Empirical Paper

Life Events and Personality Change: A Systematic Review and Meta-Analysis

Janina Larissa Bühler[1], Ulrich Orth[2] , Wiebke Bleidorn[3], Elisa Weber[3], André Kretzschmar[3], Louisa Scheling[1] and Christopher J. Hopwood[3]

Abstract

While there is some evidence for changes in personality traits, life satisfaction, and self-esteem as a function of life events, effects have been small and inconsistent across studies. In this preregistered meta-analysis, we summarize the available evidence on personality change in response to life events using data from 44 studies, including 89 samples with a total of 121,187 participants. Results supported reliable and specific albeit relatively small effects of life events on personality change. Effects were larger and more consistent in the work than in the love domain, with graduation, the first job, a new relationship, marriage, and divorce showing the strongest effects on change in personality variables. Estimates were largely comparable across samples with and without comparison groups. Finally, moderator analyses indicated significant effects of time lag on the links between life events in the love domain and personality change but no effects of other examined variables. We discuss these results in the context of a field-wide turn towards designs that go beyond the study of single life events to examine the mechanisms of personality change using more sophisticated and sensitive designs.

Introduction

Personality traits can be defined as broad patterns of thoughts, feelings, and behaviors (Lucas & Donnellan, 2011). Early empirical research on personality mainly focused on the structure, measurement, and consequences of traits (e.g., Digman, 1990). Stability and change in traits were less common topics, largely because traits were regarded as highly stable once people reach adulthood (McCrae & Costa, 2008). However, longitudinal studies accumulated that suggested that personality traits can change, particularly during young adulthood and generally in the direction of greater maturity (Bleidorn et al., 2022; Roberts et al., 2006). Moreover, individual differences in personality traits are not perfectly stable over time, suggesting that some people change more than others (e.g., Anusic & Schimmack, 2016; Roberts & DelVecchio, 2000; Schwaba & Bleidorn, 2018). The widespread recognition that personality traits can change inspired a generation of personality researchers to search for the factors that can explain these changes (Fraley & Roberts, 2005; Hudson et al., 2019; Orth et al., 2018). One particular preoccupation, spurred by the availability of large panel studies that tracked personality variables over time, had to do with the question of whether major life events might be

involved in systematic personality change (Bleidorn et al., 2020; Kandler et al., 2014; Wagner et al., 2020).

Despite early enthusiasm, narrative reviews of this literature suggested that the observed effects of life events on personality change tend to be small and inconsistent across studies (e.g., Bleidorn et al., 2018; Bühler et al., 2022; Luhmann et al., 2012; Reitz, 2022). The goal of this preregistered meta-analysis was to systematically aggregate the available data on the effects of life events on personality change to gain a robust and precise picture of this evidence. By aggregating the results of a generation of studies on the role of major life events in personality change, we conceptualize this study as a turning point in research on personality change, from studies focusing on single life events, to more complex studies designed at better understanding the mechanisms of personality development.

[1]Johannes Gutenberg University Mainz, Mainz, Germany
[2]Department of Psychology, University of Bern, Bern, Switzerland
[3]Department of Psychology, University of Zurich, Zürich, Switzerland

Corresponding author:
Christopher J. Hopwood, Department of Psychology, University of Zurich, Binzmuehlestrasse 14, Zurich 8050, Switzerland.
Email: chopwoodmsu@gmail.com

Personality

Consistent with this literature, we focus on both Big Five personality traits (sometimes referred to as "core characteristics" or "dispositional traits"; Kandler et al., 2014; McAdams & Pals, 2006) and self-esteem and life satisfaction (sometimes referred to as "surface characteristics" or "characteristic adaptations"). Self-esteem and life satisfaction are trait-like in that they are relatively stable, associated with a wide range of life outcomes and have often been studied in the context of major life events (Luhmann et al., 2012; Orth et al., 2010). However, they are not always conceptualized as personality traits, in part because they have somewhat lower rank-order stabilities than the Big Five (Anusic & Schimmack, 2016; see also Fraley & Roberts, 2005; Kuster & Orth, 2013). A potential reason for this difference is that these surface characteristics develop through the transaction with specific environments (Henry & Mõttus, 2020). It would follow that self-esteem and life satisfaction change more in response to life events than Big Five personality traits, although evidence for this hypothesis has so far been ambiguous.

Life Events

Life events can be defined as time-specific transitions that indicate a new status (i.e., position, rank, role, condition) or denote the end of a previous status (e.g., Bleidorn et al., 2018; Luhmann et al., 2012). In this study, we focused on the 10 major life events that have been studied most often: Entering a new relationship, marriage, birth of a child, separation, divorce, widowhood, graduation, entering the first job, unemployment, and retirement. Life events often require individuals to react to the transition with a new repertoire of cognitive, emotional, and behavioral tendencies (Hopson & Adams, 1976; Luhmann et al., 2014). Life events are thought to trigger change in personality through changes in a person's everyday pattern of thoughts, feelings, and behaviors (Roberts, 2018; Roberts & Jackson, 2008; Wrzus & Roberts, 2017).

The broad variety of life events can be organized in several ways. A common distinction has been the classification of events that fall in the "love" versus "work" domains (see Bleidorn et al., 2018; Luhmann et al., 2012). For the love or relationship domain, theory and some evidence suggested that the beginning of a romantic relationship, marriage, the birth of a child, separation, divorce, and widowhood may be associated with change in Big Five personality traits, self-esteem, and life satisfaction (e.g., Denissen et al., 2019; Lucas, 2007; Reitz, 2022; Specht et al., 2011b). For the work domain, theory and evidence suggest that graduation from school and college, the first job, unemployment, and retirement may be associated with personality change (e.g., Bleidorn et al., 2013; Lucas, 2007; Luhmann et al., 2012; Reitz, 2022; Specht et al., 2011b).

Within both of these domains, life events can be further divided in terms of their provision of gains or losses (Denissen et al., 2019). Gain-based life events occur when something is added to someone's life. Examples include entering a new relationship or beginning the first job. Loss-based life events occur when something that has been a part of someone's life is taken away. Examples include divorce or retirement. Gain-based life events involve accommodating new roles, resources, or burdens, whereas loss-based life events involve changing established patterns to adapt to new contingencies. As such, the gain-loss distinction of events might be an important factor in whether or how personality variables change in response to an event. For instance, gain-based events tend to be more normative and positive, meaning that they reflect generally good things that happen to most people, particularly during certain life stages, whereas loss-based events tend to be less normative, meaning that they generally reflect bad things that are less common (Bühler et al., 2022; Neyer et al., 2014). Societies tend to develop strong expectations regarding how people ought to change in response to normative life events, and it is easier to find other people who have gone through a normative than a non-normative life event. In contrast, non-normative life events come with a greater likelihood of standing out or feeling unique, which could lead people to feel special or lonely. On the one hand, normative life events that come with a specific script of how to react may be associated with more pronounced mean-level changes in traits, because they may produce more similar changes in people's patterns of thoughts, feelings, and behaviors than less scripted, less normative events (e.g., Caspi & Moffitt, 1993; Neyer et al., 2014). However, it has also been argued that negative, loss-based life events would tend to show stronger and more persistent effects than positive, gain-based life events (e.g., Baumeister et al., 2001). Current evidence is mixed about the overall effect of gain-based, normative, and positive versus loss-based, less normative, and negative life events in affecting personality change (Bleidorn et al., 2018; Luhmann et al., 2012).

Life Events and Personality Change

Existing research provides some evidence for the effects of life events on change in personality in the domains of love and work.

Love. Entering a new relationship has been linked with increases in emotional stability (Lehnart et al., 2010; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Wagner et al., 2015), extraversion (Moher et al., 2009; Neyer & Lehnart, 2007; Wagner et al., 2015), and conscientiousness (Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Wagner et al., 2015), and a decrease in openness (Pusch et al., 2019). Entering a romantic relationship has also been associated with an increase in self-esteem, especially when entering a long-term romantic relationship (Luciano & Orth, 2017; Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007; Wagner et al., 2015), and with an increase in life satisfaction (Wagner et al., 2015).

For the effect of marriage, some studies indicated increases in emotional stability (Costa et al., 2000) and decreases in extraversion (Bühler et al., 2022; Costa et al., 2000; Specht et al., 2011b) and openness (Asselmann & Specht, 2020; Costa et al., 2000; Specht et al., 2011b), while other studies observed no change in Big Five personality traits (Denissen et al., 2019; Neyer & Asendorpf, 2001). Similarly, there seems to be no change in self-esteem in response to marriage (Luciano & Orth, 2017; Neyer & Asendorpf, 2001) but short-term increases in life satisfaction, followed by a long-term decrease (Luhmann et al.,

2012). This decrease, however, appears to reflect a positive anticipatory effect, suggesting a temporal increase in life satisfaction before marriage (Lucas et al., 2003).

For the effect of childbirth, some studies reported decreases in conscientiousness (Specht et al., 2011b) and extraversion (Galdiolo & Roskam, 2019; also depending on the initial level of extraversion, see Jokela et al., 2009). Other studies, however, found no change in Big Five personality traits (Neyer & Asendorpf, 2001), especially when preexisting differences between parents and non-parents had been controlled for (van Scheppingen et al., 2016). The birth of a child, however, has been associated with decreases in self-esteem (Bleidorn et al., 2016; Chen et al., 2016, 2016 van Scheppingen et al., 2018) and life satisfaction (Luhmann et al., 2012). At least for women, the decrease in self-esteem appears to be most pronounced during pregnancy (van Scheppingen et al., 2018).

For separation, some studies reported increases in extraversion (Neyer & Lehnart, 2007), agreeableness (Bühler et al., 2022; Specht et al., 2011b), and openness (Specht et al., 2011b), while other studies found no change in Big Five personality traits (Asselmann & Specht, 2020; Denissen et al., 2019; Neyer & Asendorpf, 2001; Pusch et al., 2019). Separation has also been associated with a decline in self-esteem, which mainly applied to the dissolution of a relationship longer (vs. shorter) than 1 year (Luciano & Orth, 2017), and a decline in life satisfaction (Preetz, 2022).

For divorce, research found decreases in emotional stability (Asselmann & Specht, 2020; Costa et al., 2000) and increases in agreeableness (Spikic et al., 2021) and openness (Costa et al., 2000; Spikic et al., 2021). More mixed evidence, however, exists regarding the two other Big Five personality traits—extraversion and conscientiousness—with studies reporting both increases (Costa et al., 2000; Specht et al., 2011b) and decreases (Allemand et al., 2015; Costa et al., 2000; Roberts & Bogg, 2004; Spikic et al., 2021) in these traits. Divorce has also been associated with a pre-divorce decrease in self-esteem, followed by a more stable pattern of self-esteem after divorce (Bleidorn et al., 2021). Finally, divorce has been associated with a short-term decrease in life satisfaction, followed by a long-term increase after divorce (Luhmann et al., 2012). These effects may again be driven by the particularly low levels of life satisfaction before divorce (Lucas, 2005; Luhmann et al., 2012), which may be due to individuals in to-be-dissolved marriages either anticipating the divorce or being effectively less satisfied with their lives because of their less satisfying marriages (Be et al., 2013).

Research on widowhood provided mixed effects on the Big Five personality traits. While some studies found no change in personality traits following widowhood (Bühler et al., 2022; Denissen et al., 2019), Specht et al. (2011b) reported gendered effects on conscientiousness, with widows decreasing and widowers increasing in conscientiousness after the death of their spouse. Widowhood has also been associated with a decline in self-esteem, mainly among widowers (Carr, 2004), and a decline in life satisfaction (Luhmann et al., 2012). Again, individuals had

lower life satisfaction prior to the event, presumably anticipating the death of their spouse, and this lower life satisfaction tended to persist in the years after the event (Lucas et al., 2003).

Work. There is mixed evidence for links between graduation and personality change. While some studies found graduation from school to be linked with increases in conscientiousness, agreeableness, openness, emotional stability (Bleidorn, 2012; Lüdtke et al., 2011), and self-esteem (Wagner et al., 2013), others observed no change in any of the Big Five traits or self-esteem (Neyer & Asendorpf, 2001). Similarly, while some studies found an increase following graduation (Lindfors et al., 2014; Williams et al., 2015), others suggested more mixed findings (Salmela-Aro & Tynkkynen, 2010).

For entering the first job, research has indicated an increase in conscientiousness (Salmela-Aro & Tynkkynen, 2010; Specht et al., 2011b), an increase in emotional stability (Salmela-Aro & Tynkkynen, 2010; van der Velde et al., 1995), and an increase in extraversion (van der Velde et al., 1995), but no significant changes in agreeableness and openness (Salmela-Aro & Tynkkynen, 2010; Specht et al., 2011b). Entering the first job has also been linked with an increase in self-esteem (Reitz et al., 2020; van der Velde et al., 1995; Wagner et al., 2013), while no significant change was observed for life satisfaction (van der Velde et al., 1995).

For unemployment, there is mixed evidence for change in the Big Five traits. Some studies found decreases in emotional stability and conscientiousness (Costa et al., 2000), others reported gender-specific, non-linear changes in agreeableness, conscientiousness, and openness (Boyce et al., 2015), while others found no change in any of the Big Five traits following unemployment (Specht et al., 2011a, 2011b). Unemployment has been associated with a decline in self-esteem before but not after becoming unemployed (Reitz et al., 2022). Finally, there is consistent evidence for a decrease in life satisfaction following unemployment (Luhmann et al., 2012), with the sharpest decline directly before (Lucas et al., 2004; Reitz et al., 2022) and after (Lucas et al., 2004) becoming unemployed.

For retirement, some studies reported an increase in agreeableness and a decrease in extraversion (i.e., the facet activity; Löckenhoff, Terracciano, & Costa, 2009), while other studies found a decrease in conscientiousness (Specht et al., 2011b), an increase in emotional stability (Schwaba & Bleidorn, 2019), and a pattern of increases and decreases in openness and agreeableness (Schwaba & Bleidorn, 2019). Retirement has also been associated with a decrease in self-esteem in the 5 years before retirement and an increase in the 5 years after becoming retired (Bleidorn & Schwaba, 2018). Finally, research indicated an initial decrease in life satisfaction in response to retirement, followed by an increase (Luhmann et al., 2012).

Summary. Table 1 summarizes the research on life events and personality change across domains. Several themes are evident. First, there is, at least based on this narrative review, some evidence that personality changes as a function of life events. Moreover, there is evidence for specificity, in that different personality variables change as a function of

Table 1. Summary of Existing Evidence for the Impact of Life Events on Personality Change.

