examines predictors of volitional personality development (i.e., change goals). In turn, Chapter IV combines a macro- and a micro-analytical perspective to investigate whether people can change their personality as desired and which processes contribute to personality development in general and volitional personality development in particular. Finally, Chapter V provides an integration and general discussion of this dissertation's findings.

Chapter II:

Do Age Differences in Personality Development Diminish Under Similar Contextual Conditions? Longitudinal Evidence from Self-Ratings, Other-Ratings, and Implicit Measures in Younger and Older Students[4]

[4] This chapter is based on the following manuscript:

Wrzus, C., Quintus, M., & Egloff, B. (2018). Do age differences in personality development diminish under similar contextual conditions? Longitudinal evidence from self-ratings, other-ratings, and implicit measures in younger and older students. Manuscript submitted for publication.

2.1. Introduction

The most pronounced personality trait development occurs in young adulthood compared with later periods in adult life (Lucas & Donnellan, 2011; Roberts et al., 2006a). Part of the increases in emotional stability, conscientiousness, and agreeableness have been linked to the experience of life transitions that typically occur during young adulthood, such as engaging in a serious romantic relationship (Finn, Mitte, & Neyer, 2015; Neyer & Asendorpf, 2001) or entering college or the workforce (Bleidorn et al., 2016; Lüdtke et al., 2011). However, research has yet to identify whether personality development is less pronounced after young adulthood (a) because greater environmental stability contributes to smaller mean-level changes among older adults (Caspi & Roberts, 2001; Hutteman et al., 2014; Reitz & Staudinger, 2017) or (b) because older adults' personality is more established (i.e., less malleable; Caspi & Roberts, 2001; Costa, Herbst, McCrae, & Siegler, 2000).

To test these competing but not exclusive explanations of greater *context stability* or greater *trait stability* with older age, we applied a quasi-experimental design to examine whether age differences in personality change would be less pronounced when younger and older people experienced a similar life transition such as college. In addition, because nearly all longitudinal studies on adult personality development only have used self-ratings of personality traits (i.e., focused on personality as perceived by the person him- or herself), we investigated whether personality development would follow the same trajectories when other perspectives were considered (e.g., ratings from knowledgeable others, implicit representations). The results should help clarify whether trait development is mainly explicit and subjective or also perceived by others and/or apparent in implicit representations of traits.

Next, we briefly describe how Big Five traits develop with respect to mean-level changes from emerging adulthood to old age, and subsequently address the role of life transitions for personality development. We then highlight the scarce findings on longitudinal personality development from the perspective of others and refer to implicit representations of personality traits as an interesting additional route for studying personality development.

2.1.1 Big Five Development across Adulthood.

Over the last decade, researchers have accumulated empirical evidence that during young adulthood, emotional stability, conscientiousness, and agreeableness increase on average (Bleidorn & Schwaba, 2017; Lucas & Donnellan, 2011; Roberts & Mroczek, 2008). By contrast, during middle and later adulthood, most Big Five traits show little mean-level change (Costa et al., 2000; Lucas & Donnellan, 2011; Roberts & Mroczek, 2008). Only in old age, that is, in people's late 70s and beyond, most Big Five traits seem to decrease again (Lucas & Donnellan, 2011; Mueller, Wagner, & Gerstorf, 2017; Wagner, Ram, Smith, & Gerstorf, 2016; Wortman et al., 2012).

The differential patterns of change and continuity during young, middle, and later adulthood have been attributed to biological and contextual changes and continuity, respectively (Bleidorn, 2015; Caspi & Roberts, 2001; Wrzus & Roberts, 2017). Specifically, it has been argued that the general development of Big Five traits toward greater maturity in young adulthood largely results from mastering age-normative transitions and investing in age-normative roles, such as stable romantic partnerships and work responsibilities (Bleidorn, 2015; Wrzus & Roberts, 2017). By contrast, little mean-level change during middle and later adulthood may result from personality traits becoming more consolidated—as increases in rank-order stability have also suggested (Caspi & Roberts, 2001; Lucas & Donnellan, 2011; Roberts & DelVecchio, 2000).

Still, greater rank-order stability does not equal greater *trait stability* because rank-order and mean-level changes can be largely independent, and more important, the stability of the context is not controlled for in these kinds of studies. Yet, family and work environments have been discussed as remaining rather steady over the years of middle and later adulthood, suggesting greater *context stability* with age (Caspi & Roberts, 2001; Hutteman et al., 2014; Reitz & Staudinger, 2017), which could contribute to greater mean-level and rank-order stability. Indeed, the majority of life transitions occur in young adulthood, whereas a relative continuity in context and social relationships characterizes middle adulthood (Hutteman et al., 2014; Specht et al., 2011).

2.1.2 Life transitions as catalysts of Big Five development.

Personality development has been repeatedly and reliably linked to life transitions, such as engaging in a serious relationship and starting college or work (Bleidorn & Schwaba, 2017; Lodi-Smith & Roberts, 2007). For example, engaging in a serious partnership in young adulthood triggers or co-occurs with increases in emotional stability (Costa et al., 2000; Finn et al., 2015; Neyer & Asendorpf, 2001; Wagner et al., 2015). Although engaging in a first serious partnership has been studied repeatedly, this transition is not well-suited for comparing different age groups due to its strong normative timing (Havighurst, 1967; Lehnart et al., 2010). The transition from school to college is another important transition in young adulthood (Bleidorn, 2012; Lüdtke et al., 2011). Given the demands of lifelong learning and the substantial number of people older than 50 engaging in various extension studies or training (41% in Germany; Adults Education Survey, 2016), college is a context that is well-suited for studying personality development in different age groups.

Among young adults, the transition to college and the experiences people have during their college years seem to trigger or co-occur with personality development, that is, increases in agreeableness, conscientiousness, and openness to experience (Table 1; see Bleidorn et al., 2016 for a review). In addition, the increases in agreeableness, conscientiousness, and openness to experience seem to be more pronounced at the beginning of college compared with the later college years (Lüdtke et al., 2011). Increases in emotional stability also occur during this time (Asendorpf & Wilpers, 1998; Bleidorn, 2012; Lüdtke et al., 2011; Robins, Noftle, Trzesniewski, & Roberts, 2005). Yet, this increase may be typical for young adulthood in general and might thus not be closely tied to experiences in college because same-age people who enter the workforce also experience similar increases in emotional stability (Lüdtke et al., 2011). Increases in emotional stability may also be attributable to engaging in a serious partnership, which most people also experience at this time (Neyer & Asendorpf, 2001). Extraversion seems to be stable when people enter college (Bleidorn, 2012; Lüdtke et al., 2011; Robins et al., 2005), although one study observed general increases in extraversion, decreases in shyness, and increases in sociability, all of which were related to the amount of interaction with peers during the first months of college (Asendorpf & Wilpers, 1998). Due to the differences between the studies regarding the time between assessments, the amount of standardized mean-level changes has been found to vary. Still, most studies indicated that openness to experience, agreeableness, and conscientiousness increase when young adults enter college (Table 1).

The transition to college seems to provide a context that fosters increases in openness, agreeableness, and conscientiousness through specific behavioral opportunities and demands, such as meeting new people, learning new things, and completing college tasks. For example, the more students studied and the better grades they got (i.e., perhaps due to studying), the more conscientiousness increased in previous studies (Bleidorn, 2012; Robins et al., 2005). Furthermore, the more students interacted with other students and had good friends, the more extraversion, specifically sociability, increased (Asendorpf & Wilpers, 1998; Robins et al., 2005). Typically, intensive learning and getting along with new people may occur less often in middle adulthood, but when they occur, they may nonetheless result in increases in openness, agreeableness, and conscientiousness. Thus, the transition to college seems well-suited for studying whether age per se or also the context matters for personality development.

Table 1

Overview of Previous Findings on Personality Development During the Transition to College (Mean-Level Change in Cohen's d)

Source	**Sample**	**Time**	**C**	**A**	**O**	**E**	**ES**
Asendorpf & Wilpers, 1998	N = 237 M_{age} = 20.1 yrs 73% women,	T1 1995: 2nd college week, duration: 1.5 years	-.11	.04	-.10	.17*	.38*
Bleidorn, 2012	Sample 2, N = 360, M_{age} = 20.4 yrs 66% women	T1 2009: last high school year duration: 1 year	.34*	.24*	.25*	-.05	.06
Lüdtke et al., 2011[a]	N = 1,908 M_{age} = 19.5 yrs 62% women,	T1 2002: last high school year duration: 2 years (+ 2yrs)	.32* (.18*)	.32* (.16*)	.20* (.02)	.08 (.01)	.27* (-.03)
Robins et al., 2005	N = 295 59% women	T1 1992: 1st college week duration: 4 years	.27*	.44*	.22*	.03	.49*

Note. C = conscientiousness, A = agreeableness, O = openness to experience, E = extraversion, ES = emotional stability. Coefficients are longitudinal mean-level changes in Cohen's d. [a] Lüdtke et al. (2011) examined change over two consecutive 2-year periods. The coefficients in the table refer to the change that occurred during the transition to college, whereas the coefficients in parentheses refer to change during the later 2 years of college.

2.1.3 Different manifestations of traits: Self-ratings, other-ratings, and implicit measures.

So far, personality development when entering college has been examined only with self-ratings, that is, by focusing on the propositional representations people consciously hold about their traits (Back et al., 2009). Yet, personality traits are often conceptualized as latent factors that manifest in different ways: (a) propositional self-knowledge, (b) associative, implicit self-knowledge, (c) momentary behavior, thoughts, and feelings, (d) others' knowledge about a person's past behavior, thoughts, and feelings (i.e., a person's reputation), and (e) physiological changes associated with behavior, thoughts, and feelings (Allport, 1961; Back & Vazire, 2012; Rauthmann, 2017).

Studies on age differences in personality traits, which have examined manifestations other than propositional self-knowledge, are rare, and usually these studies have not taken life transitions into account. For example, in line with self-ratings of Big Five traits, other-ratings have revealed similar age-related differences in the Big Five when young and middle-aged adults have been compared (McCrae et al., 2004; McCrae & Terracciano, 2005). Also, among adolescents and young adults, age differences in personality traits were generally similar for self- and other-ratings with small divergences regarding timing or magnitude (Rohrer, Egloff, Kosinski, Stillwell, & Schmukle, 2017).

A few longitudinal studies have examined personality development during adolescence from the perspective of the adolescents and their families (Branje, van Lieshout, & Gerris, 2007; Göllner et al., 2017; Luan, Hutteman, Denissen, Asendorpf, & van Aken, 2017). Although these studies covered similar age ranges (12-16 years), results were mixed, and in general, adolescents (i.e., self-ratings) and their parents (i.e., other-ratings) disagreed about whether certain Big Five traits increased, decreased, or remained unchanged. For example, adolescents perceived themselves as stable in emotional stability, whereas parents perceived an increase (Göllner et al., 2017; Luan et al., 2017). Such results indicate that at least the parents of adolescents may perceive personality development differently than the adolescents do themselves. It remains an open question whether the deviation stems from the specifics of parent-child dyads or from adolescence or whether other-ratings generally reveal longitudinal patterns that diverge from those identified with self-ratings.

To our knowledge, associative or implicit representations of Big Five traits have not yet been examined longitudinally. The small number of previous longitudinal studies employing implicit measures have focused on implicit attitudes (Colder et al., 2014; Field, Lawson, & Banerjee, 2008; Ramsey & Sekaquaptewa, 2011; van Ryn et al., 2015) or other implicit representations of the self (e.g., self-esteem, van Tuijl, de Jong, Sportel, de Hullu, & Nauta, 2014; being depressed, Elgersma, Glashouwer, Bockting, Penninx, & de Jong, 2013; tendencies to injure the self, Glenn, Kleiman, Cha, Nock, & Prinstein, 2016). Furthermore, these studies did not examine whether propositional and implicit representations of attitudes, self-esteem, or being depressed tend to change in the same direction.

Previous work on short-term changes in attitudes, often in single laboratory sessions, has suggested that explicit and implicit attitudes often change separately, and corresponding change occurs only under specific conditions (Gawronski & Bodenhausen, 2006; Gawronski & LeBel, 2008). For example, when implicit attitudes are altered experimentally through repeated exposure during unintentional learning, explicit attitudes can remain unaffected (Gawronski & LeBel, 2008). By contrast, when people focus on their feelings, correspondence between implicit and explicit representations of attitudes or personality traits can be enhanced (Egloff, Weck, & Schmukle, 2008; Gawronski & LeBel, 2008; Hofmann, Gschwendner, & Schmitt, 2005b). Yet, such research has generally examined attitude change over a few minutes (i.e., within an experimental session), and therefore, the generalizability to implicit and explicit personality change over several months and years remains open.

2.1.4 Current research.

In this longitudinal multi-method study, we contrasted for the first time the effects of age and context on personality development. Since previous studies reported generally consistent patterns of trait changes during the transition to college during young adulthood (i.e., increases in conscientiousness, agreeableness, openness, and emotional stability, Table

1), we formulated trait-general instead of trait-specific hypotheses. First, we hypothesized that age differences in personality trait changes would be less pronounced when younger and older people experienced a similar life transition such as college and thereby experienced similar contextual conditions (H1). In line with the study on young adults that reported stronger increases in Big Five traits during the first two years of college compared to the next two college years (Lüdtke et al., 2011), we hypothesized that personality change is more pronounced for freshmen compared to more advanced students (H2). In addition and hardly ever accomplished in research on personality development, we included age- and education-matched control groups to distinguish change associated with the life transition from normative change, which typically occurs in the respective age periods in control groups. Thus, we further hypothesized that personality trait changes are more positive among students compared age- and education matched people who do not enter college (H3). To summarize, the more younger and older students differ in personality traits changes, the more the trait-stability explanation is favored; the more older students differ from older control group participants in trait changes, the more the context explanation is favored.

Second, we examined whether previously observed increases in self-ratings of conscientiousness, agreeableness, openness to experience, and emotional stability (Bleidorn, 2012; Lüdtke et al., 2011; Robins et al., 2005) would manifest in implicit representations and reputations (i.e., how knowledgeable others rate the person) of these traits in a similar way. To the best of our knowledge, no previous longitudinal study on personality development in adulthood has employed implicit measures or other-ratings. Nonetheless, other-ratings and implicit measures have been successfully and validly used in age-heterogeneous samples (Allik, de Vries, & Realo, 2016; McCrae & Terracciano, 2005; Wrzus, Egloff, & Riediger, 2017a).

To address these hypotheses, we conducted a longitudinal study with three assessments each spaced half a year apart. Although generally, personality change is more pronounced after more time has passed (Roberts et al., 2006a), previous panel studies, which could only assess trait changes every four or five years, typically called for shorter assessment intervals to obtain better knowledge on the timing and shape of change (Luhmann et al., 2014). In addition, earlier studies examining Big Five changes among young adults during the transition to college observed significant mean-level changes after one to two years (Asendorpf & Wilpers, 1998; Bleidorn, 2012; Lüdtke et al., 2011). A total of 380 younger and older participants had just entered college, had been engaged in college studies for some time, or belonged to the age- and education-matched control groups. In contrast to previous studies on personality development in adulthood, we employed other-ratings and implicit measures in addition to self-ratings to examine the generalizability of personality development to different manifestations or measures of personality traits.

2.2 Method

2.2.1 Participants.

The present longitudinal study included 380 participants[5] from five subgroups: younger freshmen (n = 114; M_{age} = 21.1 years, SD = 1.8; 76% female), younger advanced students (n = 112; M_{age} = 22.2, SD = 1.7; 76% female), younger controls (i.e., nonstudents; n = 27; M_{age} = 23.3, SD = 3.9; 70% female), older students (n = 64; M_{age} = 67.5, SD = 4.5; 64% female), and older controls (i.e., nonstudents; n = 63; M_{age} = 68.0, SD = 6.1; 73% female). To compare age-differential effects of the transition to college, we aimed to compare younger and older freshmen with younger and older advanced students as well as with younger and older nonstudents, that is, we intended to apply a 2 (age) by 3 (student status) factorial design.

[5] During recruitment, freshmen were not invited if they had begun studying a different subject before (i.e., already experienced the transition to college). However, two freshmen with previous college education took part inadvertently and were excluded from the current sample.

However, for older students, a categorization into freshmen and advanced students was not available because students did not follow a strict curriculum. Hence, we combined the older students into one group and used the number of semesters as a control variable.

Before and during the first few weeks of the fall semester 2015, we recruited participants via local newspapers, flyers in public places (cafés, drug stores), university mailing lists, and from nonpsychology introductory courses for younger and older students at the University of Mainz. The University of Mainz offers a program for adults older than 50 years with several lectures and courses from different disciplines. The courses are highly similar to the regular courses taken by younger students, and often taught by the same professors. We specifically recruited younger and older students from the same faculties and fields (e.g., philology, social sciences, see below). All participants had to have completed their secondary school education (German Abitur) to ensure a similar educational background. As a consequence, the younger control group of people with secondary school education (i.e., Abitur), who do not enter college, was smaller than the other groups because most young people with Abitur enter college nowadays, as we discuss in section “2.4.3 Limitations and future directions.”. In addition, the younger freshmen were required to have entered college for the first time, and the older participants had to be retired from their previous job to eliminate influences of work experiences on personality development.

The younger students were primarily studying for a Bachelor of Arts degree (e.g., 37% philology or philosophy; 22% social sciences; 11% history or cultural studies; 6% law and economics). Most of the younger advanced students were in their third semester (78%; 13% second semester; 9% fourth or fifth semester). Most of the older students were attending courses on philology and philosophy (45%), history and cultural studies (25%), or law and economics (5%). Among the older students, 27% were in their first or second semester, 39% in their third to sixth semester, and 34% in their seventh to eleventh semester. Based on a priori power analyses to detect longitudinal changes of d = 0.2 and differences in change between the two age groups of d = 0.10 with an intended power of .95, and an anticipated attrition rate of 10%, we aimed at 200 to 250 participants per age group. We reached this number for young adults, but had to stop recruitment for logistic reasons among older students and the control groups (i.e., despite much effort during the weeks before and during the semester started, the number of interested people among the target groups was very low).

2.2.2 Procedure.

T1 to T3 assessments. The present study consisted of three assessment periods that were conducted at the beginning of the fall semester 2015 (Time 1 = T1), at the beginning of the spring semester 2016 (Time 2 = T2), and at the beginning of the fall semester 2016 (Time 3 = T3). At T1, participants provided informed consent, answered online questionnaires on personality traits at home, and came to the laboratory over the next few days to complete further questionnaires and tests (e.g., Big Five Implicit Association Tests). The assessments were part of a larger study (see also Quintus, Egloff, & Wrzus, 2017) and a complete list of measures is available at osf.io/qp4az/?view_only=d1374fa304924303899c13709e4aea3e. At T2, all assessments were conducted in the laboratory. All laboratory assessments were administered in small age-homogeneous group sessions on personal computers. T3 took place at home as an online assessment because participants were familiar with the procedure and the instruments at that point. Participants received a reimbursement of 53€ for completing T1 to T3 and partial reimbursement if they left the study early. The ethics committee at the University of Mainz approved the study (approval #2015-JGU-psychEK-012).

Obtaining other-ratings. At the end of the laboratory assessment at T1, participants named up to two persons (e.g., spouses, friends, or family members) who could provide ratings of the participants' personality at each wave. Other-ratings were obtained using online questionnaires or paper-pencil questionnaires if no Internet access was available. At T1, a total of 612 other people provided personality ratings of 106 younger freshmen, 107 younger advanced students, 22 younger nonstudents, 53 older students, and 51 older nonstudents. Thus, at T1, of 380 participants, 73% were rated by two other persons, 17% were rated by only one person, and 10% were not rated by other persons. The mean age of the raters was 28.1 years (SD = 13.6) for younger freshmen, 27.6 years (SD = 11.1) for younger advanced students, 31.0 years (SD = 12.5) for younger nonstudents, 60.2 years (SD = 14.1) for older students, and 58.6 years (SD = 14.4) for older nonstudents. Most of the raters were friends (45%), family members (30%), or spouses (15%). The five study groups did not differ in the types of relationships, $\chi^2(8, 544) = 6.35$, $p = .61$. Participants and raters had usually (i.e., 80% of raters) been acquainted for more than 3 years. Participants could nominate new raters at T2 or T3 if previous raters were no longer available, yet, out of 612 raters at T1, 85% participated at T2 and 71% participated at T3. At each time point T1, T2 or T3, we averaged the other-ratings if two ratings were available to form a composite score for each participant. All raters provided informed consent at T1 and received a compensation of 10€ for each rating at T1, T2, and T3.

2.2.3 Measures.

Explicit self-ratings of Big Five personality traits. Participants answered the German version of the 44-item Big Five Inventory (BFI; John & Srivastava, 1999; Lang, Lüdtke, & Asendorpf, 2001) to provide self-ratings of the personality traits conscientiousness, agreeableness, openness to experience, extraversion, and emotional stability. Agreement with items was rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The scale reliabilities were satisfactory at all assessments: T1 (average α = .83, range α = .73 to .89, average ω = .88, range ω = .81 to .93), T2 (average α = .81, range α = .72 to .88, average ω = .86, range ω = .79 to .91), and T3 (average α = .82, range α = .75 to .88, average ω = .87, range ω = .81 to .92).

Other-ratings of Big Five personality traits. Participants' acquaintances and family members also answered the German version of the 44-item Big Five Inventory (BFI; John & Srivastava, 1999; Lang et al., 2001) using a 7-point scale ranging from a 1 (*strongly disagree*) to 7 (*strongly agree*). For the other-rated traits, the scale reliabilities were also satisfactory at all assessments: T1 (average $\alpha = .85$, range $\alpha = .81$ to .87, average $\omega = .90$, range $\omega = .87$ to .92), T2 (average $\alpha = .86$, range $\alpha = .81$ to .87, average $\omega = .90$, range $\omega = .87$ to .92), and T3 (average $\alpha = .85$, range $\alpha = .84$ to .87, average $\omega = .91$, range $\omega = .90$ to .92). The agreement between the two other-raters ranged from ICC(1,2) = .30 (agreeableness) to .46 (conscientiousness) at T1, from ICC(1,2) = .19 (emotional stability) to .42 (openness) at T2, and from ICC(1,2) = .25 (agreeableness) to .41 (extraversion) at T3.

Implicit Big Five personality traits. To measure participants' implicit Big Five personality traits, we applied a Big Five Implicit Association Test (i.e., IAT; Schmukle, Back, & Egloff, 2008). Following standard IAT procedures (e.g., Greenwald et al., 1998; Greenwald, Nosek, & Banaji, 2003; Richetin, Costantini, Perugini, & Schönbrodt, 2015), the Big Five IAT consisted of five blocks of 20 trials each in Practice Blocks 1, 2, and 4, and 60 trials in the combined Test Blocks 3 and 5. To lower the burden on participants, we presented Practice Block 1 for only the first personality trait (Schmukle et al., 2008). Target categories labeled *me* and *others* consisted of five stimuli each (e.g., I, myself, their, your) and were identical for each personality trait. Attribute categories also contained five stimuli each and were labeled differently for each Big Five trait. For example, the labels for extraversion were *extraversion* versus *introversion* (e.g., stimuli: talkative, outgoing, passive, shy), and the labels for openness were *openness* versus *narrow-mindedness* (e.g., stimuli: imaginative, interested, limited, indifferent; Schmukle et al., 2008). Within each block, stimuli were presented in a randomized order in the center of the screen and repeated when all stimuli had been displayed (i.e., repeated sampling without replacement). In the combined Test Blocks 3 and 5, the target and the attribute stimuli alternated. Participants sorted the stimuli to the left or right categories using the answer keys “D” and “K,” which are on the left and right sides of the German keyboard, respectively. For the whole task, participants were instructed to leave their left and right index fingers on the keys. When participants made a mistake, a red “X” appeared on the center of the screen, and the next item appeared only after participants pressed the correct key. Split-half reliabilities were mostly satisfactory at T1 (average $\alpha = .74$, range $\alpha = .68$ to .79), T2 (average $\alpha = .75$, range $\alpha = .71$ to .80), and T3 (average $\alpha = .73$, range $\alpha = .65$ to .83).

Life events. At each time point, participants indicated whether certain life events (e.g., new relationship, new job, death of family member) had occurred (0 = no, 1 = within the last 3 months, 2 = within the last 4 to 6 months), and if yes, how pleasant or unpleasant the event was (1 = *very negative* to 7 = *very positive*). The list consisted of 21 events, which were adapted from Lüdtke et al. (2011) and Sarason, Johnson, and Siegel (1978).

2.2.4 Attrition analyses.

To assess sample selectivity due to attrition, we compared T1 participants who also completed T2 and T3 ($n = 325$) with those who participated at only one or two assessments ($n = 55$). Participants who remained in the study did not differ from participants who dropped out with respect to gender, $\chi^2(1, 380) = 0.17$, $p = .68$, self-rated Big Five traits (range *d*s -0.25 to 0.33, all *p*s > .07), other-rated Big Five traits (range *d*s: -0.06 to 0.26, *p*s > .16), or implicit Big Five traits (range *d*s: -0.26 to 0.34, all *p*s > .06) with two exceptions: Participants who remained in the study were rated by others as significantly more conscientious than participants who dropped out after T1, $d = 0.59$, $p < .01$, or after T2, $d = 0.57$, $p = .011$, and showed lower implicit extraversion than participants who dropped out after T1, $d = -0.31$, $p = .05$. Also, participants who remained in the study were somewhat older than participants who dropped out, $d = 0.29$, $p = .03$. In addition, drop-out differed across the study groups, $\chi^2(4,$

380) = 10.36, p = .03, with participants in the younger control group being slightly more likely to drop out than expected (z = 2.07).

We also tested whether the assumption that data were missing at random and not related to participant characteristics was generally supported (MCAR = missing completely at random; Little, 1988). Using all items of every assessment from T1 to T3 used in the analyses, we found that the MCAR assumption was supported because the test for "nonrandomness" was not significant, $X^2(15682) = 15629.19$, p = .62. Accordingly, we applied the full information maximum likelihood (FIML) estimation in the analyses (see section "2.2.5 Analytic strategy.").

2.2.5 Analytic strategy.

IAT scoring algorithm. To assess implicit personality traits at each time point, we computed D_2 scores according to current guidelines (Greenwald et al., 2003; Richetin et al., 2015; Wrzus et al., 2017a). We used built-in error penalties so that we assessed the reaction time for each trial until the correct key was pressed, and we winsorized the reaction times that were < 300 ms and > 10,000 ms. Then each participant's mean reaction time from Combined Block 3 was subtracted from the mean reaction time from Combined Block 5 and divided by the pooled standard deviation of the combined blocks. Finally, per trait and assessment we winsorized one to five outliers in IAT scores (i.e., > M +3SD) to the respective mean value plus 3 SD.[6]

Latent change modeling. We examined interindividual differences in intraindividual changes for each Big Five trait using latent neighbor change models (McArdle, 1988; McArdle & Hamagami, 2001; McArdle & Nesselroade, 1994; Steyer et al., 1997; Steyer, Partchev, & Shanahan, 2000) in structural equation frameworks with the *lavaan* package version 0.5-23 in

[6] Conscientiousness 1 score at T1, 3 scores at T2, 1 score at T3; agreeableness: 1 score at T1, 4 scores at T2, 2 scores at T3; openness 3 scores at T1 and T2; extraversion no scores; emotional stability 5 scores at T1, 2 scores at T2, 1 score at T3.

R version 3.3.3 (R Core Team, 2017; Rosseel, 2012). The code is available at osf.io/qp4az/?view_only=d1374fa304924303899c13709e4aea3e. We computed latent neighbor change models (Geiser, 2011; Steyer et al., 2000) because we were interested in the latent changes from one time point to another, which is slightly more flexible than latent growth models in modeling nonlinear change. In the neighbor change version of latent change models (i.e., LCM), the latent factors at T2 are decomposed into the initial intercepts at T1 and the differences between T2 and T1, whereas the latent factors at T3 are decomposed into the initial intercept of T1, the difference between T2 and T1, and the difference between T3 and T2 (Figure 1). As indicated by Figure 1, we specified occasion-specific measurement models where multiple manifest indicators determined the occasion-specific latent trait to control for unreliability (i.e., measurement error) in the manifest variables (Steyer et al., 1997; Steyer, Schmitt, & Eid, 1999). Another benefit of LC modeling is that all latent variables implemented in the model can serve as endogenous and exogenous variables (Steyer et al., 2000). Thus, we were able to examine whether the study groups differed in individual change (i.e., the variance of the latent change variables) as well as whether the intercept and change parameters covaried.

We tested differences between study groups using contrasts because compared to multigroup models, the contrast approach offered a higher statistical power due to including the entire sample (n = 380) in each model. In addition, the use of contrast codes allowed testing specific hypotheses for combined groups (e.g., a comparison of all younger students with all older students). The contrasts were entered simultaneously into the models and coded as follows to achieve orthogonal contrasts (Cohen, Cohen, West, & Aiken, 2003): younger (0.4 for all younger participants) versus older adults (-0.6 for all older participants); younger freshmen (0.5) versus younger advanced students (-0.5); older students (0.5) versus older controls (-0.5). Thus, we specified 15 models (5 traits × 3 manifestations: self-ratings, other-ratings, and IAT scores, Table A1) and included all contrasts simultaneously into the models to achieve orthogonal contrasts, to account for multiple testing, and to rely on the complete sample. Note that for each contrast more than 100 data points were available, that is the analysis were not based on the group sizes.

In general, we specified separate models for each trait and each manifestation. In addition, we computed correlated change models to explore common change among different manifestations of traits. Specifically, for each trait, latent intercepts and change scores of self-ratings, other-ratings, and IAT scores were modeled simultaneously in one model per trait and were allowed to correlate. The results are reported in Table A2 in the Appendix. All latent change models were computed using maximum likelihood estimation with robust standard errors and scaled test statistics. Missing values for personality trait variables were treated with the FIML method implemented in *lavaan* (Rosseel, 2012).

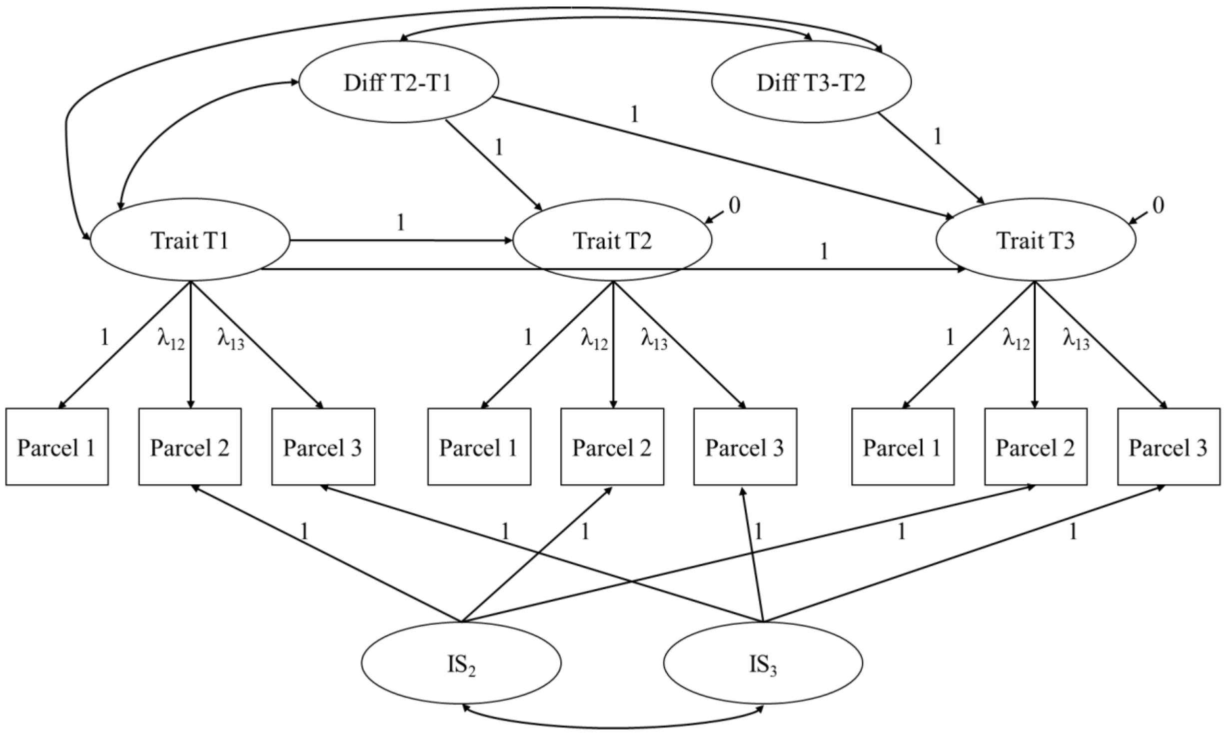


Figure 1. Latent neighbor change model of the Big Five traits. Latent traits from self- and other-ratings were estimated with three indicators (parcels) for each measurement occasion (T1, T2, and T3). Latent traits from IATs were estimated with two indicators for each measurement occasion (T1, T2, and T3). Measurement invariance was achieved by

constraining intercepts (not displayed) and factor loadings to be equal for each measurement occasion (λ12, λ13). Longitudinal method effects were accounted for using indicator-specific correlated method factors (IS2, IS3). Latent variables Diff T2-T1 and Diff T3-T2 reflect the amount of latent change in Big Five traits from T1 to T2 and from T2 to T3 respectively.

Parceling strategy. For self- and other-ratings, we specified three parcels of two or three items each to model occasion-specific latent personality traits. We used item-to-construct parceling to achieve equally balanced parcels with respect to discrimination and difficulty (Allemand, Zimprich, & Hertzog, 2007; T. D. Little, Cunningham, Shahar, & Widaman, 2002). To model occasion-specific implicit personality traits, we specified two parcels, each consisting of split-half D_2 scores (Schmukle et al., 2008).[7]

Measurement invariance. We assessed the invariance of the measurement model across the three time points to ensure that the changes we examined in personality traits represented change that had not resulted from only changes in associations between indicators and the respective latent variables (Horn & McArdle, 1992; Van de Schoot, Lugtig, & Hox, 2012; Vandenberg & Lance, 2000). For self-ratings, full strong factorial invariance across time (i.e., invariant factor loadings and intercepts of manifest variables) held for openness (Table A1). For conscientiousness, agreeableness, extraversion, and emotional stability, partial strong factorial invariance was established by freeing one factor loading and/or one manifest variable's intercept in each model (Table A1). For other-ratings, full strong factorial invariance across time held for all traits but conscientiousness. For conscientiousness, we again achieved partial strong invariance by releasing one factor loading and one manifest variable's intercept (Table A1). For IAT models, full strong factorial invariance across time

[7] Item parceling offers at least two main advantages over the use of single items. First, item parcels generally offer better psychometric properties such as higher reliability, higher communality, and a higher likelihood of being normally distributed (T. D. Little et al., 2002). Second, item parceling allows researchers to specify more parsimonious models with lower chances of encountering correlated residuals or cross-loadings between indicators (T. D. Little et al., 2002).

held for all traits but extraversion, where we freed one manifest variable's intercept to establish partial strong invariance (Table A1). Due to full or partial strong factorial invariance, latent change scores for self-ratings, other-ratings, and IAT scores could be substantially interpreted (Byrne, Shavelson, & Muthén, 1989; Steenkamp & Baumgartner, 1998). To further account for shared method variance over time, we implemented two correlated indicator-specific (IS) factors for the respective parcels (Eid, Schneider, & Schwenkmezger, 1999; Geiser & Lockhart, 2012). This approach yields theoretical (i.e., using well-defined latent variables) and psychometric advantages (i.e., handling method effects as separate effects instead of as part of the error variance) over the widely used correlated uniqueness approach (Geiser & Lockhart, 2012).

Model evaluation. To provide broad information for model evaluation, we assessed model fit with the chi-square test, the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). As the χ^2 test statistic suffers from several drawbacks such as being dependent on the sample size (Hu & Bentler, 1999; Schermelleh-Engel, Moosbrugger, & Müller, 2003), we focused on the descriptive goodness-of-fit indices. For the CFI and TLI, values > .95 are recommended to indicate an acceptable model fit, and values > .97 should indicate a good model fit (Hu & Bentler, 1999; Schermelleh-Engel et al., 2003). With respect to the RMSEA, guidelines favor values of < .08 as indicating adequate model fit and values < .05 as indicating good model fit (Hu & Bentler, 1999; Schermelleh-Engel et al., 2003). SRMR indices < .10 and < .05 point to acceptable and good model fits, respectively (Hu & Bentler, 1999; Schermelleh-Engel et al., 2003).

2.3 Results

Table 2 shows the means, standard deviations, mean-level changes, and correlations between assessment points (i.e., temporal stability) for all central constructs based on manifest variables. For the current research hypotheses, individual differences (i.e., variances) in mean-level change were more important than the average change in the full sample because we assumed that the study groups differed. The variances in mean-level change were significant ($p < .01$) for all constructs and assessment periods. The temporal stability (i.e., rank-order correlation between assessments) across all transition and control groups reached expected values over the 6-month intervals of around .80 for self- and other-ratings and around .40 for IAT scores. The size of the temporal stability of IAT scores corresponds to previously reported coefficients over 1-2 months (Rauthmann, 2017).

Table 2

Descriptive Information on Self-Rated, Other-Rated, and Implicit Big Five Traits

	T1 M (SD)	T1-T2 d	T2-T3 d	Stability r_{12}	Stability r_{23}
Conscientiousness					
Self-rating	4.99 (0.92)	-0.06	0.05	.79**	.83**
Other-rating	5.33 (0.94)	-0.07	0.04	.77**	.74**
Implicit measure (IAT)	0.26 (0.27)	-0.14	0.00	.33**	.28**
Agreeableness					
Self-rating	4.97 (0.84)	0.05	-0.05	.81**	.81**
Other-rating	5.15 (0.87)	-0.08	-0.05	.72**	.67**
Implicit measure (IAT)	0.51 (0.30)	-0.03	-0.14	.38**	.39**
Openness					
Self-rating	5.26 (0.95)	-0.06	-0.06	.84**	.86**
Other-rating	5.40 (0.83)	-0.07	0.06	.77**	.73**
Implicit measure (IAT)	0.27 (0.29)	0.00	-0.12	.34**	.34**
Extraversion					
Self-rating	5.04 (1.10)	-0.02	-0.04	.82**	.89**
Other-rating	5.47 (0.97)	-0.06	0.10	.80**	.69**
Implicit measure (IAT)	-0.05 (0.35)	0.11	0.07	.42**	.47**
Emotional stability					
Self-rating	4.17 (1.26)	0.08	0.02	.84**	.84**
Other-rating	4.38 (1.07)	-0.07	0.04	.75**	.73**
Implicit measure (IAT)	0.30 (0.30)	0.06	-0.06	.36**	.37**

Note. d = standardized mean difference, positive values represent an increase between time periods. r_{12} = correlation between T1 and T2. r_{23} = correlation between T2 and T3.

** $p < .01$.

Next, we report the results of the latent neighbor change models that we used to test our hypotheses for each trait. Again, we specified one model per trait and measure (i.e., 15 models in sum) that included all contrasts simultaneously to reduce the number of tests. Table 3 provides model fit indices of the final models; Tables 4 to 8 provide the estimated coefficients for the contrast effects of the models. We report follow-up analyses on contrast effects (i.e., simple intercepts and simple slopes) in the main text. For each trait, we first describe differences between the study groups at T1, and then we report results regarding our hypotheses how the groups changed differently over time in self-ratings, other-ratings, and IAT scores. We examined correlated changes for self-ratings, other-ratings, and IAT scores and report the results in the Appendix because hardly any correlated changes occurred (Table A2).

Table 3

Model Fit Indices for Final Latent Neighbor Change Models Examining Change in Self-Rated, Other-Rated, and Implicit Big Five Traits from T1 to T2 and T3

	χ^2	CFI	TLI	RMSEA	SRMR
Conscientiousness					
Self-rating	52.222	0.997	0.960	0.019	0.023
Other-rating	75.870	0.988	0.983	0.041	0.045
Implicit measure (IAT)	22.951	0.986	0.975	0.030	0.027
Agreeableness					
Self-rating	56.802	0.995	0.993	0.023	0.027
Other-rating	74.930	0.989	0.985	0.036	0.037
Implicit measure (IAT)	57.553	0.936	0.882	0.079	0.048
Openness					
Self-rating	40.838	1.000	1.004	0.000	0.020
Other-rating	71.614	0.992	0.989	0.034	0.026
Implicit measure (IAT)	20.702	0.994	0.989	0.021	0.023
Extraversion					
Self-rating	100.200	0.983	0.976	0.054	0.032
Other-rating	114.441	0.975	0.967	0.058	0.052
Implicit measure (IAT)	25.003	0.990	0.980	0.037	0.021
Emotional stability					
Self-rating	100.689	0.981	0.973	0.055	0.036
Other-rating	81.679	0.987	0.982	0.042	0.041
Implicit measure (IAT)	33.501	0.973	0.951	0.049	0.028

Note. All models were calculated using maximum likelihood estimation with robust standard errors (Huber-White) and scaled test statistics. CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual.

2.3.1 Conscientiousness.

The model fits were good to excellent for all three models (i.e., self-ratings, other-ratings, IAT scores; Table 3). The participants differed at T1 in the predicted manner (Table 4, Figures 2A-C): Younger adults had significantly lower conscientiousness scores compared with older adults when measured with self-ratings ($M_{younger}$ = 4.31, SE = 0.06; M_{older} = 5.14, SE = 0.08), other-ratings ($M_{younger}$ = 4.86, SE = 0.06; M_{older} = 5.71, SE = 0.07), and the IAT ($M_{younger}$ = 0.22, SE = 0.01; M_{older} = 0.31, SE = 0.01, Table 4). Younger freshmen rated themselves significantly lower in conscientiousness (M = 4.15, SE = 0.09) than younger advanced students did (M = 4.43, SE = 0.08, Table 4).

Regarding group differences in changes in conscientiousness over time and consistent with Hypothesis 1, younger and older participants did not differ significantly in change over time when measured with self-ratings, other-ratings, or IAT scores (Table 4). The results were the same when we compared only younger and older students (Table A3). Similar to previous studies and supporting Hypothesis 2, we observed that younger freshmen's self-ratings increased during the first 6 months of college (b_{T2T1} = 0.077, SE = 0.03, p < .01). By contrast, younger advanced students' self-ratings decreased (b_{T2T1} = -0.155, SE = 0.03, p < .01, Figure 2A). Others perceived no significant differences between how younger freshmen and younger advanced students in how they changed from T1 to T2. Yet, others perceived that the advanced students increased from T2 to T3 (b_{T3T2} = 0.094, SE = 0.04, p = .02, Figure 2B), whereas others perceived that the freshmen did not change significantly (b_{T3T2} = 0.023, SE = 0.05, p = .64). In IAT-based conscientiousness, both younger freshmen and younger advanced students decreased from T1 to T2 (freshmen: b_{T2T1} = -0.031, SE = 0.01, p = .03; advanced students: b_{T2T1} = -0.043, SE = 0.02, p = .01; Figure 2C), which contradicted the freshmen's self-ratings and matched the self-ratings of the advanced students. Examining Hypothesis 3 among older adults, students showed no significant change from T1 to T2 (b_{T2T1} = 0.013, SE = 0.04, p =

.74), whereas older control group participants decreased in their self-ratings (b_{T2T1} = -0.310, *SE* = 0.04, $p < .01$, Table 4, Figure 2A). With respect to other-ratings and IAT scores, older students and control groups participants showed similar changes (Table 4, Figures 2B and 2C). The results were the same when we compared all students with all non-students (Table A3).

The divergent pattern of change in self-ratings, other-ratings, and IAT scores suggests that these manifestations of conscientiousness did not change concurrently. We formally tested correlated changes in latent neighbor change models that included all three measures (see section “2.2.5 Analytic strategy.”). Overall, changes in self-ratings, other-ratings, or IAT scores were not significantly correlated during the same interval (e.g., from T1 to T2) and also showed no lagged correlations (e.g., change in self-ratings from T1 to T2 did not significantly predict change in other-ratings from T2 to T3, Table A2).

Table 4
Group Differences in Initial Latent Level and Latent Change Over Time for Conscientiousness

	Self-rating			Other-rating			Implicit measure (IAT)		
	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2
Younger *vs.* older adults	-0.831**	0.106	-0.031	-0.848**	0.134	0.165	-0.091**	0.015	-0.023
Younger freshmen *vs.* advanced students	-0.280*	0.232*	-0.016	0.039	-0.091	-0.071	0.027	0.012	-0.010
Older students *vs.* older controls	0.061	0.323*	0.024	0.017	0.089	-0.043	-0.050	0.019	0.041

Note. Coefficients represent the unstandardized contrast effects for testing for group differences in intercepts or change scores. The contrast "Younger freshmen *vs.* advanced students" was coded as 0.5 = younger freshmen, -0.5 = younger advanced students. The contrast "Older students vs. older controls" was coded as 0.5 = older students, -0.5 = older control group. The contrast "Younger vs. older" was coded as 0.4 = younger freshmen, younger advanced students, and younger control group, -0.6 = older students and older control group.

* $p < .05$. ** $p < .01$

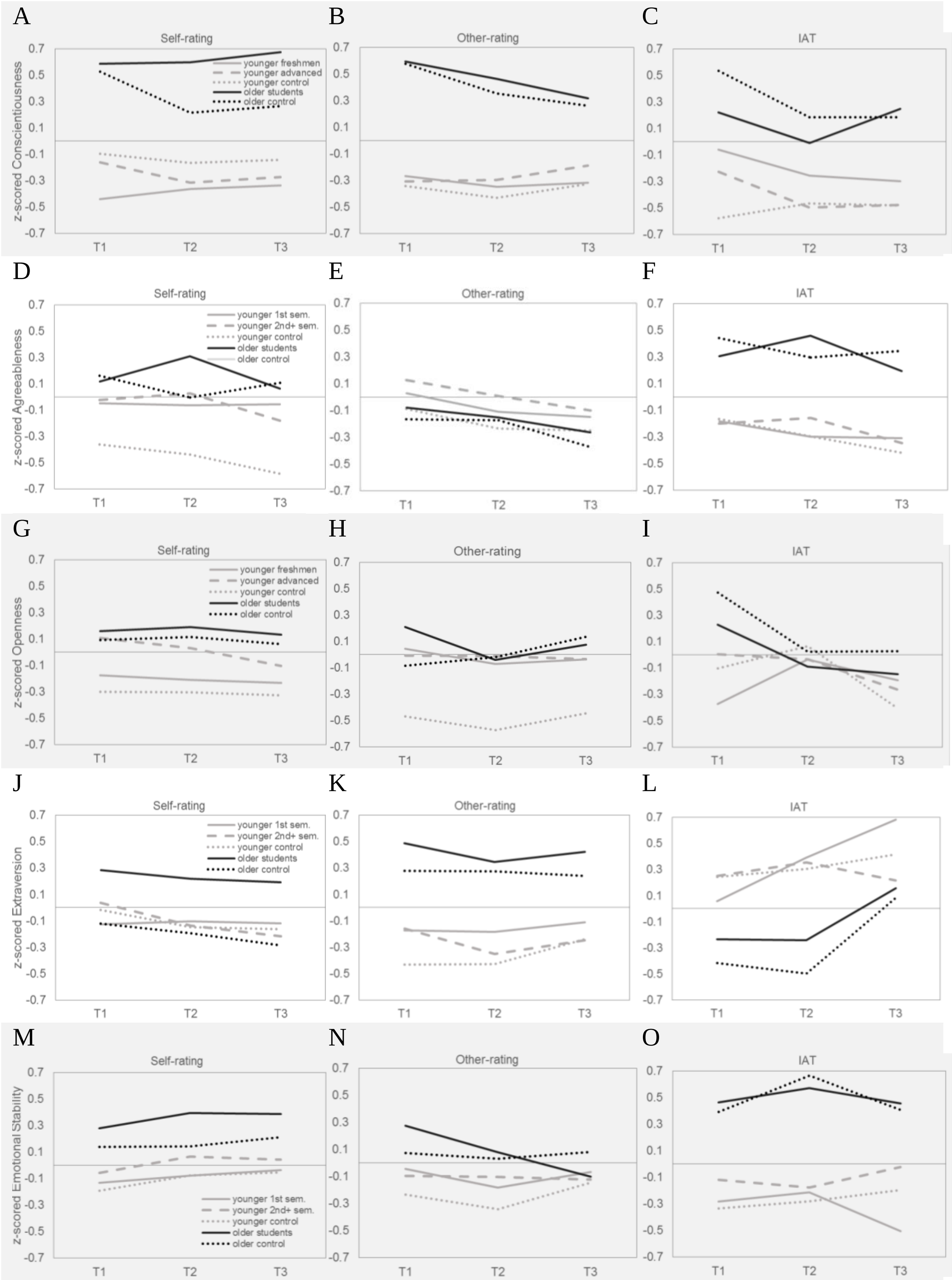


Figure 2. Predicted longitudinal change in Big Five personality traits in younger (grey lines) and older adults (black lines). Student groups are indicated with solid and dashed lines; control groups are indicated with dotted lines. See Tables 4 to 8 for statistical models of group differences.

2.3.2 Agreeableness.

The model fits were good to excellent for the models including the self- or other-ratings (Table 3). For the IAT model, however, the model fit was merely adequate (except for the TLI; Table 3). This could be attributed to including nonsignificant contrast codes because the model fit was excellent without contrast codes (CFI = 1.00, TLI = 1.01, RMSEA = .000, SRMR = .018). Still, we kept the contrast codes in the model to test the hypotheses. The participants did not differ significantly at T1 (Table 5, Figures 2D-F), except that younger adults had lower values on the implicit measure of agreeableness compared with older adults ($M_{younger} = 0.44$, $SE = 0.01$; $M_{older} = 0.55$, $SE = 0.02$, Table 5), and a similar trend occurred for self-ratings ($M_{younger} = 4.61$, $SE = 0.07$; $M_{older} = 4.78$, $SE = 0.05$, b = -0.17, $p = .09$).

Regarding group differences in changes in agreeableness over time, in line with Hypothesis 1, younger and older participants did not differ significantly in change over time (Table 5, Table A3). In addition, younger freshmen remained stable in self-rated agreeableness ($b_{T3T2} = 0.007$, $SE = 0.02$, $p = .75$), whereas younger advanced students decreased from T2 to T3 ($b_{T3T2} = -0.169$, $SE = 0.02$, $p < .01$, Figure 2D, Hypothesis 2). Examining hypothesis 3 among older adults, students differed from older control group participants in changes that were based on self-ratings, such that students first increased ($b_{T2T1} = 0.154$, $SE = 0.03$, $p < .01$) and then decreased in agreeableness ($b_{T3T2} = -0.197$, $SE = 0.03$, $p < .01$), whereas the older nonstudents showed the opposite pattern ($b_{T2T1} = -0.134$, $SE = 0.03$, $p < .01$; $b_{T3T2} = 0.090$, $SE = 0.03$, $p < .01$; Table 5, Figure 2D). These differences in change patterns among older adults were not observed for the other-ratings or IAT scores (Table 5). The results were highly similar when we compared all students with all non-students (Table A3).

The change patterns diverged between the self-ratings, other-ratings, and IAT scores, but still, we tested correlated changes in latent neighbor change models that included all three measures of agreeableness. Overall, changes in self-ratings, other-ratings, or IAT scores were not significantly correlated during the same interval (e.g., from T1 to T2) and also showed no lagged correlations (e.g., change in self-ratings from T1 to T2 did not significantly predict change in other-ratings from T2 to T3, see Table A2).

.

Table 5
Group Differences in Initial Latent Level and Latent Change Over Time for Agreeableness

	Self-rating			Other-rating			Implicit measure (IAT)		
	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2
Younger *vs.* older adults	-0.172†	-0.003	-0.031	0.156	-0.077	0.076	-0.112**	-0.010	0.001
Younger freshmen *vs.* advanced students	-0.021	-0.054	0.176*	-0.084	-0.019	0.062	0.003	-0.031	0.035
Older students *vs.* older controls	-0.035	0.288*	-0.288*	0.074	-0.055	0.078	-0.027	0.059	-0.063

Note. Coefficients represent the unstandardized contrast effects for testing for group differences in intercepts or change scores. The contrast "Younger freshmen *vs.* advanced students" was coded as 0.5 = younger freshmen, -0.5 = younger advanced students. The contrast "Older students vs. older controls" was coded as 0.5 = older students, -0.5 = older control group. The contrast "Younger vs. older" was coded as 0.4 = younger freshmen, younger advanced students, and younger control group, -0.6 = older students and older control group.

† $p < .10$. * $p < .05$. ** $p < .01$

2.3.3 Openness to experience.

The model fits were good to excellent for all three models (i.e., self-ratings, other-ratings, IAT scores; Table 3). At T1, the participants differed significantly only in the implicit measure of openness at T1 (Table 6, Figure 2G-I): Younger adults had lower IAT values (M = 0.24, SE = 0.01) compared with older adults (M = 0.34, SE = 0.02, Table 6), again with a similar pattern in self-ratings (M_{Younger} = 5.36, SE = 0.06, M_{Older} = 5.54, SE = 0.07, b = -0.18, p = .09). In addition, younger freshmen had lower IAT values (M = 0.20, SE = 0.02) compared with younger advanced students (M = 0.27, SE = 0.02, Table 6), with a similar pattern in self-ratings (M_{Freshmen} = 5.25, SE = 0.09, M_{Advanced} = 5.52, SE = 0.09, b = -0.27, p = .07).

The study groups hardly differed in how self-rated and other-rated openness changed (or remained stable) over time. Yet, in implicit representations of openness, younger adults increased from T1 to T2 (b_{T2T1} = 0.027, SE = 0.01 p = .01), a finding that can likely be attributed to changes among younger freshmen (see below), whereas older adults decreased from T1 to T2 (b_{T2T1} = -0.073, SE = 0.02, p < .01, Table 6, Figure 2I, Table A3). At the beginning of college, younger freshmen increased on the implicit measure of openness (b_{T2T1} = 0.06, SE = 0.01 p < .01), whereas younger advanced students did not (b_{T2T1} = 0.01, SE = 0.02, p = .65, Figure 2I, Hypothesis 2). Unexpectedly, older students showed a larger decrease in how others rated their openness (b_{T2T1} = -0.202, SE = 0.05 p < .01) compared with how older control group participants were rated (b_{T2T1} = 0.051, SE = 0.06, p = .35, Table 6, Figure 2H). Additional control analyses that compared all students with all non-students while controlling for age effects, we observed that students were rated by others as more open compared to non-students, but changes in perceived openness did not differ significantly (Table A3).

Again, we examined correlated changes in self-ratings, other-ratings, and IAT scores (Table A2). The nonsignificant correlated changes corresponded to the diverging pattern of changes in self-ratings, other-ratings, and IAT scores.

Table 6

Group Differences in Initial Latent Level and Latent Change Over Time for Openness

	Self-rating			Other-rating			Implicit measure (IAT)		
	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2
Younger *vs.* older adults	-0.181†	-0.073	-0.016	-0.079	0.023	-0.093	-0.102**	0.104**	-0.038
Younger freshmen *vs.* advanced students	-0.266†	0.038	0.103	0.041	-0.088	0.045	-0.073*	0.072†	0.014
Older students *vs.* older controls	0.066	0.009	0	0.238	-0.254*	-0.034	-0.047	0.026	-0.012

Note. Coefficients represent the unstandardized contrast effects for testing for group differences in intercepts or change scores. The contrast "Younger freshmen *vs.* advanced students" was coded as 0.5 = younger freshmen, -0.5 = younger advanced students. The contrast "Older students vs. older controls" was coded as 0.5 = older students, -0.5 = older control group. The contrast "Younger vs. older" was coded as 0.4 = younger freshmen, younger advanced students, and younger control group, -0.6 = older students and older control group.

† $p < .10$. * $p < .05$. ** $p < .01$.

2.3.4 Extraversion.

The model fits were good for all three models (i.e., self-ratings, other-ratings, IAT scores; Table 3). At T1, younger and older adults did not differ in their self-ratings of extraversion (Table 7). However, acquaintances rated the younger adults as less extraverted (M = 5.01, SE = 0.07) than the older adults (M = 5.62, SE = 0.08, Table 7, Figure 2K), whereas the pattern was reversed for the implicit representations of extraversion (M_{Younger} = -0.03, SE = 0.01, M_{Older} = -0.16, SE = 0.03, Table 7, Figure 2L). In addition, older students rated themselves higher in extraversion (M = 4.98, SE = 0.14) compared with older control group participants (M = 4.52, SE = 0.13, Table 7, Figure 2J).

Regarding age differences in changes in extraversion over time and supporting Hypothesis 1, younger and older adults did not differ (i.e., based on self-ratings and other-ratings, Table 7), except that the younger participants did not change in the implicit measure of extraversion (b_{T3T2} = -0.00, SE = 0.02, p = .74), whereas the older participants increased significantly (b_{T3T2} = 0.10, SE = 0.01, p < .01, Figure 2L). Younger freshmen and younger advanced students differed in changes over time (Hypothesis 2): Whereas younger freshmen did not change in how extraverted they rated themselves (b_{T2T1} = 0.02, SE = 0.05, p = .61) or others rated them (b_{T2T1} = -0.01, SE = 0.05, p = .78), younger advanced students decreased in self-rated (b_{T2T1} = -0.20, SE= 0.05, p < .01) and other-rated extraversion (b_{T2T1} = -0.21, SE= 0.05, p < .01). For the implicit representations of extraversion, younger freshmen even increased (b_{T3T2} = 0.05, SE = 0.02 p < .01), whereas younger advanced students decreased significantly (b_{T3T2} = -0.06, SE = 0.02, p < .01). Older students and the age-matched control group did not differ significantly in how they changed over time (Table 7, Hypothesis 3). Likewise, no significant differences in changes occurred when all students were compared to all non-students (Table A3).

We examined correlated changes in self-ratings, other-ratings, and IAT scores (Table A2) for the whole sample and observed that the more people increased between T1 and T2 in how extraverted they saw themselves, the more others also saw them as becoming increasingly extraverted during this time ($b_{T2T1} = 0.07$, *SE* = 0.03, $p < .05$). In addition, people's explicit self-ratings of extraversion decreased more the more their implicit representations of extraversion had increased 6 months earlier (b = -0.04, *SE* = 0.01, $p < .01$).

.

Table 7
Group Differences in Initial Latent Level and Latent Change Over Time for Extraversion

	Self-rating			Other-rating			Implicit measure (IAT)		
	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2
Younger *vs.* older adults	-0.138	-0.014	0.018	-0.610**	-0.020	0.082	0.130**	0.066	-0.109**
Younger freshmen *vs.* advanced students	-0.182	0.220*	0.072	-0.015	0.192	-0.033	-0.052	0.061	0.115*
Older students *vs.* older controls	0.455*	0.011	0.075	0.221	-0.144	0.114	0.049	0.018	-0.048

Note. Coefficients represent the unstandardized contrast effects for testing for group differences in intercepts or change scores. The contrast “Younger freshmen *vs.* advanced students” was coded as 0.5 = younger freshmen, -0.5 = younger advanced students. The contrast “Older students vs. older controls” was coded as 0.5 = older students, -0.5 = older control group. The contrast “Younger vs. older” was coded as 0.4 = younger freshmen, younger advanced students, and younger control group, -0.6 = older students and older control group.

* $p < .05$. ** $p < .01$.

2.3.5 Emotional stability.

The model fits were good for all three models (i.e., self-ratings, other-ratings, IAT scores; Table 3). At T1, younger adults showed consistently lower values in emotional stability compared with older participants (self-ratings: M_{Younger} = 4.04, *SE* = 0.08, M_{Older} = 4.41, *SE* = 0.10; other-ratings: M_{Younger} = 4.34, *SE* = 0.06, M_{Older} = 4.60, *SE* = 0.09, IAT: M_{Younger} = 0.26, *SE* = 0.01, M_{Older} = 0.39, *SE* = 0.02, Table 8, Figures 2M-O). Other than that, no significant differences between the participants occurred (Table 8).

On average, participants saw themselves as becoming more emotionally stable (b_{T2T1} = 0.09, p = .02), but others viewed them as becoming less stable (b_{T2T1} = -0.09, p = .04), without significant differences between the age or study groups (Table 8, Figures 2M & 2N; Table A3). Only others reported stronger increases from T2 to T3 among all non-students (b_{T3T2} = 0.26, *SE* = 0.09, $p < .01$) compared to all students (b_{T3T2} = -0.04, *SE* = 0.05, p = .45, Table A3, controlled for age). And regarding implicit representations of emotional stability, younger freshmen decreased from T2 to T3 (b_{T3T2} = -0.06, *SE* = 0.02, $p < .01$), whereas younger advanced students increased (b_{T3T2} = 0.03, *SE* = 0.01, $p < .05$, Table 8, Figure 2O). The divergence in change trajectories of self-ratings, other-ratings, and IAT scores was mirrored in the results of correlated change, all of which were in general uncorrelated across the different manifestations of emotional stability (Table A2).

Table 8
Group Differences in Initial Latent Level and Latent Change Over Time for Emotional Stability

	Self-rating			Other-rating			Implicit measure (IAT)		
	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2
Younger *vs.* older adults	-0.374**	0.040	-0.023	-0.255*	0.042	0.127	-0.133**	-0.037	0.027
Younger freshmen *vs.* advanced students	-0.090	-0.083	0.080	0.051	-0.128	0.129	-0.033	0.026	-0.092*
Older students *vs.* older controls	0.169	0.129	-0.088	0.194	-0.146	-0.225	0.014	-0.034	0.030

Note. Coefficients represent the unstandardized contrast effects for testing for group differences in intercepts or change scores. The contrast "Younger freshmen *vs.* advanced students" was coded as 0.5 = younger freshmen, -0.5 = younger advanced students. The contrast "Older students vs. older controls" was coded as 0.5 = older students, -0.5 = older control group. The contrast "Younger vs. older" was coded as 0.4 = younger freshmen, younger advanced students, and younger control group, -0.6 = older students and older control group.

* $p < .05$. ** $p < .01$

2.3.6 Control analyses.

We focused on how the Big Five traits changed and remained stable among younger and older adults while they experienced college life compared with their respective age- and education-matched control groups. To examine how other events that might also have occurred (e.g., changes in romantic relationships or health) contributed to the observed trajectories, we included the occurrence and the subjective valence of other life events as time-varying covariates in the latent neighbor change models (Table A4). The previously reported patterns of results remained unchanged except that the difference between younger and older participants regarding how conscientious others rated them was no longer statistically significant (Table A4).

In additional control analyses, we included the number of previously studied semesters as a covariate for the older students because it varied for the older students but not for the two groups of younger students. Controlling for the number of previous semesters did not alter the main effects reported in Tables 4 to 8. Furthermore, the number of semesters hardly showed significant effects on the initial level or the amount of change in traits. The few significant effects were: The more semesters older adults had studied, the more others perceived decreases from T1 to T2 in openness (b = -0.079, SE = 0.022, p < .01), extraversion (b = -0.080, SE = 0.024, p < .01), and emotional stability (b = -0.061, SE = 0.025, p = .02). Also, with a higher number of semesters, implicitly represented agreeableness (b = 0.017, SE = 0.008, p = .02) and other-perceived openness were higher at T1 (b = 0.088, SE = 0.033, p <.01). The number of semesters was higher, the older participants of the *older student* group were (r_{age} = .38, p < .01), a finding that might partially explain the effects of the number of semesters on personality changes.

2.3.7 Summary of results.

Our first hypothesis was that age differences in personality change would be diminished if younger and older people experienced a similar life transition, which would speak against the assumption of generally greater trait stability among older adults. Consistent with our hypothesis, we observed no significant differences between younger and older adults—and more specifically between younger and older students—regarding self- or other-perceived changes across the 1-year time span in all Big Five traits. Young adults changed differently than older adults only in implicit representations of openness and extraversion. Further evidence for similar trait stability in younger and older adults in similar contexts arose from comparable retest correlations for younger (mean r = .84, range .78 to .88) and older students (mean r = .82, range .73 to .93).

Our study replicated previous findings that were based on self-ratings of young adults such that younger freshmen increased in conscientiousness as well as emotional stability and remained stable in extraversion. Only partly supporting Hypothesis 2, freshmen showed more positive trait changes than advanced students during the first six months of college in conscientiousness, and extraversion. In addition, our study extended previous findings such that these changes were usually not observed in how others viewed young adults over time (i.e., changes in other-ratings) or in implicit representations except that implicit measures of extraversion and openness showed significant increases among younger freshmen.

Finally, our study further extended previous findings by testing the effect of context (Hypothesis 3) and showing that changes in propositional representations of traits in older adulthood diverged when older adults experienced different contexts such as college and retirement. In contrast to the age- and education-matched control group, older students showed no significant decrease in self-rated conscientiousness and even increased in self-rated agreeableness; however, this latter effect was reversed in the second half year of the study.

Older students showed a larger decrease in other-rated openness but also started at a somewhat higher level. In addition, although the two groups of older adults did not differ from each other in stability or change in extraversion and emotional stability, older students generally remained at higher levels than their same-aged control group. Thus, for same-aged people, the context mattered for personality change, which we discuss in detail next.

2.4 Discussion

This longitudinal multi-method study examined whether age differences in personality trait changes would be less pronounced when younger and older people experienced similar contextual conditions, in this case, college life, as well as, whether same-aged people who experienced different contexts would display divergent trait changes. Next, we discuss the implications of the current findings for age differences in personality development. Because we examined propositional representations (i.e., explicit self-ratings), reputations (i.e., other-ratings), and associative representations of traits (i.e., implicit self-views), this study offers initial insights into the personality changes that occur in different manifestations of traits among younger and older adults.

2.4.1 Age differences in personality development.

To the best of our knowledge, no previous study has compared the personality development of younger and older adults who were both experiencing a similar life transition, that is, similar conditions in their daily environment. Accordingly, research had yet to clarify whether personality development is less pronounced after young adulthood because older adults' personality is indeed more established and less malleable (i.e., greater *trait stability*; (Caspi & Roberts, 2001; Costa et al., 2000) or because more stable environments (i.e., greater *context stability*) contribute to smaller mean-level changes among older adults (Caspi & Roberts, 2001; Hutteman et al., 2014; Reitz & Staudinger, 2017). The current study offers some initial answers to these questions by comparing trait changes in (a) age- and education-matched older adults who were either currently attending college or not and (b) younger and older adults who were currently engaged in college life.

In general and compared with same-aged nonstudents, older students showed more favorable development in some traits (e.g., stability in self-rated conscientiousness and increases in self-rated agreeableness), which had previously been shown to increase when young students entered college (e.g., Bleidorn, 2012; Lüdtke et al., 2011). Older students and nonstudents did not differ in their development of extraversion or emotional stability, but these traits were also hardly affected in young adults who went to college (Bleidorn, 2012; Lüdtke et al., 2011, but see Asendorpf & Wilpers, 1998). These patterns of results further support the idea that contextual factors contribute to differences in personality change in older adults (Wagner et al., 2016), and personality traits might not be generally less susceptible to being changed by environmental factors in older age groups compared with younger adulthood.

Regarding openness to experience, older students showed larger decreases than older nonstudents. However, students started with somewhat higher levels of openness, which indicates selection effects among older students (i.e., adults who were more open than their same-aged peers entered college in their 60s). Still, it may be more difficult to maintain higher levels of openness at this age when cognitive abilities are generally decreasing (Curtis, Windsor, & Soubelet, 2015; Salthouse, 2010). Theoretically, enriching one’s daily life by engaging in enjoyable, demanding activities and social contacts could slow cognitive aging (Hertzog, Kramer, Wilson, & Lindenberger, 2008; Stine-Morrow et al., 2014), and this could partially contribute to slowing down decreases in openness. Previous studies among older adults have even showed increases in openness after a 4-month inductive reasoning program (Jackson, Hill, Payne, Roberts, & Stine-Morrow, 2012). The unexpected difference between older students and nonstudents suggests that additional experiences in daily life might have contributed to the personality development of older adults, a finding that emphasizes the necessity not only to compare groups but also to examine individual processes in daily life (see section “2.4.3 Limitations and future directions.”).

When directly testing greater *trait stability* with age by comparing age differences in trait changes, younger and older students did not differ significantly in how they or others viewed their personality traits (i.e., in self- or other-ratings), yet they differed in changes in implicit representations of openness and extraversion: Whereas younger students increased in openness as expected, older students decreased in openness. Extraversion did not change significantly among younger students, but it even increased among older students. Because such changes were not apparent in self- or other-ratings, it may well be the case that propositional and associative representations of changing traits form in different ways (Back & Nestler, 2016; Wrzus, 2018; Wrzus & Roberts, 2017). For example, both younger and older students may have been immersed in new ideas and knowledge (i.e., states relevant for openness), but this did not alter their explicit representations of their levels of openness, perhaps because younger students believe that this behavior is typical for students and not noteworthy. By contrast, implicit associations may have changed due to younger students’ increased engagement with new ideas, whereas the daily lives of older students most likely provided more familiar experiences (i.e., less novel situations; Gutsch et al., 2018), which contributed to decreases in their implicit associations regarding openness. Thus, we assume that the processes leading to changes in propositional and associative representations differ and may diverge between younger and older adults (for further details, see section “2.4.2 Divergences between the self-perspective, the perspective of others, and implicit representations of traits.”).

It has to be acknowledged that younger and older students’ changes did not show statistically significant differences in this sample, but it may nonetheless be the case that they changed differently in the overall population. We compared all younger with all older adults to achieve higher power for the statistical tests from the larger samples, and in addition, we contrasted younger and older students to specifically test the effect of age among students. For these analyses, we treated younger freshmen and advanced students as one group and compared them with older students, whereas further analyses showed that younger freshmen and advanced students sometimes differed in trait changes, as we discuss next.

The current study replicated and extended several effects of previous studies on young adults' transition to college (e.g., Bleidorn, 2012; Lüdtke et al., 2011; Robins et al., 2005). For example, self-rated conscientiousness increased among freshmen, and although self-rated openness and extraversion were stable, implicit representations of both traits increased among freshmen. Also, as in previous studies (Lüdtke et al., 2011; Roberts et al., 2006a; Specht et al., 2011), self-ratings of emotional stability generally increased in all younger and older participants. In contrast to previous studies (Bleidorn, 2012; Lüdtke et al., 2011; Robins et al., 2005), self-rated agreeableness remained stable among younger freshmen and even decreased among younger advanced students. Differences between the current and previous studies may have resulted from the somewhat shorter duration of 1 year compared with 2 and 4 years (Lüdtke et al., 2011; Robins et al., 2005). It is possible that the increases in implicit representations of openness and extraversion will also show up as increases in explicit, propositional representations a few months or years later. Thus, a longer duration of assessments would be desirable although studies with assessments four or five years apart often acknowledge that shorter assessment periods are needed to observe personality change close to the life transition and changes in contexts. Furthermore, one study (Bleidorn, 2012) also examined young adults across a 1-year period and found changes in self-rated Big Five traits that were comparable to those from longer studies (see Table 1).

