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Life events and personality trait change: A coordinated data analysis

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Abstract

Life events have been theorized to elicit personality trait changes. However, the empirical evidence for event-related personality development remains inconclusive. Even comprehensive reviews and meta-analyses are limited by the availability of effect sizes, the control for relevant confounders, and the way time is treated in the analyses. To overcome these limitations, we conducted a coordinated data analysis and examined event-related personality changes across seven large-scale panel studies (N_{total} = 196,256). Furthermore, we investigated corresponding event-related changes in life satisfaction and self-esteem as benchmarks for the interpretation of effect sizes. Integrating the results across panel studies, we found several consistent changes in the Big Five personality traits in response to life events. For example, new employment predicted increases in conscientiousness and emotional stability, whereas marriage predicted a decrease in openness. However, event-related changes in the Big Five personality traits were small (average b_{std} = 0.05), with effect sizes similar to those of event-related changes in self-esteem but smaller than corresponding changes in life satisfaction. Building on these findings, future research should focus on the life events with replicable effects on personality development and examine how these life events lead to personality changes.

Plain Language Summary

Personality traits such as extraversion and conscientiousness change throughout the lifespan. Theories on personality development suggest that life events like retirement, divorce, or graduation may drive these personality changes. However, existing research on this topic has been inconclusive. In the present study, we combined the data of seven panel studies to advance our understanding of whether and how life events change personality traits. In these panel studies, personality traits, life satisfaction, and self-esteem were assessed every few years in large, representative samples (more than 195,000 individuals in total). Across these panel studies, we found several consistent effects of life events predicting personality changes. For example, starting a new job predicted increases in people's conscientiousness and emotional stability, whereas marriage predicted a decrease in openness. However, event-related changes in the Big Five personality traits were less pronounced than corresponding changes in life satisfaction. The present study is an important step toward a better understanding of the sources of personality development.

Keywords

personality change, life events, Big Five, self-esteem, life satisfaction

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Introduction

Personality traits predict a broad range of important life outcomes including health, well-being, relationship quality, work-related success, and educational attainment (Beck & Jackson, 2022; Hoff et al., 2021; Jokela et al., 2013; Roberts et al., 2007; Soto, 2019). Understanding whether, when, and why personality traits change is thus of critical practical relevance (Bleidorn, 2024; Bleidorn et al., 2019). Life events such as childbirth or divorce have been theorized to be important triggers of personality trait changes (Denissen et al., 2019; Roberts & Nickel, 2017; Specht et al., 2014; Wrzus & Roberts, 2017). However, existing evidence for event-related personality changes is inconclusive and knowledge accumulation has been complicated by differences in research approaches across studies (Asselmann & Specht, 2020b, 2021; Bleidorn et al., 2020; Denissen et al., 2019; Lüdtke et al., 2011; Van Scheppingen et al., 2016). Even methods that seek to aggregate and provide a broad indicator of existing evidence, such as comprehensive reviews and meta-analyses, are limited by the availability of effect sizes and varying methodological approaches of primary research that are difficult to integrate

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(Bleidorn & Denissen, 2021; Bleidorn et al., 2018; Bühler et al., 2024; Hopwood et al., 2024).

The present study aims to advance our understanding of event-related personality changes by using a coordinated data analysis (CDA) approach that takes advantage of existing high-quality datasets on personality development (Graham et al., 2022). Examining seven large-scale panel studies with the same statistical method and integrating findings using meta-analytic tools, we extended existing research on event-related personality trait changes. Furthermore, similar to recent meta-analytic work on this topic (Bühler et al., 2024), we compared findings on changes in the Big Five to event-related changes in self-esteem and life satisfaction to obtain benchmarks for effect size comparisons.

Personality traits, personality change, and life events

Personality traits describe relatively stable patterns of thoughts, feelings, and behaviors that distinguish individuals from each other (Allport, 1961). Most research has focused on the Big Five personality traits—agreeableness, conscientiousness, emotional stability, extraversion, and openness—that provide a useful balance between conceptual breadth and accuracy (Bleidorn, 2024). Although personality traits are typically conceptualized as relatively stable constructs (Anusic & Schimmack, 2016; Haehner, Sleep, et al., 2024; Wright et al., 2025), they remain malleable across the lifespan, with changes being driven by biological maturation and environmental influences (Bleidorn et al., 2022; Haehner, Hopwood, et al., 2024; Seifert et al., 2024). Understanding when and why personality traits change is theoretically and practically relevant, as personality traits and personality trait changes have been found to predict various important life outcomes. Wright and Jackson (2023) found, for example, that higher levels of neuroticism and increases in neuroticism over time predicted a worse health status several years later.

Life events—infrequent, clearly timed status transitions that disrupt people's lives—are considered to be important drivers of such personality trait changes (Bleidorn et al., 2018; Luhmann et al., 2021; Specht et al., 2014). In research, life events, such as job loss, childbirth, and separation, are often grouped into broader domains that are assumed to have similar effects on personality development. Two prominent distinctions are those between love- and work-related events and gain- and loss-related events. For instance, divorce would be an example for loss-related love events because a person loses the social role as spouse.

Theoretical accounts of personality trait development converge on the idea that life events can drive trait changes in adulthood (Specht et al., 2014). For example, the Social Investment Principle of the Neo-Socioanalytic Theory (Lodi-Smith & Roberts, 2007; Roberts & Nickel, 2017) posits that changes and investments in social roles are critical for personality development. As life events entail such social role changes (e.g., becoming an employee and becoming a parent), they can serve as triggers for personality changes. Furthermore, the Event-Dependent Set-Point Model (Ormel et al., 2017) predicts that personality trait levels fluctuate around a genetically determined set-point, but that strong environment influences such as life events can permanently alter this set-point and thus foster lasting personality changes. Finally, the TESSERA model (Wrzus & Roberts, 2017) posits that life events can lead to personality changes if they lead to long-lasting changes in everyday sequences of personality state expression. For example, a new employment may drive an increase in a person's conscientiousness if it repeatedly leads to increased expressions of conscientious behavior such as being punctual and working efficiently in everyday life.

Existing evidence for event-related personality changes

Although there are theoretical reasons to expect that life events can cause personality trait changes, existing empirical evidence is less clear (Bleidorn et al., 2018). One reason for the mixed body of evidence might be the methodological requirements that are needed to examine event-related personality changes with the necessary rigor (Bleidorn et al., 2020; Luhmann et al., 2014). First, because most life events occur infrequently, large samples are needed to examine event-related personality development with sufficient statistical power. Second, as people can change in anticipation of an event before it occurs, prospective longitudinal studies are needed with assessments before and after the occurrence of a life event. Third, ideally, there should be more than just two personality assessments to uncover non-linear personality trait changes. Fourth, as people cannot randomly be exposed to life events, statistical procedures are required that allow researchers to control for relevant confounders to come closer to causal estimates of life event effects under reasonable assumptions.

Some existing studies fulfilled these requirements by drawing on large-scale panel datasets such as the *Health and Retirement Study* or the *Longitudinal Internet studies for the Social Sciences* (e.g., Asselmann & Specht, 2020b, 2021; Denissen et al., 2019; Specht et al., 2011). However, even evidence from these high-quality studies has been inconclusive. For example, Asselmann and Specht (2020) found that people decreased in their extraversion but increased in their emotional stability after widowhood, whereas Denissen et al. (2019) found no such effects. These diverging results may be explained by differences in statistical methods, samples, identification of life events, or creation of control groups. More generally, the mixed evidence suggests that research syntheses are needed that integrate findings across studies (Bleidorn et al., 2018).

A recent meta-analysis by Bühler et al. (2024) filled this gap by integrating evidence from 44 longitudinal studies on event-related personality changes. Across studies, some life events were associated with small changes in personality traits from pre-event to post-event assessments. For example, entering a new relationship and divorce predicted slight increases in conscientiousness ($d = 0.15$ and $d = 0.10$, respectively), whereas marriage was associated with a decrease in openness ($d = -0.18$).

However, this meta-analysis still has several limitations that constrain the conclusions that can be drawn regarding event-related personality development. First, even though the authors conducted a systematic literature search, the

number of effect sizes and participants were relatively low for some life events (e.g., divorce: $k = 3$ with 962 individuals). Second, based on the availability of effect sizes, the meta-analysis by Bühler et al. (2024) was restricted to integrate findings of relatively simple pre-post-event changes in personality traits. Consequently, potential non-linear change patterns and the temporal unfolding of event-related changes before and after events could not be examined (Luhmann et al., 2014). Third, only few studies accounted for relevant confounders, for example, by including a control group. In addition, procedures to form these control groups differed across studies, complicating conclusions about the distinction between event-related versus normative personality development.

In summary, understanding whether and why people change in response to life events is important for theoretical and practical reasons. Although questions about event-related personality development have been addressed in several longitudinal studies and reviews, limitations of the existing research preclude definitive conclusions on event-related personality trait changes. As a result, scholars differ in their interpretation of existing findings, while agreeing on the necessity of future research (Hopwood et al., 2024).

The present study

With the present study, we aimed to advance the understanding of event-related personality development by using a CDA approach. CDA describes a strategy to examine existing datasets with the same analytical methods and integrate findings using meta-analytic tools (Graham et al., 2022). Specifically, we investigated event-related personality development in seven longitudinal panel studies, examined non-linear changes, used statistical procedures that account for relevant confounders, and meta-analytically integrated findings. In addition to examining event-related changes in the Big Five personality traits, we also investigated event-related changes in self-esteem and life satisfaction with the same approach. Similar to the Big Five traits, self-esteem and life satisfaction are theorized to change in response to life events (Luhmann & Intelisano, 2018; Reitz, 2022). As self-esteem and life satisfaction are, however, assumed to be less stable than the Big Five personality traits (Anusic & Schimmack, 2016; Denissen et al., 2019; Haehner et al., 2022), we included them in our CDA to serve as benchmarks for the comparison of effect sizes.

This approach of examining personality traits, life satisfaction, and self-esteem was similar to the meta-analysis by Bühler et al. (2024), with some overlap in the considered datasets (see Section 1 of the Supplemental Materials). However, we relied on two to 10-times larger sample sizes per event and thus provide a more comprehensive examination and integration of event-related personality development. Based on the meta-analytic findings by Bühler et al. (2024), we derived hypotheses about event-related personality changes for specific life events and traits, summarized in Table 1. We also explored event-related personality changes for some trait-event combinations without specific hypotheses. Furthermore, as a general result pattern, we expected that event-related changes in self-esteem and life satisfaction would be more pronounced than event-related changes in the Big Five personality traits. Overall, our CDA approach aimed to provide a macro-level perspective on event-related personality changes complementing existing research on event-related changes for specific trait-event combinations.