Life event	Emotional Stability	Agreeableness	Extraversion	Conscientiousness	Openness	Self-Esteem	Life Satisfaction
Love							
New relationship*	+		+	+		+	+
Marriage*	?		?		?		^
Childbirth*			?	?		-	-
Separation~		?	?		?	-	-
Divorce~	-	+	?	?	+	^	^
Widowhood~				?		-	-
Work							
Graduation*	?	?		?	?	?	
First job*	+		+			+	
Unemployment~	?	?		?	?	^	-
Retirement~	?	?	?	?	?	^	^

Note. * = gain-based event, ~ = loss-based event, + = increase, - = decrease, ^ = change occurs in different directions as a function of the timing of the event, ? = mixed evidence.

different life events. Second, changes in self-esteem and life satisfaction tended to be more consistent than changes in Big Five personality traits, as predicted by theories that suggest that these surface characteristics are more responsive to environmental changes (Henry & Mõttus, 2020). Third, there is some support for the idea that gain-based events are associated with positive personality changes and loss-based events are associated with negative personality changes, although this picture is complicated. For instance, childbirth, a gain-based event, seems to be associated with decreases in self-esteem and life satisfaction, whereas divorce, a loss-based event, may be associated with increases in agreeableness and openness. Fourth, there is a lot of mixed evidence, as indicated by the many question marks in Table 1.

Notably, this summary is based on a qualitative review of the existing literature, thus suffering from all of the attendant biases and imprecision, many of which can be addressed via systematic meta-analysis. Moreover, several conceptual and methodological issues need to be considered when evaluating the empirical literature on life events and personality change, such as differences in study designs and sample compositions.

Methodological Considerations

A major challenge in studying life events and personality change is the reliance on correlational studies to test causal hypotheses. To strengthen the conclusions that can be drawn from observational studies, scholars have used prospective-longitudinal designs in which personality differences were assessed before and after the occurrence of an event. While some studies only included an event group (i.e., participants who experienced the life event), others included both an event and a comparison group of participants who did not experience the life event during the study period or experienced the life event at a later time (e.g., Neyer & Asendorpf, 2001; Neyer & Lehnart, 2007). In this meta-analysis, we therefore compared effect sizes that were drawn from event-group studies with studies that included both event and comparison groups to quantify

potential effect-size differences between these study designs.

An additional complexity is that comparison and event groups may differ in several ways even before an event occurs, limiting the conclusions that can be drawn about group differences that occur after the experience of an event (Rosenbaum & Rubin, 1983). More recent studies have adopted matching approaches, such as propensity score matching, to match participants from both groups in their preexisting differences (e.g., Luciano & Orth, 2017; Jackson er al., 2012; Schwaba & Bleidorn, 2019; van Scheppingen & Leopold, 2020; Wagner et al., 2015). This technique allows scholars to statistically isolate the net effect of a life event because participants of both groups had the same *propensity* to experience a life event (Rosenbaum & Rubin, 1983). Therefore, in this research, we tested whether the type of matching (e.g., no matching, propensity score matching) explains heterogeneity in the findings.

Moderators

The substantial heterogeneity in the effects of life events on personality variables raises questions about the factors that may explain these differences. In this meta-analysis, we examined the moderating effects of age, gender, time lag between assessments, birth cohort, country, ethnicity, sample type, and type of matching (if a comparison group was used; see above) on the between-study differences in the effect sizes.

Some evidence suggests that life events may have different effects on people's personality depending on their age and gender (Costa et al., 2000; Specht et al., 2011b; Wagner et al., 2015; but see Bühler et al., 2022). For example, Wagner et al. (2015) found that entering a romantic relationship was linked with increases in emotional stability, extraversion, and conscientiousness among young adults who entered their first romantic relationship between 23 and 25 years, but not among young adults who entered their first romantic relationship between 21 and 23 years. Moreover, Specht et al. (2011b) found differences between how women and men changed in conscientiousness following the death of their spouse.

The effect of a life event may also depend on the time that passed since the occurrence of that event. For example, some changes may occur immediately after the event, while other changes may be delayed over longer periods of time (e.g., Luciano & Orth, 2017; Hopwood et al., 2022). To study the role of time in the effects of life events on personality change, we tested whether the length of the lag between the pre- and post-event assessments moderated between-study differences in the effect sizes.

Finally, we also explored the effects of birth cohort, country, ethnicity, and sample type (see also Bühler et al., 2021; Orth et al., 2018). The normativity of specific life events may differ across cohorts, such as how normative it is to stay single versus to enter a romantic relationship (Scheling & Richter, 2021; Yu et al., 2018), and this may have an effect on personality change. Moreover, certain life events may be culture-sensitive, for instance, regarding their expected onset (e.g., age at first marriage; Bleidorn et al., 2013), so it is important to test whether effect sizes differ between countries and ethnic groups. Finally, representative samples typically allow for more valid conclusions compared to non-representative samples, such as community samples and samples of college students (Orth et al., 2018). Therefore, testing the moderating effects of birth cohort, country, ethnicity, and sample type provides important information about the robustness and generalizability of the findings.

The Present Research

The goal of this preregistered meta-analysis was to provide precise and robust evidence about the extent to which life events are associated with personality change. We estimated the average effect of 10 life events (i.e., entering a romantic relationship, marriage, birth of a child, separation, divorce, widowhood, graduation, first job, unemployment, retirement) on change in Big Five personality traits, self-esteem, and life satisfaction. This design allowed us to compare different combinations of life events and personality characteristics to assess, for example, whether self-esteem and life satisfaction as surface characteristics change more than Big Five personality traits as core characteristics. Moreover, we aggregated all gain-based and loss-based life events within the love and work domains to examine their overall effects on change in Big Five personality traits, self-esteem, and life satisfaction. In addition, we compared effect size measures from event and comparison groups. Finally, we tested a series of theoretically relevant moderators (e.g., age, gender, time lag) that may explain variance in the effect size.

Method

This meta-analysis used anonymized data and was therefore exempt from receiving ethical approval by the University of Zurich in accordance with national law.

Search and Selection Procedure

To identify relevant studies, we searched for English-language journal articles, books, book chapters, and dissertations in the database PsycINFO.[1] We used the following search terms:[2]

> (personality or big five or extraver* or introver* or agreeable* or conscientious* or openness or open to experience* or neurotic* or emotional stability or emotionally stable or self-esteem or life satisfaction) and (life event* or transition* or romantic relationship* or marriage or marry or parenthood or motherhood or fatherhood or birth or separat* or divorc* or widow* or graduat* or first job or new job or unemploy* or retire*)

Methodological limiters were empirical, longitudinal, and quantitative studies. The search was conducted on February 16, 2022, and yielded 1,710 potentially relevant articles. We updated the search on May 16, 2023, and also included "bereavement" as search term, which yielded 70 additional potentially relevant articles. We used three additional strategies to identify relevant studies: First, we sent a call for unpublished data via relevant mailing lists in the field (e.g., Association for Research in Personality, German Psychological Society, European Association of Personality Psychology, and Society for Personality and Social Psychology); the call was sent in December 2022. Second, we examined the references cited in reviews on the effects of life events on personality change (e.g., Bleidorn et al., 2018; Bühler et al., 2022; Lucas, 2007; Luhmann et al., 2012; Reitz, 2022; Specht, 2017). Third, we included relevant articles that we were aware of but that were not identified by these strategies. These strategies resulted in 56 additional articles, yielding an overall number of 1,836 potentially relevant articles. A file that shows all articles assessed for eligibility is available on OSF (https://osf.io/dnjs2/?view_only=None).

Screening, Eligibility, and Inclusion of Studies

To decide on the eligibility of studies, the fourth or fifth author assessed all study abstracts.[3] The coders were trained by the first author and followed the guidelines reported in the coding manual (see https://osf.io/dnjs2/?view_only=None) and described below. The search and selection procedure is summarized in Figure 1 (Moher et al., 2009).

Inclusion Criteria. For each study, the coders indicated whether the study met the criteria for being included in the meta-analysis or must be excluded (with reference to the specific exclusion criterion). A study was included if (a) it reported a life event (i.e., study included one of the following life events: beginning of a romantic relationship, marriage, birth of a child, separation, divorce, widowhood, graduation, first job, unemployment, or retirement); (b) it included a personality characteristic (i.e., study included a measure of at least one of the following personality characteristics: Big Five personality trait, self-esteem, or life satisfaction); (c) it was an empirical-quantitative study; (d) it was a longitudinal study (i.e., study included two or more assessments of the same sample); (e) it had a prospective design (i.e., study included at least one assessment before the event and at least one assessment after the event); (f) it included a measure of the personality characteristic that was
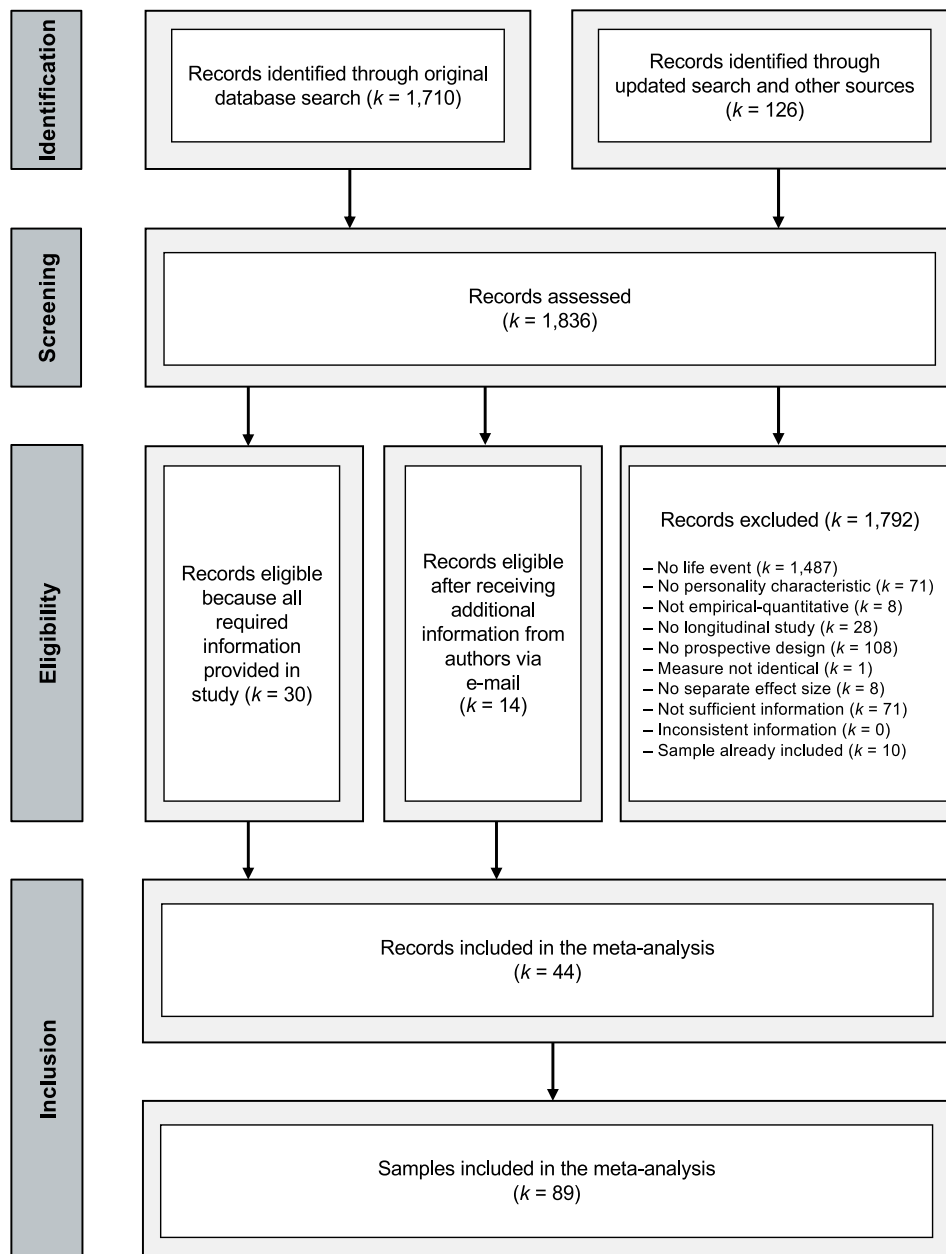
Figure 1. Flow Diagram of the Search and Selection Procedure. *Note.* The diagram has been adapted from Moher et al. (2009). Records refer to studies and data sets.

identical across assessments; (g) effect size information was reported separately for the event group (i.e., sample that experienced the life event) and, if available, for the comparison group (i.e., sample that did not experience the life event); (h) sufficient information was reported to compute the effect size (i.e., the minimal information needed were sample size at Time 1, type of life event, mean of the personality characteristic at Time 1 [i.e., assessment that occurred closest before the event] and Time 2 [i.e., assessment that occurred after the event; note that more than one assessment after the event could be included. These assessments were denoted Time 3, Time four etc.], and standard deviation of the personality characteristic at Time 1); (i) it included consistent information on effect size data (e.g., in abstract, text, tables, figures); and (j) the data had not already been used in another study included in the meta-analytic data set that examined the same combination of life

event and personality construct (note that the study with the larger sample size, or if identical, the study with the most comprehensive information on sample and effect size data were selected).

To obtain estimates of interrater agreement in this first step of coding, a random sample of 50 articles was assessed and rated by the two raters for inclusion versus exclusion. Interrater agreement was high (i.e., κ = 1.00).

Final Data Set. A total of 84 studies met the inclusion criteria. Of these, 30 studies could be included immediately because they provided sufficient information to compute the effect sizes. For the 54 studies that met the inclusion criteria except for providing information needed to compute the effect size, we contacted the authors of the study and requested the missing information. This procedure led to the inclusion of 14 additional studies. In sum, the search and

selection procedure resulted in a total of 44 eligible studies, including 89 samples with 519 effect sizes.

Coding of Studies

The raters coded the samples according to the coding manual (see https://osf.io/dnjs2/?view_only=None). The following data were coded: year of publication, publication type, sample size, sample type, country, ethnicity, mean age, proportion of female participants, year of Time 1 assessment, type of intervention (if any), life event, measure of personality characteristic, mean and standard deviation of personality characteristic at Time 1 and subsequent assessment(s), time lag between Time 1 and event, time lag between Time 1 and subsequent assessments, and the test-retest correlation of the personality characteristic between Time 1 and subsequent assessments. If the study also included a comparison group, the following additional information was coded for the comparison group: type of matching between groups (if any), sample size, mean and standard deviation of the personality characteristic at Time 1 and subsequent assessment(s), and the test-retest correlation of the personality characteristic between Time 1 and subsequent assessments. If information on year of Time 1 assessment was not reported, we estimated these data as follows: Year of Time 1 assessment = publication year—3 years—time lag between the first and last measurement occasion of the study (based on the assumption that studies are, on average, published 3 years after data collection has been completed; for a similar procedure, see Orth et al., 2018).

To obtain estimates of interrater agreement in this second step of coding, about two-thirds of all included samples ($k =$ 46) were rated by both coders for sample and effect size information. The interrater agreement was high, with an average κ of .95 for categorical variables and an average r of .99. for continuous variables.[4] All diverging assessments were discussed until consensus was reached.