It is possible that recent changes in the German college system contribute to divergences from earlier German and US studies. Germany replaced the Diploma with a

Bachelor's and Master's degree system around 2010—with some variations between universities and subjects. For most subjects, this led to stricter curricula, more frequent exams, and greater perceived strain among bachelor students (Bargel, Ramm, & Multrus, 2012). Thus, whereas entering college in the US (Robins et al., 2005) or entering the earlier diploma system (Asendorpf & Wilpers, 1998; Bleidorn, 2012; Lüdtke et al., 2011) included greater freedom in comparison with high school regarding the exploration of study topics and the scheduling of courses, nowadays, German bachelor education includes strict curricula and exams in the first two semesters. As a consequence, bachelor students perceive more demands and less leeway in comparison with diploma students (Sieverding, Schmidt, Obergfell, & Scheiter, 2013). These changes in the conditions might contribute to different effects of college on personality development, especially because recent studies with bachelor students have also observed decreases in agreeableness and stability in openness among advanced students (Niehoff, Petersdotter, & Freund, 2017).

2.4.2 Divergences between the self-perspective, the perspective of others, and implicit representations of traits.

Self-ratings, other-ratings, and implicit measures are not simply three measures of traits but rather assess different parts of traits, that is, a person's explicit propositional representations, the reputations others hold about a person, and implicit associative representations (Back et al., 2011; Back & Vazire, 2012; Funder, 2012; Nosek, Greenwald, & Banaji, 2007). Accordingly, these three representations might develop differently because they respond to distinct processes (Back & Nestler, 2016; Wrzus, 2018; Wrzus & Roberts, 2017). So far, research on personality development in adulthood has nearly exclusively focused on explicit representations (i.e., self-ratings; Roberts et al., 2006a, footnote 2). No previous study has examined longitudinal changes in implicit trait representations, and only recently have a few longitudinal studies in adolescence and parts of young adulthood included other-ratings and generally found diverging patterns in changes in reputations and explicit self-representations (Branje et al., 2007; Göllner et al., 2017; Luan et al., 2017).

Several coefficients in the current study indicated that the other-ratings we obtained were as suited as self-ratings to assess personality traits over time: internal consistency coefficients and retest-correlations were generally comparable and high; measurement invariance was established and led to good model fits; and the level of self-other agreement (Quintus et al., 2017) was comparable to previous studies (e.g., Allik et al., 2016; McCrae et al., 2004). In addition, age differences in traits at the beginning of the study were comparable for self- and other-ratings, and the average mean-level changes were generally similar for self- and other-ratings. Yet, the developmental trajectories of specific groups often differed between self- and other-ratings, a finding that was also expressed in the generally absent correlated change between self- and other-ratings. One possible explanation could be that people are generally less sensitive to detecting change in other people. However, similar retest correlations (i.e., stability coefficients) and mean-level differences in other- and self-ratings contradict this explanation.

The low concurrent (i.e., correlated) changes rather suggest that processes leading to changes (and stability) in one's own and others' explicit representations differ. For example, personality perception seems to include explicit, deliberate as well as implicit, intuitive judgments (Hirschmüller, Egloff, Nestler, & Back, 2013). Furthermore, people have many more opportunities to observe themselves than others do (i.e., availability and detection of behavioral cues; Back & Vazire, 2012; Funder, 2012). Yet, it is well-established that people do not always perceive and judge themselves accurately but also aim for consistency (i.e., judging oneself in line with existing propositional representations) or self-enhancement (i.e., judging oneself better than others or objective standards do; Robins & John, 1997; Wilson & Dunn, 2004). For example, older students did not change in the extent to which they saw themselves as conscientious, but others perceived them as less conscientious over time. It is possible that older students may want to preserve their positive self-perception, whereas others (correctly) perceive decreases in conscientiousness. Alternatively, others might not see older students working hard in their courses, but they might instead see that some household chores are neglected. This necessarily leads to different opinions between the people themselves and the knowledgeable others in the extent to which conscientiousness ratings remain high or show a decrease. It is interesting that implicit representations of conscientiousness also decreased during the same period.

It has to be acknowledged that self- and other-ratings of Big Five traits showed greater methodological similarities compared to the IAT: Self- and other-ratings were collected with the same item content and the same rating scale, whereas the IATs involved computer-based categorization tasks of trait adjectives. Nonetheless, the IATs also showed satisfactory internal consistencies, and the retest correlations were within the ranges that were reported previously (e.g., 1 month: r = .48 Rauthmann, 2017; r = .51 Hofmann et al., 2005; 1 and 2 years r = .47 , Egloff, Schwerdtfeger, and Schmukle, 2005; r = .52; Elgersma et al., 2013). In addition, measurement invariance was established for all Big Five traits and led to good model fits, and the application of IATs in age-heterogeneous studies was successfully demonstrated (Hummert, Garstka, O'Brien, Greenwald, & Mellott, 2002; Riediger, Wrzus, Schmiedek, Wagner, & Lindenberger, 2011; Wrzus & Roberts, 2017).

Accordingly, we assume that the pattern of changes in implicit representations of traits are meaningful, especially because they partly supported and also extended previous findings that were based on self-ratings. For example, as previously reported for explicit representations (i.e., self-ratings; Asendorpf & Wilpers, 1998; Lüdtke et al., 2011; Robins et al., 2005), young freshmen increased in their implicit representations of openness and extraversion. In addition, whereas self-ratings suggested increases in emotional stability for all participants, implicit representations suggested decreases in emotional stability for freshmen during their second semester of college, that is, during the time when the freshmen were preparing for their first exams. Such a pattern is consistent with other findings of decreased emotional stability and well-being when experiencing stress (Lazarus, 1999; Myin-Germeys & van Os, 2007; Suls & Martin, 2005). As stated in the beginning, we assume that explicit and implicit representations of traits can change in both similar and distinct ways—similar to findings on attitudes (Gawronski & Bodenhausen, 2006; Gawronski & LeBel, 2008)—because different processes are involved. The TESSERA framework (Wrzus, 2018; Wrzus & Roberts, 2017) offers a detailed account of how explicit representations are more strongly shaped by rather conscious, reflective processes (e.g., reflection, accommodation, and self-narration), whereas implicit representations are more strongly shaped by associative processes (e.g., implicit learning and reinforcement learning). Future studies are needed to focus on such reflective and associative processes to better understand changes in explicit and implicit representations of traits and the conditions under which they change concurrently.

2.4.3 Limitations and future directions.

In the current study, we examined personality development in younger and older adults longitudinally under similar, yet admittedly not identical, contextual conditions and using multiple independent methods, that is self-ratings, other-ratings, and indirect measures. Though the overall sample of 380 participants is considerably smaller than samples of nation-wide panel studies (e.g., SOEP, HILDA, MIDUS), the current study relied not only on self-ratings and had lower attrition rates compared to most panel studies (e.g., SOEP 30% attrition, Specht et al., 2011; HILDA 24% attrition, Wortman et al., 2012): Over 94% of the current participants and 85% of the acquainted raters completed at least two assessments (85% of the participants and 71% of the raters completed all three assessments). Thus the drop-out rate was very low given the extensive, multi-method nature of the study and the focus on nonstudents and nonpsychology students.

Still, some limitations need to be acknowledged. First, the sample was comprised of more than two thirds women because we recruited from philology, history, and cultural studies, areas that often include more women than men (Dickson, 2010). In addition, the sample of older adults was somewhat selective because the older adults showed higher values in extraversion and openness in comparison with what is known from previous studies (e.g., McCrae et al., 2004; Roberts et al., 2006a). It is very plausible that people have to be more open and more extraverted to engage in such an intensive study and specifically in college life during their mid-60s. Also, we included an equivalent number of age- and education-matched older nonstudents and students, but the number of age- and education-matched younger nonstudents was low. Currently, the percentage of people per birth cohort who engage in college education almost matches the percentage of people with the Abitur (i.e., university entrance degree, Autorengruppe Bildungsberichtserstattung, 2016). This impeded the recruitment of participants who had received the Abitur but who did not engage in a college education. We took the unequal number of participants into account by testing specific contrasts that matched our hypotheses and thus avoided analyses based on too small groups (see section “2.2.5 Analytic strategy.”).

A second limitation concerns the people who provided other-ratings. Not all participants named two acquaintances, and participants also named different types of acquaintances (e.g., spouses, friends, family members), but the numbers and types of acquaintances did not vary significantly with participants’ personality traits. For example, the level of extraversion was not significantly related to whether participants named more or different acquaintances. In addition, about 80% of acquaintances had known the participant for 3 or more years, that is, an amount of time that is long enough to provide valid ratings.

Previous studies showed that the validity of other-ratings increases as the length of acquaintance increases from zero-acquaintance to well-acquainted (Brown & Bernieri, 2017), but it does not increase further when people have known each other for a larger number of years (Allik et al., 2016; Funder, 2012). Future studies might want to specify more strictly that participants should identify one friend and one family member (ideally a spouse), but this might not be feasible to actually implement.

Finally, although the design with younger and older students and nonstudents offered us the advantage of being able to test specific hypotheses on age effects and effects of the college context, the study groups still might differ in some ways. For example, older people with secondary school education (i.e., German Abitur) are less common in their age cohort compared to young people with Abitur. Still, it seemed methodologically more appropriate to have the same educational requirements for all participants compared to including older adults without Abitur only because they are more common for their age cohort. In addition, although not exotic attending college courses might be experienced as less common among older adults and older adults might attend courses partly for different reasons than younger adults (e.g., personal growth and enlightment vs. preparation for a job). To the extent that daily experiences in college are similar (e.g., accomplishing course demands, meeting other and new people, dealing with new ideas and knowledge), one could speculate that initial and inevitable group differences do not affect trait changes substantially. Nonetheless, heterogeneity (i.e., variance) remained **within** the groups. This means that not all freshmen and not all older students changed in similar ways. Accordingly, further research is needed to study individual differences in change and stability by focusing on individuals' daily processes (Wrzus, 2018; Wrzus & Roberts, 2017). For example, examining how often people actually interact with new people or discuss new ideas, how they behave and feel in such situations, and how they later reflect on such experiences might differ considerably within younger as well as older students and might thus explain why some students increase more markedly in openness than others. Thus, future studies are needed to complement longitudinal assessments of traits with repeated momentary assessments of experiences and behaviors that might contribute to longitudinal personality development.

2.4.4 Conclusion.

This study addressed whether age differences in how the Big Five traits change diminish when younger and older adults undergo a similar transition and encounter the same context such as college. Overall, younger and older students did not differ much in trait changes, whereas older students and older non-students differed in trait changes. This suggests that contextual influences are essential for understanding age differences and more generally for understanding individual differences in personality development. Still, the question remains whether the effects of any life transition can be compared for any two people—be they of different ages or the same age. The experience of a life transition and its effects on personality and well-being will likely depend on whether the life transition occurs at a normative age (e.g., Lehnart et al., 2010), whether it has been experienced before (Luhmann & Eid, 2009), and how previous other experiences have cumulatively shaped personality (Caspi & Roberts, 2001; Roberts & Wood, 2006). With the current quasi-experimental study, we strove to achieve similar contextual conditions because random assignment to experimental effects seems unattainable in the field of personality development.

In addition to examining context effects among younger and older adults, the study extended previous studies on personality development by including other-ratings as well as implicit measures of traits. Both representations revealed unique patterns of change, which suggests that they are not simply additional measures of traits. Rather, these additional representations show that further perceptional and interpretive processes occur in comparison with the processes that occur when participants provide self-assessments. One of the most challenging tasks for future studies will be to capture and to compare the underlying processes in how explicit, implicit, and others' representations of traits change at different times during people's lives.

Chapter III:

Predictors of Volitional Personality Change in Younger and Older Adults: Response Surface Analyses Signify the Complementary Perspectives of the Self and Knowledgeable Others[8]

[8] This chapter is based on the following manuscript:

Quintus, M., Egloff, B., & Wrzus, C. (2017). Predictors of volitional personality change in younger and older adults: Response surface analyses signify the complementary perspectives of the self and knowledgeable others. *Journal of Research in Personality, 70,* 214-228. doi: 10.1016/j.jrp.2017.08.001

3.1 Introduction

People's personality traits exhibit continuity and change across the entire lifespan (Roberts et al., 2008). In part, people actively shape this development by setting goals to maintain or change certain characteristics. Such self-regulated or volitional personality development is currently discussed as one factor that contributes to the lifelong development of personality (Denissen et al., 2013; Hudson & Fraley, 2015, 2016b; Wrzus & Roberts, 2017). However, little is known about why people set goals to change themselves (Hudson & Roberts, 2014). Previous research has shown that goals to change depend on the current self-reported trait level (Hudson & Fraley, 2015, 2016a). For example, with lower self-perceived extraversion, the goal to increase in extraversion is more pronounced. Researchers have yet to determine whether setting goals to change is a purely subjective phenomenon (e.g., I think I am shy and thus I want to be more extraverted) or whether others' perspectives play a role as well (e.g., others tell me I am shy, and therefore I want to be more extraverted, especially when I agree that I am shy).

To fill this gap, we investigated the role of self- and other-reported Big Five traits in change goals in an age-heterogeneous sample. Specifically, in younger and older adults, we examined whether self- and other-perceptions that agree are associated with stronger change goals than trait perceptions that disagree. In addition, we examined more domain-specific predictors beyond the Big Five traits (e.g., self-esteem and entity orientation) as well as whether the effects of the predictors varied with age. This enabled us to provide a comprehensive picture of why and when people want to change or maintain certain traits.

3.1.1 Current knowledge on goals to change or maintain personality traits.

In general, goals are future states that a person wants or feels obliged to achieve (R. M. Ryan et al., 1996). Given the broad agreement that personality traits can be organized in terms of the Big Five dimensions—emotional stability (the inverse of neuroticism), conscientiousness, agreeableness, extraversion, and openness to experience (Goldberg, 1993; John et al., 2008)—Hudson and Roberts (2014) showed that goals to change personality traits can be organized within the same dimensions. Even when people freely described goals to change personality, the Five Factor structure emerged except for openness (Baranski et al., 2017).

In recent studies, the vast majority of people expressed goals to change aspects of their personality and generally wanted to become more emotionally stable, extraverted, open, agreeable, and conscientious (Baranski et al., 2017; Hudson & Fraley, 2015, 2016b; Hudson & Roberts, 2014; Robinson et al., 2015). Hudson and Roberts (2014) emphasized the importance of experiencing discrepancies between actual and desired future traits as an antecedent of change goals (see also Higgins, 1987). Similarly, a recent framework for self-regulated personality change (Hennecke et al., 2014) proposed that changing trait-related behavior needs to be considered necessary or desirable (i.e., motivated) and feasible to enact behavioral changes, which, after becoming habitual, might change latent traits. Thus, initial studies investigated current trait levels as reasons for why trait changes are considered necessary or desirable (Hudson & Fraley, 2015; Hudson & Roberts, 2014; Robinson et al., 2015). People might want to increase traits that are less pronounced because higher values on the aforementioned Big Five personality traits are partly socially desirable (Dunlop et al., 2012). Accordingly, lower self-reported Big Five trait levels were consistently associated with stronger goals to change the trait (Hudson & Fraley, 2015, 2016b; Hudson & Roberts, 2014; Robinson et al., 2015).

Personality development has been found to be most prominent in young adulthood (Roberts, Walton, & Viechtbauer, 2006b; Soto, John, Gosling, & Potter, 2011). Therefore, goals to change personality might also be most prevalent in young adulthood. Supporting this assumption, for 6,800 adults between the ages of 18 and 70, goals to change traits were generally less pronounced in older participants (Hudson & Fraley, 2016b). The age differences were especially prominent for conscientiousness, emotional stability, and extraversion. Nonetheless, change goals were prevalent, albeit weaker, in later life, with, for example, 85% of participants at age 70 expressing goals to change their conscientiousness (Hudson & Fraley, 2016b). Yet previous studies relied on self-reported traits and change goals, inviting the questions of whether associations between traits and change goals arise from common response bias and whether such associations would also exist if traits were measured differently, for example, with observer reports. Hence, considering such an outside perspective would help to address this open question and to provide information on whether change goals are related only to self-perceived levels of personality traits or more generally to trait levels, irrespective of how the traits are assessed.

3.1.2 Self- and other-perspectives on traits and goals to change.

People can provide valid and unique information about their personality because they have access to a great quantity (e.g., due to their access to a long time span and many diverse situations) and quality (e.g., due to their access to intrapsychic processes) of trait-relevant data (McDonald, 2008; Paulhus & Vazire, 2007). However, people's perception of their own personality may also include biases and blind spots due to processes such as consistency seeking and self-enhancement (Back & Vazire, 2012; John & Robins, 1994; Kwan et al., 2004; Paulhus & Vazire, 2007). Other people (e.g., friends or family) may provide complementary and unique information (Vazire & Carlson, 2011). Although such other-ratings may also suffer from biases (e.g., enhancement bias, fundamental attribution error) and may be based on less information (McDonald, 2008), they have been shown to be accurate, valid, and incrementally useful in predicting personality outcomes (Vazire, 2006; Vazire & Mehl, 2008).

Regarding change goals, others' perceptions may provide another view on a person's "real" trait level (Back & Vazire, 2012). Because there is no direct, unbiased measure of the "real" trait level, it is important to consider multiple sources (e.g., self- and other-ratings) that might provide corresponding or complementary information about a person's personality traits. In addition, close, knowledgeable others may also influence goals to change if they provide feedback on a person's current and prospectively desired personality (Taylor, 2006). In social interactions, such close others perceive a person's personality through the person's behavior and might communicate both the perceived and the desired personality (Back et al., 2009; Funder, 1995; Vazire, 2010). The person might react to how knowledgeable others perceive her, so that the feedback might alter goals to change one's personality (Back et al., 2011). Aside from directly providing explicit feedback, others may interact with a person according to their perceptions of the person's personality and thus provide more indirect feedback. In turn, the person could use such (behavioral) interactions with others to form a meta-perception that may then form the basis for evaluating the need for personality change (Back et al., 2011; Back & Vazire, 2012). For example, if others perceive a person as shy or reserved, they may make fewer efforts to start a conversation. The experience of such situations and indirect social feedback may then foster the person's self-perception of being shy so that the person might thus desire personality change.

A person and his or her knowledgeable others might agree or disagree in their perceptions of that person's personality traits. This may lead to *self- and other-ratings that agree* more (e.g., my friends and I agree on my level of extraversion) or less, with *disagreements* taking two forms: *higher self- than other-ratings* (e.g., I think I am more extraverted than my friends think I am) or *lower self- than other-ratings* (e.g., I think I am less extraverted than my friends think I am; Atwater, Ostroff, Yammarino, & Fleenor, 1998; Atwater & Yammarino, 1997). Most literature on the consequences of self-other agreement comes from leadership research (for an overview, see Fleenor, Smither, Atwater, Braddy, & Sturm, 2010). For example, leaders who over- or underestimate their effectiveness relative to how others rate their effectiveness misjudge their own strengths and deficits (Atwater & Yammarino, 1997). At the same time, leaders who overestimate themselves fail to set developmental goals to overcome their deficits (Atwater & Yammarino, 1997; Bass & Yammarino, 1991). Individuals who underestimate themselves may be interested in self-development but may lack the aspirations and self-efficacy to set high goals (London & Smither, 1995). Thus, a rather accurate self-rating (i.e., self- and other-ratings that agree) of oneself seems important for realistic goal setting and goal accomplishment (London & Smither, 1995; Taylor, 2006).

Translating these findings into the research on goals to change personality, one could expect that agreement between a person and others regarding the person's traits would be associated with stronger goals to change traits compared with when the person and others disagree because views (i.e., ratings) that agree might better reflect the "real" trait level. In contrast, people with higher self- than other-ratings might neglect their weaknesses, give more weight to their own perception of strengths, and thus set lower change goals. For example, others may provide direct feedback or behave in a manner that corresponds with their impression that a person is not very extraverted, but the person might still hold the belief she is more extraverted than others think she is. Thus, the person may find it unnecessary to try to become more extraverted. Also, people with lower self- than other-ratings may be open about their assumed weaknesses but at the same time lack the self-confidence to set stronger goals to develop this trait. Furthermore, change goals may seem less necessary with lower self- than other-ratings because others' feedback might be incorporated into a person's self-view and thus lead to an adjustment of the person's self-ratings (Back & Vazire, 2012). An accurate perception of one's personality should provide an appropriate basis for forming realistic change goals because self- and other-ratings that agree are more likely to represent a person's "real" trait level (Back & Vazire, 2012). In line with previous findings that lower self-perceived Big Five traits were associated with stronger change goals in these traits (Hudson & Fraley, 2015; Hudson & Roberts, 2014), we suggest that when self- and other-ratings are both low (e.g., my friends and I agree that I am not very extraverted), goals to change a trait are more pronounced—compared with self- and other-ratings that are both high.

Self-other agreement may be especially relevant for change goals regarding traits that play a stronger role in interpersonal relationships such as extraversion (Borkenau & Liebler, 1995; Denissen & Penke, 2008; Selfhout et al., 2010), agreeableness (Denissen & Penke, 2008; Nettle, 2006), and conscientiousness (Jensen-Campbell, Knack, Waldrip, & Campbell, 2007). For these traits, and especially for extraversion, others may have detailed information, can thus provide more valid feedback, and may provide feedback because trait-related behavior is relevant for the relationship (Funder, 2012; Vazire, 2010; Vazire & Carlson, 2011). In addition, people might be more willing to complement their own perspective on their traits by considering close others' feedback when they believe that this feedback is based on more valid information, which might be the case for these social traits (Back et al., 2011). Therefore, we suggest that both people's own perceptions and the perceptions of others are important when people set goals to change extraversion, agreeableness, and conscientiousness. Others' perceptions might not be equally important concerning change goals for less social traits and traits that the self has privileged access to, such as emotional stability or openness to experience (Denissen & Penke, 2008; Funder, 2012; Vazire, 2010).

3.1.3 Beyond the Big Five to predict goals to change.

In addition to current trait levels, several additional personality characteristics might be relevant for change goals for theoretical or empirical reasons. Here, we focus on life satisfaction, self-esteem, locus of control, entity orientation, optimism, and loneliness and explain this selection next.

First, life satisfaction was found to be associated with intentional self-change (Kiecolt, 1994), and low satisfaction with one's life predicted stronger goals to change traits in previous studies, although this association was partly explained by existing Big Five traits (Hudson & Fraley, 2016a; Hudson & Roberts, 2014). That is, people who were less satisfied with their lives wanted to change their lives and themselves (Hudson & Fraley, 2016a; Hudson & Roberts, 2014), especially if the dissatisfaction was linked to their current traits (e.g., being shy and dissatisfied with one's social life).

Self-esteem, "an individual's subjective evaluation of her or his worth as a person" (Donnellan, Trzesniewski, & Robins, 2011, p. 718), has been linked to higher life satisfaction (Diener & Diener, 1995; Donnellan et al., 2011). Lower self-esteem can therefore be seen as domain-specific dissatisfaction with oneself (Robins, Hendin, & Trzesniewski, 2001; Robins, Tracy, Trzesniewski, Potter, & Gosling, 2001) which could thus be expected to elicit stronger goals to change oneself.

An internal locus of control, that is, perceiving events as contingencies of one's own actions or traits (Rotter, 1966), seems important for having change goals. Goal setting and specifically volitional changes in traits would seem promising only if events, e.g., goal achievement, are believed to result from one's own actions. Accordingly, a stronger internal locus of control was found to predict more pronounced goal setting and pursuit of these goals in general (Judge, Bono, Erez, & Locke, 2005). Furthermore, having a stronger internal locus of control was associated with engaging more in self-developmental activities at work (e.g., career planning; Ng, Sorensen, & Eby, 2006). By contrast, having a stronger external locus of control, defined as perceiving events as the result of others' actions or of destiny, has been linked to learned helplessness, passivity, and less intrinsic goal pursuit (Judge et al., 2005; Rotter, 1992), thus making goal setting for personality change less likely.

Believing that, in general, personality is dynamic and malleable (incremental orientation) instead of fixed and immutable (entity orientation) could be associated with change goals on theoretical grounds (Dweck, 2008; Dweck, Chiu, & Hong, 1995). Goals to change traits are reasonable only if personality is assumed to be malleable. Implicit theories were found to be largely independent of current Big Five trait levels (Spinath, Spinath, Riemann, & Angleitner, 2003) but they have not yet been linked directly to change goals. Previous research has suggested that beliefs about the changeability of characteristics affect self-regulatory processes (Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013; Dweck, 2008; Molden & Dweck, 2006). For example, an incremental orientation predicted the pursuit of learning goals and the use of mastery-oriented strategies, which include an active and tenacious pursuit of aims (Burnette et al., 2013).

Optimism, having a positive and therefore confident view of one’s future, represents another possible predictor of goals to change. The anticipation that positive things will happen to oneself should promote active coping strategies (e.g., changing things) and individuals’ expectations that they can succeed in reaching their personal goals (Andersson, 1996; Carver, Scheier, & Segerstrom, 2010; Nes & Segerstrom, 2006). However, lower optimism has been found to be associated with lower extraversion and emotional stability (Sharpe, Martin, & Roth, 2011) as well as lower life satisfaction (Bailey, Eng, Frisch, & Snyder, 2007). Hence, less optimistic people could have more reasons to change lower traits and might therefore express stronger change goals.

Finally, loneliness, an “individual’s subjective perception of deficiencies in his or her network of social relationships” (Russell, Cutrona, Rose, & Yurko, 1984, p. 1313), has been associated with lower happiness, extraversion, and emotional stability (Booth, Bartlett, & Bohnsack, 1992; H. Cheng & Furnham, 2002; Ernst & Cacioppo, 1999). Prior research has suggested that personality affects loneliness inasmuch as behavioral expressions of traits might lead to social exclusion (Ernst & Cacioppo, 1999; Shaver, Furman, & Buhrmester, 1985). For example, showing higher levels of aggression and anger in different contexts might evoke rejection by others and thereby generate feelings of loneliness (Leary, Twenge, & Quinlivan, 2006). In addition, attributing failure to one's character (i.e., personality) was associated with loneliness (Anderson, Miller, Riger, Dill, & Sedikides, 1994), so changing one's personality could provide a promising way to overcome feelings of loneliness.

3.1.4 Current study.

We conducted the current study to investigate predictors of goals to change personality traits in two age groups of younger and older adults recruited from student and nonstudent contexts. As goals to change are part of an individual's personal developmental strategy, we assessed them with self-report measures. In line with previous findings (Hudson & Fraley, 2016b; Hudson & Roberts, 2014), we hypothesized that lower current trait levels would be associated with stronger change goals in both age groups (Hypothesis 1). Extending previous research, we used other-ratings of personality traits in addition to self-reported traits to predict goals to change. For both age groups, we hypothesized that self- and other-ratings that agree would be associated with stronger change goals than ratings that disagree and that change goals would be strongest when both self- and other-ratings indicate low current trait levels (Hypothesis 2). We also expected that agreement effects would be most pronounced for traits that are important in social situations such as extraversion, agreeableness, and conscientiousness, whereas a person's own perceptions (i.e., self-rated traits) would be more important than others' perceptions for traits that are not as apparent in social situations such as emotional stability and openness to experience. To look beyond the Big Five traits as predictors of change goals, we investigated a wide range of additional theoretically and empirically meaningful predictors: We expected that change goals would be more pronounced with lower life satisfaction, lower self-esteem, less entity orientation, higher internal locus of control, and higher loneliness (Hypothesis 3). Because theoretical and empirical research has suggested different effects for optimism, we examined its association with change goals exploratively.

3.2 Method

3.2.1 Participants and procedure.

We recruited 378 participants via local newspapers, flyers in public places (cafés, drug stores, vocational schools), Facebook groups, mailing lists, and from introductory nonpsychology courses for regular and older students at the university of Mainz, Germany. Participants were part of an ongoing longitudinal study on personality development, which aimed to assess 200 younger and older participants each, based on power analyses and considerations of attrition.[9] The ethics committee of the Psychological Institute of the University of Mainz approved the study (approval #2015-JGU-psychEK-012). Due to the longitudinal nature of the study, we had to restrict the period for the first assessment and assessed 254 young adults between 17 and 32 years of age (M = 21.88, SD = 2.27; 75% female) and 124 older adults between 51 and 78 years of age (M = 67.85, SD = 5.33; 69% female). These sample sizes provided a power of .99 for younger adults and .96 for older adults to detect average-sized zero-order effects with $p \leq .05$ ($r = .30$ for Big Five traits; Hudson & Fraley, 2015; Hudson & Roberts, 2014). The power was .94 (younger adults) and .72 (older adults) for detecting smaller effects ($r = .20$ for additional personality characteristics) with $p \leq .05$. Participants received information about the study, provided informed consent, and first answered online questionnaires at home. Afterwards, participants came to the laboratory where they completed additional questionnaires and tests on personal computers in small age-

[9] The main focus of this project was on longitudinal personality change and daily experiences. An a priori power analysis for corresponding multilevel analyses suggested that with an anticipated attrition rate of 10%, 250 to 300 participants were sufficient.

homogeneous group sessions. At the end of the laboratory session, participants named up to two persons (e.g., friends or family members) who would provide ratings of the participants' personality.

For 237 younger and 104 older participants, a total of 616 other people provided ratings online or on paper-pencil questionnaires if no internet access was available. Of the 341 participants, 81% were rated by two other persons, and 19% were rated by one other person. If available, two ratings were averaged to form a composite other-rating score. The mean age of other-raters was 28.5 years (SD = 12.57) for younger adults and 59.3 years (SD = 14.16) for older adults. Participants most frequently named friends (46% of younger adults, 42% of older adults) or family members (31% of younger adults, 28% of older adults) with whom they had been acquainted often for 3 or more years (73% of younger adults, 98% of older adults). Agreement among other raters was ICC(1,2) = .34 for emotional stability, .46 for conscientiousness, .30 for agreeableness, .46 for extraversion, and .37 for openness (all ps < .001).

3.2.2 Measures.

Personality traits.

We obtained self- and other-report ratings of emotional stability, conscientiousness, agreeableness, extraversion, and openness to experience using the German version of the 44-item Big Five Inventory (BFI; John & Srivastava, 1999; Lang et al., 2001). Items were rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) and averaged for each trait to form composites. Cronbach's α reliabilities were satisfactory for self-reported (average α = .83, range α = .72 to .89) and other-reported BFI traits (average α = .85, range α

= .81 to .88). Revell's ω total indicated good reliability for self-reported (average ω = .88, range ω = .80 to .93) and other-reported BFI traits (average ω = .89, range ω = .87 to .91).[10]

Life satisfaction.

We measured participants' life satisfaction with the German version of the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985; Ferring, Filipp, & Schmidt, 1996), which extends the five-item English version of the SWLS (Diener et al., 1985) and differentiates between current, retrospective, and prospective life satisfaction. To form a comparable composite score, we aggregated the subscales for measuring current (six items, e.g., "My life is filled with interesting things") and retrospective life satisfaction (four items, e.g., "Looking back on my life, I am rather satisfied"). The subscales correlated $r = .65$, $p < .01$. Participants rated their agreement with the items on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The average of all 10 items showed high reliability (Cronbach's α = .89, Revell's ω total = .92).

Self-esteem.

We assessed participants' self-esteem with the German version of the Rosenberg Self-Esteem scale (RSE; Ferring & Filipp, 1996; Rosenberg, 1965). All 10 items were rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) and again averaged to form a composite (α = .86, ω total = .89).

Locus of control.

We measured locus of control with a four-item scale (IE-4; Kovaleva, Beierlein, Kemper, & Rammstedt, 2012) that includes two items each for external and internal locus of control (e.g., "If I work hard, I will succeed"). Items were rated on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Answers to the external locus of control items

[10] To account for methodological drawbacks of Cronbach's alpha, we additionally report Revelle's ω total for scales with more than three items (McNeish, 2017).

were reversed so that a four-item composite for locus of control could be formed with higher values indicating a more internal locus of control (α = .57, ω total = .65).[11]

Entity orientation.

We measured the implicit theory on changeability of personality traits with a three-item scale adapted from Robins et al. (2005) in which all items reflect an entity orientation (e.g., "personality traits are hardly changeable"; see also Dweck, 1999; Dweck et al., 1995). Items were rated on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) so that low values indicated an incremental orientation and high values represented an entity orientation. We averaged all items to form a composite (α = .69, ω total = .71).

Optimism.

A six-item German version of the Life-Orientation-Test (LOT-R; Glaesmer, Hoyer, Klotsche, & Herzberg, 2008; Scheier & Carver, 1985) served as a measure of optimism (e.g., "I am always optimistic about my future"). Items were rated on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) and averaged to form a composite (α = .79, ω total = .84).

Loneliness.

We assessed global feelings of loneliness with 11 items from the German version of the UCLA Loneliness scale (e.g., "I feel completely alone"; Döring & Bortz, 1993). Items were rated on a 5-point scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Averaging items resulted in a composite with α = .89 and ω total = .94.

Change goals.

Participants provided ratings on goals to change their emotional stability, conscientiousness, agreeableness, extraversion, and openness to experience. We measured

[11] Table A5 in the Appendix presents analyses for the two subscales separately and shows that effects are somewhat stronger for the subscale internal locus of control.

change goals with a 16-item German short-version of the Change Goals BFI (C-BFI; Hudson & Roberts, 2014), which was originally developed from the 44-item BFI (John & Srivastava, 1999). All items began with the stem "I want to be…" instead of "I am" as in the BFI, and then the original BFI items were presented (e.g., "I want to be … someone who is considerate and kind to almost everyone"; Hudson & Roberts, 2014). The short version of the C-BFI is based on the validated German BFI-S (Gerlitz & Schupp, 2005). Items were rated on a 5-point scale ranging from -2 (*much less than I currently am*), to 0 (*I do not want to change on this trait*), to +2 (*much more than I currently am*). The scale reliabilities were on average α = .63 (range α = .43 to .76) and ω = .67 (range ω = .43 to .76).

3.2.3 Analytic strategy.

We tested Hypotheses 1 and 3 on associations of change goals with Big Five traits and additional personality characteristics by computing Pearson correlations and multiple regression analyses. To test Hypothesis 2 on agreement effects of self- and other-rated traits on goals to change, we applied polynomial regressions with response surface analysis (RSA), which extends moderated regression or difference scores analysis (Edwards, 1994, 2001; Edwards & Parry, 1993; Nestler, Grimm, & Schönbrodt, 2015; Shanock, Baran, Gentry, Pattison, & Heggestad, 2010). Barranti, Carlson, and Côté (2017) provide a detailed and easy-to-read overview of RSA along with its advantages and several examples from personality psychology (for a recent empirical application, see, e.g., Weidmann, Schönbrodt, Ledermann, & Grob, 2017).

In the unconstrained full polynomial regression, individuals' change goals were predicted by self-rated traits (linear and quadratic terms), other-rated traits (linear and quadratic terms), and the multiplicative interaction of self- and other-ratings. Formally, the regression model was specified as

$$\text{Change goal} = b_0 + b_1 * \text{Self-rated trait} + b_2 * \text{Other-rated trait} + b_3 * \text{Self-rated trait}^2 + b_4 * \text{Self-rated trait} * \text{Other-rated trait} + b_5 * \text{Other-rated trait}^2 + e, \quad (1)$$

We used the *RSA* package (Schönbrodt, 2016; for *R* 3.3.3, R Core Team, 2017) with the Full Information Maximum Likelihood estimator to estimate the full polynomial regression models as well as simpler models (e.g., only self-ratings as predictors of change goals). Thus, several simpler models were also tested and preferred if they fit the data equally well to avoid overfitting of the data with the full polynomial model (Schönbrodt, 2015). Specifically, we used the Akaike Information Criterion (AICc), the model weight (an index that compares the relative fit of nested models), and the comparative fit index (CFI) to compare several strictly hierarchically nested polynomial regression models to find the most parsimonious model that did not show a significantly worse model fit than the previous more complex model (Schönbrodt, 2015). A difference in AICc (ΔAICc) < 2 indicated that two models fit equally well (Schönbrodt, 2015). We present the specific best fitting models for each trait and age group in Table 11 using the common RSA model terms to allow for model comparisons within the RSA framework (Schönbrodt, 2015). To facilitate model interpretation, we provide detailed information on what each selected model tests in the corresponding results section and in Table 12.

After selecting the best fitting models, we then used the coefficients from the regression to construct response surface plots to visually represent the linear or quadratic effects of agreement and disagreement between self- and other-rated traits on change goals (Edwards & Parry, 1993; Schönbrodt, 2015; Shanock et al., 2010). The response surface plots contain a line of incongruence (LOIC; Figure 3) that shows where the self- and other-ratings disagree perfectly. The coefficients describing the slope ($a_3 = b_1 - b_2$; see Equation 1) and the curvature ($a_4 = b_3 - b_4 + b_5$) along the LOIC indicate how disagreement between self-ratings and other-ratings predicts change goals. For example, a negative curvature in a_4 (displayed as a concave surface bending downwards) indicates that self- and other-ratings that disagree are associated with weaker change goals than ratings that agree. A negative a_3 slope indicates that change goals are stronger when other-ratings are higher than self-ratings. The response surface plots also contain a line of congruence (LOC; Figure 3), where self- and other-ratings agree perfectly (self-rating = other-ratings). The LOC is described by a slope ($a_1 = b_1 + b_2$) and a curvature ($a_2 = b_3 + b_4 + b_5$) that both specify agreement effects: For example, a negative a_1 slope means that people express stronger change goals as both their own and others' ratings of the trait become lower. A positive a_2 curvature means that change goals are more pronounced the more both self- and other-ratings approach high or low levels (convex curve; see also Barranti et al., 2017).

The response surface can be additionally shifted by a constant (parameter *C*) or rotated along the LOC according to a scaling factor (parameter *S*), which we explain in the relevant results sections. It is important to mention that, in the displayed surface plots, the shape of the surface can be interpreted only in regions where actual data exist (Schönbrodt, 2015)—indicated by the observed data points and the black contour (see Figure 3). To offer an easy interpretation of RSA parameters and plots, we centered all predictor variables on the scale midpoint (Barranti et al., 2017).

3.3 Results

When reporting the results, we first show that goals to change traits were more pronounced with lower self- or other-rated Big Five trait levels in both age groups (Hypothesis 1). We then demonstrate that self- and other-ratings that agree on lower current trait levels were associated with stronger goals to change for extraversion and agreeableness in both age groups and for conscientiousness in older adults (Hypothesis 2). Finally, when life satisfaction, self-esteem, internal locus of control, and optimism were lower and when loneliness was greater, change goals were stronger (zero-order correlation), whereas entity orientation showed no association with change goals (Hypothesis 3). However, multiple regression analyses suggested that the associations could be attributed to shared variance with current Big Five traits. Table 9 presents descriptive statistics for all predictors and their correlations with goals to change, separately for younger and older participants.

3.3.1 Self- and Other-Reported Traits Predict Goals to Change.

In general, younger participants reported significantly stronger change goals than older participants (Table 9, last row, all *t*s > 2.08, *p*s < .05). As predicted, lower self-reported Big Five trait levels were significantly associated with stronger change goals for that particular trait in both age groups (average r = -.42 for younger and r = -.43 for older adults).

Table 9

Descriptive Statistics and Correlations for Traits, Additional Personality Characteristics, and Change Goals

			Change goals				
	M	*SD*	Emotional stability	Conscientiousness	Agreeableness	Extraversion	Openness
Variable	Younger/ older	Younger/ older	Younger/ older	Younger/ older	Younger/ older	Younger/ older	Younger/ older
Self-reported traits							
1. Emotional stability	4.08_a / 4.36_b	1.27 / 1.22	-.65* / -.51*	.05 / -.20*	-.05 / -.10	-.13* / -.19	.04 / -.10
2. Conscientiousness	4.77_a / 5.43_b	0.90 / 0.80	.06 / -.10	-.46* / -.42*	-.09 / -.10	.02 / -.30*	-.10 / -.16
3. Agreeableness	4.91_a / 5.10_b	0.86 / 0.80	.07 / -.08	.08 / -.03	-.21* / -.33*	.00 / -.15	.14* / .03
4. Extraversion	5.03_a / 5.05_a	1.09 / 1.12	-.10 / -.28*	-.14* / -.26*	.05 / .03	-.49* / -.56*	-.05 / -.26*
5. Openness	5.21_a / 5.38_a	0.99 / 0.85	.10 / -.13	-.04 / -.10	.07 / .11	-.04 / -.32*	-.17* / -.34*
Other-reported traits							
6. Emotional stability	4.33_a / 4.51_a	1.04 / 1.13	-.34* / -.33*	.14* / -.14	-.04 / -.05	.08 / -.15	.09 / -.13

Table 9 continued

			Change goals				
	M	*SD*	Emotional stability	Conscientiousness	Agreeableness	Extraversion	Openness
Variable	Younger/ older	Younger/ older	Younger/ older	Younger/ older	Younger/ older	Younger/ older	Younger/ older
7. Conscientiousness	5.12_a / 5.79_b	0.91 / 0.84	.08 / .01	-.21* / -.25*	.12 / -.14	.12 / .02	-.03 / .15
8. Agreeableness	5.19_a / 5.04_a	0.84 / 0.92	.05 / -.13	.05 / -.10	-.17* / -.14	.06/ -.07	.13 / -.06
9. Extraversion	5.37_a / 5.70_b	0.97 / 0.92	-.08 / -.08	-.01 / -.05	.09 / -.00	-.38* / -.31*	.06 / -.13
10. Openness	5.38_a / 5.45_a	0.83 / 0.81	.13 / -.14	-.03 / -.10	.06 / -.07	-.02 / -.17	-.06 / -.20*
Additional personality characteristics							
11. Life satisfaction	5.52_a / 5.83_b	1.05 / 0.93	-.19* / -.32*	-.26* / -.16	-.06 / -.18	-.12 / -.36*	-.07 / -.25*
12. Self-esteem	5.17_a / 5.91_b	1.02 / 0.79	-.29* / -.17	-.22* / -.26*	.02 / -.08	-.01 / -.28*	-.13* / -.27*
13. Locus of control	3.87_a / 4.02_b	0.54 / 0.51	-.15* / -.26*	-.23* / -.21*	-.03 / -.18	-.08 / -.13	-.13* / -.21*

Table 9 continued

			Change goals				
	M	*SD*	Emotional stability	Conscientiousness	Agreeableness	Extraversion	Openness
Variable	Younger/ older	Younger/ older	Younger/ older	Younger/ older	Younger/ older	Younger/ older	Younger/ older
14. Entity orientation	3.51_a / 3.91_b	1.22 / 1.50	-.10 / -.02	.04 / -.08	-.08 / .15	-.03 / -.03	-.05 / -.07
15. Optimism	3.62_a / 4.04_b	0.68 / 0.63	-.26* / -.34*	-.15* / -.08	-.06 / -.08	.00 / -.17	-.01 / -.07
16. Loneliness	1.74_a / 1.70_a	0.65 / 0.60	.21* / .31*	.19* / .26*	.16* / .15	.18* / .37*	.05 / .32*
Change goals M			0.88_a / 0.66_b	0.82_a / 0.28_b	0.40_a / 0.31_b	0.47_a / 0.29_b	0.52_a / 0.41_b
Change goals SD			0.62 / 0.57	0.55 / 0.44	0.46 / 0.41	0.59 / 0.51	0.41 / 0.43

Note. Values to the left of the slashes refer to younger adults; values to the right refer to older adults.

Means for younger and older participants with different subscripts within rows and columns are significantly different at $p \leq .05$ according to *t* tests for independent samples.

* $p < .05$.

Zero-order correlations (Table 9) suggested that the associations between traits and change goals differed between age groups. We therefore predicted change goals with the corresponding self-reported Big Five traits, age group, and Big Five Traits × Age Group interactions in multiple regression models (Table 10). As in zero-order correlations, lower current Big Five traits significantly predicted higher corresponding goals to change. The significant age group effects mirrored the mean-level differences in change goals presented in Table 9 when differences in current trait levels were controlled for. The significant Trait × Age Group interaction for emotional stability indicated that associations between current trait level with goals to change varied between age groups. The correlation was stronger for younger adults ($r = -.66$, $p < .01$) than for older adults ($r = -.49$, $p < .01$). No further significant differences between age groups in the associations between self-reported traits and change goals were found.[12]

The zero-order associations of other-reported trait levels and change goals suggested that, in general, goals to change were more pronounced with lower trait levels and also when others reported the traits (Table 9).[13] This was especially true for extraversion, conscientiousness, and emotional stability.

[12] Table A6 presents regression analysis predicting goals to change simultaneously from all Big Five Traits, age group, and Big Five × Age Group interactions.
[13] The correlations of self- and other-reported traits were on average $r = .53$, $p \leq .001$, in younger adults (range $r = .45$, $p \leq .001$ for agreeableness to $r = .62$, $p \leq .001$ for extraversion,) and $r = .41$, $p \leq .001$, in older adults ($r = .21$, $p = .035$ for conscientiousness to $r = .55$, $p \leq .001$ for emotional stability). Self-other agreement did not differ significantly between younger and older adult, zs < 1.96, *p*s > .05, except for conscientiousness, z = 2.52, $p = .012$.

Table 10
Regression Analysis Predicting Goals to Change from Self-Reported Big Five Traits and Age group

	Change goals				
	Emotional stability	Conscientiousness	Agreeableness	Extraversion	Openness
Trait	-.66*	-.47*	-.22*	-.51*	-.17*
	[-.71, -.61]	[-.53, -.40]	[-.28, -.16]	[-.57, -.46]	[-.22, -.12]
Age group	-.12*	-.31*	-.07	-.14*	-.09
	[-.22, -.01]	[-.42, -.20]	[-.16, .02]	[-.25, -.04]	[-.18, <.01]
Trait × Age Group	.11*	.06	-.07	-.03	-.11
	[.02, .19]	[-.06, .19]	[-.18, .04]	[-.07, .13]	[-.21, <.01]
R^2	.39	.36	.07	.26	.07
$F(3, 374)$	81.01	71.12	10.69	45.70	10.09
p	< .001	< .001	< .001	< .001	< .001

Note. All continuous predictors are standardized. Age group is dummy-coded with 0 = younger adults, 1 = older adults.

* $p < .05$.

3.3.2 Self-Other Agreement in Traits Predicts Goals to Change in Extraversion, Agreeableness, and Conscientiousness.

In a next step, we conducted RSAs for each Big Five trait and age group separately to test whether agreement between self- and other-ratings predicted change goals. We report the model indices for the three best fitting models (Table 11) to allow retracing of the model selection and next describe the final model for each trait and the appropriate regression coefficients.[14] The regression coefficients for the selected models are summarized in Table 12.

[14] To provide a more intuitive account of whether self-other agreement matters in the prediction of change goals, we additionally calculated linear interaction models for each trait. Results can be found in Table A7. Furthermore, we present results for the full polynomial models for each trait in Table A8 and response surfaces in Figure A1 to A5 to allow for comparisons with the selected models.

Table 11

Model Comparisons for Big Five Traits per Age Group, Ordered by ΔAICc

Trait	Age group	*Model*	*k*	AICc	ΔAICc	Model weight	Evidence ratio	CFI	R^2_{adj}	Δ-2LL (df)	$p_{\Delta\text{-2LL}}$
ES	Younger adults	**Onlyx**	3	4197.24	0.00	.31		1.00	.43		
		Onlyx²	4	4197.60	0.36	.26	1.20	1.00	.44	1.66 (1)	.197
		Additive	4	4199.12	1.89	.12	2.57	1.00	.43	0.15 (1)	.702
ES	Older adults	**Onlyx**	3	1920.23	0.00	.35		1.00	.24		
		Additive	4	1921.62	1.38	.18	2.00	1.00	.24	0.37 (1)	.540
		Onlyx²	4	1921.92	1.69	.15	2.33	1.00	.24	0.68 (1)	.408
C	Younger adults	**Onlyx**	3	3494.09	0.00	.27		0.99	.23		
		SRR	5	3494.85	0.76	.18	1.47	1.00	.23	3.32 (2)	.190
		IA	5	3494.91	0.82	.18	1.50	1.00	.23	3.26 (2)	.195

Table 11 continued

Trait	Age group	*Model*	*k*	AICc	ΔAICc	Model weight	Evidence ratio	CFI	R^2_{adj}	Δ-2LL (df)	$p_{\Delta\text{-2LL}}$
C	Older adults	**SRRR**	6	1386.79	0.00	.22		1.00	.22		
		Additive	4	1387.12	0.33	.19	1.18	0.93	.19	4.56 (2)	.102
		SRR	5	1387.51	0.72	.15	1.43	0.96	.20	2.85 (1)	.091
A	Younger adults	**RR**	4	3125.21	0.00	.34		1.00	.06		
		IA	5	3127.09	1.89	.13	2.57	1.00	.05	0.16 (1)	.687
		SRR	5	3127.17	1.97	.13	2.67	1.00	.05	0.08 (1)	.776
A	Older adults	**Full polynomial**	7	1393.94	0.00	.43		1.00	.25		
		SRRR	6	1394.04	0.11	.40	1.05	0.97	.24	2.28 (1)	.131
		SRR	5	1397.22	3.28	.08	5.16	0.85	.20	7.59 (2)	.022

Table 11 continued

Trait	Age group	*Model*	*k*	AICc	ΔAICc	Model weight	Evidence ratio	CFI	R^2_{adj}	Δ-2LL (df)	$p_{\Delta\text{-2LL}}$
E	Younger adults	**IA**	5	3712.74	0.00	.27		1.00	.28		
		Onlyx²	4	3713.42	0.68	.19	1.40	0.99	.28	2.72 (1)	.098
		SRRR	6	3713.62	0.88	.18	1.55	1.00	.28	1.18 (1)	.276
E	Older adults	**SRR**	5	1736.54	0.00	.56		1.00	.33		
		SRRR	6	1738.64	2.11	.20	2.87	1.00	.33	0.03 (1)	.865
		Onlyx	3	1740.64	4.10	.07	7.77	0.94	.28	8.27 (2)	.016
O	Younger adults	**Onlyx**	3	3195.97	0.00	.32		1.00	.03		
		Onlyx²	4	3197.42	1.45	.15	2.07	1.00	.03	0.58 (1)	.447
		Additive	4	3197.50	1.53	.15	2.25	1.00	.03	0.50 (1)	.480

Table 11 continued

Trait	Age group	*Model*	*k*	AICc	ΔAICc	Model weight	Evidence ratio	CFI	R^2_{adj}	Δ-2LL (df)	$p_{\Delta\text{-2LL}}$
O	Older adults	**Onlyx²**	4	1373.20	0.00	.22		0.99	.14		
		SRSQD	5	1373.64	0.43	.18	1.24	1.00	.15	1.67 (1)	.196
		Onlyx	3	1373.69	0.48	.18	1.27	0.96	.12	2.55 (1)	.110

Note. **Boldface**, selected model. k = Number of parameters; AICc = corrected Akaike Information Criterion; Model weight = probability of a model being the best of the examined models given the data; Evidence ratio = Ratio of model weights of the best model compared with each other model; CFI = Comparative fit index; R^2_{adj} = adjusted variance explained of the model, all *p*s < .05; Δ-2LL = Log-likelihood Difference Test comparing a model with the selected model, significant values indicating a better model fit of the selected model. Onlyx = Model with one linear main effect of self-rated traits; Onlyx² = Model with one linear and quadratic main effect of self-rated traits; Additive = Model with two linear main effects of self- and other-rated traits; IA = Interaction model with two linear main effects and the interaction between self- and other-rated traits; SRSQD = Shifted and rotated squared difference model with nonlinear additive and interaction effects; RR = Rising ridge model with nonlinear additive and interaction effects; SRR = Shifted rising ridge model with nonlinear additive and interaction effects; SRRR = Shifted and rotated rising ridge model with nonlinear additive and interaction effects. For detailed model descriptions, see Schönbrodt (2015).

Table 12
Regression Coefficients and Derived Model Parameters for each Big Five Trait and Age Group

	Change goals									
	Emotional stability		Conscientiousness		Agreeableness		Extraversion		Openness	
	Younger: self-rating only model (Onlyx)	Older: self-rating only model (Onlyx)	Younger: self-rating only model (Onlyx)	Older: nonlinear interaction model (SRRR)	Younger: nonlinear interaction model (RR)	Older: full polynomial model	Younger: linear interaction model (IA)	Older: nonlinear interaction model (SRR)	Younger: self-rating only model (Onlyx)	Older: self-rating only² model (Onlyx²)
b_1	-0.32*	-0.23*	-0.29*	-0.27*	-0.07*	-0.38*	-0.35*	-0.33*	-0.08*	-0.33*
	[-0.36,-0.28]	[-0.31,-0.16]	[-0.37,-0.22]	[-0.45,-0.09]	[-0.11,-0.03]	[-0.54,-0.22]	[-0.46,-0.25]	[-0.41,-0.25]	[-0.13,-0.02]	[-0.50,-0.17]
b_2	-	-	-	0.14	-0.07*	-0.01	-0.11*	-0.05	-	-
	-	-	-	[-0.09,0.38]	[-0.11,-0.03]	[-0.14,0.11]	[-0.20,-0.02]	[-0.03,0.13]	-	-
b_3	-	-	-	-0.01	0.04	0.00	-	-0.07*	-	0.06
	-	-	-	[-0.05,0.03]	[<-0.01,0.09]	[-0.08,0.08]	-	[-0.12,-0.03]	-	[-0.02,0.14]
b_4	-	-	-	0.06	-0.08	0.20*	0.07*	0.14*	-	-
	-	-	-	[-0.08,0.20]	[-0.17,0.01]	[0.07,0.33]	[0.02,0.13]	[0.06,0.23]	-	-
b_5	-	-	-	-0.11*	0.04	-0.13*	-	-0.07*	-	-
	-	-	-	[-0.19,-0.02]	[<-0.01,0.09]	[-0.22,-0.05]	-	[-0.12,-0.03]	-	-
C	-	-	-	2.50	-	-	-	1.34*	-	-

Table 12 continued

	Change goals									
	Emotional stability		Conscientiousness		Agreeableness		Extraversion		Openness	
	Younger: self-rating only model (Onlyx)	Older: self-rating only model (Onlyx)	Younger: self-rating only model (Onlyx)	Older: nonlinear interaction model (SRRR)	Younger: nonlinear interaction model (RR)	Older: full polynomial model	Younger: linear interaction model (IA)	Older: nonlinear interaction model (SRR)	Younger: self-rating only model (Onlyx)	Older: self-rating only^2 model (Onlyx^2)
	-	-	-	[-1.66,6.66]	-	-	-	[0.41,2.27]	-	-
S	-	-	-	0.28*	-	-	-	-	-	-
				[-0.29,0.86]	-	-	-	-	-	-
a_1	-0.32*	-0.23*	-0.29*	-0.13	-0.14*	-0.39*	-0.46*	-0.28*	-0.08*	-0.33*
	[-0.36,-0.28]	[-0.31,-0.16]	[-0.37,-0.22]	[-0.45,0.20]	[-0.22,-0.06]	[-0.63,-0.16]	[-0.59,-0.33]	[-0.36,-0.20]	[-0.13,-0.02]	[-0.50,-0.17]
a_2	-	-	-	-0.06	-	0.07	0.07*	-	-	0.06
				[-0.15,0.04]	-	[-0.04,0.18]	[0.02,0.13]	-	-	[-0.02,0.14]
a_3	-0.32*	-0.23*	-0.29*	-0.41*	-	-0.37*	-0.24*	-0.38*	-0.08*	-0.33*
	[-0.36,-0.28]	[-0.31,-0.16]	[-0.37,-0.22]	[-0.68,-0.14]	-	[-0.54,-0.20]	[-0.39,-0.09]	[-0.52,-0.25]	[-0.13,-0.02]	[-0.50,-0.17]
a_4	-	-	-	-0.18	0.17	-0.33*	-0.07*	-0.29*	-	0.06
	-	-	-	[-0.41,0.05]	[-0.01,0.35]	[-0.58,-0.09]	[-0.13,-0.02]	[-0.46,-0.11]	-	[-0.02,0.14]

Table 12 continued

	Change goals									
	Emotional stability		Conscientiousness		Agreeableness		Extraversion		Openness	
	Younger: self-rating only model (Onlyx)	Older: self-rating only model (Onlyx)	Younger: self-rating only (Onlyx)	Older: nonlinear interaction model (SRRR)	Younger: nonlinear interaction model (RR)	Older: full polynomial model	Younger: linear interaction model (IA)	Older: nonlinear interaction model (SRR)	Younger: self-rating only model (Onlyx)	Older: self-rating only² model (Onlyx²)
a´$_4$	-	-	-	-0.44*	-	-	-	-	-	-
	-	-	-	[-0.77,-0.10]	-	-	-	-	-	-
b$_M$	-	-	-	-0.81	-	-	-	-	-	-
	-	-	-	[-2.31,0.52]	-	-	-	-	-	-

Note. Younger = younger adults, Older = older adults. 95% confidence intervals based on robust standard errors in brackets. b_1 = self-reported trait; b_2 = other-reported trait; b_3 = self-reported trait²; b_4 = self- and other-reported trait interaction; b_5 = other-reported trait². For the *S* parameter, the *p*-value resulted from a test of H_0: S = 1; for all other parameters, the *p*-value resulted from a test of whether the parameter was zero. Note that in less complex models (e.g., without significant quadratic effects), not all regression coefficients b_1 to b_5 and consequently not all surface parameters a_1 to a_4 were estimated.

* $p < .05$.

3.3.2.1 Emotional stability.

Regarding emotional stability, for both age groups, the best fitting and most parsimonious models according to the lowest AICc and greatest model weight (i.e., the probability that the model is the best fitting model) were models where only self-rated emotional stability predicted goals to change (Tables 11 and 12). As shown in Figures 3A and 3B, for both age groups, the response surfaces indicated that goals to increase in emotional stability were more pronounced the lower participants rated themselves on emotional stability (coefficient b_1, Table 12). It is important to mention that the surfaces did not cross zero at the z-axis, which means that people with the highest levels of self-rated emotional stability reported goals to maintain but not to decrease their level of emotional stability (Figures 3A and 3B).

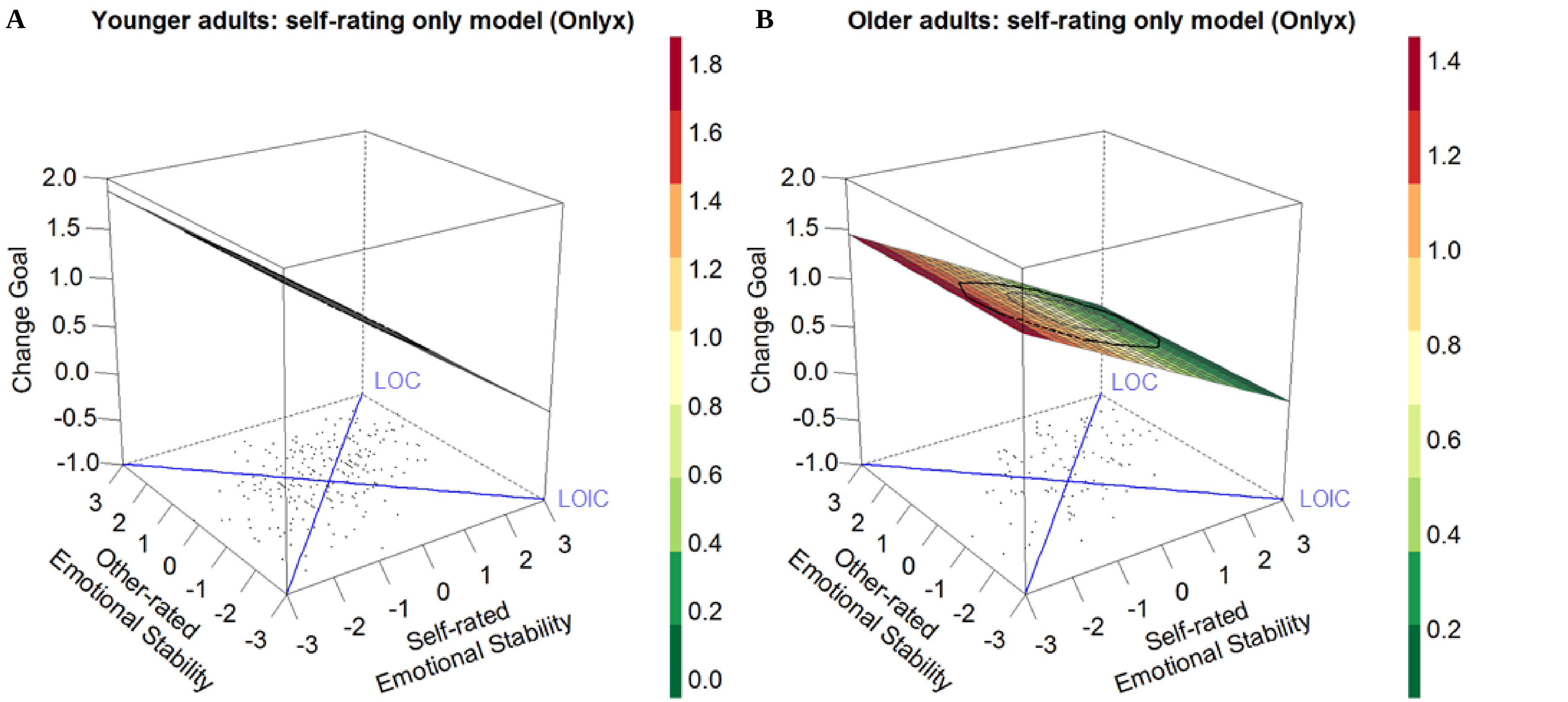


Figure 3. Response surfaces for the association of self- and other-rated emotional stability with goals to change emotional stability for each age group: (A) for younger and (B) for older adults. Both predictors were centered on the scale midpoint. Change goals ranged from -3 (*decrease emotional stability*) to +3 (*increase emotional stability*), with 0 indicating *no change desired*.

3.3.2.2 Conscientiousness.

The best fitting model for conscientiousness in younger adults was a model in which only self-reported conscientiousness predicted change goals (Table 11; coefficient b_1, Table 12). Figure 4A shows that goals to change were stronger the lower younger people rated themselves regarding conscientiousness.

In older adults, goals to change conscientiousness were best predicted by a model that considered both participants' and others' perspectives in a nonlinear combination (Table 11). In addition, the response surface was rotated to the left as indicated by the significant rotation parameter *S* (Table 12; dotted line in Figure 4B). In general, change goals were more pronounced when older adults' self-ratings on conscientiousness were low (coefficient b_1, Table 12). Change goals were stronger for self- and other-ratings that agreed, albeit only for the curvature along the rotated ridge, as suggested by the curvature in Figure 4B and the significant a'_4 parameter (rotation-adjusted a_4, Table 12). In addition, change goals were more pronounced when others rated people as more conscientious than the people rated themselves, as indicated by the significant a_3 parameter (Table 12). Furthermore, as we found for emotional stability, in both age groups, actual data existed only when people held goals to increase but not to decrease in conscientiousness.

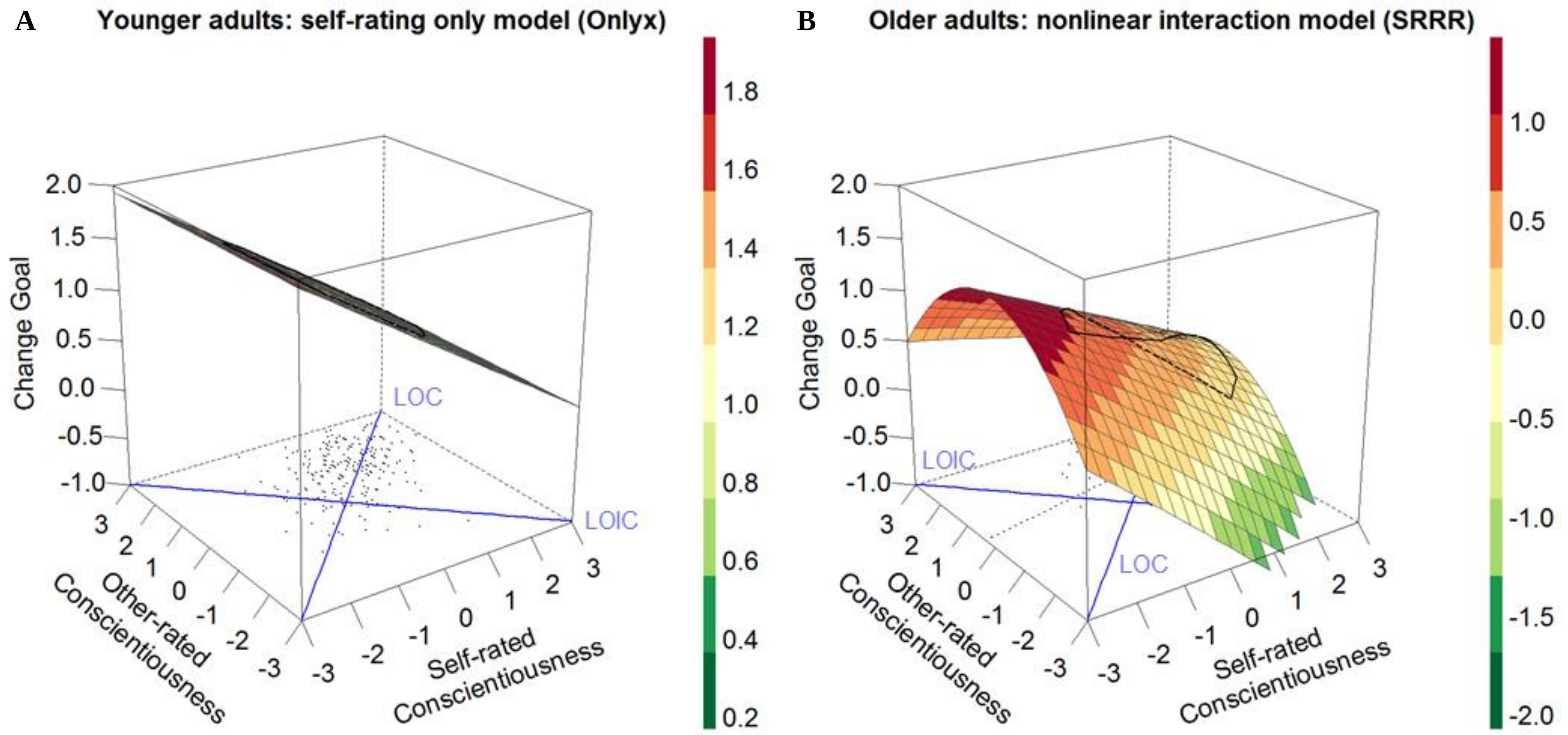


Figure 4. Response surfaces for the association of self- and other-rated conscientiousness with goals to change conscientiousness for each age group: (A) for younger and (B) for older adults. Both predictors were centered on the scale midpoint. Change goals ranged from -3 (*decrease conscientiousness*) to +3 (*increase conscientiousness*), with 0 indicating *no change desired*.

3.3.2.3 Agreeableness.

For agreeableness in younger adults, the best fitting model was a nonlinear interaction model in which both self- and other-rated trait levels were considered (Table 11). In general, change goals were stronger when both the people themselves and their knowledgeable others rated current traits as lower (coefficients b_1 and b_2, Table 12). The curvature in Figure 5A suggested more pronounced change goals when participants and their knowledgeable others disagreed on current traits. However, the nonsignificant a_4 parameter (Table 12) and the region of actual data in the surface plot suggested that no significant effect of disagreement occurred. However, change goals were stronger when participants and their knowledgeable others agreed on low current trait levels (parameter a_1, Table 12). Furthermore, for younger adults, the surface did not cross zero at the z-axis so that only goals to increase in agreeableness were modeled.

For older adults, goals to change agreeableness were best predicted by the full polynomial model, which included both self- and other-ratings (Table 11). Change goals were stronger when older adults rated themselves lower on agreeableness (coefficient b_1, Table 12). In addition, change goals were stronger for self- and other-ratings that agreed along the LOC (parameter a_4, Table 12). Moreover, change goals were stronger when other-rated agreeableness exceeded self-rated agreeableness (parameter a_3, Table 12). Goals to change agreeableness were more pronounced when the participants and others consistently gave low agreeableness ratings (parameter a_1, Table 12). Note that for older adults, the observed data in the model included both goals to increase and goals to decrease in agreeableness (Figure 5B).

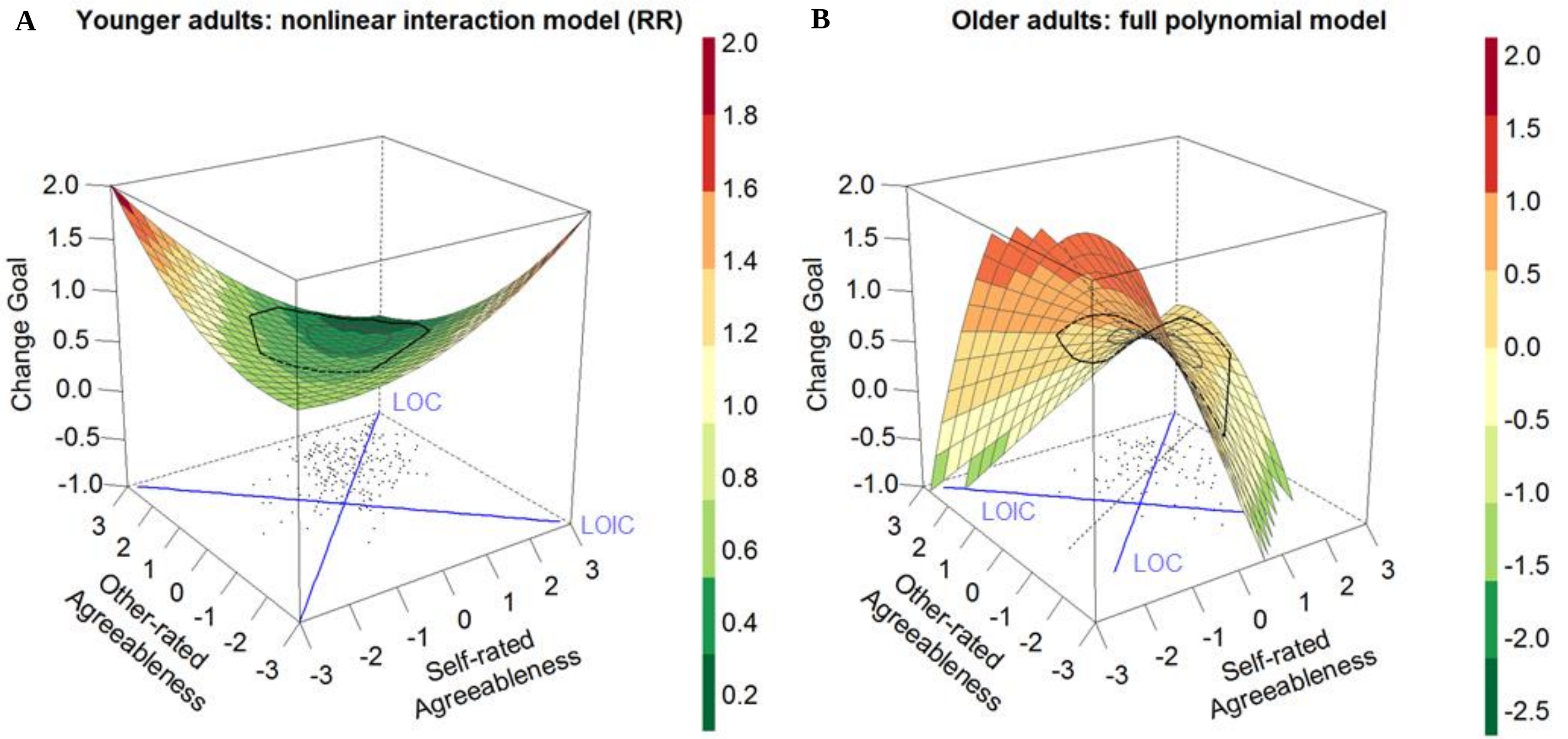


Figure 5. Response surfaces for the association of self- and other-rated agreeableness with goals to change agreeableness for each age group: (A) for younger and (B) for older adults. Both predictors were centered on the scale midpoint. Change goals ranged from -3 (*decrease agreeableness*) to +3 (*increase agreeableness*), with 0 indicating *no change desired*.