Methods

Transparency and openness

The coordinated data analysis was preregistered on November 12, 2024, at https://osf.io/f4cbd. At the time of the preregistration, we had explored the suitability of our proposed statistical method in one dataset to ensure there were no estimation problems. There were some minor deviations from the preregistration which are described in detail in the Supplemental Materials. Analysis scripts, a codebook, and Supplemental Materials can be retrieved from OSF (https://osf.io/v8csw/). Data included in the coordinated data analysis could not be uploaded to OSF due to legal constraints, but researchers can get access to these datasets after signing user contracts with the respective panel providers (see below for details). This study was exempt from ethical review at University of Zurich because it relied exclusively on anonymized, secondary data. We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study.

Participants and procedures

We included studies in our coordinated data analysis that (a) used random sampling methods, (b) assessed personality traits at least three times with the same measure to examine more than just pre-post personality changes, and (c) had a sample size of $N > 5{,}000$ to ensure a sufficient number of event occurrences. Seven large-scale panel studies fulfilled these inclusion criteria. Section 1 of the Supplemental Materials provides an overview of the overlap of our CDA with the meta-analysis by Bühler et al. (2024) and lists further datasets that were considered but did not fulfill the inclusion criteria. Sample characteristics across the seven included panel studies are summarized in Table 2.

Household, Income and Labour Dynamics in Australia (HILDA). HILDA is an ongoing longitudinal panel study conducted in Australia (Watson & Wooden, 2012). The target population of HILDA are individuals living in Australian households. Data collection began in 2001, with assessments every year. Data access can be requested here and prior publications relying on this dataset can be found here. We used Release 22 for our analyses.

Health and Retirement Study (HRS). HRS is an ongoing longitudinal panel study conducted in the United States (Juster & Suzman, 1995). The target population of HRS are US inhabitants over age 50. Data collection began in 1992, with assessments every 2 years. Data access can be requested here and prior publications relying on this dataset

Table 1. Hypotheses on Event-Related Personality Development.

Life event	Agreeableness	Conscientiousness	Emotional stability	Extraversion	Openness	Self-esteem	Life satisfaction
Single events							
New relationship		+ (H1)					+ (H2)
Marriage					– (H3)		+ (H4)
Childbirth				– (H5)			
Separation							[a]
Divorce		+ (H6)					– (H7)
Widowhood							
Graduation			+ (H8)			+ (H9)	+ (H10)
New employment		+ (H11)				+ (H12)	+ (H13)
Unemployment		– (H14)	+ (H15)				
Retirement							
Event domains							
Gain-related love	– (H16)			– (H17)	– (H18)		
Loss-related love					– (H19)		+ (H20)
Gain-related work		+ (H21)	+ (H22)			+ (H23)	+ (H24)
Loss-related work			+ (H25)				

Note. These hypotheses (H1–H25) were based on the meta-analytic evidence provided by Bühler et al. (2024). A "+" indicates that we expected an increase in the respective trait from pre-event to post-event assessments, whereas a "–" indicates that we expected a decrease in the respective trait from pre-event to post-event assessments. An empty cell indicates that we had no hypothesis for an effect but that we examined corresponding event-related personality changes exploratorily. It should be noted that the panel studies included in the CDA partly overlapped with the dataset included in the meta-analysis by Bühler et al. (2024). Across events, approximately 12% of participants overlapped (see Section 1 of the Supplemental Materials for details).
[a]Bühler et al. (2024) reported an increase in life satisfaction after separation. However, this estimate was based on data from only 48 individuals so that we did not include this effect.

Table 2. Sample Characteristics Across Panel Studies.

Panel	*N*	Mean age (*SD*)	% female	% higher education
HILDA	34,501	36.05 (18.20)	51.49	42.51
HRS	23,846	66.46 (11.68)	58.35	47.64
LISS	16,482	44.70 (18.10)	54.05	44.50
MIDUS	6,452	47.06 (12.97)	52.46	39.34
NLSY	8,670	19.08 (4.57)	48.87	24.47
PAIRFAM	12,398	25.86 (8.34)	51.39	28.16
SOEP	93,907	39.18 (17.36)	51.30	28.12
Total	196,256	40.94 (19.50)	52.36	34.87

Note. N = number of individuals included in at least one analysis. Age = age at the first included assessment. Higher education = having any form of university degree.

can be found here. We used the HRS 2020 Core data and RAND Longitudinal Final 2020 for our analyses.

Longitudinal Internet Panel for the Social Sciences (LISS). LISS is an ongoing longitudinal panel study conducted in the Netherlands (Scherpenzeel, 2010). The target population of a LISS are individuals living in Dutch households. Data collection began in 2007, with assessments every year. Data access can be requested here and prior publications relying on this dataset can be found here. We used data collected until September 2023 for our analyses.

Midlife in the United States (MIDUS). MIDUS is an ongoing longitudinal panel study conducted in the United States (Radler, 2014). The target population of MIDUS are US inhabitants aged between 25 and 75 in the United States. Data collection began in 1995, with assessments every 8–9 years. Data access can be requested here and prior publications relying on this dataset can be found here. We used data from MIDUS 1 Core, MIDUS 2 Core, and MIDUS 3 Core for our analyses (Brim et al., 1999; Ryff et al., 2007, 2015).

National Longitudinal Survey of Youth (NLSY). NLSY is an ongoing longitudinal study conducted in the United States (Bureau Labor of Statistics et al., 2023). For the CDA, we used the child and young adult cohorts of this longitudinal study (NLSY79-CYA), which targets the biological children of the women of the NLSY79 cohort. Data collection began in 1986, with assessments every 2 years. Data access can be requested here and prior publications relying on this dataset can be found here. We used data released in April 2023 for our analyses.

Panel Analysis of Intimate Relationships and Family Dynamics (PAIRFAM). PAIRFAM is a longitudinal panel study conducted in Germany (Huinink et al., 2011). The target population of PAIRFAM are individuals from three birth cohorts living in Germany (1971–1973, 1981–1983, 1991–1993). Data collection began in 2008, with assessments every year. Data access can be requested here and prior publications relying on this dataset

Table 3. Identification of Event Occurrences and Control Groups Across Panel Studies.

Event	Definition	Control group	HILDA	HRS	LISS	MIDUS	NLSY	PAIRFAM	SOEP
New relationship	Starting a new romantic relationship, not necessarily the first one	*No specific criterion*	X	X	X	X	X	X	X
Marriage	Getting married; should be evident in a change in the marital status	*No specific criterion*	X	X	X	X	X	X	X
Childbirth	Having a child (self or romantic partner); adoption also included	*No specific criterion*	X	X	X	X	X	X	X
Separation	Ending a romantic relationship; depending on the panel, marital and/or non-marital separations were considered	Being in a romantic relationship or marriage at the time of the first personality assessment or thereafter[a]	X	X	X		X	X	X
Divorce	Getting legally divorced; should be evidence in a change in the marital status	Being married at the time of the first personality assessment or thereafter	X	X	X	X	X	X	X
Widowhood	Spouse of person dies; for some panels, more broadly defined as death of romantic partner	Being in a romantic relationship or marriage at the time of the first personality assessment or thereafter[a]	X	X	X	X			X
Graduation	Graduating from secondary or tertiary education (e.g., university, high school, vocational training)	*No specific criterion*	X		X		X	X	X
New employment	Starting a new employment; can be the first job, a job change, or a new job after unemployment	*No specific criterion*	X	X	X			X	X
Unemployment	Becoming unemployed; can result from a job loss or other employment changes	Being still in the workforce (e.g., employed or in education) at the time of the first personality assessment or thereafter	X	X	X		X	X	X
Retirement	Starting retirement; includes early retirement	Being still in workforce (e.g., employed, in education, or unemployed) at the time of the first personality assessment or thereafter	X	X	X	X			X

Note. This table describes how we identified event occurrences and formed control groups across panel studies. An "X" indicates that a life event was identified in a certain panel. We only considered life events with a sample size of $N > 150$ to ensure model convergence.
[a]For separation and widowhood, the creation of the control group depended on how these events were identified in the different panels. For example, in the PAIRFAM panel, we included also death of romantic partners after non-marital romantic relationships in the event widowhood. In this case, we used individuals in a relationship (instead of married individuals) at the time of the first personality assessment or thereafter as control group.

can be found here. We used Release 14.0 for our analyses (Brüderl et al., 2023).

Socio-Economic Panel (SOEP). SOEP is an ongoing longitudinal panel study conducted in Germany (Goebel et al., 2023). The target population of SOEP are individuals living in German households. Data collection began in 1984, with assessments every year. We included all subsamples except of the refugee samples, which differed in their data collection procedures. Data access can be requested here and prior publications relying on this dataset can be found here. We used Version 38.1 for our analyses.

Measures

Life events. In line with the recent meta-analysis on event-related personality changes by Bühler et al. (2024), we identified the occurrence of 10 life events: *new romantic relationship*, *marriage*, *childbirth*, *separation*, *divorce*, *widowhood*, *graduation*, *new employment*, *unemployment*, and *retirement.* Table 3 summarizes which life event could be identified in which panel study, how we defined these life events for our study, and how we composed the control groups for each event.

Outcome variables. We examined the Big Five personality traits, self-esteem, and life satisfaction as outcome variables of event-related changes. The number of available assessment waves for these outcomes differed across the seven panel studies. Table 4 provides an overview of the measurement characteristics and assessment frequency for these variables.

Statistical analysis

We used R (Version 4.3.2) for our analyses. Our data analytic procedure comprised four steps. First, we prepared

Table 4. Overview of the Assessment of the Big Five Personality Traits, Life Satisfaction, and Self-Esteem Across Panel Studies.

