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Terminal decline in well-being differs between residents in East Germany and West Germany

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Abstract

Lifespan research has long been interested in how contexts shape individual development. Using the separation and later reunification of Germany as a kind of natural experiment we examine whether and how living and dying in the former East or West German context has differentially shaped late-life development of well-being. We apply multi-level growth models to annual reports of life satisfaction collected over 20+ years since German reunification from 4,159 deceased participants in the Socio-Economic Panel ($N_{West} = 3,079$, $M_{age\ at\ death} = 73.90$, 47% women; $N_{East} = 1,080$, $M_{age\ at\ death} = 72.23$, 48% women). We examine differences between East and West Germany in levels, rates of change, and onset of terminal decline in well-being and the role of age at death, gender, education, disability and time spent in reunification. Analyses revealed that West Germans reported higher life satisfaction than East Germans, and that these differences get smaller both with passing time since reunification and in late life. The gap between East and West Germany diminishes over the last 10 years of life by more than 25%. Taking into account key individual characteristics only slightly attenuated this pattern, with education and age at death moderating late-life well-being level and decline in East Germany. Our results are consistent with long-standing notions that contextual factors shape individual development and illustrate the plasticity of human development. After having experienced disadvantages in life circumstances for up to 40 years through living in East Germany, effects of this natural experiment diminish considerably with passing time since reunification.

Keywords

late life, life satisfaction, Socio-Economic Panel, SOEP, time-to-death

Lifespan psychological and life course sociological perspectives have long noted that contextual factors offer both constraints to and affordances for individual functioning and development (Baltes, 1987; Elder, 1974). In line with these notions, a large body of research documents how contexts such as neighborhoods, municipalities and countries shape behavioral and emotional individual-level outcomes across adulthood and old age (Litwin, 2010; Pruchno, Wilson-Genderson, & Cartwright, 2012). However, less is known about how regional contexts are related to individual differences that manifest late in life. The aim of the current study is to examine how regional contexts shape well-being trajectories in the last 15 years of life by using the natural experiment provided by the separation of Germany into East and West.

The role of contextual factors for individual development

Several theories highlight the role that context plays in individual development (Baltes, 1987; Elder, 1974) and that contextual influences become stronger as people age and/or their functional abilities decline (Lawton, 1982). These theories indicate that contextual factors operate as moderators, influencing how individual risk and protective factors affect developmental outcomes.

More generally, late-life provides a unique opportunity to identify and understand the mechanisms and factors involved in how context shapes individual development because the disruption in

functioning provoked by mortality-related processes makes between-person differences changes easier to observe (Gerstorf & Ram, 2012). Consistent with these arguments, empirical studies have repeatedly found that a variety of contextual factors shape individual outcomes such as health and disability in old age (Clarke & Smith, 2011; Pruchno et al., 2012). For example, the influence of individuals' functional limitations on their well-being is shaped by regional characteristics such as availability of ambulatory care services that may help people maintain their daily routines and fulfill their needs despite being faced with disability. Environmental characteristics such as barrier-free living in and around older people's homes, higher neighborhood socioeconomic status, higher health expenditures on municipality levels, and social characteristics (e.g., frequency of contact) of the region where people live were each related to higher well-being (Kotakorpi & Laamanen, 2010; Litwin, 2010). Differences emerge even at the country-level. For

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example, in the US, older adults' higher sense of control functions as a resource against developing mild to moderate disabilities more so than in the UK (Clarke & Smith, 2011). The authors explain these results with differences in macro-societal characteristics, namely that individual control is more fostered in the US as an adaptation towards less control by the state (e.g., with respect to health care programs).

Over the past decade, studies have repeatedly documented that the well-established stability of well-being across adulthood and old age (Kunzmann, Little, & Smith, 2000) does not apply at the end of life. Instead, late-life well-being is often characterized by terminal decline (for overview, see Gerstorf & Ram, 2013) and described by either an accelerating decline trajectory or a transition from a relatively stable phase to a steep decline phase. Investigating late-life changes in well-being with respect to individuals' distance to death allows us to begin parsing how context contributes or alleviates terminal decline. For example, Gerstorf and colleagues (2010) found evidence of contextual differences in late life change: Regional characteristics such as lower gross domestic product in the county people were living and dying related to lower well-being and amplified the effects of individuals' education on rates of well-being decline. In the current study, we extend these initial findings and examine whether people who have lived and died in a larger regional context (East or West Germany) differ in crucial aspects of late-life well-being, namely level, rates of change, and onset of terminal decline.