3.3.2.4 Extraversion.

The model considering the interaction between self- and other-ratings fit best when predicting goals to change extraversion for younger adults (Table 11). In general, change goals were stronger when both the participants themselves and their knowledgeable others gave lower ratings on current extraversion (coefficients b_1 and b_2, Table 12). Furthermore, change goals were stronger the more participants and their knowledgeable others agreed on the current level of extraversion (parameter a_4, Table 12), also shown by the downward curvature in Figure 6A, and the more participants and their knowledgeable others agreed that the current trait levels were low (parameter a_1, Table 12). In addition, change goals were stronger when self- and other-ratings agreed that the current trait levels were extremely high or extremely low (parameter a_2, Table 12). Change goals were stronger when other-rated extraversion exceeded self-rated extraversion (parameter a_3, Table 12).

For older adults, a nonlinear interaction model accounting for both self- and other-ratings had the best fit (Table 11). Change goals were stronger when both the participants themselves and their knowledgeable others rated current extraversion as low (coefficients b_1, b_3, and b_5, Table 12). Also, change goals were stronger the more people and their knowledgeable others agreed about current levels of extraversion (parameter a_4, Table 12), suggested by the downward curvature in Figure 6B. Goals to increase in extraversion were more pronounced the more people and their knowledgeable others agreed that current trait levels were low (parameter a_1, Table 12). In addition, change goals were stronger for higher other- than self-rated extraversion (parameter a_3, Table 12). For both age groups, the actual data in the model included both goals to increase and slightly decrease in extraversion (Figures 6A and 6B).

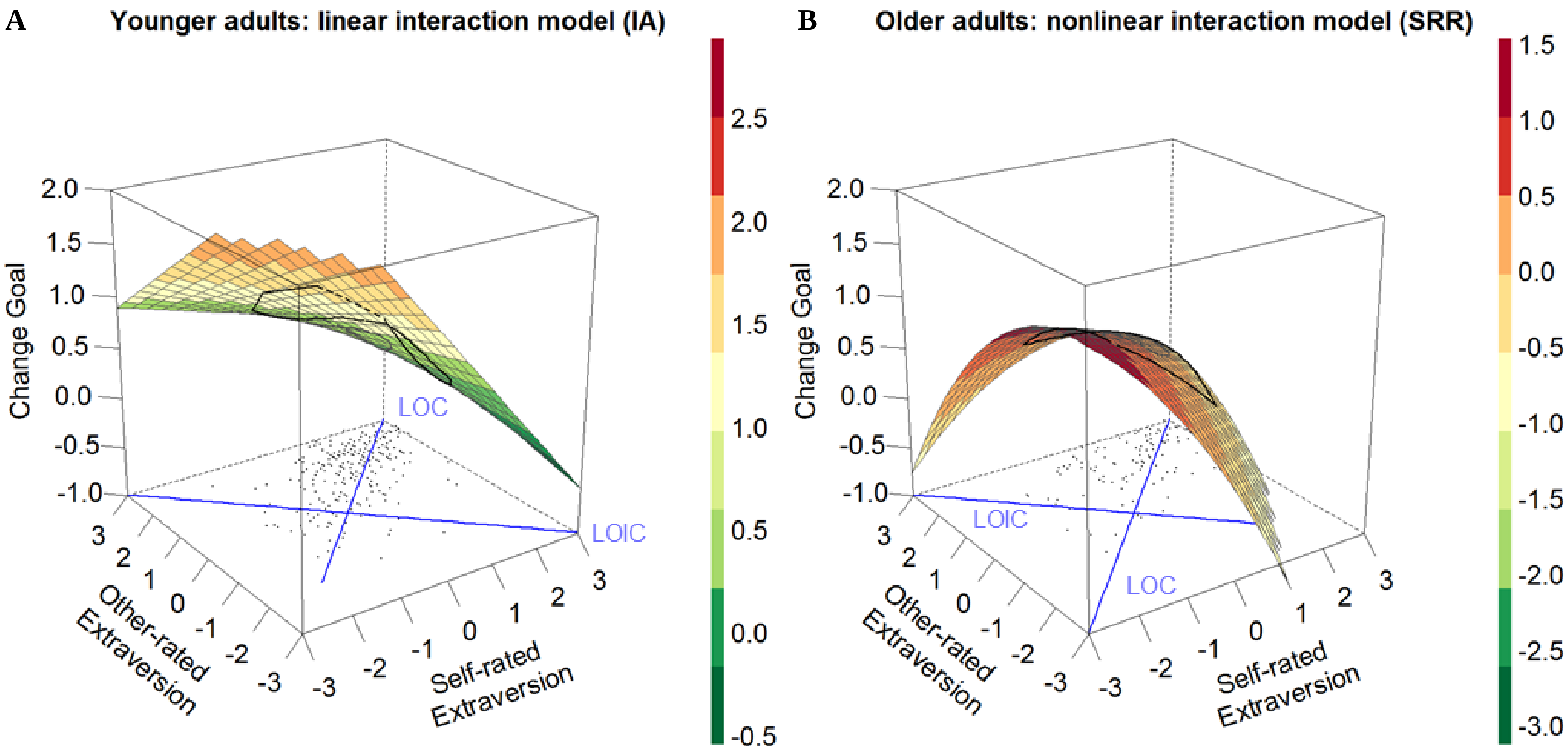


Figure 6. Response surfaces for the association of self- and other-rated extraversion with goals to change extraversion for each age group: (A) for younger and (B) for older adults. Both predictors were centered on the scale midpoint. Change goals ranged from -3 (*decrease extraversion*) to +3 (*increase extraversion*), with 0 indicating *no change desired*.

3.3.2.5 Openness to experience.

The best fitting models for predicting goals to change openness to experience included self-ratings as a linear predictor among younger adults and as a quadratic predictor among older adults (Table 11). The response surface in Figure 7A shows that, for younger adults, goals to increase openness were more pronounced when participants gave themselves low ratings on their current level of openness (coefficient b_1, Table 12). Similarly, for older adults, the curved response surface in Figure 7B indicates that change goals were again more pronounced when participants gave themselves low ratings on openness (coefficient b_1, Table 12). Note again that the actual data included only goals to increase openness (Figures 7A and 7B).

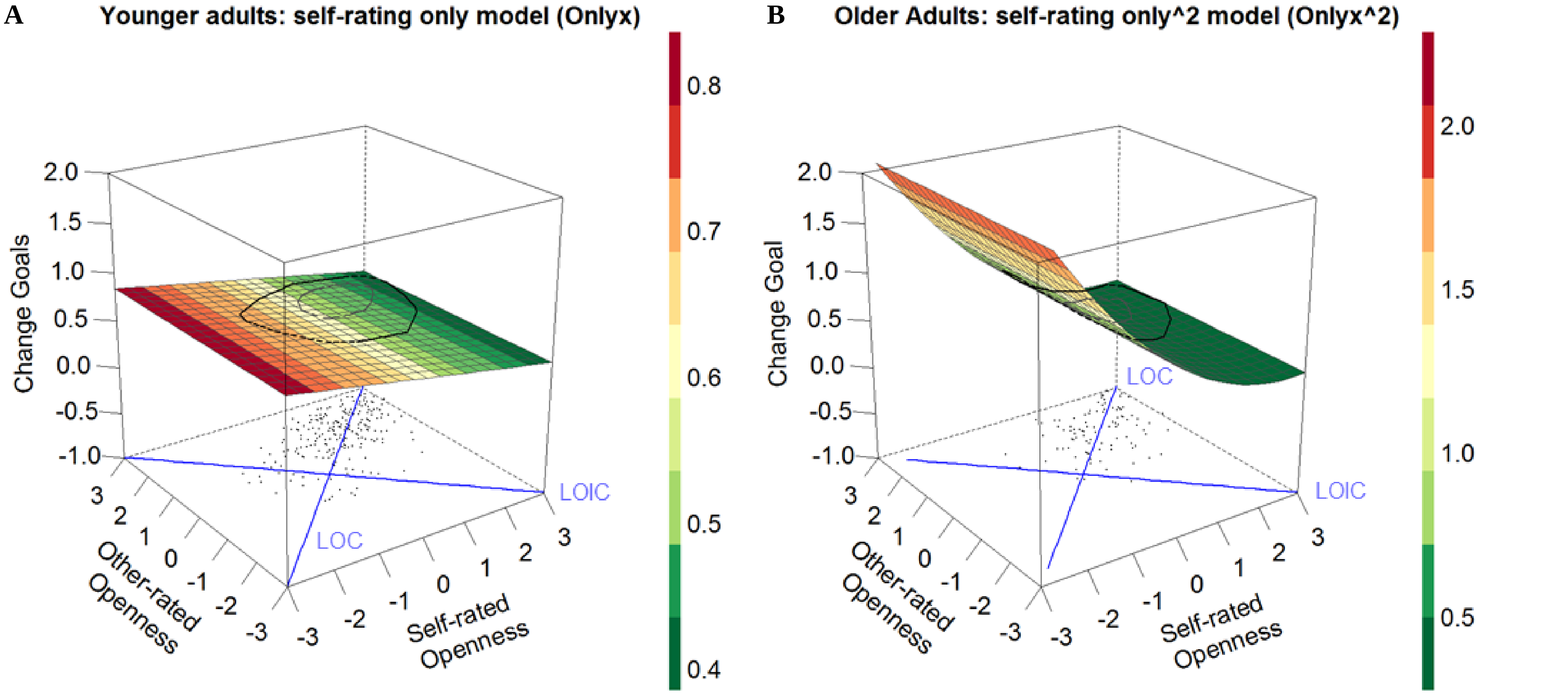


Figure 7. Response surfaces for the association of self- and other-rated openness with goals to change openness for each age group: (A) for younger and (B) for older adults. Both predictors were centered on the scale midpoint. Change goals ranged from -3 (*decrease openness*) to +3 (*increase openness*), with 0 indicating *no change desired*.

3.3.3 Personality characteristics beyond the Big Five and goals to change.

To extend knowledge on which characteristics predict goals to change traits beyond the Big Five traits, we examined associations with life satisfaction, self-esteem, locus of control, entity orientation, optimism, and loneliness. In addition, we analyzed whether the associations between personality characteristics and change goals differed with age, that is, whether age moderated the associations in multiple regression analyses. We report the zero-order correlations (Table 9) and regression results when all characteristics and the respective current Big Five traits were considered simultaneously (Table A9) to reduce the number of tests and avoid reports of false positive results.

In general, with lower life satisfaction, lower self-esteem, less internal locus of control, less optimism, and greater loneliness, most change goals were more pronounced in both age groups on a zero-order level (Table 9). The belief that personality is fixed and unchangeable (entity orientation) was not significantly associated with goals to change any trait (Table 9).

However, most of these zero-order associations diminished in the multiple regression analyses in which we additionally controlled for the current Big Five traits, whereas the associations of the Big Five with change goals remained significant (see Table A9 for the complete results; see Table A10 for correlations between the Big Five traits and personality characteristics). The few exceptions were that, with lower life satisfaction, goals to change conscientiousness were more pronounced ($\beta = -.17$, $p = .043$), and higher optimism was now associated with stronger goals to change extraversion ($\beta = .16$, $p = .042$).

3.3.4 Summary of results.

In this study, we investigated the roles of several potentially important predictors of goals to change in a sample of younger and older adults. Across both age groups, results suggested that on a zero-order level, self-rated and other-rated current Big Five trait levels predicted change goals. We showed that for agreeableness, extraversion, and partly for conscientiousness, self-other agreement mattered in the prediction of change goals. For most of these traits, change goals were stronger when both the self and others consistently rated a current trait level as low. For both age groups, only self-rated traits predicted goals to change emotional stability and openness. Characteristic adaptations such as life satisfaction, self-esteem, or optimism were significantly associated with change goals across both age groups on a zero-order level. However, most associations diminished in the multiple regression when the current Big Five traits were considered simultaneously. We discuss the results next.

3.4 Discussion

This study is the first to investigate the importance of both self- and other-rated Big Five traits for goals to change personality traits. Furthermore, we examined several personality characteristics beyond the Big Five traits to provide a comprehensive picture of factors that contribute to people’s goals to change or maintain personality traits. As a previous study showed age differences in goals to change personality traits (Hudson & Fraley, 2016b), we also examined an age-heterogeneous sample and replicated the age differences. We next discuss the relevance of one’s own and others’ perspectives on an individual's traits for goals to maintain or change the traits.

3.4.1 Change goals differ with self-perceived trait levels and age.

In line with previous research (Hudson & Fraley, 2015, 2016b; Hudson & Roberts, 2014) and Hypothesis 1, we found that both younger and older adults wanted to increase their Big Five traits and, most important, goals to increase traits were more pronounced the less participants perceived themselves to have the trait. Younger adults expressed stronger change goals than older adults for all Big Five traits, a finding that could be partly attributed to younger adults showing lower current trait levels (Hudson & Fraley, 2016b). Hence, change goals might facilitate increases in maturity (Roberts & Wood, 2006) or identity development (Roberts & Caspi, 2003) in young adulthood. For both age groups, goals to increase traits that are less pronounced might, for example, reflect the belief that a certain trait level is desirable (Dunlop et al., 2012; Hennecke et al., 2014). In addition, such goals may indicate that the trait is helpful for fulfilling age-specific social roles such as being a reliable employee (Hudson, Roberts, & Lodi-Smith, 2012) or a caring grandparent (D. Wood & Roberts, 2006). To test whether change goals merely reflect low self-perceived trait levels and might therefore result from a response bias, we examined the role of others’ perspectives.

3.4.2 Self-other agreement in traits is important for specific change goals.

We investigated whether change goals were more pronounced when self- and other-ratings agreed than when they disagreed and whether change goals were stronger the more both self- and other-ratings indicated lower current trait levels (Hypothesis 2). As expected, self-other agreement on traits was most important for goals to change extraversion. In both age groups, goals to change extraversion were more pronounced the more ratings agreed and stronger when both self- and other-ratings suggested lower current trait levels. We found a similar pattern of self-other agreement for goals to change agreeableness. For conscientiousness in younger adults, only one's own perspective on the current trait level played a role in the prediction of goals to change. Among older adults, goals to change conscientiousness were also linked to both one's own and others' perspective as well as their agreement. Finally, only one's own perspective on traits mattered for goals to change emotional stability and openness in both age groups.

To explain why self-other agreement on current traits is important for goals to change extraversion, agreeableness, and in part conscientiousness but not for emotional stability and openness, it may be helpful to consider their importance in social interactions and the different perspectives of the self and of others on these traits. Extraversion, agreeableness, and conscientiousness are considered social traits with great relevance for interpersonal interactions and relationships (Denissen & Penke, 2008; K. Harris & Vazire, 2016; Selfhout et al., 2010). Because these traits are expressed strongly in social behavior (Borkenau & Liebler, 1995; Funder, 2012; John & Robins, 1993), others may have many opportunities to observe trait-relevant behavior and to form a comprehensive personality judgment (Vazire, 2010; Vazire & Carlson, 2011) that they could (directly or indirectly) report back to the person (Back et al., 2011; Back & Vazire, 2012). This feedback may be taken into account when people assess whether they want to change because they may consider the feedback to be valid as others had the opportunity to observe trait-relevant behavior. When evaluating the need to set goals to change these more social traits, people with self- and other-ratings that agree might have the most sensible and least distorted self-perceptions of their “real” trait levels (Atwater & Yammarino, 1997; Back & Vazire, 2012; London & Smither, 1995) and might in part therefore form the strongest change goals for lower current trait ratings that agree.

Others’ perspectives on people’s trait levels might not play an equally important role for goals to change emotional stability and openness because these traits may be less relevant in many social situations. Therefore, others might (be able to) provide less feedback. Also, people may see fewer reasons to integrate the perspectives of others for these traits because they might not believe that others possess valid knowledge about their anxieties, worries and intellectual preferences. Thus, when evaluating the need to set goals to change emotional stability or openness, people largely rely on their own, unique perspective and tend to neglect others’ perspectives on their current personality. At this point, our explanations for differences between change goal domains remain tentative and await further examination.

We examined whether higher or lower self- than other-ratings would be found to be associated with stronger change goals, and results showed a consistent picture for extraversion, agreeableness, and conscientiousness. When disagreement occurred, change goals were stronger when other-ratings exceeded self-ratings. Yet, this effect occurred in addition to the general effect that change goals were more pronounced with lower self-perceived trait levels. This finding might indicate that people set stronger change goals to bring their personality in line with how significant others perceive them.

We did not expect large age differences in the role of self-other agreement for change goals and largely observed similar patterns for all Big Five domains except conscientiousness. Among younger adults, only the perspective of the self mattered for goals to change conscientiousness, which stands in contrast to the results for older adults. Although this age difference awaits replication, it is possible that feedback processes as described above might not be of vital importance in young adulthood where increasing conscientiousness might be a normative, work-related developmental task (Hudson & Roberts, 2016; Hudson et al., 2012; Roberts & Wood, 2006). Alternatively, other-ratings of one's conscientiousness provided by friends or family members may be less relevant compared with feedback from other sources (e.g., work- or study-related feedback from colleagues).

When interpreting the results for goals to change openness or agreeableness, it has to be noted that even the best fitting models explained only a little variance. This is in line with previous findings (Hudson & Fraley, 2015; Hudson & Roberts, 2014) and leaves open the question of which other predictors (e.g., more specific personality characteristics) might contribute to an individual's change goals for these traits.

3.4.3 Personality characteristics beyond the Big Five traits as predictors of change goals.

We investigated the association of several additional personality characteristics beyond the Big Five traits with change goals and found significant zero-order effects for all characteristics except entity orientation. So, for example, the finding that with lower life satisfaction, people in both age groups stated stronger change goals for emotional stability and extraversion is in line with previous findings in young adults (Hudson & Roberts, 2014) and highlights the idea that dissatisfaction with one's life may contribute to a desire for change. Unexpectedly, entity orientation was not associated with change goals at all, although a less pronounced entity orientation (i.e., believing that traits are malleable) was associated with greater actual personality change (Robins et al., 2005). Perhaps assuming that change is possible in general might not necessarily lead to wanting to change oneself, and vice versa, goals to change oneself might not always be met by the assumption that change is possible.

In the multiple regression analyses, the zero-order associations diminished when we controlled for current Big Five traits, likely because most of the characteristics we examined were associated with Big Five traits. Thus, the zero-order effects could have resulted from shared variance with current traits. In contrast to zero-order effects, higher optimism was now associated with stronger goals to change extraversion when controlling for personality traits. This might indicate that if the current personality profile is statistically controlled for (e.g., low extraversion), optimism may foster the wish to change, perhaps because change is considered possible. These findings on the additional personality characteristics seem relevant for achieving a better understanding of factors that do and do not contribute to the desire to change personality traits and for advancing theoretical knowledge of volitional personality development. We carefully conclude that people’s current standing on a trait seems to be the most important factor for wanting to change therein. We speculate that the same applies to goals to change characteristics beyond the Big Five (e.g., goals to change self-esteem), where the specific characteristics (i.e., self-esteem) would be more important predictors than broad Big Five traits (for example, see Kiecolt & Mabry, 2000).

3.4.4 Limitations and future directions.

The current study is the first to investigate the importance of self-other agreement in current traits and a comprehensive set of personality characteristics beyond Big Five traits in the prediction of change goals. Still, some limitations and future directions need to be discussed. First, although participants were recruited through various channels, we cannot rule out potential self-selection effects. For example, older adults in the current sample reported being as extraverted and open to experience as younger adults, which is an atypical pattern because extraversion and openness were found to be lower in older participants in a representative German sample (Specht et al., 2011). Second, only participants’ Big Five traits were rated by others, whereas other characteristics and change goals were assessed with self-reports. However, goals to change might not be observable, and hence reportable, for others because such goals are rarely manifested in everyday behavior. In addition, some subscales displayed lower reliabilities (e.g., goals to change agreeableness, entity orientation), which might result from using only a few, somewhat heterogeneous items. Third, mechanisms of and causal associations among other-rated current Big Five traits and self-rated change goals remain open. Future studies could assess or experimentally manipulate feedback provided by others as well as individuals' meta-perceived traits (e.g., "Others think I am talkative") to better understand the mechanisms.

3.4.5 Conclusion.

Previous research used self-reported current traits and focused on life satisfaction in addition to Big Five traits to investigate goals to change traits. The present study extended this research by showing that other-rated trait levels also matter for most traits. Self-other agreement, especially about low current trait levels, predicted goals to change extraversion, agreeableness, and in part conscientiousness. We therefore conclude that goals to change traits may reflect much more than a biased perception of one's own traits but instead domains where individuals (and their significant others) see room for personality development.

Chapter IV:

Momentary Processes and Goals to Change Personality as Predictor of Long-term Development in Explicit and Implicit Representations of Big Five Traits: An Empirical Test of the TESSERA Framework[15]

[15] This chapter is in part based on the following manuscript:

Quintus, M., & Egloff, B., Wrzus, C. (2018). Momentary processes predict long-term development in explicit and implicit representations of Big Five traits: An empirical test of the TESSERA framework. Manuscript in preparation.

4.1 Introduction

Broad evidence suggests that people's explicit, self-rated representations of Big Five traits show both normative continuity and change across the lifespan (Lucas & Donnellan, 2011; Roberts et al., 2006a; Roberts et al., 2008). At the same time, people show individual (i.e., person-specific) patterns of trait development with large differences regarding direction, amount or timing of changes (Schwaba & Bleidorn, 2017). A growing body of research emphasizes that, aside from interpersonal factors (e.g., life transitions, see Chapter II), intrapersonal factors (e.g., goals, motives, see Chapter III) may contribute to both normative and person-specific patterns of development as well. Specifically, self-regulated or volitional trait changes, based on people's goals to change traits, have come into focus as one factor that contributes to the larger picture of personality development in general (Hennecke et al., 2014; Hudson & Fraley, 2015; Hudson & Roberts, 2014).

Both personality development in general and volitional personality development in particular are often theoretically explained by different daily (i.e., momentary) processes that contribute to long-term trait development (Hennecke et al., 2014; Roberts, 2006, 2009, 2017; Wrzus & Roberts, 2017). However, such momentary processes received little attention in previous longitudinal research that employed more macro-analytical approaches (e.g., by focusing on life events; Specht et al., 2011). Although theory postulates that trait-relevant momentary states contribute to personality development, little is known about the developmental links between traits, goals to change traits and repeated states as well as the cascade of momentary processes that precedes and follows such states in daily situations (Durbin & Hicks, 2014; Hennecke et al., 2014; Hopwood et al., 2009; Wrzus & Roberts, 2017).

Importantly, longitudinal research on both personality development in general and volitional development in particular focused so far on self-rated traits, that is propositional or explicit representations, and neglected the long-term development of implicitly measured traits and their underlying processes. Yet, previous research demonstrated the importance and validity of implicit, less conscious representations of traits (Asendorpf, Banse, & Mücke, 2002; Back et al., 2009; Schmukle et al., 2008). Aside from its relevance for personality research, a more detailed understanding of processes of development in both explicit and implicit representation of traits could guide psychological interventions for example in clinical (e.g., changing aggressive behavior; Penton-Voak et al., 2013; Roberts et al., 2017) and organizational psychology (i.e., supporting managers in changing their personality to improve organizational performance; Peterson, Smith, Martorana, & Owens, 2003).

The aim of this chapter is twofold: First, we examine momentary processes of general long-term development in explicit and implicit representations of traits as proposed by the TESSERA framework (Wrzus & Roberts, 2017). On this basis, we secondly address volitional aspects of development in explicit and implicit representations of traits by investigating whether people's change goals a) are linked with goal-relevant momentary experiences as suggested by the TESSERA framework (Wrzus & Roberts, 2017) and b) further manifest in actual trait changes, especially when they are perceived as important and feasible.

4.1.1 A brief overview of the TESSERA framework on personality development.

According to the recently proposed TESSERA framework, long-term trait development results from repeated sequences of momentary processes, which consist of the four components: **T**riggering situations, **E**xpectancies, **S**tates/**S**tate **E**xpressions, and **R**e**A**ctions (Wrzus & Roberts, 2017; see Wrzus, 2018 for a comparison with other theories on personality development, e.g., Back et al., 2011; Dweck, 2017; Geukes et al., 2017; Hennecke et al., 2014; Roberts & Jackson, 2008). For example, the TESSERA framework describes that experiencing a triggering situation (e.g., sitting at one's work desk) may elicit clear expectations on one's behavior (e.g., working on a task or project) that is in turn linked to a specific state (e.g., thoroughly working on a paper), and reaction (e.g., feeling good); subsequent repetitions of similar sequences may finally lead to trait changes (e.g., increases in conscientiousness; Wrzus & Roberts, 2017). As specified in previous work on situation selection (Emmons, Diener, &

Larsen, 1986; Wrzus et al., 2016) and trait expression (Fleeson, 2001; Rauthmann et al., 2015b), TESSERA components are systematically modified and constrained by environmental (e.g., cultural and proximal social contexts) and individual factors (e.g., Big Five traits, change goals, see sections “4.1.3.Linking momentary processes with long-term development of traits.” and “4.1.4 Change goals may shape the experience of situations and states.”).

The generic TESSERA framework acknowledges that traits manifest on different levels and thus distinguishes between explicit and implicit representations of traits. Distinguishing explicit and implicit representations of traits is useful, since both representations reflect different levels of personality (i.e., propositional self-perceptions vs. associative self-concepts, see below), that may not be linked closely to each other (Hofmann et al., 2005a). Explicit representations of traits (e.g., assessed with self-ratings) generally refer to people’s propositional representations of self-concepts that is based on a conscious perception and evaluation of own behavior, thoughts or feelings (Back et al., 2009; Paulhus & Vazire, 2007). Implicit representations of traits (e.g., assessed with indirect measures) refer to associative representations of self-concepts (Greenwald & Banaji, 1995; Marco Perugini & Leone, 2009; Schmukle et al., 2008). Accordingly, reflective processes should translate TESSERA sequences into long-term development of explicit representations of traits, while associative processes should account for development of implicit representations of traits (Smith & DeCoster, 2000; Strack & Deutsch, 2004; see section "4.1.3. Linking momentary processes with long-term development of traits.").

Note that the TESSERA framework can be applied to both personality development in general and volitional development in particular (Wrzus, 2018; Wrzus & Roberts, 2017). Specifically, although change goals may differentially contribute to people’s experience of situations and states, momentary TESSERA sequences and reflective as well as associative processes should be equally important for volitional personality development.

4.1.2 Momentary processes of personality development.

The TESSERA framework suggests that momentary processes of personality development can be organized in recursive TESSERA sequences and makes specific predictions on the associations of components within these sequences (Wrzus & Roberts, 2017). Next, we briefly describe each TESSERA component and explain how components are expected to be associated within the framework (i.e., form TESSERA sequences).

Triggering situations cover daily situations or events external to people that may occur in different contexts (e.g., life events, social roles, interactions with others, Wrzus & Roberts, 2017)[16]. Although such situations can be described in terms of their physical properties (e.g., location, time), psychological properties (e.g., perceiving adversity, request to work) seem to be more relevant for subsequent states (Fleeson & Jolley, 2006; Rauthmann et al., 2015b; Sherman, Rauthmann, Brown, Serfass, & Jones, 2015). Triggering situations, and especially common situations (e.g., working or social situations) should produce clear expectations on how to behave, think or feel within that situation (D. Wood & Denissen, 2015; Wrzus & Roberts, 2017). Moreover, the situation may directly trigger certain states or state expressions for example in terms of if-then contingencies (Mischel & Shoda, 1995; Rauthmann et al., 2014; Roberts, 2017; Schmitt et al., 2013; D. Wood & Denissen, 2015; Wrzus & Roberts, 2017). Needless to say, different situations (e.g., being at the office vs. at a party) are generally linked to specific states (e.g., working vs. socializing; Rauthmann et al., 2014; Sherman et al., 2015).[17] In addition, certain situations might directly elicit people’s reactions. Previous research for example suggests that people feel more positive in social situations (David, Green, Martin, & Suls, 1997; Weinstein & Mermelstein, 2007). In contrast, people feel more uncomfortable in

[16] The TESSERA framework also acknowledges that internal events can serve as triggers within TESSERA sequences (Wrzus & Roberts, 2017). For example thoughts about a situation might evoke subsequent expectancies, states or reactions. For the sake of clarity, we however focused on external triggering situations.

[17] In reality, a triggering situation might not only elicit one distinct state (Mischel & Shoda, 1995) but result in co-occurring different aspects of states (Wrzus & Roberts, 2017). The investigation of such co-occurring states will be a methodological question for future research.

demanding or unpleasant situations (e.g., including work or adversity; Bolger, DeLongis, Kessler, & Schilling, 1989; Bryson & MacKerron, 2017; Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004; Stephan & Renfro, 2002).

Expectancies describe part of people’s momentary motivation that guides how to behave or feel in a situation (Wrzus & Roberts, 2017). Thereby, expectancies help to intentionally select a response (i.e., state or state expression) from a broad range of possible responses (Fleeson & Jayawickreme, 2015; Roberts & Wood, 2006; D. Wood, Gardner, & Harms, 2015) and ensure a more conscious, goal-related pathway from triggering situations to states (Wrzus & Roberts, 2017; see also Ajzen, 1991; Eccles, 1983; Fishbein & Ajzen, 1975).

States refer to people’s momentary, concrete patterns of behaviors, thoughts, or feelings (Heller, Komar, & Lee, 2007; Steyer, Mayer, Geiser, & Cole, 2015; Wrzus & Roberts, 2017). Since traits display somewhat persistent inter-individual differences in behavior, thoughts or feelings across time and situations (Fleeson & Jayawickreme, 2015; Fleeson & Jolley, 2006; Hooker & McAdams, 2003; Mischel & Shoda, 1995; Roberts & Jackson, 2008), states and state expressions should form the basis of long-term trait change (Geukes et al., 2017; Hennecke et al., 2014; Roberts, 2017; Roberts & Jackson, 2008; Wrzus & Roberts, 2017). In addition, momentary states may be linked with momentary reactions (e.g., feelings; Wrzus & Roberts, 2017), particularly, if such behavior reflects a socially desirable trait level (Dunlop et al., 2012). For example, conscientiously working on a task should be associated with feeling more positive than procrastinating.

Reactions include one’s own or others’ responses to states (i.e., thoughts, feelings, or behavior; Wrzus & Roberts, 2017). Especially one’s own feelings after a TESSERA sequence might play an important role in long-term trait development because it offers an immediate and significant reward or punishment for one’s state (Bower, 1992; Corr, 2008; Wrzus & Roberts, 2017). Reacting with positive feelings should reinforce one’s displayed behaviors, thoughts or feelings while states that result in negative feelings should be avoided (Caspi & Roberts, 2001;

Kanfer & Grimm, 1977; Kanfer & Phillips, 1970; Mischel & Shoda, 1995; Roberts & Wood, 2006). The punishing element of negative feelings requires a change in one's behavior, thoughts or feelings to avoid future punishment and approach more positive feelings (Wrzus & Roberts, 2017; see also Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Baumeister, Vohs, Nathan DeWall, & Zhang, 2007; Bless, Hamilton, & Mackie, 1992; Mor & Winquist, 2002). We therefore suggest that negative feelings following a TESSERA sequence will be associated with a stronger reflection of this sequence that is necessary to implement such change in the future.

Reflection is not conceptualized as part of TESSERA sequences, but instead covers people's conscious thinking about TESSERA sequences (Wrzus & Roberts, 2017). When thinking about an experience, it is not only remembered, but also weighted and actively restructured or evaluated (Grant, Franklin, & Langford, 2002; Mayer, 2004; Staudinger, 2001; Wrzus & Roberts, 2017). Thus, reflective processes should play a crucial role in the development of explicit, but not implicit representation of traits (Wrzus & Roberts, 2017).

In the next section, we first explain how traits affect the experience of situations and states. In addition, we describe reflective and associative processes in greater detail to explain how these processes link momentary TESSERA sequences with long-term development of explicit and implicit representations of traits. Addressing volitional personality development, we thereafter explain how change goals may affect people's experience of situations and states. Finally, we briefly summarize current knowledge on whether volitional personality development is indeed possible and outline important remaining questions that need to be tackled.

4.1.3 Linking momentary processes with long-term development of traits.

The TESSERA framework takes into account that people's experiences of situations, behavior, thoughts, and feelings are at least partly shaped by their explicit and implicit representations of traits (Wrzus & Roberts, 2017). Traits may affect the experience of situations because people tend to actively select or form trait-congruent environments (Buss, 1987; Caspi

& Roberts, 2001; Diener, Larsen, & Emmons, 1984; Emmons et al., 1986; Rauthmann et al., 2015b; Roberts & Robins, 2004; Wrzus et al., 2016). In line with the idea that traits manifest in states, previous research showed that both explicit and implicit representations of traits predicted subsequent, trait-relevant behavior (Asendorpf et al., 2002; Back et al., 2009; Egloff & Schmukle, 2002; Fleeson, 2001; Fleeson & Gallagher, 2009; Mehl et al., 2006; Schnabel, Banse, & Asendorpf, 2006). Importantly, each representation provided a unique contribution to the prediction of the examined behavior (Back et al., 2009).

Yet, associations between traits and states are assumed to be bidirectional with states also influencing traits over time (Geukes et al., 2017; Roberts, 2017; Roberts & Jackson, 2008; Roberts & Wood, 2006; Wrzus & Roberts, 2017). Thus, people could use experienced trait-relevant states and state expressions as indicators of their latent traits (Back & Vazire, 2012; Buss & Craik, 1983; Fleeson & Gallagher, 2009; Hutteman et al., 2015; Wrzus & Roberts, 2017). In line with this assumption, previous studies demonstrated that adults who increased in momentary stress reactivity (i.e., increased negative affect when hassles occurred in daily life) increased in trait neuroticism over 6 years (Wrzus et al., 2018a), and young adults who increased in monthly-assessed state self-esteem increased in self-esteem over one year (Hutteman et al., 2015). In addition, long-term development in explicit representations of traits should result from reflective processes on TESSERA sequences (Wrzus & Roberts, 2017). In line with previous research, reflective processes like conscious remembering or reappraising should help to translate momentary experiences into people's self-concepts (Bem, 1972; Brandtstädter, 1989; Caspi & Roberts, 2001; Hooker & McAdams, 2003; Staudinger, 2001). By actively evaluating an experience and especially by reflecting on experienced states, people should be able to confirm or adjust their explicit representations of traits (Back et al., 2009; Bem, 1972; Brandtstädter & Greve, 1994; Gawronski & Bodenhausen, 2006; Wrzus & Roberts, 2017).

The repeated experience of TESSERA sequences should foster changes in implicit representations of traits due to associative processes like implicit learning and reinforcement learning (Wrzus, 2018; Wrzus & Roberts, 2017). Specifically, implicit learning (Seger, 1994) helps to transfer repeated states into the procedural memory whereby habit formation is fostered that may finally lead to changes in implicit representations of traits (Aarts & Dijksterhuis, 2000; Amodio & Ratner, 2011; Rauthmann, 2017; W. Wood & Neal, 2007). The repeated and combined activation of states and people's self-concept might further contribute to the development of implicit associations within the associative memory (Back & Nestler, 2016; Back et al., 2009; Higgins, 1996b; Wrzus, 2018; Zinkernagel, Hofmann, Gerstenberg, & Schmitt, 2013). Aside from the mere repetition of states and accompanied implicit learning, reinforcement learning should contribute to long-term trait development (Wrzus, 2018; Wrzus & Roberts, 2017). Especially people's own positive or negative affective reactions should reinforce or punish preceding states or state expressions so that they more easily condense into new or altered habits and finally, changes in implicit self-concepts (W. Wood, 2017; Wrzus, 2018; Wrzus & Roberts, 2017; Yin & Knowlton, 2006).

Due to the generic nature of the TESSERA framework (Wrzus & Roberts, 2017), the above explained links of momentary processes with long-term development in explicit and implicit representations of traits should apply to both personality development in general and volitional development in particular (Wrzus, 2018; Wrzus & Roberts, 2017; see also Hennecke et al., 2014). Yet, in addition, the association of states and state expressions with long-term changes in explicit and implicit representations of traits may also depend on people's change goals. Specifically, people who both hold stronger change goals and experience more pronounced states and state expressions may show more pronounced trait changes, because they pay more attention to changes in their behavior, thoughts or feelings and are more motivated to perceive these changes as part of their self-concepts (i.e., traits; Hennecke et al., 2014; Hudson & Fraley, 2015, 2017; Wrzus & Roberts, 2017).

4.1.4 Change goals may shape the experience of situations and states.

To successfully implement more abstract, long-term goals like goals to change traits, people may need to translate them into subordinate but more concrete short-term goals (Bandura, 2001; Emmons, 1992). In particular, such short-term goals may involve specific plans of which situations to engage in or how to behave, think or feel in this situations (e.g., to increase one's extraversion, attending parties and starting conversations with strangers might be sensible; Gollwitzer, 1999; Masicampo & Baumeister, 2011). In line with this idea, the TESSERA framework (Wrzus & Roberts, 2017) suggests that change goals shape the experience of subsequent situations and states.

In particular, change goals may be linked with experiencing more goal-relevant situations because people's enhanced encountering of such situations offers possibilities to gain new trait-relevant experiences and to display or train altered behavior, thoughts or feelings (Denissen et al., 2013; Hennecke et al., 2014; Wrzus & Roberts, 2017). In line with this suggestion, a previous study showed that students joined extracurricular activities (i.e., exposing themselves to new situations, for example by joining collaborative, prosocial activities) that they believed to help approaching their desired self (e.g., being an altruistic person; Stevenson & Clegg, 2011). Furthermore, recent research demonstrated that change goals were more successfully implemented if people followed a "change plan" that also covered intensified engagement in goal-relevant situations (e.g., asking a friend to lunch; Hudson & Fraley, 2015), again highlighting potential associations between change goals and experienced situations. Connecting traits and change goals, the association of change goals and experienced situations may additionally depend on people's current trait level. Specifically, people with lower current trait levels who also hold stronger change goals may feel amplified needs to actively reduce these larger discrepancies and therefore may expose themselves to more goal-related situations (for arguments in favor of this idea, see Higgins, 1987, 1996a; Higgins & Tykocinski, 1992; R. M. Ryan & Deci, 2000).

Goals to change should also affect the experienced states because, as a bottom-up strategy, actively changing trait-relevant behavior, thoughts and feelings was suggested to be a viable way to change a trait in the long run (Denissen et al., 2013; Hennecke et al., 2014; Hudson & Fraley, 2015; Magidson et al., 2014). In that sense, a study in which laypersons were asked to describe strategies they use to change their traits suggested that people may indeed try to tackle their states by changing concrete patterns of their behaviors (e.g., "try to force myself to talk more") or thoughts (e.g., "acknowledging when my thoughts stray into criticism"; Baranski et al., 2017). In line with these findings, another study showed that the more people wanted to change, the more trait-relevant behavior they reported, which in turn was associated with more pronounced trait changes (Hudson & Fraley, 2015; but see also McCabe & Fleeson, 2012). Yet, in contrast, another study did not show an association of change goals with more trait-relevant daily behavior, especially when current traits were controlled (Hudson & Roberts, 2014), thereby supporting the idea that showing new, or contra-trait behavior requires more effort and is therefore harder to perform (Gallagher, Fleeson, & Hoyle, 2011; see also W. Wood & Neal, 2007). Again, showing both lower current traits and stronger change goals may be linked with experiencing more goal-relevant states as people may strongly want to overcome their self-perceived shortcomings (for arguments in favor of this idea, see Carver & Scheier, 1999; W. Cheng & Ickes, 2009; Higgins, 1987, 1996a; R. M. Ryan & Deci, 2000; for arguments against this idea, see Hudson & Roberts, 2014).

Importantly, people may not show equal efforts to implement all of their change goals. Instead, more important and more feasible change goals may benefit from intensified attempts and actual capacity for their successful implementation (Hennecke et al., 2014; B. R. Little, 1983; Peters, 2015; D. Wood & Denissen, 2015). Specifically, people may feel more committed to more important goals so that they may expose themselves to more goal-relevant situations and show more goal-relevant states (for similar arguments, see Ajzen, 1985; Fishbein & Ajzen, 1975; Gollwitzer, 1990; H. Heckhausen, 1991; for empirical examples, see Harris, Daniels &

Briner, 2003; Hollenbeck & Williams, 1987). More feasible change goals may in turn profit from clearer requirements (e.g., which situations to expose to and how to behave) and higher perceived ability to meet these requirements so that people could invest more strongly into these goals (Ajzen, 1985; Fishbein & Ajzen, 1975; Gollwitzer, 1990; H. Heckhausen, 1991; for an empirical example, see Perugini & Conner, 2000). Moreover, both the more important and the more feasible a change goal appears, the more goal-relevant situations and states people may experience (see also Gollwitzer & Oettingen, 2012; Hennecke et al., 2014; Peters, 2015; D. Wood & Denissen, 2015; for empirical research in favor of this idea, see Brandstätter & Frank, 2002). In addition, the general effects of both goal importance and feasibility should be more pronounced the stronger the corresponding change goals are framed (for similar arguments, see Hennecke et al., 2014). For example, people with a stronger goal to increase in extraversion who also consider this goal to be highly important should strongly seek out for goal-relevant situations (e.g., parties) and display more goal-relevant states (e.g., chatting with strangers).

4.1.5 Is volitional personality development possible?.

So far, with momentary TESSERA sequences forming the building blocks of long-term personality development, the TESSERA framework (Wrzus & Roberts, 2017) served as theoretical foundation to also explain volitional personality development. In a nutshell, people's change goals should shape both the experienced situations and states whereas reflective or associative processes should transform the experienced TESSERA sequences into long-term development in explicit or implicit representations of traits. With this perspective in mind, any association of change goals and subsequent trait development should be due to momentary processes (i.e., in terms of a full mediation). Yet, in addition, more direct links between change goals and actual trait development need to be considered for at least two reasons.

First, empirical examinations of processes of volitional personality development may face substantial methodological challenges to assess all TESSERA sequences and reflective or associative processes relevant for volitional trait changes, because for example limited research resources allow to only taking a glimpse into people's momentary experiences. Consequently, change goals and trait development may be linked beyond the assessed momentary processes (for a discussion on methodological challenges in the assessment of momentary processes, see Mehl & Wrzus, in press; Wrzus & Mehl, 2015). Second, as indicated by a previous study, change goals may directly result in the construction of a new, desired identity that could be largely independent from people's momentary experiences in the first place (Hudson & Fraley, 2015). Specifically, change goals may, via more learning-oriented (i.e., top-down) processes and increased self-reflection alter people's schemata of themselves (Allemand & Flückiger, 2017; Prochaska & Prochaska, 2010).

In the light of a growing interest in volitional aspects of personality development (Denissen & Penke, 2008; Denissen et al., 2013; Hennecke et al., 2014; Hudson & Fraley, 2017; Hudson & Roberts, 2014), research recently started to investigate direct links between people's change goals and actual trait changes. However, to date, this research remains scarce and provides mixed results (Hudson & Fraley, 2015, 2016a; Robinson et al., 2015). A recent study for example repeatedly assessed people's self-reported traits and change goals over a period of four months (Hudson & Fraley, 2015). As hypothesized, results showed that stronger change goals at the first assessment were linked with stronger subsequent growth in actual traits (Hudson & Fraley, 2015). For example, people who at the first assessment expressed goals to become more extraverted experienced stronger growth in self-rated extraversion across four months than people who did not want to change this trait. In contrast, another study found that change goals were not followed by self-rated trait changes after a period of 12 months (Robinson et al., 2015). Instead, goals to change conscientiousness and neuroticism were even associated with decreases in the respective traits (Robinson et al., 2015). One potential explanation for these inconclusive findings might be that change goals affect trait development only within a short time span (e.g., four months; Hudson & Fraley, 2015, 2016a), while their effects fade out in the long run (e.g., after one year; Robinson et al., 2015). However, this explanation remains to be tested.

In addition, previous research on whether change goals contribute to long-term trait development suffers from at least three limitations. First, previous studies relied only on self-reports and were therefore limited to examine changes in explicit representations of traits (Hudson & Fraley, 2015, 2016a; Robinson et al., 2015). It remains an open question whether change goals can also manifest in changes of different manifestations of personality like implicit representations of traits (Hudson & Fraley, 2017; see also Rauthmann, 2017). Second, although change goals seem to be common across the entire lifespan (Hudson & Fraley, 2016b), previous studies focused on younger students thereby limiting the generalizability of their findings (Hudson & Fraley, 2015, 2016a; Robinson et al., 2015). Since young adulthood and especially the college years reflect a life period of more pronounced trait development (Arnett, 2004; Lucas & Donnellan, 2011; Lüdtke et al., 2011; Roberts et al., 2006a), such samples may overestimate the malleability of traits due to change goals. Third, preceding research did hardly investigate additional factors that may foster direct links between change goals and long-term trait development (for a recent exception, see Peters, 2015). For example, people with lower current trait levels and stronger change goals may experience more pronounced trait changes, maybe because they invest more resources to overcome these discrepancies and have simply more to gain in terms of trait development (Higgins, 1987, 1996a; Latham & Locke, 1991; R. M. Ryan & Deci, 2000; for empirical arguments from clinical psychology, see Shapiro et al., 1994). In addition, more important and more feasible change goals and especially change goals that are considered both more important and feasible may benefit from increased goal dedication and higher perceived capacity of goal implementation (for similar arguments, see Ajzen, 1985; Fishbein & Ajzen, 1975; H. Heckhausen, 1991; Hennecke et al., 2014; for empirical examples, see Beattie, Hardy & Woodman, 2015; Maier & Brunstein, 2001). Furthermore, research needs to clarify whether both general effects of importance and feasibility are more pronounced the stronger the corresponding change goal is framed (see also Hennecke et al., 2014; D. Wood & Denissen, 2015).

4.1.6 Current research.

The first aim of this chapter was to examine central assumptions of the TESSERA framework (Wrzus & Roberts, 2017) on momentary TESSERA processes and their importance in long-term development of explicit and implicit representations of Big Five traits. We hypothesized that situational characteristics predict expectancies on how to behave (H1a). Furthermore, situations should predict situation-relevant states (H1b) and affective reactions (H1c). Additionally, we expected clearer expectancies on how to behave to predict more pronounced states (H1d). In turn, states should predict affective reactions (H1e) and reflections on the experiences (H1f). Finally, we suggested that less positive reactions should be associated with more reflections on the experiences (H1g).

In addition, we hypothesized that both explicit and implicit representations of Big Five traits predict the subsequent experience of situations and states (H2). Although previous experimental research and research on explicit trait representations and daily situations and states support our hypothesis (Back et al., 2009; Rauthmann et al., 2014; Wrzus et al., 2016), we are not aware of any longitudinal research that investigated the associations of both explicit and implicit representations of traits with subsequent momentary situations and states in daily life.

Finally, we expected that the more trait-relevant momentary states people experience and the more they reflect on experiences with more pronounced states, the more they change in explicit representations of Big Five traits (H3a). For implicit representations of Big Five traits more trait-relevant momentary states and stronger reactions on experiences with more pronounced states should be relevant for trait changes (H3b). Previous studies primarily linked momentary states with change in explicit representations of traits (e.g., Wrzus et al., 2018a), but did not investigate the role of reflective and associative processes for change in both explicit and implicit representations of traits. In contrast to previous studies, we combined a multi-method approach with extensive daily diary assessments (i.e., in terms of a measurement burst design; Nesselroade, 1991, 2004; Sliwinski, 2008) and thus were able to examine the generalizability of effects in different manifestations of Big Five traits.

The second aim of this chapter was to expand the aforementioned hypotheses addressing personality development in general by additionally examining volitional personality development and its momentary processes. In line with the TESSERA framework (Wrzus & Roberts, 2017), we hypothesized that stronger change goals should be linked with more pronounced experiences of corresponding situations and states (H4a), especially when people show low current trait levels (H4b). In addition, the more important (H4c) or feasible (H4d) people rate their change goals, the more goal-relevant situations and states they should experience. Yet, this effect should be stronger for change goals that are perceived both more important and more feasible (H4e). Finally, stronger change goals that are at the same time considered to be more important (H4f) or feasible (H4g), should be more strongly associated with experiencing more goal-relevant situations and states.

Lastly, moving beyond associations of momentary processes with long-term trait changes as proposed by the TESSERA framework (Wrzus & Roberts, 2017), stronger change goals should be directly linked with more pronounced long-term trait changes in both explicit and implicit representations of traits (H5a). These associations should be stronger for people who show lower current trait levels (H5b) and experience more pronounced goal-relevant states (H5c). Furthermore, more important (H5d) or more feasible (H5e) change goals should be linked with more pronounced trait changes, especially when goals are rated both important and feasible (H5f). Finally, the stronger a change goal and the more important (H5g) or more feasible (H5h) it is perceived, the more according trait changes should be experienced.

4.2 Method

4.2.1 Participants.

The current longitudinal study investigated processes of trait development in an age-heterogeneous sample of 382 participants (73% women) with comparable high educational background (i.e., German Abitur or similar), who either studied at the University of Mainz, Germany, or belonged to the non-student control-group (see Wrzus, Quintus, & Egloff, 2018b for further details on the sample and recruitment strategy). The sample consisted of 255 younger adults (M_{age} = 21.57, SD_{age} = 2.20) and 127 older adults (M_{age} = 67.76, SD_{age} = 5.31). A priori power analysis suggested that with an anticipated attrition rate of 10%, >300 participants were sufficient to detect longitudinal changes of d = 0.2 with a power of .95. In addition, a priori sample considerations indicated that in a sample of >300 participants answering at least 30 daily diaries, an assumed unstandardized within-person association of b = 0.4 would be significant with $p < .01$.

4.2.2 Procedure.

Personality trait assessments. We assessed explicit and implicit representations of participants' traits as well as their goals to change in four assessment periods that took place in fall 2015 (Time 1 = T1), in spring 2016 (Time 2 = T2, 6 months after T1), in fall 2016 (Time 3 = T3, 6 months after T2) and in fall 2017 (Time 4 = T4, 12 months after T3). For logistic reasons, a small subgroup of younger adults (n = 27) started the study in spring 2016 and then followed the original assessment design (i.e., with analog time lags). At T1, participants provided informed consent and answered questionnaires online and in the laboratory as part of a larger study (see Quintus et al., 2017; Wrzus et al., 2018b). A list of all measures applied in this study is available at https://osf.io/k9wsv/?view_only=ac0c0b103fff4a61959ed1b893ddfcce. At T2, participants answered all questionnaires in the laboratory. Both laboratory assessments at T1 and T2 were administered in small age-homogeneous group sessions using personal computers. At T3 and

T4, participants could answer all questionnaires online at home because they were now familiar with the procedure and the instruments. The ethics committee at the University of Mainz approved the study (approval #2015-JGU-psychEK-012). Participants were provided with regular study updates, holiday greetings, and continuous email- and phone-support which helped to maintain a high participation rate at T2 (n = 358), T3 (n = 327) and T4 (n = 327, 85.8% of initial participants).

Daily diary assessment. To investigate momentary processes of trait development, participants completed up to 30 daily diaries between T1 and T2 and another 20 daily diaries between T2 and T3. Specifically, right after the T1 trait assessment, participants started the first period of ten daily diaries (Diary 1 = D1) that should be answered on ten consecutive evenings. Eight weeks after the beginning of D1, participants were invited for the second period of ten daily diaries (Diary 2 = D2) and another eight weeks after the beginning of D2, participants should answer the third period of ten daily diaries (Diary 3 = D3). Again, right after the T2 trait assessment, participants were asked to complete the fourth (Diary 4 = D4) and, eight weeks later, the final fifth (Diary 5 = D5) period of ten daily diaries each. In the present study, the first three periods of daily diaries represented momentary processes between T1 and T2 and were analyzed as a combined set of 30 daily diaries (D1-D3, see section “4.2.5 Analytic strategy.”). The final two periods of daily diaries however represented momentary processes between T2 and T3 and were analyzed as combined set of 20 daily diaries (D4-D5, see section “4.2.5 Analytic strategy.”).

During the 50 days of daily diary assessment, participants received emails at 6pm and reminders at 10pm including a personalized link that invited them to answer an online questionnaire. Daily diaries were conducted via the online survey platform SoSci Survey (https://soscisurvey.de) that allowed participants to answer the questionnaire with any internet-enabled device at hand (e.g., personal computer, smartphone). All daily diary assessments started on a Saturday and ended on a Monday to cover both working days and weekends. If participants could not answer the questionnaire in the evening, they were allowed to keep their personalized link and complete it the next day (as scheduled, at 87% of days only one questionnaire was completed). On average participants completed diaries for 43.90 days (*SD* = 10.64, range 3-50 days) with 97% of participants providing information on a minimum of five days per assessment period (range for assessment periods 93%-99%). Participants received a compensation of 117€ for completing the full study protocol and partial compensation if they missed assessments.

4.2.3 Measures.

Explicit representations of Big Five traits. At all four trait assessments we assessed explicit representations of the Big Five traits openness to experience, conscientiousness, extraversion, agreeableness and emotional stability with self-ratings using the German version of the 44-item Big Five Inventory (BFI; John & Srivastava, 1999; Lang et al., 2001). Participants rated agreement with BFI-items on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Scale reliabilities were satisfactory at all assessments: T1 (average α = .83, range α = .73 to .89, average ω = .88, range ω = .81 to .93), T2 (average α = .81, range α = .72 to .88, average ω = .86, range ω = .79 to .91), T3 (average α = .82, range α = .75 to .88, average ω = .87, range ω = .81 to .92) and T4 (average α = .83, range α = .76 to .89, average ω = .87, range ω = .83 to .91).

Implicit representations of Big Five traits. We assessed participants' implicit representations of Big Five traits using the Big Five Implicit Association Test (i.e., IAT; Schmukle et al., 2008). The IAT consisted of five blocks of word classification tasks with 20 trials in each Practice Block 1, 2, and 4, and with 60 trials in each of the combined Test Blocks 3 and 5 as recommended in standard literature (Greenwald et al., 1998; Greenwald et al., 2003; Richetin et al., 2015). The two target categories *me* and *others* were used across all Big Five traits and included five different stimuli each (e.g., I, my, those, other). Attribute category labels were specific for each Big Five trait (e.g., *agreeableness* vs. *disagreeableness*, *conscientiousness* vs. *carelessness*) and required the discrimination of five different stimuli each (e.g., for agreeableness: friendly, helpful, quarrelsome, resentful; for conscientiousness: reliable, neat, careless, erratic). In each block, after participants had successfully assigned all stimuli once, stimuli were repeated without replacement until participants reached the specified number of trials in each block. Target and attribute stimuli alternated in the combined Test Blocks 3 and 5. More details on the IAT assessment applied in this study can be found in Wrzus et al. (2018b). Split-half reliabilities were largely satisfactory at T1 (average α = .74, range α = .68 to .79), T2 (average α = .75, range α = .71 to .80), T3 (average α = .73, range α = .65 to .83) and T4 (average α = .74, range α = .68 to .84).

Change goals. At T1, we assessed participants' goals to change Big Five traits with a 16-item German short-version of the Change Goals BFI (C-BFI; Hudson & Roberts, 2014). For a recent application and further details on the short version of the C-BFI see Quintus et al. (2017). A sample extraversion item is "I want to be outgoing, sociable" (Hudson & Roberts, 2014; Quintus et al., 2017). Items were rated on a 5-point scale ranging from -2 (*much less than I currently am*), to 0 (*I do not want to change on this trait*), to +2 (*much more than I currently am*). The scale reliabilities were on average α = .63 (range α = .43 to .76) and ω = .67 (range ω = .44 to .76). Additionally, participants rated how important and feasible each of their change goal appeared to them. Importance of change goals was rated on a 5-point scale ranging from 1 (*not important at all*) to 5 (*very important*) and averaged to form a composite for each trait (average α = .71, range α = .65 to .76, average ω = .72, range ω = .69 to .76). Similarly, feasibility of change goals was rated on a 5-point scale ranging from 1 (*not difficult at all*) to 5 (*very difficult*) that was inverted and averaged to form a composite of for each trait (average α = .67, range α = .56 to .76, average ω = .69, range ω = .59 to .78).

TESSERA components assessed in daily diaries. At the beginning of each daily diary questionnaire, participants were instructed to recall the most relevant experience of their day (i.e., the experience that "…still stuck in their mind…"). Participants then rated that experience regarding the TESSERA components *triggering situation*, *expectancy*, *states*, and *reaction*. Finally, participants rated their *reflections* on situation as a whole. The *triggering situation* was rated with the German DIAMONDS S8-I questionnaire (Rauthmann & Sherman, 2016) on a 7-point scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Based on previously reported relevance for Big Five traits (Rauthmann et al., 2014), the analyses focused on the dimensions intellect, duty, sociality, deception, negativity and adversity, which were measured with one item each (e.g., duty "Work had to be done.", adversity "Somebody is being threatened, accused, or criticized."). Participants' *expectations* were measured using one item ("Did you have expectations on how to behave in this situation?") that was rated on a 7-point scale ranging from 1 (*no expectations*) to 7 (*very clear expectations*). To assess *states*, participants rated their behavior during the experience on a 7-point scale using five items with opposite anchor adjectives that mirrored the Big Five traits: for openness *narrow-minded* and *open*, for conscientiousness *careless* and *thoughtful*, for extraversion *shy* and *sociable*, for agreeableness *rejecting* and *empathic*, and for emotional stability *insecure* and *secure*. We measured participant's *reaction* to the experience with one item ("How did you feel after the experience?") that could be answered on a 7-point scale ranging from 1 (*very bad*) to 7 (*very good*). Finally, to assess reflection, participants rated how much they had thought about the situation during the day on a 7-point scale ranging from 1 (*not at all*) to 7 (*all day long*).

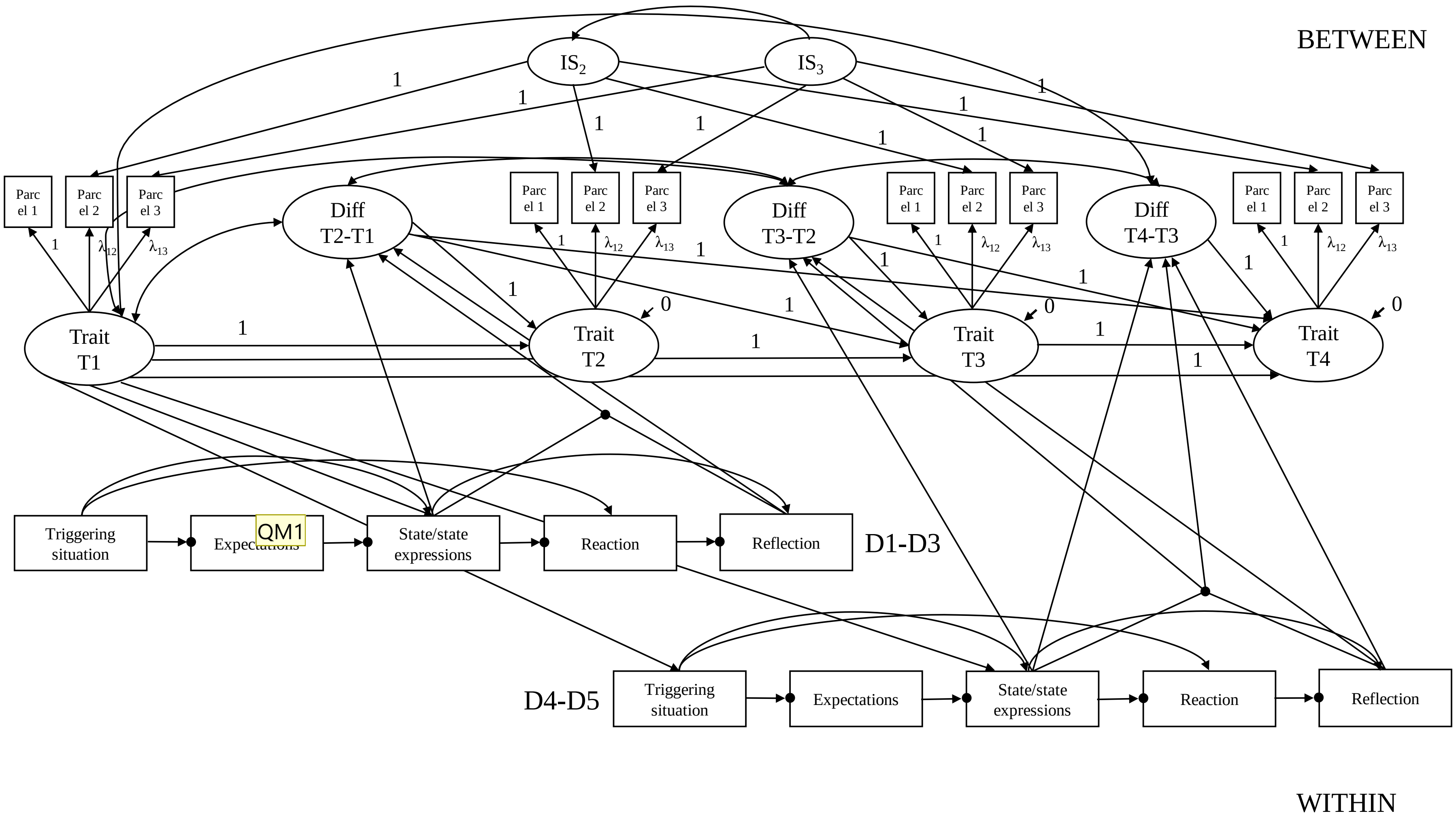
4.2.4 Attrition analyses.

We compared participants who missed out at least one personality trait assessment (n = 73) with completers to test for sample selectivity due to attrition. Participants who missed out at least one personality trait assessment did not differ from remaining participants with respect to age (d = 0.18, p = .17), gender (χ^2(1, 382) = 0.15, p = .70) or explicit representations of traits (range ds -0.29 to 0.18, all ps > .05), except for emotional stability at T3 (d = 0.58, p = .03). In addition, participants who missed out at least one personality trait assessment did not differ in implicit representations of traits (range ds -0.29 to 0.25, all ps > .05). Furthermore, we examined whether missing data were missing completely at random (MCAR; R. J. A. Little, 1988). A non-significant test for "nonrandomness" that included all parcels from each assessment T1 to T4 supported the MCAR assumption ($X^2(1551) = 1601.88$, $p = .18$). Hence, we used full information maximum likelihood estimation (FIML) that accounts for missing data (Enders, 2010).

4.2.5 Analytic strategy.

IAT scoring algorithm. We computed participants' scores for implicit representations of traits at each assessment by calculating D_2 scores (Greenwald et al., 2003; Richetin et al., 2015) with built-in error penalties and winsorized reaction times < 300 ms and > 10,000 ms. D_2 scores for each participant where computed as the difference between the participant's mean reaction time from Combined Block 5 and Combined Block 3 divided by the pooled standard deviation of the combined blocks. Afterwards, in total, 35 outliers > M +3*SD* were winsorized to their respective means plus 3 *SD*.

Multilevel structural equation modeling. To account for the multilevel data structure with daily diary assessments being nested within participants, we applied multilevel structural equation modeling (MSEM; Asparouhov & Muthen, 2008; Mehta & Neale, 2005; Muthén & Satorra, 1995) in Mplus Version 7.3 (Muthén & Muthén, 1998-2017). MSEM combines the advantages of structural equation modeling (i.e., modeling of complex associations of latent variables while accounting for measurement error) and multilevel regression (i.e., modeling of hierarchical data with measurements clustered within superordinate levels such as individuals). MSEM handles the current study's two-level data by decomposing the total variance/covariance matrix into two components, the *within-person level* (i.e., within-person associations of momentary TESSERA components) and the *between-person level* (i.e., individual differences in within-person means, associations, or traits) and is therefore suitable to investigate associations of daily TESSERA components and traits (for recent applications see Roesch et al., 2010; Sturgeon, Zautra, & Arewasikporn, 2014). To assess the need for MSEM, we formally tested the amount of variability within TESSERA components that is due to between-person differences using intraclass correlation coefficients (ICC; Muthén & Satorra, 1995). As shown in Table 13, ICCs indicated that most TESSERA components varied substantially between participants so that the application of MSEM is recommended (Hedges & Hedberg, 2007; Muthén & Satorra, 1995; Snijders & Bosker, 2012). We tested our hypotheses by estimating separate but structurally similar MSEMs for each Big Five trait (i.e., separate models for self-rated and implicitly measured traits, see Figure 8). For openness, conscientiousness and extraversion, we tested one model for each trait representation that was based on one trait-relevant aspect of situations (e.g., duty in models for self-rated and implicitly measured conscientiousness). Since two different aspects of situations could be important for agreeableness and emotional stability, for these two traits we tested two models per trait representation (e.g., sociality and deception for self-rated and implicitly measured agreeableness), resulting in 14 models to investigate personality development in general. All models on personality development in general were computed using the Maximum Likelihood Estimator with robust standard errors that is also robust for non-normality and non-independence of observations (Muthén & Muthén, 1998-2017). The code is available at https://osf.io/k9wsv/?view_only=ac0c0b103fff4a61959ed1b893ddfcce.



BETWEEN
IS2
IS3
Parcel 1
Parcel 2
Parcel 3
Diff T2-T1
Diff T3-T2
Diff T4-T3
Trait T1
Trait T2
Trait T3
Trait T4
1
λ12
λ13
0
Triggering situation
Expectations
State/state expressions
Reaction
Reflection
D1-D3
D4-D5
WITHIN

Figure 8. MSEM on the associations of latent changes in self-rated Big Five traits with TESSERA components. The upper half covers the between-person level with latent traits being estimated with three indicators (parcels) for each measurement occasion (T1, T2, T3, T4). Latent traits at T1 predicted subsequent triggering situations and states. Longitudinal method effects were accounted for using indicator-specific correlated method factors (IS2, IS3). Latent variables Diff T2-T1, Diff T3-T2 and Diff T4-T3 reflect the amount of latent change in Big Five traits from T1 to T2, from T2 to T3 and from T3 to T4 respectively. Latent trait changes were predicted by preceding states, reflections and their interaction-term (black dots). For TESSERA components, we allowed for covarying intercepts during D1-D3 and D4-D5 (not depicted). Additionally, we predicted each TESSERA component during D4-D5 by its equivalent component during D1-D3 (not depicted).

The lower part covers the within-person level which used random incepts (black dots) to test associations of TESSERA components within TESSERA sequences (see text for details).

Modeling associations of TESSERA components (within-person level). To examine the hypothesized associations of TESSERA components we specified manifest path models (Muthén & Muthén, 1998-2017) for the one-item measures assessed during daily diaries D1-D3 and D4-D5 (lower part of Figure 8). In MSEM for implicit representations of traits, we did not model the reflection component in within-person level path models since we did not expect reflective processes to play a role in development of implicit representations of traits (see section "4.1.3 Linking momentary processes with long-term development of traits."). We tested associations of TESSERA components using random intercepts, but not random slopes, because we had no specific hypothesis that required these coefficients and because models were more easily identified without random slopes. To ease interpretability, we centered all daily diary variables on their scale midpoint.

Modeling individual differences in initial traits and trait change (between-person level). As shown in the upper part of Figure 8, we used latent neighbor change models (McArdle, 1988; McArdle & Hamagami, 2001; McArdle & Nesselroade, 1994; Steyer et al., 1997; Steyer et al., 2000) to assess individual changes in explicit and implicit representations of traits from T1 to T4. Latent neighbor change models offer a flexible but parsimonious way to model latent trait change from one assessment to the next (Geiser, 2011; Steyer et al., 2000). Specifically, in latent neighbor change models, a latent trait is simply dismantled into its initial latent trait at T1 and the according latent differences to previous trait assessments (e.g., the latent trait at T2 is dismantled into the latent trait at T1 and the differences between T2 and T1). The latent difference score coefficients reflect participants' average trait change whereas the variances of the latent difference scores capture the amount of variability in change. Another crucial advantage of latent change modelling is that all latent variables can act as exogenous and endogenous variables (Steyer et al., 2000) for example allowing trait assessments to predict subsequent states and to be predicted by preceding states.

For all measurement occasions T1-T4, multiple manifest indicators specified the occasion-specific latent trait thereby controlling for measurement error in the manifest indicators (see upper part of Figure 8; Steyer et al., 1997; Steyer et al., 1999). At each measurement occasion, we modeled explicit latent representations of traits by three parcels consisting of two or three items each. We generated parcels using the item-to-construct parceling method that ensures equally balanced parcels with respect to discrimination and difficulty (Allemand et al., 2007; T. D. Little et al., 2002). For implicit latent representations of traits, we generated two parcels at each measurement occasion based on split-half D_2-scores (Schmukle et al., 2008).

Modeling associations of traits and TESSERA components (between-person level). To test our hypotheses regarding the associations of traits and trait change with TESSERA components on the between-person level, we expanded the basic latent neighbor change models. Specifically, we predicted states during D1-D3 and D4-D5 and situations during D4-D5 by traits at T1 (lower part of Figure 8). However, it was not possible to predict situations during D1-D3 because this TESSERA component served as exogenous variable on the within-person level (lower part of Figure 8). Moreover, we predicted change in traits by preceding states, reflections and the interaction of states × reflections (only for self-rated traits), or reactions and the interaction of states × reactions (only for implicitly measured traits) in daily diaries (lower part of Figure 8). We also predicted each TESSERA component during D4-D5 by its equivalent TESSERA component during D1-D3 to account for temporal consistencies in participants' everyday experiences (see for example Epstein, 1979; Fleeson, 2007; Wrzus, 2018). Finally, we allowed for covarying intercepts of TESSERA components during D1-D3 and D4-D5. Thereby we accounted for the possibility that participants with a higher mean-level for a TESSERA component (e.g., higher average perceived duty of situations) could also have a higher-mean level for other TESSERA components (e.g., higher average thoughtful behavior).

Expanding models on personality development in general to investigate volitional personality development (between-person level). We tested our hypotheses on volitional personality development by computing 14 additional models that simply expanded the previously described MSEMs (see Figure 9). Specifically, to investigate whether change goals were successfully implemented into actual trait changes, especially when participants exhibited lower current trait levels, we predicted trait changes by change goals at T1 and their interaction with traits at T1 (i.e., change goals × traits at T1). Moreover, we predicted trait changes by the importance and feasibility of change goals, the corresponding interaction (i.e., importance × feasibility) as well as their interactions with change goals (i.e., change goals × importance, change goals × feasibility). However, expanding the MSEMs applied to investigate personality development in general by three latently modeled predictors (i.e., change goals, importance, feasibility) as well as a total of four latent interaction terms lead to a non-convergence of the model estimation that may have resulted from a too small sample size, especially for estimating latent interactions (but see Marsh, Wen, & Hau, 2004; Moosbrugger, Schermelleh-Engel, & Klein, 1997). In addition, even simplified MSEMs that included only one latent interaction (i.e., change goals × traits at T1) did not converge. Thus, to provide a parsimonious but sufficient test of our hypotheses on volitional personality development, we relied on MSEMs being built solely on manifest variables (however, for disadvantages of using manifest variables see for example Bentler & Weeks, 1980; Muthen, 2002). Specifically, in models considering volitional personality development, long-term trait changes were now conceptualized in terms of manifest neighbor-change models (upper part of Figure 9). Equally, all predictors and their interaction terms represented manifest composite scores (see section “4.2.3 Measures.”). All predictors were mean-centered.