	Big Five personality traits				Life satisfaction				Self-esteem			
Panel	# waves	Years assessed	Measure	# of items	# waves	Years assessed	Measure	# of items	# waves	Years assessed	Measure	# of items
HILDA	5	2005, 2009, 2013, 2017, 2021	Adjective approach based on Saucier (1994) and Goldberg (1992)	28	22	2001–2022	Single item measure (Cheung & Lucas, 2014)	1	–	–	–	–
HRS	4	2006/2008, 2010/2012, 2014/2016, 2018/2020	Midlife Development Inventory (MIDI) Personality Scales (Lachman, 1997)	26	4	2008, 2010/2012, 2014/2016, 2018/2020	Satisfaction With Life Scale (Diener et al., 1985)	5	–[a]	–	–	–
LISS	15	2008–2023	50-item version of the IPIP Big-Five inventory (Goldberg, 1992)	50	15	2008–2023	Satisfaction With Life Scale (Diener et al., 1985)	5	15	2008–2023	Rosenberg Self-Esteem Scale (Rosenberg, 1965)	10
MIDUS	3	1995, 2004, 2013	Midlife Development Inventory (MIDI) Personality Scales (Lachman, 1997)	25	3	1995, 2004, 2013	Single item measure (Cheung & Lucas, 2014)	1	2	2004, 2013	Short version of Rosenberg Self-Esteem Scale (Rosenberg, 1965)	7
NLSY	4	2006, 2010, 2014, 2018/2020	Items from the TIPI (Gosling et al., 2003)	10	4	2014, 2016, 2018, 2020	Single item measure (Cheung & Lucas, 2014)	1	14	1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016, 2018, 2020	Short version of Rosenberg Self-Esteem Scale (Rosenberg, 1965)	3
PAIRFAM	3	2009, 2013, 2017	Short version of the Big Five Inventory (BFI-K; Rammstedt & John, 2005)	21	10[b]	2008–2017	Single item measure (Cheung & Lucas, 2014)	1	10[b]	2008–2017	Short version of Rosenberg Self-Esteem Scale (Rosenberg, 1965)	3
SOEP	5	2005, 2009, 2012/2013, 2017, 2019	Short version of the Big Five Inventory (Schupp & Gerlitz, 2008)	15	34	1987–2021	Single item measure (Cheung & Lucas, 2014)	1	3	2010, 2015, 2020	Single item measure (Robins et al., 2001)	1

[a]The HRS panel includes one to two waves of self-esteem data per person, which was, however, not sufficient to estimate our statistical models.
[b]The PAIRFAM panel comprised four more assessment waves after 2017. However, as there was a change in assessment mode after 2017, we did not include these later waves.

and harmonized the data from the different panel studies. Second, we identified the occurrence of the 10 life events of interest and created appropriate control groups. Third, we estimated within-person personality changes using fixed-effects regression models. Fourth, we integrated findings across datasets using meta-analytic tools.

Step 1: Data preparation. As the first step, we cleaned the data of the seven panel studies and prepared them in a consistent way for our analyses. Specifically, we provided consistent variable names across datasets, calculated mean scores for all multi-item measures, and harmonized factors across studies to ensure that different factor levels corresponded to each other across datasets. Furthermore, we *z*-standardized all outcome variables within the different panel studies using their grand mean and grand standard deviation.

Step 2: Identification of event group and control group. Next, we created event groups within each panel study by identifying participants who had experienced one of the 10 life events of interest. We focused on life events that had occurred after an individual's first Big Five personality trait assessment so that each person had at least one pre-event personality assessment. To be consistent across outcomes, we used the same identification strategy for all outcomes (Big Five traits, life satisfaction, and self-esteem). A participant was allowed to contribute data to multiple life events (e.g., a person who experienced a divorce and a childbirth was included in the analyses for both events). However, within each life event category, only the first event occurrence was considered for a person to avoid confounding pre- and post-event changes. For example, if a person experienced multiple childbirths after the first personality assessment, we used the first childbirth as target event.

For each life event, we also created a control group comprising individuals who did not experience the event but could in principle have experienced it in the time after the first personality assessment. Due to the causal interdependence of some life events, individuals in the control group had to fulfill specific conditions for some life events (Krämer et al., 2025). For example, individuals in the control group for divorce had to be married at one assessment after the first personality assessment (see Table 3 for information on control groups for all events). This is because divorce proceedings typically require at least 1 year of marriage. In our statistical models, these control groups were used to contribute to a more precise estimation of age-graded development but—in contrast to matching procedures—we did not compare personality development between the event group and the control group.

Step 3: Examining event-related personality changes using fixed-effects models. We used fixed-effects regression models as implemented in the R package *plm* (Croissant & Millo, 2008) to examine event-related changes in the seven outcome variables. With fixed-effects models, a dummy variable for each person is included in the model that accounts for stable between-person differences. This approach thus controls for potential bias through omitted time-invariant confounders (e.g., gender, childhood characteristics, and prior education) and exclusively analyzes within-person changes (Krämer et al., 2025; Seifert et al., 2024). Fixed-effects models are comparable to person-mean centering of all Level-1 predictors in multilevel models but rely on fewer statistical assumptions (McNeish & Kelley, 2019). They are particularly beneficial for our case where the inclusion of time-invariant confounders to multilevel models as control variables could be problematic because of assessment differences in these variables across panels. Thus, fixed-effects regression models are also more compatible with a CDA approach than matching procedures like propensity score matching because the latter would require that all relevant matching variables are available and equivalently assessed in all studies (Lawes et al., 2025).

We estimated one fixed-effects model for each *Event* × *Trait* × *Dataset* combination (>400 models in total). Standardized Big Five trait scores, self-esteem, or life satisfaction for person i at time point t served as dependent variables ($Trait_{it}$). As predictors, we included five mutually exclusive dummy variables that quantified event-related changes in the outcome variables at different time points before and after the event occurrence: (1) $D_{-2Y} = 1$ for assessments that took place 2 years prior to the occurrence of the target event, (2) $D_{-1Y} = 1$ for assessments that took place 1 year prior to the occurrence of the target event, (3) $D_{+1Y} = 1$ for assessments that took place 1 year after the occurrence of the target event, (4) $D_{+2Y} = 1$ for assessments that took place 2 years after the occurrence of the target event, and (5) $D_{>+2Y} = 1$ for assessments that took place more than 2 years after the occurrence of the target event.

Using these dummies to represent time in relation to the event occurrence allowed us to examine event-related changes without implying a specific functional form of the change trajectories (Busch et al., 2023; Haehner et al., 2023). We did not model possible effects of life events on personality that occurred more than 2 years prior to the event because there was initial evidence that event-related changes in life satisfaction, personality traits, and self-esteem are negligible 2 years prior to an event occurrence (Asselmann & Specht, 2021; Denissen et al., 2019; Krämer et al., 2025; Reitz et al., 2022). Furthermore, we included *age* and age^2 in the models to account for age-graded personality differences (Bleidorn et al., 2022). Participants belonging to the control group received a 0 on all event dummies and thus only contributed to the estimation of the intercept and the age-graded trajectories. As such, we did not estimate separate personality trajectories for event groups and control groups but used control groups to gain more precise estimations of age-graded trajectories. An example model equation reads as follows:

$$\begin{aligned} Trait_{it} = {} & \alpha_i + \beta_1 \cdot D_{-2Y_{it}} + \beta_2 \cdot D_{-1Y_{it}} + \beta_3 \cdot D_{+1Y_{it}} \\ & + \beta_4 \cdot D_{+2Y_{it}} + \beta_5 \cdot D_{>+2Y_{it}} \\ & + \beta_6 \cdot age_{it} + \beta_7 \cdot age_{it}^2 + \varepsilon_{it} \end{aligned}$$

α_i represents the person-specific fixed effects that accounted for stable between-person differences. The

regression coefficients (β_1 to β_7) describe whether a predictor was associated with within-person personality trait changes. We examined the statistical significance of these regression coefficients using cluster-robust standard errors (with longitudinal observations nested within individuals). Most relevant to our research question were the regression coefficients β_1 to β_5, describing within-person changes in our outcome variables between assessments at a certain time point before or after the event occurrence and assessments unrelated to the event occurrence.

Furthermore, we compared nested models with and without the five event-related dummies (D_{-2Y} to $D_{>+2Y}$) to estimate R^2 difference scores. These ΔR^2 informed us about the incremental variance that the event-related dummies explained in the different outcome variables above and beyond stable between-person differences and age-graded changes.

Finally, as a supplementary analysis, we tested linear contrasts of the different event-related dummies using the *multcomp* package (Hothorn et al., 2002). Specifically, we examined the size and statistical significance of six linear contrasts to investigate personality changes occurring from specific pre-event to specific post-event assessments: (1) $D_{+1Y} - D_{-2Y}$, (2) $D_{+2Y} - D_{-2Y}$, (3) $D_{>+2Y} - D_{-2Y}$, (4) $D_{+1Y} - D_{-1Y}$, (5) $D_{+2Y} - D_{-1Y}$, (6) $D_{>+2Y} - D_{-1Y}$. For example, the linear contrast $D_{+1Y} - D_{-2Y} = 0$ allowed us to examine within-person personality changes from assessments 2 years prior to the event occurrence to assessments 1 year after the event occurrence.

Step 4: Meta-analytic aggregation of results from Step 3. To examine the robustness of effects across panels, we aggregated findings using meta-analytic tools as implemented in the *metafor* package (Viechtbauer, 2010). We first integrated results on regression coefficients and linear contrasts across datasets for each *Event x Trait* combination. Then, similar to the procedure of Bühler et al. (2024), we also integrated findings across similar life events. Specifically, we integrated findings across gain-related love events (marriage, new relationship, and childbirth), loss-related love events (divorce, separation, and widowhood), gain-related work events (new employment and graduation), and loss-related work events (retirement and unemployment). To deal with the dependency of effect sizes in this analysis, we used the procedure recommended by Pustejovsky and Tipton (2022). That is, we estimated an approximative variance-covariance matrix of effect sizes based on working assumptions on their dependency and calculated cluster-robust standard errors. In our case, we assumed that effect sizes for different life events belonging to the same domain were correlated by $\rho = .64$ (ρ represents the average of pairwise correlations of effect sizes across domains in Tables 3 and 4 of Bühler et al., 2024).

Furthermore, we calculated a weighted average of the ΔR^2 scores across panel studies, which was weighted based on the number of observations included in the analyses across event and control groups from a specific study. We did not use a meta-analytic procedure for these scores because there is no established way to estimate their sampling variance and because we were primarily interested in their magnitude (and not their statistical significance).

Statistical significance. The CDA comprised the estimation of various analyses and statistical tests. However, most tests can be considered as testing different hypotheses (i.e., event-related changes in context of different life events or for different traits). Within each event-trait combination, there were however five statistical tests according to the five regression coefficients. We thus used an adjusted level of significance of $\alpha = .05/5 = .01$ to evaluate the statistical significance of these regression coefficients.

Sensitivity analysis. As a sensitivity analysis, we explored the consistency of our findings when using a different way to specify the event-related dummies. We repeated Step 3 and Step 4 of our analysis procedure with the just two event-related dummies: (1) $D_{Pre} = 1$ for all assessments that took place up to 2 years prior to the occurrence of the target event and (2) $D_{Post} = 1$ for all assessments that took place after the occurrence of the target event. These dummies quantify changes in our outcome variables across assessments occurring up to 2 years prior to or any time after the occurrence of a life event. Furthermore, the linear contrast $D_{Pre} - D_{Post} = 0$ allowed us to examine whether there were any personality trait changes from pre-event to post-event personality assessments.

Results

Descriptive statistics

Table 5 summarizes the sample sizes of the event groups and control groups across the different life events and panel studies. Combined across panel studies, samples sizes of the event groups ranged from $N = 5{,}153$ for divorce to $N = 33{,}363$ for new employment, with on average approximately three personality assessments per person (combined across panel studies: 16,959 to 102,504 personality assessments in the event groups). Further descriptive statistics can be found in Section 2 of the Supplemental Materials.