East and West Germany as different contexts

Operationalizing geographic context at the state or country level is important because many political and economic regulations operate on large regional units. The separation of Germany after World War II in 1949 created two different countries and political systems. Because any intention of self-selection by people living in East and West Germany was hindered by the building of The Wall in 1961 (i.e., from 1961 till 1989 there was almost no choice), researchers consider German separation as a (quasi-) natural experiment that exposed individuals in adjacent geographic contexts to different living conditions (e.g., Frijters, Haisken-DeNew, & Shields, 2004a). East Germany had a centrally planned economy, whereas West Germany pursued a market economy that enabled people to reach a prosperous and (financially) self-determined life, which in turn contributes to higher life satisfaction (Diener, 2000). In social life, people living in East Germany were allowed only under rare circumstances (e.g., after retirement) to visit non-communist countries (including family in West Germany). Because of these and further differences between East and West Germany, we expect late-life well-being trajectories to differ between the two German countries.

Drawing on notions of Cumulative Inequality (Ferraro & Shippee, 2009), we assume that inequality in social systems in which individuals are embedded in do accumulate across life, shape individual development, and reflect enhanced exposure to risk (Clarke et al., 2013). For example, as opposed to West Germany, air pollution due to industrial emission had reached a high level at the time of reunification in East Germany. Likewise, financial means for and quality of health care services, especially for older people, were lower in East Germany (e.g., fewer personnel; few modern pharmaceuticals and equipment; lower density of emergency hospitals; Busse & Riesberg, 2004; Mand, Muller, Lefering, Ruchholtz, & Kuhne, 2013) and can thus be considered to have an accumulative

influence on overall quality of life. Although East Germans might also have experienced lower risk in some domains (e.g., exclusion from the labor market, poverty), these were rather exceptions. The extent of disparities between East and West regions is also reflected in East German individuals living close to the border who, compared to their Eastern peers living further away from the border, might have had more access to cultural and material goods from West Germany but do not differ in life satisfaction reports (Frijters et al., 2004a). In sum, the far-reaching disparities between East and West Germany suggest that individuals in East Germany experienced disadvantaged living conditions.

Empirical work on a variety of demographic, socioeconomic, and psychological variables chronicle the wide range of differences related to East–West differences. Differences in life expectancy (mirroring effects of life circumstances on health; Maier & Scholz, 2004) had accumulated during the German separation to 3.4 years for men and 2.7 for women until 1990, favoring those in West Germany (Scholz & Maier, 2003). In contrast to West Germany, for example, the East German system was not able to further decrease mortality rates from avoidable cardiovascular diseases—a key indicator of medical care (Nolte, Scholz, Shkolnikov, & McKee, 2002) and East German individuals' unhealthier nutrition (e.g., higher fat and calorie intake, lower fresh vegetables intake; Thiel & Heinemann, 1996).

In the late 2000s, East Germans ran also a higher risk to become in need of care (after accounting for income disparities, these difference were still visible for men; Unger & Rothgang, 2010). Second, from a socioeconomic perspective, West Germans' average income is currently still about 20% higher than that of East Germans, and older people in East Germany face a higher risk for old-age poverty (Frommert & Himmelreicher, 2010; Kumpmann, Gühne, & Buscher, 2012). Finally, differences between both regions have also been reported for numerous psychological domains. Relative to West Germans, East Germans, for example, typically report more social losses over the previous 10 years, more worries about their economic situation, and lower subjective health (Motel-Klingebiel, Simonson, & Tesch-Römer, 2010; Westerhof & Keyes, 2006). Our overarching assumption is that the structural differences between both regions in demographic, socioeconomic, and psychological domains also shape trajectories of late-life well-being.

Because the 'natural experiment' of German reunification has now taken place almost a quarter-century ago, there is evidence to suggest that regional disparities in juridical, organizational, political and economic domains are narrowing. To illustrate, enormous funds were injected into East Germany to move health care services up to the state-of-the-art levels existing in West Germany. Similarly, to reduce deficits in retirement incomes that resulted from lower wages, East German pensions are up-valued by law (Frommert & Himmelreicher, 2010). Since 1990, life expectancy (Scholz & Maier, 2003), the number of diseases, medical treatments, and prognosis for patients with severe injuries are converging (Mand et al., 2013; Motel-Klingebiel et al., 2010). That is, some of the East–West differences are getting smaller.