To further examine associations of change goals and TESSERA components, we additionally predicted situations during D4-D5 as well as states during D1-D3 and D4-D5 by change goals, their interaction with traits at T1, their importance and feasibility as well as corresponding interaction terms (i.e., importance × feasibility, change goals × importance, change goals × feasibility; lower part of Figure 9). To control for effects of current trait levels, both situations and states were additionally predicted by corresponding traits at T1 (see subsection "*Modeling associations of traits and TESSERA components (between-person level)";* lower part of Figure 9*)*. Further expanding models on personality development in general, trait changes were additionally predicted by the interaction of change goals and preceding states (lower part of Figure 9). The code is available at https://osf.io/k9wsv/?view_only=ac0c0b103fff4a61959ed1b893ddfcce.

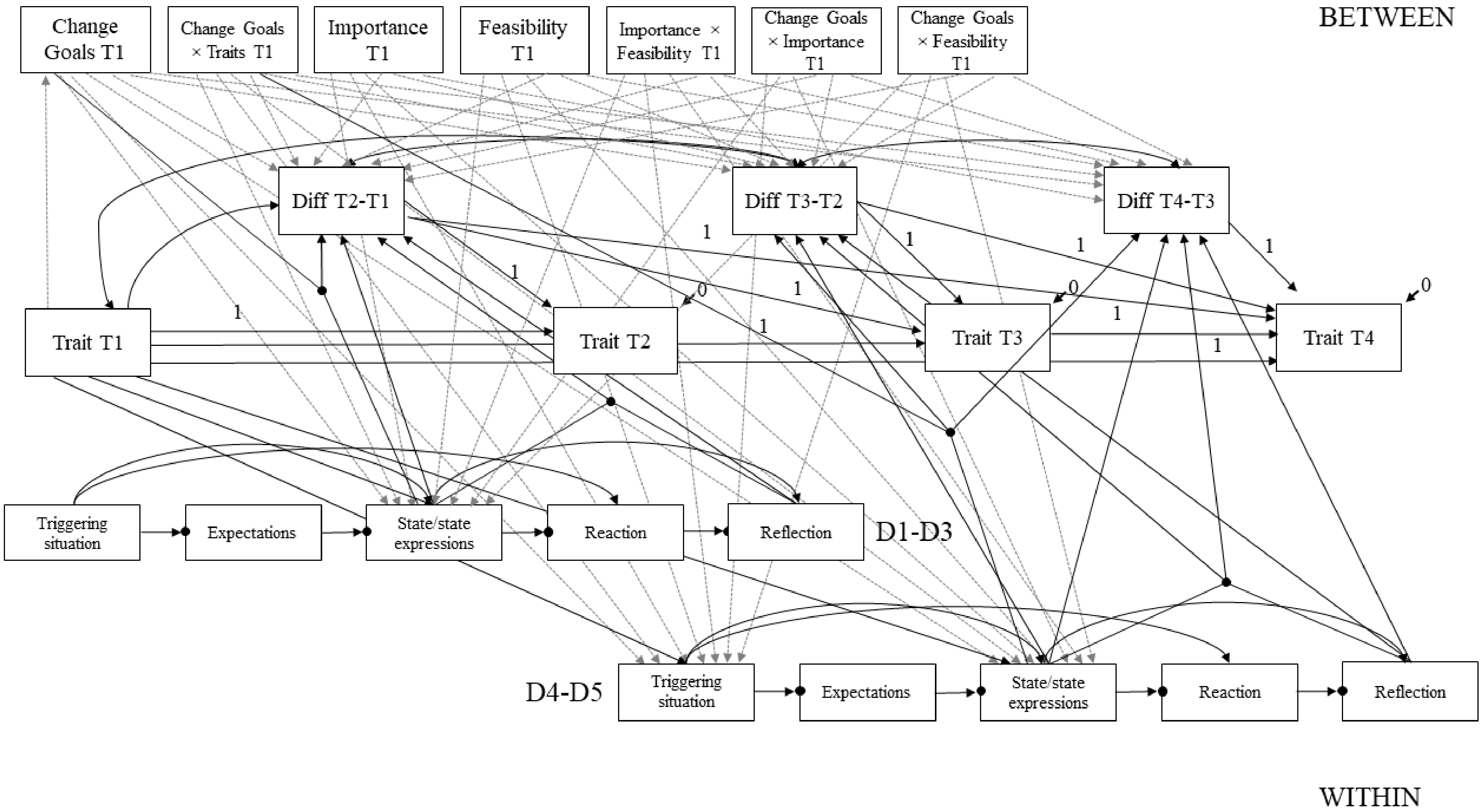

Change Goals T1
Change Goals × Traits T1
Importance T1
Feasibility T1
Importance × Feasibility T1
Change Goals × Importance T1
Change Goals × Feasibility T1
BETWEEN
Diff T2-T1
Diff T3-T2
Diff T4-T3
Trait T1
Trait T2
Trait T3
Trait T4
1
0
Triggering situation
Expectations
State/state expressions
Reaction
Reflection
D1-D3
D4-D5
Triggering situation
Expectations
State/state expressions
Reaction
Reflection
WITHIN

Figure 9. MSEM on the associations of manifest changes in self-rated Big Five traits with TESSERA components and change goals. Note that these models closely mirrored MSEMs on personality development in general as depicted in Figure 8. Yet, the upper half depicts expansions made to additionally account for volitional personality development on the between person level. To maintain clarity, associations of change goals at T1, their importance, their feasibility and corresponding interaction terms with subsequent triggering situations, states/state expressions, and long-term trait changes are depicted in dashed gray arrows.

Measurement invariance. To ensure that changes in explicit and implicit representations of traits can be interpreted as actual trait changes and not as changes in the measurement model, we tested measurement invariance for latent neighbor change models on personality development in general across T1-T4 (Horn & McArdle, 1992; Van de Schoot et al., 2012; Vandenberg & Lance, 2000). Due to the sensitivity of chi square difference tests for sample size, we also investigated changes in CFI, RMSEA and SRMR for each step towards strong measurement invariance (Chen, 2007; Cheung & Rensvold, 2002). Testing weak measurement invariance, we suggested models with ΔCFI $\leq$ .010, ΔRMSEA $\leq$ .015 and ΔSRMR $\leq$ .030 to provide an approximately equivalent fit so that the more parsimonious (i.e., more measurement invariant) model was accepted (Chen, 2007). To determine strong measurement invariance, we suggested models with ΔCFI $\leq$ .010, ΔRMSEA $\leq$ .015 and ΔSRMR $\leq$ .010 to be equivalent with models with weak measurement invariance (Chen, 2007). Following these guidelines, for measures of all explicit and all implicit representations of traits, except extraversion, full strong measurement invariance held in each model (Table A11). For implicit measures of extraversion, we achieved partial strong invariance by freeing one manifest variable's intercept (Table A11; Byrne et al., 1989; Steenkamp & Baumgartner, 1998). Furthermore, we included indicator specific factors (IS) for the non-reference parcels (upper part of Figure 8) to account for shared method variance over time (Eid, 2000; Eid, Schneider, & Schwenkmezger, 1999; Geiser & Lockhart, 2012). The implementation of IS factors offers theoretical and methodological advantages over the popular correlated uniqueness approach (e.g., more parsimonious models, differentiation of method and residual variance, Geiser & Lockhart, 2012).

Model evaluation. We evaluated the model fits with chi-square test, the comparative fit index (CFI), the Tucker-Lewis index (TLI), the root mean square error of approximation (RMSEA), and the standardized root mean square residual (SRMR). For SRMR, MPlus offers separate indices for both the within- and between-person level in MSEM (Muthén & Muthén, 1998-2017). Since the chi-square test tends to reject plausible models with increasing sample size, we primarily concentrated on CFI, TLI, RMSEA and SRMR (Hu & Bentler, 1999; Schermelleh-Engel et al., 2003; West, Taylor, & Wu, 2012). For ordinary SEM, common guidelines on CFI and TLI recommend values > .90 or >.95 to indicate reasonable or good model fit respectively (Kline, 2005; Van de Schoot et al., 2012). For RMSEA, indices < .08 imply adequate model fit and indices < .05 point to good model fit (Hu & Bentler, 1999; Schermelleh-Engel et al., 2003). Finally, SRMR values < .10 indicate acceptable model fit and values < .05 demonstrate good model fit (Hu & Bentler, 1999; Schermelleh-Engel et al., 2003).These guidelines arise from studies without multilevel data structures and therefore the appropriateness for MSEM is currently open. Although research starts to address this issue (Ryu, 2014; Yuan & Bentler, 2007), MSEM specific model fit evaluation techniques still await its implementation in research and practice. Thus, we preliminary apply the above stated recommendations for SEM.

4.3 Results

Table 13 shows descriptive statistics on within-person means, within-person *SDs* and ICCs for TESSERA components, i.e., situations, expectancies, states, reactions, and reflection. As indicated by wide ranges of within-person means and the substantial within-person *SDs*, participants showed both inter-individual differences and intra-individual variation in their experiences of TESSERA components (Table 13, see table note for people with zero intra-individual variation).

Table 13
Descriptive Information on TESSERA Sequences

	Average within-person mean	Range within-person means	Average within-person SD	Range within-person SD	ICC for D1-D3	ICC for D4-D5
Triggering situations						
Intellect	3.21	1.18 – 6.29	1.93	0.69 – 2.93	.139	.187
Duty	3.15	1 – 6.84	2.22	0 – 3.21	.124	.154
Sociality	4.96	1 – 6.63	2.11	0 – 3.21	.125	.161
Deception	1.39	1 – 3.21	0.91	0 – 2.60	.109	.138
Negativity	2.86	1 – 6	2.00	0.74 – 3.46	.136	.145
Adversity	1.63	1 – 3.76	1.30	0 – 2.89	.094	.140
Own Expectations	4.47	1.04 – 6.84	1.86	0.29 – 3.20	.258	.338
States						
Open	5.42	3.65 – 7	1.32	0 – 2.27	.144	.147
Conscientious	5.11	3 – 7	1.26	0 – 2.70	.248	.277

Table 13 continued

	Average within-person mean	Range within-person means	Average within-person SD	Range within-person SD	ICC for D1-D3	ICC for D4-D5
States						
Extraverted	5.26	3.33 – 7	1.32	0 – 2.42	.120	.153
Agreeable	4.96	3.25 – 7	1.29	0 – 3.21	.158	.159
Emotional stable	5.23	2.25 – 7	1.47	0 – 3.46	.180	.195
Affective reaction after experiences	5.27	2.79 – 6.67	1.69	0.5 – 3.21	.096	.120
Reflection on experiences	4.11	1.31 – 6.62	1.63	0.55 – 2.93	.174	.264

Note. For some variables, ranges for within-person SDs also include 0 because few participants did not vary in their responses across the investigated days. For triggering situations, two participants showed no variation in duty (3 and 30 days completed), one showed no variation in sociality (25 days completed) and 51 did not experience deceptive or adverse situations at all (3 – 50 days completed). For states, three participants showed no variation in conscientious behavior (3, 5 and 6 days completed), two showed no variation in extraverted behavior (5 and 6 days completed), one showed no variation in open and agreeable behavior (5 days completed) and another one did not show variation in emotional stable behavior (6 days completed).

Table 14 presents descriptive information on explicit and implicit representations of Big Five traits for all 4 assessments. Since the present research focused on explaining individual differences in change, variances in trait changes were more important than average (i.e., mean-level) trait changes in the entire sample. As expected, variances for mean-level changes were significant ($p < .01$) for both self-rated and implicitly measured traits in all assessment periods (see also Chapter II).

Table 14

Descriptive Information on Explicit and Implicit Representations of Big Five Traits for T1-T4

	Openness		Conscientiousness		Extraversion		Agreeableness		Emotional stability	
	Self-rating	IAT	Self-rating	IAT	Self-rating	IAT	Self-rating	IAT	Self-rating	IAT
Mean (*SD*) T1	5.264	0.272	4.988	0.265	5.036	-0.046	4.972	0.508	4.170	0.303
	(0.952)	(0.290)	(0.919)	(0.270)	(1.099)	(0.348)	(0.841)	(0.302)	(1.255)	(0.296)
Mean (*SD*) T2	5.212	0.270	4.934	0.225	5.002	-0.006	5.014	0.499	4.268	0.320
	(0.893)	(0.283)	(0.887)	(0.289)	(1.121)	(0.354)	(0.884)	(0.293)	(1.195)	(0.287)
Mean (*SD*) T3	5.162	0.236	4.982	0.225	4.969	0.020	4.968	0.458	4.290	0.301
	(0.900)	(0.270)	(0.934)	(0.252)	(1.129)	(0.371)	(0.900)	(0.300)	(1.143)	(0.289)
Mean (*SD*) T4	5.198	0.244	5.012	0.224	5.016	0.019	4.994	0.458	4.265	0.299
	(0.930)	(0.276)	(0.953)	(0.266)	(1.111)	(0.357)	(0.896)	(0.291)	(1.181)	(0.286)
r_{12}	.839**	.344**	.794**	.325**	.816**	.423**	.807**	.382**	.837**	.363**
r_{23}	.860**	.335**	.827**	.277**	.891**	.470**	.807**	.390**	.839**	.374**
r_{34}	.831**	.321**	.827**	.278**	.879**	.384**	.787**	.331**	.823**	.319**

Note. IAT = implicit association test. r_{12} = correlation between T1 and T2. r_{23} = correlation between T2 and T3. r_{34} = correlation between T3 and T4. Descriptives for T1-T3 are also reported in Chapter II.

** $p < .01$.

Zero-order correlations of self-rated and implicitly measured traits at T1 as well as change goals at T1 with subsequent TESSERA components are shown in Table 15. Means, standard deviations and intercorrelations of change goals, importance and feasibility at T1 are presented in Table A12. Table A13 shows correlations of importance and feasibility of change goals at T1 with subsequent TESSERA components.

Next, we for each trait first report the results of MSEMs on personality development in general. Afterwards we for each trait present results of MSEMs on volitional personality development.

Table 15
Correlations of Self-Rated, Implicitly Measured Big Five Traits and Change Goals at T1 with TESSERA components

	Openness			Conscientiousness			Extraversion			Agreeableness			Emotional stability		
	Self-rating	IAT	CG	Self-rating	IAT	CG	Self-rating	IAT	CG	Self-rating	IAT	CG	Self-rating	IAT	CG
Triggering situations															
Intellect	.205*	.058	.003	.051	.056	.086	.048	-.027	-.043	-.030	.004	.096	-.017	.030	.003
Duty	.007	.056	-.102*	.107*	.138*	-.028	.031	.016	-.101	-.087	.063	-.034	-.046	.070	-.040
Sociality	.032	.056	-.045	-.033	-.013	-.028	.181*	.088	-.130*	.116*	.024	.001	.034	.058	.072
Deception	.017	-.007	.045	-.124*	.047	.123*	-.043	.005	-.003	-.117*	.061	.118*	-.170*	-.062	.132*
Negativity	-.012	-.037	.078	-.242*	.064	.272*	-.162*	.049	.089	-.266*	-.034	.143*	-.399*	-.138*	.295*
Adversity	.071	-.002	.038	-.191*	-.008	.127*	-.086	-.021	.031	-.206*	.004	.069	-.191*	-.077	.117*
Own Expectations	.073	.004	-.110*	.077	.033	-.087	.039	-.057	-.067	-.082	.052	.010	.078	.007	-.157*
States and state expressions															
Open	.155*	.050	-.118*	.334*	.026	-.211*	.415*	.012	.415*	.334*	.047	-.091	.301*	.166*	-.202*
Conscientious	.148*	.052	-.188*	.343*	.057	-.290*	.218*	-.037	.218*	.073	.121*	-.052	.234*	.164*	-.222*

Table 15 continued

	Openness			Conscientiousness			Extraversion			Agreeableness			Emotional stability		
	Self-report	IAT	CG	Self-report	IAT	CG	Self-report	IAT	CG	Self-report	IAT	CG	Self-report	IAT	CG
States and state expressions															
Extraverted	.050	.075	-.091*	.224*	.008	-.107*	.414*	.108*	-.183*	.255*	.055	-.003	.317*	.147*	-.193*
Agreeable	.194*	.051	-.136*	.290*	.030	-.165*	.329*	-.014	-.206*	.383*	.090	-.093	.225*	.124*	-.128*
Emotional stable	.069	.049	-.151*	.338*	.023	-.325*	.373*	.050	-.219*	.179*	.087	-.125*	.423*	.206*	-.358*
Affective reaction after experiences	.056	.067	-.122*	.263*	-.043	-.250*	.297*	-.048	-.129*	.256*	.020	-.081	.397*	.161*	-.278*
Reflection on experiences	.088	.062	-.062	.101	.072	-.026	.029	.018	-.019	-.094	.031	.111*	-.158*	.001	.108*

Note. IAT = implicit association test. CG = Change goals.

* *p* < .05. ** *p* < .01.

4.3.1 Personality development in general.

Regarding personality development in general, for each trait we first briefly explain model fit indices for MSEMs as displayed in Table 16. Afterwards, for each trait, we describe associations among TESSERA components within TESSERA sequences (i.e., on the within-person level) for self-rated traits. Note that parameter estimates for the within-person level associations were equivalent for self-rated and implicitly measured traits, but the latter models did not include reflection. We then explain associations between both self-rated and implicitly measured traits at T1 and subsequent TESSERA components (i.e., on the between-person level). Finally, we describe associations of TESSERA components with subsequent changes in both self-rated and implicitly measured traits (i.e., on the between-person level). Table 17 to 21 provide the estimated coefficients on the between-level associations of TESSERA components and traits for personality development in general.

Table 16

Model Fit Indices for MSEMs Examining Associations of TESSERA Components with Changes in Self-Rated and Implicitly Measured Big Five Traits

	χ^2	CFI	TLI	RMSEA	SRMR (within)	SRMR (between)
Openness						
Self-rating	1256.310	0.913	0.893	0.021	0.050	0.058
IAT	273.692	0.979	0.972	0.011	0.016	0.079
Conscientiousness						
Self-rating	530.180	0.960	0.951	0.011	0.024	0.105
IAT	286.267	0.957	0.941	0.012	0.023	0.065
Extraversion						
Self-rating	755.808	0.962	0.953	0.015	0.031	0.097
IAT	242.173	0.988	0.983	0.010	0.014	0.069
Agreeableness						
Self-rating	620.101 / 652.824	0.960 / 0.955	0.950 / 0.944	0.013 / 0.013	0.028 / 0.027	0.088 / 0.088
IAT	259.574 / 264.217	0.980 / 0.978	0.973 / 0.970	0.011 / 0.011	0.016 / 0.017	0.066 / 0.069
Emotional stability						
Self-rating	1428.931 / 807.702	0.944 / 0.956	0.931 / 0.947	0.022 / 0.015	0.041 / 0.030	0.127 / 0.139
IAT	297.409 / 232.823	0.990 / 0.988	0.986 / 0.984	0.012 / 0.010	0.017 / 0.009	0.102 / 0.100

Note. IAT = implicit association test. All models were calculated using maximum likelihood estimation with robust standard errors and scaled test statistics. CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. For agreeableness, values to the left of the slashes refer to models comprising sociality; values to the right refer to models comprising deception. For emotional stability, values to the left of the slashes refer to models comprising negativity; values to the right refer to models comprising adversity.

4.3.1.1 Openness.

Aside from TLI, model fit indices for self-rated openness demonstrated a reasonable to good fit of the applied MSEMs (Table 16). Since the TLI was only slightly below the recommended value of .90 for conventional SEM, we decided to keep this model to allow for comparisons between traits. For implicitly measured openness, model fit indices were good to excellent (Table 16).

Testing associations of TESSERA components (i.e., on the within-person level), during D1-D3, results showed that the more intellect a situation required, the clearer were participants' own expectations on how to behave (b = 0.084, *SE* = 0.014, $p < .01$) and the worse they felt after the experiences (b = -0.128, *SE* = 0.010, $p < .01$). Unexpectedly, higher perceived need for intellect of a situation predicted less open behavior (b = -0.020, *SE* = 0.014, $p = .049$). Again as expected, clearer expectations on how to behave predicted more open behavior (b = 0.075, *SE* = 0.009, $p < .01$). Also, the more open behavior participants reported, the better they felt after the experience (b = 0.666, *SE* = 0.016, $p < .01$). Finally, more open behavior (b = 0.075, *SE* = 0.018, $p < .01$) and feeling worse after the experience (b = -0.233, *SE* = 0.010, $p < .01$) predicted more reflection on the experience. Results during D4-D5 closely replicated these findings (Table A14).

For associations of openness at T1 and subsequent TESSERA components, results showed that higher self-rated openness at T1 predicted higher required intellect of situations (Table 15, Table 17) and more open behavior during D1-D3 (Table 17). However, self-rated openness at T1 did not predict open behavior in the long run (i.e., during D4-D5, see also section "4.3.3 Control analyses."). Implicitly measured openness did not predict required intellect of situations or open behavior (Table 15, Table 17).

Linking momentary TESSERA components with long-term trait development, it showed that neither open behavior nor other TESSERA components predicted change in self-rated or implicitly measured openness (Table 17, but see section "4.3.3 Control analyses.").

Table 17

Associations of TESSERA components with Openness at T1 and Long-term Development in Openness (between-person level)

	Self-rating		IAT	
	Estimate	CI	Estimate	CI
Predicting TESSERA components by openness at T1				
Intellect of triggering situations (D4-D5) on openness	0.179*	[0.061; 0.298]	0.223	[-0.334; 0.780]
Open state (D1-D3) on openness	0.060*	[0.008; 0.112]	0.097	[-0.138; 0.332]
Open state (D4-D5) on openness	-0.008	[-0.054; 0.038]	0.046	[-0.150; 0.243]
Predicting difference in change T2 – T1 by TESSERA components during D1-D3				
Change T2-T1 on open state	0.078	[-0.033; 0.189]	-0.023	[-0.108; 0.061]
Change T2-T1 on reflection on experience	0.048	[-0.030; 0.126]	-	-
Change T2-T1 on open state × reflection on experience	0.002	[-0.073; 0.077]	-	-
Change T2-T1 on reaction to experience	-	-	-0.021	[-0.098; 0.055]
Change T2-T1 on open state × reaction to experience	-	-	-0.009	[-0.033; 0.016]

Table 17 continued

	Self-rating		IAT	
	Estimate	CI	Estimate	CI
Predicting difference in change T3 – T2 by TESSERA components during D4-D5				
Change T3-T2 on open state	0.040	[-0.070; 0.151]	-0.002	[-0.097; 0.094]
Change T3-T2 on reflection on experience	0.039	[-0.021; 0.100]	-	-
Change T3-T2 on open state × reflection on experience	0.007	[-0.065; 0.078]	-	-
Change T3-T2 on reaction to experience	-	-	0.050	[-0.040; 0.139]
Change T3-T2 on open state × reaction to experience	-	-	0.003	[-0.032; 0.038]
Predicting difference in change T4 – T3 by TESSERA components during D4-D5				
Change T4-T3 on open state	0.039	[-0.083; 0.162]	0.017	[-0.073; 0.108]
Change T4-T3 on reflection on experience	-0.009	[-0.085; 0.066]	-	-
Change T4-T3 on open state × reflection on experience	-0.003	[-0.093; 0.086]	-	-
Change T4-T3 on reaction to experience	-	-	0.021	[-0.064; 0.106]
Change T4-T3 on open state × reaction to experience	-	-	0.025	[-0.015; 0.066]

Note. IAT = implicit association test. CI = 95% confidence interval.

* $p < .05$.

4.3.1.2 Conscientiousness.

For self-rated conscientiousness, fit indices of MSEMs pointed to a good to excellent model fit, except for SRMR (between) that lay slightly above the recommended value for conventional SEM of .10 (Table 16). Nonetheless, since all other indices indicated a very good fit, we kept this model to allow for comparisons between traits. For implicitly measured conscientiousness, model fit was good to excellent (Table 16).

Again, we examined associations of TESSERA components on the within-person level. As hypothesized, during D1-D3, the more duty a situation implied, the clearer participants' own expectations were on how to behave (b = 0.153, SE = 0.011, p < .01), the more conscientious behavior they reported (b = 0.077, SE = 0.008, p < .01), and the worse they felt after their experiences (b = -0.098, SE = 0.009, p < .01). In addition, clearer expectations on how to behave predicted more conscientious behavior (b = 0.126, SE = 0.009, p < .01). Furthermore, the more conscientious behavior participants reported, the better they felt after the experiences (b = 0.256, SE = 0.024, p < .01) and the more they reflected on these experiences (b = 0.138, SE = 0.017, p < .01). Lastly, worse feelings after the experiences predicted more reflection on the experiences (b = -0.217, SE = 0.013, p < .01). Results during D4-D5 mirrored these findings (Table A14).

Regarding associations of self-rated conscientiousness at T1 and subsequent TESSERA components, results showed that associations of conscientiousness at T1 and perceived duty in situations were in the expected direction but missed the conventional significance level (Table 15, Table 18). In addition, the higher participants rated themselves in conscientiousness at T1, the more conscientious behavior they reported during D1-D3 (Table 18). Associations between conscientiousness at T1 and self-rated conscientious behavior during D4-D5 remained non-significant when controlling for conscientious behavior during D1-D3 (see also section "4.3.3 Control analyses."). Implicitly measured conscientiousness at T1 predicted higher perceived duty in situations on a marginally significant level, but did not predict subsequent conscientious behavior (Table 15, Table 18).

As expected, for associations of TESSERA components and long-term trait development, during D1-D3, it showed that the more conscientious behavior participants reported and the more they reflected on experiences in which they behaved conscientiously, the more they increased in self-rated conscientiousness from T1 to T2 (Table 18). However, associations of TESSERA components during D4-D5 and subsequent changes in self-rated conscientiousness remained non-significant (Table 18, see also section "4.3.3 Control analyses."). For implicitly measured conscientiousness, only conscientious behavior during D4-D5 predicted lagged increases in conscientiousness from T3 to T4 (Table 18).

Table 18

Associations of TESSERA components with Conscientiousness at T1 and Long-term Development in Conscientiousness (between-person level)

	Self-rating		IAT	
	Estimate	CI	Estimate	CI
Predicting TESSERA components by conscientiousness at T1				
Duty of triggering situations (D4-D5) on conscientiousness	0.123†	[-0.002; 0.249]	0.806†	[-0.022; 1.635]
Conscientious state (D1-D3) on conscientiousness	0.142**	[0.066; 0.218]	0.310	[-0.145; 0.765]
Conscientious state (D4-D5) on conscientiousness	-0.001	[-0.058; 0.056]	0.011	[-0.322; 0.345]
Predicting difference in change T2 – T1 by TESSERA components during D1-D3				
Change T2-T1 on conscientious state	0.128*	[0.020 ; 0.237]	0.024	[-0.018; 0.065]
Change T2-T1 on reflection on experience	-0.073	[-0.164 ; 0.019]	-	-
Change T2-T1 on conscientious state × reflection on experience	0.123*	[0.006; 0.241]	-	-
Change T2-T1 on reaction to experience	-	-	-0.010	[-0.076 ; 0.055]
Change T2-T1 on conscientious state × reaction to experience	-	-	0.001	[-0.023; 0.024]

Table 18 continued

	Self-rating		IAT	
	Estimate	CI	Estimate	CI
Predicting difference in change T3 – T2 by TESSERA components during D4-D5				
Change T3-T2 on conscientious state	-0.023	[-0.140; 0.095]	-0.043†	[-0.091; 0.005]
Change T3-T2 on reflection on experience	0.066	[-0.031; 0.162]	-	-
Change T3-T2 on conscientious state × reflection on experience	-0.030	[-0.126; 0.067]	-	-
Change T3-T2 on reaction to experience	-	-	0.062†	[-0.010; 0.135]
Change T3-T2 on conscientious state × reaction to experience	-	-	0.007	[-0.019; 0.034]
Predicting difference in change T4 – T3 by TESSERA components during D4-D5				
Change T4-T3 on conscientious state	-0.095	[-0.216; 0.026]	0.048*	[0.002; 0.094]
Change T4-T3 on reflection on experience	0	[-0.113; 0.112]	-	-
Change T4-T3 on conscientious state × reflection on experience	-0.073	[-0.184; 0.037]	-	-
Change T4-T3 on reaction to experience	-	-	-0.025	[-0.082; 0.031]
Change T4-T3 on conscientious state × reaction to experience	-	-	-0.002	[-0.036; 0.033]

Note. IAT = implicit association test. CI = 95% confidence interval.

† $p < .10$. * $p < .05$. ** $p < .01$.

4.3.1.3 Extraversion.

Model fits for self-rated extraversion exhibited an acceptable to good model fit. For implicitly measured extraversion, model fits were good to excellent (Table 16).

Associations of TESSERA components during D1-D3 (i.e., on the within-person level) indicated that, as expected, higher sociality of situations predicted clearer own expectations on how to behave (b = 0.113, SE = 0.013, p < .01) and more extraverted behavior (b = 0.296, SE = 0.008, p < .01). Unexpectedly, higher perceived sociality of situations was associated with worse feelings after the experiences (b = -0.128, SE = 0.010, p < .01). Yet, as predicted, clearer expectations on how to behave predicted more extraverted behavior (b = 0.039, SE = 0.009, p < .01). In addition, the more extraverted behavior participants reported, the better they felt after the experiences (b = 0.674, SE = 0.018, p < .01). However, extraverted behavior did not predict reflections on the experiences (b = -0.026, SE = 0.017, p = .130). Again, worse feelings after the experiences predicted more reflections on the experiences (b = -0.190, SE = 0.013, p < .01). All results were replicated during D4-D5 (Table A14).

For associations of extraversion at T1 and subsequent TESSERA components, results showed that the higher participants rated themselves in extraversion at T1, the higher they rated sociality of situations (Table 15, Table 19) and the more extraverted behavior they reported during D1-D3 (Table 19). Extraversion at T1 did not predict extraverted behavior during D4-D5 when controlling for extraverted behavior at D1-D3 (Table 19, see also section “4.3.3 Control analyses.”). Associations for self-ratings were replicated in implicitly measured extraversion, with however implicitly measured extraversion at T1 predicting perceived sociality of situations only on a marginally significant level (Table 15, Table 19).

Investigating associations of TESSERA components and long-term trait development showed that extraverted behavior during D1-D3 predicted subsequent increases in both self-rated and implicitly measured extraversion from T1 to T2 (Table 19). Unexpectedly and only marginally significant, the worse participants felt after their experiences during D1-D3, the more they increased in implicitly measured extraversion from T1 to T2 (Table 19). However, links between TESSERA components during D4-D5 and subsequent changes in extraversion were statistically non-significant (Table 19, see also section “4.3.3 Control analyses.”).

Table 19

Associations of TESSERA components with Extraversion at T1 and Long-term Development in Extraversion (between-person level)

	Self-rating		IAT	
	Estimate	CI	Estimate	CI
Predicting TESSERA components by extraversion at T1				
Sociality of triggering situations (D4-D5) on extraversion	0.116*	[0.013; 0.220]	0.403†	[-0.076; 0.881]
Extraverted state (D1-D3) on extraversion	0.086**	[0.047; 0.125]	0.201*	[0.039; 0.363]
Extraverted state (D4-D5) on extraversion	0.016	[-0.029; 0.061]	0.062	[-0.125; 0.248]
Predicting difference in change T2 – T1 by TESSERA components during D1-D3				
Change T2-T1 on extraverted state	0.325**	[0.099; 0.552]	0.194**	[0.094; 0.295]
Change T2-T1 on reflection on experience	0.047	[-0.066; 0.161]	-	-
Change T2-T1 on extraverted state × reflection on experience	-0.027	[-0.173; 0.118]	-	-
Change T2-T1 on reaction to experience	-	-	-0.086†	[-0.176; 0.004]
Change T2-T1 on extraverted state × reaction to experience	-	-	0.008	[-0.032; 0.049]

Table 19 continued

	Self-rating		IAT	
	Estimate	CI	Estimate	CI
Predicting difference in change T3 – T2 by TESSERA components during D4-D5				
Change T3-T2 on extraverted state	0.007	[-0.128; 0.141]	-0.011	[-0.105; 0.083]
Change T3-T2 on reflection on experience	0.022	[-0.067; 0.111]	-	-
Change T3-T2 on extraverted state × reflection on experience	0.033	[-0.066; 0.131]	-	-
Change T3-T2 on reaction to experience	-	-	0.039	[-0.053; 0.131]
Change T3-T2 on extraverted state × reaction to experience	-	-	0.012	[-0.033; 0.058]
Predicting difference in change T4 – T3 by TESSERA components during D4-D5				
Change T4-T3 on extraverted state	0.079	[-0.081 ; 0.239]	-0.055	[-0.169; 0.058]
Change T4-T3 on reflection on experience	0.027	[-0.065; 0.118]	-	-
Change T4-T3 on extraverted state × reflection on experience	0.083	[-0.035; 0.200]	-	-
Change T4-T3 on reaction to experience	-	-	0.016	[-0.098; 0.130]
Change T4-T3 on extraverted state × reaction to experience	-	-	-0.001	[-0.059; 0.058]

Note. IAT = implicit association test. CI = 95% confidence interval.

† $p < .10$. * $p < .05$. ** $p < .01$.

4.3.1.4 Agreeableness.

For self-rated and implicitly measured agreeableness, we calculated two models each to test the associations with sociality and deception in situations. For self-rated agreeableness, both models showed a reasonable to good fit and for implicitly measured agreeableness, both models demonstrated a good to excellent fit (Table 16).

Results for the associations of TESSERA components on the within-person level during D1-D3 showed that higher perceived sociality of situations did predict clearer own expectations on how to behave (b = 0.114, *SE* = 0.013, *p* < .01), and more agreeable behavior (b = 0.216, *SE* = 0.008, *p* < .01), but failed to predict feelings after the experiences (b = 0.005, *SE* = 0.011, *p* = .674). Higher perceived deception in situations however did not predict participants' expectations on how to behave (b = -0.040, *SE* = 0.021, *p* = .052) but did predict less agreeable behavior (b = -0.221, *SE* = 0.008, *p* < .01) and feeling worse after the experiences (b = -0.401, *SE* = 0.008, *p* < .01). In turn, in models for both sociality and deception in situations, the clearer participants' expectations on how to behave were, the more agreeable behavior they reported (b = 0.027, *SE* = 0.008, *p* < .01; b = 0.055, *SE* = 0.008, *p* < .01, respectively). In addition, the more agreeable behavior participants reported, the better they felt after their experiences (b = 0.561, *SE* = 0.017, *p* < .01; b = 0.499, *SE* = 0.016, *p* < .01) and the more they reflected on their experiences (b = 0.083, *SE* = 0.017, *p* < .01; b = 0.081, *SE* = 0.017, *p* < .01). Also, feeling worse after the experiences predicted more reflection on the experiences (b = -0.226, *SE* = 0.013, *p* < .01; b = -0.228, *SE* = 0.013, *p* < .01). The two coefficients for each association differed slightly between the two models with different situational predictor because the situational variable accounted for different amounts of variance in the subsequent variables of the TESSERA sequence. By and large, results during D4-D5 replicated these findings (Table A14).

Higher self-rated agreeableness at T1 was associated with less perceived deception but not with more perceived sociality of situations (Table 15, Table 20). Also, the higher participants rated themselves in agreeableness at T1, the more agreeable behavior they reported during D1-D3 (Table 20). Again, agreeableness at T1 did not predict self-rated agreeable behavior during D4-D5 controlling for agreeable behavior during D1-D3 (Table 20, see also section "4.3.3 Control analyses."). For implicitly measured agreeableness however, none of these associations were significant (Table 15, Table 20).

For associations of TESSERA components and long-term trait development, results of both models for sociality and deception in situations demonstrated that agreeable behavior during D1-D3 predicted increases in self-rated agreeableness from T1 to T2 (Table 20, see also section "4.3.3 Control analyses."). Yet, for implicitly measured agreeableness, no TESSERA component predicted trait change (Table 20).

Table 20

Associations of TESSERA components with Agreeableness at T1 and Long-term Development in Agreeableness (between-person level)

	Self-rating		IAT	
	Estimate	CI	Estimate	CI
Predicting TESSERA components by agreeableness at T1				
Sociality / deception of triggering situations (D4-D5) on agreeableness	0.010 / -0.063**	[-0.124; 0.145] / [-0.117; -0.008]	0.196 / 0.145	[-0.309; 0.701] / [-0.084; 0.374]
Agreeable state (D1-D3) on agreeableness	0.166** / 0.175**	[0.106; 0.227] / [0.115; 0.236]	0.148 / 0.148	[-0.119; 0.415] / [-0.115; 0.410]
Agreeable state (D4-D5) on agreeableness	-0.011 / -0.017	[-0.069; 0.046] / [-0.071; 0.036]	0.114 / 0.110	[-0.117; 0.346] / [-0.104; 0.324]
Predicting difference in change T2 – T1 by TESSERA components during D1-D3				
Change T2-T1 on agreeable state	0.254** / 0.213**	[0.100; 0.408] / [0.072; 0.354]	0.027 / 0.027	[-0.043; 0.097] / [-0.044; 0.099]
Change T2-T1 on reflection on experience	0.011 / 0.022	[-0.070; 0.092] / [-0.062; 0.105]	-	-
Change T2-T1 on agreeable state × reflection on experience	-0.007 / 0.002	[-0.142; 0.127] / [-0.131; 0.136]	-	-

Table 20 continued

	Self-rating		IAT	
	Estimate	CI	Estimate	CI
Predicting difference in change T2 – T1 by TESSERA components during D1-D3				
Change T2-T1 on reaction to experience	-	-	0.029 / 0.016	[-0.050; 0.109] / [-0.062; 0.095]
Change T2-T1 on agreeable state × reaction to experience	-	-	0.013 / 0.010	[-0.018; 0.043] / [-0.020; 0.039]
Predicting difference in change T3 – T2 by TESSERA components during D4-D5				
Change T3-T2 on agreeable state	-0.017 / -0.013	[-0.192; 0.159] / [-0.190; 0.165]	-0.026 / -0.032	[-0.123; 0.071] / [-0.136; 0.072]
Change T3-T2 on reflection on experience	0.002 / -0.003	[-0.073; 0.077] / [-0.079; 0.073]	-	-
Change T3-T2 on agreeable state × reflection on experience	-0.027 / -0.025	[-0.139; 0.084] / [-0.136; 0.086]	-	-
Change T3-T2 on reaction to experience	-	-	-0.015 / -0.001	[-0.109; 0.078] / [-0.096; 0.093]
Change T3-T2 on agreeable state × reaction to experience	-	-	0.019 / 0.020	[-0.009; 0.048] / [-0.009; 0.048]

Table 20 continued

	Self-rating		IAT	
	Estimate	CI	Estimate	CI
Predicting difference in change T4 – T3 by TESSERA components during D4-D5				
Change T4-T3 on agreeable state	-0.049 / -0.043	[-0.229; 0.132] / [-0.230; 0.145]	0.023 / 0.021	[-0.076; 0.122] / [-0.081; 0.123]
Change T4-T3 on reflection on experience	-0.012 / -0.015	[-0.103; 0.080] / [-0.107; 0.077]	-	-
Change T4-T3 on agreeable state × reflection on experience	0.064 / 0.064	[-0.078; 0.205] / [-0.077; 0.204]	-	-
Change T4-T3 on reaction to experience	-	-	0.000 / 0.008	[-0.098; 0.098] / [-0.095; 0.112]
Change T4-T3 on agreeable state × reaction to experience	-	-	-0.028 / -0.027	[-0.066; 0.011] / [-0.066; 0.012]

Note. IAT = implicit association test. Values to the left of the slashes refer to models comprising sociality; values to the right refer to models comprising deception. CI = 95% confidence interval.

** $p < .01$.

4.3.1.5 Emotional stability.

For both self-rated and implicitly measured emotional stability, we again calculated two MSEMs each to investigate the role of negativity and adversity of situations. Except for SRMR (between), fit indices demonstrated a good to excellent model fit for both self-rated and implicitly measured emotional stability (Table 16). As SRMR (between) did not exceed conventional SEM's cut-off values by large, we decided to keep these models to allow for comparisons between traits.

In general, in both models for negativity and adversity of situations, path coefficients for associations of TESSERA components were similar in direction and magnitude. Unexpectedly neither perceived negativity, nor adversity of situations predicted participants' own expectations on how to behave (b = 0.008, *SE* = 0.013, *p* = .578; b = -0.013, *SE* = 0.017, *p* = .431, respectively). The more participants perceived negativity and adversity in situations, the less emotional stable behavior they reported (b = -0.348, *SE* = 0.011, *p* < .01; b = -0.200, *SE* = 0.015, *p* < .01) and the worse they felt after the experiences (b = -0.485, *SE* = 0.011, *p* < .01; b = -0.359, *SE* = 0.015, *p* < .01). Moreover, clearer expectations on how to behave predicted more emotional stable behavior (b = 0.141, *SE* = 0.010, *p* < .01; b = 0.135, *SE* = 0.013, *p* < .01). In addition, the more emotional stable behavior participants reported, the better they felt after their experiences (b = 0.298, *SE* = 0.014, *p* < .01; b = 0.535, *SE* = 0.013, *p* < .01) and the less they reflected on their experiences (for negativity b = -0.140, *SE* = 0.017, *p* < .01; for adversity b = -0.138, *SE* = 0.017, *p* < .01). Finally, as suggested, feeling worse after the experiences predicted more reflection on the experiences (for negativity b = -0.141, *SE* = 0.015, *p* < .01; for adversity b = -0.137, *SE* = 0.015, *p* < .01). These results replicated during D4-D5 (Table A14).

Regarding associations of emotional stability at T1 and subsequent TESSERA components, results showed that self-rated emotional stability at T1 predicted less perceived negativity of situations (Table 15, Table 21). In addition, implicitly measured emotional stability at T1 was on a marginally significant level linked with less adversity of situations

(Table 15, Table 21). Both higher self-rated and implicitly measured emotional stability at T1 predicted more emotional stable behavior during D1-D3, but not during D4-D5 when controlling for emotional stable behavior during D1-D3 (Table 21, see also section "4.3.3 Control analyses.").

Unexpectedly, no TESSERA component was associated with long-term development in self-rated and implicitly measured emotional stability (Table 21).

Table 21

Associations of TESSERA components with Emotional Stability at T1 and Long-term Development in Emotional Stability (between-person level)

	Self-rating		IAT	
	Estimate	CI	Estimate	CI
Predicting TESSERA components by emotional stability at T1				
Negativity / adversity of triggering situations (D4-D5) on emotional stability	-0.057* / -0.026	[-0.108; -0.006] / [-0.088; 0.037]	-0.102 / -0.290†	[-0.389; 0.185] / [-0.600; 0.021]
Emotional stable state (D1-D3) on emotional stability	0.133** / 0.119**	[0.087; 0.180] / [0.068 ; 0.171]	0.523** / 0.453**	[0.256; 0.791] / [0.188; 0.717]
Emotional stable state (D4-D5) on emotional stability	-0.004 / -0.016	[-0.046; 0.038] / [-0.058; 0.026]	-0.144 / -0.153	[-0.383; 0.095] / [-0.389; 0.083]
Predicting difference in change T2 – T1 by TESSERA components during D1-D3				
Change T2-T1 on emotional stable state	-0.040 / 0.023	[-0.190; 0.111] / [-0.113; 0.160]	0.037 / 0.034	[-0.026; 0.099] / [-0.031; 0.098]
Change T2-T1 on reflection on experience	-0.017 / -0.031	[-0.117; 0.083] / [-0.127; 0.066]	-	-
Change T2-T1 on emotional stable state × reflection on experience	0.012 / 0.007	[-0.065; 0.089] / [-0.072; 0.086]	-	-

Table 21 continued

	Self-rating		IAT	
	Estimate	CI	Estimate	CI
Predicting difference in change T2 – T1 by TESSERA components during D1-D3				
Change T2-T1 on reaction to experience	-	-	-0.008 / -0.004	[-0.094; 0.077] / [-0.099; 0.090]
Change T2-T1 on emotional stable state × reaction to experience	-	-	0.004 / 0.006	[-0.024; 0.032] / [-0.022; 0.034]
Predicting difference in change T3 – T2 by TESSERA components during D4-D5				
Change T3-T2 on emotional stable state	0.069 / 0.045	[-0.056; 0.195] / [-0.078; 0.168]	-0.025 / -0.025	[-0.103; 0.052] / [-0.105; 0.055]
Change T3-T2 on reflection on experience	0.038 / 0.043	[-0.041; 0.117] / [-0.035; 0.121]	-	-
Change T3-T2 on emotional stable state × reflection on experience	0.065 / 0.067	[-0.036; 0.165] / [-0.033; 0.167]	-	-
Change T3-T2 on reaction to experience	-	-	0.055 / 0.050	[-0.034; 0.143] / [-0.048; 0.148]
Change T3-T2 on emotional stable state × reaction to experience	-	-	-0.016 / -0.016	[-0.048; 0.016] / [-0.048; 0.015]

Table 21 continued

	Self-rating		IAT	
	Estimate	CI	Estimate	CI
Predicting difference in change T4 – T3 by TESSERA components during D4-D5				
Change T4-T3 on emotional stable state	0.075 / 0.071	[-0.067; 0.218] / [-0.069; 0.210]	-0.033 / -0.035	[-0.116; 0.049] / [-0.120; 0.049]
Change T4-T3 on reflection on experience	0.014 / 0.013	[-0.079; 0.107] / [-0.079; 0.105]	-	-
Change T4-T3 on emotional stable state × reflection on experience	0.026 / 0.026	[-0.081; 0.134] / [-0.082; 0.134]	-	-
Change T4-T3 on reaction to experience	-	-	-0.011 / -0.001	[-0.116; 0.094] / [-0.108; 0.107]
Change T4-T3 on emotional stable state × reaction to experience	-	-	-0.013 / -0.011	[-0.051; 0.025] / [-0.049; 0.027]

Note. IAT = implicit association test. Values to the left of the slashes refer to models comprising negativity; values to the right refer to models comprising adversity. CI = 95% confidence interval.

† $p < .10$. * $p < .05$. ** $p < .01$.

4.3.2 Volitional personality development.

Regarding volitional personality development, we again for each trait first explain model fit indices for MSEMs as displayed in Table 22. Thereafter, for each trait, we first report associations of change goals at T1 and subsequent TESSERA components (i.e., on the between-person level). Then, we explain direct links between change goals and long-term development in both self-rated and implicitly measured traits (i.e., on the between-person level). Table 23 to 27 provide the estimated coefficients. Keep in mind that associations among TESSERA components within TESSERA sequences (i.e., on the within-person level) and links between reflective or associative processes and long-term trait change (i.e., on the between-person level) were modeled just like in models on personality development in general and are therefore not reported in further detail. With only one exception (i.e., during D1-D3, more positive feelings after the experiences now predicted less changes in implicitly measured extraversion from T1 to T2; b = -0.105, *SE* = 0.047, *p* = .025), these associations closely mirrored their counterparts in models on personality development in general. Notably, and consistent with previous research, lower self-rated traits at T1 consistently predicted stronger respective change goals (all βs ≥ -0.215, all *p*s < .01). In addition, the lower participants' implicitly measured conscientiousness (β = -0.229, *p* < .01), extraversion (β = -0.184, *p* < .01) and emotional stability (β = -0.137, *p* = .028), the stronger their according change goals.

Table 22

Model Fit Indices for MSEMs Examining Associations of Change Goals with TESSERA Components and Long-Term Changes in Self-Rated and Implicitly Measured Big Five Traits

	χ^2	CFI	TLI	RMSEA	SRMR (within)	SRMR (between)
Openness						
Self-rating	1281.115	0.883	0.819	0.024	0.050	0.077
IAT	428.893	0.957	0.929	0.015	0.016	0.085
Conscientiousness						
Self-rating	617.105	0.925	0.884	0.015	0.025	0.098
IAT	448.900	0.913	0.857	0.015	0.023	0.079
Extraversion						
Self-rating	847.513	0.941	0.909	0.019	0.031	0.122
IAT	465.290	0.964	0.941	0.016	0.014	0.098
Agreeableness						
Self-rating	636.110 / 673.817	0.945 / 0.939	0.916 / 0.906	0.016 / 0.016	0.028 / 0.027	0.078 / 0.078
IAT	385.142 / 397.716	0.961 / 0.957	0.936 / 0.929	0.014 / 0.014	0.016 / 0.017	0.071 / 0.073
Emotional stability						
Self-rating	1332.627 / 735.848	0.939 / 0.950	0.906 / 0.923	0.025 / 0.017	0.041 / 0.030	0.108 / 0.115
IAT	404.784 / 355.260	0.984 / 0.975	0.973 / 0.959	0.014 / 0.013	0.018 / 0.009	0.095 / 0.096

Note. IAT = implicit association test. All models were calculated using maximum likelihood estimation with robust standard errors and scaled test statistics. CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. For agreeableness, values to the left of the slashes refer to models comprising sociality; values to the right refer to models comprising deception. For emotional stability, values to the left of the slashes refer to models comprising negativity; values to the right refer to models comprising adversity.

4.3.2.1 Openness.

Except for the CFI and TLI, model fit indices for self-rated openness demonstrated a reasonable to good fit of the applied MSEMs (Table 22). Although both CFI and TLI were below the recommended value of .90, they did not indicate a severe miss-specification, so that we decided to keep this model to allow for comparisons between traits. For implicitly measured openness, model fit indices were good to excellent (Table 22).

Testing associations of change goals at T1 and subsequent TESSERA components, results unexpectedly showed that, controlling for openness at T1, both stronger goals to change openness and higher perceived feasibility predicted less open behavior during D4-D5 (Table 23). Only in models on implicitly measured openness, stronger change goals that were also perceived as more feasible predicted less open behavior during D4-D5 (Table 23). All other associations remained non-significant (Table 23, see also Table 15, Table A13).

Linking change goals with long-term development in self-rated openness, it showed that only higher perceived importance of change goals predicted stronger trait change for self-rated openness from T1 to T2 (Table 23). In addition, change goals that were perceived both more important and more feasible, were associated with less changes in self-rated openness from T1 to T2 (Table 23). For implicitly measured openness however, no significant link between change goals and actual trait changes emerged (Table 23).

Table 23

Associations of Change Goals, their Importance and their Feasibility at T1 with TESSERA Components and Long-term Development in Openness (between-person level)

	Self-rating	IAT
Predicting triggering situations during D4-D5 by change goals, importance and feasibility at T1		
Situation: Intellect on change goals	0.017 [-0.282; 0.316]	0.033 [-0.260; 0.326]
Situation: Intellect on change goals × traits	-0.025 [-0.342; 0.291]	-0.707 [-1.623; 0.210]
Situation: Intellect on importance	-0.028 [-0.190; 0.134]	0.070 [-0.073; 0.213]
Situation: Intellect on feasibility	0.006 [-0.167; 0.179]	0.123 [-0.028; 0.274]
Situation: Intellect on importance × feasibility	0.052 [-0.149; 0.252]	-0.057 [-0.416; 0.303]
Situation: Intellect on change goals × importance	0.081 [-0.358; 0.519]	0.050 [-0.291; 0.391]
Situation: Intellect on change goals × feasibility	-0.073 [-0.421; 0.276]	-0.021 [-0.215; 0.173]
Predicting states and state expressions during D1-D3 by change goals, importance and feasibility at T1		
State: Open (D1-D3) on change goals	0.036 [-0.111; 0.182]	0.024 [-0.123; 0.171]
State: Open (D1-D3) on change goals × traits	-0.089 [-0.226; 0.049]	-0.075 [-0.447; 0.297]
State: Open (D1-D3) on importance	-0.023 [-0.094; 0.047]	0.016 [-0.048; 0.080]
State: Open (D1-D3) on feasibility	0.015 [-0.061; 0.092]	0.057 [-0.014; 0.127]
State: Open (D1-D3) on importance × feasibility	0.031 [-0.061; 0.122]	-0.005 [-0.093; 0.082]
State: Open (D1-D3) on change goals × importance	0.125 [-0.061; 0.310]	0.068 [-0.093; 0.229]
State: Open (D1-D3) on change goals × feasibility	0.022 [-0.127; 0.171]	-0.020 [-0.166; 0.126]
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Open (D4-D5) on change goals	-0.137* [-0.241; -0.032]	-0.131* [-0.237; -0.025]
State: Open (D4-D5) on change goals × traits	0.002 [-0.122; 0.126]	-0.260† [-0.526; 0.007]

Table 23 continued

	Self-rating	IAT
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Open (D4-D5) on importance	-0.001 [-0.061; 0.058]	-0.003 [-0.053; 0.047]
State: Open (D4-D5) on feasibility	-0.071* [-0.132; -0.009]	-0.069* [-0.123; -0.015]
State: Open (D4-D5) on importance × feasibility	-0.029 [-0.100; 0.042]	-0.025 [-0.094; 0.044]
State: Open (D4-D5) on change goals × importance	-0.056 [-0.203; 0.091]	-0.045 [-0.163; 0.074]
State: Open (D4-D5) on change goals × feasibility	-0.112† [-0.240; 0.017]	-0.109* [-0.217; <-0.001]
Predicting difference in change T2 – T1 by change goals, importance and feasibility at T1		
Change T2-T1 on change goals	-0.048 [-0.220; 0.123]	-0.040 [-0.139; 0.059]
Change T2-T1 on change goals × traits	-0.008 [-0.138; 0.121]	-0.066 [-0.297; 0.165]
Change T2-T1 on change goals × open state (D1-D3)	-0.033 [-0.218; 0.151]	-0.025 [-0.129; 0.078]
Change T2-T1 on importance	0.121* [0.047; 0.196]	-0.014 [-0.051; 0.022]
Change T2-T1 on feasibility	0.046 [-0.032; 0.125]	-0.010 [-0.056; 0.036]
Change T2-T1 on importance × feasibility	-0.112* [-0.194; -0.030]	0.022 [-0.034; 0.078]
Change T2-T1 on change goals × importance	-0.153 [-0.344; 0.038]	0.034 [-0.079; 0.147]
Change T2-T1 on change goals × feasibility	0.037 [-0.131; 0.204]	-0.049 [-0.134; 0.037]
Predicting difference in change T3 – T2 by change goals, importance and feasibility at T1		
Change T3-T2 on change goals	-0.020 [-0.200; 0.160]	0.077 [-0.030; 0.183]
Change T3-T2 on change goals × traits	0.013 [-0.146; 0.172]	0.079 [-0.188; 0.345]
Change T3-T2 on change goals × open state (D4-D5)	-0.120 [-0.288; 0.047]	0.028 [-0.070; 0.126]
Change T3-T2 on importance	0.025 [-0.058; 0.107]	0.007 [-0.038; 0.052]
Change T3-T2 on feasibility	0.003 [-0.079; 0.085]	0.035 [-0.023; 0.092]
Change T3-T2 on importance × feasibility	0.005 [-0.096; 0.106]	-0.037 [-0.100; 0.027]

Table 23 continued

	Self-rating	IAT
Predicting difference in change T3 – T2 by change goals, importance and feasibility at T1		
Change T3-T2 on change goals × importance	0.016 [-0.211; 0.243]	-0.086 [-0.211; 0.039]
Change T3-T2 on change goals × feasibility	-0.049 [-0.211; 0.113]	-0.020 [-0.117; 0.077]
Predicting difference in change T4 – T3 by change goals, importance and feasibility at T1		
Change T4-T3 on change goals	0.035 [-0.165; 0.234]	-0.090 [-0.204; 0.025]
Change T4-T3 on change goals × traits	-0.164† [-0.329; 0.002]	-0.166 [-0.422; 0.090]
Change T4-T3 on change goals × open state (D4-D5)	0.107 [-0.097; 0.312]	-0.062 [-0.185; 0.061]
Change T4-T3 on importance	-0.074 [-0.169; 0.022]	0.005 [-0.043; 0.054]
Change T4-T3 on feasibility	-0.023 [-0.131; 0.085]	-0.039 [-0.095; 0.018]
Change T4-T3 on importance × feasibility	0.090 [-0.032; 0.212]	-0.005 [-0.067; 0.058]
Change T4-T3 on change goals × importance	0.092 [-0.170; 0.354]	0.019 [-0.123; 0.162]
Change T4-T3 on change goals × feasibility	0.040 [-0.125; 0.206]	0.016 [-0.080; 0.113]

Note. IAT = implicit association test. 95% confidence intervals are shown in brackets.
† $p < .10$. * $p < .05$. ** $p < .01$.

4.3.2.2 Conscientiousness.

For both self-rated and implicitly measured conscientiousness, fit indices of MSEMs indicated an acceptable to good model fit, except for the TLI that lay slightly below the recommended value for conventional SEM of .90 (Table 22). As all other indices indicated an at least acceptable fit, we kept both models to allow for comparisons between traits.

Regarding associations of change goals at T1 and subsequent TESSERA components, results showed that only for implicitly measured traits, change goals predicted less conscientious behavior during D1-D3 while controlling for conscientiousness at T1 (Table

24). All other associations of change goals and subsequent TESSERA components remained non-significant (Table 24, see also Table 15, Table A13).

Unexpectedly, change goals at T1 predicted less actual change in self-rated conscientiousness from T2 to T3 and less actual change in implicitly measured conscientiousness from T1 to T2 (Table 24). Also, the stronger participants’ change goals and the higher their implicitly measured conscientiousness, the more they changed from T2 to T3. Importance of change goals at T1 was linked with more pronounced increases in implicitly measured conscientiousness from T1 to T2, yet this effect was reversed from T2 to T3 (Table 24). Furthermore, higher perceived feasibility of change goals at T1 predicted more pronounced actual changes in self-rated conscientiousness from T1 to T2 (Table 24). Moreover, the stronger a change goal and the higher its perceived feasibility, the more participants’ changed in implicitly measured conscientiousness from T1 to T2, however with this association being reversed from T2 to T3 (Table 24).

Table 24

Associations of Change Goals, their Importance and their Feasibility at T1 with TESSERA Components and Long-term Development in Conscientiousness (between-person level)

	Self-rating	IAT
Predicting triggering situations during D4-D5 by change goals, importance and feasibility at T1		
Situation: Duty on change goals	0.044 [-0.246; 0.335]	-0.007 [-0.287; 0.274]
Situation: Duty on change goals × traits	-0.061 [-0.323; 0.201]	0.193 [-0.573; 0.958]
Situation: Duty on importance	0.031 [-0.153; 0.215]	0.075 [-0.104; 0.255]
Situation: Duty on feasibility	-0.046 [-0.239; 0.146]	0.000 [-0.172; 0.172]
Situation: Duty on importance × feasibility	-0.019 [-0.303; 0.266]	0.066 [-0.119; 0.250]
Situation: Duty on change goals × importance	-0.135 [-0.497; 0.228]	-0.140 [-0.502; 0.223]
Situation: Duty on change goals × feasibility	0.076 [-0.111; 0.262]	-0.014 [-0.248; 0.220]
Predicting states and state expressions during D1-D3 by change goals, importance and feasibility at T1		
State: Conscientious (D1-D3) on change goals	-0.069 [-0.233; 0.096]	-0.172* [-0.342; -0.002]
State: Conscientious (D1-D3) on change goals × traits	-0.060 [-0.193; 0.073]	-0.120 [-0.553; 0.313]
State: Conscientious (D1-D3) on importance	-0.035 [-0.129; 0.060]	0.017 [-0.078; 0.112]
State: Conscientious (D1-D3) on feasibility	-0.007 [-0.108; 0.094]	0.050 [-0.050; 0.150]
State: Conscientious (D1-D3) on importance × feasibility	0.028 [-0.067; 0.123]	0.008 [-0.089; 0.105]
State: Conscientious (D1-D3) on change goals × importance	0.055 [-0.123; 0.234]	0.071 [-0.112; 0.254]
State: Conscientious (D1-D3) on change goals × feasibility	-0.056 [-0.206; 0.094]	-0.043 [-0.173; 0.086]
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Conscientious (D4-D5) on change goals	-0.003 [-0.123; 0.118]	0.002 [-0.125; 0.128]
State: Conscientious (D4-D5) on change goals × traits	0.034 [-0.077; 0.146]	0.058 [-0.280; 0.397]

Table 24 continued

	Self-rating	IAT
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Conscientious (D4-D5) on importance	0.020 [-0.056; 0.096]	0.014 [-0.059; 0.087]
State: Conscientious (D4-D5) on feasibility	0.012 [-0.070; 0.094]	0.010 [-0.068; 0.088]
State: Conscientious (D4-D5) on importance × feasibility	0.017 [-0.057; 0.091]	-0.035 [-0.136; 0.066]
State: Conscientious (D4-D5) on change goals × importance	-0.026 [-0.178; 0.126]	-0.030 [-0.183; 0.124]
State: Conscientious (D4-D5) on change goals × feasibility	-0.046 [-0.168; 0.076]	0.016 [-0.058; 0.090]
Predicting difference in change T2 – T1 by change goals, importance and feasibility at T1		
Change T2-T1 on change goals	-0.121 [-0.267; 0.025]	-0.079* [-0.144; -0.013]
Change T2-T1 on change goals × traits	-0.036 [-0.148; 0.075]	-0.155 [-0.346; 0.036]
Change T2-T1 on change goals × conscientious state (D1-D3)	0.100 [-0.023; 0.223]	0.042 [-0.015; 0.098]
Change T2-T1 on importance	0.075† [-0.004; 0.153]	0.049* [0.008; 0.091]
Change T2-T1 on feasibility	0.133** [0.041; 0.225]	0.008 [-0.037; 0.052]
Change T2-T1 on importance × feasibility	-0.078 [-0.163; 0.007]	-0.004 [-0.045; 0.037]
Change T2-T1 on change goals × importance	-0.099 [-0.286; 0.089]	0.020 [-0.063; 0.102]
Change T2-T1 on change goals × feasibility	-0.039 [-0.181; 0.103]	0.081* [0.008; 0.154]
Predicting difference in change T3 – T2 by change goals, importance and feasibility at T1		
Change T3-T2 on change goals	-0.174** [-0.301; -0.046]	0.007 [-0.069; 0.084]
Change T3-T2 on change goals × traits	-0.065 [-0.202; 0.071]	0.187* [0.009; 0.365]
Change T3-T2 on change goals × conscientious state (D4-D5)	0.010 [-0.109; 0.129]	-0.009 [-0.075; 0.056]
Change T3-T2 on importance	0.018 [-0.066; 0.101]	-0.058* [-0.109; -0.007]
Change T3-T2 on feasibility	-0.072 [-0.164; 0.020]	-0.028 [-0.081; 0.025]

Table 24 continued

	Self-rating	IAT
Predicting difference in change T3 – T2 by change goals, importance and feasibility at T1		
Change T3-T2 on importance × feasibility	0.011 [-0.069; 0.091]	0.024 [-0.034; 0.082]
Change T3-T2 on change goals × importance	0.052 [-0.086; 0.190]	0.026 [-0.080; 0.133]
Change T3-T2 on change goals × feasibility	0.095 [-0.043; 0.233]	-0.071* [-0.133; -0.008]
Predicting difference in change T4 – T3 by change goals, importance and feasibility at T1		
Change T4-T3 on change goals	0.064 [-0.080; 0.208]	0.067 [-0.009; 0.143]
Change T4-T3 on change goals × traits	0.106 [-0.053; 0.264]	-0.011 [-0.234; 0.211]
Change T4-T3 on change goals × conscientious state (D4-D5)	0.007 [-0.138; 0.152]	-0.007 [-0.084; 0.071]
Change T4-T3 on importance	-0.034 [-0.127; 0.058]	0.027 [-0.029; 0.083]
Change T4-T3 on feasibility	0.006 [-0.094; 0.106]	0.018 [-0.037; 0.072]
Change T4-T3 on importance × feasibility	0.085 [-0.010; 0.180]	0.036 [-0.028; 0.100]
Change T4-T3 on change goals × importance	0.122 [-0.056; 0.300]	0.073 [-0.039; 0.184]
Change T4-T3 on change goals × feasibility	-0.103 [-0.271; 0.064]	0.053 [-0.038; 0.144]

Note. IAT = implicit association test. 95% confidence intervals are shown in brackets.
† $p < .10$. * $p < .05$. ** $p < .01$.

4.3.2.3 Extraversion.

Except for SRMR (between), model fits for self-rated extraversion demonstrated an acceptable to good model fit. As SRMR (between) only slightly exceeded recommended values of .10, we kept this model to allow for comparisons between traits (Table 22). For implicitly measured extraversion, fit indices exhibited an acceptable to good model fit (Table 22).

For links of change goals at T1 and subsequent TESSERA components, results showed that higher perceived feasibility of goals to change extraversion predicted more extraverted behavior during D1-D3 while controlling for extraversion at T1 (Table 25). Unexpectedly, all other associations of change goals and subsequent TESSERA components remained non-significant (Table 25, see also Table 15, Table A12).

Investigating associations of change goals and long-term trait development, it unexpectedly showed that the more participants wanted to increase in extraversion, the less they actually changed in self-rated traits from T1 to T2 (Table 25). Again as expected, more important change goals and change goals that were both stronger and more important predicted stronger increases in self-rated extraversion from T1 to T2 (Table 25). In contrast, the more feasible participants perceived a change goal, the less they actually changed in implicitly measured extraversion from T2 to T3 (Table 25).

Table 25

Associations of Change Goals, their Importance and their Feasibility at T1 with TESSERA Components and Long-term Development in Extraversion (between-person level)

	Self-rating	IAT
Predicting triggering situations during D4-D5 by change goals, importance and feasibility at T1		
Situation: Sociality on change goals	-0.046 [-0.297; 0.204]	-0.074 [-0.325; 0.177]
Situation: Sociality on change goals × traits	0.080 [-0.174; 0.333]	0.205 [-0.350; 0.761]
Situation: Sociality on importance	-0.016 [-0.148; 0.116]	0.002 [-0.124; 0.128]
Situation: Sociality on feasibility	0.019 [-0.117; 0.156]	0.059 [-0.062; 0.181]
Situation: Sociality on importance × feasibility	-0.020 [-0.141; 0.100]	-0.028 [-0.145; 0.090]
Situation: Sociality on change goals × importance	0.058 [-0.172; 0.287]	0.057 [-0.170; 0.285]
Situation: Sociality on change goals × feasibility	0.038 [-0.218; 0.295]	0.102 [-0.105; 0.309]
Predicting states and state expressions during D1-D3 by change goals, importance and feasibility at T1		
State: Extraverted (D1-D3) on change goals	0.087 [-0.021; 0.196]	0.060 [-0.049; 0.169]
State: Extraverted (D1-D3) on change goals × traits	0.021 [-0.071; 0.113]	0.067 [-0.162; 0.296]
State: Extraverted (D1-D3) on importance	0.002 [-0.052; 0.057]	0.020 [-0.030; 0.070]
State: Extraverted (D1-D3) on feasibility	0.063* [0.007; 0.118]	0.090** [0.038; 0.143]
State: Extraverted (D1-D3) on importance × feasibility	-0.030 [-0.082; 0.022]	-0.036 [-0.089; 0.017]
State: Extraverted (D1-D3) on change goals × importance	-0.054 [-0.153; 0.045]	-0.053 [-0.151; 0.045]
State: Extraverted (D1-D3) on change goals × feasibility	-0.009 [-0.123; 0.104]	0.024 [-0.065; 0.113]
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Extraverted (D4-D5) on change goals	-0.027 [-0.151; 0.097]	-0.030 [-0.148; 0.088]
State: Extraverted (D4-D5) on change goals × traits	0.055 [-0.053; 0.164]	0.072 [-0.170; 0.313]

Table 25 continued

	Self-rating	IAT
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Extraverted (D4-D5) on importance	-0.017 [-0.079; 0.044]	-0.012 [-0.070; 0.046]
State: Extraverted (D4-D5) on feasibility	-0.017 [-0.082; 0.049]	0.004 [-0.056; 0.064]
State: Extraverted (D4-D5) on importance × feasibility	0.015 [-0.042; 0.073]	0.016 [-0.041; 0.072]
State: Extraverted (D4-D5) on change goals × importance	-0.055 [-0.161; 0.052]	-0.046 [-0.148; 0.057]
State: Extraverted (D4-D5) on change goals × feasibility	-0.063 [-0.181; 0.055]	-0.019 [-0.113; 0.074]
Predicting difference in change T2 – T1 by change goals, importance and feasibility at T1		
Change T2-T1 on change goals	-0.380* [-0.556; -0.205]	0.006 [-0.082; 0.094]
Change T2-T1 on change goals × traits	-0.009 [-0.148; 0.130]	-0.166 [-0.347; 0.015]
Change T2-T1 on change goals × extraverted state (D1-D3)	-0.123 [-0.359; 0.114]	-0.030 [-0.131; 0.070]
Change T2-T1 on importance	0.096* [0.001; 0.190]	0.000 [-0.044; 0.043]
Change T2-T1 on feasibility	0.090 [-0.003; 0.183]	0.039 [-0.007; 0.086]
Change T2-T1 on importance × feasibility	0.027 [-0.054; 0.107]	0.021 [-0.022; 0.064]
Change T2-T1 on change goals × importance	0.184* [0.029; 0.339]	0.002 [-0.087; 0.091]
Change T2-T1 on change goals × feasibility	0.093 [-0.097; 0.283]	0.007 [-0.073; 0.087]
Predicting difference in change T3 – T2 by change goals, importance and feasibility at T1		
Change T3-T2 on change goals	0.029 [-0.138; 0.197]	-0.034 [-0.127; 0.060]
Change T3-T2 on change goals × traits	0.015 [-0.138; 0.168]	0.151 [-0.035; 0.337]
Change T3-T2 on change goals × extraverted state (D4-D5)	-0.035 [-0.195; 0.125]	0.013 [-0.082; 0.107]
Change T3-T2 on importance	0.020 [-0.058; 0.098]	-0.003 [-0.055; 0.050]
Change T3-T2 on feasibility	-0.014 [-0.100; 0.071]	-0.068* [-0.120; -0.017]

Table 25 continued

	Self-rating	IAT
Predicting difference in change T3 – T2 by change goals, importance and feasibility at T1		
Change T3-T2 on importance × feasibility	-0.057 [-0.133; 0.020]	0.000 [-0.049; 0.049]
Change T3-T2 on change goals × importance	-0.080 [-0.240; 0.079]	-0.002 [-0.102; 0.098]
Change T3-T2 on change goals × feasibility	-0.034 [-0.193; 0.125]	0.013 [-0.080; 0.106]
Predicting difference in change T4 – T3 by change goals, importance and feasibility at T1		
Change T4-T3 on change goals	-0.092 [-0.255; 0.072]	0.029 [-0.078; 0.136]
Change T4-T3 on change goals × traits	-0.025 [-0.152; 0.101]	0.032 [-0.218; 0.283]
Change T4-T3 on change goals × extraverted state (D4-D5)	0.093 [-0.052; 0.238]	-0.010 [-0.119; 0.099]
Change T4-T3 on importance	0.029 [-0.045; 0.103]	0.016 [-0.040; 0.072]
Change T4-T3 on feasibility	0.036 [-0.060; 0.133]	0.013 [-0.037; 0.064]
Change T4-T3 on importance × feasibility	0.001 [-0.075; 0.076]	-0.007 [-0.059; 0.044]
Change T4-T3 on change goals × importance	0.011 [-0.162; 0.183]	-0.029 [-0.131; 0.072]
Change T4-T3 on change goals × feasibility	-0.022 [-0.195; 0.152]	0.009 [-0.090; 0.108]

Note. IAT = implicit association test. 95% confidence intervals are shown in brackets.
† $p < .10$. * $p < .05$. ** $p < .01$.