Event-related personality changes

To examine event-related personality changes, we estimated one fixed-effects model for each *Event x Trait x Dataset* combination (>400 models in total). To keep the Results section concise, we focus on the results from the meta-analytic aggregation across panel studies (Table 6). Findings from individual panel studies are presented in Sections 5 and 6 of the Supplemental Materials and in an interactive ShinyApp: https://life-event-research.shinyapps.io/CDA_LifeEvents/.

Furthermore, we focus on significant effects of our event-related dummies with a minimum effect size of $|b_{std}| > 0.01$. This cut-off was not preregistered but chosen after we expected the results to keep the summary of findings concise. Furthermore, the practical relevance of changes

Table 5. Sample Sizes of Event Groups and Control Groups Across Life Events and Panels.

Group	HILDA	HRS	LISS	MIDUS	NLSY	PAIRFAM	SOEP	Total
New relationship								
Event group	748	597	1,533	178	1,521	3,204	8,588	16,369
Control group	33,753	23,249	14,949	6,274	7,149	9,194	85,319	179,887
Marriage								
Event group	3,146	783	1,056	321	2,440	1,145	3,545	12,436
Control group	31,355	23,063	15,426	6,131	6,230	11,253	90,362	183,820
Childbirth								
Event group	4,136	1,599	818	400	3,554	1,584	4,328	16,419
Control group	30,365	22,247	15,664	6,052	5,116	10,814	89,579	179,837
Separation								
Event group	4,032	871	185		522	2,723	1,292	9,625
Control group	10,684	1,034	8,155		2,824	4,936	32,470	60,103
Divorce								
Event group	913	1,054	369	349	742	291	1,435	5,153
Control group	11,811	14,802	8,029	4,482	2,628	3,272	32,773	77,797
Widowhood								
Event group	812	2,968	271	346			1,038	5,435
Control group	11,783	12,822	8,092	4,442			32,751	69,890
Graduation								
Event group	3,890		2,345		4,081	307	3,744	14,367
Control group	30,611		14,137		4,589	12,091	90,163	151,591
New employment								
Event group	10,135	2,345	2,652			4,043	14,188	33,363
Control group	24,366	21,501	13,830			8,355	79,719	147,771
Unemployment								
Event group	3,920	840	1,551		1,122	1,410	5,536	14,379
Control group	15,565	10,944	10,293		5,228	7,419	32,921	82,370
Retirement								
Event group	3,249	5,298	1,269	1,088			3,781	14,685
Control group	17,423	5,506	11,132	4,184			51,130	89,375

Note. This table summarizes sample sizes of event and control groups across panels and events. A participant could contribute data to multiple groups. An empty cell indicates that an event was not examined in the respective panel study. The number of observations across outcomes, events, and panels can be found in Section 2 of the Supplemental Materials.

below this cut-off is likely very limited. As a reminder, these dummies describe within-person personality trait changes between assessments unrelated to the event occurrence and assessments at a certain time point before/after the event occurrence (e.g., changes from assessments unrelated to the event occurrence to assessments 1 year after the event occurrence). Additionally, at selected occasions, we refer to findings from the linear contrasts that describe within-person personality changes between specific pre-event assessments and specific post-event assessments (e.g., changes from assessments 1 year prior to the event occurrence to assessments 1 year after the event occurrence).

New relationship. Personality changes in response to a new relationship are illustrated in Figure 1. Few significant effects emerged for this event. First, extraversion increased in the year prior to the relationship start (b_{std} = 0.04, p = .004). Second, self-esteem increased after the event occurrence, with the only significant effect emerging 2 years after the event occurrence (b_{std} = 0.06, p < .001). Third, life satisfaction decreased 2 years before the event (b_{std} = −0.06, p < .001) and gradually increased thereafter with a significant effect for assessments more than 2 years after the event (b_{std} = 0.02, p = .002). The linear contrast across the event-related dummies indicated significant increases in life satisfaction from all pre-event assessments to all post-event assessments. Our findings were thus not in line with Hypothesis 1 that conscientiousness would increase in response to a new relationship. They were, however, in line with Hypothesis 2 suggesting that life satisfaction increases in response to a new relationship.

Marriage. Personality changes in response to marriage are illustrated in Figure 1. We found that both agreeableness (b_{std} = 0.05, p = .001) and conscientiousness (b_{std} = 0.06, p < .001) slightly increased 2 years before marriage, with linear contrasts across dummies indicating a subsequent decrease in these traits from pre-event to post-event assessments. Furthermore, openness decreased in the year after marriage (b_{std} = −0.05, p = .003), with linear contrasts again showing a significant decrease from pre-event to post-event assessments. Self-esteem increased in the year before (b_{std} = 0.05, p = .006) and after marriage (b_{std} = 0.06, p = .003). Finally, life satisfaction increased at all event-related assessments, with the largest effects found 1 year (b_{std} = 0.22,

Table 6. Significant Event-Related Changes in the Big Five Personality Traits, Life Satisfaction, and Self-Esteem.

		$D_{-2Years}$		D_{-1Year}		D_{+1Year}		$D_{+2Years}$		$D_{>+2Years}$	
Event	Outcome	*b*	99% CI	*b*	99% CI	*b*	99% CI	*b*	99% CI	*b*	99% CI
New relationship	Extraversion			0.04	[0.00, 0.07]						
	Life satisfaction	−0.06	[−0.08, −0.04]							0.02	[0.00, 0.03]
	Self-esteem							0.06	[0.02, 0.10]		
Marriage	Agreeableness	0.05	[0.01, 0.09]								
	Conscientiousness	0.06	[0.03, 0.1]								
	Openness					−0.05	[−0.09, −0.01]				
	Life satisfaction	0.10	[0.07, 0.12]	0.17	[0.11, 0.22]	0.22	[0.16, 0.28]	0.19	[0.14, 0.24]	0.02	[0.00, 0.03]
	Self-esteem			0.05	[0.00, 0.10]	0.06	[0.01, 0.11]				
Childbirth	Conscientiousness									−0.01	[−0.01, 0.00]
	Openness					−0.09	[−0.13, −0.04]	−0.07	[−0.13, −0.02]		
	Life satisfaction	0.05	[0.02, 0.09]	0.11	[0.01, 0.20]	0.16	[0.04, 0.27]	0.08	[0.03, 0.13]		
	Self-esteem			0.08	[0.01, 0.15]	0.07	[0.02, 0.11]				
Separation	Agreeableness							0.08	[0.01, 0.15]		
	Emotional stability									0.01	[0.00, 0.01]
	Openness									0.00	[0.00, 0.01]
	Life satisfaction					−0.26	[−0.42, −0.10]	−0.14	[−0.25, −0.04]		
Divorce	Agreeableness					0.08	[0.01, 0.15]				
	Conscientiousness			−0.09	[−0.15, −0.02]						
	Openness									0.01	[0.00, 0.01]
	Life satisfaction	−0.22	[−0.27, −0.17]	−0.25	[−0.43, −0.06]					0.02	[0.00, 0.03]
Widowhood	Extraversion					−0.08	[−0.14, −0.03]				
	Emotional stability	−0.07	[−0.12, −0.01]	−0.11	[−0.16, −0.05]						
	Life satisfaction	−0.09	[−0.16, −0.02]	−0.22	[−0.31, −0.13]	−0.47	[−0.76, −0.18]	−0.26	[−0.39, −0.14]		
Graduation	Openness			0.05	[0.02, 0.09]						
New employment	Agreeableness					0.03	[0.01, 0.06]				
	Conscientiousness					0.05	[0.01, 0.09]	0.04	[0.01, 0.07]		
	Emotional stability					0.03	[0.00, 0.06]	0.03	[0.01, 0.06]	0.00	[0.00, 0.01]
	Life satisfaction			−0.06	[−0.11, −0.01]	0.02	[0.01, 0.03]	0.02	[0.00, 0.03]	0.01	[0.00, 0.02]
	Self-esteem									0.01	[0.00, 0.01]
Unemployment	Emotional stability			−0.06	[−0.11, 0.00]						
	Life satisfaction			−0.08	[−0.15, −0.01]	−0.15	[−0.20, −0.10]	−0.08	[−0.12, −0.04]		
	Self-esteem					−0.06	[−0.11, −0.01]				

Note. This table summarizes all significant effects ($p < .01$) for event-related changes in the Big Five personality traits, self-esteem, and life satisfaction based on our meta-analytic aggregation across panels. The event retirement is not included in this table because no significant effects emerged for this event. Complete result tables including non-significant effects can be found in Section 3 of the Supplemental Materials.

$p < .001$) and 2 years ($b_{std} = 0.19$, $p < .001$) after marriage. Our findings were thus in line with Hypothesis 3 (openness decreases after marriage) and Hypothesis 4 (life satisfaction increases in response to marriage).

Childbirth. Personality changes in response to childbirth are illustrated in Figure 1. Findings for this life event were similar to those for marriage. First, for openness, we found a significant decrease 1 year ($b_{std} = -0.09$, $p < .001$) and 2 years ($b_{std} = -0.07$, $p = .001$) after the event occurrence, with linear contrast indicating a significant decrease from pre- to post-event assessments. Second, self-esteem increased in the year before ($b_{std} = 0.08$, $p = .003$) and after childbirth ($b_{std} = 0.07$, $p < .001$). Finally, life satisfaction increased in the years surrounding childbirth, with the largest effects emerging 1 year after the event ($b_{std} = 0.16$, $p < .001$). Our findings were thus not in line with Hypothesis 5 that extraversion decreases in response to childbirth.

Separation. Personality changes in response to separation are illustrated in Figure 2. We found that agreeableness increased 2 years after the event occurrence ($b_{std} = 0.08$, $p = .004$), with linear contrasts indicating a significant increase from immediate pre-event assessments to assessments up to 2 years after a separation. Furthermore, life satisfaction decreased 1 year ($b_{std} = -0.26$, $p < .001$) and 2 years after separation ($b_{std} = -0.14$, $p < .001$). We had no hypotheses for this life event.

Divorce. Personality changes in response to divorce are illustrated in Figure 2. Similar to the findings on separation, we found that agreeableness increased 1 year after the event occurrence ($b_{std} = 0.08$, $p = .004$). Furthermore, conscientiousness decreased in the year before the divorce ($b_{std} = -0.09$, $p < .001$). Finally, life satisfaction decreased in anticipation of the divorce (2 years before: $b_{std} = -0.22$, $p < .001$; 1 year before: $b_{std} = -0.25$, $p = .001$), with linear contrasts indicating significant increases in life satisfaction from pre-event to post-event assessments. Our findings were not in line with Hypothesis 6 that conscientiousness would increase in response to divorce. They were, however, partly in line with Hypothesis 7 as we found pronounced decreases in life satisfaction before the event occurred.