However, there are still some differences between East and West Germany. A substantial body of research tracking differences between East and West Germany in life satisfaction across the adult life span attests to West Germans' higher reports and East Germans' increase after reunification (Frijters et al., 2004a; Westerhof & Keyes, 2006). For example, Frijters and colleagues (2004a) found that East Germans aged 21 to 64 years reported lower life

satisfaction in the decade after reunification and that individual (e.g., death of spouse in the last year) and household characteristics (e.g., income) contributed to these differences. The extent of convergence between East and West German's life satisfaction over time appears to be domain specific. For example, satisfaction with built environment (e.g., streets) and free time has converged, but satisfaction with living standards, economic situation and supply of goods and services have not (Federal Institute for Research on Building, Urban Affairs and Spatial Development, 2011; Federal Statistical Office, 2004). In particular, among adults aged 65 to 85 years, the East–West difference in life satisfaction remained intact and stable (1996–2008; Motel-Klingebiel et al., 2010).

The current study thus extends earlier reports by making use of the natural experiment of German separation and reunification. Specifically, we examine how regional factors shape terminal decline in well-being and explore (as a means to illustrate how malleable human development is) whether and how these differences diminish with the passage of time since reunification.

The role of individual difference factors

To better understand differences between East and West Germany in terminal well-being decline, we also consider several individual difference characteristics. First, age at death may be important for well-being because, for example, Vogt (2013) reported from a simulation study that increases in life expectancy have been most pronounced for the older East German cohorts, probably because of better retirement conditions and health care. Second, gender differences may exist because East German women often worked full-time, whereas West German women often had disrupted occupation histories and rather conformed to traditional roles (Bauernschuster & Rainer, 2012). As a consequence, retired women in West Germany face a greater dependence on their husbands' financial support (Frommert & Himmelreicher, 2010) and thus might report relatively lower life satisfaction. Third, known associations of well-being with education and disability may be more pronounced in East Germany because resource-poor regions may exacerbate individual-level disparities (Cramm, van Dijk, & Nieboer, 2013; Lucas, 2007). For example, people with special needs in West Germany may have access to higher-quality services and thus report higher well-being than their East German peers.

The present study

We applied two-level growth models to 22-year longitudinal data from now deceased participants of the Socio-Economic Panel Study (SOEP; $N = 4,159$) to examine how context, operationalized as the region in which people lived and died, has influenced terminal well-being decline. First, we examined differences between East and West Germany in levels, rates of change, and timing in onset of terminal decline and expected that East Germans were disadvantaged in three aspects of terminal well-being decline (level, rate of decline, onset of decline). Following the general trends toward convergence between East and West observed in the last two decades, we expected that East–West differences in terminal decline have gotten smaller with the passage of time since reunification. Second, we examined the role of age at death, gender, education and disability and expected that dying in older cohorts and being more educated are more protective in East Germany compared to West Germany.

Methods

Participants

Data for the present analyses were drawn from the SOEP, a longitudinal, nationally representative household panel study in Germany with yearly assessments since 1984 (Headey, Muffels, & Wagner, 2010). Initial response rates are satisfactory ranging between 60% and 70% with yearly longitudinal attrition of less than 5% (Kroh, Pischner, Spieß, & Wagner, 2008; Kroh & Siegers, 2014). Compared to still living participants, the subsample of deceased participants is older, included more men, reported slightly lower life satisfaction, had fewer years of education, and lower household income (Gerstorff et al., 2010). Among deceased participants, 90% do not have a migration background. In total, the death rates and ages of death of SOEP are representative of mortality in Germany (Brockmann & Klein, 2004; Burkhauser, Giles, Lillard, & Schwarze, 2005). East Germans were included in the sample beginning in 1990. For this article, we selected all participants from East or West Germany who (a) were known to have died between 1990 and 2012 and (b) provided at least one report of life satisfaction during the last 10 years of life. This sample consisted of $N = 4,159$ participants (48% women) who were born between 1894 and 1990 and of whom 78% provided 3+ waves of data. The analysis makes use of the 33,908 annual life satisfaction reports individuals provided before they died at ages between 18 and 101 years ($M = 73.47$, $SD = 14.14$).