Effect Size Measure

We computed two types of effect size measures. First, given that all samples included an event group, we computed the standardized mean change between the pre-event (i.e., Time 1) and post-event (e.g., Time 2, Time 3) assessment of the personality characteristic in the event group (denoted as d_E). Thus, this effect size measure is based on a pretest–posttest event group design. Following Becker (1988) and Morris (2008), the standardized mean change for the event group is given by

$$d_E = c_E \frac{M_{\text{post, E}} - M_{\text{pre, E}}}{SD_{\text{pre, E}}},$$

where $M_{\text{post,E}}$ is the mean of the event group at the post-event assessment (e.g., Time 2, Time 3), $M_{\text{pre,E}}$ is the mean of the event group at Time 1, $SD_{\text{pre,E}}$ is the standard deviation of the event group at Time 1, and c_E is a bias correction. Following Morris (2008), the bias correction is given by

$$c_E = 1 - \frac{3}{4\left(n_{\text{pre, E}} - 1\right) - 1},$$

where $n_{\text{pre,E}}$ is the sample size of the event group at Time 1. The effect size d_E was computed for all available post-event assessments (i.e., Time 2, Time 3, etc.) of the event group.

Second, some samples included a comparison group of participants who did not experience the life event. For these samples, we computed an additional effect size measure, which compared the standardized mean change between the event and comparison group. To that aim, we first computed the standardized mean change of the personality characteristic in the comparison group (denoted as d_C). Following Becker (1988) and Morris (2008), the standardized mean change in the comparison group is computed in the same way as in the event group, specifically by

$$d_C = c_C \frac{M_{\text{post, C}} - M_{\text{pre, C}}}{SD_{\text{pre, C}}},$$

where $M_{\text{post,C}}$ is the mean of the comparison group at the post-event assessment (e.g., Time 2, Time 3), $M_{\text{pre,C}}$ is the mean of the comparison group at Time 1, $SD_{\text{pre,C}}$ is the standard deviation of the comparison group at Time 1, and c_C is the bias-correction factor, which is given by

$$c_C = 1 - \frac{3}{4\left(n_{\text{pre, C}} - 1\right) - 1},$$

where $n_{\text{pre,C}}$ is the sample size of the comparison group at Time 1. Next, following Morris (2008), we computed the difference between the standardized mean change for the event and comparison groups (denoted as d_{EC}), given by

$$d_{EC} = d_E - d_C,$$

Thus, the effect size measure d_{EC} is based on a pretest–posttest event-comparison group design and was available for the subset of studies that include a comparison group.[5] The effect size d_{EC} was computed for all post-event assessments (i.e., Time 2, Time 3, etc.), for which data on the event and comparison group were available.

Meta-Analytic Procedure

Data were analyzed using R (R Development Core Team., 2022) and the meta-analytic computations were conducted with the metafor package (Viechtbauer, 2010).

Effect Size Analyses. As noted above, many samples provided more than one effect size measure. Specifically, effect size measures based on different post-event assessments were nested in samples. Therefore, we accounted for the multilevel structure in the meta-analytic computations, by using the "rma.mv" function in the metafor package (Viechtbauer, 2010). Following Lipsey and Wilson (2001), we used multilevel random-effects models to estimate weighted mean effect sizes and multilevel mixed-effects models to test for moderators.

In the effect size analyses, we computed weighted mean effect sizes. First, we focused on all possible combinations of specific life events (e.g., entering a new relationship,

beginning a new job) and personality constructs. This approach allowed us to obtain *construct-specific estimates for specific types of life events*. Then, in each of the domains (i.e., love and work), we aggregated the life events into the categories of gain-based and loss-based life events, consistent with prior research (Denissen et al., 2019). In each category, we then computed weighted mean effect sizes, which resulted in *construct-specific estimates for gain-based and loss-based life events.*[6]

Following Becker (1988), the sampling variance in the event group was computed by

$$var(d_E) = \frac{2\left(1 - r_{E,\,pre/post}\right)}{n_{pre,\,E}} + \frac{d_E^{\,2}}{2n_{pre,\,E}},$$

where $r_{E,pre/post}$ is the test-retest correlation of the personality characteristic between the pre-event assessment (i.e., Time 1) and the post-event assessment (e.g., Time 2, Time 3) in the event group, $n_{pre,E}$ is the sample size of the event group at Time 1, and d_E is the bias-corrected standardized mean change of the personality characteristic in the event group.

Correspondingly, the sampling variance in the comparison group was computed by

$$var(d_C) = \frac{2\left(1 - r_{C,\,pre/post}\right)}{n_{pre,\,C}} + \frac{d_C^{\,2}}{2n_{pre,\,C}},$$

where $r_{C,pre/post}$ is the test-retest correlation of the personality characteristic between the pre-event assessment (i.e., Time 1) and the post-event assessment (e.g., Time 2, Time 3, etc.) in the comparison group, $n_{pre,C}$ is the sample size of the comparison group at Time 1, and d_C is the bias-corrected standardized mean change of the personality characteristic in the comparison group.

As preregistered, if a study did not report the requested test-retest correlation or did not report this coefficient separately for both groups, we used an estimate of the correlation coefficient. Specifically, we used the average correlation in the meta-analytic data set (for a similar approach, see Bühler et al., 2021), which was $r = .64$. In total, 40 samples reported the correlation coefficient, while it was estimated in 49 samples.

As described above, we used two types of effect size measures for the analyses. For all samples, we used the d_E effect size measure (i.e., standardized mean change between the pre- and post-event assessment in the event group). In the subset of samples that also included a comparison group, we additionally used the d_{EC} effect size measure (i.e., difference between the standardized mean change for the event and comparison groups) and compared it with the d_E effect size measure. In the effect size analyses with d_E, we used the sampling variance computed for the event group, and in the effect size analyses with d_{EC}, we used the sum of both sampling variances (Morris, 2008).[7]

Testing for Outliers and Publication Bias. We tested for outliers by using the "influence" command in the metafor package (Viechtbauer, 2010). Given that this command is not available for the "rma.mv" function that accounts for the multilevel data structure (see above), we used the "rma" function in the outlier analyses. If a sample qualified as

potential outlier, we conducted sensitivity analyses that excluded this sample. We report both sets of analyses (i.e., analyses with the full data set and analyses with the exclusion of potential outliers) and discuss any differences in the findings.

For examining publication bias, we used three methods. First, we examined the funnel plot, which shows the association between effect size and standard error, serving as a graphical device to detect publication bias (Light & Pillemer, 1984; Rothstein et al., 2005; Sterne & Egger, 2001; Sutton, 2009). Second, we tested for asymmetry of the funnel plot by using Egger's regression test (Egger et al., 1997). We used the "rma" function for this test given that the "rma.mv" function is not available for the test. Third, we compared effect sizes that were published with effect sizes that were not published (i.e., not included in a published article but obtained from the study authors upon request), by using multilevel mixed-effects meta-regression models. Together, these three methods allowed for a comprehensive assessment of publication bias in the meta-analytic data set.

Results

Description of Studies

The meta-analytic data set included 44 studies, which provided information on 89 samples and 519 effect sizes. The publication years ranged from 1995 to 2022 (*Mdn* = 2015). The average lag between pre- and post-event assessments was $M = 2.45$ years (*SD* = 2.44, range = 0.08–15.00). Table 2 provides an overview of the samples, including their descriptive information; all effect sizes are reported on OSF (https://osf.io/dnjs2/?view_only=None).

In sum, 121,187 participants were included in the samples, and sample sizes ranged from 4 to 45,488 (*M* = 1,362, *SD* = 5,577, *Mdn* = 255). Of the samples, 60% were nationally representative, 36% were community samples, and 4% were samples of college students. Almost all samples came from Western countries (96%), including Germany (46%), the Netherlands (12%), Australia (9%), USA (6%), Finland (5%), Norway (5%), United Kingdom (5%), France (2%), Sweden (2%), Switzerland (2%), Belgium (1%), and Lithuania (1%). Only 4% were from Asian countries (i.e., China, Japan), and none from South American and African countries. Of the samples, 94% were predominantly White/European (with "predominantly" defined as at least 70% of the sample), 5% predominantly Asian, and 1% belonged to another ethnicity or were ethnically diverse. No samples were predominantly Black or predominantly Hispanic/Latin America.

The mean proportion of female participants was 60%, ranging from 0% to 100% (*SD* = 25%, *Mdn* = 55%). Mean age of participants was 38.15 (*SD* = 16.13), ranging from 15.00 years to 74.83 years. Participants' mean year of birth was 1967 (*SD* = 20.57), ranging from 1912 to 1996, and mean year of Time 1 assessment was 2005 (*SD* = 9.47), ranging from 1984 to 2021. All samples used self-report measures, and no sample was an intervention or prevention study. The effect sizes were related to six life events from the love domain—beginning of a romantic relationship ($k = 74$), marriage ($k = 20$), birth of a child ($k = 65$), separation ($k = 69$),

Table 2. Descriptive Information on the Samples Included in the Meta-Analysis.

Sample	Personality Construct(s)	Life event	Event Sample						Comparison Sample	
			Sample Size	Mean age T1	Female (in %)	Sample Type	Country	Ethnicity	Sample Size	Matching
Bleidorn (2012)	Big Five traits	Graduation	137	20.00	73	Community	DEU	White	—	—
Bleidorn and Schwaba (2018)	Self-esteem	Retirement	690	64.41	—	National	NLD	White	515	Strong
Bleidorn et al. (2016), female	Self-esteem	Birth of a child	132	49.92	100	Community	NLD	White	51	No
Bleidorn et al. (2016), male	Self-esteem	Birth of a child	132	52.07	0	Community	NLD	White	51	No
Brazil and Andersson (2020)	Self-esteem	Graduation	1453	15.40	55	National	USA	White	—	—
Bühler et al. (2022)	Big Five traits	New relationship	1233	32.13	—	National	DEU	White	11,359	No
Bühler et al. (2022)	Big Five traits	New relationship	361	34.13	—	National	AUS	White	1,999	No
Bühler et al. (2022)	Big Five traits	Marriage	1839	35.10	—	National	AUS	White	7,870	No
Bühler et al. (2022)	Big Five traits	Separation	2056	36.57	—	National	AUS	White	7,656	No
Bühler et al. (2022)	Big Five traits	Divorce	504	43.91	—	National	AUS	White	9,039	No
Bühler et al. (2022)	Big Five traits	Widowhood	363	70.85	—	National	AUS	White	9,184	No
Bühler et al. (2022)	Big Five traits	Marriage	512	36.78	—	National	GBR	White	2,567	No
Bühler et al. (2022)	Big Five traits	Separation	158	42.13	—	National	GBR	White	2,587	No
Bühler et al. (2022)	Big Five traits	Divorce	229	46.83	—	National	GBR	White	2,508	No
Bühler et al. (2022)	Big Five traits	Widowhood	156	69.66	—	National	GBR	White	2,579	No
Chen et al. (2020)	Life satisfaction	Widowhood	198	64.89	70	National	CHN	Asian	—	—
Chopik (2018), Sample 1	Big Five traits	Widowhood	570	71.65	59	National	USA	White	9,374	No
Chopik (2018), Sample 2	Big Five traits	Widowhood	255	70.18	85	Community	USA	White	280	No
Denissen et al. (2019)	Emo. stability	Widowhood	97	44.50	60	National	NLD	White	—	—
Dingemans and Henkens (2014), retirees before Wave 2	Life satisfaction	Retirement	972	60.96	23	National	NLD	White	—	—
Dingemans and Henkens (2014) retirees before Wave 3	Life satisfaction	Retirement	276	63.64	29	National	NLD	White	—	—
Galdiolo and Roskam (2019), female	Big Five traits	Birth of a child	204	28.32	100	Community	FRA	White	63	No
Galdiolo and Roskam (2019), male	Big Five traits	Birth of a child	204	30.79	0	Community	FRA	White	63	No
Gnambs and Stiglbauer (2019)	Big Five traits	Unemployment	74	46.65	43	National	DEU	White	4,774	No

(continued)

Table 2. (continued)

| Sample | Personality Construct(s) | Life event | Event Sample | | | | | | Comparison Sample | |
			Sample Size	Mean age T1	Female (in %)	Sample Type	Country	Ethnicity	Sample Size	Matching
Hansson et al. (2020)	Big Five traits, self-esteem, life satisfaction	Retirement	475	63.00	53	National	SWE	White	—	—
Henning et al. (2022), retirees 1996–2002	Life satisfaction	Retirement	196	58.48	47	National	DEU	White	—	—
Henning et al. (2022), retirees 2002–2208	Life satisfaction	Retirement	111	59.35	45	National	DEU	White	—	—
Henning et al. (2022), retirees 2008–2014	Life satisfaction	Retirement	257	60.13	54	National	DEU	White	—	—
Keizer et al. (2010), female	Life satisfaction	Birth of a child	130	35.00	100	National	NLD	White	208	No
Keizer et al. (2010), male	Life satisfaction	Birth of a child	98	35.00	0	National	NLD	White	164	No
Krämer et al. (2020), female	Life satisfaction	Birth of a child	439	30.00	100	National	DEU	White	317	Strong
Krämer et al. (2020), male	Life satisfaction	Birth of a child	374	30.00	0	National	DEU	White	354	Strong
Leikas and Salmela-Aro (2015)	Big Five traits	New relationship	54	20.00	47	Community	FIN	White	—	—
Leikas and Salmela-Aro (2015)	Big Five traits	New job	128	20.00	47	Community	FIN	White	—	—
Lindfors et al. (2014)	Life satisfaction	Graduation	1491	29.41	89	College	SWE	White	—	—
Luciano and Orth (2017)	Self-esteem	New relationship	685	26.40	52	National	DEU	White	1,323	Strong
Luciano and Orth (2017)	Self-esteem	Marriage	127	26.40	52	National	DEU	White	251	Strong
Luciano and Orth (2017)	Self-esteem	Separation	462	26.40	52	National	DEU	White	786	Strong
Ludtke et al. (2009)	Big Five traits	Graduation	2141	19.51	63	Community	DEU	White	—	—
Malinauskas and Dumciene (2017)	Self-esteem	Graduation	197	18.54	58	College	LTU	White	—	—
Nakagawa and Hülür (2021)	Life satisfaction	Widowhood	142	74.83	74	National	JPN	Asian	—	—
NEXT Study (2019)	Big Five traits, life satisfaction	New relationship	20	21.61	73	Community	DEU	White	—	—
NEXT Study (2019)	Big Five traits, life satisfaction	Separation	8	21.61	73	Community	DEU	White	—	—
NEXT Study (2019)	Big Five traits, life satisfaction	Graduation	86	21.61	73	Community	DEU	White	—	—
NEXT Study (2019)	Big Five traits, life satisfaction	New job	28	21.61	73	Community	DEU	White	—	—
NEXT Study (2019)	Big Five traits, life satisfaction	Unemployment	4	21.61	73	Community	DEU	White	—	—
Orth and Luciano (2015), Study 1	Self-esteem	Separation	28	21.20	—	Community	CHE	White	—	—

Table 2. (continued)