4.3.2.4 Agreeableness.

Just like for personality development in general, we calculated two models each for self-rated and implicitly measured agreeableness, to test associations with sociality and deception in situations. For all four models, model fit indices demonstrated a good to excellent fit (Table 22). However, since models for sociality and deception did hardly differ in their results, we in Table 26 only report detailed results for deception in situations. For sociality in situations, detailed results are reported in the appendix (Table A15).

As expected, while controlling for agreeableness at T1, goals to change agreeableness at T1 that were both perceived more important and more feasible were linked with more perceived deception of situations during D4-D5 (Table 26). In addition, for implicitly measured agreeableness, the more feasible participants perceived a change goal, the more agreeable behavior they reported during D1-D3 (Table 26, Table A15). Again only for implicitly measured agreeableness and sociality of situations, change goals that were perceived both more important and more feasible were linked with less agreeable behavior during D1 to D3 (Table A15). In contrast, for both self-rated and implicitly measured agreeableness, change goals that were both stronger and perceived as more feasible were linked with more agreeable behavior during D1-D3 (Table 26, Table A15). Again unexpectedly, change goals that were both stronger and perceived as more important were associated with less agreeable behavior during D4-D5 (Table 26, Table A15).

Regarding associations of change goals with long-term trait change, it showed that stronger goals to change agreeableness at T1 were linked with less actual change in self-rated agreeableness from T1 to T2 (Table 26, Table A15). Furthermore, both the stronger and the more important participants' goals to change agreeableness, the more they changed in implicitly measured agreeableness from T1 to T2 (Table 26, Table A15).

Table 26

Associations of Change Goals, their Importance and their Feasibility at T1 with TESSERA Components and Long-term Development in Agreeableness (between-person level)

	Self-rating	IAT
Predicting triggering situations during D4-D5 by change goals, importance and feasibility at T1		
Situation: Deception on change goals	0.035 [-0.115; 0.185]	0.062 [-0.079; 0.204]
Situation: Deception on change goals × traits	0.073 [-0.078; 0.225]	-0.027 [-0.531; 0.477]
Situation: Deception on importance	-0.042 [-0.092; 0.009]	-0.043 [-0.092; 0.006]
Situation: Deception on feasibility	-0.034 [-0.101; 0.033]	-0.030 [-0.091; 0.031]
Situation: Deception on importance × feasibility	0.067* [0.008; 0.125]	0.061* [0.005; 0.117]
Situation: Deception on change goals × importance	0.099 [-0.019; 0.218]	0.101 [-0.019; 0.221]
Situation: Deception on change goals × feasibility	-0.031 [-0.195; 0.133]	-0.034 [-0.175; 0.107]
Predicting states and state expressions during D1-D3 by change goals, importance and feasibility at T1		
State: Agreeable (D1-D3) on change goals	0.044 [-0.078; 0.167]	-0.004 [-0.128; 0.120]
State: Agreeable (D1-D3) on change goals × traits	-0.082 [-0.201; 0.036]	-0.196 [-0.515; 0.123]
State: Agreeable (D1-D3) on importance	0.017 [-0.039; 0.072]	0.052† [-0.004; 0.108]
State: Agreeable (D1-D3) on feasibility	0.017 [-0.050; 0.085]	0.079* [0.009; 0.149]
State: Agreeable (D1-D3) on importance × feasibility	-0.047 [-0.113; 0.018]	-0.062† [-0.128; 0.005]
State: Agreeable (D1-D3) on change goals × importance	-0.013 [-0.136; 0.111]	-0.001 [-0.130; 0.128]
State: Agreeable (D1-D3) on change goals × feasibility	0.204** [0.066; 0.343]	0.203** [0.069; 0.337]
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Agreeable (D4-D5) on change goals	-0.010 [-0.145; 0.124]	0.010 [-0.122; 0.141]
State: Agreeable (D4-D5) on change goals × traits	0.113 [-0.025; 0.252]	0.278 [-0.069; 0.624]

Table 26 continued

	Self-rating	IAT
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Agreeable (D4-D5) on importance	0.028 [-0.019; 0.074]	0.031 [-0.013; 0.075]
State: Agreeable (D4-D5) on feasibility	-0.011 [-0.069; 0.048]	-0.012 [-0.065; 0.042]
State: Agreeable (D4-D5) on importance × feasibility	-0.040 [-0.092; 0.013]	-0.047† [-0.098; 0.003]
State: Agreeable (D4-D5) on change goals × importance	-0.131* [-0.239; -0.023]	-0.130* [-0.238; -0.022]
State: Agreeable (D4-D5) on change goals × feasibility	-0.109 [-0.257; 0.040]	-0.049 [-0.179; 0.081]
Predicting difference in change T2 – T1 by change goals, importance and feasibility at T1		
Change T2-T1 on change goals	-0.295* [-0.428; -0.162]	-0.023 [-0.092; 0.045]
Change T2-T1 on change goals × traits	0.031 [-0.132; 0.193]	-0.002 [-0.246; 0.241]
Change T2-T1 on change goals × Agreeable state (D1-D3)	-0.061 [-0.295; 0.174]	-0.067 [-0.160; 0.026]
Change T2-T1 on importance	-0.005 [-0.070; 0.060]	-0.008 [-0.040; 0.024]
Change T2-T1 on feasibility	0.071 [-0.006; 0.149]	0.000 [-0.034; 0.035]
Change T2-T1 on importance × feasibility	-0.109 [-0.288; 0.071]	0.013 [-0.020; 0.045]
Change T2-T1 on change goals × importance	-0.055 [-0.197; 0.086]	0.076* [0.010; 0.143]
Change T2-T1 on change goals × feasibility	-0.007 [-0.078; 0.065]	-0.051 [-0.130; 0.029]
Predicting difference in change T3 – T2 by change goals, importance and feasibility at T1		
Change T3-T2 on change goals × Agreeable state (D4-D5)	0.176 [-0.079; 0.431]	0.054 [-0.086; 0.193]
Change T3-T2 on change goals	0.050 [-0.113; 0.214]	-0.036 [-0.135; 0.062]
Change T3-T2 on change goals × traits	-0.112 [-0.326; 0.103]	0.023 [-0.252; 0.298]
Change T3-T2 on importance	-0.025 [-0.101; 0.050]	0.014 [-0.030; 0.059]
Change T3-T2 on feasibility	-0.042 [-0.123; 0.040]	-0.009 [-0.056; 0.039]

Table 26 continued

	Self-rating	IAT
Predicting difference in change T3 – T2 by change goals, importance and feasibility at T1		
Change T3-T2 on importance × feasibility	0.018 [-0.064; 0.099]	-0.017 [-0.069; 0.035]
Change T3-T2 on change goals × importance	0.019 [-0.126; 0.164]	-0.057 [-0.153; 0.039]
Change T3-T2 on change goals × feasibility	0.005 [-0.193; 0.203]	0.020 [-0.087; 0.126]
Predicting difference in change T4 – T3 by change goals, importance and feasibility at T1		
Change T4-T3 on change goals	0.099 [-0.074; 0.272]	0.030 [-0.069; 0.130]
Change T4-T3 on change goals × traits	0.118 [-0.077; 0.313]	-0.081 [-0.404; 0.242]
Change T4-T3 on change goals × Agreeable state (D4-D5)	-0.113 [-0.376; 0.151]	0.096 [-0.069; 0.261]
Change T4-T3 on importance	-0.006 [-0.084; 0.072]	-0.013 [-0.055; 0.029]
Change T4-T3 on feasibility	0.004 [-0.088; 0.096]	0.006 [-0.044; 0.055]
Change T4-T3 on importance × feasibility	0.018 [-0.066; 0.102]	-0.026 [-0.073; 0.022]
Change T4-T3 on change goals × importance	0.054 [-0.080; 0.189]	-0.003 [-0.092; 0.086]
Change T4-T3 on change goals × feasibility	-0.001 [-0.213; 0.210]	-0.026 [-0.073; 0.022]

Note. IAT = implicit association test. 95% confidence intervals are shown in brackets.
† $p < .10$. * $p < .05$. ** $p < .01$.

4.3.2.5 Emotional stability.

Again, we calculated two models each for self-rated and implicitly measured emotional stability to test associations for negativity and adversity in situations. Model fit indices for all four models demonstrated a good to excellent fit (Table 22). To maintain clarity, we in Table 27 focus on results for negativity in situations because there were only little differences in model results for negativity and adversity. For adversity in situations, detailed results are reported in the appendix (Table A16).

For associations of goals to change emotional stability at T1 and subsequent TESSERA components, results showed that participants who both expressed stronger change goals and were lower in self-rated or implicitly measured emotional stability at T1 experienced less adverse situations (Table A16). In addition, for self-rated emotional stability, more feasible change goals were linked with more negativity and adversity in situations (Table 27, Table A16). Unexpectedly, for implicitly measured emotional stability, the more participants wanted to increase in emotional stability, the less emotional stable behavior participants reported during D1-D3 (Table 27, Table A16). Also, both higher implicitly measured emotional stability at T1 and stronger change goals were associated with more emotional stable behavior during D1-D3 (Table 27, Table A16). Again as expected, the more important participants perceived a change goal, the more emotional stable behavior during D1-D3 they reported (Table 27, Table A16).

Linking change goals at T1 with long-term trait changes, for self-rated traits, it unexpectedly showed that the more participants wanted to change, the less they changed in self-rated traits from T1 to T2 (Table 27, Table A16). Also, stronger change goals that went along with more goal-relevant states predicted less actual changes in self-rated traits from T1 to T2 (Table 27, Table A16). However, as expected, more feasible change goals were associated with more pronounced changes in self-rated traits from T3 to T4 (Table 27, Table A16).

Table 27

Associations of Change Goals, their Importance and their Feasibility at T1 with TESSERA Components and Long-term Development in Emotional Stability (between-person level)

	Self-rating	IAT
Predicting triggering situations during D4-D5 by change goals, importance and feasibility at T1		
Situation: Negativity on change goals	0.088 [-0.058; 0.234]	0.135† [-0.005; 0.275]
Situation: Negativity on change goals × traits	-0.054 [-0.139; 0.031]	0.097 [-0.244; 0.439]
Situation: Negativity on importance	0.058 [-0.026; 0.141]	0.043 [-0.043; 0.128]
Situation: Negativity on feasibility	0.125** [0.040; 0.210]	0.070 [-0.011; 0.152]
Situation: Negativity on importance × feasibility	-0.016 [-0.106; 0.075]	-0.029 [-0.119; 0.062]
Situation: Negativity on change goals × importance	-0.106 [-0.286; 0.074]	-0.123 [-0.303; 0.056]
Situation: Negativity on change goals × feasibility	0.061 [-0.062; 0.185]	0.009 [-0.107; 0.125]
Predicting states and state expressions during D1-D3 by change goals, importance and feasibility at T1		
State: Emotional Stable (D1-D3) on change goals	-0.070 [-0.196; 0.056]	-0.153** [-0.269; -0.037]
State: Emotional Stable (D1-D3) on change goals × traits	-0.023 [-0.085; 0.039]	0.487** [0.198; 0.776]
State: Emotional Stable (D1-D3) on importance	0.081* [0.011; 0.152]	0.087** [0.019; 0.154]
State: Emotional Stable (D1-D3) on feasibility	0.034 [-0.039; 0.106]	0.062 [-0.007; 0.131]
State: Emotional Stable (D1-D3) on importance × feasibility	-0.023 [-0.085; 0.039]	-0.032 [-0.098; 0.034]
State: Emotional Stable (D1-D3) on change goals × importance	-0.034 [-0.161; 0.092]	-0.070 [-0.203; 0.062]
State: Emotional Stable (D1-D3) on change goals × feasibility	0.022 [-0.109; 0.153]	-0.005 [-0.110; 0.100]
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Emotional Stable (D4-D5) on change goals	-0.036 [-0.139; 0.066]	-0.020 [-0.123; 0.082]
State: Emotional Stable (D4-D5) on change goals × traits	-0.006 [-0.080; 0.068]	-0.096 [-0.341; 0.149]

Table 27 continued

	Self-rating	IAT
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Emotional Stable (D4-D5) on importance	-0.021 [-0.090; 0.049]	-0.014 [-0.082; 0.053]
State: Emotional Stable (D4-D5) on feasibility	0.005 [-0.066; 0.075]	0.006 [-0.058; 0.070]
State: Emotional Stable (D4-D5) on importance × feasibility	0.017 [-0.042; 0.075]	0.021 [-0.039; 0.080]
State: Emotional Stable (D4-D5) on change goals × importance	0.039 [-0.082; 0.160]	0.054 [-0.070; 0.178]
State: Emotional Stable (D4-D5) on change goals × feasibility	-0.007 [-0.116; 0.101]	-0.004 [-0.098; 0.089]
Predicting difference in change T2 – T1 by change goals, importance and feasibility at T1		
Change T2-T1 on change goals	-0.279** [-0.436; -0.121]	-0.047 [-0.105; 0.010]
Change T2-T1 on change goals × traits	0.079 [-0.033; 0.190]	0.042 [-0.143; 0.226]
Change T2-T1 on change goals × Emotional Stable state (D1-D3)	-0.153** [-0.267; -0.040]	-0.012 [-0.050; 0.027]
Change T2-T1 on importance	0.014 [-0.083; 0.111]	0.027 [-0.013; 0.066]
Change T2-T1 on feasibility	0.081 [-0.015; 0.176]	0.004 [-0.030; 0.037]
Change T2-T1 on importance × feasibility	0.005 [-0.076; 0.086]	-0.026 [-0.060; 0.009]
Change T2-T1 on change goals × importance	0.064 [-0.101; 0.230]	-0.016 [-0.079; 0.047]
Change T2-T1 on change goals × feasibility	-0.060 [-0.194; 0.075]	0.017 [-0.028; 0.063]
Predicting difference in change T3 – T2 by change goals, importance and feasibility at T1		
Change T3-T2 on change goals	-0.059 [-0.225; 0.107]	0.017 [-0.059; 0.093]
Change T3-T2 on change goals × traits	-0.073 [-0.197; 0.051]	0.027 [-0.190; 0.243]
Change T3-T2 on change goals × Emotional Stable state (D4-D5)	0.072 [-0.070; 0.215]	0.018 [-0.039; 0.074]
Change T3-T2 on importance	0.047 [-0.052; 0.146]	-0.006 [-0.055; 0.043]

Table 27 continued

	Self-rating	IAT
Predicting difference in change T3 – T2 by change goals, importance and feasibility at T1		
Change T3-T2 on feasibility	-0.058 [-0.145; 0.030]	-0.009 [-0.053; 0.035]
Change T3-T2 on importance × feasibility	0.017 [-0.129; 0.163]	0.013 [-0.038; 0.065]
Change T3-T2 on change goals × importance	-0.085 [-0.279; 0.109]	0.015 [-0.077; 0.107]
Change T3-T2 on change goals × feasibility	-0.030 [-0.117; 0.058]	-0.025 [-0.079; 0.030]
Predicting difference in change T4 – T3 by change goals, importance and feasibility at T1		
Change T4-T3 on change goals	0.152 [-0.019; 0.323]	0.027 [-0.054; 0.107]
Change T4-T3 on change goals × traits	0.078 [-0.057; 0.213]	0.054 [-0.188; 0.296]
Change T4-T3 on change goals × Emotional Stable state (D4-D5)	-0.100 [-0.253; 0.053]	0.016 [-0.050; 0.082]
Change T4-T3 on importance	0.051 [-0.064; 0.166]	0.002 [-0.046; 0.050]
Change T4-T3 on feasibility	0.110* [0.003; 0.217]	-0.006 [-0.056; 0.045]
Change T4-T3 on importance × feasibility	-0.005 [-0.111; 0.102]	-0.020 [-0.067; 0.027]
Change T4-T3 on change goals × importance	0.073 [-0.154; 0.299]	-0.025 [-0.115; 0.065]
Change T4-T3 on change goals × feasibility	-0.044 [-0.208; 0.120]	0.035 [-0.046; 0.116]

Note. IAT = implicit association test. 95% confidence intervals are shown in brackets.
† $p < .10$. * $p < .05$. ** $p < .01$.

4.3.3 Control analyses.

In the analysis focusing on personality development in general, traits at T1 were for the most part associated with subsequent corresponding self-reported behavior during D1-D3 but not during D4-D5 when controlling for D1-D3. In addition, for self-rated conscientiousness, self-rated and implicitly measured extraversion and self-rated agreeableness, trait-relevant behavior during D1-D3 predicted subsequent trait changes (i.e. from T1 to T2), while behavior during D4-D5 failed to predict subsequent trait changes (e.g., from T2 to T3, or T3 to T4). To investigate whether these non-significant findings for self-reported behavior during D4-D5 resulted from strong associations between behavior during D1-D3 and D4-D5 (all βs $\geq$ 0.909, all *p*s < .01), we conducted several control analyses. First, we investigated trait changes in restricted models that only included T2 and T3 and momentary processes during D4-D5. As expected, except for openness (b = 0.056, *p* = .092), all self-rated traits as well as implicitly measured extraversion at T2 were associated with corresponding behavior during D4-D5 (all bs $\geq$ 0.101, all *p*s < .01, see online supplement). Although associations of self-reported conscientious and agreeable behavior during D4-D5 and subsequent trait changes were in the expected directions, they failed to reach statistical significance. For both self-rated and implicitly measured extraversion however, the association of behavior during D4-D5 with trait changes from T2 to T3 did not resemble its counterpart for earlier assessments in our main analysis (i.e., predicting changes from T1 to T2 by behavior during D1-D3) and dropped to zero. A closer inspection of latent changes in self-rated extraversion (i.e., latent difference scores) indicated that this effect could be due to variance restriction in trait change from T2 to T3 (i.e., the latent difference score showed 68% less inter-individual variance than the latent difference score for changes in extraversion from T1 to T2).

To test this assumption of variance restriction, we examined additional models that linked trait changes from T1 to T4 (e.g., 74% increase in variance for changes in self-rated extraversion compared to models including only T2 and T3) with momentary processes during D4-D5.[18] Supporting the restricted variance hypotheses, self-reported extraverted (b = 0.330, $p < .01$) and agreeable (b = 0.312, $p < .01$), but not conscientious behavior (b = -0.014, p = .843) during D4-D5 predicted trait changes from T1 to T4. In addition, the more open behavior people reported during D4-D5 the more self-rated openness increased from T1 to T4 (b = 0.164, $p < .01$). For implicitly measured extraversion however, this strategy only led to an 18% variance increase and a still non-significant association of extraverted behavior during D4-D5 and subsequent trait change (b = 0.094, p = .124). In addition, except for self-rated openness (b = 0.054, p = .069), all self-rated traits at T1 predicted self-rated behavior during D4-D5 (all bs ≥ 0.075, all *p*s < .01). Although implicitly measured extraversion at T1 did predict self-rated behavior during D4-D5 only on a marginally significant level (b = 0.158, p = .096), emotional stability at T1 was still linked with corresponding states during D4-D5 (b = 0.392, p = .012).

As additional control analyses for personality development in general, we included the sum of positively, neutrally and negatively rated life events participants experienced into the models. Specifically, we examined whether such life events predicted both momentary processes and long-term trait development, thereby rendering previously reported associations non-significant. With very few exceptions, controlling for life events did hardly change the

[18] To investigate whether the shorter time-span of merely 20 days covered in D4-D5 compared to 30 days covered in D1-D3 may have resulted in a lack of power, we shortened D1-D3 by 10 days (i.e., by deleting D3) and conducted restricted models for conscientiousness extraversion and agreeableness in which D1-D2 predicted trait changes from T1 to T2. Speaking against a lack of power, results closely mirrored findings of our main analysis with conscientious (b = 0.150, *SE* = 0.056, $p < .01$), extraverted (b = 0.427, *SE* = 0.135, $p < .01$) and agreeable (for models comprising sociality b = 0.196, *SE* = 0.077, $p < .05$; for models comprising deception b = 0.198, *SE* = 0.075, $p < .01$) behavior during D1-D2 predicting subsequent trait changes. In addition, a more detailed attrition analysis that investigated whether participants who dropped out after T1, T2 or T3 differed in previously assessed conscientiousness, extraversion or agreeableness revealed no further attrition effects. Thus, selective attrition could not explain the non-significant associations of behavior during D4-D5 and subsequent trait change.

results: The effect of self-rated extraversion predicting sociality in situations during D4-D5 decreased to b = 0.100 (*SE* = 0.057, *p* = .057). Also, the effect of implicitly measured conscientiousness predicting duty in situations during D4-D5 diminished (b = 0.839, *SE* = 0.431, *p* = .051).

Although we were not primarily interested in differences between younger and older adults or between students and non-students, we intended to also control for potential group differences by using multi-group MSEMs. However, for methodological reasons (i.e., lack of measurement invariance across groups) these control analyses could not be conducted. Wrzus et al. (2018b) provide further information on group differences in longitudinal trajectories of both self-rated and implicitly measured traits.

In models on volitional personality development, we focused on two-times interactions of change goals, importance and feasibility. To additionally investigate whether stronger change goals that were perceived both more important and more feasible were linked with the experience of TESSERA components or long-term trait changes, we expanded previous models on volitional personality development by change goal × importance × feasibility interactions. Yet, across all 14 expanded models investigating a total of 84 additional three-times interactions, only three significant effects emerged. Unexpectedly, for self-rated openness as well as both self-rated and implicitly measured emotional stability, stronger change goals that were perceived both more important and more feasible predicted less goal-relevant behavior during D1-D3 (Table A17). In contrast, for conscientiousness, stronger change goals that were perceived both more important and more feasible predicted more conscientious behavior during D4-D5 (Table A17). Note that adding goals × importance × feasibility interaction terms led to worse model fits, especially regarding the TLI (e.g., for self-rated traits, in 6 of 7 models, the TLI fell below .90; see table note of Table A17), maybe because most interactions remained non-significant predictors. Detailed results for all control analyses are available at https://osf.io/k9wsv/?view_only=ac0c0b103fff4a61959ed1b893ddfcce.

4.3.4 Summary of results.

Results were largely in line with Hypothesis 1. Thus, as expected, higher intellect, duty and sociality of situations predicted clearer expectations while however perceived deception, negativity, and adversity did not predict clear expectations. In addition, except for intellect, situational characteristics predicted situation-relevant behavior as expected. In line with our hypothesis, more intellect, duty, deception, negativity and adversity of situations was linked with feeling worse after the experiences. Again as expected, clearer expectations predicted more open, conscientious, extraverted, agreeable and emotional stable behavior, which in turn predicted feeling better after the experiences. More pronounced self-reported states, except for extraverted and emotional stable behavior, predicted more reflection on the experiences. Finally, as suggested, feeling worse after the experiences predicted more reflection on the experiences.

Second, our study replicated previous findings on the associations of self-rated traits and subsequent momentary experiences (i.e., TESSERA components). Hence, the higher participants rated themselves in Big Five traits at T1, the more trait-relevant situations they experienced and the more trait-relevant behavior they reported. We were able to extend previous findings by showing that implicitly measured extraversion and emotional stability predicted more trait-relevant behavior in daily life.

Finally, we investigated associations of TESSERA components with long-term development in self-rated and implicitly measured traits. As expected, self-rated conscientious, extraverted and agreeable behavior during D1-D3 predicted subsequent changes in matching self-rated traits from T1 to T2. Conversely our main analysis indicated that states during D4-D5 were not linked with subsequent changes in self-rated traits (i.e., from

T2 to T3 and T3 to T4). Control analyses however suggested that this finding could be due to variance restrictions in later trait changes. Also, reflection on behavior only predicted changes in self-rated conscientiousness from T1 to T2. Self-reported extraverted behavior during D1-D3 and conscientious behavior during D4-D5 predicted changes in matching implicitly measured traits. Unexpectedly, reactions on states did not predict changes in implicitly measured traits.

Regarding volitional personality development, results did hardly provide a consistent picture and were only partly in line with our hypotheses and previous research. Unexpectedly, change goals were not associated with experiencing goal-relevant situations. Yet, as expected, the more feasible participants perceived goals to change emotional stability and both the more important and feasible they perceived goals to change agreeableness, the more goal relevant situations they experienced. Surprisingly, change goals were, if at all, linked with experiencing less goal-relevant states. However, as expected, more important goals to change emotional stability were linked with the experience of more emotional stable behavior during D1-D3. Only for implicitly measured extraversion and agreeableness, more feasible change goals were associated with experiencing more goals-relevant behavior during D1-D3. Yet, for both self-rated and implicitly measured agreeableness, change goals that were considered both important and feasible were linked with less agreeable behavior during D4-D5. Unexpectedly, both the more participants wanted to increase in agreeableness and the more important they perceived this goal, the less agreeable behavior they reported during D4-D5. Yet, stronger goals to increase in agreeableness that were also considered more feasible were associated with more agreeable behavior during D1-D3.

Second, we examined associations of change goals at T1 with long-term development in self-rated and implicitly measured traits. Again, change goals were, if at all, linked with less actual trait changes, especially from T1 to T2. Similarly, participants who held stronger change goals and experienced more goal-relevant states, if at all, showed less pronounced trait changes. However, as expected, more important or more feasible change goals at least in part predicted stronger trait changes for all traits except for agreeableness. Surprisingly, change goals that were considered both important and feasible predicted, if at all, less actual trait changes. Again as expected, for extraversion and agreeableness, the more participants wanted to change and the more important they considered these changes, the more they actually increased in traits from T1 to T2. Similarly, in implicitly measured conscientiousness, stronger change goals that were also perceived as more feasible, predicted stronger trait changes from T1 to T2, but less trait changes from T2 to T3. Control analysis revealed that three-way interactions (i.e., change goals × importance × feasibility) did hardly predict TESSERA components or long-term trait changes. We next discuss our findings.

4.4 Discussion

In the current longitudinal multi-method study, we investigated momentary processes of daily experiences and their role in long-term development of explicit and implicit representations of Big Five traits. The study also represents a first empirical test of predictions derived from the TESSERA framework for explaining personality development. The findings offer unique insights into trait development by combining the extensive assessment of momentary processes in up to 50 daily diaries with a multi-method assessment of traits four times across two years. Next, we first discuss the implications of our findings on associations of momentary processes within TESSERA sequences. Then, we integrate our results on personality development in general into previous research on long-term development of traits. Thereafter, we discuss our findings on volitional personality development against the background of prior research. Finally, we outline limitations and future directions for both personality development in general and volitional development in particular.

4.4.1 Momentary processes can be generalized as TESSERA sequences.

This is the first study on personality development to investigate whether momentary processes can be generalized in terms of repeated sequences of **T**riggering situations, **E**xpectancies, **S**tates & **S**tate **E**xpressions, and **R**e**A**ctions (i.e., TESSERA sequences; Wrzus & Roberts, 2017). Previous studies of personality development focused primarily on momentary states, but did not comprehensively examine preceding situations and expectations, or subsequent reactions and reflective processes that elicit or follow these momentary states (e.g., Hutteman et al., 2015). Thus, the current study broadens previous perspectives on momentary processes of personality development by examining specific predictions on the associations of momentary processes as stated in the TESSERA framework (Wrzus & Roberts, 2017).

Specifically, in line with H1a and previous theoretical suggestions (D. Wood & Denissen, 2015; Wrzus & Roberts, 2017), higher perceived intellect, duty and sociality of situations were associated with clearer expectations on how to behave. Thus, a clear classification of a situations' content may produce a clearer mental guideline for its requirements (D. Wood & Denissen, 2015; see also Rauthmann et al., 2014). Higher perceived deception, negativity and adversity however were not associated with clearer expectations. Since such situations seem to have a lower base rate (Rauthmann et al., 2014; see also Table 13) and appear to be less structured, we suggest that people may be insecure about appropriate behavior and thus have less clear expectations (i.e., less pronounced if-then contingencies; Mischel & Shoda, 1995). In addition, more negative situations may imply less clear demands on people's behavior, resulting in more spontaneous (i.e., less expectancy driven) behavior (J. H. Block & Block, 1981; Cooper & Withey, 2009; Lazarus, 1991; Murray, 1938; Rauthmann, Sherman, & Funder, 2015a).

Confirming H1b and earlier research (Rauthmann et al., 2014; Sherman et al., 2015), situations were in general linked with situation-relevant behavior. Hence, psychological properties of situations may reflect a key component in producing varying states in daily life (Roberts, 2017; D. Wood et al., 2015; Wrzus & Roberts, 2017). Exceptionally, higher perceived intellect of situations was not associated with more, but with less open behavior what could be the result of our less intellect-specific conceptualization of such open behavior (i.e., narrow-minded – open). For example, previous research showed strong associations of a situations' perceived intellect with intellectual or cognitive demanding behavior (Rauthmann et al., 2014; Sherman et al., 2015), but not with open-minded behavior per se (e.g., displaying a wide range of interests, see Rauthmann et al., 2014).

Also, as suggested in H1c, situations were by and large associated with specific affective responses (Wrzus & Roberts, 2017). That is, more challenging or uncomfortable situations (e.g., higher perceived duty or adversity) seem to be directly linked with more negative affect (see for example Bolger et al., 1989; Bryson & MacKerron, 2017). In contrast to previous studies (David et al., 1997; Weinstein & Mermelstein, 2007) however, social situations were not associated to more positive affect. This could be due to the fact that within the DIAMONDS framework, the mere possibility of social interaction is asked for, but not actual social participation that may finally elicit more positive affect (Rauthmann et al., 2014; Rauthmann & Sherman, 2016). In addition, we did not assess whether the social interaction turned out as pleasant or unpleasant. Thus, future studies may examine the valence of social interactions as contributing factor to people's subsequent affect.

In line with H1d and the TESSERA framework, clearer expectancies appeared as an additional, more conscious pathway from situations to states (Wrzus & Roberts, 2017). Thereby, clearer expectancies seem to act like a preset for stronger states (Ajzen, 1991; Eccles et al., 1983; Fishbein & Ajzen, 1975; Fleeson & Jayawickreme, 2015; Roberts & Wood, 2006;

D. Wood et al., 2015) maybe resulting from the perceived affordance character of a situation (Rauthmann et al., 2014).

As expected, the more open, conscientious, extraverted, agreeable and emotional stable participants behaved, the better they felt afterwards (H1e). This is in line with the idea that such behavior is intrinsically and socially valued and rewarded (Dunlop et al., 2012; Roberts et al., 2008). The fact that more open, conscientious, extraverted, agreeable and emotional stable behavior receives such an immediate positive reinforcement further amplifies the importance of these states in the long-term development of corresponding traits (Roberts, 2017; Roberts & Wood, 2006; Wrzus & Roberts, 2017).

In addition, as stated in H1f, more open, conscientious and agreeable behavior was associated with more reflections on the experiences. This is in line with the idea that people may want to actively integrate momentary experiences into their self-concept, especially when they show more pronounced trait-relevant behavior (Bem, 1972; Brandtstädter, 1989; Brandtstädter & Greve, 1994; Wrzus & Roberts, 2017). The finding that extraverted behavior was not significantly associated with reflections awaits replication, and a more fine-grained assessment of social behavior (e.g., regarding dominance, cooperativeness) might be needed to disentangle facet-specific effects on reflections (see for example Roberts et al., 2006a). The finding that less emotional stable behavior was associated with more reflections could have resulted from people thinking or ruminating especially about experiences that made them feel insecure.

Finally, as suggested in H1g, negative affective reactions were linked to stronger reflections. This is in line with previous research indicating that negative information and associated negative affective reactions are more carefully processed (Baumeister et al., 2001; Baumeister et al., 2007; Bless et al., 1992; Mor & Winquist, 2002). Thus, by reflecting an unpleasant experience, people may be able to cope with their experience, for example by considering adjustments in their future behavior, thoughts or feelings (Wrzus & Roberts, 2017).

One of the unique contributions of the TESSERA framework is that it highlights the importance of distinct momentary processes and makes specific predictions on their associations in daily life (Wrzus & Roberts, 2017; compare to for example Dweck, 2017; Hennecke et al., 2014; Roberts, 2017; Roberts & Wood, 2006). In conclusion, our findings indicate that, regarding personality development, momentary processes can indeed be generalized as TESSERA sequences and thus provide first support for a key proposition of the TESSERA framework (Wrzus & Roberts, 2017). Importantly, we were able to closely replicate findings from first 30 daily diaries (i.e., D1-D3) within a second, time-delayed set of 20 daily diaries (i.e., D4-D5), thereby bolstering the relevance of our findings. Next, we discuss our findings on a second central proposition of the TESSERA framework that addresses links between momentary processes and traits as well as trait development.

4.4.2 TESSERA sequences partly predict long-term Big Five trait development.

Although momentary processes (e.g., experienced situations or states) and traits are frequently conceptualized to bidirectionally influence each other (e.g., Geukes et al., 2017; Roberts, 2017; Roberts & Jackson, 2008; Wrzus & Roberts, 2017), to our knowledge, this is the first empirical study to comprehensively investigate such bidirectional associations in a longitudinal design. In addition, previous studies almost exclusively focused on momentary states as driving force of long-term development in explicit representations of traits (i.e., self-ratings, see for example Hutteman et al., 2015; Wrzus et al., 2018a), thereby neglecting development in implicit representations of traits and its momentary processes (Rauthmann, 2017). By testing central propositions of the TESSERA framework (Wrzus & Roberts, 2017), the current study is the first to address these gaps and to examine specific processes in long-term development of explicit (i.e., momentary states and reflective processes) and implicit (i.e., momentary states and associative processes) representations of traits.

Results partly support our assumptions. Confirming previous empirical research and H2, both zero-order correlations and MSEMs demonstrated that in general, explicit representations of traits at T1 contributed to the experience of subsequent situations (see also Emmons et al., 1986; Rauthmann et al., 2015b; Roberts & Robins, 2004; Wrzus et al., 2016). This finding is even more striking, as trait assessments at T1 were still linked with the experience of situations more than 6 months later (i.e., during D4-D5). Thus, our results further support the idea that people are able to select or form environments in their everyday life based on their traits (Buss, 1987; Caspi & Roberts, 2001; Rauthmann et al., 2015b; Roberts & Robins, 2004; Wrzus et al., 2016). For implicit representations however, results were less consistent providing merely first hints on associations of conscientiousness and extraversion with corresponding situations in daily life.

Also in line with H2 and previous research, explicit representations of traits were consistently linked with corresponding, subsequent states, thereby supporting the idea that traits may manifest in everyday behavior (Back et al., 2009; Fleeson, 2001; Fleeson & Gallagher, 2009; Mehl et al., 2006). For implicit representations of traits however, only extraversion and emotional stability were associated with corresponding states. These findings closely replicated previous research suggesting that, in contrast to other traits, both extraversion and emotional stability comprise affective dimensions (i.e., positive and negative affect) as well as approach-avoidance tendencies that contribute to impulsive or automatic behavior (Asendorpf et al., 2002; Back et al., 2009; Egloff & Schmukle, 2002; Schnabel et al., 2006).

Partly supporting H3a, states were linked with according changes in explicit representations of conscientiousness, extraversion and agreeableness. This greatly extends previous research (Hutteman et al., 2015; Wrzus et al., 2018a) and supports the idea that changes in momentary trait-relevant states (e.g., behavior) form the basis of long-term changes in explicit representations of traits (Geukes et al., 2017; Hennecke et al., 2014; Roberts, 2017; Roberts & Jackson, 2008; Wrzus & Roberts, 2017). Specifically, in a more bottom-up fashion, when people's self-perceived behaviors, thoughts and feelings change permanently (i.e., become habitual), their self-concept (e.g., traits) may also change in the long run (Back & Vazire, 2012; Buss & Craik, 1983; Roberts, 2017; Roberts & Jackson, 2008; Wrzus & Roberts, 2017). However, for openness and emotional stability, the examined momentary states may have been less relevant for corresponding trait changes. Specifically, the assessed open behavior may have been too vague and thus may have missed behavior relevant for long-term changes in trait openness (e.g., bringing up new ideas, engaging in artistic experiences). In turn, for long-term changes in emotional stability, the mere amount of secure behavior may be less relevant than for example people's reactivity to stressful daily situations (Wrzus et al., 2018a). The finding that primarily states during D1-D3 but not during D4-D5 were associated with subsequent trait changes may have resulted from variance restrictions in later trait changes (i.e., from T2 to T3 and T3 to T4; see section "4.3.3 Control analyses."). These variance restrictions may have emerged because about one third of our sample consisted of younger freshmen who started to engage in the transition into college right after T1. Consequently, they may have experienced more pronounced individual differences in change from T1 to T2 that may have leveled off in the course of the study.

Only for conscientiousness, more reflections on experiences with more pronounced trait-relevant thoughtful behavior were linked to greater long-term change in trait conscientiousness. This provides merely weak support for the importance of reflective processes in long-term trait change (Back et al., 2009; Bem, 1972; Brandtstädter, 1989; Caspi & Roberts, 2001; Gawronski & Bodenhausen, 2006; Staudinger, 2001; Wrzus & Roberts, 2017). However, at least three cautionary remarks need to be made before the importance of reflective processes for personality development is dismissed. First, within the applied analytic strategy, for each combined set of diaries D1-D3 and D4-D5, only people's average reflection on experiences with more pronounced states (i.e., average reflection × state interaction) could be modeled. Thus, for example, trait-relevant reflections on states within a specific experience (e.g., receiving negative feedback on a work performance) or a distinct set of experiences (e.g., starting to attend parties once a week) could have averaged out. Second, we only assessed how much participants reflected upon their experience in general, yet these reflections may have not only included adjusting but also confirming processes like using different comparison standards (e.g., comparison versus past or future self) or self-evaluation motives (e.g., self-verification or self-improvement). Consequently, reflections may have also led people to confirm their current self-concept instead of altering it, thereby forming a barrier for trait change (Wrzus, 2018; Wrzus & Roberts, 2017). Future research needs to disentangle both confirmative and adjusting aspects of reflective processes. Third, in our approach, we focused on reflective processes that took place during the day of the experience, although the TESSERA framework acknowledges that time-delayed reflections could be important, too (Wrzus & Roberts, 2017).

Regarding hypothesis H3b on the development of implicit trait representations, only sociable and conscientious states were associated with subsequent changes in corresponding extraversion and conscientiousness. Yet, methodological challenges may have biased our results. Specifically, self-rated states may have only assessed the conscious, deliberate aspects of people's states, but not the more unconscious, automatic aspects. Yet, especially the latter should contribute to the development of implicit representations of traits (e.g., through implicit learning or habit formation; Aarts & Dijksterhuis, 2000; Amodio & Ratner, 2011; Seger, 1994;

W. Wood & Neal, 2007). Thus, future research may need to rely on more diverse assessment strategies (e.g., behavioral observation).

Furthermore, we found no evidence for the importance of associative processes (i.e., affective reactions) for long-term development of implicit representations of traits. This could be again due to the time-delayed assessment of participants' self-rated affective reactions. An immediate assessment of people's reaction may identify more relevant affective responses that could determine future behavior more strongly, for example in terms of feedback loops (Wrzus, 2018). Also, we did not explicitly track slower, but gradual habit formation that could be based on reinforcement learning and may finally condense into long-term changes in implicit representation of traits (W. Wood, 2017; Wrzus & Roberts, 2017; Yin & Knowlton, 2006). As this is the first study to investigate momentary processes of development in implicit representations of traits, our results certainly await replication and methodological expansions.

4.4.3 Change goals hardly predict the experience of situations and states.

Regarding volitional personality development, this is the first study to comprehensively examine whether goals to change are associated with experiencing goal-relevant situations and states in both explicit and implicit representations of traits as suggested by the TESSERA framework (Wrzus & Roberts, 2017). In addition, this study expands previous empirical research (see for example Hudson & Fraley, 2015) by investigating links between goal importance, feasibility and a broad range of momentary experiences as suggested by theory (Hennecke et al., 2014; D. Wood & Denissen, 2015; for recent research focusing on extraverted and neuroticistic states, see Peters, 2015).

However, results were only partly in line with our assumptions and previous research. Specifically, in contrast to H4a, when controlling for current traits, stronger change goals were, if at all, associated with experiencing less goal-relevant situations and states. In addition, speaking against H4b, these associations hardly depended on people's current trait levels.

Although these findings contradict theoretical suggestions (Denissen et al., 2013; Hennecke et al., 2014; Wrzus & Roberts, 2017) and some prior empirical research (Hudson & Fraley, 2015; McCabe & Fleeson, 2012; Stevenson & Clegg, 2011), they are in line with another study, suggesting that associations of change goals and states can be attributed to shared variance with traits (Hudson & Roberts, 2014). In particular, change goals may not induce subsequent changes in people's experienced situations or states, but instead may merely mirror people's lower current level of trait-relevant behaviors, thoughts or feelings and thus ultimately, reflect their underlying lower trait levels (Hudson & Roberts, 2014). Supporting this interpretation, in MSEMs, lower trait levels were consistently linked with stronger change goals (see also Hudson & Fraley, 2015; Hudson & Roberts, 2014; Robinson et al., 2015). In addition, while on a zero-order level change goals were partly linked with experiencing less goal-relevant situations and states, these associations mostly diminished when trait levels were controlled for (i.e., in MSEMs).[19] Another explanation on why change goals failed to guide people's experience of situations and states as expected may be that long-term change goals, being measured on a broad trait level, are too abstract (see for example the abstractness of the item "I want to be original, come up with new ideas.") to be successfully translated into subordinate but more concrete plans or short-term goals without psychological assistance (Bandura, 2001; Emmons, 1992; Gollwitzer, 1999; Hudson & Fraley, 2015; Magidson et al., 2014; Masicampo & Baumeister, 2011). Even if people are able to specify such short-term goals (e.g., to change goal-relevant thoughts; Baranski et al., 2017), they may finally fail to overcome their solidified habits and show new, contra-trait thoughts, behavior, or feelings

[19] Moreover, Hudson and Roberts (2014) argued that non-significant associations of change goals and subsequent states may also occur because change goals need time to be implemented. However, as stronger change goals were not linked with more pronounced goal-relevant states after about six month (i.e., during D4-D5), this explanation seems unlikely.

(Gallagher et al., 2011; W. Wood & Neal, 2007; for a more detailed discussion of this issue see section "5.2 The Relevance of Volitional Personality Development").

Yet, in line with H4c and H4d, for emotional stability and implicit representations of agreeableness and extraversion, change goals that were considered as more important or more feasible were at least in part linked with experiencing more goal relevant situations or states. These findings provide some support for the idea that more important change goals profit from higher goal commitment and increased efforts for their implementation while more feasible change goals for example benefit from higher perceived ability to successfully take concrete steps in the desired direction (Ajzen, 1985; Fishbein & Ajzen, 1975; Gollwitzer, 1990; H. Heckhausen, 1991; Hennecke et al., 2014; Peters, 2015; D. Wood & Denissen, 2015). Note however that associations of importance and feasibility with momentary experiences were not consistent a) within traits (e.g., for emotional stability, feasibility was linked with experiencing goal-relevant situations but not with states) and b) between traits (i.e., for openness and conscientiousness, importance and feasibility were not associated with situations and states as expected). To explain these inconsistent findings, it at first sight could be assumed that when people try to change their traits, more action-based traits (e.g., extraversion, conscientiousness) are perceived as more changeable than more emotion-based traits (e.g., emotional stability) and profit from an facilitated accessibility of goal-relevant situations or states–yet results contradict this idea. However, traits like extraversion or emotional stability may be highly socially desirable (e.g., in terms of experiencing more positive and less negative affect; Dunlop et al., 2012; Kuncel & Tellegen, 2009), putting more pressure (i.e., importance) and stronger external expectations on people to make efforts to increase in these traits (but see Table A12 for somewhat contradicting findings). In addition, although people may perceive goals to change openness or conscientiousness as feasible, they may in fact be unexpectedly hard to implement in terms of changes in everyday situations or behavior (e.g., because people don't know which situations are actually relevant to increase in openness; see also Baranski et al., 2017; Peters, 2015).

Importantly, in contrast to H4e as well as previous theoretical suggestions (Hennecke et al., 2014; D. Wood & Denissen, 2015) and empirical findings (Peters, 2015), change goals that were considered both more important and more feasible were only for agreeableness linked with experiencing more goal relevant situations, albeit not states. Thus, a change goal's importance or feasibility alone seems to differentially contribute to people's momentary experiences. For example, only the importance of goals to change emotional stability affected subsequent emotional stable behavior, but not their feasibility or both importance and feasibility, probably because for such a highly functional and socially desirable trait (Dunlop et al., 2012; D. Wood & Denissen, 2015), a strong enough demand for a change is sufficient to find ways to change one's behavior irrespective of how hard to implement this change is. Furthermore, this finding may imply that both high goal importance and feasibility are not necessarily linked with actual goal commitment or striving what would be a necessary prerequisite for actual goal implementation (Gollwitzer & Oettingen, 2012).

Given these considerations and the mostly non-significant associations of change goals with momentary experiences, it is little surprising that stronger change goals that were considered more important or more feasible were not linked with experiencing situations and states as proposed in H4f and H4g. Yet, collectively, results on H4 in general surely await replication in future research.

4.4.4 Important or feasible change goals partly contribute to volitional personality development.

So far, only a few studies investigated direct links between change goals and long-term trait changes, yet these studies produced inconsistent results and suffered from several limitations (Hudson & Fraley, 2015, 2016a; Robinson et al., 2015). By examining volitional personality development in an age-heterogeneous sample using multiple trait assessments across two years, this study aimed to clarify these inconsistent results and tackle previous limitations. In addition, this is the first study to investigate if change goals also manifest in actual changes of implicit representation of traits. Finally, using a more naturalistic setting, this study greatly extends previous research by examining whether goal importance and feasibility contribute to volitional personality development as suggested by theory (Hennecke et al., 2014; D. Wood & Denissen, 2015; for research using an intervention to change extraversion and neuroticism, see Peters, 2015).

However, in contrast to H5a, stronger change goals were, if at all, linked with less changes in explicit or implicit representations of traits. Although these results contradict some previous findings (Hudson & Fraley, 2015, 2016a), they are consistent with results presented by Robinson et al. (2015). Thus, to explain why change goals do not manifest in actual trait changes, at least three preliminary arguments can be made that are not mutually exclusive. First, since stronger change goals may merely reflect lower current trait levels (Quintus et al., 2017), these lower trait levels may form a major obstacle for people to successfully implement the intended change in the first place (e.g., by not being able to show new goal-relevant behavior, see section “4.4.3. Change goals hardly predict the experience of situations and states.”; Robinson et al., 2015). Second, emerging from lower current trait levels, change goals may in the first place assess the social desirability of having higher trait levels, so that they hardly reflect a concrete goal that people really commit to (see also Gollwitzer & Oettingen, 2012; Quintus et al., 2017). Third, when people actually try to implement their change goals, they may indeed fail to subsequently alter their behavior (see section “4.4.3 Change goals hardly predict the experience of situations and states.”; Hudson & Roberts, 2014) or to gradually change their self-concepts in daily life (e.g., because friends provide feedback on people still being less extraverted; Allemand & Flückiger, 2017; Hudson & Fraley, 2015;

Prochaska & Prochaska, 2010). Consequently, when people realize their failure, they may, in relation to their earlier change goals, indeed perceive a decrease in their trait level (i.e., self-appraisal of failure, see Robinson et al., 2015).

Currently, it can only be speculated on why one research group nevertheless repeatedly found that change goals contribute to actual trait change (Hudson & Fraley, 2015, 2016a). Most likely, the repeated and relatively proximal assessment of both traits (i.e., once per week) and change goals (i.e., once every five weeks) may have facilitated a successful implementation of change goals, that was however probably due to overestimating of one's own trait changes or consistency seeking with remembered change goals (Hudson & Fraley, 2015, 2016a; see also, Robins & John, 1997; Wrzus, 2018). In addition, as pointed out by the current study, change goals, if at all, were only linked with less trait change within the subsequent months, but not in the long run. Thus, examining merely short-term effects of change goals (i.e., across a total of four months; Hudson & Fraley, 2015, 2016a) may provide favorable conditions for apparently successful volitional personality development.

Contrary to H5b and H5c, direct associations of change goals and long-term trait change hardly depended on people's current trait level or previously experienced states. These findings suggest that neither do people succeed in decreasing larger discrepancies between traits and change goals, nor do stronger change goals motivate them to integrate experienced states into their self-concept (but compare to Hennecke et al., 2014; Hudson & Fraley, 2015, 2017; Wrzus & Roberts, 2017).

As suggested by H5d and H5e, more important or feasible change goals were at least partly linked with more pronounced trait changes from T1 to T2 for all traits except agreeableness. Again, this is in line with the idea that higher perceived importance or feasibility facilitate the successful implementation of change goals (Ajzen, 1985; Fishbein & Ajzen, 1975; Gollwitzer, 1990; H. Heckhausen, 1991; Hennecke et al., 2014; Peters, 2015; D.

Wood & Denissen, 2015). Note however that for later trait changes from T2 to T3, results partly contradicted this idea, which might indicate that both importance and feasibility affect actual trait change only on the short run. As goals to change agreeableness were in general hardly linked with any successful changes in this trait, psychological assistance might be especially needed to achieve volitional changes in agreeableness (see for example, Hudson & Fraley, 2015; Magidson et al., 2014; Peters, 2015).

In contrast to H4f, change goals that were perceived as both more important and feasible were not linked with more pronounced trait changes as suggested by previous research (Hennecke et al., 2014; Peters, 2015; D. Wood & Denissen, 2015). Again, it seems that either importance or feasibility are by themselves differentially relevant for volitionally changing a trait (e.g., importance is relevant to achieve changes in openness; feasibility is relevant to achieve changes in conscientiousness). In addition, future research might assess actual goal commitment as contributing factor to volitional personality development (Gollwitzer & Oettingen, 2012).

Finally, only for explicit representations of extraversion as well as implicit representations of conscientiousness and agreeableness, stronger change goals that were perceived as more important or feasible were partly linked with subsequent trait changes as expected in H4g and H4h. Although awaiting replication, this finding provides further support for the idea that primarily the importance and feasibility differentially contribute to volitional personality development, mostly independent from the strength of a change goal.

4.4.5 Limitations and future directions.

This study used an extensive, multi-method longitudinal measurement burst design (Nesselroade, 1991, 2004; Sliwinski, 2008) to investigate momentary processes and their importance for both personality development in general and volitional personality development of explicit and implicit representations of traits. In addition, although participants' burden was comparatively high (i.e., up to four IAT assessments and 50 daily diaries), we were able to maintain a high participation rate in daily diary assessments and personality trait assessments (e.g., almost 85% of participants continued for two years). At the same time, some limitations need to be considered.[20]

First, our study covered a comparatively short time span of two years. Typically, large panel studies track personality development across a longer period of time (e.g., across four years, see Specht et al., 2014). Yet, these studies usually do not combine trait assessments and daily diaries, partly also for monetary or logistic reasons. However, to investigate personality development and its underlying processes across a longer time span, additional daily diary assessments (e.g., D6-D8) would have been necessary. This approach however would have presented both further organizational challenges and increased participants' burden.

Second, in our daily diary assessment, we asked participants to rate the most relevant experience of their day. This approach reflected a compromise between practicability (e.g., acceptable strains for participants) and the desire to gain insights into daily experiences, but it may also suffer from blind spots. For example, we may not have gained insight into rather minor daily hassles (e.g., arguments on housework) or changing daily routines (e.g., starting to work earlier) unless participants considered them as most important experience of a day. Also, we followed a fixed schedule with participants answering daily diaries not before the evening. Hence, when recalling the experience, participants may have suffered from some recall biases as well as self-enhancement or consistency seeking (see for example Robins & John, 1997). To overcome this limitations, future research may for example implement ambulatory assessments and passive observation of situations and behavior that allow repeated or close to continuous assessment of TESSERA components (e.g., after finishing a work-related task, see also Mehl, 2017; Mehl & Wrzus, in press; Wrzus & Mehl, 2015).

[20] For a more detailed discussion on limitations regarding recruitment strategy and sample see Chapter II.

Third, we solely relied on participants themselves to answer personality trait assessments (i.e., self-ratings or IAT) and to rate their daily experiences. The TESSERA framework however explicitly acknowledges the importance of additional levels of observation (Wrzus & Roberts, 2017). Thus, future research could for example link other-ratings of daily experiences (e.g., provided by romantic partners or friends) with long-term development in other-rated traits. Also, links between change goals and long-term development in other-rated traits could be examined (Hudson & Fraley, 2017). In addition, behavioral observation or biological functioning could be included (Wrzus & Roberts, 2017).

Fourth, in some traits, rank-order stability of about .30 for IATs appeared to be somewhat lower than in previous studies (across 11 studies, r = .51 ; Hofmann et al., 2005a; across 1 year, r = .47; Egloff, Schwerdtfeger, & Schmukle, 2005), making it harder to track reliable long-term trait changes and, in turn linking momentary processes with these changes.

Fifth, regarding volitional personality development, this study examined trait changes in a naturalistic setting that did not provide participants with any psychological assistance to successfully implement their change goals. However, as outlined by previous research, such interventions may provide substantial and probably much needed support for successful volitional personality development (see for example, Hudson & Fraley, 2015; Peters, 2015).

Sixth, we focused on goal importance and feasibility as contributing factors for successful goal implementation. Yet, both factors may not necessarily depict whether participants actually commit or strive for a goal so that assessing goal commitment provides a fruitful starting point for future research (Gollwitzer & Oettingen, 2012; for a self-rating questionnaire on goal commitment, see Hollenbeck, Williams, & Klein, 1989).

Finally, regarding personality development in general, for self-rated openness, conscientiousness and emotional stability, fit indices slightly exceeded conventional cut-off criteria for ordinary SEM. Regarding volitional personality development, this was true for self-rated openness, conscientiousness and partly extraversion. As research has still to provide guidelines for MSEM, we recommend a careful interpretation of these models. Thus, future studies are needed to replicate our findings.

4.4.6 Conclusion.

In the current study, we examined central propositions of the TESSERA framework on momentary processes and long-term development of traits regarding both personality development in general and volitional personality development in particular (Wrzus & Roberts, 2017). First, we investigated the cascade of momentary processes that precede, elicit and result from trait-relevant states in daily experiences. By and large, it showed that momentary processes can be generalized as recursive sequences of Triggering situations, Expectancies, States & State Expressions, and ReActions (i.e., TESSERA sequences; Wrzus & Roberts, 2017). This suggests that momentary states (e.g., behavior) hardly stand for themselves but need to be considered as imbedded within for example other more motivational (e.g., expectations) or affective (e.g., reactions) processes. We therefore encourage researchers to model more complex associations of momentary processes to gain a more complete picture on underlying processes of long-term trait development. In addition, we extended previous research on personality development in general by linking momentary processes with long-term development of explicit and for the first time implicit representations of Big Five traits. Explicit representations of traits provided a rather clear picture regarding their manifestations in daily life (i.e., experience of situations and states) and underlying processes of their long-term development (i.e., experience of states and, partly, reflections on states), supporting propositions of the TESSERA framework (Wrzus & Roberts, 2017). In contrast, implicit representations of traits provided a more inconclusive picture with little evidence for their manifestations in daily life and for the importance of states or associative processes in long-term trait development. Thus, future research is needed to further clarify underlying processes of trait change in different representations of traits.

Second, we extended previous research on volitional personality development by investigating whether change goals as well as their importance and feasibility shape the experience of situations and states as suggested by the TESSERA framework (Wrzus & Roberts, 2017) and other theoretical research (e.g., Hennecke et al., 2014). While change goals where hardly linked with momentary experiences, importance and feasibility in part affected situations and states as expected for both explicit and implicit representations of traits. Furthermore, in the examined naturalistic setting, it unexpectedly showed that change goals were not directly associated with actual changes in explicit or implicit representations of traits. However, again, goal importance and feasibility, yet not their interaction, were partly linked with long-term trait changes. Future research needs to further clarify whether people actually commit to change goals and how much assistance (i.e., in terms of an intervention) is needed for their successful implementation.

Chapter V:

General Discussion

The overall aim of the present dissertation was to investigate both macro-analytical factors and micro-analytical processes of personality development. Regarding macro-analytical factors, the current research focused on the role of environmental factors for personality development as well as volitional aspects of personality development. To determine the role of environmental factors, this dissertation in Chapter II longitudinally examined whether age differences in personality development diminished when younger and older adults experienced a similar life transition (i.e., experiencing college life). In addition, this chapter compared if personality measured via self-ratings, other-ratings, and implicit measures exhibited a similar pattern of development. To shed light on volitional personality development, Chapter III in a first step investigated whether people's current self- and other-rated traits as well as a broad range of additional personality characteristics predicted people's change goals. Finally, Chapter IV longitudinally examined if change goals, especially when they were perceived as more important and feasible, indeed manifested in actual changes in self-rated and implicitly measured traits.

Regarding micro-analytical processes, Chapter IV provided a first empirical test of central propositions of the TESSERA framework (Wrzus & Roberts, 2017) on whether momentary processes of personality development can be generalized in terms of recursive sequences of **T**riggering situations, **E**xpectancies, **S**tates & **S**tate **E**xpressions, and **R**e**A**ctions (i.e., TESSERA sequences; Wrzus & Roberts, 2017). Furthermore, Chapter IV tested if self-rated and implicitly measured traits as well as change goals, especially when they were perceived as more important and feasible, shaped the subsequent experience of situations and states. Finally, this chapter examined the relevance of reflective or associative processes for translating TESSERA sequences (Wrzus & Roberts, 2017) into actual trait changes.

The current dissertation accomplished to address these different research questions by conducting a measurement burst study (Nesselroade, 1991, 2004; Sliwinski, 2008) that combined multi-method longitudinal trait assessments with an extensive daily diary approach in an age-heterogeneous sample. In particular, across two years, participants completed up to four trait assessments (including self-ratings, other-ratings and implicit measures) and answered up to 50 daily diaries focusing on the most relevant experience of their day.

Next, the dissertation's main findings on a) the importance of environmental factors for personality development, b) volitional personality development and c) processes of personality development will be summarized and integrated. Finally, this dissertation's limitations will be addressed and potential implications for research and psychological practice will be outlined.

5.1 Illuminating the Role of Environmental Factors in Personality Development

To illuminate the role of environmental factors for personality development, the current dissertation examined personality development in the context of a life transition, namely the transition to college. While, due to biological and/or social constraints, most life transitions can be experienced only within a specific age (J. Heckhausen, 2000; Roberts et al., 2005), the transition to college reflects a transition that, in principle, can be experienced by people of all age. Thus, using a quasi-experimental design, this dissertation was able to examine the effects of the transition to college on personality development in younger and older adults. In addition, the inclusion of age- and education-matched control groups allowed to distinguish personality development associated with the life transition from normative (i.e., age-typical) personality development.

As expected, Chapter II showed that, except for implicitly measured openness and extraversion, younger and older adults and especially younger and older students did not differ in the development of self- or other-rated traits. Furthermore, in contrast to younger advanced students, younger freshmen increased in self-rated conscientiousness as well as implicitly measured extraversion and openness. In addition, they exhibited stability in self-rated agreeableness as well as self- and other-rated extraversion while more advanced students decreased in these traits. Finally as expected, in contrast to older control group participants, older students increased in conscientiousness and agreeableness, yet the latter effect did not last across the entire study. Conversely, although older students started with somewhat higher levels of other-rated openness, they decreased in how others rated their openness whereas older control group participants did not.

Taken together, these findings are largely in line with previous research on the transition to college (Bleidorn, 2012; Lüdtke et al., 2011) and other life transitions (Lehnart et al., 2010; Löckenhoff et al., 2009; Neyer & Lehnart, 2007; Specht et al., 2011; Wagner et al., 2015), suggesting that life transitions in general may indeed contribute to the observed patterns of mean-level changes across the lifespan (Lucas & Donnellan, 2011; Roberts et al., 2006a). More specifically and especially in young adulthood, a broad range of at least partly normative life transitions (e.g., transition into a serious partnership, transition into college or first job) may finally account for personality maturation (i.e., in terms of the maturity principle; Roberts & Wood, 2006; Roberts et al., 2008). For example, as highlighted by the current findings and previous research (Bleidorn, 2012; Lüdtke et al., 2011), the engagement in college life was associated with increases in conscientiousness, while the engagement in a serious partnership was in previous research shown to be linked with increases in emotional stability (Lehnart et al., 2010; Neyer & Lehnart, 2007; Wagner et al., 2015). In turn, the experience of such a broad range of life transitions, possibly even with slightly different onsets and intensities, may contribute to the observed lower rank-order stability in young adulthood (Caspi & Roberts, 2001; Lucas & Donnellan, 2011; Roberts & DelVecchio, 2000; Wortman et al., 2012). As life transitions become less frequent in older adulthood, rank-order may consequently exhibit higher stability (i.e., in terms of the cumulative continuity principle; Roberts & Wood, 2006; Roberts et al., 2008). Moreover, results further underline that life transitions foster such trait changes that are helpful or functional for a successful mastery of the transition (Denissen et al., 2013; D. Wood & Denissen, 2015). For example, the observed increase of self-rated conscientiousness in younger freshmen may be functional to meet requirements of college life like self-organized learning and attending to lectures or courses.

By investigating the transition into college in a quasi-experimental study on younger and older adults, this dissertation greatly extends previous research that merely examined life transitions in either younger or older adults (e.g., Löckenhoff et al., 2009; Lüdtke et al., 2011). Thereby, the current dissertation provides a more conclusive evaluation for previous considerations on underlying principles of personality development (Roberts & Wood, 2006; Roberts et al., 2008).

In line with the social investment principle (Roberts et al., 2008; Roberts et al., 2005), younger and older students hardly differed in personality development. Thus, if people of different age are confronted with similar environmental requirements (e.g., managing college life), they may similarly invest in social roles (e.g., being a student) that help to meet these new requirements, for example by specifying social expectations (e.g., socializing after courses to get integrated into new social groups) or behavioral demands (e.g., preparing courses; Roberts et al., 2008; Roberts et al., 2005; see also Danish et al., 1980; Levinson, 1978). The fact that, at least for conscientiousness and agreeableness, personality development in older students somewhat mirrored development of younger students as reported in previous studies (Bleidorn, 2012; Lüdtke et al., 2011) can be further interpreted in favor of the social investment principle (Roberts et al., 2008; Roberts et al., 2005). Thus, experiencing life transitions and investing in corresponding social roles may be one of the driving forces in personality development (Bleidorn et al., 2013; Denissen et al., 2014; Helson et al., 1984; Roberts et al., 2005).

Moreover, the finding that over the course of the study, both younger freshman and older students showed a favorable development in self-rated conscientiousness and partly agreeableness, provides some support for the idea that keeping a social role (e.g., being a dependable student) may result in continuity of personality (see role continuity principle; Roberts et al., 2008; Roberts et al., 2005). However, as in general, both younger and older adults did not exhibit large trait changes over the course of the study, it is hardly surprising that this dissertation found no support for greater consistency in personality development of older adults (see identity development principle; Roberts et al., 2008; Roberts et al., 2005). In addition, the current dissertation found only mixed evidence for the idea that life transitions may deepen those traits that lead to their experience in the first place (see corresponsive principle; Roberts et al., 2008; Roberts et al., 2005). On the one hand, speaking in favor of the corresponsive principle, in contrast to older control participants, older students were able to keep higher levels of self-rated conscientiousness. However, on the other hand, older students started at somewhat higher levels of other-rated openness, but were not able to maintain these higher other-ratings. Finally, supporting the plasticity principle (Roberts et al., 2008; Roberts et al., 2005), it altogether showed that personality traits were open systems that can be affected by environmental factors like the engagement in college in both younger and older adulthood (see also Baltes, 1987).

By relying on self-ratings, other-ratings and implicit measures, this dissertation provides first empirical research on long-term personality development using different data sources to infer people's traits. However, as findings on these three trait measures indicated diverging trajectories and hardly any correlated change, they support the idea that self-ratings, other-ratings and implicit measures assess different parts of people's traits (Gawronski & Bodenhausen, 2006; Göllner et al., 2017). Consequently, to examine the importance of environmental factors, and especially life transitions for personality development, using different data sources may allow researchers to disentangle different patterns of development and their underlying causes (e.g., do stressful life transitions affect implicitly measured emotional stability differently than self-ratings?). However, if findings from different data sources indeed converge, this may provide a strong test for the underlying principles of personality development. For example, providing strong support for the maturity principle (Roberts et al., 2008; Roberts et al., 2005), older adults consistently showed higher levels of conscientiousness and emotional stability across all three measures.

In sum, the current results further endorse the idea that environmental factors and especially life transitions play a crucial role for personality development across the entire lifespan (Roberts & Wood, 2006; Roberts et al., 2008). The finding that both younger and older students showed a similar developmental pattern when they experienced a similar life transition contrasts earlier conceptualization of personality development that perceived personality development as being merely the result of intrinsic, biological maturation (Costa & McCrae, 1994; McCrae & Costa, 2008; McCrae et al., 2000).

5.2 The Relevance of Volitional Personality Development

The current dissertation greatly expands previous research on volitional personality development by comprehensively examining why people set goals to change and if these change goals can be translated into actual trait changes. Specifically, extending previous research (e.g., Hudson & Fraley, 2016a; Hudson & Roberts, 2014) this dissertation provided first evidence on whether both self- and other-rated traits as well as a broad range of characteristic adaptations reflect predictors of change goals in both younger and older adults. In addition, using two-year longitudinal data, this dissertation was able to examine whether change goals, especially when they are perceived as more important and feasible, affect development in self-rated and implicitly measured traits (for somewhat inconclusive findings, see Hudson & Fraley, 2015; Robinson et al., 2015; see also Hennecke et al., 2014).

As expected, findings presented in Chapter III suggested that both lower current self- and other-rated traits were associated with stronger change goals. Importantly, for traits more relevant in social interactions (i.e., extraversion, agreeableness and partly conscientiousness) it showed that also self-other agreement mattered in the prediction of change goals. In these traits, change goals were stronger when both self and others consistently rated the current trait level as low. Unexpectedly, characteristic adaptations were hardly linked with change goals when controlling for current trait levels. Surprisingly, results presented in Chapter IV suggested that change goals were not associated with more pronounced changes in both self-rated and implicitly measured traits. However, more important and more feasible change goals, but not change goals that were considered both important and feasible, were at least partly linked with stronger trait changes.

Given this rather limited evidence in favor of the importance of change goals, the question arises whether volitional personality development is even relevant in the global picture of personality development in general. To address this question, I next discuss three positions, which are not completely mutually exclusive, that can be taken in regard to change goals.

First, with the above-summarized rather disillusioning results in mind, one could argue that change goals as assessed in this dissertation may merely reflect a response bias resulting from lower current trait levels (e.g., “I previously rated myself low in extraversion, hence I now say that I of course want to increase in this trait”). Indeed, although with distracting tasks in between, change goals were captured within the same assessment as corresponding traits so that people may have remembered their previous answers and thus have been subject to a response bias. Following this argumentation, change goals would not represent a desired state that people actually seek to achieve (i.e., an actual goal; Emmons, 1996; R. M. Ryan et al., 1996) and unsurprisingly, change goals would fail to provide a framework to successfully shape people's lives and actions, that would have led to actual trait changes (Carver & Scheier, 1998; Klinger, 1977; Pervin, 1982). Yet, speaking against the idea that change goals reflect merely a response bias, for extraversion, agreeableness and partly conscientiousness, change goals were strongest when both self- and other-ratings agreed on lower current trait levels. In addition, suggesting that people wanted to adjust their trait levels to the perception of their significant others, for agreeableness and conscientiousness, change goals were stronger when other-ratings exceeded self-ratings. Thus, goals to change constitute more than a purely subjective phenomenon and can therefore be considered more than a bare response bias. In line with this conclusion, the finding that more important or more feasible change goals were at least partly linked with actual trait changes suggests that people do to some extent implement their goals to change.

Second, it can be argued that, since both younger and older adults almost exclusively wanted to increase in their traits (see also, Hudson & Fraley, 2016b; Hudson & Roberts, 2014), change goals may first and foremost reflect people's mere desire for more socially desirable trait levels (Dunlop et al., 2012; D. Wood & Roberts, 2006) and/or to develop a more mature personality (Roberts & Wood, 2006; Roberts et al., 2008). In fact, change goals primarily reflected people's desire to overcome their self- and partly other-perceived shortcomings in current trait levels (see also, Hudson & Fraley, 2016b; Hudson & Roberts, 2014), but were somehow not associated with characteristic adaptations (e.g., life satisfaction, self-esteem) when controlling for current traits (see also, Hudson & Roberts, 2014; Kiecolt, 1994). Thus, aside from their links to current traits, change goals may represent a rather isolated phenomenon that seems to lack functional associations to other psychological constructs (e.g., in Chapter III, lower life satisfaction did not predict goals to change one's extraversion; D. Wood & Denissen, 2015, but see Hudson & Fraley, 2016a for arguments against this idea). In addition, when people were in previous research asked to describe their change goals in terms of open-ended responses, they did hardly formulate concrete goals, but primarily expressed more vague desires of having a different personality (i.e., sample desires for personality change start with phrases like “I would like to be […]”, “I wish I could […]”, see Table 1 in Baranski et al., 2016; see also Robinson et al., 2015). Consequently, change goals could be conceptualized as a different measure for desirability of higher trait levels, but not as actual goals that people actively commit to. Thus, advocates of this position would not be surprised by the current finding of change goals being hardly linked with the experience of goal-relevant situations and states.

Yet, the finding that people were partly able to achieve trait changes if they perceived their change goals as either more important or feasible somehow contradicts this conclusion. Conversely, it could still be argued that change goals in general do merely reflect trait desirability and only grow to actual goals that people commit to if they were considered as highly important or feasible (see also Atkinson, 1964; Eccles et al., 1983; Fishbein & Ajzen, 1975; Gollwitzer & Moskowitz, 1996; H. Heckhausen, 1977; Vroom, 1964).

Third, compared to for example more narrow developmental tasks (e.g., getting married; Havighurst, 1953; J. Heckhausen et al., 2010), change goals may be simply harder to implement, because they aim to alter rather broad personality traits (Baranski et al., 2017; Hudson & Roberts, 2014). Stated otherwise, with merely rather abstract higher-order goals on how to be in mind, people may be unable to form and pursue more specific, smaller scaled goals that ensure a successful implementation of these higher-order goals (Freund & Baltes, 2000; Gollwitzer, 1996; Hoyle & Sherrill, 2006; Powers, 1973; see also Study 1 in Hudson & Fraley, 2015; Robinson et al., 2015). Indeed, more specific goals (e.g., “I will join Peter's birthday party and talk to at least one stranger.”; Gollwitzer & Brandstätter, 1997; see also Study 2 in Hudson & Fraley, 2015; Robinson et al., 2015) should be linked with better goal-related performance than rather vague do-your-best goals (e.g., “I want to be outgoing, sociable.”; see also, Locke & Latham, 1990; Locke & Latham, 2002). Further impeding a successful implementation of change goals, they may set reference values (e.g., being outgoing, sociable) that are difficult to satisfy because they require people to maintain trait related actions across diverse situations and for a longer time period (i.e., in terms of dynamic goals; Carver & Scheier, 1998; Powers, 1973). Thus, change goals may be less likely to result in habitual changes (see also, Hennecke et al., 2014; Magidson et al., 2014; W. Wood, 2017; W. Wood & Neal, 2007). Taken together, this position argues that change goals were not linked with actual trait changes because people may simply lack the capability needed to successfully implement them.

In line with this idea, the current results showed that if people perceived a change goal as more important and more feasible, they were partly able to achieve actual trait changes. In addition, if the third position holds true, then a successful implementation of change goals should be much more likely under the aid of psychological assistance that for example helps to translate change goals into more specific goals. Indeed, psychological interventions showed to successfully encourage volitional personality development (Allan et al., 2018; Hudson & Fraley, 2015; Magidson et al., 2014; Martin et al., 2014; Peters, 2015; Roberts et al., 2017). For example, by forming specific implementation intentions (i.e., “If I encounter situation X, then I will do Y,”; Gollwitzer & Brandstätter, 1997), the successful implementation of change goals was significantly boosted (Hudson & Fraley, 2015).