Measures

Well-being. Life satisfaction, one indicator of the cognitive-evaluative facet of well-being, was assessed annually since 1984 in the SOEP with the item 'How satisfied are you with your life, all things considered?' on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). The item has been widely used in psychological research (Fujita & Diener, 2005; Schimmack & Oishi, 2005).

Region. Individuals' residence in East or West Germany was derived as the last available location and treated as a time-invariant person-level variable. Overall, individuals tended to stay within one or the other region through the entire reporting period with less than 1% of the analysis sample having moved from one region to the other during their participation in the study.

Time-to-death (TTD) is calculated for every participant at each wave as the difference in years between the year of assessment and year of death.

Covariates. We included five covariates as time-invariant variables: Age at death, gender, education, disability and time spent in reunified Germany. *Age at death* was recoded into a reference group aged 70–79 years old at death ($n = 1,183$), a younger deceased group with age at death < 70 years ($n = 1,392$) and an older deceased group with age at death ≥ 80 years ($n = 1,594$). Following earlier work (Gerstorff et al., 2010), we considered age groups instead of continuous age at death because of nonlinearity in the association between well-being and *age at death*. The cutoff criterion of 80 years aligns the usual distinction between the Third Age and the Fourth Age (Baltes & Smith, 2003). From a demographic perspective, individuals who died before reaching age 70 years are dying prematurely and have often suffered from lethal

diseases that differ from those who died at later ages (OECD, 2011). *Education* was measured as numbers of years spent in formal schooling. *Gender* was a binary variable, and *disability* was assessed via self-report and based on official certificates. Our measure contrasts all participants who had been disabled at some point during the study ($n = 1,984$) and those who were not ($n = 2,175$). *Time spent in reunification* was computed as the difference between a participants' year of death (e.g., 1999) and 1990 (the year of reunification).

Scores of the outcome variable, life satisfaction, were transformed to T-metric ($M = 50$, $SD = 10$) based on the larger SOEP sample of deceased and non-deceased participants in 2002 ($M = 6.90$, $SD = 1.81$). TTD was centered at 2 years prior to death to enable estimation at a time point as close as possible to death with sufficient observations. Other covariates were grand-mean centered so that model parameters could be easily interpreted as applying to the average person in the sample.

Data analysis

We used two sets of nonlinear growth models (Ram & Grimm, 2015). In the first set of models, we described trajectories of life satisfaction using a quadratic function (single-phase model). Specifically, the repeated measures nested within individuals were modeled as

$$\text{LifeSatisfaction}_{it} = \beta_{0i} + \beta_{1i}TTD_{it} + \beta_{2i}TTD_{it}^2 + e_{it} \quad (1)$$

where $\text{LifeSatisfaction}_{it}$ represents an individual i 's life satisfaction at occasion t ; β_{0i} are person-specific intercepts; β_{1i} and β_{2i} are person-specific linear and quadratic rates of change over time-to-death; and e_{it} is person- and time-specific residual error.

Simultaneously, the person-specific intercepts (β_{0i}), linear slopes (β_{1i}), and quadratic slopes (β_{2i}) were modeled as

$$\beta_{0i} = \gamma_{00} + \gamma_{01}(\text{region}_i) + \gamma_{02}(\text{time spent in Reunification}_i) + \gamma_{03}(\text{region}_i \times \text{time spent in Reunification}_i) + u_{0i} \quad (2)$$

$$\beta_{1i} = \gamma_{10} + \gamma_{11}(\text{region}_i) + \gamma_{12}(\text{time spent in Reunification}_i) + \gamma_{13}(\text{region}_i \times \text{time spent in Reunification}_i) + u_{1i} \quad (3)$$

$$\beta_{2i} = \gamma_{20} + u_{2i} \quad (4)$$

where γ_{00} , γ_{10} and γ_{20} describe the trajectory of the average person in the sample. Residual between-person differences u_{0i} , u_{1i} and u_{2i} were assumed to be multivariate normally distributed, correlated with each other and uncorrelated with the residual errors, e_{it} . Between-person differences in the quadratic slope, u_{2i} , were accommodated, but after no significant predictors emerged, were left un-modeled. Models were estimated using SAS 9.3 (Proc mixed; SAS institute Inc., 2009), with incomplete data treated as missing at random (Little & Rubin, 1987).