Widowhood. Personality changes in response to widowhood are illustrated in Figure 2. We found that emotional stability decreased, in anticipation of the event, 2 years ($b_{std} = -0.07$, $p = .002$) and 1 year before the event occurrence ($b_{std} = -0.11$, $p < .001$). Furthermore, extraversion decreased in the year after widowhood ($b_{std} = -0.08$, $p < .001$). Finally, life satisfaction decreased in the 4 years surrounding widowhood, with the largest effects emerging

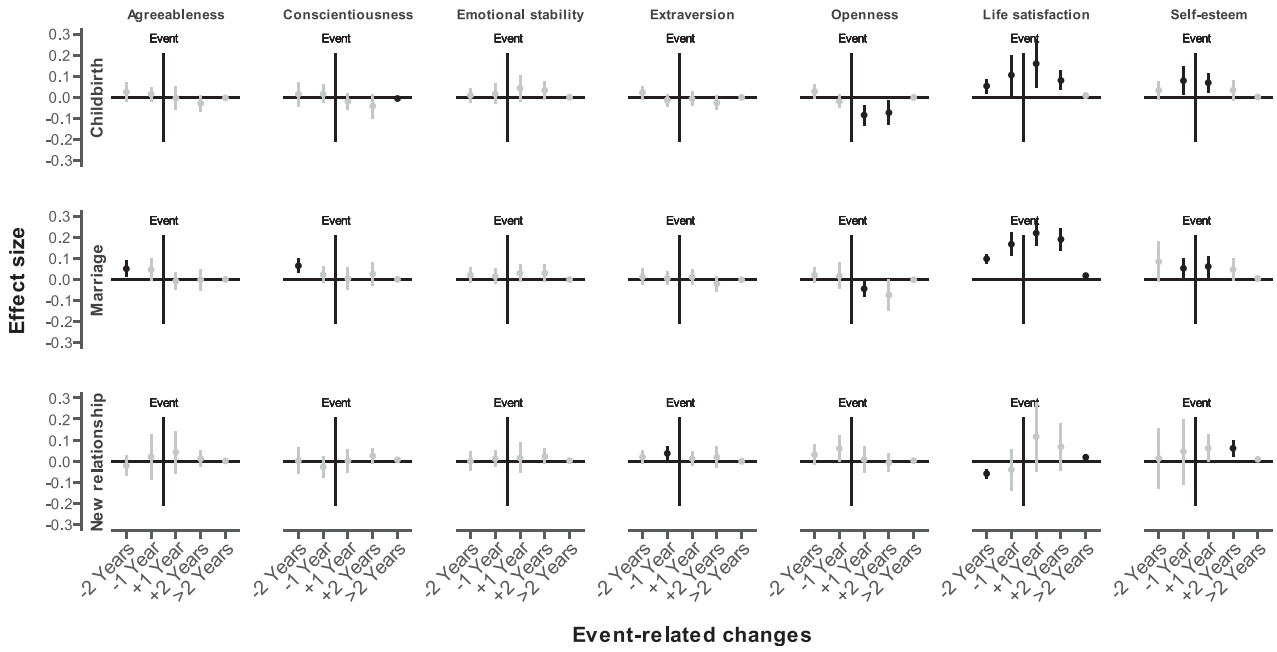

Figure 1. Personality Changes in Response to Gain-Related Love Events. *Note*. This figure illustrates the meta-analytic estimates of the five event-related dummy variables. The vertical line separates pre- and post-event estimates. Error bars indicate 99% confidence intervals. The length of confidence intervals primarily depends on the heterogeneity of effect sizes in the different panel studies. Significant effects ($p < .01$) are depicted in black.

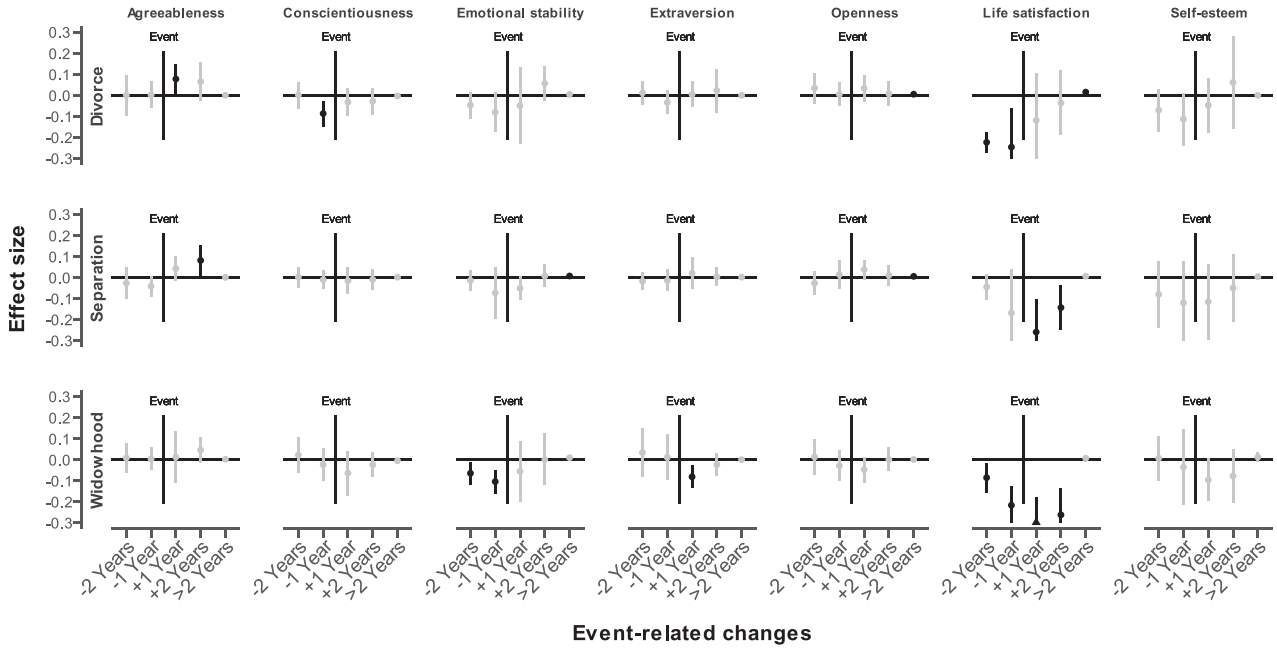

Figure 2. Personality Changes in Response to Loss-Related Love Events. *Note*. This figure illustrates the meta-analytic estimates of the five event-related dummy variables. The vertical line separates pre- and post-event estimates. Error bars indicate 99% confidence intervals. The length of confidence intervals primarily depends on the heterogeneity of effect sizes in the different panel studies. Significant effects ($p < .01$) are depicted in black. The triangle shape in the life satisfaction plot indicates that this value was truncated to $b = -0.30$ to allow comparable *y*-axis scaling across outcomes. The true effect size was $b = -0.47$.

1 year after the event occurrence ($b_{std} = -0.47$, $p < .001$). We had no hypotheses for this life event.

Graduation. Personality changes in response to graduation are illustrated in Figure 3. Only one significant effect emerged for this life event. We found that openness increased in the year before graduation ($b_{std} = 0.05$, $p < .001$). Our findings were thus not in line with Hypotheses 8–10 that emotional stability, self-esteem, and life satisfaction increase in response to the event.

New employment. Personality changes in response to a new employment are illustrated in Figure 3. Several significant effects emerged for this life event. First, agreeableness increased in the year after the event occurrence ($b_{std} = 0.03$, $p = .002$). Second, conscientiousness and emotional

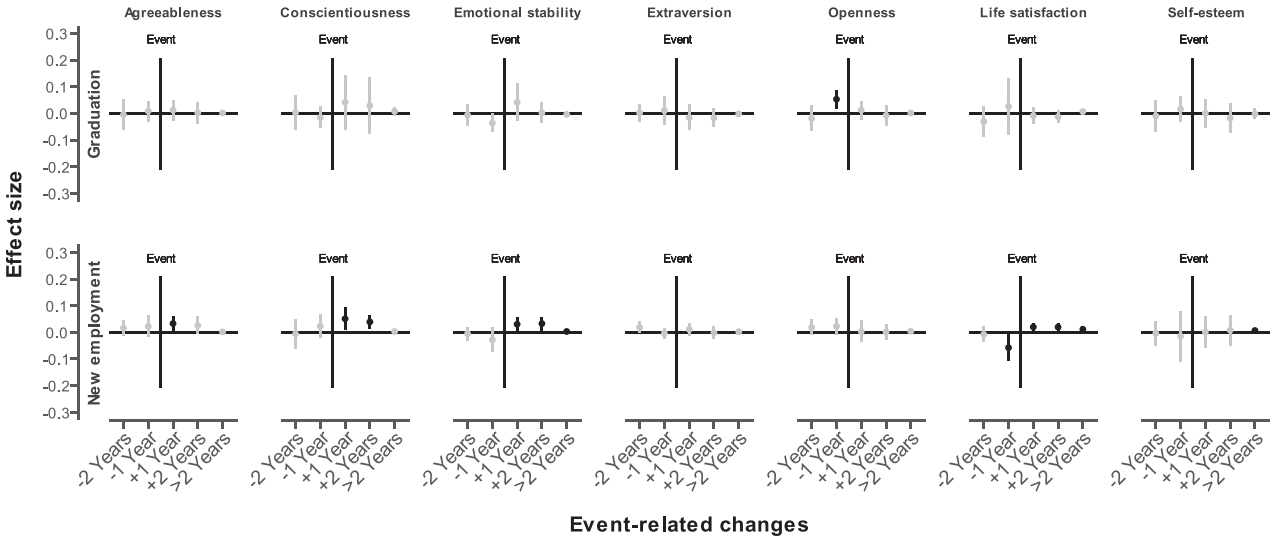

Figure 3. Personality Changes in Response to Gain-Related Work Events. *Note*. This figure illustrates the meta-analytic estimates of the five event-related dummy variables. The vertical line separates pre- and post-event estimates. Error bars indicate 99% confidence intervals. The length of confidence intervals primarily depends on the heterogeneity of effect sizes in the different panel studies. Significant effects ($p < .01$) are depicted in black.