Sample	Personality Construct(s)	Life event	Event Sample						Comparison Sample	
			Sample Size	Mean age T1	Female (in %)	Sample Type	Country	Ethnicity	Sample Size	Matching
Orth and Luciano (2015), Study 2	Self-esteem	Separation	32	29.00	—	Community	CHE	White	—	—
PEC Study (2021)	Big Five traits, life satisfaction	New relationship	23	29.10	74	Community	DEU	White	—	—
PEC Study (2021)	Big Five traits, life satisfaction	Separation	24	29.10	74	Community	DEU	White	—	—
PEC Study (2021)	Big Five traits, life satisfaction	Graduation	18	29.10	74	Community	DEU	White	—	—
PEC Study (2021)	Big Five traits, life satisfaction	Unemployment	42	29.10	74	Community	DEU	White	—	—
Reitz et al. (2020)	Self-esteem	New job	78	27.08	69	National	DEU	White	—	—
Reitzes et al. (1996)	Self-esteem	Retirement	295	61.00	52	Community	USA	White	432	No
Salmela-Aro and Tynkkynen (2010), female	Life satisfaction	Graduation	317	15.00	100	Community	FIN	White	—	—
Salmela-Aro and Tynkkynen (2010), male	Life satisfaction	Graduation	325	15.00	0	Community	FIN	White	—	—
Schwaba and Bleidorn (2019)	Big Five traits	Retirement	134	63.60	—	National	NLD	White	306	Strong
SOS Study (2021)	Life satisfaction	New relationship	16	34.18	71	Community	DEU	White	—	—
SOS Study (2021)	Life satisfaction	Separation	16	34.18	71	Community	DEU	White	—	—
SOS Study (2021)	Life satisfaction	Graduation	16	34.18	71	Community	DEU	White	—	—
SOS Study (2021)	Life satisfaction	Unemployment	25	34.18	71	Community	DEU	White	—	—
Specht et al. (2011a)	Big Five traits	Marriage	664	47.21	52	National	DEU	White	—	—
Specht et al. (2011a)	Big Five traits	Birth of a child	993	47.21	52	National	DEU	White	—	—
Specht et al. (2011a)	Big Five traits	Separation	690	47.21	52	National	DEU	White	—	—
Specht et al. (2011a)	Big Five traits	Divorce	229	47.21	52	National	DEU	White	—	—
Specht et al. (2011a)	Big Five traits	Widowhood	228	47.21	52	National	DEU	White	—	—
Specht et al. (2011a)	Big Five traits	New job	456	47.21	52	National	DEU	White	—	—
Specht et al. (2011a)	Big Five traits	Unemployment	860	47.21	52	National	DEU	White	—	—
Specht et al. (2011a)	Big Five traits	Retirement	693	47.21	52	National	DEU	White	—	—
Specht et al. (2011a)	Life satisfaction	Widowhood	387	64.95	69	National	DEU	White	—	—
Stringer et al. (2012)	Emo. stability	Graduation	454	17.20	60	Community	USA	Other	—	—
Uglanova and Staudinger (2013)	Life satisfaction	Marriage	475	48.70	53	National	DEU	White	—	—
Uglanova and Staudinger (2013)	Life satisfaction	Birth of a child	283	48.70	53	National	DEU	White	—	—

Table 2. (continued)

Sample	Personality Construct(s)	Life event	Event Sample						Comparison Sample	
			Sample Size	Mean age T1	Female (in %)	Sample Type	Country	Ethnicity	Sample Size	Matching
Uglanova and Staudinger (2013)	Life satisfaction	Unemployment	46	48.70	53	National	DEU	White	—	—
van der Velde et al. (1995)	Emo. stability, extraversion, self-esteem, life satisfaction	New job	168	19.80	60	College	NLD	White	146	No
van Scheppingen et al. (2016), female	Big Five traits	Birth of a child	276	27.28	50	National	AUS	White	789	No
van Scheppingen et al. (2016), male	Big Five traits	Birth of a child	280	27.28	50	National	AUS	White	908	No
van Scheppingen et al. (2018), first child	Self-esteem	Birth of a child	45,488	28.04	100	National	NOR	White	—	—
van Scheppingen et al. (2018) second child	Self-esteem	Birth of a child	25,524	30.47	100	National	NOR	White	—	—
van Scheppingen et al. (2018), third child	Self-esteem	Birth of a child	11,211	34.72	100	National	NOR	White	—	—
van Scheppingen et al. (2018), fourth child	Self-esteem	Birth of a child	2488	32.72	100	National	NOR	White	—	—
van Scheppingen and Leopold (2020)	Life satisfaction	Divorce	787	36.00	60	National	DEU	White	1,629	Strong
Wagner et al. (2013)	Self-esteem	Graduation	4532	19.60	55	Community	DEU	White		
Wagner et al. (2015)	Big Five traits, self-esteem, life satisfaction	New relationship	105	21.40	48	Community	DEU	White	136	Strong
Wille et al. (2012)	Big Five traits	Graduation	260	22.80	47	College	BEL	White	—	—
Williams et al. (2015)	Life satisfaction	Graduation	466	17.00	55	Community	AUS	White	—	—
Yeung (2018)	Life satisfaction	Retirement	197	58.78	37	Community	CHN	Asian	—	—
Zhan et al. (2023)	Life satisfaction	Retirement	667	52.12	51	National	CHN	Asian	—	—

Note. Mean age is given in years. The column "Female" shows the percentage of female participants. T1 = Time 1. Country follows the ISO–3166–1 alpha–3 codes: AUS = Australia; BEL = Belgium; CHE = Switzerland; CHN = China; DEU = Germany; FIN = Finland; FRA = France; GBR = United Kingdom of Great Britain and Northern Ireland; JPN = Japan; LTU = Lithuania; NLD = Netherlands; NOR = Norway; SWE = Sweden; USA = United States of America. National = nationally representative. No = No matching. Strong = Strong matching (e.g., propensity score matching). Dash indicates that this information was not available.

divorce ($k = 23$), widowhood ($k = 41$), and to four life events from the work domain—graduation ($k = 80$), first job ($k = 39$), unemployment ($k = 61$), and retirement ($k = 47$). The effect sizes were based on the following personality constructs: emotional stability ($k = 81$), agreeableness ($k = 74$), extraversion ($k = 75$), conscientiousness ($k = 74$), openness ($k = 74$), self-esteem ($k = 52$), and life satisfaction ($k = 89$).

While 67% of the studies did not include a comparison group, 33% did. Of the latter, 79% did not use matching and 21% used strong matching (e.g., propensity score matching); none of the studies used a weak matching procedure (e.g., matching with regard to some sample characteristics, such as age and gender). In sum, 12,758 participants were included in the comparison samples, and their sample sizes ranged from 74 to 2,056 ($M = 440$, $SD = 488$, $Mdn = 276$). The right part of Table 2 shows descriptive information for the samples that included a comparison group.

Standardized Mean Change in the Event Groups

Specific Types of Life Events. Table 3 reports the construct-specific estimates of standardized mean change for each type of life event in the love domain. Most of the meta-

Table 3. Standardized Mean Change in Personality Constructs in Response to Life Events in the Love Domain.

Personality Construct	k	N	Weighted Mean Effect Size (d_E)	95% CI	Q	Variances σ_1^2	σ_2^2
Entering a new relationship							
Emotional stability	12	1796	0.116	[−0.085, 0.316]	**51.0**	.039	.007
Agreeableness	12	1797	−0.084	[−0.188, 0.020]	10.4	.007	.000
Extraversion	12	1796	0.009	[−0.071, 0.088]	10.5	.004	.000
Conscientiousness	12	1796	**0.154**	[0.044, 0.265]	**29.2**	.000	.014
Openness	12	1795	−0.035	[−0.137, 0.067]	**20.2**	.000	.011
Self-esteem	4	790	0.156	[−0.109, 0.420]	18.2	.016	.016
Life satisfaction	10	164	**0.337**	[0.221, 0.452|	6.8	.002	.002
Marriage							
Emotional stability	3	3015	0.023	[−0.063, 0.109]	**12.6**	.000	.005
Agreeableness	3	3017	−0.121	[−0.353, 0.111]	**34.6**	.025	.004
Extraversion	3	3017	−0.091	[−0.191, 0.009]	**9.0**	.002	.003
Conscientiousness	3	3014	−0.011	[−0.183, 0.161]	**21.8**	.014	.000
Openness	3	3010	**−0.175**	[−0.316, −0.033]	**14.9**	.010	.000
Self-esteem	3	127	−0.043	[−0.129, 0.043]	1.1	.000	.000
Life satisfaction	2	475	**0.066**	[0.012, 0.120]	0.5	.000	.000
Birth of a child							
Emotional stability	7	1957	0.038	[−0.074, 0.151]	**22.2**	.008	.001
Agreeableness	7	1957	−0.090	[−0.225, 0.044]	**37.2**	.013	.000
Extraversion	7	1957	**−0.098**	[−0.156, −0.040]	11.2	.000	.002
Conscientiousness	7	1957	0.022	[−0.079, 0.124]	**52.2**	.000	.010
Openness	7	1957	−0.078	[−0.167, 0.012]	**22.5**	.005	.000
Self-esteem	20	84975	0.035	[−0.129, 0.198]	**1612.3**	.013	.000
Life satisfaction	10	1324	−0.067	[−0.139, 0.004]	**92.3**	.003	.000
Separation							
Emotional stability	11	2936	0.070	[−0.041, 0.181]	**53.8**	.000	.012
Agreeableness	11	2941	0.041	[−0.037, 0.119]	**29.1**	.004	.000
Extraversion	11	2940	−0.026	[−0.064, 0.011]	16.2	.000	.000
Conscientiousness	11	2937	0.076	[−0.081, 0.233]	**43.3**	.021	.002
Openness	11	2933	−0.032	[−0.117, 0.054]	**43.2**	.006	.000
Self-esteem	5	522	−0.097	[−0.285, 0.091]	**10.2**	.014	.000
Life satisfaction	9	48	**0.136**	[0.006, 0.266]	11.3	.003	.003
Divorce							
Emotional stability	3	962	0.065	[−0.130, 0.260]	**24.0**	.000	.027
Agreeableness	3	962	0.008	[−0.047, 0.062]	1.9	.000	.000
Extraversion	3	962	−0.024	[−0.165, 0.117]	5.3	.009	.000
Conscientiousness	3	961	**0.096**	[0.033, 0.158]	1.3	.000	.000
Openness	3	961	−0.062	[−0.138, 0.015]	4.0	.000	.002
Self-esteem	5	225	0.000	[−0.050, 0.050]	9.3	.000	.000
Life satisfaction	3	787	**−0.052**	[−0.087, −0.017]	**38.6**	.000	.000
Widowhood							
Emotional stability	7	1669	0.034	[−0.175, 0.243]	**45.5**	.038	.020
Agreeableness	6	1578	0.060	[−0.026, 0.146]	**16.7**	.000	.007
Extraversion	6	1575	−0.074	[−0.152, 0.005]	**11.8**	.000	.005
Conscientiousness	6	1574	−0.079	[−0.200, 0.043]	**19.4**	.000	.016
Openness	6	1571	−0.111	[−0.231 0.009]	**11.6**	.009	.000
Self-esteem	0	0	—	—	—	—	—
Life satisfaction	10	727	0.112	[−0.053, 0.276]	**142.4**	.010	.010

Note. Computations were made with multilevel random-effects models. Dash indicates that meta-analytic coefficients are not available because of insufficient number of effect sizes. Values in bold are significant at $p < .05$. k = number of effect sizes; N = number of participants included in the effect size analyses; d_E = standardized mean change in personality construct; CI = confidence interval; Q = test statistic of the test for (residual) heterogeneity; σ_1^2 = variance proportion attributable to the grouping variable (i.e., between samples); σ_2^2 = variance proportion attributable to the level nested within the grouping variables (i.e., within samples). Note that in some cases a single study reported multiple effect sizes with the same participants.

analytically aggregated effect sizes were relatively small, with absolute values ranging between $d = 0.000$ and $d = 0.337$. Entering a new relationship, marriage, and divorce were the life events, for which significant effects were

observed for the largest number of personality constructs (i.e., two), whereas none of the construct-specific effects were significant for widowhood. Entering a new relationship showed the strongest effect on a personality construct,

indicating an increase in life satisfaction. Specifically, the weighted mean effect size was $d = 0.337$, which corresponds to a small to medium effect size based on Cohen (1977, 1988). Thus, people who entered a new relationship showed meaningful albeit relatively mild increase in life satisfaction. As we will discuss later, small effects may be consequential in the long run (Funder & Ozer, 2019). Overall, conscientiousness and life satisfaction were the personality constructs that showed the largest number of significant changes in response to specific life events in the love domain, followed by extraversion and openness, while no effects were observed for emotional stability, agreeableness, and self-esteem.

Table 4 reports the construct-specific estimates of standardized mean change for each life event in the work domain. Overall, the effect sizes were relatively small, with absolute values ranging from $d = 0.010$ to $d = 0.276$. Graduation and entering the first job were the life events, for which significant effects were observed for the largest

number of personality constructs (i.e., three), while unemployment showed two effects, and retirement showed no significant effect. Entering the first job showed the strongest effect, indicating an increase in conscientiousness. This effect size, however, was based on a small number of participants ($N = 612$). Overall, emotional stability, conscientiousness, self-esteem, and life satisfaction were the personality constructs that showed most changes in response to specific life events in the work domain (i.e., two effects), while no effects were observed for extraversion and openness.

Gain-Based and Loss-Based Life Events. Table 5 (upper part) reports the construct-specific estimates of standardized mean change for gain-based life events in the love domain, while Table 5 (lower part) reports the estimates for loss-based life events in the love domain. As the table shows, gain-based life events yielded three significant effects and loss-based life events yielded two, and these significant

Table 4. Standardized Mean Change in Personality Constructs in Response to Life Events in the Work Domain.