In the second set of models, the same repeated measures of life satisfaction were modeled as a multi-phase linear spline, with individual differences in the timing of the transition between phases (Cudeck & Klebe, 2002).

Specifically,

$$\text{LifeSatisfaction}_{it} = \alpha_{0i} + \alpha_{1i}(TTD_{it} - k_i) + e_{it} \text{ if } TTD_{it} < k_i, \text{ and} \quad (5)$$

$$\text{LifeSatisfaction}_{it} = \alpha_{0i} + \alpha_{2i}(TTD_{it} - k_i) + e_{it} \text{ if } TTD_{it} \geq k_i \quad (6)$$

where α_{0i} represents a person i 's level of life satisfaction at k_i , a person-specific transition point, and α_{1i} and α_{2i} are person-specific linear slopes in the terminal and pre-terminal, respectively, phases (TTD_{it} is coded in negative integers). As in the previous models, person-specific intercept and linear pre- and terminal slope parameters were modeled as a function of region and time since reunification as in Equations 2 and 3. Additionally, transition points were modeled as

$$\begin{aligned} k_i = \alpha_{3i} = & \gamma_{30} + \gamma_{31}(\text{EastGermany}_i) \\ & + \gamma_{32}(\text{time spent in Reunification}_i) \\ & + \gamma_{33}(\text{EastGermany}_i \times \text{time spent in Reunification}_i) \end{aligned} \quad (7)$$

Variances and covariances were parameterized in terms of (squared) standard deviations to facilitate convergence, and although attempted, the data did not additionally support estimation of random effects for the transition point (i.e., no u_{3i}). Person-level predictors were centered at sample means with the exception of region which was now modeled with = 1 indicating the participant resided in East Germany.

We proceeded to examine differences in change with respect to the other individual characteristics. Given the difficulties in estimation faced with the multiphase model, the single phase (quadratic) change models, Equations 1 to 4, were expanded. Specifically, the set of individual differences variables were added as additional predictors (main effects and interactions with region_i) so that Equations 2 and 3 were of the form

$$\begin{aligned} \beta_{0i} = & \gamma_0 + \gamma_{01}(\text{region}_i) + \gamma_{02}(\text{time spent in Reunification}_i) \\ & + \gamma_{03}(\text{deceased} \leq 69 \text{ years}_i) + \gamma_{04}(\text{deceased} \geq 80 \text{ years}_i) \\ & + \gamma_{05}(\text{gender}_i) + \gamma_{06}(\text{education}_i) + \gamma_{07}(\text{education}_i^2) \\ & + \gamma_{08}(\text{disability}_i) + \gamma_{09}(\text{region}_i \\ & \times \text{time spent in Reunification}_i) + \dots + u_{0i} \end{aligned} \quad (8)$$

Here, higher parameter estimates, γ_s , indicate differences favoring participants who died in East Germany, those who spent more time in reunification, died younger and older than the 70–79-year-old reference group, are men, more educated, and were disabled. To maintain parsimony, non-significant interactions were trimmed iteratively, always retaining the relevant 2-way interactions when any 3-way interactions remained in the model. As usual, models were estimated using SAS 9.3 (Proc mixed; SAS institute Inc., 2009), with full information maximum likelihood (i.e., incomplete data treated as missing at random). In checking the viability of assumptions regarding exchangeability of those participants who provided two or three waves of data with those who provided more extensive longitudinal change information (four or more waves of data), we found, as would be expected, that participants who provided more longitudinal data were younger and reported higher well-being initially. Although these differences are accommodated by the inclusion of attrition-informative variables in the analysis, a bit of care should be taken in generalizing results to the full population, particularly to 'hidden' segments not covered by the analysis sample (e.g., homeless, special populations).