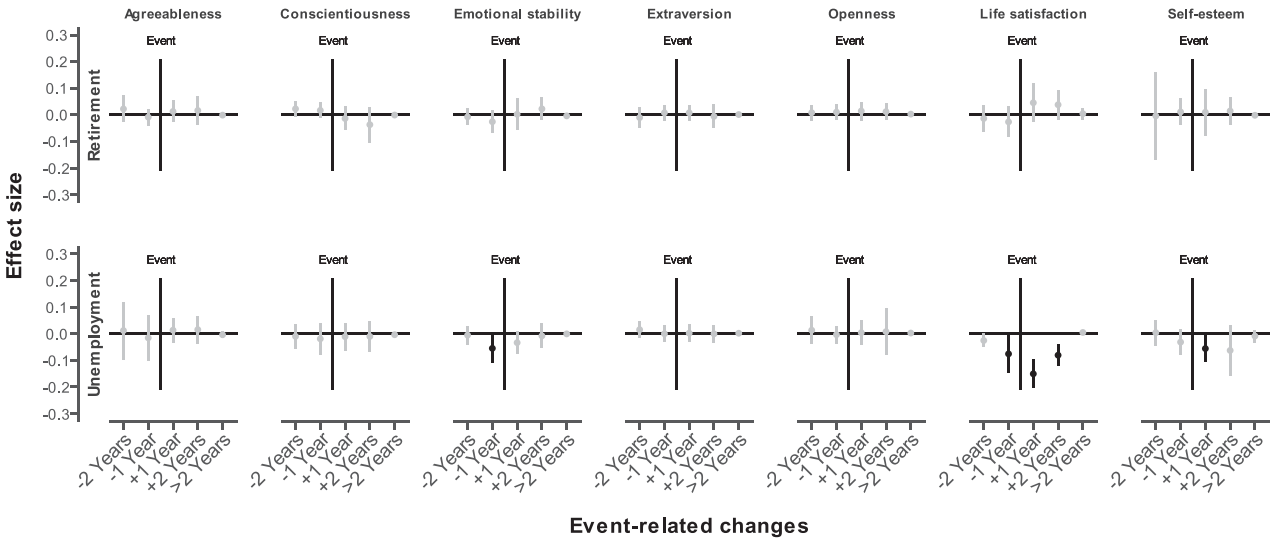

Figure 4. Personality Changes in Response to Loss-Related Work Events. *Note*. This figure illustrates the meta-analytic estimates of the five event-related dummy variables. The vertical line separates pre- and post-event estimates. Error bars indicate 99% confidence intervals. The length of confidence intervals primarily depends on the heterogeneity of effect sizes in the different panel studies. Significant effects ($p < .01$) are depicted in black.

stability increased 1 year and 2 years after starting a new employment ($0.03 \leq b \leq 0.05$). Third, life satisfaction decreased in the year before the event occurrence ($b_{std} = -0.06$, $p = .003$) but increased in the years thereafter ($b_{std} = 0.02$, $p = .001$). Our findings were thus in line with Hypotheses 11 and 13 that conscientiousness and life satisfaction increase in response to this event. However, we did not find the hypothesized increase in self-esteem in response to a new employment (Hypothesis 12).

Unemployment. Personality changes in response to unemployment are illustrated in Figure 4. We found that emotional stability decreased in the year before unemployment ($b_{std} = -0.06$, $p = .008$). Furthermore, self-esteem decreased in the year after the event occurrence ($b_{std} = -0.06$, $p = .003$). Finally, life satisfaction decreased in the year before unemployment ($b_{std} = -0.08$, $p = .005$), 1 year after unemployment ($b_{std} = -0.15$, $p < .001$), and 2 years after unemployment ($b_{std} = -0.08$, $p < .001$). Our findings were thus not in line with Hypotheses 14 and 15 that conscientiousness would decrease and emotion stability increase in response to this event.

Retirement. Personality changes in response to retirement are illustrated in Figure 4. There were no event-related personality changes in response to this life event and we also had no hypotheses.

Event-related personality changes across domains

Similar to the procedure by Bühler et al. (2024), we next integrated findings across life events that were assigned to the

same domain: gain-related love events, loss-related love events, gain-related work events, loss-related work events. Findings from this analysis are summarized in Table 7 and Figure 5.

Gain-related love events. Integrating results across marriage, new relationship, and childbirth, we found that emotional stability increased 2 years after the event occurrence (b = 0.03, p = .009). In contrast, openness decreased 2 years after the event occurrence (b = −0.05, p = .004), with linear contrast indicating a significant decrease from pre-event to post-event assessments. Furthermore, self-esteem ($0.05 \leq b \leq 0.06$) and life satisfaction ($0.12 \leq b \leq 0.16$) increased in the years after the occurrence of gain-related love events. Our findings were thus in line with Hypothesis 18 that openness decreases in response to gain-related love events. They were, however, not in line with Hypotheses 16 and 17 that agreeableness and extraversion would decrease in response to these events.

Table 7. Significant Event-Related Changes in the Big Five Personality Traits, Life Satisfaction, and Self-Esteem in Broader Event Domains.

		$D_{-2Years}$		D_{-1Year}		D_{+1Year}		$D_{+2Years}$		$D_{>+2Years}$	
Event	Outcome	*b*	99% CI	*b*	99% CI	*b*	99% CI	*b*	99% CI	*b*	99% CI
Love gain	Emotional stability							0.03	[0.00, 0.07]		
	Openness							−0.05	[−0.10, −0.01]		
	Life satisfaction					0.16	[0.08, 0.24]	0.12	[0.05, 0.18]	0.01	[0.00, 0.03]
	Self-esteem					0.06	[0.02, 0.11]	0.05	[0.01, 0.09]		
Love loss	Agreeableness							0.07	[0.01, 0.13]		
	Emotional stability			−0.08	[−0.14, −0.01]						
	Life satisfaction	−0.11	[−0.18, −0.04]	−0.20	[−0.34, −0.06]	−0.25	[−0.44, −0.07]	−0.14	[−0.26, −0.02]		
Work gain	Agreeableness					0.03	[0.00, 0.06]				
	Conscientiousness					0.05	[0.00, 0.10]				
	Emotional stability					0.04	[0.00, 0.07]				
	Openness			0.03	[0.00, 0.06]						
	Life satisfaction									0.01	[0.00, 0.02]
Work loss	Emotional stability			−0.04	[−0.08, 0.00]						
	Life satisfaction			−0.06	[−0.11, 0.00]						

Note. This table summarizes all significant effects (p < .01) for event-related changes in the Big Five personality traits, self-esteem, and life satisfaction based on our meta-analytic aggregation across panels and similar life events. Complete result tables including non-significant effects can be found in Section 3 of the Supplemental Materials.

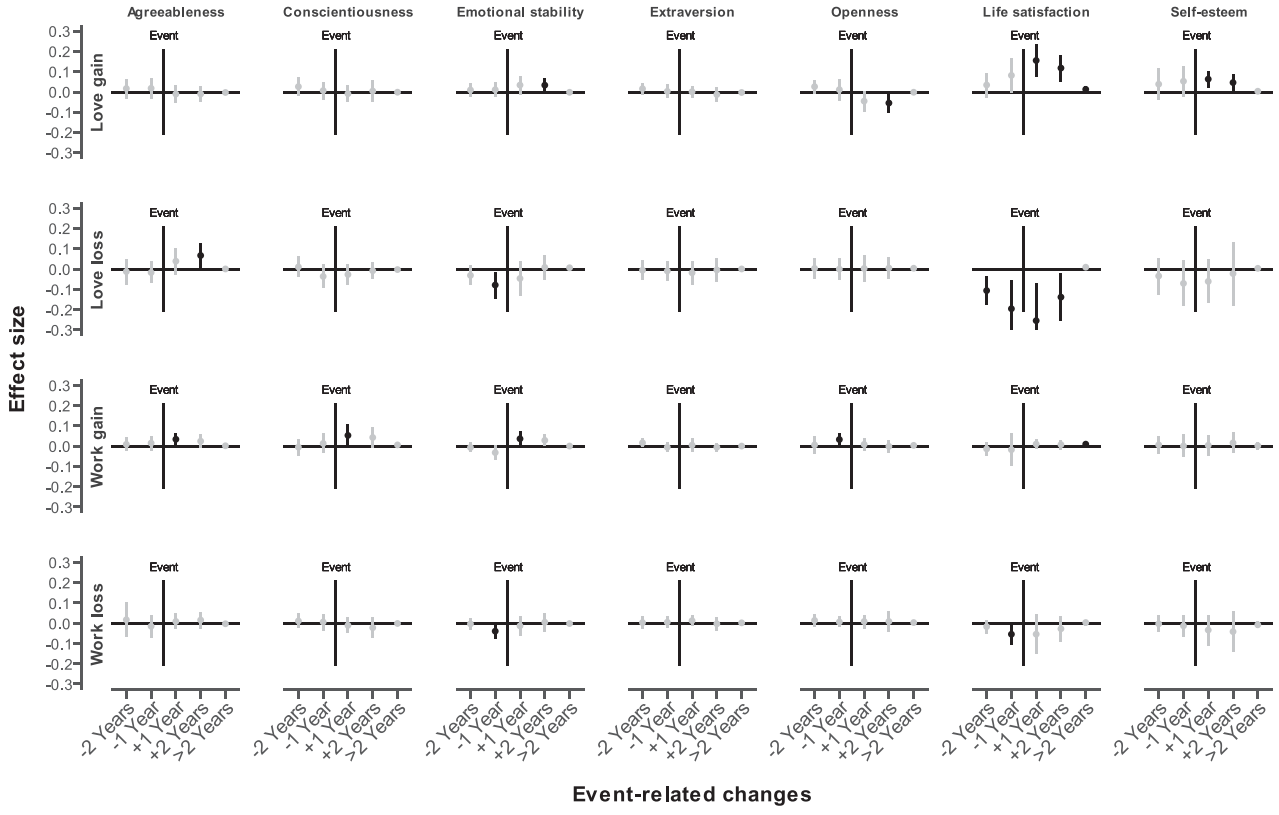

Figure 5. Personality Changes in Response to Broader Event Domains. *Note.* This figure illustrates the meta-analytic estimates of the five event-related dummy variables. The vertical line separates pre- and post-event estimates. Error bars indicate 99% confidence intervals. The length of confidence intervals primarily depends on the heterogeneity of effect sizes in the different panel studies. Significant effects (p < .01) are depicted in black.

Loss-related love events. Integrating results across separation, divorce, and widowhood, we found that agreeableness increased 2 years after the event occurrence ($b = 0.07$, $p = .005$). In contrast, emotional stability decreased in the year prior to the event occurrence ($b = -0.08$, $p = .002$). Finally, life satisfaction decreased in the 4 years surrounding loss-related love events, with the largest effect emerging 1 year after the event occurrence ($b = -0.26$, $p < .001$). Linear contrasts across event-related dummies, however, indicated a significant increase from pre-event assessments to assessments more than 2 years after the event. Our findings were thus not in line with Hypothesis 19 that openness would decrease in response to loss-related love events. They were, however, partly in line with Hypothesis 20 that life satisfaction increases in response to loss-related love events as we found a significant increase in life satisfaction from pre-event assessments to long-term follow-up assessments, possibly indicating an adaptation to these events.