Personality Construct	k	N	Weighted Mean Effect Size (d_E)	95% CI	Q	σ_1^2	σ_2^2
Graduation							
Emotional stability	16	3096	**0.164**	[0.019, 0.310]	**106.1**	.015	.015
Agreeableness	11	2642	0.070	[−0.150, 0.289]	**80.1**	.030	.030
Extraversion	11	2642	−0.011	[−0.079, 0.057]	18.9	.002	.002
Conscientiousness	11	2642	0.128	[−0.142, 0.398]	**137.9**	.046	.046
Openness	11	2642	−0.041	[−0.285, 0.202]	**186.8**	.037	.037
Self-esteem	3	6182	**0.128**	[0.040, 0.215]	**26.1**	.002	.002
Life satisfaction	17	2719	**0.133**	[0.043, 0.222]	**72.0**	.003	.008
First job							
Emotional stability	7	780	0.089	[−0.005, 0.184]	7.3	.003	.003
Agreeableness	6	612	0.077	[−0.104, 0.257]	**20.8**	.011	.011
Extraversion	7	780	0.071	[−0.056, 0.197]	18.2	.007	.007
Conscientiousness	6	612	**0.276**	[0.092, 0.460]	12.9	.011	.011
Openness	6	612	−0.054	[−0.197, 0.088]	14.0	.006	.006
Self-esteem	2	246	**0.232**	[0.117, 0.347]	0.0	.000	.000
Life satisfaction	5	196	**0.222**	[0.045, 0.399]	7.4	—	—
Unemployment							
Emotional stability	10	980	**0.095**	[0.046, 0.143]	4.7	.000	.000
Agreeableness	10	980	0.182	[−0.298, 0.662]	**26.3**	.107	.107
Extraversion	10	980	0.053	[−0.151, 0.258]	16.3	.017	.017
Conscientiousness	10	980	**−0.058**	[−0.097, −0.019]	5.2	.000	.000
Openness	10	980	−0.039	[−0.191, 0.113]	11.1	.007	.007
Self-esteem	0	0	—	—	—	—	—
Life satisfaction	11	117	0.010	[−0.205, 0.225]	**30.0**	.021	.021
Retirement							
Emotional stability	5	1302	0.058	[−0.030, 0.146]	**11.4**	.002	.002
Agreeableness	5	1305	−0.056	[−0.166, 0.054]	**15.6**	.004	.004
Extraversion	5	1310	−0.056	[−0.151, 0.038]	**14.5**	.003	.003
Conscientiousness	5	1305	−0.047	[−0.307, 0.213]	**112.0**	.025	.025
Openness	5	1304	−0.076	[−0.161, 0.009]	**9.6**	.002	.002
Self-esteem	10	1666	0.012	[−0.070, 0.093]	**44.7**	.002	.002
Life satisfaction	12	3359	−0.006	[−0.132, 0.121]	**123.8**	.017	.003

Note. Computations were made with multilevel random-effects models. Dash indicates that meta-analytic coefficients are not available because of the insufficient number of effect sizes. Values in bold are significant at $p < .05$. k = number of effect sizes; N = number of participants included in the effect size analyses; d_E = standardized mean change in personality construct; CI = confidence interval; Q = test statistic of the test for (residual) heterogeneity; σ_1^2 = variance proportion attributable to the grouping variable (i.e., between samples); σ_2^2 = variance proportion attributable to the level nested within the grouping variables (i.e., within samples). Note that in some cases a single study reported multiple effect sizes with the same participants.

Table 5. Standardized Mean Change in Personality Constructs in Response to Gain-Based and Loss-Based Life Events in the Love Domain.

Personality Construct	k	N	Weighted Mean Effect Size (d_E)	95% CI	Q	Variances σ_1^2	σ_2^2
Gain-based life events							
Emotional stability	22	6768	0.082	[−0.025, 0.190]	**87.3**	.016	.006
Agreeableness	22	6771	**−0.092**	[−0.172, −0.013]	**86.9**	.009	.000
Extraversion	22	6,770	**−0.059**	[−0.109, −0.010]	**43.2**	.001	.003
Conscientiousness	22	6,767	0.082	[−0.007, 0.170]	**121.8**	.009	.006
Openness	22	6,762	**−0.066**	[−0.141, 0.008]	**81.7**	.006	.003
Self-esteem	27	85,892	0.081	[−0.051, 0.213]	**1655.1**	.016	.000
Life satisfaction	22	1,963	0.154	[−0.013, 0.320]	**186.6**	.044	.000
Loss-based life events							
Emotional stability	21	5,567	0.074	[−0.054, 0.202]	**175.2**	.015	.013
Agreeableness	20	5,481	0.038	[−0.016, 0.092]	**50.2**	.001	.002
Extraversion	20	5,477	−0.042	[−0.101, 0.017]	**43.2**	.002	.002
Conscientiousness	20	5,471	0.019	[−0.108, 0.147]	**108.8**	.014	.010
Openness	20	5,465	**−0.063**	[−0.138, 0.011]	**83.5**	.005	.001
Self-esteem	10	747	−0.020	[−0.053, 0.013]	**20.5**	.000	.000
Life satisfaction	22	1,562	**0.089**	[−0.013, 0.190]	**244.2**	.008	.008

Note. Computations were made with multilevel random-effects models. Gain-based life events included beginning of a new relationship, marriage, and birth of a child. Loss-based life events included separation, divorce, and widowhood. Values in bold are significant at $p < .05$. k = number of effect sizes; N = number of participants included in the effect size analyses; d_E = standardized mean change in personality construct; CI = confidence interval; Q = test statistic of the test for (residual) heterogeneity; $\sigma 12$ = variance proportion attributable to the grouping variable (i.e., between samples); $\sigma 22$ = variance proportion attributable to the level nested within the grouping variables (i.e., within samples). Note that in some cases a single study reported multiple effect sizes with the same participants.

effects were uniformly small. Table 6 (upper part) reports the construct-specific estimates of standardized mean change for gain-based life events in the work domain, while Table 6 (lower part) reports the estimates for loss-based life events in the work domain. In contrast to the love domain, here there was somewhat more evidence that effects are larger and more frequent for gain-based life events than for loss-based life events: Gain-based life events yielded four significant effects on personality constructs, while loss-based life events had one significant effect.

Difference Between Standardized Mean Change for the Event and Comparison Groups

As described in the Method section, a subset of samples included a comparison group. For these samples, we examined whether the effect sizes differed when including the information from the comparison group. Specifically, we tested whether the effect size measure d_{EC} (which included data from both the event and comparison group; see Method section) differed from the effect size measure d_E (as used in the analyses reported above) when tested in the set of samples that allowed to compute both effect size measures ($k = 130$). The mean difference between effect sizes (i.e., $d_E − d_{EC}$) was .025 [.004; .045], which was significant, $t(129) = 2.36$, $p = .020$. The correlation between the effect sizes was .544 ($p < .001$), which suggested strong consistency between the effect size measures. Thus, although the mean difference was significant, it was small and suggested together with the large correlation that the effect sizes did not differ systematically from each other.

However, it is still possible that d_E overestimates the effects relative to d_{EC}, given that changes in the comparison group were not controlled for in d_E. That is,

absolute values of d_E could be systematically larger than absolute values of d_{EC}, both in the positive direction (i.e., among effects with positive sign) and in the negative direction (i.e., among effects with negative sign). If this was the case, then the t-test reported above would not capture the overestimation by d_E, because the overestimation of positive versus negative effects would cancel each other out. Therefore, we also tested whether absolute values of d_E and d_{EC} differed significantly from each other. The mean difference of absolute values was .014 [−.001; .028], which was nonsignificant, $t(129) = 1.78$, $p = .077$. As expected, absolute values were slightly larger for d_E (.101) than for d_{EC} (.088).

Overall, the present results suggested that the difference between the two effect size measures was small and that the effect sizes measures were consistent across samples with and without comparison groups (as indicated by the large correlation). For these reasons and given that a larger number of effect sizes was available for d_E compared to d_{EC}, we used the effect size measure d_E in the remainder of the analyses. Nevertheless, we report all effect size analyses with d_{EC} in the Supplemental Material (Tables S1−S6). Moreover, the small difference in absolute values of the effect size measures suggests that d_E might slightly overestimate the effects. We therefore call for more studies that include comparison groups and ideally use matching procedures to increase the validity of conclusions about the effects of life events.

Moderator Analyses

As noted above, the results suggested significant heterogeneity between studies. Therefore, we tested for moderators of the effect sizes, using multilevel mixed-effects

models. In the moderator analyses, we focused on gain-based and loss-based life events in the love and work domains. We tested four continuous moderator variables (age, gender, mean year of birth, and time lag between assessments) and three categorical moderator variables (country, ethnicity, and sample type).[8]

For the categorical moderator variables, we tested specific contrasts. For country, we contrasted samples from the country for which the largest number of effect sizes were available (i.e., Germany), with samples from other countries. For ethnicity, we contrasted samples that were White/European with samples that had another ethnicity. As regards sample type, we contrasted samples that came from nationally representative samples with community samples. Given the number of tests in the moderator analyses (i.e., 7), we adjusted the significance level to $p < .007$, following the Bonferroni method (i.e., .05 divided by the number of tests).

The findings are reported in Tables 7 and 8 for the love and work domains, respectively. The results show that time lag was a significant moderator in the love domain. Specifically, for gain-based life events, effect sizes were significantly smaller the longer the time lag between the pre- and post-event assessment was. For loss-based life events, effect sizes were significantly larger, the longer the time lag between assessments was. No other moderator was significant in the love domain, and none of the moderators were significant in the work domain. Therefore, a central

Table 6. Standardized Mean Change in Personality Constructs in Response to Gain-Based and Loss-Based Life Events in the Work Domain.

Personality Construct	k	N	Weighted Mean Effect Size (d_E)	95% CI	Q	Variances σ_1^2	σ_2^2
Gain-based life events							
Emotional stability	23	3,876	**0.134**	[0.027, 0.241]	**121.5**	.024	.000
Agreeableness	17	3,254	0.063	[−0.099, 0.225]	**130.8**	.045	.000
Extraversion	18	3,422	0.020	[−0.045, 0.068]	**37.2**	.000	.007
Conscientiousness	17	3,254	**0.200**	[0.006, 0.395]	**187.2**	.041	.027
Openness	17	3,254	−0.050	[−0.225, 0.126]	**260.0**	.054	.000
Self-esteem	5	6,428	**0.152**	[0.077, 0.227]	**31.7**	.002	.002
Life satisfaction	22	2,915	**0.138**	[0.053, 0.223]	**80.9**	.005	.006
Loss-based life events							
Emotional stability	15	2,282	**0.089**	[0.060, 0.118]	16.2	.000	.000
Agreeableness	15	2,285	0.032	[−0.127, 0.192]	**45.3**	.030	.000
Extraversion	15	2,290	−0.005	[−0.114, 0.104]	**31.0**	.012	.001
Conscientiousness	15	2,285	−0.021	[−0.148, 0.105]	**120.5**	.006	.017
Openness	15	2,284	−0.047	[−0.132, 0.038]	**25.0**	.006	.000
Self-esteem	10	1,666	0.012	[−0.070, 0.093]	**44.7**	.002	.002
Life satisfaction	23	3,476	0.002	[−0.104, 0.108]	**154.5**	.020	.003

Note. Computations were made with multilevel random-effects models. Gain-based life events included graduation and first job. Loss-based life events included unemployment and retirement. Values in bold are significant at $p < .05$. k = number of effect sizes; N = number of participants included in the effect size analyses; d_E = standardized mean change in personality construct; CI = confidence interval; Q = test statistic of the test for (residual) heterogeneity; σ12 = variance proportion attributable to the grouping variable (i.e., between samples); σ22 = variance proportion attributable to the level nested within the grouping variables (i.e., within samples). Note that in some cases a single study reported multiple effect sizes with the same participants.

Table 7. Meta-Regression Models for Study Characteristics Predicting Standardized Mean Change in Personality Constructs in Response to Gain-Based and Loss-Based Life Events in the Love Domain.

Study characteristic	Gain-Based Life Events k	B	SE	p	Loss-Based Life Events k	B	SE	p
Age	159	−0.002	0.002	.451	133	0.001	0.001	.385
Female	139	−0.001	0.022	.956	101	0.355	0.218	.103
Birth cohort	159	0.002	0.001	.192	133	−0.001	0.001	.582
Time lag	159	**−0.062**	0.002	**<.001**	133	**0.045**	0.006	**<.001**
Country	159	0.019	0.025	.444	133	0.012	0.057	.833
Ethnicity	159	—	—	—	133	−0.122	0.074	.097
Sample type	159	−0.077	0.046	.098	133	−0.007	0.054	.903

Note. Computations were made with multilevel mixed-effects meta-regression models. Gain-based life events included beginning of a new relationship, marriage, and birth of a child. Loss-based life events included separation, divorce, and widowhood. The variable female refers to the proportion of female participants in the sample. The following variables were dichotomous: country (1 = Germany, 0 = other), ethnicity (1 = White, 0 = other), and sample type (1 = community or student sample, 0 = nationally representative sample). Time lag refers to the interval between the pre-event and post-event assessment (in years). Dash indicates that it was not meaningful to test the moderator in the model because there was no variation in the study characteristic (i.e., in the analyses with gain-based life events and ethnicity, all samples were White). Coefficients in bold were significant at $p < .007$ (significance level corrected following the Bonferroni method). k = number of effect sizes.

Table 8. Meta-Regression Models for Study Characteristics Predicting Standardized Mean Change in Personality Constructs in Response to Gain-Based and Loss-Based Life Events in the Work Domain.

Study characteristic	Gain-Based Life Events				Loss-Based Life Events			
	k	*B*	*SE*	*p*	*k*	*B*	*SE*	*p*
Age	119	−0.005	0.003	.063	108	−0.001	0.002	.559
Female	119	0.080	0.109	.465	97	0.162	0.250	.516
Birth cohort	119	−0.000	0.002	.928	108	0.002	0.001	.163
Time lag	119	0.003	0.005	.609	108	0.011	0.006	.061
Country	119	−0.062	0.043	.155	108	−0.054	0.058	.352
Ethnicity	119	−0.015	0.094	.875	108	−0.049	0.086	.570
Sample type	119	0.018	0.064	.773	108	−0.051	0.064	.426

Note. Computations were made with multilevel mixed-effects meta-regression models. Gain-based life events included graduation and first job. Loss-based life events included unemployment and retirement. The variable female refers to the proportion of female participants in the sample. The following variables were dichotomous: country (1 = Germany, 0 = other), ethnicity (1 = White, 0 = other), and sample type (1 = community or student sample, 0 = nationally representative sample). Time lag refers to the interval between the pre-event and post-event assessment (in years). No coefficient was significant at $p < .007$ (significance level corrected following the Bonferroni method). k = number of effect sizes.

conclusion from the moderator analyses is that the effect sizes were relatively robust across the characteristics tested.

Testing for Outliers and Publication Bias

Finally, we tested for outliers and publication bias. The analyses indicated that three samples qualified as potential outliers. Therefore, we computed sensitivity analyses without these samples to examine whether excluding these three samples would alter the conclusions from this meta-analysis. The findings are reported in Table S7−S12, indicating that the findings from the sensitivity analyses did not differ substantially from the main analyses.

The results from publication bias tests indicated that the funnel plot had a slightly asymmetric shape (Figure 2) and that Egger's regression test was significant, $z = 2.953$, $p = .003$. The comparison between published effect sizes ($k = 215$) and unpublished effect sizes ($k = 304$) yielded a significant difference, $Q_{Model} = 4.229$, $df = 1$, $p = .040$. Thus, the tests of publication bias suggested that the evidence could be affected by publication bias. Interestingly, the average effect sizes were 0.04 for published effect sizes and 0.05 for obtained effect sizes. These results suggest that there is not a bias toward publishing larger effects in this literature.