With the current evidence at hand, it can be preliminary concluded that change goals reflect more than a mere response bias and likely do not only assess the internalized desirability of having higher trait levels (but see section “5.4 Limitations and implications for future research”). Yet, without further assistance, people seem to face considerable obstacles when they want to volitionally change their traits (for a further discussion of obstacles for volitional personality development, see Hennecke et al., 2014). However, concluding that volitional personality development is irrelevant for personality development in general would be premature. Given that people's goals to change themselves can be organized using the broad Big Five domains (Baranski et al., 2017) and that the vast majority indeed wants to change at least some aspects of their traits (Hudson & Fraley, 2016b; Hudson & Roberts, 2014), it is further sensible to assume that people themselves do consider volitional personality development in terms of the Big Five as possible. In addition, aside from goals that focus on specifically changing Big Five traits, both personality psychology (see Cross & Markus, 1991; Emmons, 1986; Gollwitzer, 1987; Higgins, 1987; King & Hicks, 2007; Markus & Nurius, 1986) and developmental psychology (see Brandtstädter et al., 1999; J. Heckhausen et al., 2010; Lerner & Busch-Rossnagel, 1981; Lewin, 1934, 1943) stimulated numerous and fruitful research suggesting that people do not passively go through their lives but instead actively shape themselves, their environment and their long-term development (McAdams & Olson, 2010). In light of this research tradition, future research has to determine whether volitionally changing one's Big Five traits is possible under certain circumstances (e.g., increased goal specificity, see also section "5.4 Limitations and implications for future research").

Concerning such circumstances of successful goal pursuit, in contrast to a broad range of previous suggestions (Atkinson, 1964; Eccles et al., 1983; Fishbein & Ajzen, 1975; Gollwitzer & Moskowitz, 1996; H. Heckhausen, 1977; Hennecke et al., 2014; Vroom, 1964), the current dissertation provided surprisingly little support for the idea that both more important and more feasible change goals promote more pronounced trait changes. Aside from a lack of goal commitment and the specific relevance of either importance of feasibility for particular traits (see section "4.4.4 Important or feasible change goals partly contribute to volitional personality development."), this finding may have also resulted from a less than optimal assessment strategy. In particular, during the assessment of change goals, participants repeatedly commented that they found it difficult to rate the rather abstract change goals and especially their importance and feasibility. Thus, ratings of importance and feasibility may have been somewhat distorted. For example, as indicated by medium to strong negative correlations between importance and feasibility (see Table A12), participants may have automatically inferred that more important goals should also be less feasible so that potential interaction effects could hardly be detected. Future research may for example link the assessed change goals with illustrative functional aspects to increase their vividness and thus reduce potential response biases for importance and feasibility (Hennecke et al., 2014; but see section "5.4 Limitations and implications for future research").

Before I next discuss the current dissertation's findings on micro-analytical processes of personality development, it is important to note that the two macro-analytical factors (i.e., environmental factors and change goals) discussed above may jointly contribute to personality development across the lifespan (Hudson & Fraley, 2016b, 2017; Hudson & Roberts, 2014). For example, when experiencing the transition to college, people may internalize new social roles (e.g., being a student) and become aware of new, required behavior (e.g., need to unassisted learning) so that they actively want to change their corresponding traits (e.g., increase in conscientiousness, but see section "5.4 Limitations and implications for future research").

5.3 Investigating Processes of Personality Development

Although frequently asked for (see for example Baumert et al., 2017), this dissertation represents the first research to empirically investigate smaller scaled series of steps (i.e., processes) that may underlie personality development. While previous studies primarily focused on single components of personality development (e.g., momentary states; Hutteman et al., 2015; Wrzus et al., 2018a), this dissertation provided a first but comprehensive empirical test of whether such single components can be further embedded into preceding and subsequent momentary experiences as proposed by the TESSERA framework (Wrzus &

Roberts, 2017). In addition, using two year longitudinal data, the current research replicated and extended previous findings on associations of self-rated and implicitly measured traits as well as change goals with corresponding situations and states (e.g., Back et al., 2009; Hudson & Fraley, 2015; Mehl et al., 2006; Rauthmann et al., 2015b). Finally, this dissertation was able to provide unique insights into the importance of reflective and associative processes in long-term personality development (see Wrzus, 2018; Wrzus & Roberts, 2017).

As expected, it in Chapter IV showed that with only very few exceptions, momentary processes could indeed be generalized as recursive TESSERA sequences consisting of **T**riggering situations, **E**xpectancies, **S**tates & **S**tate **E**xpressions, and **R**e**A**ctions (Wrzus & Roberts, 2017). Furthermore, self-rated traits were consistently linked with the experience of trait-relevant situations and momentary states whereas this was only partly true for implicitly measured traits. Unexpectedly, change goals were not associated with experiencing goal-relevant situations and states. However, goals that were perceived as either more important or as more feasible were partly linked with the experience of corresponding situations and states. Finally, results indicated that momentary states were associated with subsequent changes in self-rated and partly implicitly measured traits. Conversely, results provided only very limited evidence for the relevance of reflective or associative processes in long-term development of self-rated or implicitly measured traits.

Collectively, these findings provide important empirical evidence for the idea that people’s traits shape momentary experiences (e.g., situations, states) and that the experiences people make in daily life in turn contribute to personality development across the life-span (Back et al., 2011; Dweck, 2017; Geukes et al., 2017; Hennecke et al., 2014; Roberts, 2017; Roberts & Jackson, 2008; Wrzus & Roberts, 2017). Thereby, the current findings may also help to move away from understanding the Big Five taxonomy as purely descriptive and instead provide evidence helpful to understand how inter-individual differences come into being (see also, Baumert et al., 2017; J. Block, 1995; Denissen & Penke, 2008; Roberts, 2009).

In line with previous theoretical suggestions (Back et al., 2011; Dweck, 2017; Geukes et al., 2017; Hennecke et al., 2014; Roberts, 2017; Roberts & Jackson, 2008; Wrzus & Roberts, 2017) and first empirical findings (Hutteman et al., 2015; Wrzus et al., 2018a), especially momentary states seem to play an important role in explaining how such inter-individual differences emerge in the long run. Extending previous research (e.g., Back et al., 2009; Egloff & Schmukle, 2002; Mehl et al., 2006), the current results suggest that both self-rated and in part implicitly measured traits may manifest in closely corresponding short-term behavior, cognition and affect, partly even across a time lag of six months (see also, Cervone, 2005; Denissen & Penke, 2008; DeYoung, 2015; Fleeson, 2001; Fleeson & Jayawickreme, 2015; Fleeson et al., 2002; Fridhandler, 1986; Wrzus & Roberts, 2017). More importantly however, the current findings support the idea that people may rely on their momentary states to infer their underlying traits (Back & Vazire, 2012; Buss & Craik, 1983; Fleeson & Gallagher, 2009) so that prolonged shifts in such states (i.e., habit changes) may consequently alter people's trait levels (Back et al., 2011; Dweck, 2017; Geukes et al., 2017; Hennecke et al., 2014; Roberts, 2017; Roberts & Jackson, 2008; Wrzus & Roberts, 2017).

Yet, the current findings also suggest that, in everyday life, momentary states reflect no isolated phenomena but instead need to be conceptualized as being embedded in cascades of further momentary experiences (Wrzus, 2018; Wrzus & Roberts, 2017, see also Baumert et al., 2017). Specifically, this dissertation provides a unique contribution to the identification of processes that may precede and thereby possibly elicit momentary behavior, thoughts or feelings. If such momentary states indeed form the building blocks of personality development, it is crucial to determine conditions under which people will most likely experience prolonged changes (or stability) in such states and thereby change (or maintain) their traits in the long run (Baumert et al., 2017). The current results suggest that such conditions may cover the experience of trait-relevant situations and according expectancies on how to behave as proposed by the TESSERA framework (Wrzus & Roberts, 2017). In addition, by showing that people's reactions and reflections on a state vary with its strength, the current findings suggest that people indeed try to cope with their momentary behaviors, thoughts or feelings. However, the finding that both reflective and associative processes hardly contributed to trait changes at first sight speaks against propositions made by the TESSERA framework (Wrzus & Roberts, 2017). Yet, although not meant to immunize the TESSERA framework against potential falsification, it could well be the case that associative and reflective processes still contribute in a more complex way to the translation of momentary states into actual trait changes than modeled in the current research (i.e., in terms of a simple linear association, see Chapter IV). For example, the simple amount of reflection may be less relevant for personality development until several conditions are met. As such, the discrepancy between the present self-concept and the reflected state may need to be unpleasant while simultaneously changing the self-concept is perceived important and feasible (Hennecke et al., 2014; Wrzus, 2018; see also Denissen et al., 2013). Future research may implement more advanced assessment strategies to clarify the importance of reflective and associative processes in personality development (but see section "5.4 Limitations and implications for future research").

Surprisingly, the current dissertation found hardly any support for the idea that, in order to implement their change goals, people may increasingly engage in goal-relevant situations and states (Denissen et al., 2013; Hennecke et al., 2014; Hoyle & Sherrill, 2006; Morf, 2006; Wrzus & Roberts, 2017). Again, this finding suggests that for example without the assistance of a psychological intervention (see for example Hudson & Fraley, 2015; Peters, 2015), change goals fail to affect momentary experiences. To support the implementation of change goals in daily life, such interventions may a) help to translate change goals into reference values for subordinate “do”-goals (Gollwitzer & Brandstätter, 1997; Gollwitzer & Schaal, 1998; Pervin, 1982) b) teach concrete skills on how to realize these “do”-goals (see for example, Hinsch & Pfingsten, 2007; Peters, 2015) and c) help people to determine when a change goal is successfully implemented (i.e., when reference value and the input correspond; see also Brandtstädter & Rothermund, 2002; Carver & Scheier, 1998, 2003; J. Heckhausen et al., 2010).

Although the rather complex modeling of momentary processes of personality development as presented in Chapter IV may appear somewhat daunting, it actually reflects a major strength of the current dissertation. To sufficiently explain a multi-causal phenomenon like personality development while simultaneously avoiding an inadmissible simplification, it is necessary to also apply more complex models (Baumert et al., 2017; Wrzus & Roberts, 2017). However, even with the current results at hand, empirical research on processes of personality development is still in its infancy. Consider for example the somewhat diverging findings on self-rated and implicitly rated traits. While states were rather consistently linked with self-rated traits and trait change, this was only true for extraversion and partly neuroticism in implicitly measured traits. Thus, although the current dissertation already provides a first glimpse into momentary processes of the development of implicitly measured traits, future research is needed to achieve a more profound insight. However, with respect to the TESSERA framework (Wrzus & Roberts, 2017), this dissertation provided first but encouraging findings on central propositions – albeit future research is needed to tackle limitations of the current research in testing this framework. Next, I illustrate such limitations and outline potential starting points for future research.

5.4 Limitations and Implications for Future Research

Although the current dissertation realized a comprehensive measurement-burst design that provided unique insights into both macro-analytical factors and micro-analytical processes of personality development, some limitations need to be discussed that indicate several implications for future research. Although the findings presented in Chapters II-IV of this dissertation stem from the same research project, I next discuss limitations and future directions separately for environmental factors, volitional personality development and processes of personality development to allow for a better assignability of each discussed aspect. Note that limitations discussed here cover a broader scope, for example with respect to the applied research design, than limitations already addressed in Chapters II-IV.

5.4.1 Environmental factors.

Regarding findings on the importance of environmental factors, at least five limitations and according implications for future research need to be considered. First, as already briefly outlined in Chapter II, it remains questionable whether a direct comparison of the effect of a life transition in different age groups is possible at all because older adults necessarily already collected more and surely more diverse experiences in life that may subsequently alter the effects of the life transition in question. Although future research may not be able to fully address or even overcome this limitation, a further comparison of life transitions in different age still provides a sensible research strategy to investigate underlying principles of personality development (see for example, Roberts et al., 2008). However, future research may for example examine more rare or extreme life transitions (e.g., inheriting or winning much money, death of a spouse or parents) in different age groups that are less prone to self-selection effects and more independent from previous life experiences (for first empirical research on these examples, see Gardner & Oswald, 2001; Specht et al., 2014; for a brief discussion on the nature of such experiences, see Hutteman et al., 2014). In addition, future research interested in the effects of educational life transitions may monitor the transition into job retraining programs (and associated job changes), because such trainings should cover comparable conditions for each job and can be applied in both younger and older adults (Jacobson, Lalonde, & Sullivan, 2005).

Second, although the current research tried to acquire a sufficiently divers and representative sample, the applied recruitment strategy also went along with some drawbacks. For example, to allow for a more valid comparison of the effects of the transition to college between older and younger adults, participants were required to have a rather high level of education (i.e., German Abitur or similar). This may have not only encouraged potential selection effects, especially in older adults (see Chapter II), but also limits the generalizability of the current findings. To overcome this limitation, future research needs to also investigate such life transitions that require a less homogeneous educational background but are still sufficiently comparable in age-heterogeneous samples (e.g., job retraining programs). Furthermore, with the applied recruitment strategy at hand, it was not possible to realize all planned contrasts because a sufficient number of younger control group participants as well as older freshmen in the greater area around Mainz could not be recruited. Thus, future research may be conceptualized as multi-center studies to reach a more satisfactory sample size in these groups.

Third and relatedly, due to somewhat restricted sample sizes in the investigated transitions groups (e.g., only about 60 older students and 60 controls were recruited), this dissertation was not able to examine momentary processes relevant in the transition to college. Specifically, future research might examine whether momentary processes relevant for personality development during a life transition are comparable in different age groups (see, Baumert et al., 2017; Wrzus & Roberts, 2017). Again, a higher sample size is needed to test for differences in for example single paths using complex MSEMs (e.g., see MSEMs as applied in Chapter IV).

Fourth, in line with previous research (Roberts et al., 2008; Roberts et al., 2005; see also Lüdtke et al., 2011), this dissertation assumed that experiencing college life is associated with changes in social roles and expectancies. However, the current research did not consider how much participants actually engaged in their social role as student (e.g., how much time they spent preparing their courses, how much they engaged in student life outside the university). Future research may examine whether the amount of actual investment into the social role associated with a life transition accounts for the observed similarities in developmental trajectories of younger and older adults.

Fifth, this dissertation illustrated the importance of environmental factors for personality development by examining a life transition. However, to provide a more complete picture, future research may comprehensively examine the importance of more broad environmental factors like cultural (see for example, Bleidorn et al., 2013; Ward et al., 2004) or social contexts (see for example, Gerstorf et al., 2010; Hartup & Van Lieshout, 1995) in personality development.

5.4.2 Volitional personality development.

Although research on volitional personality development can already look back at a longer research tradition (e.g., Higgins, 1987; Markus & Nurius, 1986), research on change goals is still in its infancies (Hudson & Fraley, 2017). Hence, there is comparatively much room for a further improvement of research and many questions still need to be addressed. However, to maintain clarity, I next focus on the four most important limitations and future directions that can be derived from the current dissertation.

First, the present research design was limited to the investigation of volitional personality development in a more naturalistic setting and thus did not provide any form of assistance for goal implementation (see Chapter IV). In addition, participants were only asked to rate their change goals but should not rate further goal specifications other than importance and feasibility. Hence, future research may in a first step examine such goal specifications to determine conditions under which volitional personality development might be possible. For example, researchers may ask participants to indicate a concrete time period in which they want to implement their goals (Austin & Vancouver, 1996), so that participants may express more realistic change goals and refrain from simply rating trait desirability. Needless to say that more long-term change goals would also require a longer period of observation. In addition, participants may indicate whether their change goals are functional to achieve other superordinate goals (Austin & Vancouver, 1996; Denissen et al., 2013; Hennecke et al., 2014; D. Wood & Denissen, 2015) like fulfilling life goals (Bleidorn et al., 2010; Peters, 2015), social role expectations (D. Wood & Roberts, 2006) or broader needs (Dweck, 2017). By clarifying the functionality of change goals researchers may a) increase goal commitment and b) be able to identify determinants of successfully goal implementation (e.g., increases in conscientiousness could be more successful if people thereby want to achieve the life goal of graduating from university). In a second step, research may then examine whether further assistance is needed to successfully implement change goals. For example, providing participants with tailored reminders or feedback regarding their goal progress (e.g., after the second and third trait assessment) might significantly help them to judge whether they are on the right track and may additionally boost motivation for further goal pursuit (Locke & Latham, 1990; 2002; but compare to Study 1 in Hudson & Fraley, 2016).

Second, although the current findings suggest that change goals reflect indeed more than mere desirability of higher trait levels, a direct test of this suggestion is still missing. Thus, to further clarify the nature of change goals, future research may separately assess change goals as well as trait desirability and compare their effects on long-term trait change.

In addition, providing participants with a fixed list of potential change goals as done by the C-BFI (Hudson & Roberts, 2014) may have itself acted as an intervention that tempted participants to indicate change goals that would otherwise not have come to their mind and thus might have reflected trait desirability. To address this limitation, future research may compare change goals expressed in questionnaires with given items (Hudson & Roberts, 2014) and open-ended questionnaires (see also, Baranski et al., 2017; Hennecke et al., 2014) especially regarding their effect on long-term trait change.

Third, the current dissertation did not investigate inter-individual differences in successful goal implementation. For example by using cluster analytical approaches, future research could clarify whether certain subgroups of people are indeed able to change their traits as desired. Potential properties of these subgroups may cover for example higher self-efficacy (Locke & Latham, 2002; Zimmerman, Bandura, & Martinez-Pons, 1992), higher goal commitment (Hollenbeck & Klein, 1987; Locke & Latham, 2002), less conflicts with other motives and goals (Baumert et al., 2017) or a stronger general motivation to pursue potentially rewarding goals (Baumert et al., 2017; see also Corr, 2004, 2008). Finally, successors may understand change goals as rather specific means to the end of a successful individuation process (Koepke & Denissen, 2012).

Fourth, due to restrictions in sample size, this dissertation did not examine links between change goals and environmental factors (i.e., the transition into college). With a sufficient sample size, future research could examine whether people who for example experience a life transition may express stronger change goals especially for those traits that help to meet requirements put forward by changing environmental conditions (see Bleidorn et al., 2016).

5.4.3 Processes of personality development.

The current dissertation greatly extends previous research on processes of personality development and provides a promising starting point for future research. Importantly, such future research may benefit from both the present empirical research and previous theoretical groundwork like the TESSERA framework (Wrzus & Roberts, 2017). Yet, the applied research design also suffers from several drawbacks of which the four most important will be briefly discussed next.

First, although the current dissertation already applied an extensive measurement burst design, this research design was limited to provide only a first test of some, but not all, propositions made by the TESSERA framework. Specifically, albeit the current dissertation managed to examine a broad range of TESSERA components, it did not investigate potential moderators that may influence the size or direction of subsequent personality development (Wrzus & Roberts, 2017). Thus, future research may for example examine the externality-internality of TESSERA components to test whether more extrinsic social triggers or reactions as well as intrinsic expectations are linked with more pronounced trait changes (Wrzus & Roberts, 2017). In addition, this dissertation only examined TESSERA sequences by averaging the according daily experiences during different diary phases (e.g., during D1-D3), but did not model more complex associations between consecutive TESSERA sequences (Wrzus, 2018; Wrzus & Roberts, 2017). To provide a more comprehensive test of propositions made by the TESSERA framework, future research may apply more complex time-series analyses to additionally investigate whether TESSERA sequences and especially states can be conceptualized to occur within dynamic systems that also include previous as well as subsequent momentary experiences (e.g., in terms of dynamic networks or homeostatic processes; Wrzus, 2018). Furthermore, the current dissertation did not explicitly examine potential barriers of trait change as proposed by the TESSERA framework (Wrzus & Roberts,

2017) that may have at least partly explained the findings from Chapter IV. Applying a more fine-grained analysis of TESSERA sequences, future research may be able to tackle this limitation for example by focusing on those TESSERA sequences that indeed a) cover triggering situations that are perceived by participants themselves to be relevant for a trait, b) include states that do not already correspond to participants' trait level and c) are sufficiently repeated (Wrzus & Roberts, 2017).

Second, to maintain analyzability, the current dissertation focused on participants' direct ratings of their experiences that were obtained using different, short rating forms. These ratings however may have only been able to cover parts of the experience, participants wanted to report about. In addition, as can be concluded from various support queries, participants may have had their difficulties to properly express their experience in terms of the applied questionnaires, especially regarding the DIAMONDS questionnaire (Rauthmann et al., 2014). To overcome this limitation, an in-depth analysis of participants' open-ended descriptions of their experiences as also assessed in each daily diary (see section "4.2.3 Measures.") may provide further fruitful insights into momentary processes of personality development.

Third, the applied daily diary approach that required participants to rate their daily experiences in the evening may have itself acted as a trigger or intervention that may have fostered or even hindered personality development (Wrzus, 2018). For example, as indicated by direct feedback of participants, some looked forward to completing the daily diary because they perceived it as possibility to reflect on their day and learn something about their personality. Others however reported that the daily diary helped them to align their experiences with their current self-perception. Thus, future research may also use ambulatory assessments of daily experiences, which however pose their own challenges and drawbacks (Wrzus, 2018; Wrzus et al., 2017b).

Fourth, regarding volitional personality development, to maintain clarity, the current dissertation did not examine associations of change goals with reflective or associative processes. However, to actually implement their change goals, people may more actively try to integrate their momentary experiences into their self-concept or change their evaluation of certain experiences. In addition, by applying random slope MSEMs, future research may for example examine whether stronger change goals are also linked with stronger associations between TESSERA components (e.g., the more I want to change, the more I reflect on situations in which I showed stronger goal-relevant states).

5.5 Implications for Psychological Practice

The current dissertation primarily aimed to provide researchers with unique insights into both macro-analytical factors and micro-analytical processes of personality development. However, the current findings may also help practitioners to support their clients in successfully developing their personality across the lifespan.

With the current findings at hand, practitioners find further support for the idea that a clients' personality development is not set in stone (e.g., due to a fixed schedule of intrinsic maturation) but remains plastic even in older age (e.g., due to changing environmental factors). However, the requirement to flexibly adjust one's personality for example to environmental factors even in older age may provide a substantial struggle for some people. Thus, psychotherapists and psychological counselors may especially keep an eye on whether a client strives to deal with a life transition but still lacks those trait levels that are required for their successful management (e.g., conscientiousness may be needed to manage the transition to college or job). In a second step, the practitioner may support clients in increasing these traits. In addition, when working with clients who want to change themselves or have a distinct future self in mind, practitioners should feel encouraged to propose these clients to engage in such life transitions that foster the desired personality changes (e.g., by suggesting that an older client who wants to increase in conscientiousness or agreeableness engages in college life). Finally, the current results highlight that a successful personality development hardly only covers an altered clients' self-rating but also needs to manifest in changed implicitly measured traits and reputation (i.e., other-reports). Consequently, measures need to be taken to ensure that change condenses in all three manifestations (e.g., encouraging clients to emphasize new behaviors, thoughts or feelings in social interactions with relevant others, but see, Back et al., 2011; Seger, 1994; Vazire, 2010).

Regarding volitional personality development, the current findings suggest that in a more naturalistic setting, people can hardly implement their change goals into actual trait changes. However, as previous research suggests that psychological interventions may foster trait change in general (Roberts et al., 2017) and volitional trait change in particular (Allan et al., 2018; Hudson & Fraley, 2015; Martin et al., 2014; Peters, 2015), practitioners should feel encouraged to use available tools at hand to support their clients in volitional personality development (Allemand & Flückiger, 2017; Gollwitzer & Brandstätter, 1997; Hinsch & Pfingsten, 2007; Magidson et al., 2014). For example, by supporting self-reflections, practitioners may foster a clients' insights into such beliefs and expectations that might hinder a successful volitional trait change (Allemand & Flückiger, 2017). Furthermore, especially in a therapeutic setting, therapists may support clients to develop and implement such change goals that help to ensure therapeutic success in the long run (e.g., increasing emotional stability to secure treatment success of generalized anxiety disorder). However, if change goals turn out to merely reflect a client's desire for self-optimization that is for example driven by external social pressure, it could be more sensible to encourage self-acceptance and address potentially low or fragile self-esteem than to support actual goal implementation (Asendorpf, 2018; see also Hardin & Larsen, 2014).

The current findings also provide practitioners with further helpful insights into momentary processes of personality development. Specifically, based on the TESSERA framework (Wrzus & Roberts, 2017), practitioners and their clients may together elaborate situations to engage in, potential own and other's expectations, desired behaviors, thoughts or feelings as well as potential own and other's reactions. Furthermore, practitioners may help their clients to build an altered self-concept by relying on these newly displayed momentary states. Although the reflective processes as assessed in this dissertation hardly contributed to personality development, practitioners may for example still encourage their clients to aim at achieving accuracy but not consistency when reflecting about their momentary experiences to foster further personality development (Baumert et al., 2017; Wrzus, 2018; Wrzus & Roberts, 2017).

5.6 Concluding Remarks

Despite the above outlined limitations, the current dissertation provides much needed insights into both macro-analytical factors (i.e., life transitions and change goals) and micro-analytical processes of personality development. By comparing a similar life transition (i.e., the transition into college) in younger and older adults, Chapter II provided strong evidence for the idea that environmental factors indeed substantially contribute to personality development across the lifespan. Acknowledging a more volitional perspective on personality development, Chapter III comprehensively examined factors contributing to people's goals to change traits and showed that change goals primarily reflect people's self- and other-perceived shortcomings in current trait levels. Unexpectedly, Chapter IV showed that change goals hardly manifested in actual changes in self-rated or implicitly measured traits. Yet, more important or feasible change goals were in part successfully implemented. Finally, regarding micro-analytical processes of personality development, Chapter IV provided a first but comprehensive test of central proposition of the TESSERA framework (Wrzus & Roberts, 2017). It showed that momentary processes can be generalized in terms of repeated sequences of triggering situations, expectancies, states, and reactions and that traits and momentary experiences bidirectionally influence each other.

Taken together, the current results can be condensed into two more broad conclusions. First, this dissertation suggests that the observed general patterns of personality development across the life-span (Lucas & Donnellan, 2011; Roberts et al., 2006a) can be at least partly explained by the experiences people make – be it in the context of larger-scaled life transitions or in terms of smaller-scaled daily experiences. Specifically, as suggested by previous research (see for example, Bleidorn et al., 2016; Caspi & Roberts, 2001; Hutteman et al., 2014), results provide evidence for the idea that a more consistent context (e.g., experiencing less life transitions) may at least in part account for less pronounced trait changes in older adults. In addition, although the current research found little evidence in favor of a successful implementation of change goals (see also, Hudson & Fraley, 2015; Peters, 2015; Robinson et al., 2015), it still provides helpful and unique insights into the importance of volitional aspects of personality development. As such, this dissertation substantially illuminated the nature of change goals (but compare to Hudson & Roberts, 2014; Robinson et al., 2015), comprehensively tested proposed conditions of volitional personality development (see Hennecke et al., 2014) and finally provided suggestions on further conditions that may need to be met for a successful implementation of change goals. Moreover, the current findings highlight that momentary experiences and especially momentary states provide a fruitful asset for explaining long-term personality development.

Second, by combining an extensive measurement burst design (Nesselroade, 1991, 2004; Sliwinski, 2008) with a multi-method assessment of traits (i.e., self- and other-ratings, implicit measures), this dissertation constitutes an important methodological advance in research on personality development. Although repeatedly called for (see for example, Hennecke et al., 2014; Wrzus & Roberts, 2017), to my knowledge, this dissertation is one of the first to realize such a complex research design (but see Peters, 2015 for a similar but somewhat less comprehensive approach). Yet, such complex research designs are both necessary and expedient to empirically test newly developed, more comprehensive frameworks on personality development (e.g., Geukes et al., 2017; Wrzus & Roberts, 2017). The current dissertation sends out an encouraging signal for future research suggesting that although extensive measurement burst studies may go along with somewhat increased effort they at the same time reward researchers with unique and much needed insights into the complex phenomenon of personality development.

It remains to be noted that although empirical research has in recent years made substantial progress in understanding personality development, much is still unknown about why and under which circumstances people develop their personality. Just as psychological research will have to further investigate personality development, this subject also does not fade in literature until today. Rooted in German literature of the 18th and 19th century (Keller 1855/2008; Goethe, 1796/1986; Wieland, 1767/1986), in the 20th century, authors like Brecht and Hesse have pushed forward new aspects of personality development in their coming-of-age novels that still inspire contemporary literature like “Die Blechtrommel” (Grass, 1959/1994), “Das Parfüm” (Süskind, 1985) or even “Harry Potter” (Rowling, 1997/2000) to emphasize the development of their main character’s personality.

References

Aarts, H., & Dijksterhuis, A. (2000). Habits as knowledge structures: Automaticity in goal-directed behavior. *Journal of Personality and Social Psychology, 78,* 53-63.

Adults Education Survey (2016). *Weiterbildungsverhalten in Deutschland: Ergebnisse des Adult Education Survey 2016 [Extended studies in Germany: Results of the Adult Education Survey 2016]*. Bonn: Bundesministerium für Bildung und Forschung.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action control: From cognition to behavior* (pp. 11-39). Berlin, Heidelberg: Springer Berlin Heidelberg.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179-211. doi: 10.1016/0749-5978(91)90020-T

Allan, J., Leeson, P., & Martin, S. (2018). Application of a 10 week coaching program designed to facilitate volitional personality change: Overall effects on personality and the impact of targeting. *International Journal of Evidence Based Coaching and Mentoring, 16*, 80-94.

Allemand, M., & Flückiger, C. (2017). Changing personality traits: Some considerations from psychotherapy process-outcome research for intervention efforts on intentional personality change. *Journal of Psychotherapy Integration*, *27*, 476-494. doi: 10.1037/int0000094

Allemand, M., Grunenfelder-Steiger, A. E., & Hill, P. L. (2013). Stability of personality traits in adulthood. *GeroPsych*, *26*, 5-13. doi: 10.1024/1662-9647/a000080

Allemand, M., Zimprich, D., & Hertzog, C. (2007). Cross-sectional age differences and longitudinal age changes of personality in middle adulthood and old age. *Journal of Personality, 75*, 323-358. doi: 10.1111/j.1467-6494.2006.00441.x

Allik, J., de Vries, R. E., & Realo, A. (2016). Why are moderators of self-other agreement difficult to establish? *Journal of Research in Personality*, *63*, 72-83. doi: 10.1016/j.jrp.2016.05.013

Allport, G. W. (1961). *Pattern and growth in personality*. Oxford, UK: Holt, Reinhart & Winston.

Allport, G. W. (1966). Traits revisited. *American Psychologist*, *21*, 1-10.

Amodio, D. M., & Ratner, K. G. (2011). A memory systems model of implicit social cognition. *Current Directions in Psychological Science, 20*, 143-148. doi: 10.1177/0963721411408562

Anderson, C. A., Miller, R. S., Riger, A. L., Dill, J. C., & Sedikides, C. (1994). Behavioral and characterological attributional styles as predictors of depression and loneliness: Review, refinement, and test. *Journal of Personality and Social Psychology, 66*, 549-558. doi: 10.1037/0022-3514.66.3.549

Andersson, G. (1996). The benefits of optimism: A meta-analytic review of the life orientation test. *Personality and Individual Differences, 21*, 719-725. doi: 10.1016/0191-8869(96)00118-3

Ardelt, M. (2000). Still stable after all these years? Personality stability theory revisited. *Social Psychology Quarterly, 63*, 392-405. doi: 10.2307/2695848

Arnett, J. J. (2004). *Emerging adulthood : The winding road from the late teens through the twenties*. New York ; Oxford: Oxford University Press.

Asendorpf, J. B. (2018). Kann ich – und sollte ich? Über Selbstoptimierung. In J. B. Asendorpf (Ed.), *Persönlichkeit: Was uns ausmacht und warum* (pp. 323-340). Berlin, Heidelberg: Springer.

Asendorpf, J. B., Banse, R., & Mücke, D. (2002). Double dissociation between implicit and explicit personality self-concept: The case of shy behavior. *Journal of Personality and Social Psychology, 83*, 380-393. doi: 10.1037/0022-3514.83.2.380

Asendorpf, J. B., & Wilpers, S. (1998). Personality effects on social relationships. *Journal of Personality and Social Psychology, 74*, 1531-1544. doi: 10.1037/0022-3514.74.6.1531

Asparouhov, T., & Muthen, B. (2008). Multilevel mixture models. In G. R. Hancock & K. M. Samuelson (Eds.), *Advances in latent variable mixture models* (pp. 27-51). Charlotte, NC: Information Age Publishing.

Atkinson, J. W. (1964). *An introduction to motivation*. Oxford, England: Van Nostrand.

Atwater, L. E., Ostroff, C., Yammarino, F. J., & Fleenor, J. W. (1998). Self-other agreement: Does it really matter? *Personnel Psychology, 51*, 577-598. doi: 10.1111/j.1744-6570.1998.tb00252.x

Atwater, L. E., & Yammarino, F. J. (1997). Self-other rating agreement: A review and model. *Research in Personnel and Human Resources Management, 15*, 121-174.

Austin, J. T., & Vancouver, J. B. (1996). Goal constructs in psychology: Structure, process, and content. *Psychological Bulletin, 120*, 338-375.

Autorengruppe Bildungsberichtserstattung (2016). *Bildung in Deutschland 2016. Ein indikatorengestützter Bericht mit einer Analyse zu Bildung und Migration*. Bielefeld: Bertelsmann.

Back, M. D., Baumert, A., Denissen, J. J. A., Hartung, F. M., Penke, L., Schmukle, S. C., . . . Wrzus, C. (2011). PERSOC: A unified framework for understanding the dynamic interplay of personality and social relationships. *European Journal of Personality, 25*, 90-107. doi: 10.1002/Per.811

Back, M. D., & Nestler, S. (2016). Dual process approaches to personality. In D. R., G. B. & H. W. (Eds.), *Reflective and impulsive determinants of human behavior* (pp. 137-154). New York: NY: Psychology Press.

Back, M. D., Schmukle, S. C., & Egloff, B. (2009). Predicting actual behavior from the explicit and implicit self-concept of personality. *Journal of Personality and Social Psychology, 97*, 533-548. doi: 10.1037/a0016229

Back, M. D., & Vazire, S. (2012). Knowing our personality. In S. Vazire & T. D. Wilson (Eds.), *Handbook of self-knowledge* (pp. 131-156). New York: Guilford.

Bailey, T. C., Eng, W., Frisch, M. B., & Snyder, C. (2007). Hope and optimism as related to life satisfaction. *The Journal of Positive Psychology, 2*, 168-175. doi: 10.1080/17439760701409546

Baltes, P. B. (1987). Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. *Developmental Psychology, 23*, 611-626.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52*, 1-26. doi: 10.1146/annurev.psych.52.1.1

Baranski, E. N., Morse, P. J., & Dunlop, W. L. (2017). Lay conceptions of volitional personality change: From strategies pursued to stories told. *Journal of Personality, 85*, 285-299. doi: 10.1111/jopy.12240

Bargel, T., Ramm, M., & Multrus, F. (2012). Schwierigkeiten und Belastungen im Bachelorstudium–wie berechtigt sind die studentischen Klagen. *Beiträge zur Hochschulforschung, 34*, 26-41.

Barranti, M., Carlson, E. N., & Côté, S. (2017). How to test questions about similarity in personality and social psychology research: Description and empirical demonstration of response surface analysis. *Social Psychological and Personality Science, 8*. doi: 10.1177/1948550617698204

Bass, B. M., & Yammarino, F. J. (1991). Congruence of self and others leadership ratings of naval officers for understanding successful performance. *Applied Psychology: An International Review, 40*, 437-454. doi: 10.1111/j.1464-0597.1991.tb01002.x

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology, 5*, 323-370. doi: 10.1037//1089-2680.5.4.323

Baumeister, R. F., Vohs, K. D., Nathan DeWall, C., & Zhang, L. (2007). How emotion shapes behavior: Feedback, anticipation, and reflection, rather than direct causation. *Personality and Social Psychology Review, 11*, 167-203. doi: 10.1177/1088868307301033

Baumert, A., Schmitt, M., Perugini, M., Johnson, W., Blum, G., Borkenau, P., . . . Grafton, B. (2017). Integrating personality structure, personality process, and personality development. *European Journal of Personality, 31*, 503-528. doi: 10.1002/per.2115

Beattie, S., Hardy, L., & Woodman, T. (2015). A longitudinal examination of the interactive effects of goal importance and self-efficacy upon multiple life goal progress. *Canadian Journal of Behavioural Science / Revue canadienne des sciences du comportement, 47*, 201-206. doi: 10.1037/a0039022

Bem, D. J. (1972). Self-perception theory. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 6, pp. 2-62). New York: Academic Press.

Bentler, P. M., & Weeks, D. G. (1980). Linear structural equations with latent variables. *Psychometrika, 45*, 289-308. doi: 10.1007/bf02293905

Berg, A. I., & Johansson, B. (2014). Personality change in the oldest-old: Is it a matter of compromised health and functioning? *Journal of Personality, 82*, 25-31. doi: 10.1111/jopy.12030

Bleidorn, W. (2012). Hitting the road to adulthood: Short-term personality development during a major life transition. *Personality and Social Psychology Bulletin, 38*, 1594-1608. doi: 10.1177/0146167212456707

Bleidorn, W. (2015). What accounts for personality maturation in early adulthood? *Current Directions in Psychological Science, 24*, 245-252. doi: 10.1177/0963721414568662

Bleidorn, W., Hopwood, C. J., & Lucas, R. E. (2016). Life events and personality trait change. *Journal of Personality, 86*, 83-96. doi: 10.1111/jopy.12286

Bleidorn, W., Kandler, C., & Caspi, A. (2014). The behavioural genetics of personality development in adulthood-classic, contemporary, and future trends. *European Journal of Personality, 28*, 244-255. doi: 10.1002/Per.1957

Bleidorn, W., Kandler, C., Hülsheger, U. R., Riemann, R., Angleitner, A., & Spinath, F. M. (2010). Nature and nurture of the interplay between personality traits and major life goals. *Journal of Personality and Social Psychology, 99*, 366-379. doi: 10.1037/a0019982

Bleidorn, W., Kandler, C., Riemann, R., Angleitner, A., & Spinath, F. M. (2009). Patterns and sources of adult personality development: Growth curve analyses of the NEO PI-R scales in a longitudinal twin study. *Journal of Personality and Social Psychology, 97*, 142-155. doi: 10.1037/a0015434

Bleidorn, W., Klimstra, T. A., Denissen, J. J. A., Rentfrow, P. J., Potter, J., & Gosling, S. D. (2013). Personality maturation around the world: A cross-cultural examination of social-investment theory. *Psychological Science, 24*, 2530-2540. doi: 10.1177/0956797613498396

Bleidorn, W., & Schwaba, T. (2017). Personality development in emerging adulthood. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 39-51). San Diego, CA: Elsevier.

Bless, H., Hamilton, D. L., & Mackie, D. M. (1992). Mood effects on the organization of person information. *European Journal of Social Psychology, 22*, 497-509. doi: 10.1002/ejsp.2420220507

Block, J. (1995). A contrarian view of the five-factor approach to personality description. *Psychological Bulletin*, *117*, 187-215.

Block, J. H., & Block, J. (1981). Studying situational dimensions: A grand perspective and some limited empiricism. In D. Magnusson (Ed.), *Toward a psychology of situations* (pp. 85-106). Hillsdale, NJ: Erlbaum.

Bolger, N., DeLongis, A., Kessler, R. C., & Schilling, E. A. (1989). Effects of daily stress on negative mood. *Journal of Personality and Social Psychology, 57*, 808-818.

Bollen, K. A., & Curran, P. J. (2006). *Latent curve models: A structural equation perspective*. Hoboken, NJ: Wiley.

Booth, R., Bartlett, D., & Bohnsack, J. (1992). An examination of the relationship between happiness, loneliness, and shyness in college-students. *Journal of College Student Development, 33*, 157-162.

Borkenau, P., & Liebler, A. (1995). Observable attributes as manifestations and cues of personality and intelligence. *Journal of Personality, 63*, 1-25. doi: 10.1111/j.1467-6494.1995.tb00799.x

Bower, G. H. (1992). How might emotions affect learning. In S.-A. Christianson (Ed.), *The handbook of emotion and memory: Research and theory* (pp. 3-31). Hillsdale, NJ: Erlbaum.

Brandtstädter, J. (1989). Personal self-regulation of development: Cross-sequential analyses of development-related control beliefs and emotions. *Developmental Psychology, 25*, 96-108.

Brandtstädter, J., & Greve, W. (1994). The aging self: Stabilizing and protective processes. *Developmental Review, 14*, 52-80. doi: 10.1006/drev.1994.1003

Brandtstädter, J., & Rothermund, K. (2002). The life-course dynamics of goal pursuit and goal adjustment: A two-process framework. *Developmental Review, 22,* 117-150. doi: 10.1006/drev.2001.0539

Brandtstädter, J., Wentura, D., & Rothermund, K. (1999). Intentional self-development through adulthood and later life: Tenacious pursuit and flexible adjustment of goals. In J. Brandtstädter & R. M. Lerner (Eds.), *Action & self-development: Theory and research through the life span.* (pp. 373-400). Thousand Oaks, CA, US: Sage Publications, Inc.

Branje, S. J. T., van Lieshout, C. F. M., & Gerris, J. R. M. (2007). Big Five personality development in adolescence and adulthood. *European Journal of Personality*, 45-62. doi: 10.1002/per.596

Brecht, B. (1983). Die unwürdige Greisin. In B. Brecht, *Kalendergeschichten* (pp. 92-97). Hamburg: Rowohlt. (Original work published 1949)

Brown, J. A., & Bernieri, F. (2017). Trait perception accuracy and acquaintance within groups: Tracking accuracy development. *Personality and Social Psychology Bulletin, 43*, 716-728. doi: 10.1177/0146167217695557

Bryson, A., & MacKerron, G. (2017). Are you happy while you work? *The Economic Journal, 127*, 106-125. doi: 10.1111/ecoj.12269

Burnette, J. L., O'Boyle, E. H., VanEpps, E. M., Pollack, J. M., & Finkel, E. J. (2013). Mind-sets matter: A meta-analytic review of implicit theories and self-regulation. *Psychological Bulletin, 139*, 655-701. doi: 10.1037/a0029531

Buss, D. M. (1987). Selection, evocation, and manipulation. *Journal of Personality and Social Psychology, 53*, 1214-1221.

Buss, D. M., & Craik, K. H. (1983). The act frequency approach to personality. *Psychological Review, 90*, 105-126. doi: 10.1037/0033-295X.90.2.105

Byrne, B. M., Shavelson, R. J., & Muthén, B. (1989). Testing for the equivalence of factor covariance and mean structures: The issue of partial measurement invariance. *Psychological Bulletin, 105*, 456-466. doi: 10.1037/0033-2909.105.3.456

Carver, C. S., & Scheier, M. F. (1998). *On the self-regulation of behavior*. New York: Cambridge University Press.

Carver, C. S., & Scheier, M. F. (1999). Themes and issues in the self-regulation of behavior. In R. S. Wyer (Ed.), *Perspectives on behavioral self-regulation: Advances in social cognition* (Vol. 12, pp. 1-106). Mahwah, NJ: Erlbaum.

Carver, C. S., & Scheier, M. F. (2003). Self-regulatory perspectives on personality. In T. Millon & J. Lerner (Eds.), *Handbook of psychology* (Vol. 5, pp. 185-208). New York: John Wiley.

Carver, C. S., & Scheier, M. F. (2014). Cognition, affect, and self-regulation. In M. S. Clark & S. T. Fiske (Eds.), *Affect and cognition: 17th annual carnegie mellon symposium on cognition* (pp. 167-194). New York: Psychology Press.

Carver, C. S., Scheier, M. F., & Segerstrom, S. C. (2010). Optimism. *Clinical Psychology Review, 30*, 879-889. doi: 10.1016/j.cpr.2010.01.006

Caspi, A., & Moffitt, T. E. (1993). When do individual differences matter? A paradoxical theory of personality coherence. *Psychological Inquiry, 4*, 247-271. doi: 10.1207/s15327965pli0404_1

Caspi, A., & Roberts, B. W. (2001). Personality development across the life course: The argument for change and continuity. *Psychological Inquiry, 12*, 49-66. doi: 10.1207/S15327965pli1202_01

Cattell, R. B. (1943). The description of personality: Basic traits resolved into clusters. *The Journal of Abnormal and Social Psychology, 38*, 476-506.

Cattell, R. B. (1946). *Description and measurement of personality*. Yonkers, NY: World Book.

Cervone, D. (2005). Personality architecture: Within-person structures and processes. *Annual Review of Psychology, 56*, 423-452. doi: 10.1146/annurev.psych.56.091103.070133

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling, 14*, 464-504. doi: 10.1080/10705510701301834

Cheng, H., & Furnham, A. (2002). Personality, peer relations, and self-confidence as predictors of happiness and loneliness. *Journal of Adolescence, 25*, 327-339. doi: 10.1006/yjado.475

Cheng, W., & Ickes, W. (2009). Conscientiousness and self-motivation as mutually compensatory predictors of university-level GPA. *Personality and Individual Differences, 47*, 817-822. doi: 10.1016/j.paid.2009.06.029

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*, 233-255. doi: 10.1207/S15328007SEM0902_5

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed. ed.). Mahwah: NJ: Erlbaum.

Colder, C. R., O'Connor, R. M., Read, J. P., Eiden, R. D., Lengua, L. J., Hawk Jr, L. W., & Wieczorek, W. F. (2014). Growth trajectories of alcohol information processing and associations with escalation of drinking in early adolescence. *Psychology of Addictive Behaviors, 28,* 659-670. doi: 10.1037/a0035271

Cooper, W. H., & Withey, M. J. (2009). The strong situation hypothesis. *Personality and Social Psychology Review, 13,* 62-72. doi: 10.1177/1088868308329378

Corr, P. J. (2004). Reinforcement sensitivity theory and personality. *Neuroscience & Biobehavioral Reviews, 28,* 317-332. doi: 10.1016/j.neubiorev.2004.01.005

Corr, P. J. (2008). *The reinforcement sensitivity theory of personality*. Cambridge, UK: Cambridge University Press.

Costa, P. T., Herbst, J. H., McCrae, R. R., & Siegler, I. C. (2000). Personality at midlife: Stability, intrinsic maturation, and response to life events. *Assessment, 7,* 365-378. doi: 10.1177/107319110000700405

Costa, P. T., & McCrae, R. R. (1985). *The NEO personality inventory: Manual, form S and form R*: Psychological Assessment Resources.

Costa, P. T., & McCrae, R. R. (1992). *Revised NEO personality inventory (NEO-PI-R) and NEO five-factor inventory (NEO-FFI): Professional manual*: Psychological Assessment Resources, Incorporated.

Costa, P. T., & McCrae, R. R. (1994). Set like plaster? Evidence for the stability of adult personality. In T. Heatherton & J. Weinberger (Eds.), *Can personality change?* (pp. 21-40). Washington, DC: American Psychological Association.

Cross, S., & Markus, H. (1991). Possible selves across the life span. *Human Development, 34*, 230-255. doi: 10.1159/000277058

Curtis, R. G., Windsor, T. D., & Soubelet, A. (2015). The relationship between Big-5 personality traits and cognitive ability in older adults – a review. *Aging, Neuropsychology, and Cognition*, *22*, 42-71. doi: 10.1080/13825585.2014.888392

Danish, S. J., Smyer, M. A., & Nowak, C. A. (1980). Developmental intervention: Enhancing life-event processes. In P. B. Baltes & O. G. Brim (Eds.), *Life-span development and behavior* (pp. 339-366). New York: Academic Press.

David, J. P., Green, P. J., Martin, R., & Suls, J. (1997). Differential roles of neuroticism, extraversion, and event desirability for mood in daily life: An integrative model of top-down and bottom-up influences. *Journal of Personality and Social Psychology, 73*, 149-159.

De Houwer, J. (2006). What are implicit measures and why are we using them. In R. W. Wiers & A. W. Stacy (Eds.), *The handbook of implicit cognition and addiction* (pp. 11-28). Thousand Oaks, CA: Sage.

De Houwer, J., Teige-Mocigemba, S., Spruyt, A., & Moors, A. (2009). Implicit measures: A normative analysis and review. *Psychological Bulletin, 135*, 347-368. doi: 10.1037/a0014211

Denissen, J. J. A., & Penke, L. (2008). Motivational individual reaction norms underlying the five-factor model of personality: First steps towards a theory-based conceptual framework. *Journal of Research in Personality, 42*, 1285-1302. doi: 10.1016/j.jrp.2008.04.002

Denissen, J. J. A., Ulferts, H., Lüdtke, O., Muck, P. M., & Gerstorf, D. (2014). Longitudinal transactions between personality and occupational roles: A large and heterogeneous study of job beginners, stayers, and changers. *Developmental Psychology, 50*, 1931-1942. doi: 10.1037/a0036994

Denissen, J. J. A., van Aken, M. A. G., Penke, L., & Wood, D. (2013). Self-regulation underlies temperament and personality: An integrative developmental framework. *Child Development Perspectives, 7*, 255-260. doi: 10.1111/Cdep.12050

Denissen, J. J. A., van Aken, M. A. G., & Roberts, B. W. (2011). Personality development across the life span. In T. Chamorro-Premuzic, A. Furnham & S. Von Stumm (Eds.), *The Wiley-Blackwell handbook of individual differences* (pp. 75-100). Oxford: Wiley-Blackwell.

DeYoung, C. G. (2015). Cybernetic Big Five theory. *Journal of Research in Personality, 56*, 33-58. doi: 10.1016/j.jrp.2014.07.004

DeYoung, C. G., Quilty, L. C., & Peterson, J. B. (2007). Between facets and domains: 10 aspects of the Big Five. *Journal of Personality and Social Psychology, 93*, 880-896.

Dickson, L. (2010). Race and gender differences in college major choice. *The ANNALS of the American Academy of Political and Social Science, 627*, 108-124. doi: 10.1177/0002716209348747

Diener, E., & Diener, M. (1995). Cross-cultural correlates of life satisfaction and self-esteem. *Journal of Personality and Social Psychology, 68*, 653-663. doi: 10.1037/0022-3514.68.4.653

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*, 71-75. doi: 10.1207/s15327752jpa4901_13

Diener, E., Larsen, R. J., & Emmons, R. A. (1984). Person× situation interactions: Choice of situations and congruence response models. *Journal of Personality and Social Psychology, 47*, 580-592. doi: 10.1037/0022-3514.47.3.580

Donnellan, M. B., Trzesniewski, K. H., & Robins, R. W. (2011). Self-esteem. In T. Chamorro-Premuzic, S. von Stumm & A. Furnham (Eds.), *The Wiley-Blackwell handbook of individual differences* (pp. 718-746). Oxford, UK: Wiley-Blackwell.

Döring, N., & Bortz, J. (1993). Psychometrische Einsamkeitsforschung: Deutsche Neukonstruktion der UCLA loneliness scale [psychometric loneliness research: A new german version of the UCLA loneliness scale]. *Diagnostica, 39*, 224-239.

Duncan, T. E., Duncan, S. C., & Strycker, L. A. (2006). *An introduction to latent variable growth curve modeling: Concepts, issues, and application (2nd ed.)*. Mahwah, NJ: Lawrence Erlbaum Associates.

Dunlop, P. D., Telford, A. D., & Morrison, D. L. (2012). Not too little, but not too much: The perceived desirability of responses to personality items. *Journal of Research in Personality, 46*, 8-18. doi: 10.1016/j.jrp.2011.10.004

Durbin, C. E., & Hicks, B. M. (2014). Personality and psychopathology: A stagnant field in need of development. *European Journal of Personality, 28*, 362-386. doi: 10.1002/per.1962

Dweck, C. S. (1999). *Self-theories: Their role in personality, motivation, and development*. Philadelphia: Psychology Press.

Dweck, C. S. (2008). Can personality be changed? The role of beliefs in personality and change. *Current Directions in Psychological Science*, *17*, 391-394. doi: 10.1111/j.1467-8721.2008.00612.x

Dweck, C. S. (2017). From needs to goals and representations: Foundations for a unified theory of motivation, personality, and development. *Psychological Review, 124*, 689-719.

Dweck, C. S., Chiu, C. Y., & Hong, Y. Y. (1995). Implicit theories and their role in judgments and reactions - a world from 2 perspectives. *Psychological Inquiry*, *6*, 267-285. doi: 10.1207/s15327965pli0604_1

Eccles, J. (2009). Who am I and what am I going to do with my life? Personal and collective identities as motivators of action. *Educational Psychologist, 44*, 78-89. doi: 10.1080/00461520902832368

Eccles, J., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., & Meece, J. L. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motives* (pp. 75-146). San Francisco: W. H. Freeman.

Edwards, J. R. (1994). The study of congruence in organizational-behavior research - critique and a proposed alternative. *Organizational Behavior and Human Decision Processes, 58,* 51-100. doi: 10.1006/obhd.1994.1029

Edwards, J. R. (2001). Ten difference score myths. *Organizational Research Methods, 4*, 265-287. doi: 10.1177/109442810143005

Edwards, J. R., & Parry, M. E. (1993). On the use of polynomial regression equations as an alternative to difference scores in organizational research. *Academy of Management Journal, 36*, 1577-1613. doi: 10.2307/256822

Egloff, B., & Schmukle, S. C. (2002). Predictive validity of an implicit association test for assessing anxiety. *Journal of Personality and Social Psychology, 83,* 1441-1455.

Egloff, B., Schwerdtfeger, A., & Schmukle, S. C. (2005). Temporal stability of the implicit association test-anxiety. *Journal of Personality Assessment, 84*, 82-88. doi: 10.1207/s15327752jpa8401_14

Egloff, B., Weck, F., & Schmukle, S. C. (2008). Thinking about anxiety moderates the relationship between implicit and explicit anxiety measures. *Journal of Research in Personality, 42*, 771-778. doi: 10.1016/j.jrp.2007.08.005

Eid, M., Schneider, C., & Schwenkmezger, P. (1999). Do you feel better or worse? The validity of perceived deviations of mood states from mood traits. *European Journal of Personality, 13*, 283-306. doi: 10.1002/(SICI)1099-0984(199907/08)13:4<283::AID-PER341>3.0.CO;2-0

Elgersma, H. J., Glashouwer, K. A., Bockting, C. L., Penninx, B. W., & de Jong, P. J. (2013). Hidden scars in depression? Implicit and explicit self-associations following recurrent depressive episodes. *Journal of Abnormal Psychology, 122*, 951-960. doi: 10.1037/a0034933

Emmons, R. A. (1986). Personal strivings: An approach to personality and subjective well-being. *Journal of Personality and Social psychology, 51*, 1058-1068.

Emmons, R. A. (1992). Abstract versus concrete goals: Personal striving level, physical illness, and psychological well-being. *Journal of Personality and Social Psychology, 62*, 292-300. doi: 10.1037/0022-3514.62.2.292.

Emmons, R. A. (1996). Striving and feeling: Personal goals and subjective well-being *The psychology of action: Linking cognition and motivation to behavior.* (pp. 313-337). New York, NY, US: Guilford Press.

Emmons, R. A., Diener, E., & Larsen, R. J. (1986). Choice and avoidance of everyday situations and affect congruence: Two models of reciprocal interactionism. *Journal of Personality and Social Psychology, 51*, 815-826.

Enders, C. K. (2010). *Applied missing data analysis*. New York: Guilford Press.

Epstein, S. (1979). The stability of behavior: On predicting most of the people much of the time. *Journal of Personality and Social Psychology, 37*, 1097-1126. doi: 10.1037/0022-3514.37.7.1097

Ernst, J. M., & Cacioppo, J. T. (1999). Lonely hearts: Psychological perspectives on loneliness. *Applied & Preventive Psychology, 8*, 1-22. doi: 10.1016/S0962-1849(99)80008-0

Ferring, D., & Filipp, S. H. (1996). Measurement of self-esteem: Findings on reliability, validity, and stability of the rosenberg scale. *Diagnostica, 42*, 284-292.

Ferring, D., Filipp, S. H., & Schmidt, K. (1996). Die „Skala zur Lebensbewertung“: Empirische Skalenkonstruktion und erste Befunde zu Reliabilität, Stabilität und Validität [the life satisfaction scale: Construction and findings on reliability, stability, and validity]. *Zeitschrift für Differentielle und Diagnostische Psychologie, 17*, 141-153.

Field, A. P., Lawson, J., & Banerjee, R. (2008). The verbal threat information pathway to fear in children: The longitudinal effects on fear cognitions and the immediate effects on avoidance behavior. *Journal of Abnormal Psychology, 117*, 214-224. doi: 10.1037/0021-843x.117.1.214

Finn, C., Mitte, K., & Neyer, F. J. (2015). Recent decreases in specific interpretation biases predict decreases in neuroticism: Evidence from a longitudinal study with young adult couples. *Journal of Personality, 83*, 274-286. doi: 10.1111/jopy.12102

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Fleenor, J. W., Smither, J. W., Atwater, L. E., Braddy, P. W., & Sturm, R. E. (2010). Self-other rating agreement in leadership a review. *Leadership Quarterly, 21*, 1005-1034. doi: 10.1016/j.leaqua.2010.10.006

Fleeson, W. (2001). Toward a structure-and process-integrated view of personality: Traits as density distributions of states. *Journal of Personality and Social Psychology, 80*, 1011-1027. doi: 10.1037/0022-3514.80.6.1011

Fleeson, W. (2007). Situation-based contingencies underlying trait-content manifestation in behavior. *Journal of Personality, 75*, 825-862. doi: 10.1111/j.1467-6494.2007.00458.x

Fleeson, W., & Gallagher, P. (2009). The implications of Big Five standing for the distribution of trait manifestation in behavior: Fifteen experience-sampling studies and a meta-analysis. *Journal of Personality and Social Psychology, 97*, 1097-1114. doi: 10.1037/a0016786

Fleeson, W., & Jayawickreme, E. (2015). Whole trait theory. *Journal of Research in Personality, 56*, 82-92. doi: 10.1016/j.jrp.2014.10.009

Fleeson, W., & Jolley, S. (2006). A proposed theory of the adult development of intraindividual variability in trait-manifesting behavior. In D. K. Mroczek & T. D. Little (Eds.), *Handbook of personality development* Mahwah: NJ, US: Lawrence Erlbaum Associates Publishers.

Fleeson, W., Malanos, A. B., & Achille, N. M. (2002). An intraindividual process approach to the relationship between extraversion and positive affect: Is acting extraverted as" good" as being extraverted? *Journal of Personality and Social Psychology, 83*, 1409-1422. doi: 10.1037/0022-3514.83.6.1409

Freund, A. M., & Baltes, P. B. (2000). The orchestration of selection, optimization and compensation: An action-theoretical conceptualization of a theory of developmental regulation. In W. J. Perrig & A. Grob (Eds.), *Control of human behavior, mental processes, and consciousness: Essays in honor of the 60th birthday of August Flammer* (pp. 35-58). Hillsdale, NJ: Erlbaum.

Fridhandler, B. M. (1986). Conceptual note on state, trait, and the state–trait distinction. *Journal of Personality and Social Psychology, 50*, 169-174. doi: 10.1037/0022-3514.50.1.169

Funder, D. C. (1995). On the accuracy of personality judgment: A realistic approach. *Psychological Review, 102*, 652-670. doi: 10.1037/0033-295X.102.4.652

Funder, D. C. (2012). Accurate personality judgment. *Current Directions in Psychological Science, 21*, 177-182. doi: 10.1177/0963721412445309

Gallagher, P., Fleeson, W., & Hoyle, R. H. (2011). A self-regulatory mechanism for personality trait stability:Contra-trait effort. *Social Psychological and Personality Science, 2*, 335-342. doi: 10.1177/1948550610390701

Gardner, J., & Oswald, A. (2001). Does money buy happiness? A longitudinal study using data on windfalls: mimeo, Warwick University.

Gawronski, B., & Bodenhausen, G. V. (2006). Associative and propositional processes in evaluation: An integrative review of implicit and explicit attitude change. *Psychological Bulletin, 132*, 692-731. doi: 10.1037/0033-2909.132.5.692

Gawronski, B., & LeBel, E. P. (2008). Understanding patterns of attitude change: When implicit measures show change, but explicit measures do not. *Journal of Experimental Social Psychology, 44*, 1355-1361. doi: 10.1016/j.jesp.2008.04.005

Geiser, C. (2011). *Datenanalyse mit MPLUS [data analysis with MPLUS: An application-oriented introduction]*. Berlin: Springer.

Geiser, C., & Lockhart, G. (2012). A comparison of four approaches to account for method effects in latent state-trait analyses. *Psychological Methods, 17*, 255-283. doi: 10.1037/a0026977

Gerlitz, J.-Y., & Schupp, J. (2005). Zur Erhebung der Big-Five-basierten Persoenlichkeitsmerkmale im SOEP [the measurement of the Big Five personality traits in the SOEP]. *DIW Research Notes, 4*, 2005.

Gerstorf, D., Ram, N., Goebel, J., Schupp, J., Lindenberger, U., & Wagner, G. G. (2010). Where people live and die makes a difference: Individual and geographic disparities in well-being progression at the end of life. *Psychology and Aging, 25*, 661-676. doi: 10.1037/a0019574

Geukes, K., van Zalk, M. H., & Back, M. D. (2017). Analyzing processes in personality development. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 455-472). San Diego, CA: Elsevier.

Glaesmer, H., Hoyer, J., Klotsche, J., & Herzberg, P. Y. (2008). The German version of the life-orientation-test (LOT-R) for dispositional optimism and pessimism. *Zeitschrift für Gesundheitspsychologie, 16*, 26-31. doi: 10.1026/0943-8149.16.1.26

Glenn, C. R., Kleiman, E. M., Cha, C. B., Nock, M. K., & Prinstein, M. J. (2016). Implicit cognition about self-injury predicts actual self-injurious behavior: Results from a longitudinal study of adolescents. *Journal of Child Psychology and Psychiatry, 57*, 805-813. doi: 10.1111/jcpp.12500

Goethe, J. W. von (1986). *Wilhelm Meisters Lehrjahre.* Stuttgart: Reclam. (Original work published 1796)

Goldberg, L. R. (1990). An alternative" description of personality": The Big-Five factor structure. *Journal of Personality and Social Psychology, 59*, 1216-1229. doi: 1037/0022-3514.59.6.1216

Goldberg, L. R. (1993). The structure of phenotypic personality-traits. *American Psychologist, 48*, 26-34. doi: 10.1037//0003-066x.48.1.26

Göllner, R., Roberts, B. W., Damian, R. I., Lüdtke, O., Jonkmann, K., & Trautwein, U. (2017). Whose “storm and stress” is it? Parent and child reports of personality development in the transition to early adolescence. *Journal of Personality, 85*, 376-387. doi: 10.1111/jopy.12246

Gollwitzer, P. M. (1987). The implementation of identity intentions: A motivational-volitional perspective on symbolic self-completion. In F. Halisch & J. Kuhl (Eds.), *Motivation, intention, and volition* (pp. 349-369). Berlin, Heidelberg: Springer Berlin Heidelberg.

Gollwitzer, P. M. (1990). Action phases and mind-sets. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition* (pp. 53-92). New York: Guilford.

Gollwitzer, P. M. (1996). The volitional benefits of planning. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 287-312). New York: Guilford Press.

Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist*, *54*, 493–503. doi: 10.1037/0003-066X.54.7.493.

Gollwitzer, P. M., & Brandstätter, V. (1997). Implementation intentions and effective goal pursuit. *Journal of Personality and Social Psychology, 73*, 186-199.

Gollwitzer, P. M., & Moskowitz, G. B. (1996). Goal effects on action and cognition. In E. Tory (Ed.), *Social psychology : Handbook of basic principles*. New York: Guilford.

Gollwitzer, P. M., & Oettingen, G. (2012). Goal pursuit. In R. M. Ryan (Ed.), *The oxford handbook of human motivation* (pp. 208-231). New York: Oxford University Press.

Gollwitzer, P. M., & Schaal, B. (1998). Metacognition in action: The importance of implementation intentions. *Personality and Social Psychology Review, 2*, 124-136. doi: 10.1207/s15327957pspr0202_5

Grant, A. M., Franklin, J., & Langford, P. (2002). The self-reflection and insight scale: A new measure of private self-consciousness. *Social Behavior and Personality: An International Journal*, *30*, 821-835. doi: 10.2224/sbp.2002.30.8.821

Grass, G. (1994). *Die Blechtrommel* (V. Neuhaus Ed.). München: Artemis und Winkler. (Original work published 1959)

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review, 102*, 4-27.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74*, 1464-1480. doi: 10.1037/0022-3514.74.6.1464

Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the implicit association test: An improved scoring algorithm. *Journal of Personality and Social Psychology*, *85*, 197-216.

Hardin, E. E., & Larsen, J. T. (2014). Distinct sources of self-discrepancies: Effects of being who you want to be and wanting to be who you are on well-being. *Emotion, 14*, 214-226. doi: 10.1037/a0033893

Harris, C., Daniels, K., & Briner, R. (2003). A daily diary study of goals and affective well-being at work. *Journal of Occupational and Organizational Psychology, 76*, 401-410. doi: 10.1348/096317903769647256

Harris, K., & Vazire, S. (2016). On friendship development and the Big Five personality traits. *Social and Personality Psychology Compass, 10*, 647-667. doi: 10.1111/spc3.12287

Hartup, W. W., & Van Lieshout, C. F. (1995). Personality development in social context. *Annual Review of Psychology, 46*, 655-687.

Havighurst, R. J. (1953). *Human development and education*. London, England: Longman.

Havighurst, R. J. (1967). *Development tasks and education* (2nd ed. ed.). New York: McKay.

Heckhausen, H. (1977). Achievement motivation and its constructs: A cognitive model. *Motivation and Emotion, 1*, 283-329. doi: 10.1007/bf00992538

Heckhausen, H. (1991). *Motivation and action*. Berlin, Germany: Springer.

Heckhausen, J. (2000). *Motivational psychology of human development: Developing motivation and motivating development*. Amsterdam, The Netherlands: Elsevier.

Heckhausen, J., Wrosch, C., & Schulz, R. (2010). A motivational theory of life-span development. *Psychological Review, 117*, 32-60. doi: 10.1037/a0017668

Hedges, L. V., & Hedberg, E. C. (2007). Intraclass correlation values for planning group-randomized trials in education. *Educational Evaluation and Policy Analysis, 29*, 60-87. doi: 10.3102/0162373707299706

Heller, D., Komar, J., & Lee, W. B. (2007). The dynamics of personality states, goals, and well-being. *Personality and Social Psychology Bulletin, 33*, 898-910. doi: 10.1177/0146167207301010

Helson, R., Mitchell, V., & Moane, G. (1984). Personality and patterns of adherence and nonadherence to the social clock. *Journal of Personality and Social Psychology, 46*, 1079-1096. doi: 10.1037/0022-3514.46.5.1079

Hennecke, M., Bleidorn, W., Denissen, J. J. A., & Wood, D. (2014). A three-part framework for self-regulated personality development across adulthood. *European Journal of Personality, 28*, 289-299. doi: 10.1002/Per.1945

Hennecke, M., & Freund, A. M. (2017). The development of goals and motivation. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 257-273). San Diego, CA: Elsevier.

Hertzog, C., Kramer, A. F., Wilson, R. S., & Lindenberger, U. (2008). Enrichment effects on adult cognitive development: Can the functional capacity of older adults be preserved and enhanced? *Psychological Science in the Public Interest, 9*, 1-65. doi: 10.1111/j.1539-6053.2009.01034.x

Hesse, H. (1974): *Demian, Die Geschichte von Emil Sinclairs Jugend*. Frankfurt am Main, Suhrkamp. (Original work published 1919)

Higgins, E. T. (1987). Self-discrepancy - A theory relating self and affect. *Psychological Review, 94*, 319-340. doi: 10.1037//0033-295x.94.3.319

Higgins, E. T. (1996a). Affect und motivation from distinct pains and pleasures. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 91-114). New York: Guilford Press.

Higgins, E. T. (1996b). Knowledge activation: Accessibility, applicability, and salience. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 133-168). New York: NY: Guilford Press.

Higgins, E. T., & Tykocinski, O. (1992). Seff-discrepancies and biographical memory: Personality and cognition at the level of psychological situation. *Personality and Social Psychology Bulletin, 18*, 527-535. doi: 10.1177/0146167292185002

Hinsch, R., & Pfingsten, U. (2007). *Gruppentraining sozialer Kompetenzen GSK; Grundlagen, Durchführung, Anwendungsbeispiele [group training on social competencies: GSK]* (Vol. 5). Weinheim, Basel: Beltz, PVU.

Hirschmüller, S., Egloff, B., Nestler, S., & Back, M. D. (2013). The dual lens model: A comprehensive framework for understanding self–other agreement of personality judgments at zero acquaintance. *Journal of Personality and Social Psychology, 104*, 335-353. doi: 10.1037/a0030383

Hirst, M. K. (1988). Intrinsic motivation as influenced by task interdependence and goal setting. *Journal of Applied Psychology, 73*, 96-101. doi: 10.1037/0021-9010.73.1.96

Hofmann, W., Gawronski, B., Gschwendner, T., Le, H., & Schmitt, M. (2005a). A meta-analysis on the correlation between the implicit association test and explicit self-report measures. *Personality and Social Psychology Bulletin, 31*, 1369-1385. doi: 10.1177/0146167205275613

Hofmann, W., Gschwendner, T., & Schmitt, M. (2005b). On implicit–explicit consistency: The moderating role of individual differences in awareness and adjustment. *European Journal of Personality, 19*, 25-49. doi: 10.1002/per.537

Hollenbeck, J. R., & Klein, H. J. (1987). Goal commitment and the goal-setting process: Problems, prospects, and proposals for future research. *Journal of Applied Psychology, 72*, 212-220.

Hollenbeck, J. R., & Williams, C. R. (1987). Goal importance, self-focus, and the goal-setting process. *Journal of Applied Psychology, 72*, 204-211. doi: 10.1037/0021-9010.72.2.204

Hollenbeck, J. R., Williams, C. R., & Klein, H. J. (1989). An empirical examination of the antecedents of commitment to difficult goals. *Journal of Applied Psychology, 74*, 18-23.

Hooker, K., & McAdams, D. P. (2003). Personality reconsidered: A new agenda for aging research. *Journals of Gerontology Series B-Psychological Sciences and Social Sciences, 58*, 296-304. doi: 10.1093/geronb/58.6.P296

Hopson, B., & Adams, J. (1976). Towards an understanding of transition: Defining some boundaries of transition dynamics. In A. J. Hayes & B. Hopson (Eds.), *Transition: Understanding and managing personal change* (pp. 3-25). London, England: Martin Robertson.

Hopwood, C. J., Newman, D. A., Donnellan, M. B., Markowitz, J. C., Grilo, C. M., Sanislow, C. A., . . . Shea, M. T. (2009). The stability of personality traits in individuals with borderline personality disorder. *Journal of Abnormal Psychology, 118*, 806-815. doi: 10.1037/a0016954

Horn, J. L., & McArdle, J. J. (1992). A practical and theoretical guide to measurement invariance in aging research. *Experimental Aging Research, 18*, 117-144. doi: 10.1080/03610739208253916

Hoyle, R. H., & Sherrill, M. R. (2006). Future orientation in the self-system: Possible selves, self-regulation, and behavior. *Journal of Personality, 74*, 1673-1696. doi: 10.1111/j.1467-6494.2006.00424.x

Hu, L. t., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*, 1-55. doi: 10.1080/10705519909540118

Huber, V. L. (1985). Effects of task difficulty, goal setting, and strategy on performance of a heuristic task. *Journal of Applied Psychology, 70*, 492-504.