Gain-related work events. Integrating results across graduation and new employment, we found that agreeableness ($b = 0.03$, $p = .002$), conscientiousness ($b = 0.05$, $p = .009$), and emotional stability ($b = 0.04$, $p = .008$) increased in the year after the event occurrence. Furthermore, openness increased in the year before the occurrence of gain-related work events ($b = 0.03$, $p = .007$). Our findings were thus in line with Hypotheses 21 and 22 that conscientiousness and emotional stability would increase in response to gain-related work events. However, we did not find the hypothesized increase in self-esteem and life satisfaction in response to these events.

Loss-related work events. Integrating results across unemployment and retirement, we found that emotional stability ($b = -0.04$, $p = .008$) and life satisfaction ($b = -0.06$, $p = .009$) decreased in the year before the occurrence of loss-related work events. Our findings were thus not in line with Hypothesis 23 that emotional stability would increase in response to loss-related work events.

Patterns across life events and comparison across outcomes (not preregistered)

Our results comparing R^2 values indicated that accounting for event-related changes explained on average 0.06% incremental variance in the within-person changes in the different outcomes beyond age-related trends. Explained variance was largest for life satisfaction (0.17%) and smallest for extraversion (0.03%), with event-related dummies predicting changes in life satisfaction after widowhood being the largest effect size for a single life event (0.32%).

Overall, 17% of the effects of the event-related dummies were significant which was well beyond our level of significance of 1%, indicating that the significant results cannot just be explained by Type 1 error accumulation. Again, most significant effects were found for life satisfaction (54%) and the fewest effects were found for extraversion (4%). The average absolute standardized effect size of significant effects across events, outcomes, and the different event-related dummies was $b_{std} = 0.08$, ranging from $b_{std} = 0.05$ for personality traits and self-esteem to $b_{std} = 0.13$ for life satisfaction. These effect sizes imply that an event-related dummy on average predicted 0.05 to 0.13 *SD* changes in the outcome of interest.

Sensitivity analysis: Different event-related dummies

As a robustness check, we explored the consistency of our findings when using differently specified event-related dummies. Specifically, we included one pre-event dummy capturing personality changes in the 2 years before the event occurrence and one post-event dummy capturing changes occurring across all post-event assessments. Most findings were robust across both time coding methods. In the following, we thus only describe the most important differences between our main analysis and our sensitivity analysis (see Section 4 of the Supplemental Materials for details).

First, if an event-related change was only observed at a specific time point before or after the occurrence of an event (i.e., only in one event-related dummy in the main analysis), these effects only partly replicated when using a less fine-grained coding of time. For example, although we found decreases in openness in the year after a marriage, no such changes were found in the post-event dummy ($b_{std} = -0.06$, $p = .068$). Second, for childbirth, two additional significant event-related changes were found, indicating that conscientiousness ($b_{std} = -0.05$, $p = .007$) and extraversion ($b_{std} = -0.03$, $p = .002$) tended to decrease after the event occurrence, with the latter finding being in line with Hypothesis 5. Third, we additionally found a significant decrease in conscientiousness after the occurrence of widowhood ($b_{std} = -0.06$, $p = .001$) and an increase in agreeableness after graduation ($b_{std} = 0.04$, $p = .002$). Finally, the post-event increase in life satisfaction after a new employment did not replicate in our sensitivity analysis ($b_{std} = 0.02$, $p = .170$).

As an exploratory analysis (not preregistered), we used the linear contrast of these two event-related dummies (Post – Pre) to evaluate the accuracy of our hypotheses for making predictions about event-related personality changes (see Section 4 of the Supplemental Materials). These linear contrasts can be seen as the closest equivalent to the results reported by Bühler et al. (2024). However, we did not find a significant association between our hypotheses (see Table 1) and the aggregated empirical results of the CDA (i.e., the pattern of significant positive and negative effects). Relatedly, when comparing the effect sizes for trait-event combinations where we expected negative effects, positive effects, or had no hypothesis, we found no significant differences in the effect sizes across these three groups. In sum, the hypotheses about event-related personality trait changes—derived from the findings by Bühler et al. (2024)—did not match the results pattern, overall.

Findings in individual panel studies

Findings from individual panel studies can be found in an interactive ShinyApp: https://life-event-research.shinyapps.io/CDA_LifeEvents/. This ShinyApp allows researchers to obtain detailed model results and illustrations for event-related changes of specific outcomes in specific panel studies. For most trait-event combinations, the results were relatively consistent across panel studies. The most frequent pattern was

a consistent null effect across panel studies. However, there were also some interesting differences in the results across studies. For example, the HILDA panel showed negative changes in life satisfaction in the first years after the occurrence of a new relationship, whereas other panel studies showed positive changes. Forest plots illustrating the consistency of effects across datasets can be found in Sections 5 and 6 of the Supplemental Materials.

Discussion

Understanding the sources of personality trait changes is of great practical relevance as personality traits predict a broad range of relevant life outcomes (Bleidorn et al., 2019). Life events have been theorized to elicit personality trait changes (Bleidorn et al., 2018; Roberts & Nickel, 2017; Specht et al., 2014). However, the empirical evidence on this topic has been inconclusive. Using a CDA approach, the present study provided an integration of prior research and an exploration of new questions on event-related personality development, moving beyond existing meta-analyses and reviews (Bleidorn & Denissen, 2021; Bleidorn et al., 2018; Bühler et al., 2024). We found several significant event-related changes in the Big Five personality traits. For example, openness decreased in response to marriage, whereas conscientiousness increased after starting a new employment. However, event-related changes in the Big Five personality traits were small (b_{std} = 0.05, R^2 = 0.04%), with effect sizes being similar to event-related changes in self-esteem (b_{std} = 0.05, R^2 = 0.06%) but smaller than corresponding changes in life satisfaction (b_{std} = 0.13, R^2 = 0.17%). Findings from individual panel studies can be found in an interactive ShinyApp.

Event-related personality changes

Integrating findings across seven large-scale panel studies, we aimed to overcome limitations of existing research on event-related personality development. Our results partly replicated the meta-analytic findings by Bühler et al. (2024), but also differed in several regards (see Figure 6 for an integrative overview). In the following, we focus on results that emerged consistently across research approaches.

First, a robust finding that emerged across systematic reviews, meta-analyses and this CDA is that entering a new employment predicts subsequent increases in conscientiousness. This finding is consistent with theoretical expectations because this life event is typically associated with a new social role that requires conscientious behavior (Lodi-Smith & Roberts, 2007). For example, in most professions, employees are required to be punctual, to work efficiently, and to be self-disciplined. Relatedly, starting a new employment is often accompanied with new opportunities to show conscientious behavior in everyday life, which may also lead to corresponding trait changes (Wrzus & Roberts, 2017).

Second, there now is consistent evidence across studies and methods that gain-related work events including graduation and new employment predict increases in emotional stability. A commonality of these gain-related work events is that they tend to reduce financial concerns, provide a sense of mastery, and decrease negative affect, all of which are changes that, in turn, may also elicit increases in emotional stability (Luhmann et al., 2012; Reitz et al., 2024).

Third, consistent with previous studies (Asselmann & Specht, 2020a; Bühler et al., 2024; Specht et al., 2011), we found that marriage—and possibly gain-related love events more generally—predicted decreases in openness. These findings may indicate that married people tend to reduce their explorative behavior and focus more on traditional values and routines (Schwaba et al., 2019).

Fourth, life satisfaction increased in response to a new relationship, marriage, and starting a new employment, whereas it decreased in response to loss-related love events like divorce. These findings were not only consistent with the meta-analysis by Bühler et al. (2024) but also extended a meta-analysis on event-related changes in subjective well-being by providing further insights into the temporal unfolding of these effects (Luhmann et al., 2012). We found that people show anticipatory

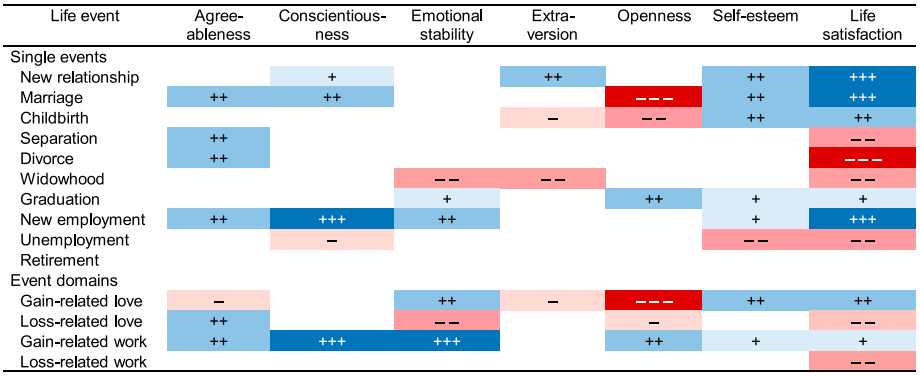

Figure 6. Overview of Replicable Findings on Event-Related Personality Trait Changes. *Note.* This figure provides an integrative overview of the findings of the present CDA and the meta-analysis by Bühler et al. (2024). Findings that were consistently found in both studies are presented in dark, with dark blue indicating a consistent positive effect (+++) and dark red indicating a consistent negative effect (– – –). Findings that were only found in our study are indicted in medium-light blue for positive effects (++) and medium-light red for negative effects (– –), and findings that were only found in the meta-analysis by Bühler et al. (2024) are indicated in very light blue for positive effects (+) and in very light red for negative effects (–). Empty cells indicate that we had no hypotheses for an effect and found no significant effect or that findings differed in direction between the two studies.

changes before an event occurs, the most pronounced changes in the year after the event occurs, and then a return into the direction of their pre-event levels in the subsequent years.

Fifth, there were a few significant event-related changes that emerged in our CDA that were not found in the meta-analysis by Bühler et al. (2024), which we nonetheless consider as likely candidates to be replicated due to their consistency with theoretical accounts. For example, the anticipatory decrease in emotional stability before widowhood could indicate changes in everyday life or negative affect due to health declines. These effects may have been overseen in the meta-analysis by Bühler et al. (2024) because the authors could not explicitly examine pre-event changes due to the limited availability of effect sizes. Furthermore, the increase in agreeableness after separation and divorce could indicate that after these events people show more agreeable behavior to find a new partner or because they experience fewer situations that may elicit unagreeable behavior (e.g., relationship conflicts).