Discussion

In the early days of personality psychology research, scholars focused on issues involving the structure and measurement of traits (Digman, 1996), which were assumed to be basically stable. However, challenges to personality psychology in the second half of the 20th century (Fleeson & Noftle, 2008; Kenrick & Funder, 1988), coupled with the more regular collection of longitudinal data, led to a body of research suggesting that personality traits can change, and that some people change more than others (Roberts & Mroczek, 2008). Naturally, this evidence raised questions about the causes of personality change. Researchers tried to answer this question in various ways, using behavioral genetic designs (Briley & Tucker-Drob, 2014), studying specific change mechanisms (Roberts &

Bogg, 2004), and exploring personality change interventions (Allemand & Flückiger, 2022). One of the most common approaches during the last generation of personality development research has been to examine systematic personality changes as a function of major life events. This approach is consistent with lay beliefs about how events like marriage, childbirth, divorce, or retirement change personality are common (Haslam et al., 2007). It also follows from popular theories of personality development that implicate adaptations to environmental dynamics as important change mechanisms (Roberts, 2018; Wrzus & Roberts, 2017, but see McCrae & Costa, 2008). Finally, it was enabled by the availability of large panel studies that made it possible to examine this issue with reasonable power. With all of these considerations in mind, life events were a natural place to look for evidence that environmental factors could affect systematic personality change.

The results of this meta-analysis suggest that major life events are indeed associated with personality change on average, and that effects are specific in that different life events affect different personality variables. People who enter a new relationship tend to become more conscientious and satisfied with life. Marriage further increases satisfaction with life but lowers openness, whereas separation is associated with increased life satisfaction and divorce is associated with increased conscientiousness and decreased life satisfaction. Childbirth decreases extraversion on average, and there are no reliable effects for widowhood. In the work domain, graduation is associated with increased emotional stability, self-esteem, and life satisfaction, the first job is associated with increases in conscientiousness, self-esteem, and life satisfaction, unemployment is associated with increased emotional stability and decreased conscientiousness, while there are no reliable effects for retirement.

Effects tended to be relatively small, albeit in a similar range as previous studies on the impacts of life events on mental health and well-being (Luhmann et al., 2012; McKee-Ryan et al., 2005). Even small effects, when aggregated across many people and over time, can have broad impact and relevance (Funder & Ozer, 2019). Many of the effects we studied are common and thus could have these
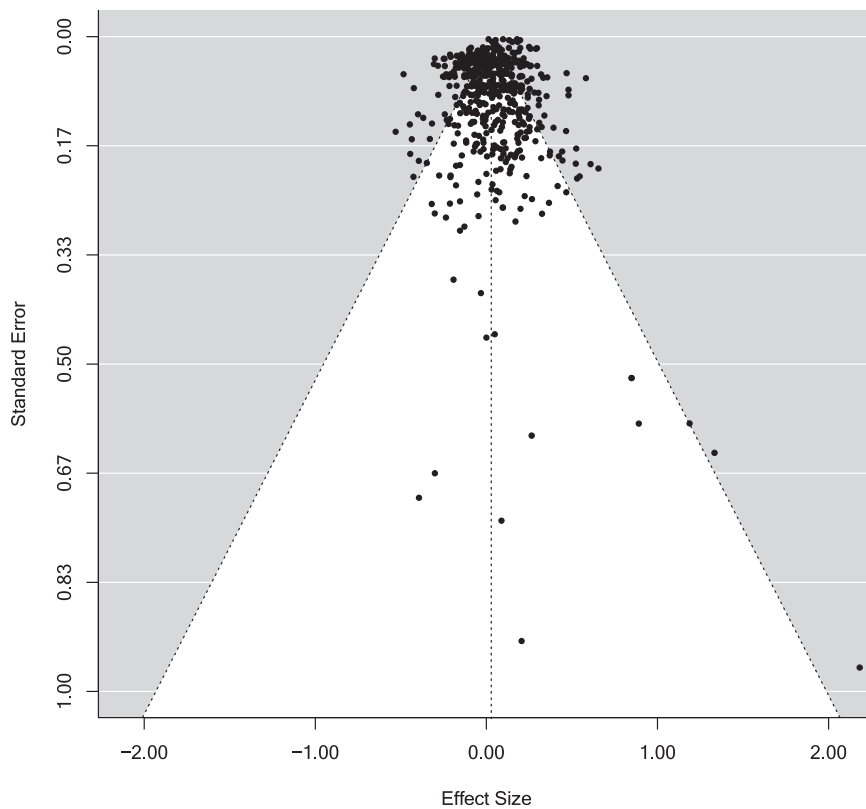
Figure 2. Funnel Plot Displaying the Relation Between the Effect Size and its Standard Error With d_E as Effect Size. Note. d_E = standardized mean change in personality constructs.

kinds of aggregating effects, but they can also be important for individual lives in their own right. The kinds of events we studied often entail long-term changes in people's life circumstances that may come with sustained changes in contexts and habits. These enduring changes in life conditions and adaptations may be associated with additional personality change even many years after the transition and these additional effects are probably not captured well by the effect sizes in our meta-analytic dataset. Thus, some of the events studied in this paper could lead to cumulative change across years or even decades. Overall, these results are consistent with the intuition that life events can be influential for individuals and society, they add specificity and confidence to the results of a narrative review (Table 1), and they provide a firm basis for future research on how and why these kinds of experiences change personality.

General Patterns

The examination of a range of life events and personality variables allowed for the emergence of certain patterns that may provide important clues about underlying mechanisms of personality development. For instance, effects tended to be somewhat more consistent for life events involving work (29% of all possible effects were significant) than love (19%). These domains also seemed to have different implications for features of personality. Whereas life satisfaction showed the most consistent changes in response to life events involving love, self-esteem and conscientiousness showed emerged more often in response to life events involving work. These differences may have to do with factors such as the kinds of demands placed upon people by

different kinds of events or the level of variability of responses by people to different kinds of events.

A second general pattern was that gain-based events tended to be more influential than loss-based events in the work domain, although differences were small. This finding contradicts the assumption that negative, loss-based events would show stronger effects than positive, gain-based events (Baumeister et al., 2001), and perhaps implicates models emphasizing how normativity provides cultural scripts that enable more consistent change across people (e.g., Caspi & Moffitt, 1993; Neyer et al., 2014). However, we also found that, within the love domain, gain-based events had larger short-term effects whereas losses had larger long-term effects, which in some sense is consistent with the general hypothesis that loss-based events are more influential. We note that this kind of comparison is complicated, however, by the fact that the same life event could be perceived as positive or negative depending on the person and context, highlighting the importance of better understanding individual differences in changes related to the same kind of event.

A third pattern was that self-esteem and life satisfaction ("surface characteristics") changed, on average, more consistently as a function of life events than Big Five personality traits ("core characteristics"). Thus, although this pattern was subtle and may have depended on the specific events examined here, it suggests that core and surface characteristics changed differently in response to life events, consistent with theories of personality differences emphasizing the relative sensitivity of surface characteristics to environmental dynamics (Henry & Mõttus, 2020; Kandler et al., 2014).

A fourth pattern was that the longer the time lag between the pre- and post-event assessment, the smaller was the personality change in response to gain-based life events and the larger was the personality change in response to loss-based life events, at least for those events involving love. This suggests that gain-based life events may have more immediate and temporary impacts, whereas loss-based events may have more slowly unfolding and sustained consequences. It also raises the possibility that some studies may not be sensitive to the effects of life events on personality change depending on the frequency and durations of their assessments. In general, this finding highlights the importance of distinguishing between gain-based versus loss-based life events in the domains of work and love and demonstrates the importance of study designs in this kind of research.

Where Do We Go From Here?

This review provides a summary of the kinds of effects and general patterns that are likely to be observed when examining single life events in longitudinal data from mainly Western samples of adolescents and adults. In addition to summarizing the literature on life events and personality change, this meta-analysis also provokes questions about how resources could be most effectively allocated in the next generation of research projects on personality change. Scholars have recently began turning their attention to what form this next generation of research should take.

A general theme in recent work on this topic involves the need to know more about the context surrounding life events. It should not be surprising to personality psychologists that people do not change in the same ways (Schwaba & Bleidorn, 2018) or that people may react differently to the same life event (Haehner et al., 2023), but individual differences in change have generally not been the focus of this area of research. Thus far, few reliable contextual moderators have been identified that help explain these different reactions. In some cases, objective features of the context around the event, such as the duration of employment (Boyce et al., 2015) or relationships (Luciano & Orth, 2017) are strong candidates. The fit between the person and the changes typically prompted by the event is also likely to be relevant in some cases (Bleidorn et al., 2018), as are the specific behavioral reactions the person displays in response to the event (Hutteman et al., 2015). Further complicating this issue, the distinction between traits and outcomes is not always clear, and it is possible that our trait assessments capture environmental features or summarize dynamic processes that go beyond core dispositional variables (Borsboom, 2023; Mõttus, 2016). Emerging research also suggests that the way people perceive the event and its impacts may play an important role in associated personality change (Haehner et al., 2022, Luhmann, et al., 2020a, 2020b; Schwaba et al., under review). Another approach to contextualizing life events is to account for normative sequences. For example, parenthood often follows marriage in many cultures (Mehta et al., 2020). Considering life events together could provide a powerful way to both isolate the effects of a single life event, contrast the effects of concatenated events from each other, and test the impact of normativity in terms of

sequences (e.g., marriage before parenthood; Dunlop et al., 2017).

Capturing these contextual factors typically requires different designs than have been common in this area of research. Bleidorn et al. (2020) recently suggested that the yield of studies examining the impacts of life events in panel studies originally designed to test other aims has a ceiling that could be broken with more sophisticated approaches. They proposed four particular innovations for future research on mechanisms of personality change. The first was to more carefully time assessments. Given that personality could change slowly or suddenly in response to a life event and may follow linear or nonlinear patterns of change (e.g., Lucas, 2007; Luhmann et al., 2012; Luhmann et al., 2014), studies whose measures were timed more carefully and thoughtfully are likely to be more sensitive to specific patterns of personality change (e.g., Boyce et al., 2015; Denissen et al., 2019; Luhmann et al., 2014; van Scheppingen et al., 2018). The second proposal was to use multimethod assessments. All of the studies reviewed in this meta-analysis used self-report questionnaires, and very little is known about patterns of personality change in response to life events or other environmental influences using other methods. It is furthermore possible that different methods are better at capturing different kinds of changes or environmental mechanisms (Eid & Diener, 2004). The third was to collect data from more diverse populations. The fact that this meta-analysis mainly included samples from WEIRD (Henrich et al., 2010) countries demonstrates how little is known about patterns and mechanisms of personality development in majority world populations. Similarly, our search for eligible articles relied exclusively on English-language publications, creating a risk for mono-language bias (Johnson, 2021). The fourth was to augment popular correlational designs with experimental studies. Experimental approaches are difficult in this field because people cannot be ethically assigned to experience life events. However, quasi-experimental (Schwaba et al., 2021), computational (Read et al., 2017), or intervention (Allemand & Flückiger, 2022) designs could be used to test specific mechanisms and provide more rigorous tests of causality.

These kinds of innovations are challenging. Studies designed to move past examinations of the impact of isolated life events on self-reported personality change in large panel studies will be more time-consuming and expensive and will likely require a range of skill sets that may go beyond that of any single researcher or team. Bleidorn et al. (2020) emphasized the importance of collaborative multi-lab efforts to meet the challenges likely to come in the next generation of personality change research. An initial stage of such a collaboration would be a field-wide discussion about how to build on the kinds of results reported in this study, to generate effective, efficient, and productive ideas about where we should go from here.

Conclusion

This meta-analysis of 44 studies with more than 120,000 participants detailed how major and common life events produce specific changes in Big Five traits, self-esteem, and life satisfaction. Effects in the work domain were larger and more

consistent than effects in the love domain, and gain-based events tended be more impactful than loss-based events. Study findings generally held across study design characteristics. Limitations of meta-analysis notwithstanding, these results provide a useful summary of existing research on the influence of life events and should spur a field-wide discussion about how to move beyond current designs to better understand the mechanisms of personality development.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Open Science Statement

Consistent with Journal Article Reporting Standards (Appelbaum et al., 2018; Kazak, 2018), the meta-analytic data set, the analysis script, and all research materials (e.g., coding manual, information on study variables) are available on the Open Science Framework (OSF, (https://osf.io/dnjs2/?view_only=None). The design (including search, selection, and coding procedures) and data-analysis plan of the present research were preregistered on OSF (https://osf.io/pytbx?view_only=None).

ORCID iD

Christopher J. Hopwood https://orcid.org/0000-0001-6645-8645

Supplemental Material

Supplemental material for this article is available online.

Notes

1. We included dissertations as a category of "gray" literature to help addressing the issue of publication bias (Ferguson & Brannick, 2012; McLeod & Weisz, 2004). Specifically, dissertations are publicly available and indexed in data bases, but they may be less affected by publication bias because they are typically submitted to dissertation committees regardless of the significance of their results. Hence, contrasting effect sizes obtained from peer-reviewed journal articles with effect sizes obtained from dissertations is one way to test for potential publication bias. In the meta-analytic data set, however, no dissertation met the inclusion criteria. Therefore, we were not able to contrast effect sizes from dissertations with effect sizes from peer-reviewed journal articles.
2. The asterisk is used as truncation command to search for alternate endings. Given that truncation may yield fewer results, we did not use truncation in the updated search but included the expander "apply related words," as recommended by the EBSCO search engine. We preregistered to search in abstracts, titles, and subject headings, but given that this search would have yielded a large number of potentially eligible articles (above 20,000), we restricted our effective search to titles.

3. At the time of coding (i.e., March 2022 to December 2022), both coders had a Ph.D. in Psychology. The two coders rated the 1,710 potentially relevant articles identified through PsycINFO. The potentially relevant articles that were identified through the updated search and the additional strategies were coded by a third coder in January and May 2023. At the time of coding, the third coder had an M.Sc. in Psychology. To ensure interrater agreement with the third coder, 20 samples were rated by all three coders with regard to inclusion and exclusion. The interrater agreement was high (i.e., $\kappa = .95$).
4. In the subset of double-coded studies, there were two dichotomous variables (i.e., comparison group and matching) that showed lower agreement because one coder had systematically interchanged the two response options in specific situations. The codes for these variables were corrected accordingly. Without the correction, the average κ for categorical variables would have been .84.
5. We note that Morris (2008) suggested two other approaches for computing the mean difference between two groups. These approaches, however, use pooled standard deviations of either the pre-event assessments or both the pre-event and the post-event assessments. In this meta-analysis, however, it was crucial that the sampling variances of the event and comparison groups could be computed independently (given that some studies only included an event group), which is why we used non-pooled standard deviations.
6. We had preregistered to compute construct-specific estimates for each life event. We extended this approach by computing construct-specific estimates for gain-based and loss-based life events. Important advantages of the aggregation consist in the larger number of effect sizes in the analyses (and, consequently, larger statistical power) and the conceptual contribution of obtaining estimates for gain-based and loss-based life events.
7. As supplemental analyses, we had pre-registered to contrast whether presumably similar life events—separation and divorce—had similar (or different) effects on personality change, and whether the birth of the first child (i.e., the transition to parenthood) had different (or similar) effects compared to the birth of the second or a further child. However, the low number of effect sizes per life event did not allow to conduct specific contrasts between life events (e.g., separation vs. divorce) and within life events (i.e., first child vs. further child).
8. We had preregistered to test also the categorical moderator variables intervention and type of measure, but these variables did not differ between samples (i.e., no sample was an intervention study, and all samples included a self-report measure). In the moderator analyses using d_{EC}, we also tested for the categorical moderator type of matching (Tables S5 and S6). In these analyses, we contrasted samples that used no matching with samples that used strong matching, such as propensity score matching (no samples were included in the data set that used weak matching).