Hudson, N. W., & Fraley, R. C. (2015). Volitional personality trait change: Can people choose to change their personality traits? *Journal of Personality and Social Psychology, 109*, 490-507. doi: 10.1016/j.jrp.2014.08.008

Hudson, N. W., & Fraley, R. C. (2016a). Changing for the better? Longitudinal associations between volitional personality change and psychological well-being. *Personality and Social Psychology Bulletin, 42*, 603-615. doi: 10.1177/0146167216637840

Hudson, N. W., & Fraley, R. C. (2016b). Do people's desires to change their personality traits vary with age? An examination of trait change goals across adulthood. *Social Psychological and Personality Science, 7*, 847-856. doi: 10.1177/1948550616657598

Hudson, N. W., & Fraley, R. C. (2017). Volitional personality change. In J. Specht (Ed.), *Personality development across the lifespan*. San Diego, CA: Elsevier.

Hudson, N. W., & Roberts, B. W. (2014). Goals to change personality traits: Concurrent links between personality traits, daily behavior, and goals to change oneself. *Journal of Research in Personality, 53*, 68-83. doi: 10.1016/j.jrp.2014.08.008

Hudson, N. W., & Roberts, B. W. (2016). Social investment in work reliably predicts change in conscientiousness and agreeableness: A direct replication and extension of Hudson, Roberts, and Lodi-Smith (2012). *Journal of Research in Personality, 60*, 12-23. doi: 10.1016/j.jrp.2015.09.004

Hudson, N. W., Roberts, B. W., & Lodi-Smith, J. (2012). Personality trait development and social investment in work. *Journal of Research in Personality, 46*, 334-344. doi: 10.1016/j.jrp.2012.03.002

Hummert, M. L., Garstka, T. A., O'Brien, L. T., Greenwald, A. G., & Mellott, D. S. (2002). Using the implicit association test to measure age differences in implicit social cognitions. *Psychology and Aging, 17*, 482-495. doi: 10.1037//0882-7974.17.3.482

Hutteman, R., Hennecke, M., Orth, U., Reitz, A. K., & Specht, J. (2014). Developmental tasks as a framework to study personality development in adulthood and old age. *European Journal of Personality, 28*, 267-278. doi: 10.1002/Per.1959

Hutteman, R., Nestler, S., Wagner, J., Egloff, B., & Back, M. D. (2015). Wherever i may roam: Processes of self-esteem development from adolescence to emerging adulthood in the context of international student exchange. *Journal of Personality and Social Psychology, 108*, 767-783. doi: 10.1037/pspp0000015

Jackson, J. J., & Allemand, M. (2014). Moving personality development research forward: Applications using structural equation models. *European Journal of Personality, 28*, 300-310. doi: 10.1002/per.1964

Jackson, J. J., Hill, P. L., Payne, B. R., Roberts, B. W., & Stine-Morrow, E. A. (2012). Can an old dog learn (and want to experience) new tricks? Cognitive training increases openness to experience in older adults. *Psychology and Aging, 27*, 286-292.

Jacobson, L., Lalonde, R. J., & Sullivan, D. (2005). The impact of community college retraining on older displaced workers: Should we teach old dogs new tricks? *ILR Review, 58*, 398-415. doi: 10.1177/001979390505800305

Jensen-Campbell, L. A., Knack, J. M., Waldrip, A. M., & Campbell, S. D. (2007). Do Big Five personality traits associated with self-control influence the regulation of anger and aggression? *Journal of Research in Personality, 41*, 403-424. doi: 10.1016/j.jrp.2006.05.001

John, O. P., Naumann, L. P., & Soto, C. J. (2008). Paradigm shift to the integrative Big Five trait taxonomy: History, measurement, and conceptual issues. In O. P. John, R. W. Robins & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (Vol. 3, pp. 114-158). New York: The Guilford Press.

John, O. P., & Robins, R. W. (1993). Determinants of interjudge agreement on personality-traits - the Big 5 domains, observability, evaluativeness, and the unique perspective of the self. *Journal of Personality, 61*, 521-551. doi: 10.1111/j.1467-6494.1993.tb00781.x

John, O. P., & Robins, R. W. (1994). Accuracy and bias in self-perception: Individual differences in self-enhancement and the role of narcissism. *Journal of Personality and Social Psychology, 66*, 206-219. doi: 10.1037/0022-3514.66.1.206

John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 102-138). New York: Guilford Press.

Judge, T. A., Bono, J. E., Erez, A., & Locke, E. A. (2005). Core self-evaluations and job and life satisfaction: The role of self-concordance and goal attainment. *Journal of Applied Psychology, 90*, 257-268. doi: 10.1037/0021-9010.90.2.257

Kahneman, D., Krueger, A. B., Schkade, D. A., Schwarz, N., & Stone, A. A. (2004). A survey method for characterizing daily life experience: The day reconstruction method. *Science, 306*, 1776-1780. doi: 10.1126/science.1103572

Kandler, C., Bleidorn, W., Riemann, R., Angleitner, A., & Spinath, F. M. (2012). Life events as environmental states and genetic traits and the role of personality: A longitudinal twin study. *Behavior Genetics, 42*, 57-72. doi: 10.1007/s10519-011-9491-0

Kandler, C., Kornadt, A. E., Hagemeyer, B., & Neyer, F. J. (2015). Patterns and sources of personality development in old age. *Journal of Personality and Social Psychology, 109*, 175-191. doi: 10.1037/pspp0000028

Kandler, C., Zimmermann, J., & McAdams, D. P. (2014). Core and surface characteristics for the description and theory of personality differences and development. *European Journal of Personality, 28,* 231-243. doi: 10.1002/Per.1952

Kanfer, F. H., & Grimm, L. G. (1977). Behavioral analysis: Selecting target behaviors in the interview. *Behavior Modification, 1*, 7-28.

Kanfer, F. H., & Phillips, J. S. (1970). *Learning foundations of behavior therapy*. New York: NY: John Wiley.

Keller, G. (2008). *Der grüne Heinrich* (U. Kittstein Ed.). Stuttgart: Reclam. (Original work published 1854/55)

Kiecolt, K. J. (1994). Stress and the decision to change oneself - a theoretical-model. *Social Psychology Quarterly, 57*, 49-63. doi: 10.2307/2786974

Kiecolt, K. J., & Mabry, J. B. (2000). Agency in young adulthood: Intentional self-change among college students. *Advances in Life Course Research, 5,* 181-205. doi: 10.1016/S1040-2608(00)80012-X

King, L. A., & Hicks, J. A. (2007). Lost and found possible selves: Goals, development, and well-being. *New directions for adult and continuing education, 2007,* 27-37. doi: 10.1002/ace.254

Kline, R. B. (2005). *Principles and practice of structural equation modeling*. New York: Guilford.

Klinger, E. (1977). *Meaning and void: Inner experience and the incentives in peoples lives*. Minneapolis: University of Minnesota Press.

Koepke, S., & Denissen, J. J. A. (2012). Dynamics of identity development and separation–individuation in parent–child relationships during adolescence and emerging adulthood – a conceptual integration. *Developmental Review, 32*, 67-88. doi: 10.1016/j.dr.2012.01.001

Kovaleva, A., Beierlein, C., Kemper, C. J., & Rammstedt, B. (2012). *Eine Kurzskala zur Messung von Kontrollüberzeugung: Die Skala internale-externale-Kontrollüberzeugung-4 (IE-4) [a short scale for assessing control beliefs: The scale internal-external control beliefs-4 (IE-4)]. Gesis working papers 2012|19.* Köln: GESIS.

Kuncel, N. R., & Tellegen, A. (2009). A conceptual and empirical reexamination of the measurement of the social desirability of items: Implications for detecting desirable response style and scale development. *Personnel Psychology, 62,* 201-228. doi: 10.1111/j.1744-6570.2009.01136.x

Kwan, V. S. Y., John, O. P., Kenny, D. A., Bond, M. H., & Robins, R. W. (2004). Reconceptualizing individual differences in self-enhancement bias: An interpersonal approach. *Psychological Review, 111*, 94-110. doi: 10.1037/0033-295X.111.1.94

Lang, F. R., Lüdtke, O., & Asendorpf, J. B. (2001). Validity and psychometric equivalence of the German version of the Big Five inventory in young, middle-aged and old adults. *Diagnostica, 47*, 111-121. doi: 10.1026//0012-1924.47.3.111

Latham, G. P., & Locke, E. A. (1991). Self-regulation through goal setting. *Organizational Behavior and Human Decision Processes, 50*, 212-247. doi: 10.1016/0749-5978(91)90021-K

Lazarus, R. S. (1991). *Emotion and adaptation*. London: Oxford University Press.

Lazarus, R. S. (1999). *Stress and emotion: A new synthesis*. New York, NY: Springer.

Leary, M. R., Twenge, J. M., & Quinlivan, E. (2006). Interpersonal rejection as a determinant of anger and aggression. *Personality and Social Psychology Review, 10*, 111-132. doi: 10.1207/s15327957pspr1002_2

Lehnart, J., Neyer, F. J., & Eccles, J. (2010). Long-term effects of social investment: The case of partnering in young adulthood. *Journal of Personality, 78*, 639-670. doi: 10.1111/j.1467-6494.2010.00629.x

Lerner, R. M., & Busch-Rossnagel, N. A. (1981). *Individuals as producers of their development: A life-span perspective*. New York: Academic Press.

Levinson, D. J. (1978). *The seasons of a man's life*. New York: Ballantine.

Levinson, D. J. (1986). A conception of adult development. *American Psychologist, 41*, 3-13.

Lewin, K. (1934). Der Richtungsbegriff in der Psychologie. *Psychologische Forschung, 19*, 249-299.

Lewin, K. (1943). Defining the 'field at a given time.'. *Psychological Review, 50*, 292-310. doi: 10.1037/h0062738

Little, B. R. (1983). Personal projects: A rationale and method for investigation. *Environment and Behavior, 15*, 273-309. doi: 10.1177/0013916583153002

Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association, 83*, 1198-1202. doi: 10.1080/01621459.1988.10478722

Little, T. D., Cunningham, W. A., Shahar, G., & Widaman, K. F. (2002). To parcel or not to parcel: Exploring the question, weighing the merits. *Structural Equation Modeling, 9*, 151-173. doi: 10.1207/S15328007sem0902_1

Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting & task performance*. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist, 57*, 705-717. doi: 10.1037/0003-066X.57.9.705

Locke, E. A., & Latham, G. P. (2006). New directions in goal-setting theory. *Current Directions in Psychological Science, 15*, 265-268. doi: 10.1111/j.1467-8721.2006.00449.x

Löckenhoff, C. E., Terracciano, A., & Costa, P. T. (2009). Five-factor model personality traits and the retirement transition: Longitudinal and cross-sectional associations. *Psychology and Aging, 24*, 722-728. doi: 10.1037/a0015121

Lodi-Smith, J., & Roberts, B. W. (2007). Social investment and personality: A meta-analysis of the relationship of personality traits to investment in work, family, religion, and volunteerism. *Personality and Social Psychology Review, 11*, 68-86. doi: 10.1177/1088868306294590

London, M., & Smither, J. W. (1995). Can multi-source feedback change perceptions of goal accomplishment self-evaluations, and performance-related outcomes? Theory-based applications and directions for research. *Personnel Psychology, 48*, 803-839. doi: 10.1111/j.1744-6570.1995.tb01782.x

Luan, Z., Hutteman, R., Denissen, J. J. A., Asendorpf, J. B., & van Aken, M. A. G. (2017). Do you see my growth? Two longitudinal studies on personality development from childhood to young adulthood from multiple perspectives. *Journal of Research in Personality, 67*, 44-60. doi: 10.1016/j.jrp.2016.03.004

Lucas, R. E., & Donnellan, M. B. (2011). Personality development across the life span: Longitudinal analyses with a national sample from germany. *Journal of Personality and Social Psychology, 101*, 847-861. doi: 10.1037/a0024298

Lüdtke, O., Roberts, B. W., Trautwein, U., & Nagy, G. (2011). A random walk down university avenue: Life paths, life events, and personality trait change at the transition to university life. *Journal of Personality and Social Psychology, 101*, 620-637. doi: 10.1037/A0023743

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. doi: 10.1037/a0015809

Luhmann, M., Hofmann, W., Eid, M., & Lucas, R. E. (2012). Subjective well-being and adaptation to life events: A meta-analysis. *Journal of Personality and Social Psychology, 102*, 592-615.

Luhmann, M., Orth, U., Specht, J., Kandler, C., & Lucas, R. E. (2014). Studying changes in life circumstances and personality: It's about time. *European Journal of Personality, 28*, 256-266. doi: 10.1002/Per.1951

Magidson, J. F., Roberts, B. W., Collado-Rodriguez, A., & Lejuez, C. W. (2014). Theory-driven intervention for changing personality: Expectancy value theory, behavioral activation, and conscientiousness. *Developmental Psychology, 50*, 1442-1450. doi: 10.1037/A0030583

Maier, G. W., & Brunstein, J. C. (2001). The role of personal work goals in newcomers' job satisfaction and organizational commitment: A longitudinal analysis. *Journal of Applied Psychology, 86*, 1034-1042. doi: 10.1037/0021-9010.86.5.1034

Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist, 41*, 954-969.

Marsh, H. W., Wen, Z., & Hau, K.-T. (2004). Structural equation models of latent interactions: Evaluation of alternative estimation strategies and indicator construction. *Psychological Methods, 9*, 275-300.

Martin, L. S., Oades, L. G., & Caputi, P. (2014). Intentional personality change coaching: A randomised controlled trial of participant selected personality facet change using the five-factor model of personality. *International Coaching Psychology Review, 9*, 196-209.

Masicampo, E. J., & Baumeister, R. F. (2011). Consider it done! Plan making can eliminate the cognitive effects of unfulfilled goals. *Journal of Personality and Social Psychology, 101*, 667-683. doi: 10.1037/a0024192

Mayer, J. D. (2004). How does psychotherapy influence personality? A theoretical integration. *Journal of Clinical Psychology, 60*, 1291-1315. doi: 10.1002/jclp.20076

McAdams, D. P., & Olson, B. D. (2010). Personality development: Continuity and change over the life course. *Annual Review of Psychology, 61*, 517-542. doi: 10.1146/annurev.psych.093008.100507

McAdams, D. P., & Pals, J. L. (2006). A new Big Five: Fundamental principles for an integrative science of personality. *American Psychologist, 61*, 204-217.

McArdle, J. J. (1988). Dynamic but structural equation modeling of repeated measures data. In J. R. Nesselroade & R. B. Cattell (Eds.), *Handbook of multivariate experimental psychology* (2nd ed., pp. 561-614). New York: Plenum.

McArdle, J. J., & Hamagami, F. (2001). Latent difference score structural models for linear dynamic analyses with incomplete longitudinal data. In L. M. Collins & A. G. Sayer (Eds.), *New methods for the analysis of change* (pp. 139-175). Washington, DC: American Psychological Association.

McArdle, J. J., & Nesselroade, J. R. (1994). Using multivariate data to structure developmental change. In S. H. Cohen & H. W. Reese (Eds.), *Life-span developmental psychology: Methodological contributions* (pp. 223-267). Hillsdale, NJ: Lawrence Erlbaum Associates.

McCabe, K. O., & Fleeson, W. (2012). What is extraversion for? Integrating trait and motivational perspectives and identifying the purpose of extraversion. *Psychological Science, 23*, 1498-1505. doi: 10.1177/0956797612444904

McCrae, R. R., & Costa, J., P. T. (2008). The five-factor theory of personality. In O. P. John, R. W. Robins & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 159–181). New York: The Guilford Press.

McCrae, R. R., Costa Jr, P. T., Ostendorf, F., Angleitner, A., Hřebíčková, M., Avia, M. D., . . . Woodfield, R. (2000). Nature over nurture: Temperament, personality, and life span development. *Journal of Personality and Social Psychology, 78*, 173.

McCrae, R. R., Costa, P. T., Hřebíčková, M., Urbánek, T., Martin, T. A., Oryol, V. E., . . . Senin, I. G. (2004). Age differences in personality traits across cultures: Self-report and observer perspectives. *European Journal of Personality, 1*, 143-157. doi: 10.1002/per.510

McCrae, R. R., & Terracciano, A. (2005). Universal features of personality traits from the observer's perspective: Data from 50 cultures. *Journal of Personality and Social Psychology, 88*, 547-561. doi: 10.1037/0022-3514.88.3.547

McDonald, J. D. (2008). Measuring personality constructs: The advantages and disadvantages of self-reports, informant reports and behavioural assessments. *Enquire, 1*, 1-19.

Mehl, M. R. (2017). The electronically activated recorder (EAR):A method for the naturalistic observation of daily social behavior. *Current Directions in Psychological Science, 26*, 184-190. doi: 10.1177/0963721416680611

Mehl, M. R., Gosling, S. D., & Pennebaker, J. W. (2006). Personality in its natural habitat: Manifestations and implicit folk theories of personality in daily life. *Journal of Personality and Social Psychology, 90*, 862-877. doi: 10.1037/0022-3514.90.5.862

Mehl, M. R., & Wrzus, C. (in press). Ecological sampling methods for studying personality in daily life. In O. P. John & R. W. Robins (Eds.), *Handbook of personality: Theory and research* (4th edition ed.). New York: Guilford Press.

Mehta, P. D., & Neale, M. C. (2005). People are variables too: Multilevel structural equations modeling. *Psychological Methods, 10,* 259-284.

Mischel, W., & Shoda, Y. (1995). A cognitive-affective system theory of personality: Reconceptualizing situations, dispositions, dynamics, and invariance in personality structure. *Psychological Review, 102*, 246-268.

Molden, D. C., & Dweck, C. S. (2006). Finding "meaning" in psychology - a lay theories approach to self-regulation, social perception, and social development. *American Psychologist, 61*, 192-203. doi: 10.1037/0003-066x.61.3.192

Moosbrugger, H., Schermelleh-Engel, K., & Klein, A. (1997). Methodological problems of estimating latent interaction effects. *Methods of Psychological Research Online, 2*, 95-111.

Mor, N., & Winquist, J. (2002). Self-focused attention and negative affect: A meta-analysis. *Psychological Bulletin, 128*, 638-662.

Morf, C. C. (2006). Personality reflected in a coherent idiosyncratic interplay of intra- and interpersonal self-regulatory processes. *Journal of Personality, 74*, 1527-1556. doi: 10.1111/j.1467-6494.2006.00419.x

Mõttus, R., Johnson, W., & Deary, I. J. (2012). Personality traits in old age: Measurement and rank-order stability and some mean-level change. *Psychology and Aging, 27*, 243-249. doi: 10.1037/a0023690

Mueller, S., Wagner, J., & Gerstorf, D. (2017). On the role of personality in late life. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 69-84). San Diego, CA: Elsevier.

Murray, H. A. (1938). *Explorations in personality*. Oxford, England: Oxford Univ. Press.

Muthen, B. (2002). Beyond SEM: General latent variable modeling. *Behaviormetrika, 29*, 81-117. doi: 10.2333/bhmk.29.81

Muthén, B. O., & Muthén, L. (1998-2017). *MPLUS user's guide. Eighth edition*. Los Angeles: CA: Muthen & Muthen.

Muthén, B. O., & Satorra, A. (1995). Complex sample data in structural equation modeling. *Sociological Methodology, 25*, 267-316. doi: 10.2307/271070

Myin-Germeys, I., & van Os, J. (2007). Stress-reactivity in psychosis: Evidence for an affective pathway to psychosis. *Clinical Psychology Review, 27*, 409-424. doi: 10.1016/j.cpr.2006.09.005

Nes, L. S., & Segerstrom, S. C. (2006). Dispositional optimism and coping: A meta-analytic review. *Personality and Social Psychology Review, 10*, 235-251. doi: 10.1207/s15327957pspr1003_3

Nesselroade, J. R. (1991). The warp and the woof of the developmental fabric. In D. R., L. L. & P. D. S. (Eds.), *Visions of aesthetics, the environment, and development: The legacy of joachim f. Wohlwill* (pp. 213-240). Hillsdale: NJ: Lawrence Erlbaum Associates.

Nesselroade, J. R. (2004). Intraindividual variability and short-term change. *Gerontology, 50*, 44-47. doi: 10.1159/000074389

Nestler, S., Grimm, K. J., & Schönbrodt, F. D. (2015). The social consequences and mechanisms of personality: How to analyse longitudinal data from individual, dyadic, round-robin and network designs. *European Journal of Personality, 29*, 272-295. doi: 10.1002/per.1997

Nettle, D. (2006). The evolution of personality variation in humans and other animals. *American Psychologist, 61*, 622-631. doi: 10.1037/0003-066X.61.6.622

Neyer, F. J., & Asendorpf, J. B. (2001). Personality–relationship transaction in young adulthood. *Journal of Personality and Social Psychology, 81*, 1190-1204.

Neyer, F. J., & Lehnart, J. (2007). Relationships matter in personality development: Evidence from an 8-year longitudinal study across young adulthood. *Journal of Personality, 75*, 535-568. doi: 10.1111/j.1467-6494.2007.00448.x

Ng, T. W. H., Sorensen, K. L., & Eby, L. T. (2006). Locus of control at work: A meta-analysis. *Journal of Organizational Behavior, 27*, 1057-1087. doi: 10.1002/job.416

Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2007). The implicit association test at age 7: A methodological and conceptual review. In J. A. Bargh (Ed.), *Automatic processes in social thinking and behavior* (pp. 265-292). New York: Psychology Press.

Pals, J. L. (2006). Narrative identity processing of difficult life experiences: Pathways of personality development and positive self-transformation in adulthood. *Journal of Personality, 74*, 1079-1110. doi: 10.1111/j.1467-6494.2006.00403.x

Paulhus, D. L., & Vazire, S. (2007). The self-report method. In R. W. Robins, R. C. Fraley & R. F. Krueger (Eds.), *Handbook of research methods in personality psychology* (pp. 224-239). New York: Guilford.

Penton-Voak, I. S., Thomas, J., Gage, S. H., McMurran, M., McDonald, S., & Munafò, M. R. (2013). Increasing recognition of happiness in ambiguous facial expressions reduces anger and aggressive behavior. *Psychological Science, 24*, 688-697. doi: 10.1177/0956797612459657

Perugini, M., & Conner, M. (2000). Predicting and understanding behavioral volitions: The interplay between goals and behaviors. *European Journal of Social Psychology, 30*, 705-731. doi: doi:10.1002/1099-0992(200009/10)30:5<705::AID-EJSP18>3.0.CO;2-#

Perugini, M., & Leone, L. (2009). Implicit self-concept and moral action. *Journal of Research in Personality, 43*, 747-754. doi: 10.1016/j.jrp.2009.03.015

Pervin, L. A. (1982). The stasis and flow of behavior: Toward a theory of goals. In M. M. Page & R. Dienstbier (Eds.), *Nebraska symposium on motivation* (Vol. 30, pp. 1-53). Lincoln: University of Nebraska Press.

Peters, A.-L. (2015). *Goals to change oneself: A state and trait perspective on self-regulated personality development in adulthood.* (Doctoral dissertation), Bielefeld University, Bielefeld.

Peterson, R. S., Smith, D. B., Martorana, P. V., & Owens, P. D. (2003). The impact of chief executive officer personality on top management team dynamics: One mechanism by which leadership affects organizational performance. *Journal of Applied Psychology, 88,* 795-808. doi: 10.1037/0021-9010.88.5.795

Powers, W. T. (1973). *Behavior: The control of perception*. Chicago: Aldine.

Prochaska, J. O., & Prochaska, J. M. (2010). Self-directed change: A transtheoretical model *Social psychological foundations of clinical psychology.* (pp. 431-440). New York, NY, US: Guilford Press.

Quintus, M., Egloff, B., & Wrzus, C. (2017). Predictors of volitional personality change in younger and older adults: Response surface analyses signify the complementary perspectives of the self and knowledgeable others. *Journal of Research in Personality, 70*, 214-228. doi: 10.1016/j.jrp.2017.08.001

R Core Team. (2017). R: A language and environment for statistical computing (Version 3.3.3). Vienna, Austria: R Foundation for Statistical Computing.

Ramsey, L. R., & Sekaquaptewa, D. (2011). Changing stereotypes, changing grades: A longitudinal study of stereotyping during a college math course. *Social Psychology of Education, 14*, 377-387. doi: 10.1007/s11218-010-9150-y

Rauthmann, J. F. (2017). Development of implicit personality In J. Specht (Ed.), *Personality development across the lifespan* (pp. 537-554). San Diego, CA: Elsevier.

Rauthmann, J. F., Gallardo-Pujol, D., Guillaume, E. M., Todd, E., Nave, C. S., Sherman, R. A., . . . Funder, D. C. (2014). The situational eight diamonds: A taxonomy of major dimensions of situation characteristics. *Journal of Personality and Social Psychology, 107*, 677-718. doi: 10.1037/A0037250

Rauthmann, J. F., & Sherman, R. A. (2016). Ultra-brief measures for the situational eight DIAMOND domains. *European Journal of Psychological Assessment, 32*, 165-174. doi: 10.1027/1015-5759/a000245

Rauthmann, J. F., Sherman, R. A., & Funder, D. C. (2015a). Principles of situation research: Towards a better understanding of psychological situations. *European Journal of Personality*. doi: 10.1002/per.1994

Rauthmann, J. F., Sherman, R. A., Nave, C. S., & Funder, D. C. (2015b). Personality-driven situation experience, contact, and construal: How people's personality traits predict characteristics of their situations in daily life. *Journal of Research in Personality, 55*, 98-111. doi: 10.1016/j.jrp.2015.02.003

Reitz, A. K., & Staudinger, U. M. (2017). Getting older, getting better? Toward understanding positive personality development across adulthood In J. Specht (Ed.), *Personality development across the lifespan* (pp. 219-241). San Diego, CA: Elsevier.

Richetin, J., Costantini, G., Perugini, M., & Schönbrodt, F. (2015). Should we stop looking for a better scoring algorithm for handling implicit association test data? Test of the role of errors, extreme latencies treatment, scoring formula, and practice trials on reliability and validity. *PLoS ONE, 10*, e0129601. doi: 10.1371/journal.pone.0129601

Riediger, M., Wrzus, C., Schmiedek, F., Wagner, G. G., & Lindenberger, U. (2011). Is seeking bad mood cognitively demanding? Contra-hedonic orientation and working-memory capacity in everyday life. *Emotion, 11*, 656-665. doi: 10.1037/a0022756

Roberts, B. W. (2006). Personality development and organizational behavior. In B. M. Staw (Ed.), *Research in organizational behavior* (Vol. 27, pp. 1-40). New York: NY: Elsevier.

Roberts, B. W. (2009). Back to the future: Personality and assessment and personality development. *Journal of Research in Personality, 43*, 137-145. doi: 10.1016/j.jrp.2008.12.015

Roberts, B. W. (2017). A revised sociogenomic model of personality traits. *Journal of Personality, 86*, 23-35. doi: 10.1111/jopy.12323

Roberts, B. W., & Caspi, A. (2003). The cumulative continuity model of personality development: Striking a balance between continuity and change in personality traits across the life course. In R. M. Staudinger & U. Lindenberger (Eds.), *Understanding human development* (pp. 183-214). Dordrecht, NL: Kluwer Academic Publishers.

Roberts, B. W., & DelVecchio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin, 126,* 3.

Roberts, B. W., & Jackson, J. J. (2008). Sociogenomic personality psychology. *Journal of Personality, 76*, 1523-1544. doi: 10.1111/j.1467-6494.2008.00530.x

Roberts, B. W., Luo, J., Briley, D. A., Chow, P. I., Su, R., & Hill, P. L. (2017). A systematic review of personality trait change through intervention. *Psychological Bulletin, 143*, 117-141. doi: 10.1037/bul0000088

Roberts, B. W., & Mroczek, D. (2008). Personality trait change in adulthood. *Current Directions in Psychological Science, 17*, 31-35. doi: 10.1111/j.1467-8721.2008.00543.x

Roberts, B. W., & Robins, R. W. (2004). Person-environment fit and its implications for personality development: A longitudinal study. *Journal of Personality*, *72*, 89-110. doi: 10.1111/j.0022-3506.2004.00257.x

Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006a). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin, 132*, 1-25. doi: 10.1037/0033-2909.132.1.1

Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006b). Personality traits change in adulthood: Reply to Costa and Mccrae (2006). *Psychological Bulletin, 132*, 29-32. doi: 10.1037/0033-2909.132.1.29

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.

Roberts, B. W., Wood, D., & Caspi, A. (2008). The development of personality traits in adulthood. In O. P. John, R. W. Robins & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 375-398). New York: The Guilford Press.

Roberts, B. W., Wood, D., & Smith, J. L. (2005). Evaluating five factor theory and social investment perspectives on personality trait development. *Journal of Research in Personality, 39*, 166-184. doi: 10.1016/j.jrp.2004.08.002

Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the rosenberg self-esteem scale.

Personality and Social Psychology Bulletin, 27, 151-161. doi: 10.1177/0146167201272002

Robins, R. W., & John, O. P. (1997). The quest for self-insight: Theory and research on accuracy and bias in self-perception. In J. Johnson & S. Briggs (Eds.), *Handbook of personality psychology* (pp. 649-679). San Diego: Academic Press.

Robins, R. W., Noftle, E. E., Trzesniewski, K. H., & Roberts, B. W. (2005). Do people know how their personality has changed? Correlates of perceived and actual personality change in young adulthood. *Journal of Personality, 73*, 489-521. doi: 10.1111/j.1467-6494.2005.00317.x

Robins, R. W., Tracy, J. L., Trzesniewski, K., Potter, J., & Gosling, S. D. (2001). Personality correlates of self-esteem. *Journal of Research in Personality, 35*, 463-482. doi: 10.1006/jrpe.2001.2324

Robinson, O. C., Noftle, E. E., Guo, J., Asadi, S., & Zhang, X. Z. (2015). Goals and plans for Big Five personality trait change in young adults. *Journal of Research in Personality, 59*, 31-43. doi: 10.1016/j.jrp.2015.08.002

Roesch, S. C., Aldridge, A. A., Stocking, S. N., Villodas, F., Leung, Q., Bartley, C. E., & Black, L. J. (2010). Multilevel factor analysis and structural equation modeling of daily diary coping data: Modeling trait and state variation. *Multivariate Behavioral Research, 45*, 767-789. doi: 10.1080/00273171.2010.519276

Rohrer, J. M., Egloff, B., Kosinski, M., Stillwell, D., & Schmukle, S. C. (2017). In your eyes only? Discrepancies and agreement between self- and other-reports of personality from age 14 to 29. *Journal of Personality and Social Psychology, 115*, 304-320. doi: 10.1037/pspp0000142

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton: Princeton University Press.

Rosseel, Y. (2012). Lavaan: An R package for structural equation modeling. *Journal of Statistical Software, 48*, 1-36. doi: 10.18637/jss.v048.i02

Rothermund, K., & Wentura, D. (2004). Underlying processes in the implicit association test: Dissociating salience from associations. *Journal of Experimental Psychology: General, 133*, 139-165. doi: 10.1037/0096-3445.133.2.139

Rothermund, K., Wentura, D., & De Houwer, J. (2005). Validity of the salience asymmetry account of the implicit association test: Reply to Greenwald, Nosek, Banaji, and Klauer (2005). *Journal of Experimental Psychology: General, 134*, 426-430. doi: 10.1037/0096-3445.134.3.426

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80*, 1-28. doi: 10.1037/h0092976

Rotter, J. B. (1992). "Cognates of personal control: Locus of control, self-efficacy, and explanatory style": Comment. *Applied and Preventive Psychology, 1*, 127-129. doi: 10.1016/S0962-1849(05)80154-4

Rowling, J. K. (2000). *Harry Potter und der Stein der Weisen* (K. Fritz Ed. & Trans.). Hamburg: Carlsen. (Original work published 1997)

Russell, D., Cutrona, C. E., Rose, J., & Yurko, K. (1984). Social and emotional loneliness: An examination of weiss's typology of loneliness. *Journal of Personality and Social Psychology, 46*, 1313-1321. doi: 10.1037/0022-3514.46.6.1313

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68-78. doi: 10.1037/0003-066X.55.1.68

Ryan, R. M., Sheldon, K. M., Kasser, T., & Deci, E. L. (1996). All goals are not created equal: An organismic perspective on the nature of goals and their regulation. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 7-26). New York: Guilford.

Ryan, T. A. (1970). *Intentional behavior: An approach to human motivation*. Oxford, England: Ronald Press.

Ryu, E. (2014). Model fit evaluation in multilevel structural equation models. *Frontiers in Psychology, 81*. doi: 10.3389/fpsyg.2014.00081

Salthouse, T. A. (2010). Selective review of cognitive aging. *Journal of the International Neuropsychological Society, 16*, 754-760. doi: 10.1017/S1355617710000706

Sarason, I. G., Johnson, J. H., & Siegel, J. M. (1978). Assessing the impact of life changes: Development of the life experiences survey. *Journal of Consulting and Clinical Psychology, 46*, 932-946. doi: 10.1037/0022-006X.46.5.932

Scheier, M. F., & Carver, C. S. (1985). Optimism, coping, and health - assessment and implications of generalized outcome expectancies. *Health Psychology, 4*, 219-247. doi: 10.1037//0278-6133.4.3.219

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online, 8*, 23-74.

Schmitt, M., Gollwitzer, M., Baumert, A., Blum, G., Gschwendner, T., Hofmann, W., & Rothmund, T. (2013). Proposal of a nonlinear interaction of person and situation (NIPS) model. *Frontiers in Psychology, 4*. doi: 10.3389/fpsyg.2013.00499

Schmukle, S. C., Back, M. D., & Egloff, B. (2008). Validity of the five-factor model for the implicit self-concept of personality. *European Journal of Psychological Assessment, 24*, 263-272. doi: 10.1027/1015-5759.24.4.263

Schnabel, K., Asendorpf, J. B., & Greenwald, A. G. (2008). Assessment of individual differences in implicit cognition: A review of IAT measures. *European Journal of Psychological Assessment, 24*, 210-217. doi: 10.1027/1015-5759.24.4.210

Schnabel, K., Banse, R., & Asendorpf, J. B. (2006). Assessment of implicit personality self-concept using the implicit association test (IAT): Concurrent assessment of anxiousness and angriness. *British Journal of Social Psychology, 45*, 373-396. doi: 10.1348/014466605X49159

Schönbrodt, F. D. (2015). Testing fit patterns with polynomial regression models. *Available at SSRN 2753669*.

Schönbrodt, F. D. (2016). RSA: An R package for response surface analysis (Version 0.9.10). Retrieved from https://cran.r-project.org/package=RSA

Schwaba, T., & Bleidorn, W. (2017). Individual differences in personality change across the adult lifespan. *Journal of Personality*. doi: 10.1111/jopy.12327

Seger, C. A. (1994). Implicit learning. *Psychological Bulletin, 115*, 163-196.

Selfhout, M., Burk, W., Branje, S., Denissen, J., Van Aken, M., & Meeus, W. (2010). Emerging late adolescent friendship networks and Big Five personality traits: A social network approach. *Journal of Personality, 78*, 509-538. doi: 10.1111/j.1467-6494.2010.00625.x

Senko, C., & Harackiewicz, J. M. (2005). Achievement goals, task performance, and interest: Why perceived goal difficulty matters. *Personality and Social Psychology Bulletin, 31*, 1739-1753. doi: 10.1177/0146167205281128

Shanock, L. R., Baran, B. E., Gentry, W. A., Pattison, S. C., & Heggestad, E. D. (2010). Polynomial regression with response surface analysis: A powerful approach for examining moderation and overcoming limitations of difference scores. *Journal of Business and Psychology, 25*, 543-554. doi: 10.1007/s10869-010-9183-4

Shapiro, D. A., Barkham, M., Rees, A., Hardy, G. E., Reynolds, S., & Startup, M. (1994). Effects of treatment duration and severity of depression on the effectiveness of cognitive-behavioral and psychodynamic-interpersonal psychotherapy. *Journal of Consulting and Clinical Psychology, 62*, 522-534.

Sharpe, J. P., Martin, N. R., & Roth, K. A. (2011). Optimism and the Big Five factors of personality: Beyond neuroticism and extraversion. *Personality and Individual Differences, 51*, 946-951. doi: 10.1016/j.paid.2011.07.033

Shaver, P., Furman, W., & Buhrmester, D. (1985). Transition to college: Network changes, social skills, and loneliness. In S. Duck & D. Perlman (Eds.), *Understanding personal relationships: An interdisciplinary approach* (pp. 193-219). Thousand Oaks, CA: Sage.

Sherman, R. A., Rauthmann, J. F., Brown, N. A., Serfass, D. G., & Jones, A. B. (2015). The independent effects of personality and situations on real-time expressions of behavior and emotion. *Journal of Personality and Social Psychology, 109*, 872-888. doi: 10.1037/pspp0000036

Sliwinski, M. J. (2008). Measurement-burst designs for social health research. *Social and Personality Psychology Compass, 2*, 245-261. doi: 10.1111/j.1751-9004.2007.00043.x

Smith, E. R., & DeCoster, J. (2000). Dual-process models in social and cognitive psychology: Conceptual integration and links to underlying memory systems. *Personality and Social Psychology Review, 4*, 108-131. doi: 10.1207/S15327957PSPR0402_01

Snijders, T. A. B., & Bosker, R. J. (2012). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. London Sage Publishers.

Soto, C. J., John, O. P., Gosling, S. D., & Potter, J. (2011). Age differences in personality traits from 10 to 65: Big Five domains and facets in a large cross-sectional sample. *Journal of Personality and Social Psychology, 100*, 330-348. doi: 10.1037/A0021717

Specht, J., Bleidorn, W., Denissen, J. J. A., Hennecke, M., Hutteman, R., Kandler, C., . . . Zimmermann, J. (2014). What drives adult personality development? A comparison of theoretical perspectives and empirical evidence. *European Journal of Personality, 28*, 216-230. doi: 10.1002/Per.1966

Specht, J., Egloff, B., & Schmukle, S. C. (2011). Stability and change of personality across the life course: The impact of age and major life events on mean-level and rank-order stability of the Big Five. *Journal of Personality and Social Psychology, 101*, 862-882. doi: 10.1037/a0024950

Spinath, B., Spinath, F. M., Riemann, R., & Angleitner, A. (2003). Implicit theories about personality and intelligence and their relationship to actual personality and intelligence. *Personality and Individual Differences, 35*, 939-951. doi: 10.1016/S0191-8869(02)00310-0

Staudinger, U. M. (2001). Life reflection: A social–cognitive analysis of life review. *Review of General Psychology, 5*, 148-160. doi: 10.1002/jclp.20076

Staudinger, U. M., & Kunzmann, U. (2005). Positive adult personality development: Adjustment and/or growth? *European Psychologist*, *10*, 320-329. doi: 10.1027/1016-9040.10.4.320

Steenkamp, J.-B. E., & Baumgartner, H. (1998). Assessing measurement invariance in cross-national consumer research. *Journal of Consumer Research, 25*, 78-90. doi: 10.1086/209528

Steffens, M. C., & Schulze König, S. (2006). Predicting spontaneous Big Five behavior with implicit association tests. *European Journal of Psychological Assessment, 22*, 13-20. doi: 10.1027/1015-5759.22.1.13

Stephan, W. G., & Renfro, C. L. (2002). The role of threat in intergroup relations. In E. R. Smith & D. M. Mackie (Eds.), *From prejudice to intergroup emotions: Differentiated reactions to social groups* (pp. 191-207). New York: Psychology Press.

Stern, W. (1911). *Die differentielle Psychologie in ihren methodischen Grundlagen*. Leipzig: Barth (Reprint 1994, Bern: Huber).

Stevenson, J., & Clegg, S. (2011). Possible selves: Students orientating themselves towards the future through extracurricular activity. *British Educational Research Journal, 37*, 231-246. doi: 10.1080/01411920903540672

Steyer, R., Eid, M., & Schwenkmezger, P. (1997). Modeling true intraindividual change: True change as a latent variable. *Methods of Psychological Research Online, 2*, 21-33.

Steyer, R., Mayer, A., Geiser, C., & Cole, D. A. (2015). A theory of states and traits—revised. *Annual Review of Clinical Psychology, 11*, 71-98. doi: 10.1146/annurev-clinpsy-032813-153719

Steyer, R., Partchev, I., & Shanahan, M. J. (2000). Modeling true intraindividual change in structural equation models: The case of poverty and children’s psychosocial adjustment. In T. D. Little, K. U. Schnabel & J. Baumert (Eds.), *Modeling longitudinal and multiple-group data: Practical issues, applied approaches, and specific examples* (pp. 109-126). Mahwah: NJ: Erlbaum.

Steyer, R., Schmitt, M., & Eid, M. (1999). Latent state–trait theory and research in personality and individual differences. *European Journal of Personality, 13*, 389-408. doi: 10.1002/(SICI)1099-0984(199909/10)13:5<389::AID-PER361>3.0.CO;2-A

Stine-Morrow, E. A., Payne, B. R., Roberts, B. W., Kramer, A. F., Morrow, D. G., Payne, L., . . . Noh, S. R. (2014). Training versus engagement as paths to cognitive enrichment with aging. *Psychology and Aging, 29*, 891-906. doi: 10.1037/a0038244

Strack, F., & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review, 8*, 220-247. doi: 10.1207/s15327957pspr0803_1

Sturgeon, J. A., Zautra, A. J., & Arewasikporn, A. (2014). A multilevel structural equation modeling analysis of vulnerabilities and resilience resources influencing affective adaptation to chronic pain. *Pain, 155*, 292-298. doi: 10.1016/j.pain.2013.10.007

Suls, J., & Martin, R. (2005). The daily life of the garden-variety neurotic: Reactivity, stressor exposure, mood spillover, and maladaptive coping. *Journal of Personality, 73*, 1485-1509. doi: 10.1111/j.1467-6494.2005.00356.x

Süskind, P. (1985). *Das Parfüm*. Zürich: Diogenes

Taylor, S. N. (2006). Why the real self is fundamental to intentional change. *Journal of Management Development, 25*, 643-656. doi: 10.1108/02621710610678463

Terracciano, A., Costa, P. T., & McCrae, R. R. (2006). Personality plasticity after age 30. *Personality and Social Psychology Bulletin, 32*, 999-1009. doi: 10.1177/0146167206288599

Van de Schoot, R., Lugtig, P., & Hox, J. (2012). A checklist for testing measurement invariance. *European Journal of Developmental Psychology, 9*, 486-492. doi: 10.1080/17405629.2012.686740

van Ryn, M., Hardeman, R., Phelan, S. M., PhD, D. J. B., Dovidio, J. F., Herrin, J., . . . Przedworski, J. M. (2015). Medical school experiences associated with change in implicit racial bias among 3547 students: A medical student changes study report. *Journal of General Internal Medicine, 30*, 1748-1756. doi: 10.1007/s11606-015-3447-7

van Tuijl, L. A., de Jong, P. J., Sportel, B. E., de Hullu, E., & Nauta, M. H. (2014). Implicit and explicit self-esteem and their reciprocal relationship with symptoms of depression and social anxiety: A longitudinal study in adolescents. *Journal of Behavior Therapy and Experimental Psychiatry, 45*, 113-121. doi: 10.1016/j.jbtep.2013.09.007

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational Research Methods, 3*, 4-70. doi: 10.1177/109442810031002

Vazire, S. (2006). Informant reports: A cheap, fast, and easy method for personality assessment. *Journal of Research in Personality, 40*, 472-481. doi: 10.1016/j.jrp.2005.03.003

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. doi: 10.1037/a0017908

Vazire, S., & Carlson, E. N. (2011). Others sometimes know us better than we know ourselves. *Current Directions in Psychological Science, 20*, 104-108. doi: 10.1177/0963721411402478

Vazire, S., & Mehl, M. R. (2008). Knowing me, knowing you: The accuracy and unique predictive validity of self-ratings and other-ratings of daily behavior. *Journal of Personality and Social Psychology, 95*, 1202-1216. doi: 10.1037/a0013314

Viken, R. J., Rose, R. J., Kaprio, J., & Koskenvuo, M. (1994). A developmental genetic analysis of adult personality: Extraversion and neuroticism from 18 to 59 years of age. *Journal of Personality and Social Psychology, 66*, 722-730.

Voelkle, M. C., & Wagner, J. (2017). Analyzing personality change: From average trajectories to within-person dynamics. In J. Specht (Ed.), *Personality development across the lifespan* (pp. 497-516). San Diego, CA: Elsevier.

Vroom, V. H. (1964). *Work and motivation*. Oxford, England: Wiley.

Wagner, J., Becker, M., Lüdtke, O., & Trautwein, U. (2015). The first partnership experience and personality development: A propensity score matching study in young adulthood. *Social Psychological and Personality Science, 6*, 455-463. doi: 10.1177/1948550614566092

Wagner, J., Ram, N., Smith, J., & Gerstorf, D. (2016). Personality trait development at the end of life: Antecedents and correlates of mean-level trajectories. *Journal of Personality and Social Psychology, 111*, 411-429. doi: 10.1037/pspp0000071

Ward, C., Leong, C.-H., & Low, M. (2004). Personality and sojourner adjustment: An exploration of the Big Five and the cultural fit proposition. *Journal of Cross-Cultural Psychology, 35*, 137-151. doi: 10.1177/0022022103260719

Weidmann, R., Schönbrodt, F. D., Ledermann, T., & Grob, A. (2017). Concurrent and longitudinal dyadic polynomial regression analyses of Big Five traits and relationship satisfaction: Does similarity matter? *Journal of Research in Personality, 70*, 6-15. doi: 10.1016/j.jrp.2017.04.003

Weinstein, S. M., & Mermelstein, R. (2007). Relations between daily activities and adolescent mood: The role of autonomy. *Journal of Clinical Child and Adolescent Psychology, 36*, 182-194. doi: 10.1080/15374410701274967

West, S. G., Taylor, A. B., & Wu, W. (2012). Model fit and model selection in structural equation modeling. In R. H. Hoyle (Ed.), *Handbook of structural equation modeling* (pp. 209-231). New York: Guilford.

Wieland, C. M. (1986). *Geschichte des Agathon* (F. Martini & R. Döhl Ed.). Stuttgart: Reclam. (Original work published 1767)

Wigfield, A., & Eccles, J. (1992). The development of achievement task values: A theoretical analysis. *Developmental Review, 12*, 265-310. doi: 10.1016/0273-2297(92)90011-P

Wilson, T. D., & Dunn, E. W. (2004). Self-knowledge: Its limits, value, and potential for improvement. *Annual Review of Psychology, 55*, 493-518. doi: 10.1146/annurev.psych.55.090902.141954

Wood, D., & Denissen, J. (2015). A functional perspective on personality trait development. In N. R. Branscombe & K. Reynolds (Eds.), *Psychology of change. Life contexts, experiences, and identities* (pp. 97-115). New York, NY: Psychology Press.

Wood, D., Gardner, M. H., & Harms, P. D. (2015). How functionalist and process approaches to behavior can explain trait covariation. *Psychological Review, 122*, 84-111. doi: 10.1037/a0038423

Wood, D., & Roberts, B. W. (2006). The effect of age and role information on expectations for Big Five personality traits. *Personality and Social Psychology Bulletin, 32*, 1482-1496. doi: 10.1177/0146167206291008

Wood, W. (2017). Habit in personality and social psychology. *Personality and Social Psychology Review, 21*, 389-403. doi: 10.1177/1088868317720362

Wood, W., & Neal, D. T. (2007). A new look at habits and the habit-goal interface. *Psychological Review, 114*, 843-863. doi: 10.1037/0033-295X.114.4.843

Wortman, J., Lucas, R. E., & Donnellan, M. B. (2012). Stability and change in the Big Five personality domains: Evidence from a longitudinal study of australians. *Psychology and Aging, 27*, 867-874. doi: 10.1037/a0029322

Wrzus, C. (2018). Processes of personality development: An update of the TESSERA framework. In J. F. Rauthmann (Ed.), *Handbook of personality dynamics*.

Wrzus, C., Egloff, B., & Riediger, M. (2017a). Using implicit association tests in age-heterogeneous samples: The importance of cognitive abilities and quad model processes. *Psychology and Aging, 32*. doi: 10.1037/pag0000176

Wrzus, C., & Lang, F. R. (2010). Entwicklung der Persönlichkeit [personality development]. In F. R. Lang, M. Martin & M. Pinquart (Eds.), (pp. 141-159). Göttingen: Hogrefe.

Wrzus, C., Luong, G., Wagner, G. G., & Riediger, M. (2018a). Increases in short-term affective response to daily hassles predicts increases in neuroticism over six years., Manuscript submitted for publication.

Wrzus, C., & Mehl, M. R. (2015). Lab and/or field? Measuring personality processes and their social consequences. *European Journal of Personality, 29,* 250-271. doi: 10.1002/per.1986

Wrzus, C., Quintus, M., & Baumert, A. (2017b). Measuring personality processes in the lab and in the field. In V. Zeigler-Hill & T. Shackelford (Eds.), *The SAGE handbook of personality and individual differences*.

Wrzus, C., Quintus, M., & Egloff, B. (2018b). Do age differences in personality development diminish under similar contextual conditions? Longitudinal evidence from self-ratings, other-ratings, and implicit measures in younger and older students. Manuscript submitted for publication.

Wrzus, C., & Roberts, B. W. (2017). Processes of personality development in adulthood: The TESSERA framework. *Personality and Social Psychology Review, 21*, 253-277. doi: 10.1177/1088868316652279

Wrzus, C., Wagner, G. G., & Riediger, M. (2016). Personality-situation transactions from adolescence to old age. *Journal of Personality and Social Psychology, 110*, 782-799. doi: 10.1037/pspp0000054

Yin, H. H., & Knowlton, B. J. (2006). The role of the basal ganglia in habit formation. *Nature Reviews Neuroscience, 7*, 464-476. doi: 10.1038/nrn1919

Yuan, K. H., & Bentler, P. M. (2007). Multilevel covariance structure analysis by fitting multiple single-level models. *Sociological Methodology, 37*, 53-82. doi: 10.1111/j.1467-9531.2007.00182.x

Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self-motivation for academic attainment: The role of self-efficacy beliefs and personal goal setting. *American Educational Research Journal, 29*, 663-676. doi: 10.3102/00028312029003663

Zinkernagel, A., Hofmann, W., Gerstenberg, F. X., & Schmitt, M. (2013). On the road to the unconscious self: Understanding when people gain self-knowledge of implicit disgust sensitivity from behavioural cues. *European Journal of Personality, 27,* 355-376. doi: 10.1002/per.1910

Appendix

Overview

Chapter II

Chapter III

Table A1

Fit Indices for Models with Different Levels of Measurement Invariance for Big Five Traits

	Self-rating					Other-rating					Implicit measure (IAT)				
Model	χ^2 / *df*	CFI	TLI	RMSEA	SRMR	χ^2 / *df*	CFI	TLI	RMSEA	SRMR	χ^2 / *df*	CFI	TLI	RMSEA	SRMR
Conscientiousness															
1	1.28	.996	.993	.026	.023	1.69	.990	.983	.041	.043	1.28	.989	.974	.030	.022
2	1.20	.997	.996	.021	.023	1.67	.989	.984	.040	.046	1.32	.986	.972	.032	.026
2[b]	-	-	-	-	-	-	-	-	-	-					
3	-	-	-	-	-	-	-	-	-	-	1.28	.986	.975	.030	.027
3[b]	1.17	.997	.996	.019	.023	1.73	.987	.982	.042	.047					
Agreeableness															
1	1.40	.993	.988	.030	.026	1.80	.987	.979	.043	.034	3.86	.935	.847	.090	.048
2	-	-	-	-	-	1.70	.987	.982	.040	.036	3.41	.938	.872	.082	.050
2[b]	1.32	.994	.992	.026	.027	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1.59	.989	.985	.036	.037	3.20	.936	.882	.079	.048
3[b]	1.26	.995	.993	.023	.027	-	-	-	-	-	-	-	-	-	-

Table A1 continued

Model	Self-rating					Other-rating					Implicit measure (IAT)				
	χ^2 / *df*	CFI	TLI	RMSEA	SRMR	χ^2 / *df*	CFI	TLI	RMSEA	SRMR	χ^2 / *df*	CFI	TLI	RMSEA	SRMR
Openness															
1	0.91	1.00	1.00	.000	.019	1.765	.990	.984	.042	.022	1.31	.990	.977	.031	.021
2	0.83	1.00	1.00	.000	.019	1.62	.991	.987	.037	.025	1.16	.995	.989	.021	.022
2^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	.87	1.00	1.00	.000	.020	1.52	.992	.989	.034	.026	1.15	.994	.989	.021	.023
3^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Extraversion															
1	2.27	.985	.976	.055	.030	2.72	.975	.959	.063	.048	1.60	.990	.975	.041	.018
2	2.26	.983	.976	.055	.037	2.59	.975	.963	.061	.051	1.48	.990	.979	.038	.020
2^b	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	2.43	.975	.967	.058	.052	-	-	-	-	-
3^b	2.23	.983	.976	.054	.032	-	-	-	-	-	1.48	.990	.980	.037	.021
Emotional stability															
1	2.32	.983	.972	.057	.030	2.07	.984	.974	.051	.041	2.09	.973	.937	.055	.025
2	-	-	-	-	-	1.88	.985	.978	.047	.040	2.01	.972	.943	.053	.027
2^b	2.25	.982	.973	.055	.035	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	1.74	.987	.982	.042	.041	1.86	.973	.951	.049	.028
3^b	2.24	.981	.973	.055	.036	-	-	-	-	-	-	-	-	-	-

Note. CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. 1 = Unconstrained model; 2 = Model with weak measurement invariance; 2^b = Model with partial weak measurement invariance; 3 = Model with strong measurement invariance; 3^b = Model with partial strong measurement invariance.

Partial strong measurement invariance for self-rated conscientiousness was achieved by freeing one parcel's intercept at T3. Partial strong measurement invariance for other-rated conscientiousness was achieved by freeing one parcel's intercept at T3.

Partial weak measurement invariance for self-rated agreeableness was achieved by freeing one parcel's loading at T3. Partial strong measurement invariance for self-rated agreeableness was achieved by freeing one parcel's loading and intercept at T3.

Partial strong measurement invariance for self-rated extraversion was achieved by freeing one parcel's loading and intercept at T1. Partial strong measurement invariance for IAT extraversion was achieved by freeing one parcel's intercept at T3.

Partial weak measurement invariance for self-rated emotional stability was achieved by freeing one parcel's loading at T3. Partial strong measurement invariance for self-rated emotional stability was achieved by freeing one parcel's loading and intercept at T3.

Table A2

Correlated Change: Correlations between Latent Self-Rated, Other-Rated, and Implicit Intercept T2-T1 and T3-T2 Differences

	Conscientiousness	*Agreeableness*	*Openness*	*Extraversion*	*Emotional stability*
Initial correlation					
SR_{T1} with OR_{T1}	.500**	.403**	.618**	.619**	.586**
SR_{T1} with IAT_{T1}	.136	-.011	.104†	.270**	.216**
OR_{T1} with IAT_{T1}	.180*	.000	.110†	.129*	.048
Correlated change					
SR_{T2T1} with OR_{T2T1}	.008	-.005	.110	.177*	.008
SR_{T3T2} with OR_{T3T2}	-.142	.065	.164*	.005	.194†
SR_{T2T1} with IAT_{T2T1}	-.190	-.077	.002	.153†	.032
SR_{T3T2} with IAT_{T3T2}	-.073	.045	-.022	.049	.115
OR_{T2T1} with IAT_{T2T1}	.029	-.079	.050	-.020	-.142
OR_{T3T2} with IAT_{T3T2}	-.018	.017	-.062	-.051	-.033
Lagged change					
SR_{T2T1} with OR_{T3T2}	.160	.137	-.023	-.089	-.051
OR_{T2T1} with SR_{T3T2}	-.048	-.011	-.077	.033	.017
SR_{T2T1} with IAT_{T3T2}	.157	.127	-.052	-.070	.127
IAT_{T2T1} with SR_{T3T2}	.040	.011	.067	-.284**	-.081
OR_{T2T1} with IAT_{T3T2}	-.029	-.019	.040	.127	.060
IAT_{T2T1} with OR_{T3T2}	-.052	-.005	.065	.034	-.044
Model fit					
χ^2	413.18	379.407	342.584	435.478	347.440
CFI	0.966	0.971	0.984	0.970	0.981
TLI	0.959	0.965	0.981	0.964	0.977
RMSEA	0.046	0.040	0.034	0.047	0.036
SRMR	0.057	0.069	0.041	0.071	0.039

Note. SR = self-rating, OR = other-rating, IAT = implicit association test.

The model was calculated using maximum likelihood estimation with robust (Huber-White) standard errors and scaled test statistics.

Conscientiousness: Strong invariance was achieved for the implicit measure (IAT). Partial strong invariance for self-ratings was achieved by freeing one intercept. Partial strong invariance for other-ratings was achieved by freeing one loading and one intercept.

Agreeableness: Strong invariance was achieved for other-ratings and IAT. Partial strong invariance for self-ratings was achieved by freeing one loading and intercept.

Openness: Strong invariance was achieved for self-, other-ratings and IAT.

Extraversion: Strong invariance was achieved for other-ratings. Partial strong invariance for self-ratings was achieved by freeing one loading and intercept. Partial strong invariance for IAT was achieved by freeing one parcel's intercept.

Emotional Stability: Strong invariance was achieved for other-ratings and IAT.

Partial strong invariance for self-ratings was achieved by freeing one loading and intercept.

† $p < .10$. * $p < .05$. ** $p < .01$.

Table A3

Group Differences in Initial Latent Level and Latent Change Over Time when Comparing Younger and Older Students

Trait	Self-rating			Other-rating			Implicit measure (IAT)		
	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2	Difference in intercepts T1	Difference in change T2 – T1	Difference in change T3 – T2
Conscientiousness	-0.958**	0.027	-0.028	-0.908**	0.141	0.195	-0.06†	-0.007	-0.04
Agreeableness	-0.116	-0.06	0.071	0.184	-0.063	0.043	-0.125**	-0.014	0.014
Openness	-0.153	-0.091	-0.04	-0.051	0.108	-0.121	-0.101*	0.103*	-0.012
Extraversion	-0.296†	0.011	-0.024	-0.637**	-0.027	0.026	0.116*	0.082†	-0.104*
Emotional stability	-0.421**	-0.007	-0.002	-0.288†	0.102	0.15	-0.137*	-0.033	0.005

Note. Coefficients represent the unstandardized contrast effects for testing for group differences in intercepts or change scores. The contrast “Younger students *vs*. older students” was coded as -0.5 = younger students, 0.5 = older students.

† $p < .10$. * $p < .05$. ** $p < .01$.

Table A4

Group Differences in Initial Latent Level and Latent Change Over Time Controlling for the Number and Valence of Life Events.

	Self-rating			Other-rating			Implicit measure (IAT)		
	Intercept T1	Change T2 – T1	Change T3 – T2	Intercept T1	Change T2 – T1	Change T3 – T2	Intercept T1	Change T2 – T1	Change T3 – T2
Model 1: Conscientiousness									
Sum positive life events	0.087*	0.033	0.020	0.011	-0.026	0.033	0.010	0.006	-0.001
Sum neutral life events	-0.180*	-0.044	-0.069	0.059	-0.034	-0.077	0.005	-0.039†	0.008
Sum negative life events	0.091†	-0.080*	-0.091*	-0.013	-0.057	-0.135*	-0.002	0.010	0.012
Positive life events valence	-0.083	-0.115†	0.026	-0.107	0.091†	0.088	-0.005	-0.011	0.048
Negative life events valence	0.189†	0.033	0.092	-0.102	0.015	0.007	-0.002	0.021	0.003
Y *vs. O*	-0.888*	0.092	-0.070	-0.869**	0.154†	0.120	-0.105**	0.020	-0.031
YF *vs.* YAS	-0.304*	0.242*	0.013	0.033	-0.083	-0.04	0.022	0.010	0.008
OS vs. OC	0.061	0.288*	0.033	-0.022	0.042	-0.057	-0.054	0.015	0.049

Table A4 continued

	Self-rating			Other-rating			Implicit measure (IAT)		
	Intercept T1	Change T2 – T1	Change T3 – T2	Intercept T1	Change T2 – T1	Change T3 – T2	Intercept T1	Change T2 – T1	Change T3 – T2
Model 2: Agreeableness									
Sum positive life events	0.026	0.000	0.022	0.018	-0.020	0.033	0.004	-0.004	-0.003
Sum neutral life events	-0.076	-0.041	0.070	0.035	0.012	-0.112	-0.002	0.013	0.038
Sum negative life events	-0.016	-0.038	-0.072†	0.014	-0.057	-0.069	-0.007	0.015	0.000
Positive life events valence	-0.089	0.011	0.025	-0.069	-0.057	-0.011	-0.008	-0.023	0.003
Negative life events valence	0.098	-0.005	0.161*	0.101	-0.060	0.134	0.010	-0.010	-0.010
Y *vs. O*	-0.188†	-0.005	-0.084	0.141	-0.082	0.037	-0.117**	-0.009	0.003
YF *vs.* YAS	-0.012	-0.050	0.214*	-0.089	-0.014	0.087	0.003	-0.032	0.034
OS vs. OC	-0.051	0.269*	-0.248†	0.084	-0.055	0.083	-0.028	0.074†	-0.061

Table A4 continued

	Self-rating			Other-rating			Implicit measure (IAT)		
	Intercept T1	Change T2 – T1	Change T3 – T2	Intercept T1	Change T2 – T1	Change T3 – T2	Intercept T1	Change T2 – T1	Change T3 – T2
Model 3: Openness									
Sum positive life events	0.046	0.025	-0.021	0.098**	-0.015	0.037	0.006	0.008	0.013
Sum neutral life events	-0.148	0.036	-0.099†	0.000	0.025	-0.171	0.009	-0.010	0.006
Sum negative life events	0.052	-0.014	-0.002	-0.006	-0.031	-0.105	-0.005	-0.016	-0.016
Positive life events valence	0.116	-0.025	-0.011	-0.084	-0.032	0.093†	-0.030	0.007	0.026
Negative life events valence	-0.032	0.054	0.086	-0.160†	0.041	-0.058	0.010	0.020	-0.076**
Y *vs. O*	-0.217†	-0.081	0.000	-0.193†	0.041	-0.150	-0.108**	0.099**	-0.056†
YF *vs.* YAS	-0.294*	0.042	0.110	-0.015	-0.076	0.082	-0.067†	0.067†	0.021
OS vs. OC	0.065	-0.010	0.008	0.178	-0.265*	-0.055	-0.051	0.007	-0.030

Table A4 continued

Effects on	Self-rating			Other-rating			Implicit measure (IAT)		
	Intercept T1	Change T2 – T1	Change T3 – T2	Intercept T1	Change T2 – T1	Change T3 – T2	Intercept T1	Change T2 – T1	Change T3 – T2
Model 4: Extraversion									
Sum positive life events	0.122*	0.030	0.029	0.110**	0.001	0.048	0.011	-0.003	0.004
Sum neutral life events	-0.054	-0.098	0.071	-0.003	-0.029	0.161†	-0.036	0.002	-0.024
Sum negative life events	0.017	-0.069	-0.037	-0.029	-0.065	-0.146	-0.003	-0.007	0.029
Positive life events valence	-0.281*	-0.027	0.013	-0.214*	0.064	0.045	0.023	0.020	0.037
Negative life events valence	0.293*	0.083	0.041	0.083	0.003	-0.044	0.036	0.005	0.005
Y *vs. O*	-0.255†	-0.020	-0.022	-0.736**	-0.030	0.001	0.123**	0.070	-0.118**
YF *vs.* YAS	-0.205	0.227*	0.089	-0.053	0.197†	-0.024	-0.054	0.064	0.128*
OS vs. OC	0.439*	-0.043	0.091	0.163	-0.189	0.113	0.051	0.009	-0.048

Table A4 continued

Effects on	Self-rating			Other-rating			Implicit measure (IAT)		
	Intercept T1	Change T2 – T1	Change T3 – T2	Intercept T1	Change T2 – T1	Change T3 – T2	Intercept T1	Change T2 – T1	Change T3 – T2
Model 5: Emotional stability									
Sum positive life events	0.084†	0.016	0.036	0.013	0.017	0.038	-0.001	0.012	0.001
Sum neutral life events	-0.083	-0.027	0.024	-0.107	-0.141†	0.080	-0.009	0.006	0.079**
Sum negative life events	-0.231*	-0.059	-0.103*	-0.187**	-0.052	-0.080	-0.005	0.002	-0.011
Positive life events valence	0.073	-0.059	-0.037	0.007	-0.050	0.062	0.014	0.004	-0.013
Negative life events valence	-0.042	-0.031	0.124†	-0.231*	-0.082	0.067	-0.012	0.027	0.040
Y *vs. O*	-0.481*	0.017	-0.067	-0.301*	0.006	0.059	-0.132**	-0.039	0.024
YF *vs.* YAS	-0.105	-0.080	0.099	0.074	-0.142	0.164	-0.034	0.028	-0.092†
OS vs. OC	0.111	0.134	-0.064	0.122	-0.140	-0.211	0.012	-0.045	0.045

Note. Y vs. O = Contrast younger vs. older adults; YF vs YAS = Contrast younger freshmen vs. advanced students; OS vs. OC = Contrast older students vs. older controls. Life events were: New relationship, marriage, pregnancy, birth of a child, child moved out, personal success, job success, change at work, new job, layoff, retirement, financial change, relocation, separation or divorce, own illness, illness of partner, death of partner, illness of friends or family, death of friends or family, job failure, lawsuit.

Robust model fit indices *conscientiousness*: self-report were χ^2 = 227.520, CFI = 0.976, TLI = 0.971, RMSEA = 0.031, SRMR = 0.035; other-report χ^2 = 212.838, CFI = 0.981, TLI = 0.978, RMSEA = 0.027, SRMR = 0.034; IAT χ^2 = 103.870, CFI = 0.974, TLI = 0.965, RMSEA = 0.019, SRMR = 0.031.

Robust model fit indices *agreeableness*: self-report χ^2 =193.853, CFI =0.986, TLI = 0.984, RMSEA = 0.021, SRMR = 0.038; other-report χ^2 = 218.554, CFI =0.979, TLI = 0.975, RMSEA = 0.027, SRMR = 0.036 and for IAT χ^2 = 177.370, CFI = 0.878, TLI = 0.839, RMSEA = 0.051, SRMR = 0.044.

Robust model fit indices *openness*: self-report χ^2 =203.214, CFI = 0.988, TLI = 0.986, RMSEA = 0.023, SRMR = 0.041; other-report χ^2 = 220.943, CFI =0.981, TLI = 0.978, RMSEA = 0.028, SRMR = 0.037; IAT χ^2 =140.265, CFI = 0.917, TLI = 0.891, RMSEA = 0.038, SRMR = 0.037.

Robust model fit indices *extraversion*: self-report χ^2 = 272.615, CFI = 0.967, TLI = 0.960, RMSEA = 0.041, SRMR = 0.039; other-report χ^2 = 229.327, CFI = 0.975, TLI = 0.970, RMSEA = 0.031, SRMR = 0.048 and for IAT χ^2 = 115.828, CFI = 0.972, TLI = 0.963, RMSEA = 0.027, SRMR = 0.027.

Robust model fit indices *emotional stability*: self-report χ^2 = 252.730, CFI = 0.968, TLI = 0.962, RMSEA = 0.038, SRMR = 0.039; other-report χ^2 = 202.354, CFI = 0.986, TLI = 0.983, RMSEA = 0.024, SRMR = 0.036; IAT χ^2 = 115.539, CFI = 0.958, TLI = 0.944, RMSEA = 0.028, SRMR = 0.031.

† $p < .10$. * $p < .05$. ** $p < .01$.

Table A5

Descriptive Statistics and Correlations for Internal and External Locus of Control and Change Goals

			Change goals				
Variable	*M*	*SD*	Emotional stability	Conscientiousness	Agreeableness	Extraversion	Openness
Internal locus of control	4.06_a / 4.21_b	0.60 / 0.56	-0.07 / -0.14	-0.23* / -0.19*	-0.03 / -0.18*	-0.04 / -0.09	-0.14* / -0.06
External locus of control	2.34_a / 2.18_b	0.69 / 0.67	0.08 / 0.14	0.17* / 0.05	0.04 / 0.09	0.04 / 0.02	0.07 / 0.16

Note. Values to the left of the slashes refer to younger adults; values to the right refer to older adults.

Means with different subscripts within rows are significantly different at $p \leq .05$ according to t tests for independent samples.

* $p < .05$.

Table A6

Regression Analysis Predicting Goals to Change from Age Group and Self-Reported Emotional Stability, Conscientiousness, Agreeableness, Extraversion, and Openness

	Change goals				
Variable	Emotional stability	Conscientiousness	Agreeableness	Extraversion	Openness
Age group	-.15*	-.31*	-.07	-.17*	-.09
Emotional stability	-.72*	.03	-.06	.01	.04
Emotional Stability × Age Group	.12*	-.08	.01	.02	.00
Conscientiousness	.05	-.47*	.11	.20*	-.08
Conscientiousness × Age Group	.01	.08	-.11	-.12	.02
Agreeableness	.19*	.11*	-.25*	.11*	.14*
Agreeableness × Age Group	-.06	-.04	-.06	-.07	.14
Extraversion	.03	-.05	.11	-.61*	-.05

Table A6 continued

	Change goals				
Variable	Emotional stability	Conscientiousness	Agreeableness	Extraversion	Openness
Extraversion × Age Group	-.05	.02	-.04	.10	-.04
Openness	.10*	.02	.05	.04	-.16*
Openness × Age Group	-.03	.00	.06	-.05	-.10
R^2	.42	.36	.08	.29	.07
$F(11, 366)$	26.01	20.11	4.10	14.68	3.76
p	< .001	< .001	< .001	< .001	< .001

Note. All predictors are standardized. Age group = dummy-coded; belonging to age group with “older adults” is coded as 1 and “younger adults” is coded as 0.

* $p < .05$.