Results

Frequencies of birth years and ages at death across East and West German participants are shown in Figure 1. As can be seen, the distributions are comparable in both subsamples. Frequency of observations

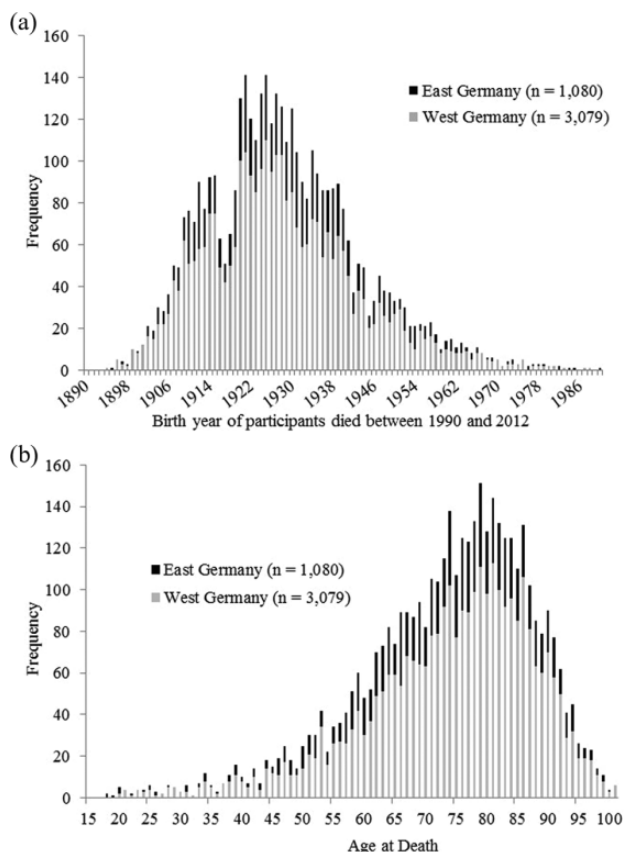


Figure 1. Panel A: Distribution for year of births separately for participants from East and West Germany. Birth years span almost a century and are distributed similarly across both regions. Panel B: Frequency of individuals' age at death across East and West Germany. Two thirds of the participants died between the age of 66 and 90.

across chronological age and distance to death is shown in the Supplementary Material. The number of observations increases with proximity to death; 44% of observations were taken in the last 5 years (West Germany: 33%; East Germany: 11%), suggesting that modeling results should be interpreted as a description focused on the last decade of life. Characteristics and differences between the East and West German participants are shown in Table 1.

Differences in terminal well-being decline between East and West Germany

Average trajectories and the individual differences therein were modeled using two models of change. Results from the single-phase (quadratic) model for life satisfaction over time-to-death are shown in Table 2 (Model 1). Model parameters indicate a trajectory of terminal decline with an intercept ($\gamma_{00} = 44.93$; 95% CI = 44.75, 45.28) two years before death at half a standard deviation below the 2002 sample average, negative linear ($\gamma_{10} = -1.17$; CI = -1.27, -1.08) and negative quadratic ($\gamma_{20} = -0.06$; CI = -0.06, -0.05) rates of change, with substantial between-person differences in all three components ($\sigma^2_{u0}, \sigma^2_{u1}, \sigma^2_{u2}$). Two years before death, East Germans reported lower life satisfaction ($\gamma_{01} = -2.79$; CI = -3.57, -2.00) than their Western peers and show a shallower linear rate of change ($\gamma_{11} = 0.19$; CI = 0.09, 0.28). Historically, the average level of life satisfaction across Germany decreases with passing

Table 1. Sample characteristics and differences between East German and West German Subsamples.

	East Germans (n = 1,080)	West Germans (n = 3,079)	p value t test (Cohen's d)
	N (%)	N (%)	
Age at death			
≤ 69 years	410 (38%)	982 (32%)	0.003 (-0.21)
70–79 years	303 (28%)	880 (28%)	0.742 (0.02)
≥ 80 years	367 (34%)	1,217 (40%)	0.001 (0.20)
Women	522 (48%)	1,455 (47%)	0.542 (0.03)
Individuals with disability	408 (38%)	1,576 (51%)	< 0.001 (0.43)
	Mean (SD) [CI]	Mean (SD) [CI]	
Age at death	72.23 (14.45) [71.36, 73.09]	73.90 (14.00) [73.41, 74.40]	< 0.001 (0.12)
Education in years	11.01 (2.03) [10.89, 11.14]	10.74 (2.19) [10.67, 10.82]	< 0.001 (-0.13)
Time spent in reunification	12.13 (5.87) [11.77, 12.48]	11.98 (6.22) [11.76, 12.20]	0.492 (-0.03)
Number of repeated measures	7.20 (4.73) [6.92, 7.49]	8.49 (4.79) [8.32, 8.66]	< 0.001 (0.27)
TTD in years at first occasion	-8.38 (4.67) [-8.66, -8.10]	-9.69 (4.59) [-9.85, -9.53]	< 0.001 (0.00)
TTD in years at last occasion	-2.10 (2.23) [-2.17, -2.01]	-2.09 (2.18) [-2.10, -2.23]	0.955 (-0.28)