References

Allemand, M., & Flückiger, C. (2022). Personality change through digital-Coaching interventions. *Current Directions in Psychological Science*, *31*(1), 41–48. https://doi.org/10.1177/09637214211067782

Allemand, M., Hill, P. L., & Lehmann, R. (2015). Divorce and personality development across middle adulthood. *Personal Relationships*, 22(1), 122–137. https://doi.org/10.1111/pere.12067

Anusic, I., & Schimmack, U. (2016). Stability and change of personality traits, self-esteem, and well-being: Introducing the meta-analytic stability and change model of retest correlations. *Journal of Personality and Social Psychology*, 110(5), 766–781. https://doi.org/10.1037/pspp0000066

Appelbaum, M., Cooper, H., Kline, R. B., Mayo-Wilson, E., Nezu, A. M., & Rao, S. M. (2018). Journal article reporting standards for quantitative research in psychology: The APA Publications and Communications Board task force report. *American Psychologist*, 73(1), 3–25. https://doi.org/10.1037/amp0000191

Asselmann, E., & Specht, J. (2020). Taking the ups and downs at the rollercoaster of love: Associations between major life events in the domain of romantic relationships and the Big Five personality traits. *Developmental Psychology*, 56(9), 1803–1816. https://doi.org/10.1037/dev0001047

Baumeister, R. F., Bratslavsky, E., Finkenauer, C., & Vohs, K. D. (2001). Bad is stronger than good. *Review of General Psychology*, 5(4), 323–370. https://doi.org/10.1037/1089-2680.5.4.323

Be, D., Whisman, M. A., & Uebelacker, L. A. (2013). Prospective associations between marital adjustment and life satisfaction. *Personal Relationships*, 20(4), 728–739. https://doi.org/10.1111/pere.12011

Becker, B. J. (1988). Synthesizing standardized mean-change measures. *British Journal of Mathematical and Statistical Psychology*, 41(2), 257–278. https://doi.org/10.1111/j.2044-8317.1988.tb00901.x

Bleidorn, W. (2012). Hitting the road to adulthood: Short-term personality development during a major life transition. *Personality and Social Psychology Bulletin*, 38(12), 1594–1608. https://doi.org/10.1177/0146167212456707

Bleidorn, W., Buyukcan-Tetik, A., Schwaba, T., van Scheppingen, M. A., Denissen, J. J. A., & Finkenauer, C. (2016). Stability and change in self-Esteem during the transition to parenthood. *Social Psychological and Personality Science*, 7, 560–569. https://doi.org/10.1177/1948550616646428

Bleidorn, W., Hopwood, C. J., Back, M. D., Denissen, J. J., Hennecke, M., & Jokela, M. (2020). Longitudinal experience–Wide association studies—A framework for studying personality change. *European Journal of Personality*, 34(3), 285–300.

Bleidorn, W., Hopwood, C. J., & Lucas, R. E. (2018). Life events and personality trait change. *Journal of Personality*, 86(1), 83–96. https://doi.org/10.1111/jopy.12286

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(12), 2530–2540. https://doi.org/10.1177/0956797613498396

Bleidorn, W., & Schwaba, T. (2018). Retirement is associated with change in self-esteem. *Psychology and Aging*, 33(4), 586–594. https://doi.org/10.1037/pag0000253

Bleidorn, W., Schwaba, T., Denissen, J. J. A., & Hopwood, C. J. (2021). Charting self-esteem during marital dissolution. *Journal of Personality*, 89(1), 9–22. https://doi.org/10.1111/jopy.12525

Bleidorn, W., Schwaba, T., Zheng, A., Hopwood, C. J., Sosa, S. S., Roberts, B. W., & Briley, D. A. (2022). Personality stability and change: A meta-analysis of longitudinal studies. *Psychological Bulletin*, 148(7–8), 588–619. https://doi.org/10.1037/bul0000365

Borsboom, D. (2023). Psychological constructs as organizing principles. In L. A. van der Ark, W. H. M. Emons, & R. R. Meijer (Eds.), *Essays on contemporary psychometrics. Methodology of educational measurement and assessment.* https://doi.org/10.1007/978-3-031-10370-4_5

Boyce, C. J., Wood, A. M., Daly, M., & Sedikides, C. (2015). Personality change following unemployment. *The Journal of Applied Psychology*, 100(4), 991–1011. https://doi.org/10.1037/a0038647

Brazil, N., & Andersson, M. (2020). Mental well-being and changes in peer ability from high school to college. *Youth & Society*, 52(5), 687–709. https://doi.org/10.1177/0044118x18764526

Briley, D. A., & Tucker-Drob, E. M. (2014). Genetic and environmental continuity in personality development: A meta-analysis. *Psychological Bulletin*, 140(5), 1303–1331. https://doi.org/10.1037/a0037091

Bühler, J. L., Krauss, S., & Orth, U. (2021). Development of relationship satisfaction across the life span: A systematic review and meta-analysis. *Psychological Bulletin*, 147(10), 1012–1053. https://doi.org/10.1037/bul0000342

Bühler, J. L., Mund, M., Neyer, F. J., & Wrzus, C. (2022). A developmental perspective on personality-relationship transactions: Evidence from three nationally representative samples. *Journal of Personality*, 0, 1–20. https://doi.org/10.1111/jopy.12757

Carr, D. (2004). Gender, preloss marital dependence, and older adults' adjustment to widowhood. *Journal of Marriage and Family*, 66(1), 220–235. https://doi.org/10.1111/j.0022-2445.2004.00016.x

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

Chen, C., Chow, A. Y. M., & Tang, S. (2020). Trajectories of depression symptoms in Chinese elderly during widowhood: A secondary analysis. *Aging & Mental Health*, 24(8), 1254–1262. https://doi.org/10.1080/13607863.2019.1603285

Chen, E. Y.-J., Enright, R. D., & Tung, E. Y.-L. (2016). The influence of family unions and parenthood transitions on self-development. *Journal of Family Psychology*, 30(3), 341–352. https://doi.org/10.1037/fam0000154

Chopik, W. J. (2018). Does personality change following spousal bereavement? *Journal of Research in Personality*, 72, 10–21. https://doi.org/10.1016/j.jrp.2016.08.010

Cohen, J. (1977). *Statistical power analysis for the behavioral sciences*. Academic Press.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Lawrence Erlbaum Associates.

Costa, P. T. Jr., Herbst, J. H., McCrae, R. R., & Siegler, I. C. (2000). Personality at midlife: Stability, intrinsic maturation, and response to life events. *Assessment*, 7(4), 365–378. https://doi.org/10.1177/107319110000700405

Denissen, J. J. A., Luhmann, M., Chung, J. M., & Bleidorn, W. (2019). Transactions between life events and personality

traits across the adult lifespan. *Journal of Personality and Social Psychology*, *116*(4), 612–633. https://doi.org/10.1037/pspp0000196

Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. *Annual Review of Psychology*, *41*(1), 417–440. https://doi.org/10.1146/annurev.ps.41.020190.002221

Digman, J. M. (1996). The curious history of the five-factor model. In J. S. Wiggins (Ed.), *The five-factor model of personality: Theoretical perspectives* (pp. 1–20). Guilford Press.

Dingemans, E., & Henkens, K. (2014). Involuntary retirement, bridge employment, and satisfaction with life: A longitudinal investigation. *Journal of Organizational Behavior*, *35*(4), 575–591. https://doi.org/10.1002/job.1914

Dunlop, W. L., Hanley, G. E., McCoy, T. P., & Harake, N. (2017). Sticking to the (romantic) script: An examination of love life scripts, stories, and self-reports of normality. *Memory*, *25*(10), 1444–1454. https://doi.org/10.1080/09658211.2017.1316509

Egger, M., Davey Smith, G., Schneider, M., & Minder, C. (1997). Bias in meta-analysis detected by a simple, graphical test. *British Medical Journal*, *315*(7109), 629–634. https://doi.org/10.1136/bmj.315.7109.629

Eid, M., & Diener, E. (2004). Global judgments of subjective wellbeing: Situational variability and long-term stability. *Social Indicators Research*, *65*, 245–277.

Ferguson, C. J., & Brannick, M. T. (2012). Publication bias in psychological science: Prevalence, methods for identifying and controlling, and implications for the use of meta-analyses. *Psychological Methods*, *17*(1), 120–128. https://doi.org/10.1037/a0024445

Fleeson, W., & Noftle, E. (2008). The end of the person–Situation debate: An emerging synthesis in the answer to the consistency question. *Social and Personality Psychology Compass*, *2*(4), 1667–1684. https://doi.org/10.1111/j.1751-9004.2008.00122.x

Fraley, R. C., & Roberts, B. W. (2005). Patterns of continuity: A dynamic model for conceptualizing the stability of individual differences in psychological constructs across the life course. *Psychological Review*, *112*(1), 60–74. https://doi.org/10.1037/0033-295x.112.1.60

Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in Methods and Practices in Psychological Science*, *2*(2), 156–168. https://doi.org/10.1177/2515245919847202

Galdiolo, S., & Roskam, I. (2019). Personality traits and attachment orientations: Longitudinal associations around the event of childbirth. *Journal of Adult Development*, *26*(4), 275–285. https://doi.org/10.1007/s10804-018-9322-0

Gnambs, T., & Stiglbauer, B. (2019). No personality change following unemployment: A registered replication of Boyce, wood, daly, and sedikides (2015). *Journal of Research in Personality*, *81*, 195–206. https://doi.org/10.1016/j.jrp.2019.06.009

Haehner, P., Bleidorn, W., & Hopwood, C. J. (2023). Examining individual differences in personality trait changes after negative life events. *European Journal of Personality*, 08902070231156840.

Haehner, P., Kritzler, S., Fassbender, I., & Luhmann, M. (2022). Stability and change of perceived characteristics of major life events. *Journal of Personality and Social Psychology*, *122*(6), 1098–1116.

Haehner, P., Rakhshani, A., Fassbender, I., Lucas, R. E., Donnellan, M. B., & Luhmann, M. (2022). Perception of major life events and personality trait change. European Journal of Personality, 08902070221107973

Hansson, I., Henning, G., Buratti, S., Lindwall, M., Kivi, M., Johansson, B., & Berg, A. I. (2020). The role of personality in retirement adjustment: Longitudinal evidence for the effects on life satisfaction. *Journal of Personality*, *88*(4), 642–658. https://doi.org/10.1111/jopy.12516

Haslam, N., Bastian, B., Fox, C., & Whelan, J. (2007). Beliefs about personality change and continuity. *Personality and Individual Differences*, *42*(8), 1621–1631. https://doi.org/10.1016/j.paid.2006.11.001

Henning, G., Segel-Karpas, D., Stenling, A., & Huxhold, O. (2022). Subjective well-being across the retirement transition-Historical differences and the role of perceived control. *Psychology and Aging*, *37*(3), 388–400. https://doi.org/10.1037/pag0000662

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not WEIRD. *Nature*, *466*(7302), 29–29. https://doi.org/10.1038/466029a

Henry, S., & Mõttus, R. (2020). Traits and adaptations: A theoretical examination and new empirical evidence. *European Journal of Personality*, *34*(3), 265–284. https://doi.org/10.1002/per.2248

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

Hopwood, C. J., Bleidorn, W., & Wright, A. G. (2022). Connecting theory to methods in longitudinal research. *Perspectives on Psychological Science*, *17*(3), 884–894. https://doi.org/10.1177/17456916211008407

Hudson, N. W., Lucas, R. E., & Donnellan, M. B. (2019). The development of subjective well-being across the lifespan. In D. P. McAdams, R. L. Shiner, & J. L. Tackett (Eds.), *Handbook of personality development* (pp. 503–517). The Guilford Press.

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*(5), 767–783. https://doi.org/10.1037/pspp0000015

Jackson, J. J., Thoemmes, F., Jonkmann, K., Lüdtke, O., & Trautwein, U. (2012). Military training and personality trait development: Does the military make the man, or does the man make the military? *Psychological Science*, *23*(3), 270–277. https://doi.org/10.1177/0956797611423545

Johnson, B. T. (2021). Toward a more transparent, rigorous, and generative psychology. *Psychological Bulletin*, *147*(1), 1–15.

Jokela, M., Kivimäki, M., & Elovainio, M. (2009). Personality and having children: A two-way relationship. *Journal of Personality and Social Psychology*, *96*(1), 218–230. https://doi.org/10.1037/a0014058

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*(3), 231–243. https://doi.org/10.1002/per.1952

Kazak, A. E. (2018). Editorial: Journal article reporting standards. *American Psychologist*, *73*(1), 1–2. https://doi.org/10.1037/amp0000263

Keizer, R., Dykstra, P. A., & Poortman, A.-R. (2010). The transition to parenthood and well-being: The impact of partner status and work hour transitions. *Journal of Family Psychology*, *24*(4), 429–438. https://doi.org/10.1037/a0020414

Kenrick, D. T., & Funder, D. C. (1988). Profiting from controversy: Lessons from the person-situation debate. *American Psychologist*, *43*(1), 23–34. https://doi.org/10.1037/0003-066X.43.1.23

Krämer, M. D., & Rodgers, J. L. (2020). The impact of having children on domain-specific life satisfaction: A quasi-experimental longitudinal investigation using the socio-Economic panel (SOEP) data. *Journal of Personality and Social Psychology*, *119*(6), 1497–1514. https://doi.org/10.1037/pspp0000279

Kuster, F., & Orth, U. (2013). The long-term stability of self-esteem: Its time-dependent decay and nonzero asymptote. *Personality and Social Psychology Bulletin*, *39*(5), 677–690. https://doi.org/10.1177/0146167213480189

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*(2), 639–670. https://doi.org/10.1111/j.1467-6494.2010.00629.x

Leikas, S., & Salmela-Aro, K. (2015). Personality trait changes among young Finns: The role of life events and transitions. *Journal of Personality*, *83*(1), 117–126. https://doi.org/10.1111/jopy.12088

Light, R. J., & Pillemer, D. B. (1984). *Summing up: The science of reviewing research*. Harvard University Press.

Lindfors, P., Hultell, D., Rudman, A., & Gustavsson, J. P. (2014). Change and stability in subjective well-being over the transition from higher education to employment. *Personality and Individual Differences*, *70*, 188–193. https://doi.org/10.1016/j.paid.2014.06.043

Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Sage.

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*(3), 722–728. https://doi.org/10.1037/a0015121

Lucas, R. E. (2005). Time does not heal all wounds: A longitudinal study of reaction and adaptation to divorce. *Psychological Science*, *16*(12), 945–950.