Table A7

Regression Coefficients and Derived Model Parameters for each Big Five Trait and Age Group for the Linear Interaction Model

	Change goals									
	Emotional stability		Conscientiousness		Agreeableness		Extraversion		Openness	
	Younger	Older	Younger	Older	Younger	Older	Younger	Older	Younger	Older
b_1	-0.32*	-0.22*	-0.23*	-0.26*	-0.02	-0.31*	-0.35*	-0.32*	-0.10*	-0.31*
	[-0.37,-0.26]	[-0.32,-0.13]	[-0.35,-0.10]	[-0.51,<0.00]	[-0.14,0.09]	[-0.45,-0.16]	[-0.46,-0.25]	[-0.46,-0.18]	[-0.20,<0.00]	[-0.50,-0.12]
b_2	-0.01	-0.03	-0.04	-0.15	0.00	-0.13*	-0.11*	0.05	0.02	-0.16
	[-0.08,0.06]	[-0.14,0.08]	[-0.05,0.13]	[-0.35,0.05]	[-0.11,0.11]	[-0.28,-0.01]	[-0.20,0.02]	[-0.16,0.07]	[-0.07,0.11]	[-0.33,0.01]
b_4	0.00	0.01	-0.07	0.04	-0.06	0.12*	0.07*	0.05	0.01	0.10
	[-0.05,0.04]	[-0.05,0.08]	[-0.15,0.02]	[-0.09,0.17]	[-0.15,0.02]	[0.01,0.22]	[0.02,0.13]	[-0.01,0.11]	[-0.05,0.07]	[-0.03,0.24]
a_1	-0.33*	-0.25*	-0.19*	-0.41*	-0.03	-0.44*	-0.46*	-0.37*	-0.08	-0.47*
	[-0.38,-0.28]	[-0.36,-0.15]	[-0.33,-0.04]	[-0.83,0.01]	[-0.21,0.16]	[-0.70,-0.19]	[-0.59,-0.33]	[-0.53,-0.20]	[-0.22,0.06]	[-0.80,-0.14]
a_2	0.00	0.02	-0.07	0.04	-0.06	0.12*	0.07*	0.05	0.01	0.10
	[-0.05,0.04]	[-0.05,0.08]	[-0.15,0.02]	[-0.10,0.17]	[-0.15,0.02]	[0.01,0.22]	[0.02,0.13]	[-0.01,0.12]	[-0.05,0.07]	[-0.03,0.24]
a_3	-0.30*	-0.19*	-0.27*	-0.11	-0.02	-0.17*	-0.24*	-0.27*	-0.12	-0.15*
	[-0.42,-0.19]	[-0.36,-0.01]	[-0.44,-0.10]	[-0.29,0.06]	[-0.15,0.11]	[-0.31,-0.03]	[-0.39,-0.09]	[-0.47,-0.08]	[-0.25,0.01]	[-0.29,-0.01]

Table A7 continued

	Change goals									
	Emotional stability		Conscientiousness		Agreeableness		Extraversion		Openness	
	Younger	Older	Younger	Older	Younger	Older	Younger	Older	Younger	Older
a_4	0.00	-0.02	0.07	-0.04	0.06	-0.12*	-0.07*	0.05	-0.01	-0.10
	[-0.04,0.05]	[-0.08,0.05]	[-0.02,0.15]	[-0.17,0.10]	[-0.02,0.15]	[-0.22,-0.01]	[-0.13,-0.02]	[-0.11,0.01]	[-0.07,0.05]	[-0.24,0.03]

Note. Younger = younger adults, Older = older adults. 95% confidence intervals based on robust standard errors in brackets. b_1 = self-reported trait; b_2 = other-reported trait; b_3 = self-reported trait²; b_4 = self- and other-reported trait interaction; b_5 = other-reported trait. The p-value corresponds to a test of whether the parameter was zero.

* $p < .05$.

Table A8

Regression Coefficients and Derived Model Parameters for each Big Five Trait and Age Group for the Full Polynomial Model

	Change Goals									
	Emotional stability		Conscientiousness		Agreeableness		Extraversion		Openness	
	Younger	Older	Younger	Older	Younger	Older	Younger	Older	Younger	Older
b_1	-0.31*	-0.25*	-0.22*	-0.32*	-0.02	-0.38*	-0.35*	-0.32*	-0.07	-0.31*
	[-0.37,-0.25]	[-0.35,-0.15]	[-0.35,-0.10]	[-0.57,-0.07]	[-0.15,0.10]	[-0.54,-0.22]	[-0.48,-0.22]	[-0.49,-0.16]	[-0.20,0.05]	[-0.50,-0.12]
b_2	-0.02	0.03	0.01	0.14	-0.02	-0.01	-0.13*	0.03	-0.03	-0.24
	[-0.09,0.06]	[-0.12,0.17]	[-0.14,0.16]	[-0.10,0.37]	[-0.24,0.19]	[-0.14,0.11]	[-0.25,-0.02]	[-0.18,0.26]	[-0.16,0.11]	[-0.50,0.01]
b_3	0.03	-0.01	0.02	0.01	0.04	0.00	0.03	-0.08	-0.03	0.05
	[0.00,0.07]	[-0.07,0.06]	[-0.05,0.10]	[-0.08,0.10]	[-0.03,0.10]	[-0.08,0.08]	[-0.05,0.10]	[-0.17,0.02]	[-0.09,0.03]	[-0.02,0.12]
b_4	-0.04	0.07	-0.1	0.06	-0.11*	0.20*	0.03	0.14*	0.03	0.02
	[-0.11,0.03]	[-0.05,0.20]	[-0.23,0.02]	[-0.08,0.20]	[-0.22,<0.00]	[0.07,0.33]	[-0.07,0.14]	[0.07,0.22]	[-0.06,0.13]	[-0.11,0.14]
b_5	0.00	-0.08	0.03	-0.11*	0.03	-0.13*	0.03	-0.07	0.01	0.08
	[-0.04,0.05]	[-0.19,0.02]	[-0.05,0.12]	[-0.19,-0.02]	[-0.07,0.12]	[-0.22,-0.05]	[-0.03,0.09]	[-0.14,<0.01]	[-0.06,0.09]	[-0.02,0.18]

Table A8 continued

	Change goals									
	Emotional stability		Conscientiousness		Agreeableness		Extraversion		Openness	
	Younger	Older	Younger	Older	Younger	Older	Younger	Older	Younger	Older
a_1	-0.33*	-0.23*	-0.21*	-0.18	-0.05	-0.39*	-0.49*	-0.29*	-0.10	-0.56*
	[-0.38,-0.27]	[-0.35,-0.11]	[-0.36,-0.06	[-0.54,0.18]	[-0.27,0.18]	[-0.63,-0.16]	[-0.61,-0.36]	[-0.47,-0.10]	[-0.25,0.05]	[-0.93,-0.19]
a_2	0.00	-0.02	-0.05	-0.04	-0.05	0.07	0.09*	0.00	0.01	0.14
	[-0.05,0.05]	[-0.10,0.07]	[-0.13,0.04	[-0.15,0.08]	[-0.15,0.05]	[-0.04,0.18]	[0.03,0.15]	[-0.07,0.07]	[-0.06,0.08]	[-0.02,0.30]
a_3	-0.29*	-0.28*	-0.23	-0.45*	0.00	-0.37*	-0.22*	-0.36*	-0.05	-0.07
	[-0.41,-0.17]	[-0.50,-0.05]	[-0.47,0.00]	[-0.80,-0.14]	[-0.27,0.28]	[-0.54,-0.20]	[-0.43,-0.01]	[-0.70,-0.02]	[-0.26,0.16]	[-0.32,0.18]
a_4	0.07	-0.17	0.16	-0.16	0.18	-0.33*	0.02	-0.28*	-0.06	0.10
	[-0.06,0.20]	[-0.41,0.08]	[-0.07,0.39]	[-0.42,0.10]	[-0.04,0.39]	[-0.58,-0.09]	[-0.19,0.23]	[-0.44,-0.13]	[-0.25,0.14]	[-0.11,0.32]

Note. Younger = younger adults, Older = older adults. 95% confidence intervals based on robust standard errors in brackets. b_1 = self-reported trait; b_2 = other-reported trait; b_3 = self-reported trait²; b_4 = self- and other-reported trait interaction; b_5 = other-reported trait². The *p*-value corresponds to a test of whether the parameter was zero.

* $p < .05$.

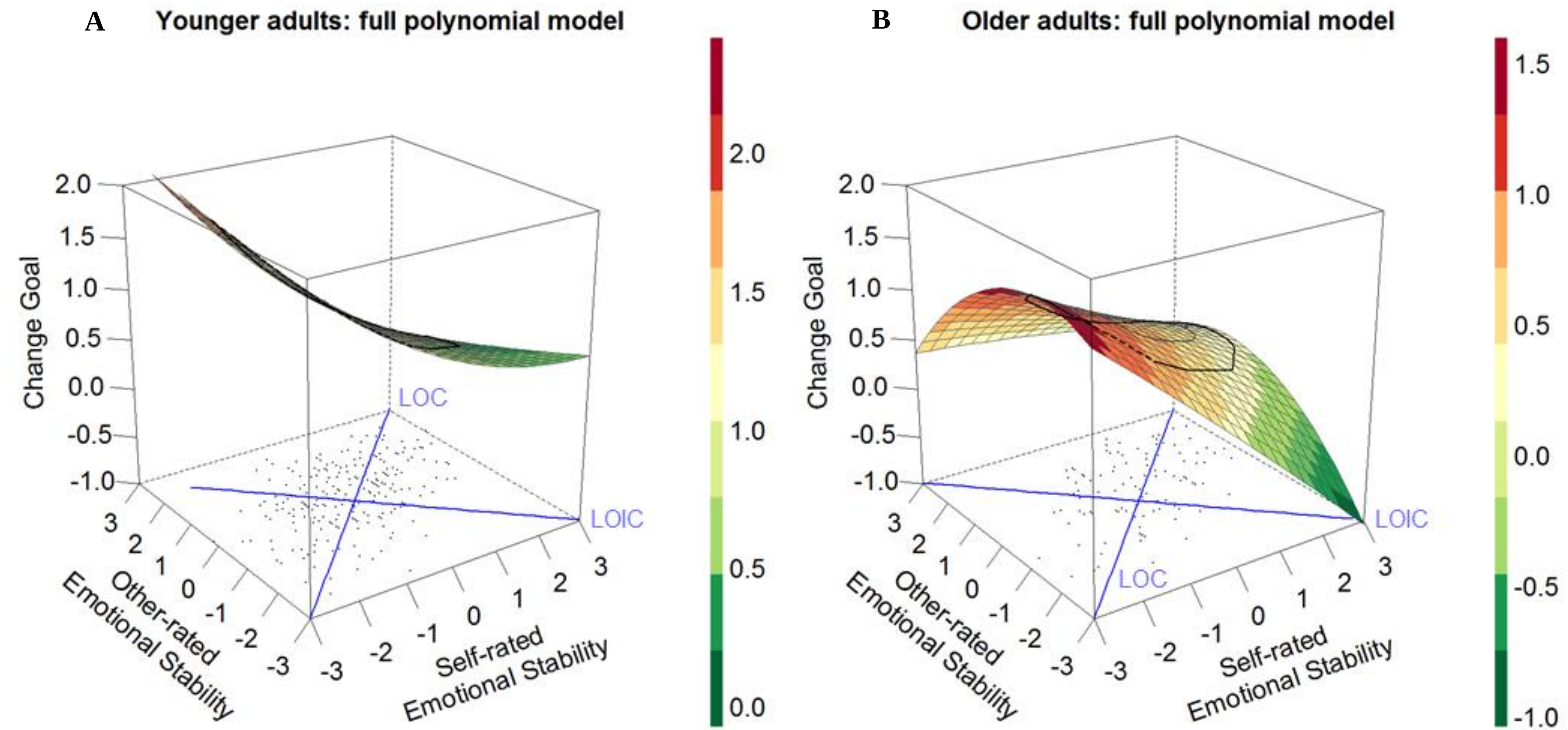


Figure A1. Response surfaces for the association of self- and other-rated emotional stability with goals to change emotional stability for each age group: (A) for younger and (B) for older adults. Both predictors were centered on the scale midpoint. Change goals ranged from -3 (*decrease emotional stability*) to +3 (*increase emotional stability*), with 0 indicating *no change desired*.

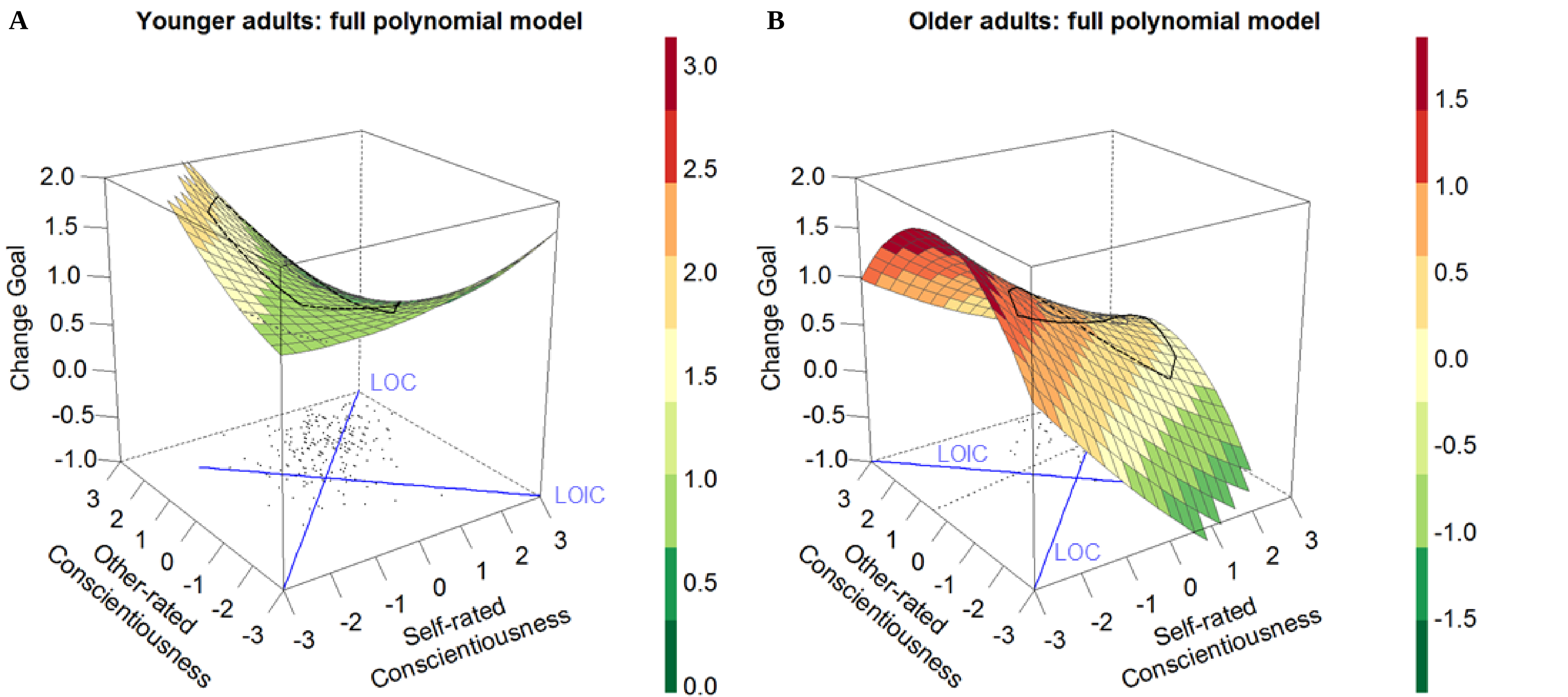


Figure A2. Response surfaces for the association of self- and other-rated conscientiousness with goals to change conscientiousness for each age group: (A) for younger and (B) for older adults. Both predictors were centered on the scale midpoint. Change goals ranged from -3 (*decrease conscientiousness*) to +3 (*increase conscientiousness*), with 0 indicating *no change desired*.

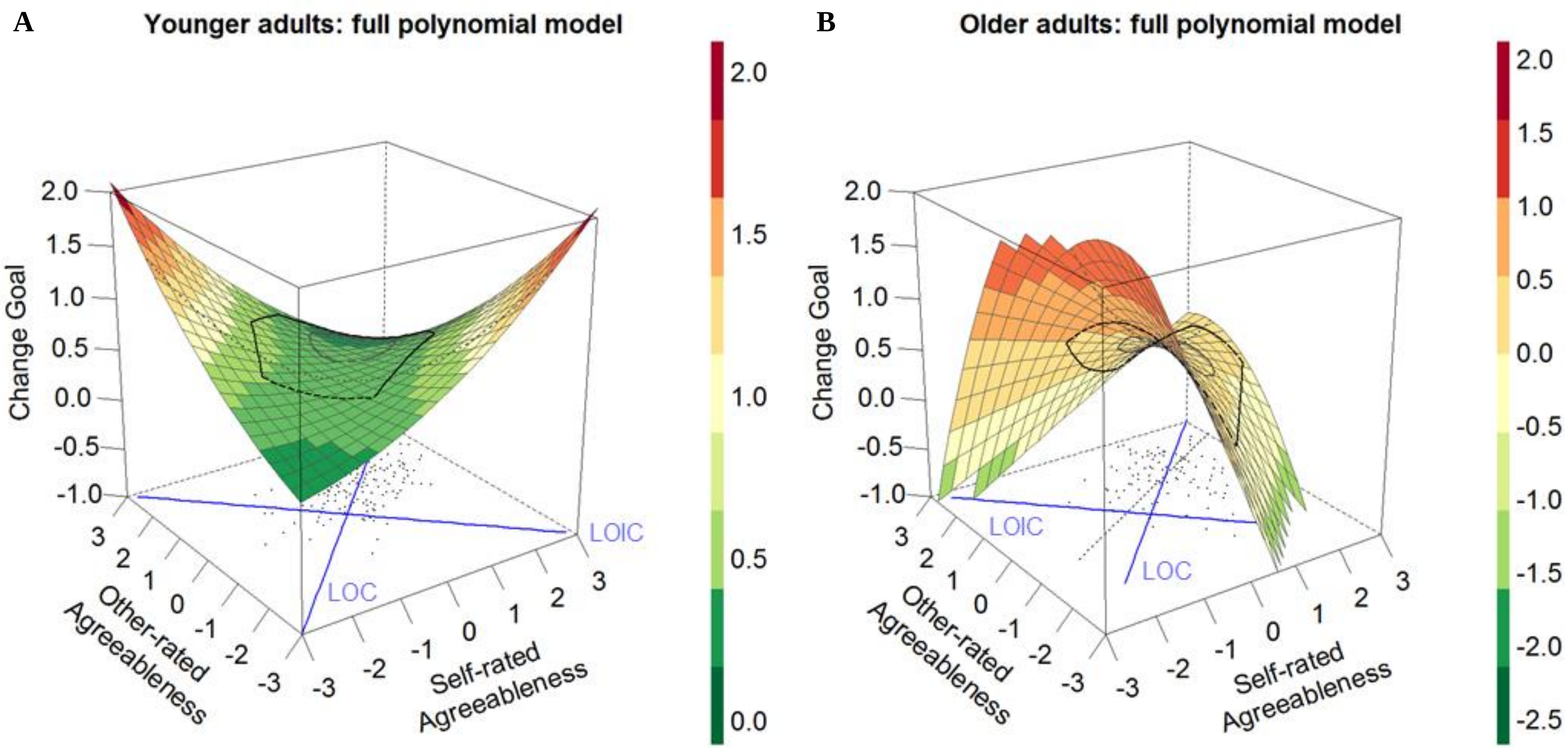


Figure A3. Response surfaces for the association of self- and other-rated agreeableness with goals to change agreeableness for each age group: (A) for younger and (B) for older adults. Both predictors were centered on the scale midpoint. Change goals ranged from -3 (*decrease agreeableness*) to +3 (*increase agreeableness*), with 0 indicating *no change desired*.

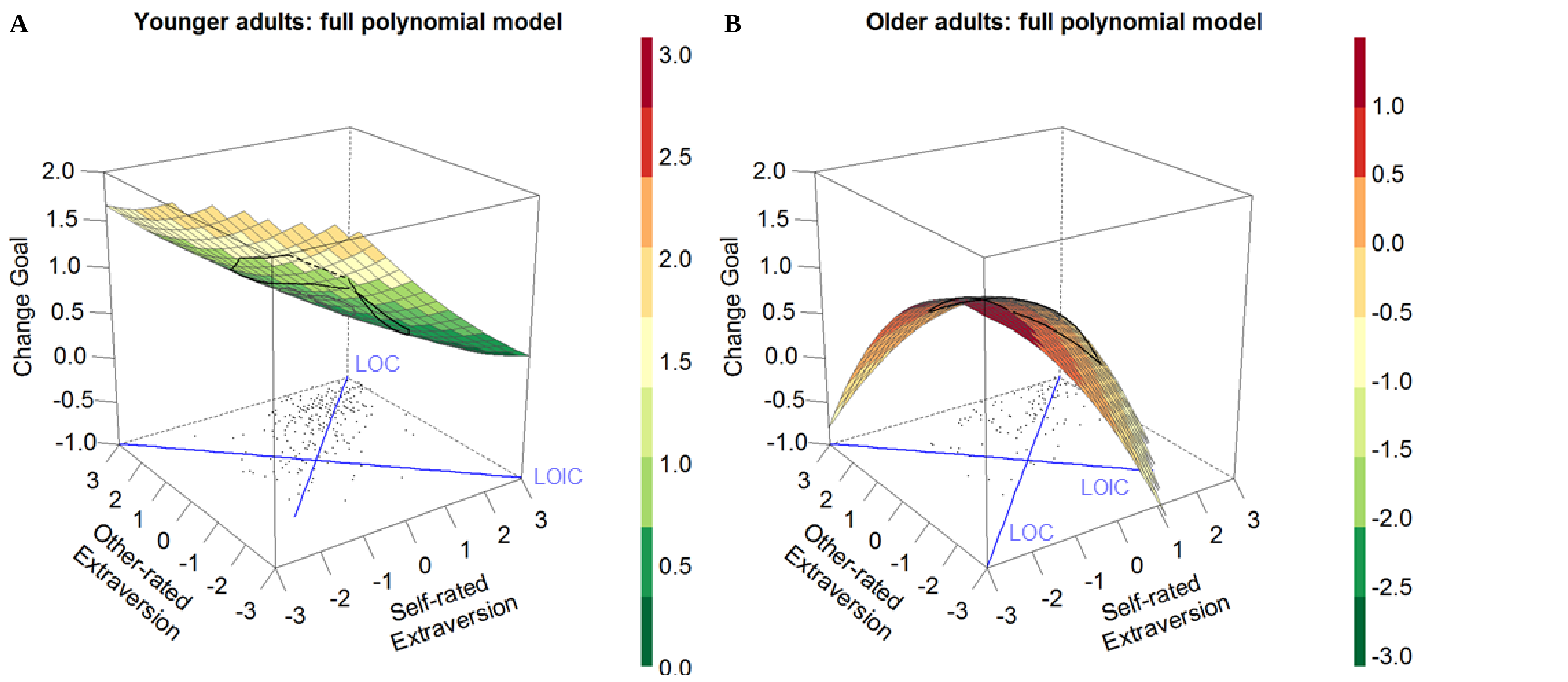


Figure A4. Response surfaces for the association of self- and other-rated extraversion with goals to change extraversion for each age group: (A) for younger and (B) for older adults. Both predictors were centered on the scale midpoint. Change goals ranged from -3 (*decrease extraversion*) to +3 (*increase extraversion*), with 0 indicating *no change desired*.

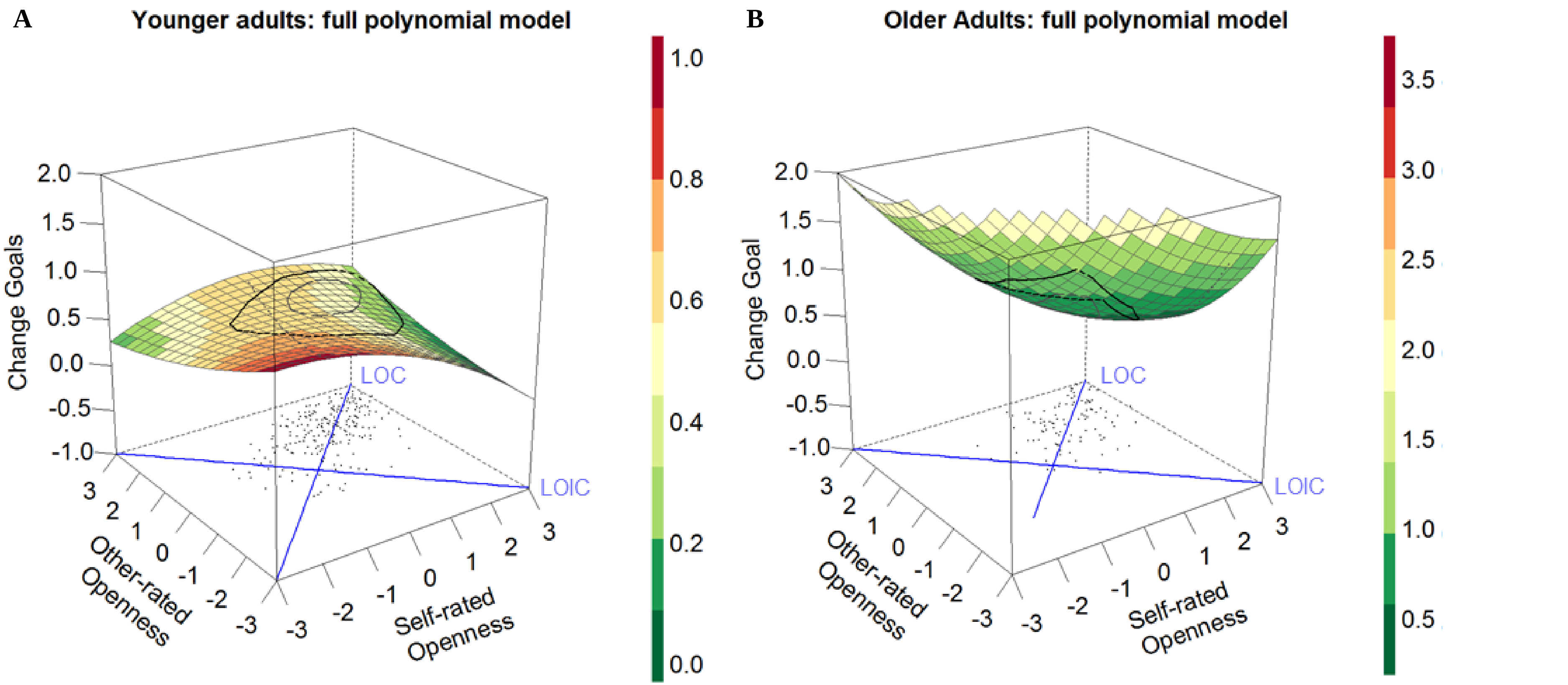


Figure A5. Response surfaces for the association of self- and other-rated openness with goals to change openness for each age group: (A) for younger and (B) for older adults. Both predictors were centered on the scale midpoint. Change goals ranged from -3 (*decrease openness*) to +3 (*increase openness*), with 0 indicating *no change desired*.

Table A9

Regression Analysis Predicting Goals to Change from Self-Reported Big Five Traits, Age Group, and Additional Personality Characteristics

	Change goals				
	Emotional stability	Conscientiousness	Agreeableness	Extraversion	Openness
Trait	-.73*	-.42*	-.19*	-.59*	-.19*
Age group	-.14*	-.33*	-.09	-.18*	-.10
Trait × Age Group	.17*	.06	-.08	-.07	-.09
Life satisfaction	.09	-.17*	.03	-.04	.08
Life Satisfaction × Age Group	-.10	.11	-.08	-.12	-.11
Self-esteem	-.04	-.02	.14	-.12	-.16
Self-Esteem × Age Group[a]	.15*	-.01	-.03	-.70	.06
Locus of control	.05	-.07	.00	-.03	-.14
Locus of Control × Age Group	.02	-.03	-.08	.10	-.01

Table A9 continued

	Emotional stability	Conscientiousness	Agreeableness	Extraversion	Openness
Entity orientation	-.09	.06	-.08	-.03	-.08
Entity Orientation × Age Group	.03	.10	.05	.02	.00
Optimism	.00	.11	-.04	.16*	.14
Optimism × Age Group	-.07	.00	.09	-.01	.12
Loneliness	.06	-.01	.17	.00	.04
Loneliness × Age Group	.11	.09	-.08	.04	.10
R^2	.40	.37	.07	.29	.09
$F(15, 359)$	17.47	15.35	2.84	10.95	3.58
p	< .001	< .001	< .001	< .001	< .001

Note. All continuous predictors are standardized. Age group is dummy-coded with 0 = younger adults, 1 = older adults.

[a] A simple slope analysis showed that the association between self-esteem and goals to change emotional stability was not significant for younger (β = -0.04, p = .597) or for older adults (β = 0.21, p = .061), when other characteristics and the Big Five traits were controlled for.

* $p < .05$.

Table A10

Correlations for Self-Reported Big Five Traits, Life Satisfaction, Self-Esteem, Locus of Control, Entity Orientation, Optimism, and Loneliness

Variable	1	2	3	4	5	6	7	8	9	10
Self-reported										
Traits										
1. Emotional stability										
2. Conscientiousness	.03 / .29*									
3. Agreeableness	.18 */ .33*	.13* / .22*								
4. Extraversion	.30* / .45*	.29* / .45*	.28* / .17							
5. Openness	-.02 / .35*	.10 / .21*	.00 / .16	.18* /.48*						
Other predictors										
6. Life satisfaction	.43* / .48*	.28* / .37*	.25* / .20*	.50* / .47*	.09 / .28*					
7. Self-esteem	.50* / .41*	.29* / .40*	.15* / .11	.35* / .39*	-.01 / .21*	.68* / .69*				
8. Locus of control	.32* / .37*	.28* / .40*	.16* / .10	.29* / .32*	.01 / .07	.56* / .60*	.52* / .48*			
9. Entity orientation	.02 / -.05	.01 / -.08	-.07 / -.26*	-.01 / -.02	-.09 / -.10	.01 / .04	-.01 / .12	.01 / .12		
10. Optimism	.47* / .45*	.22* / .32*	.26* / .08	.37* / .38*	.02 / .16	.66* / .72*	.69* / .53*	.50* / .65*	-.03 / .10	
11. Loneliness	-.43* / -.46*	-.24* / -.39*	-.31* / -.21*	-.55* / -.49*	.04 / -.17	-.69* / -.73*	-.53* / -.59*	-.42* / -.54*	-.07 / -.00	-.52* / -.55*

Note. Values to the left of the slashes refer to younger adults; values to the right refer to older adults.

* $p < .05$.

Table A11

Fit Indices for Models with Different Levels of Measurement Invariance for Big Five Traits

	Self-rating					IAT				
Model	χ^2	CFI	TLI	RMSEA	SRMR	χ^2	CFI	TLI	RMSEA	SRMR
Openness										
1	54.423	0.999	0.999	0.011	0.023	9.839	1.000	1.010	0	0.017
2	55.651	1.000	1.001	0	0.022	12.778	1.000	1.009	0	0.024
3	61.334	1.000	1.001	0	0.024	15.074	1.000	1.009	0	0.025
Conscientiousness										
1	62.460	0.995	0.993	0.030	0.023	10.446	1.000	1.009	0	0.016
2	67.787	0.996	0.994	0.027	0.027	13.894	1.000	1.006	0	0.022
3	82.029	0.993	0.992	0.032	0.028	16.728	1.000	1.005	0	0.024

Table A11 continued

	Self-rating					IAT				
Model	χ^2	CFI	TLI	RMSEA	SRMR	χ^2	CFI	TLI	RMSEA	SRMR
Extraversion										
1	58.893	0.998	0.997	0.023	0.020	14.876	0.998	0.996	0.021	0.014
2	67.077	0.997	0.997	0.024	0.027	16.738	0.999	0.998	0.015	0.019
3	96.591	0.992	0.991	0.040	0.029	30.780	0.989	0.984	0.042	0.026
3b						22.289	0.996	0.993	0.027	0.022
Agreeableness										
1	58.734	0.997	0.996	0.022	0.021	9.349	1.000	1.009	0	0.018
2	82.562	0.991	0.988	0.036	0.042	12.922	1.000	1.006	0	0.024
3	94.044	0.989	0.987	0.038	0.043	13.630	1.000	1.009	0	0.024
Emotional stability										
1	76.663	0.993	0.990	0.039	0.022	15.710	0.996	0.990	0.027	0.019
2	90.690	0.991	0.988	0.042	0.039	19.278	0.995	0.991	0.025	0.023
3	102.567	0.989	0.988	0.043	0.038	21.042	0.997	0.995	0.019	0.024

Note. IAT = implicit association test. CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual. 1 = Unconstrained model; 2 = Model with weak measurement invariance; 3 = Model with strong measurement invariance; 3^b = Model with partial strong measurement invariance.

Partial strong measurement invariance for IAT extraversion was achieved by freeing one parcel's intercept at T3.

Table A12

Means, Standard Deviations and Intercorrelations of Change Goals, their Importance and Feasibility at T1

Trait	Change Goal M (SD)	Importance M (SD)	Feasibility M (SD)	r_{CI}	r_{CF}	r_{IF}
Openness	3.48 (0.42)	3.33 (0.97)	3.59 (0.88)	.033	-.555**	0
Conscientiousness	3.65 (0.58)	3.49 (0.90)	3.30 (0.90)	.241**	-.581**	-.315**
Extraversion	3.41 (0.57)	3.34 (0.98)	3.51 (1.07)	.194**	-.579**	-.233**
Agreeableness	3.37 (0.44)	3.51 (1.03)	3.73 (0.88)	.115*	-.342**	-.166*
Emotional Stability	3.81 (0.61)	3.51 (0.98)	2.91 (1.10)	.362**	-.600**	-.531**

Note. r_{CI} = correlation between change goals and importance at T1. r_{CF} = correlation between change goals and feasibility at T1. r_{IF} = correlation between importance and feasibility at T1.

* $p < .05$. ** $p < .01$.

Table A13

Correlations of Importance and Feasibility of Change Goals at T1 with TESSERA components

	Openness		Conscientiousness		Extraversion		Agreeableness		Emotional stability	
	CG Impor-tance	CG Feasi-bility	CG Impor-tance	CG Feasi-bility	CG Impor-tance	CG Feasi-bility	CG Impor-tance	CG Feasi-bility	CG Impor-tance	CG Feasi-bility
Triggering situations										
Intellect	0.123*	0.096	0.086	-0.039	-0.018	-0.013	0.023	-0.087	0.026	0.052
Duty	0.110*	0.006	0.163**	0.008	0.060	0.014	0.020	-0.094	0.122*	-0.031
Sociality	0.016	0.009	0.040	-0.051	0.001	0.127*	0.050	0.054	0.073	-0.048
Deception	0.037	-0.018	0.068	-0.092	0.016	-0.063	-0.035	-0.134*	-0.010	-0.037
Negativity	-0.013	0.030	0.066	-0.189**	0.031	-0.130*	-0.014	-0.049	0.109*	-0.168**
Adversity	0.018	0.017	0.068	-0.132*	0.026	-0.077	-0.030	-0.056	-0.017	-0.065
Own Expectations	0.105*	-0.041	0.059	-0.023	0.102	-0.008	-0.048	-0.120*	-0.015	-0.002
States and state expressions										
Open	0.103*	0.086	-0.015	0.202**	0.004	0.268**	0.076	0.135**	-0.065	0.179**

Table A13 continued

	Openness		Conscientiousness		Extraversion		Agreeableness		Emotional stability	
	CG Impor-tance	CG Feasi-bility	CG Impor-tance	CG Feasi-bility	CG Impor-tance	CG Feasi-bility	CG Impor-tance	CG Feasi-bility	CG Impor-tance	CG Feasi-bility
States and state expressions										
Conscientious	0.122*	0.081	-0.002	0.201**	0.012	0.112*	0.044	-0.023	-0.003	0.112*
Extraverted	0.009	0.044	0.074	0.139**	0.008	0.293**	0.088	0.109*	-0.048	0.181**
Agreeable	0.133*	0.086	-0.030	0.183**	0.016	0.205**	0.092	0.117*	-0.021	0.108*
Emotional stable	0.095	0.059	0.049	0.248**	0.039	0.215**	0.067	0.078	-0.058	0.237**
Affective reaction after experiences	0.094	0.051	-0.033	0.201**	0.026	0.182**	0.067	0.063	-0.095	0.207**
Reflection on experiences	0.024	0.024	-0.009	-0.017	-0.023	-0.042	0.004	-0.099	0.042	-0.153**

Note. CG Importance = Importance of change goals at T1; CG Feasibility = Feasibility of change goals at T1.

* $p < .05$. ** $p < .01$.

Table A14

Associations of TESSERA components during D4-D5 (within-person level)

Association of TESSERA components	O	C	E	A		ES	
	Intellect *- expectancy* ***- open*** *- reaction*	***Duty*** *- expectancy* ***-conscientious*** *- reaction*	***Sociality*** *- expectancy* ***- extraverted*** *- reaction*	***Sociality*** *- expectancy* ***- agreeable*** *- reaction*	***Deception*** *- expectancy* ***- agreeable*** *- reaction*	***Negativity*** *- expectancy* ***- emotional stable*** *- reaction*	***Adversity*** *- expectancy* ***- emotional stable*** *- reaction*
Situation → expectancy	0.106**	0.167**	0.123**	0.123**	0.029	-0.002	-0.007
Situation → state	-0.057**	0.083**	0.308**	0.233**	-0.256**	-0.343**	-0.210**
Situation → reaction	-0.100**	-0.114**	-0.063**	0.028†	-0.385**	-0.476**	-0.329**
Expectancy → state	0.078**	0.145**	0.032**	0.029**	0.069**	0.161**	0.161**
State → reaction	0.677**	0.268**	0.709**	0.552**	0.502**	0.326**	0.564**
State → reflection	0.100**	0.081**	0.032	0.120**	0.120**	-0.120**	-0.120**
Reaction → reflection	-0.230**	-0.197**	-0.199**	-0.228**	-0.228**	-0.130**	-0.130**

Note. O = openness, C = conscientiousness, E = extraversion, A = agreeableness, ES = emotional stability.

† $p < .10$. ** $p < .01$.

Table A15

Associations of Change Goals, their Importance and their Feasibility at T1 with TESSERA Components (Sociality of Situations) and Long-term Development in Agreeableness for (between-person level)

	Self-rating	IAT
Predicting triggering situations during D4-D5 by change goals, importance and feasibility at T1		
Situation: Sociality on change goals	0.031 [-0.281; 0.344]	0.037 [-0.268; 0.342]
Situation: Sociality on change goals × traits	0.073 [-0.256; 0.401]	-0.323 [-1.193; 0.546]
Situation: Sociality on importance	0.034 [-0.082; 0.150]	0.045 [-0.066; 0.156]
Situation: Sociality on feasibility	-0.019 [-0.161; 0.123]	0.022 [-0.118; 0.162]
Situation: Sociality on importance × feasibility	-0.007 [-0.154; 0.140]	-0.012 [-0.154; 0.130]
Situation: Sociality on change goals × importance	-0.186 [-0.450; 0.078]	-0.158 [-0.423; 0.107]
Situation: Sociality on change goals × feasibility	0.126 [-0.203; 0.456]	0.119 [-0.176; 0.414]
Predicting states and state expressions during D1-D3 by change goals, importance and feasibility at T1		
State: Agreeable (D1-D3) on change goals	0.024 [-0.101; 0.149]	-0.024 [-0.148; 0.101]
State: Agreeable (D1-D3) on change goals × traits	-0.081 [-0.208; 0.045]	-0.180 [-0.482; 0.123]
State: Agreeable (D1-D3) on importance	0.009 [-0.047; 0.066]	0.045 [-0.011; 0.101]
State: Agreeable (D1-D3) on feasibility	0.010 [-0.056; 0.075]	0.069* [0.002; 0.136]
State: Agreeable (D1-D3) on importance × feasibility	-0.037 [-0.103; 0.028]	0.160* [0.032; 0.288]
State: Agreeable (D1-D3) on change goals × importance	0.012 [-0.109; 0.133]	0.021 [-0.101; 0.142]
State: Agreeable (D1-D3) on change goals × feasibility	0.158* [0.025; 0.291]	-0.053 [-0.118; 0.012]
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Agreeable (D4-D5) on change goals	0.012 [-0.134; 0.159]	0.029 [-0.115; 0.173]
State: Agreeable (D4-D5) on change goals × traits	0.110 [-0.042; 0.262]	0.258 [-0.108; 0.624]

Table A15 continued

	Self-rating	IAT
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Agreeable (D4-D5) on importance	0.034 [-0.015; 0.084]	0.038 [-0.008; 0.084]
State: Agreeable (D4-D5) on feasibility	-0.003 [-0.066; 0.059]	0.000 [-0.059; 0.058]
State: Agreeable (D4-D5) on importance × feasibility	-0.053† [-0.109; 0.004]	-0.059* [-0.113; -0.006]
State: Agreeable (D4-D5) on change goals × importance	-0.161** [-0.276; -0.046]	-0.158** [-0.272; -0.044]
State: Agreeable (D4-D5) on change goals × feasibility	-0.057 [-0.216; 0.102]	-0.002 [-0.142; 0.138]
Predicting difference in change T2 – T1 by change goals, importance and feasibility at T1		
Change T2-T1 on change goals	-0.286* [-0.421; -0.152]	-0.022 [-0.091; 0.047]
Change T2-T1 on change goals × traits	0.032 [-0.129; 0.192]	-0.004 [-0.245; 0.238]
Change T2-T1 on change goals × Agreeable state (D1-D3)	-0.046 [-0.277; 0.185]	-0.066 [-0.158; 0.027]
Change T2-T1 on importance	-0.004 [-0.069; 0.062]	-0.008 [-0.039; 0.024]
Change T2-T1 on feasibility	0.071 [-0.007; 0.148]	0.000 [-0.034; 0.035]
Change T2-T1 on importance × feasibility	-0.009 [-0.080; 0.062]	0.012 [-0.020; 0.044]
Change T2-T1 on change goals × importance	-0.065 [-0.207; 0.078]	0.075* [0.010; 0.141]
Change T2-T1 on change goals × feasibility	-0.095 [-0.276; 0.086]	-0.047 [-0.126; 0.033]
Predicting difference in change T3 – T2 by change goals, importance and feasibility at T1		
Change T3-T2 on change goals	0.049 [-0.114; 0.212]	-0.037 [-0.136; 0.062]
Change T3-T2 on change goals × traits	-0.110 [-0.325; 0.105]	0.020 [-0.254; 0.295]
Change T3-T2 on change goals × Agreeable state (D4-D5)	0.174 [-0.081; 0.429]	0.054 [-0.086; 0.194]
Change T3-T2 on importance	-0.025 [-0.101; 0.050]	0.014 [-0.031; 0.058]
Change T3-T2 on feasibility	-0.042 [-0.123; 0.040]	-0.008 [-0.056; 0.039]

Table A15 continued

	Self-rating	IAT
Predicting difference in change T3 – T2 by change goals, importance and feasibility at T1		
Change T3-T2 on importance × feasibility	0.018 [-0.064; 0.100]	-0.016 [-0.068; 0.035]
Change T3-T2 on change goals × importance	0.018 [-0.127; 0.164]	-0.056 [-0.152; 0.040]
Change T3-T2 on change goals × feasibility	0.004 [-0.194; 0.202]	0.017 [-0.090; 0.124]
Predicting difference in change T4 – T3 by change goals, importance and feasibility at T1		
Change T4-T3 on change goals	0.097 [-0.076; 0.269]	0.029 [-0.070; 0.129]
Change T4-T3 on change goals × traits	0.118 [-0.077; 0.313]	-0.081 [-0.405; 0.244]
Change T4-T3 on change goals × Agreeable state (D4-D5)	-0.110 [-0.373; 0.153]	0.095 [-0.070; 0.260]
Change T4-T3 on importance	-0.006 [-0.084; 0.072]	-0.013 [-0.055; 0.029]
Change T4-T3 on feasibility	0.004 [-0.088; 0.097]	0.006 [-0.044; 0.056]
Change T4-T3 on importance × feasibility	0.017 [-0.067; 0.101]	-0.026 [-0.074; 0.021]
Change T4-T3 on change goals × importance	0.053 [-0.082; 0.187]	-0.003 [-0.092; 0.086]
Change T4-T3 on change goals × feasibility	-0.003 [-0.214; 0.207]	-0.027 [-0.149; 0.095]

Note. IAT = implicit association test. 95% confidence intervals are shown in brackets.

† $p < .10$. * $p < .05$. ** $p < .01$.

Table A16

Associations of Change Goals, their Importance and their Feasibility at T1 with TESSERA Components (Adversity of Situations) and Long-term Development in Emotional Stability (between-person level)

	Self-rating	IAT
Predicting triggering situations during D4-D5 by change goals, importance and feasibility at T1		
Situation: Adversity on change goals	0.023 [-0.138; 0.184]	0.054 [-0.115; 0.223]
Situation: Adversity on change goals × traits	-0.150* [-0.278; -0.021]	0.383* [0.040; 0.726]
Situation: Adversity on importance	-0.036 [-0.124; 0.051]	-0.032 [-0.123; 0.059]
Situation: Adversity on feasibility	0.114* [0.021; 0.208]	0.072 [-0.011; 0.155]
Situation: Adversity on importance × feasibility	0.040 [-0.056; 0.135]	0.019 [-0.072; 0.110]
Situation: Adversity on change goals × importance	-0.039 [-0.251; 0.172]	-0.092 [-0.305; 0.122]
Situation: Adversity on change goals × feasibility	0.085 [-0.064; 0.234]	-0.055 [-0.170; 0.060]
Predicting states and state expressions during D1-D3 by change goals, importance and feasibility at T1		
State: Emotional Stable (D1-D3) on change goals	-0.060 [-0.189; 0.068]	-0.135* [-0.254; -0.016]
State: Emotional Stable (D1-D3) on change goals × traits	-0.025 [-0.120; 0.069]	0.451** [0.164; 0.737]
State: Emotional Stable (D1-D3) on importance	0.087* [0.016; 0.157]	0.092** [0.024; 0.159]
State: Emotional Stable (D1-D3) on feasibility	0.038 [-0.034; 0.110]	0.064 [-0.004; 0.132]
State: Emotional Stable (D1-D3) on importance × feasibility	-0.021 [-0.083; 0.041]	-0.029 [-0.095; 0.036]
State: Emotional Stable (D1-D3) on change goals × importance	-0.018 [-0.144; 0.107]	-0.053 [-0.184; 0.077]
State: Emotional Stable (D1-D3) on change goals × feasibility	0.030 [-0.101; 0.160]	-0.002 [-0.105; 0.102]
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Emotional Stable (D4-D5) on change goals	-0.035 [-0.136; 0.066]	-0.012 [-0.112; 0.088]

Table A16 continued

	Self-rating	IAT
Predicting states and state expressions during D4-D5 by change goals, importance and feasibility at T1		
State: Emotional Stable (D4-D5) on change goals × traits	-0.009 [-0.081; 0.064]	-0.062 [-0.311; 0.186]
State: Emotional Stable (D4-D5) on importance	-0.018 [-0.087; 0.051]	-0.010 [-0.077; 0.057]
State: Emotional Stable (D4-D5) on feasibility	0.011 [-0.058; 0.079]	0.006 [-0.056; 0.069]
State: Emotional Stable (D4-D5) on importance × feasibility	0.017 [-0.040; 0.074]	0.019 [-0.039; 0.077]
State: Emotional Stable (D4-D5) on change goals × importance	0.031 [-0.085; 0.146]	0.041 [-0.076; 0.159]
State: Emotional Stable (D4-D5) on change goals × feasibility	-0.008 [-0.113; 0.097]	-0.011 [-0.100; 0.078]
Predicting difference in change T2 – T1 by change goals, importance and feasibility at T1		
Change T2-T1 on change goals	-0.269** [-0.428; -0.111]	-0.047 [-0.103; 0.010]
Change T2-T1 on change goals × traits	0.078 [-0.033; 0.189]	0.043 [-0.140; 0.226]
Change T2-T1 on change goals × Emotional Stable state (D1-D3)	-0.155** [-0.268; -0.043]	-0.012 [-0.050; 0.027]
Change T2-T1 on importance	0.009 [-0.087; 0.106]	0.027 [-0.012; 0.066]
Change T2-T1 on feasibility	0.080† [-0.014; 0.174]	0.004 [-0.030; 0.037]
Change T2-T1 on importance × feasibility	0.007 [-0.074; 0.088]	-0.026 [-0.060; 0.009]
Change T2-T1 on change goals × importance	0.069 [-0.097; 0.236]	-0.017 [-0.080; 0.047]
Change T2-T1 on change goals × feasibility	-0.056 [-0.192; 0.080]	0.017 [-0.029; 0.063]
Predicting difference in change T3 – T2 by change goals, importance and feasibility at T1		
Change T3-T2 on change goals	-0.065 [-0.231; 0.101]	0.018 [-0.059; 0.094]
Change T3-T2 on change goals × traits	-0.072 [-0.196; 0.051]	0.024 [-0.191; 0.240]
Change T3-T2 on change goals × Emotional Stable state (D4-D5)	0.073 [-0.069; 0.215]	0.017 [-0.039; 0.073]

Table A16 continued

	Self-rating	IAT
Predicting difference in change T3 – T2 change goals, importance and feasibility at T1		
Change T3-T2 on importance	0.050 [-0.048; 0.149]	-0.005 [-0.055; 0.044]
Change T3-T2 on feasibility	-0.056 [-0.144; 0.031]	-0.009 [-0.053; 0.035]
Change T3-T2 on importance × feasibility	-0.030 [-0.117; 0.058]	0.013 [-0.038; 0.065]
Change T3-T2 on change goals × importance	-0.084 [-0.279; 0.110]	0.016 [-0.076; 0.108]
Change T3-T2 on change goals × feasibility	0.014 [-0.132; 0.161]	-0.025 [-0.079; 0.030]
Predicting difference in change T4 – T3 change goals, importance and feasibility at T1		
Change T4-T3 on change goals	0.153 [-0.018; 0.323]	0.028 [-0.053; 0.109]
Change T4-T3 on change goals × traits	0.078 [-0.056; 0.213]	0.054 [-0.187; 0.295]
Change T4-T3 on change goals × Emotional Stable state (D4-D5)	-0.101 [-0.254; 0.053]	0.016 [-0.050; 0.082]
Change T4-T3 on importance	0.051 [-0.065; 0.166]	0.002 [-0.046; 0.050]
Change T4-T3 on feasibility	0.110* [0.003; 0.217]	-0.005 [-0.056; 0.045]
Change T4-T3 on importance × feasibility	-0.005 [-0.111; 0.102]	-0.020 [-0.067; 0.027]
Change T4-T3 on change goals × importance	0.073 [-0.153; 0.299]	-0.025 [-0.115; 0.065]
Change T4-T3 on change goals × feasibility	-0.044 [-0.209; 0.120]	0.034 [-0.046; 0.115]

Note. IAT = implicit association test. 95% confidence intervals are shown in brackets.

† $p < .10$. * $p < .05$. ** $p < .01$.

Table A17

Change Goals × Importance ×Feasibility Interactions predicting TESSERA components and Long-Term Trait Change (between-person level)

	O	C	E	A		ES	
	Intellect *- expectancy* ***- open*** *- reaction*	***Duty*** *- expectancy* ***-conscientious*** *- reaction*	***Sociality*** *- expectancy* ***- extraverted*** *- reaction*	***Sociality*** *- expectancy* ***- agreeable*** *- reaction*	***Deception*** *- expectancy* ***- agreeable*** *- reaction*	***Negativity*** *- expectancy* ***- emotional stable*** *- reaction*	***Adversity*** *- expectancy* ***- emotional stable*** *- reaction*
Estimates for models on self-rated traits							
Change Goals × Importance × Feasibility → situation D4-D5	-0.288 [-0.708; 0.132]	-0.045 [-0.256; 0.166]	-0.142 [-0.321; 0.037]	-0.030 [-0.282; 0.221]	-0.030 [-0.139; 0.080]	0.049 [-0.034; 0.132]	0.045 [-0.050; 0.139]
Change Goals × Importance × Feasibility → state D1-D3	-0.180* [-0.345; -0.014]	-0.066 [-0.181; 0.050]	-0.038 [-0.114; 0.039]	-0.080 [-0.192; 0.032]	-0.082 [-0.204; 0.039]	-0.088* [-0.169; -0.007]	-0.098* [-0.177; -0.019]
Change Goals × Importance × Feasibility → state D4-D5	-0.040 [-0.166; 0.085]	0.097* [0.009; 0.185]	0.057 [-0.031; 0.145]	0.067 [-0.032; 0.165]	0.072 [-0.021; 0.166]	0.022 [-0.047; 0.091]	0.029 [-0.039; 0.096]
Change Goals × Importance × Feasibility → Change T2-T1	-0.046 [-0.248; 0.156]	0.048 [-0.062; 0.159]	-0.026 [-0.144; 0.093]	0.018 [-0.133; 0.169]	0.019 [-0.132; 0.170]	-0.011 [-0.104; 0.081]	-0.006 [-0.100; 0.088]
Change Goals × Importance × Feasibility → Change T3-T2	0.046 [-0.136; 0.229]	0.025 [-0.096; 0.145]	-0.009 [-0.117; 0.099]	0.006 [-0.155; 0.168]	0.007 [-0.155; 0.168]	0.024 [-0.084; 0.133]	0.023 [-0.085; 0.132]
Change Goals × Importance × Feasibility → Change T4-T3	-0.056 [-0.234; 0.122]	-0.032 [-0.153; 0.089]	0.092 [-0.025; 0.209]	-0.081 [-0.240; 0.077]	-0.081 [-0.240; 0.078]	-0.039 [-0.157; 0.079]	-0.039 [-0.157; 0.079]

Table A17 continued

	O	C	E	A		ES	
	Intellect *- expectancy* ***- open*** *- reaction*	***Duty*** *- expectancy* ***-conscientious*** *- reaction*	***Sociality*** *- expectancy* ***- extraverted*** *- reaction*	***Sociality*** *- expectancy* ***- agreeable*** *- reaction*	***Deception*** *- expectancy* ***- agreeable*** *- reaction*	***Negativity*** *- expectancy* ***- emotional stable*** *- reaction*	***Adversity*** *- expectancy* ***- emotional stable*** *- reaction*
Estimates for models on implicitly measured traits							
Change Goals × Importance ×	-0.302	-0.036	-0.136	-0.017	-0.016	0.039	0.038
Feasibility → situation D4-D5	[-0.711; 0.107]	[-0.240; 0.168]	[-0.313; 0.042]	[-0.266; 0.232]	[-0.124; 0.092]	[-0.046; 0.124]	[-0.053; 0.128]
Change Goals × Importance ×	-0.139	-0.058	-0.036	-0.107	-0.109	-0.089*	-0.098*
Feasibility → state D1-D3	[-0.297; 0.020]	[-0.181; 0.064]	[-0.115; 0.042]	[-0.225; 0.010]	[-0.237; 0.019]	[-0.167; -0.011]	[-0.173; -0.022]
Change Goals × Importance ×	-0.047	0.093*	0.058	0.065	0.071	0.021	0.024
Feasibility → state D4-D5	[-0.171; 0.077]	[0.007; 0.178]	[-0.025; 0.142]	[-0.035; 0.166]	[-0.024; 0.166]	[-0.047; 0.090]	[-0.042; 0.091]
Change Goals × Importance ×	-0.033	-0.055	0.028	0.024	0.025	-0.004	-0.004
Feasibility → Change T2-T1	[-0.110; 0.045]	[-0.142; 0.011]	[-0.040; 0.097]	[-0.047; 0.094]	[-0.045; 0.096]	[-0.043; 0.035]	[-0.044; 0.035]
Change Goals × Importance ×	0.001	0.008	-0.007	0.023	0.022	0.012	0.012
Feasibility → Change T3-T2	[-0.106; 0.107]	[-0.065; 0.081]	[-0.083; 0.068]	[-0.071; 0.117]	[-0.071; 0.116]	[-0.042; 0.065]	[-0.042; 0.065]
Change Goals × Importance ×	0.023	0.060	0.029	-0.061	-0.061	-0.040	-0.041
Feasibility → Change T4-T3	[-0.078; 0.123]	[-0.006; 0.126]	[-0.054; 0.111]	[-0.157; 0.034]	[-0.157; 0.035]	[-0.094; 0.013]	[-0.095; 0.013]

Note. O = openness, C = conscientiousness, E = extraversion, A = agreeableness, ES = emotional stability. 95% confidence intervals are shown in brackets.

Model fit indices *openness*: Self-rating, CFI = 0.877, TLI = 0.810, RMSEA = 0.025, SRMR (within) = 0.050, SRMR (between) = 0.086; IAT, CFI = 0.947, TLI = 0.912, RMSEA = 0.016, SRMR (within) = 0.016, SRMR (between) = 0.090.

Model fit indices *conscientiousness*: Self-rating, CFI = 0.907, TLI = 0.856, RMSEA = 0.017, SRMR (within) = 0.025, SRMR (between) = 0.105; IAT, CFI = 0.885, TLI = 0.810, RMSEA = 0.017, SRMR (within) = 0.023, SRMR (between) = 0.090.

Model fit indices *extraversion*: Self-rating, CFI = 0.932, TLI = 0.895, RMSEA = 0.020, SRMR (within) = 0.031, SRMR (between) = 0.129; IAT, CFI = 0.951, TLI = 0.919, RMSEA = 0.018, SRMR (within) = 0.014, SRMR (between) = 0.108.

Model fit indices *agreeableness* (sociality/deception): Self-rating, CFI = 0.941/0.934, TLI = 0.908/0.898, RMSEA = 0.016/0.017, SRMR (within) = 0.028/0.027, SRMR (between) = 0.080/0.081; IAT, CFI = 0.956/0.951, TLI = 0.927/0.918, RMSEA = 0.014/0.014, SRMR (within) = 0.016/0.017, SRMR (between) = 0.075/0.077.

Model fit indices *emotional stability* (negativity/adversity): Self-rating, CFI = 0.930/0.934, TLI = 0.892/0.899, RMSEA = 0.026/0.020, SRMR (within) = 0.041/0.030, SRMR (between) = 0.122/0.128; IAT, CFI = 0.956/0.951, TLI = 0.927/0.918, RMSEA = 0.014/0.014, SRMR (within) = 0.016/0.017, SRMR (between) = 0.075/0.077.

* $p < .05$.

Zusammenfassung

Obwohl es der Forschung zur Persönlichkeitsentwicklung erfolgreich gelungen ist, Muster aus sowohl Kontinuität als auch Veränderung über die Lebensspanne hinweg zu identifizieren, bleiben zugrundeliegende Faktoren und Prozesse weitestgehend im Unklaren. Um diese Lücke zu schließen, untersuchte die vorliegende Dissertation zwei potentiell relevante makro-analytische Faktoren sowie eine Reihe theoretisch vermuteter mikro-analytischer Prozesse. Mit Blick auf den ersten makro-analytischen Faktor legt frühere Forschung nahe, dass Umweltfaktoren und insbesondere Lebensübergänge zur Persönlichkeitsentwicklung beitragen könnten. Die in höherem Erwachsenenalter zu beobachtenden weniger stark ausgeprägten Persönlichkeitsveränderungen könnten daher aus stabileren Umweltkontexten, d.h. weniger Lebensübergängen, resultieren. Wenn dementsprechend jüngere und ältere Erwachsene einen ähnlichen Lebensübergang erlebten, sollten beide Altersgruppen ähnliche Persönlichkeitsveränderungen zeigen. Ein entsprechend aussagekräftiger Test für die Bedeutsamkeit von Umweltfaktoren für die Persönlichkeitsentwicklung fehlt allerdings bislang. Mit Blick auf den zweiten makro-analytischen Faktor legte jüngste Forschung nahe, dass Menschen auch willentlich zu ihrer Persönlichkeitsentwicklung beitragen, indem sie sich Veränderungsziele setzen und diese verfolgen. Eine umfangreiche Untersuchung von Faktoren, die zu diesen Veränderungszielen beitragen, liegt jedoch bis heute nicht vor. Darüber hinaus erbrachte frühere Forschung widersprüchliche Befunde dazu, ob sich Veränderungsziele in tatsächlichen Persönlichkeitsveränderungen niederschlagen, und untersuchte kaum, welche Zieleigenschaften, z.B. Wichtigkeit oder Schwierigkeit, eine erfolgreiche Zielverfolgung fördern. Schließlich formuliert das kürzlich vorgestellte TESSERA Rahmenmodell (Wrzus & Roberts, 2017) spezifische Hypothesen bezüglich mikro-analytischer Prozesse der Persönlichkeitsentwicklung. Allerdings steht eine erste empirische Prüfung dieses Rahmenmodells noch aus.

Um diese umfassende Agenda in Angriff nehmen zu können, wurde vorliegende multi-methodale Studie mit intensiver Messwiederholung (*measurement burst design*) durchgeführt. Über einen Gesamtzeitraum von zwei Jahren absolvierten 382 jüngere (n = 255, M_{Alter} = 21.57 Jahre) und ältere Erwachsene (n = 127, M_{Alter} = 67.76), die teilweise den Übergang an die Universität erlebten, bis zu vier umfassende Assessments von selbsteingeschätzten, fremdeingeschätzten und implizit gemessenen Big Five Eigenschaften sowie von selbsteingeschätzten Veränderungszielen. Zwischen den ersten drei Assessments wurden darüber hinaus momentane Prozesse mit Hilfe multipler Tagebuchphasen von bis zu 50 Tagen erfasst.

Die Ergebnisse zeigten wie erwartet, dass sich jüngere und ältere Erwachsene, die einen ähnlichen Lebensübergang, d.h. den Übergang an die Universität, erlebten, kaum hinsichtlich der Entwicklung von selbsteingeschätzten, fremdeingeschätzten und implizit gemessenen Eigenschaften unterschieden. Außerdem legten die Befunde nahe, dass ältere Erwachsene, die am universitären Leben teilnahmen, partiell andere Muster an Persönlichkeitsveränderungen zeigten als solche, die diesen Übergang nicht erlebten. Darüber hinaus waren Persönlichkeitsveränderungen teilweise zu Beginn des Lebensüberganges, d.h. bei Studienanfängern, stärker ausgeprägt. Mit Blick auf willentliche Persönlichkeitsveränderung zeigte sich, dass vor allem gegenwärtige Big Five Eigenschaften zu Veränderungszielen beitrugen und dass diese am stärksten ausgeprägt waren, wenn Selbst- und Fremdeinschätzungen hinsichtlich einer niedrigen Eigenschaftsausprägung übereinstimmten. Unerwarteterweise legten die Ergebnisse nahe, dass sich Veränderungsziele kaum in tatsächlichen selbsteingeschätzten und implizit gemessenen Persönlichkeitsveränderungen niederschlugen. Allerdings stützten die Ergebnisse zum Teil die Vermutung, dass höhere Wichtigkeit und Machbarkeit eine erfolgreiche Zielverfolgung förderten. Abschließend zeigte sich bezüglich mikro-analytischer Prozesse der Persönlichkeitsentwicklung, dass sich momentane Prozesse als wiederholte Sequenzen aus auslösenden Situationen, Erwartungen, Zuständen, und Reaktionen, wie im TESSERA Rahmenmodell (Wrzus & Roberts, 2017) vorgeschlagen, generalisieren lassen. Zudem waren selbsteingeschätzte und teilweise implizit gemessene Eigenschaften, aber weniger Veränderungsziele mit dem Erleben entsprechender momentaner Situationen und Zustände verbunden. Überraschenderweise trugen lediglich momentane Zustände, aber weniger reflektive oder assoziative Prozesse zur langfristigen Persönlichkeitsentwicklung bei.

Die Ergebnisse unterstreichen die Bedeutsamkeit von Umweltfaktoren für die Persönlichkeitsentwicklung über die Lebensspanne hinweg. Im Besonderen mag das Erleben von üblicherweise altersgradierten Lebensübergängen, z.B. Erleben des Übergangs an die Universität im jungen Erwachsenenalter, den unterschiedlichen Mustern von Persönlichkeitsentwicklung im jüngeren und älteren Erwachsenenalter zugrunde liegen, da ein solcher Übergang mit der Notwendigkeit verbunden sein kann, in neue oder veränderte soziale Rollen zu investieren. Obwohl Veränderungsziele scheinbar mehr als eine Antwortverzerrung oder die lediglich Erwünschtheit von höheren Eigenschaftsausprägungen widerzuspiegeln scheinen, muss weitere Forschung untersuchen, ob volitionale Persönlichkeitsentwicklung ohne psychologische Unterstützung möglich ist und welche weiteren Bedingungen für eine erfolgreiche Zielverfolgung gegeben sein müssen, wie z.B. Zielspezifität oder Zielengagement. Schließlich zeigt die vorliegende Dissertation erste, aber ermutigende Ergebnisse mit Blick auf zentrale Annahmen des TESSERA Rahmenmodells (Wrzus & Roberts, 2017). Allerdings ist weitere Forschung notwendig um die Bedeutsamkeit von reflektiven und assoziativen Prozessen für die Persönlichkeitsentwicklung zu untersuchen.

ERKLÄRUNG

gemäß § 6 Absatz 2 g) und gemäß §6 Absatz 2 h) der Promotionsordnung der Fachbereiche 02, 05, 06, 07, 09 und 10 vom 04. April 2016.

Name: Quintus

Vorname: Martin

Hiermit erkläre ich, dass ich die eingereichte Dissertation selbstständig, ohne fremde Hilfe verfasst und mit keinen anderen als den darin angegebenen Hilfsmitteln angefertigt habe, dass die wörtlichen oder dem Inhalt nach aus fremden Arbeiten entnommenen Stellen, Zeichnungen, Skizzen, bildlichen Darstellungen und dergleichen als solche genau kenntlich gemacht sind.
Von der Ordnung zur Sicherung guter wissenschaftlicher Praxis in Forschung und Lehre und zum Verfahren zum Umgang mit wissenschaftlichem Fehlverhalten habe ich Kenntnis genommen.

Ich habe mich bislang keinem Promotionsverfahren unterzogen. Diese Dissertation habe ich bisher weder ganz noch in Teilen zur Erlangung des Doktorgrades oder eines sonstigen akademischen Grades oder einer anderen Prüfung eingereicht.

Ich habe keine Hilfe von kommerziellen Promotionsberatern in Anspruch genommen.

Gemäß § 10 Abs. 5 und Abschnitt F des fachspezifischen Anhangs für Psychologie werden die folgende Teile der Dissertation als in einem wissenschaftlichen Fachjournal publiziert oder zur Publikation eingereicht kenntlich gemacht.

Kapitel II basiert auf folgendem Manuskript:

Wrzus, C., Quintus, M., & Egloff, B. (2018). Do age differences in personality development diminish under similar contextual conditions? Longitudinal evidence from self-ratings, other-ratings, and implicit measures in younger and older students. Manuscript submitted for publication.

Kapitel III basiert auf folgendem Manuskript:

Quintus, M., Egloff, B., & Wrzus, C. (2017). Predictors of volitional personality change in younger and older adults: Response surface analyses signify the complementary perspectives of the self and knowledgeable others. *Journal of Research in Personality*, *70*, 214-228. doi: 10.1016/j.jrp.2017.08.001

Bei einer publikationsorientierten Promotion:

Meine Erklärung bezieht sich auf Schriften, die ich als alleiniger Autor eingereicht habe oder bei Ko-Autorenschaften auf jene Teile, für die ich mich verantwortlich zeichne.

01.05.2019

Datum

M. Quintus

Unterschrift

Curriculum Vitae

Persönliche Daten

Name: Martin Friedrich Werner Quintus

Geburtsdatum: 13.07.1989

Ausbildungs- und Studienverlauf

Akademische Lehrerinnen und Lehrer

Univ.-Prof. Dr. M. Back, Univ.-Prof. Dr. C. Dormann, Univ.-Prof. Dr. B. Egloff, Univ.-Prof. Dr. H. Hecht, Univ.-Prof. Dr. W. Hiller, Univ.-Prof. Dr. T. Kubiak, Univ.-Prof. Dr. W. Lutz, Univ.-Prof. Dr .R. Ochsmann, Univ.-Prof. Dr. M. Schneider, Univ.-Prof. Dr. A. Schwerdtfeger, Univ.-Prof. Dr. I. Seiffge-Krenke

Abgelegte Hochschul-, Fachhochschul- oder Staatsprüfungen

08/2012 Bachelor in Psychologie

02/2015 Master in Psychologie

Studienverlauf (11 Semester)

2009 –2012	Studium der Psychologie an der Johannes Gutenberg –Universität (Bachelor of Science); Thema der Bachelorarbeit: „Psychologische Mechanismen bei somatoformen Störungen“
2012 – 2015	Weiterführendes Studium der Psychologie an der Universität Trier (Master of Science); Thema der Masterarbeit: „Early und Late Sudden Gains im Kontext Allgemeiner und Spezifischer Wirkfaktoren“

Beruflicher Werdegang

04/2011 – 06/2015 Therapeutischer Wochenenddienst der AHG-Klinik Daun Altburg

04/2015 – 04/2018 Wissenschaftlicher Mitarbeiter im DFG geförderten Forschungsprojekt „Short-and longterm processes of personality development in adulthood“ in der Abteilung Persönlichkeitspsychologie und Diagnostik der Johannes Gutenberg-Universität Mainz

04/2018 – 09/2018 Wissenschaftlicher Mitarbeiter in der Abteilung Persönlichkeitspsychologie und Diagnostik der Johannes Gutenberg-Universität Mainz

Seit 10/2018 Teilnehmer im Weiterbildungsstudiengang „Psychologische Psychotherapie“ der Johannes Gutenberg-Universität Mainz

Publikationsliste

Gutsch, C., Quintus, M., Egloff, B., Luong, G., Riediger, M., & Wrzus, C. (2018). Same old, same old: Age differences in the diversity of the daily life. Manuscript submitted for publication.

Quintus, M., Egloff, B., & Wrzus, C. (2017). Predictors of volitional personality change in younger and older adults: Response surface analyses signify the complementary perspectives of the self and knowledgeable others. *Journal of Research in Personality, 70*, 214-228. doi: 10.1016/j.jrp.2017.08.001

Wrzus, C., Quintus, M., & Baumert, A. (2017). Measuring personality processes in the lab and in the field. In V. Zeigler-Hill & T. Shackelford (Eds.), *The SAGE handbook of personality and individual differences*.

Wrzus, C., Quintus, M., & Egloff, B. (2018). Do age differences in personality development diminish under similar contextual conditions? Longitudinal evidence from self-ratings, other-ratings, and implicit measures in younger and older students. Manuscript submitted for publication.

Kongressbeiträge

Quintus, M., Lehnart, J., Wrzus, C. (2015, September). *Experten der Persönlichkeitsentwicklung? Reflektion als Mechanismus von Persönlichkeitsveränderung bei angehenden und praktizierenden Psychotherapeuten/-innen.* Vortrag bei der 13. Arbeitstagung der Fachgruppe für Differentielle Psychologie, Persönlichkeitspsychologie und Psychologische Diagnostik, Mainz.

Quintus, M., Wrzus, C. (2016, März). *Prädiktoren und zugrundeliegende Mechanismen volitionaler Persönlichkeitsentwicklung.* Vortrag beim 13. Doktorandenworkshop der Fachgruppe für Differentielle Psychologie, Persönlichkeitspsychologie und Psychologische Diagnostik, Landau.

Quintus, M., Egloff, B., Wrzus, C. (2016, Juli). *Predictors of Volitional Personality Change in Younger and Older Adults: Why Do People Set Goals to Change Their Personality Traits?* Vortrag bei der 17th European Conference on Personality, Timisoara, Rumänien.

Quintus, M., Egloff, B., Wrzus, C. (2017, September). *Wer erlebt stressreiche Tage als besonders unangenehm? Neurotizismus und Offenheit für Neues interagieren im Zusammenhang von Stress und negativem Affekt im Alltag.* Vortrag bei der 14. Arbeitstagung der Fachgruppe für Differentielle Psychologie, Persönlichkeitspsychologie und Psychologische Diagnostik, München.

Lehrerfahrung

Persönlichkeitspsychologie und Persönlichkeitsentwicklung (Seminar im „Studium 50+“, SoSe 2016, WiSe 2016/2017)

Einführung in die persönlichkeitspsychologische Literatur (SoSe 2018)

Differentielle Gesundheitspsychologie und Emotionsregulation (WiSe 2017/18)

Stand Curriculum Vitae: Mai 2019