Note. Descriptives and t tests of group differences between East German and West German subsamples. TTD = Time-to-death. SD = Standard deviation. CI = 95% confidence interval.

time since reunification ($\gamma_{02} = -0.06$; CI = -0.11, -0.01). Significant regional differences in life satisfaction proceeding (linearly) in accordance with time spent in reunification ($\gamma_{012} = 0.12$; CI = 0.01, 0.24) indicate reversal of the differences in level between both regions. Model-implied trajectories for both regions from single-phase (quadratic) shown in Figure 2 (Panel A) indicate that East Germans report lower life satisfaction all the way until death, but the gap between both regions closes with approaching death.

Results from the multi-phase (spline) model for life satisfaction over time-to-death are shown in Table 3. Similar to previous reports, model parameters describe a trajectory characterized by relatively shallow pre-terminal decline ($\gamma_{20} = -0.37$; CI = -0.42, -0.32) until approximately 3.5 years before death ($\gamma_{30} = -3.60$, for West Germans; CI = -3.77, -3.42) when individuals transition into the steeper terminal decline ($\gamma_{10} = -2.00$; CI = -2.24, -1.77). Substantial between-person differences were found in level at change point, terminal, and pre-terminal slopes ($\sigma^2_{u0}, \sigma^2_{u1}, \sigma^2_{u2}$). Significant regional differences were apparent in the onset of the terminal decline ($\gamma_{31} = 0.44$; 95% CI = 0.17, 0.72), with East Germans' onset occurring almost a half-year later in life, and in the level of life satisfaction at that point ($\gamma_{01} = -3.81$; CI = -4.50, -3.11). Regional differences in the terminal slopes were not significant ($\gamma_{11} = 0.28$; CI = -0.20, 0.76). Historical differences proceeding since reunification manifest with the onset of terminal decline moving closer to death ($\gamma_{32} = 0.02$; CI = 0.00, 0.04), generally lower life satisfaction at the transition ($\gamma_{02} = -0.11$; CI = -0.16,

Table 2. Single-phase model for life satisfaction over time-to-death: Differences between East and West Germany in terminal decline (Model 1) and contributing role of covariates (Model 2).