Lucas, R. E. (2007). Adaptation and the set-point model of subjective well-being: Does happiness change after major life events? *Current Directions in Psychological Science*, *16*(2), 75–79. https://doi.org/10.1111/j.1467-8721.2007.00479.x

Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2003). Reexamining adaptation and the set point model of happiness: Reactions to changes in marital status. *Journal of Personality and Social Psychology*, *84*(3), 527–539. https://doi.org/10.1037/0022-3514.84.3.527

Lucas, R. E., Clark, A. E., Georgellis, Y., & Diener, E. (2004). Unemployment alters the set point for life satisfaction. *Psychological Science*, *15*(1), 8–13. https://doi.org/10.1111/j.0963-7214.2004.01501002.x

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*(4), 847–861. https://doi.org/10.1037/a0024298

Luciano, E. C., & Orth, U. (2017). Transitions in romantic relationships and development of self-esteem. *Journal of Personality and Social Psychology*, *112*(2), 307–328. https://doi.org/10.1037/pspp0000109

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 [Peer Reviewed]. *Journal of Personality and Social Psychology*, *101*(3), 620–637. https://doi.org/10.1037/a0023743

Lüdtke, O., Trautwein, U., & Husemann, N. (2009). Goal and personality trait development in a transitional period: Assessing change and stability in personality development. *Personality & Social Psychology Bulletin*, *35*(4), 428–441. https://doi.org/10.1177/0146167208329215

Luhmann, M., Buecker, S., Kaiser, T., & Beermann, M. (2020a). Nothing going on? Exploring the role of missed events in changes in subjective well-being and the big five personality traits. Advance online publication.

Luhmann, M., Fassbender, I., Alcock, M., & Haehner, P. (2020b). A dimensional taxonomy of perceived characteristics of major life events. *Journal of Personality and Social Psychology*, *121*(3), 633–668. https://doi.org/10.1037/pspp0000291

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*(3), 592–615. https://doi.org/10.1037/a0025948

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*(3), 256–266. https://doi.org/10.1002/per.1951

Malinauskas, R., & Dumciene, A. (2017). Psychological well-being and self-esteem in students across the transition between secondary school and university: A longitudinal study. *Psihologija*, *50*(1), 21–36. https://doi.org/10.2298/psi160506003m

McAdams, D. P., & Pals, J. L. (2006). A new Big Five: Fundamental principles for an integrative science of personality. *American Psychologist*, *61*(3), 204–217. https://doi.org/10.1037/0003-066x.61.3.204

McCrae, R. R., & Costa, P. T. Jr (2008). The five-factor theory of personality. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 159–181). The Guilford Press.

McKee-Ryan, F., Song, Z., Wanberg, C. R., & Kinicki, A. J. (2005). Psychological and physical well-being during unemployment: A meta-analytic study. *Journal of Applied Psychology*, *90*(1), 53–76. https://doi.org/10.1037/0021-9010.90.1.53

McLeod, B. D., & Weisz, J. R. (2004). Using dissertations to examine potential bias in child and adolescent clinical trials. *Journal of Consulting and Clinical Psychology*, *72*(2), 235–251. https://doi.org/10.1037/0022-006x.72.2.235

Mehta, C. M., Arnett, J. J., Palmer, C. G., & Nelson, L. J. (2020). Established adulthood: A new conception of ages 30 to 45. *American Psychologist*, *75*(4), 431–444. https://doi.org/10.1037/amp0000600

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *Annals of Internal*

Medicine, *151*(4), 264–269. https://doi.org/10.7326/0003-4819-151-4-200908180-00135

Morris, S. B. (2008). Estimating effect sizes from pretest-posttest-control group designs. *Organizational Research Methods*, *11*(2), 364–386. https://doi.org/10.1177/1094428106291059

Mõttus, R. (2016). Towards more rigorous personality trait–outcome research. *European Journal of Personality*, *30*(4), 292–303. https://doi.org/10.1002/per.204

Nakagawa, T., & Hülür, G. (2021). Life satisfaction during the transition to widowhood among Japanese older adults. *Gerontology*, *67*(3), 338–349. https://doi.org/10.1159/000512859

Neyer, F. J., & Asendorpf, J. B. (2001). Personality-Relationship transaction in young adulthood. *Journal of Personality and Social Psychology*, *81*(6), 1190–1204. https://doi.org/10.1037/0022-3514.81.6.1190

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*(3), 535–568.

Neyer, F. J., Mund, M., Zimmermann, J., & Wrzus, C. (2014). Personality-relationship transactions revisited. *Journal of Personality*, *82*(6), 539–550. https://doi.org/10.1111/jopy.12063

Orth, U., Erol, R. Y., & Luciano, E. C. (2018). Development of self-esteem from age 4 to 94 years: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *144*(10), 1045–1080. https://doi.org/10.1037/bul0000161

Orth, U., & Luciano, E. C. (2015). Self-esteem, narcissism, and stressful life events: Testing for selection and socialization. *Journal of Personality and Social Psychology*, *109*(4), 707–721. https://doi.org/10.1037/pspp0000049

Preetz, R. (2022). Dissolution of non-Cohabiting relationships and changes in life satisfaction and mental health. *Frontiers in Psychology*, *13*, 812831. https://doi.org/10.3389/fpsyg.2022.812831

Pusch, S., Mund, M., Hagemeyer, B., & Finn, C. (2019). Personality development in emerging and young adulthood: A study of age differences. *European Journal of Personality*, *33*, 245–263. https://doi.org/10.1002/per.2181

R Development Core Team (2022). *R: A language and environment for statistical computing. R Foundation for statistical computing*. Austria. https://www.R-project.org

Read, S. J., Smith, B. J., Droutman, V., & Miller, L. C. (2017). Virtual personalities: Using computational modeling to understand within-person variability. *Journal of Research in Personality*, *69*, 237–249. https://doi.org/10.1016/j.jrp.2016.10.005

Reitz, A. K. (2022). Self-esteem development and life events: A review and integrative process framework. *Social and Personality Psychology Compass*, *16*(11), Article e12709. https://doi.org/10.1111/spc3.12709

Reitz, A. K., Luhmann, M., Bleidorn, W., & Denissen, J. (2022). Unraveling the complex relationship between work transitions and self-esteem and life satisfaction. *Journal of Personality and Social Psychology*, *123*(3), 597–620. https://doi.org/10.1037/pspp0000423

Reitz, A. K., Shrout, P. E., Denissen, J. J. A., Dufner, M., & Bolger, N. (2020). Self-esteem change during the transition from university to work. *Journal of Personality*, *88*(4), 689–702. https://doi.org/10.1111/jopy.12519

Reitzes, D. C., Mutran, E. J., & Fernandez, M. E. (1996). Does retirement hurt well-being? Factors influencing self-esteem and depression among retirees and workers. *The Gerontologist*, *36*(5), 649–656. https://doi.org/10.1093/geront/36.5.649

Roberts, B. W. (2018). A revised sociogenomic model of personality traits. *Journal of Personality*, *86*(1), 23–35. https://doi.org/10.1111/jopy.12323

Roberts, B. W., & Bogg, T. (2004). A longitudinal study of the relationships between conscientiousness and the social-environmental factors and substance-use behaviors that influence health. *Journal of Personality*, *72*(2), 325–354. https://doi.org/10.1111/j.0022-3506.2004.00264.x

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*(■■■), 3–25. https://doi.org/10.1037/0033-2909.126.1.3

Roberts, B. W., & Jackson, J. J. (2008). Sociogenomic personality psychology. *Journal of Personality*, *76*(6), 1523–1544. https://doi.org/10.1111/j.1467-6494.2008.00530.x

Roberts, B. W., & Mroczek, D. (2008). Personality trait change in adulthood. *Current Directions in Psychological Science*, *17*(1), 31–35. https://doi.org/10.1111/j.1467-8721.2008.00543.x

Roberts, B. W., Walton, K. E., & Viechtbauer, W. (2006). Patterns of mean-level change in personality traits across the life course: A meta-analysis of longitudinal studies. *Psychological Bulletin*, *132*(1), 1–25. https://doi.org/10.1037/0033-2909.132.1.1

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, *70*, 41–55. http://dx.doi.org/10.1093/biomet/70.1.41

Rothstein, H. R., Sutton, A. J., & Borenstein, M. (2005). *Publication bias in meta-analysis: Prevention, assessment and adjustments*. John Wiley & Sons. https://doi.org/10.1002/0470870168.ch1

Salmela-Aro, K., & Tynkkynen, L. (2010). Trajectories of life satisfaction across the transition to post-compulsory education: Do adolescents follow different pathways? *Journal of Youth and Adolescence*, *39*(8), 870–881. https://doi.org/10.1007/s10964-009-9464-2

Scheling, L., & Richter, D. (2021). Generation Y: Do millennials need a partner to be happy? *Journal of Adolescence*, *90*(C), 23–31. https://doi.org/10.1016/j.adolescence.2021.05.006

Schwaba, T., & Bleidorn, W. (2018). Individual differences in personality change across the adult life span. *Journal of Personality*, *86*(3), 450–464. https://doi.org/10.1111/jopy.12327

Schwaba, T., & Bleidorn, W. (2019). Personality trait development across the transition to retirement. *Journal of Personality and Social Psychology*, *116*(4), 651–665. https://doi.org/10.1037/pspp0000179

Schwaba, T., Bleidorn, W., Hopwood, C. J., Gebauer, J. E., Rentfrow, P. J., Potter, J., & Gosling, S. D. (2021). The impact of childhood lead exposure on adult personality: Evidence from the United States, Europe, and a large-scale natural experiment. *Proceedings of the National Academy of Sciences*, *118*(29), Article e2020104118.

Schwaba, T., Denissen, J. A. A., Luhmann, M., Hopwood, C. J., & Bleidorn, W. (under review). Subjective experiences of life events match individual differences in personality development.

Specht, J. (2017). Personality development in reaction to major life events. In J. Specht (Ed.), *Personality development across the*

lifespan (pp. 341–356). Elsevier. https://doi.org/10.1016/B978-0-12-804674-6.00021-1

Specht, J., Egloff, B., & Schmukle, S. C. (2011a). The benefits of believing in chance or fate: External locus of control as a protective factor for coping with the death of a spouse. *Social Psychological and Personality Science*, 2(2), 132–137. https://doi.org/10.1177/1948550610384635

Specht, J., Egloff, B., & Schmukle, S. C. (2011b). 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(4), 862–882. https://doi.org/10.1037/a0024950

Spikic, S., Mortelmans, D., & Pasteels, I. (2021). Does divorce change your personality? Examining the effect of divorce occurrence on the big five personality traits using panel surveys from three countries. *Personality and Individual Differences*, 171, 110428. https://doi.org/10.1016/j.paid.2020.110428

Sterne, J. A., & Egger, M. (2001). Funnel plots for detecting bias in meta-analysis: Guidelines on choice of axis. *Journal of Clinical Epidemiology*, 54(10), 1046–1055. https://doi.org/10.1016/s0895-4356(01)00377-8

Stringer, K., Kerpelman, J., & Skorikov, V. (2012). A longitudinal examination of career preparation and adjustment during the transition from high school. *Developmental Psychology*, 48(5), 1343–1354. https://doi.org/10.1037/a0027296

Sutton, A. J. (2009). Publication bias. In H. Cooper, L. V. Hedges, & J. C. Valentine (Eds.), *The handbook of research synthesis and meta-analysis* (pp. 435–452). Russell Sage Foundation.

Uglanova, E. A., & Staudinger, U. M. (2013). Zooming in on life events: Is hedonic adaptation sensitive to the temporal distance from the event? *Social Indicators Research*, 111(1), 265–286. https://doi.org/10.1007/s11205-012-0004-1

van Scheppingen, M. A., Denissen, J. J. A., Chung, J. M., Tambs, K., & Bleidorn, W. (2018). Self-esteem and relationship satisfaction during the transition to motherhood. *Journal of Personality and Social Psychology*, 114(6), 973–991. https://doi.org/10.1037/pspp0000156

van Scheppingen, M. A., Jackson, J. J., Specht, J., Hutteman, R., Denissen, J. J. A., & Bleidorn, W. (2016). Personality trait development during the transition to parenthood. *Social Psychological and Personality Science*, 7(5), 452–462. https://doi.org/10.1177/1948550616630032

van Scheppingen, M. A., & Leopold, T. (2020). Trajectories of life satisfaction before, upon, and after divorce: Evidence from a new matching approach. *Journal of Personality and Social Psychology*, 119(6), 1444–1458. https://doi.org/10.1037/pspp0000270

van der Velde, M. E. G., Feij, J. A., & Taris, T. W. (1995). Stability and change of person characteristics among young adults: The effect of the transition from school to work. *Personality and Individual Differences*, 18(1), 89–99. https://doi.org/10.1016/0191-8869(94)00111-5

Viechtbauer, W. (2010). Conducting meta-analyses in R with the metafor package. *Journal of Statistical Software*, 36(3), 1–48. https://doi.org/10.18637/jss.v036.i03

Wagner, J., Becker, M., Ludtke, 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(4), 455–463. https://doi.org/10.1177/1948550614566092

Wagner, J., Ludtke, O., Jonkmann, K., & Trautwein, U. (2013). Cherish yourself: Longitudinal patterns and conditions of self-esteem change in the transition to young adulthood. *Journal of Personality and Social Psychology*, 104(1), 148–163. https://doi.org/10.1037/a0029680

Wagner, J., Orth, U., Bleidorn, W., Hopwood, C. J., & Kandler, C. (2020). Toward an integrative model of sources of personality stability and change. *Current Directions in Psychological Science*, 29(5), 438–444.

Wille, B., Beyers, W., & Fruyt, F. (2012). A transactional approach to person-environment fit: Reciprocal relations between personality development and career role growth across young to middle adulthood. *Journal of Vocational Behavior*, 81(3), 307–321. https://doi.org/10.1016/j.jvb.2012.06.004

Williams, K. E., Ciarrochi, J., & Heaven, P. C. L. (2015). Relationships between valued action and well-being across the transition from high school to early adulthood. *The Journal of Positive Psychology*, 10(2), 127–140. https://doi.org/10.1080/17439760.2014.920404

Wrzus, C., & Roberts, B. W. (2017). Processes of personality development in adulthood: The TESSERA framework. *Personality and Social Psychology Review*, 21(4), 253–277. https://doi.org/10.1177/1088868316652279

Yeung, D. Y. (2018). Adjustment to retirement: Effects of resource change on physical and psychological well-being. *European Journal of Ageing*, 15(3), 301–309. https://doi.org/10.1007/s10433-017-0440-5

Yu, S., Levesque-Bristol, C., & Maeda, Y. (2018). General need for autonomy and subjective well-being: A meta-analysis of studies in the US and East asia. *Journal of Happiness Studies*, 19(6), 1863–1882. https://doi.org/10.1007/s10902-017-9898-2

Zhan, Y., Froidevaux, A., Li, Y., Wang, M., & Shi, J. (2023). Preretirement resources and postretirement life satisfaction change trajectory: Examining the mediating role of retiree experience during retirement transition phase. *The Journal of Applied Psychology*, 108(5), 871–888. https://doi.org/10.1037/apl0001043

Orth, U., Trzesniewski, K. H., & Robins, R. W. (2010). Self-esteem development from young adulthood to old age: A cohort-sequential longitudinal study. *Journal of Personality and Social Psychology*, 98(4), 645–658