However, overall, the hypotheses based on the meta-analytic findings by Bühler et al. (2024) did not match our result pattern very well. In an exploratory analysis, we found no significant differences in the effect sizes of trait-event combinations where we predicted positive effects, negative effects, or had no hypothesis. This may be explained by different factors. First, it could be the case that the meta-analysis by Bühler et al. (2024) did not find some expected effects due to reporting requirements of effect sizes that were necessary to conduct a meta-analysis. For example, although most scholars agree that widowhood is associated with decreases in life satisfaction (Luhmann et al., 2012; Stroebe et al., 2006), this was not found by Bühler et al. (2024) and thus not tested as a specific hypothesis in our study. Second, the present analyses had more power to detect significant effects due to the substantially larger sample size for almost every trait-event combination. Third, differences in the employed statistical method could also explain differences in findings. By using fixed-effects regression models, we were able to focus on within-person changes, which may be seen as a more appropriate approach for the examination of event-related personality changes than standardized mean-level differences due to the control for stable between-person confounders.

General result patterns, implications, and directions for future research

In addition to the replicable effects for specific life events and traits, three result patterns that emerged consistently across traits, events, and outcomes deserve particular attention. First, consistent with existing evidence (Denissen et al., 2019; Luhmann et al., 2014; Wright & Jackson, 2024), we found that event-related changes in the Big Five personality traits, self-esteem, and life satisfaction were mostly only temporary, with negligible effects more than 2 years after a life event occurred. These findings are in line with set-point theories of subjective well-being and personality traits (Headey, 2010; Ormel et al., 2017). Set-point theories suggest that individuals have a stable level of personality traits and well-being (i.e., the set-point) to which they return to after experiencing temporary changes due to significant life experiences. However, our findings on event-related mean-level changes do not preclude the possibility that some individuals experience lasting event-related changes in their personality traits and well-being because individuals may deviate from the mean-level trajectory (Haehner, Wright, et al., 2024; Lucas, 2007). For example, regarding event-related changes in life satisfaction, there is initial evidence that a significant share of participants experiences lasting changes after life events (Luhmann & Intelisano, 2018; Mancini et al., 2011). Future research is needed to identify the factors that can explain individual differences in the adaptation to relevant life events. For example, with regard to potentially stressful life events, a better understanding of these factors would allow researchers to identify individuals who may struggle with adapting to these stressful events (Haehner, Wright, et al., 2024).

Second, our findings outline the necessity to consider time in the relation to the event occurrence when examining event-related changes (Luhmann et al., 2014). We found that changes in the Big Five personality traits, self-esteem, and life satisfaction can be observed in anticipation of an event before it occurs and that they are most pronounced within the first 2 years after the occurrence. Our results thus provide important insights into the temporal unfolding of event-related changes that are necessary to advance personality development theories (Hopwood et al., 2022). Specifically, theories on personality development should incorporate specific suggestions on how the effects of life events unfold over time and why some event-related changes can be observed before people transition into a new social role. It could, for instance, be the case that people intentionally change trait-relevant behavior before a role transition occurs to prepare themselves for the anticipated event occurrence (Hennecke et al., 2014).

Third, the effect sizes of event-related changes were generally small, with mean-level changes of 0.05 to 0.10 *SD* in the Big Five personality traits. These small effect sizes might explain why existing research on event-related personality development has been mixed as even large-scale panel studies may have lacked power to identify these effects (Asselmann & Specht, 2021; Specht et al., 2011). As expected, event-related changes in the Big Five personality traits were smaller than corresponding changes in life satisfaction (but not self-esteem). However, even the average effect size for life satisfaction (average b_{std} = 0.13), which is typically considered to be a more malleable surface characteristic, can be described as small (Denissen et al., 2019; Funder & Ozer, 2019).

These small effect sizes for event-related personality changes may be surprising given that many people assume that a life event has significantly changed their personality (Schwaba et al., 2023). However, we would argue that these small average effect sizes are actually a realistic scenario given the nature of life events and the complexity of personality development. Specifically, life events that are supposedly similar (e.g., two individuals

experiencing unemployment) can differ substantially in the ways they are subjectively experienced, in the context in which they occur, and in the changes they may elicit in people's everyday life (Haehner, Kritzler, et al., 2024; Lawes et al., 2024; Luhmann et al., 2021). Thus, it is likely that life events affect people's personality traits and well-being in idiosyncratic ways, with pronounced effects for some people but not for others. Looking at the average effect of life events can thus be seen as a restrictive way to quantify their impact on people's personality (Bleidorn et al., 2020). Another complexity concerns the multitude of life experiences that people experience every day—including minor and major life events—that may each have implications for personality state expression and long-term personality development (Dugan et al., 2023). It is thus conceivable that individual events can only explain a small proportion of personality trait changes. This situation is similar to genetic research where individual gene variants only explain a minor proportion of the variance in personality traits (Bleidorn et al., 2020; Gandhi et al., 2024; Götz et al., 2022).

These insights have important implications for future research on event-related personality changes. As life consists of more than isolated events, moving beyond the effects of single life events as captured in large-scale panel studies is needed. Future research should examine the co-occurrence and interplay of various life experiences, including major and minor events to better understand the sources of personality development (Bleidorn et al., 2020; Haehner, Fliedner, et al., 2024; Krämer et al., 2025). Furthermore, future research should examine the "active ingredients of life events" to address the question of *how* life events elicit personality trait changes. To do so, studies that move beyond long-term longitudinal assessments and examine changes in people's everyday life are warranted. Such research designs would also allow research to examine the co-occurrence of personality trait changes and personality state changes which is needed to comprehensively test contemporary personality development theories (Wrzus & Roberts, 2017). Finally, moving beyond mean-level changes and taking a multi-metric approach to event-related personality changes is needed for a more holistic understanding of these effects. Mean-level changes are only one way of quantifying the effects of life events on personality traits while other metrics such as rank-order stability, ipsative consistency, and within-person variance offer complementary perspectives (Wright et al., 2024).

Limitations

The present CDA represents a comprehensive investigation of event-related personality changes combining an integration of prior research and exploration of new questions. It nonetheless has some limitations.

First, in the examined large-scale panel studies, the Big Five personality traits, life satisfaction, and self-esteem were assessed with short self-report measures. Although all measures seem to have appropriate psychometric properties (e.g., Cheung & Lucas, 2014), the short scales limited our ability to examine event-related personality changes beyond the domain-level. Furthermore, memory and mood can bias self-reports so that a replication of the identified effects with other methods such as peer-reports seems warranted.

Second, all included panel studies were conducted in Western, democratic countries (mostly the US and Germany). Thus, it remains unclear whether our findings generalize to other cultural contexts. As, for example, the structure of personality traits and the normativity of life events differ across cultural context, there are good reasons to assume that results on event-related personality development may be different in African or Asian samples (Haehner et al., 2025; Thalmayer et al., 2021, 2024).

Third, with at most yearly assessments of Big Five traits, life satisfaction, and self-esteem, we could not examine personality development at a more fine-grained temporal resolution. However, there is initial evidence that personality traits may change quickly (Haehner, Bleidorn, et al., 2024; Roberts et al., 2017). Thus, more frequent assessments are needed to capture the full extent of event-related personality development (Bleidorn et al., 2020). Furthermore, based on the design of the included panel studies, we could not examine the mechanisms of event-related personality development. Future research on how life events lead to changes in people's everyday lives, that then lead to personality trait changes, is needed.

Fourth, in our CDA, participants were allowed to contribute data to multiple life events. We made this decision because it increased comparability to existing research and because it reflects that life transitions often do not occur in isolation. However, if life events occur in close succession for many people (e.g., a marriage following within first 2 years after a new relationship), our coefficients may suffer from undercontrol bias (Krämer et al., 2025). That is, in such cases, our event-related estimates could reflect the combined effects from both events. To systematically test this, future research should estimate the simultaneous effects of multiple event occurrences on event-related personality changes, which could be done with a similar CDA to increase sample sizes across events. However, other research approaches that capture event-related changes in a fundamentally different way (e.g., by focusing on changes in everyday life or focusing on ideographic effects) may be needed to fully understand the effects of life events on personality trait changes.

Fifth, although our CDA approach has several advantages for examining event-related personality changes—such as the possibility to identify replicable patterns across datasets and events and the comparison of effect sizes across life events and traits—this approach also comes with some disadvantages. By examining 10 life events and seven traits, we naturally took a macro-level perspective on event-related personality changes. That is, our comprehensive approach prevented fine-grained examinations of specific life events and potential nuances therein. For example, we considered both marital and non-marital separations as *separations* although their effects on personality and well-being might differ. Relatedly, in the interest of estimating the overall effects of events, we did not look at personal, demographic, or contextual characteristics that

may explain why individuals differ in their reaction to major life events (but see Haehner, Wright, et al., 2024).

Conclusion

Over the past decades, several studies and reviews have sought to identify replicable patterns of event-related personality development. However, existing research has been inconclusive and limitations such as small samples, a lack of control for relevant confounders, and diverging research approaches have impaired drawing definite conclusions. Integrating seven large-scale panel studies, the purpose of this study was to overcome these limitations by examining event-related personality development in longitudinal data from over 195,000 individuals. We found several replicable effects of life events on changes in the Big Five personality traits. For example, there is consistent evidence that new employment predicts increases in conscientiousness and emotional stability, whereas marriage predicts decreases in openness. Although these effects were small according to common effect size guidelines and compared to event-related changes in life satisfaction, they could nonetheless be practically relevant as they may accumulate across events, across people, and across the lifespan.

However, to fully understand personality development throughout the lifespan, examining the main effects of life events on personality traits is not sufficient. The next generation of life event research should have a closer look at the life events that are consistently linked to personality trait changes and examine the active ingredients of event-related personality development such as associated changes in everyday life and related minor life events.

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Author contributions

Peter Haehner: conceptualization (lead), data curation (lead), formal analysis (lead), methodology (lead), project administration (lead), and writing—original draft (lead). **Michael D. Krämer:** conceptualization (supporting), methodology (supporting), and writing—review and editing (equal). **Amanda J. Wright:** conceptualization (supporting), methodology (supporting), and writing—review and editing (equal). **Wiebke Bleidorn:** conceptualization (supporting), methodology (supporting), writing—review and editing (equal), and supervision (lead).

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Open science statement

The coordinated data analysis was preregistered on November 12, 2024, at https://osf.io/f4cbd. Analysis scripts, a codebook, and Supplemental Materials can be retrieved from https://osf.io/v8csw. Data included in the coordinated data analysis could not be uploaded to OSF due to legal constraints, but researchers can get access to these datasets after signing user contracts with the respective panel providers (see details provided in the Methods section).

Ethical statement

Ethical approval

This study was exempt from ethical review at University of Zurich because it relied exclusively on anonymized, secondary data.

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Supplemental Material

Supplemental material for this article is available online.

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