Parameter	Life satisfaction (Model 1)		Life satisfaction (Model 2)	
	Estimate	CI	Estimate	CI
Fixed effects				
Intercept, γ_{00}	44.93*	44.75, 45.28	45.82*	45.21, 46.44
Linear slope, γ_{10}	-1.17*	-1.27, -1.08	-1.16*	-1.27, -1.04
Quadratic slope, γ_{20}	-0.06*	-0.06, -0.05	-0.06*	-0.07, -0.05
Region, γ_{01}	-2.79*	-3.57, -2.00	-4.58*	-6.00, -3.17
Time spent in reunification, γ_{02}	-0.06*	-0.11, -0.01	-0.06*	-0.11, -0.01
Deceased ≤ 69 years, γ_{03}	-	-	-1.46*	-2.28, -0.64
Deceased 70–79 years	-	-	-	-
Deceased ≥ 80 years, γ_{04}	-	-	-0.43	-1.24, 0.38
Gender, γ_{05}	-	-	0.87*	0.32, 1.43
Education, γ_{06}	-	-	2.25*	1.32, 3.19
Education ² , γ_{07}	-	-	-0.06*	-0.10, -0.03
Disability, γ_{08}	-	-	-5.02*	-5.67, -4.36
Region \times time spent in reunification, γ_{012}	0.12*	0.01, 0.24	0.15*	0.04, 0.26
Region \times deceased ≤ 69 years, γ_{013}	-	-	0.16	-1.70, 2.02
Region \times deceased ≥ 80 years, γ_{014}	-	-	2.23*	0.34, 4.12
Region \times education, γ_{016}	-	-	0.32	-0.04, 0.68
Linear slope \times region, γ_{11}	0.19*	0.09, 0.28	-0.03	-0.20, 0.14
Linear slope \times deceased ≤ 69 years, γ_{13}	-	-	0.12*	0.02, 0.22
Linear slope \times deceased ≥ 80 years, γ_{14}	-	-	-0.16*	-0.25, -0.06
Linear slope \times education, γ_{16}	-	-	0.03*	0.01, 0.05
Linear slope \times disability, γ_{17}	-	-	-0.17*	-0.25, -0.10
Linear slope \times region \times dec. ≤ 69 years, γ_{110}	-	-	0.22	-0.01, 0.45
Linear slope \times region \times dec. ≥ 80 years, γ_{111}	-	-	0.25*	0.02, 0.48
Linear slope \times region \times education, γ_{113}	-	-	0.08*	0.04, 0.13
Random effects				
Variance intercept, σ^2_{u0}	96.01*	90.69, 101.82	86.38*	81.46, 91.85
Variance linear slope, σ^2_{u1}	3.64*	3.27, 4.07	3.59*	3.22, 4.02
Variance quadratic slope σ^2_{u2}	0.02*	0.02, 0.26	0.02*	0.02, 0.02
Covariance intercept, linear slope, $\sigma_{u0,u1}$	8.06*	6.90, 9.23	7.61*	6.49, 8.73
Covariance intercept, quadratic slope, $\sigma_{u0,u2}$	0.29*	0.20, 0.37	0.27*	0.19, 0.36
Covariance linear slope, quadratic slope, $\sigma_{u1,u2}$	0.23*	0.20, 0.26	0.23*	0.20, 0.26
Residual, σ^2_e	62.62*	61.54, 63.74	62.66*	61.57, 63.77
AIC		248,892		248,470

Note. Unstandardized estimates and standard errors are presented. $N = 4,159$ ($N_{West} = 3,079$, $N_{East} = 1,080$) participants provided 33,908 observations. Scores were standardized to a T-metric ($M = 50$, $SD = 10$) based on 2002 SOEP sample ($M = 6.90$, $SD = 1.81$ on a 0–10 scale). Intercept centered at 2 years before death. Covariates are grand-mean centered. Higher parameter values denote differences favoring East Germans, more time spent in reunification, men, higher educated, and participants with disability. Bold font highlights effects of primary interest. CI = 95% confidence interval. AIC = Akaike Information Criterion. $p < .05$.

-0.06), and increased distance between the onset of terminal decline between East and West Germans' transition points ($\gamma_{33} = 0.05$; CI = 0.01, 0.10). Model-implied trajectories for multi-phase (spline) model shown in Figure 2 (Panel B) illustrate that East Germans enter, on average, the terminal decline phase 5 months later than their Western peers.

Comparing single- and multi-phase analyses, we find some evidence that the multi-phase model provide better fit of the data (AIC = 248,814 versus 248,892; $\sigma^2_e = 62.03$ versus 62.62) and explained more residual variance when including region into the models compared to an intercept-only model (33.51% versus 21.05% in single-phase models).

The role of individual difference factors

Results from the (single-phase quadratic) models with age at death, gender, education and disability included as additional covariates

are shown in Table 2 (Model 2). Even when accounting for these key individual characteristics, the gap in levels of life satisfaction reports between both East and West regions ($\gamma_{01} = -4.58$; CI = -6.00, -3.17) and East Germans' higher life satisfaction reports in recent years ($\gamma_{012} = 0.15$; CI = 0.04, 0.26) are still visible in level. When including covariates, we find that the linear change for the East German region is not experienced by all East Germans, but by specific groups ($\gamma_{11} = -0.03$; CI = -0.20, 0.14; not significant but relevant for significant three-way interactions, discussed further down). As expected, at the intercept location (2 years prior to death) individuals dying at younger ages ($\gamma_{03} = -1.46$; CI = -2.28, -0.64) and those with disability ($\gamma_{08} = -5.02$; CI = -5.67, -4.36) had lower life satisfaction, whereas men ($\gamma_{05} = 0.87$; CI = 0.32, 1.43) and those with more education reported higher life satisfaction ($\gamma_{06} = 2.25$; CI = 1.32, 3.19). Disabled participants experienced steeper well-being declines in both regions ($\gamma_{17} = -0.17$; CI = -0.25, -0.10).

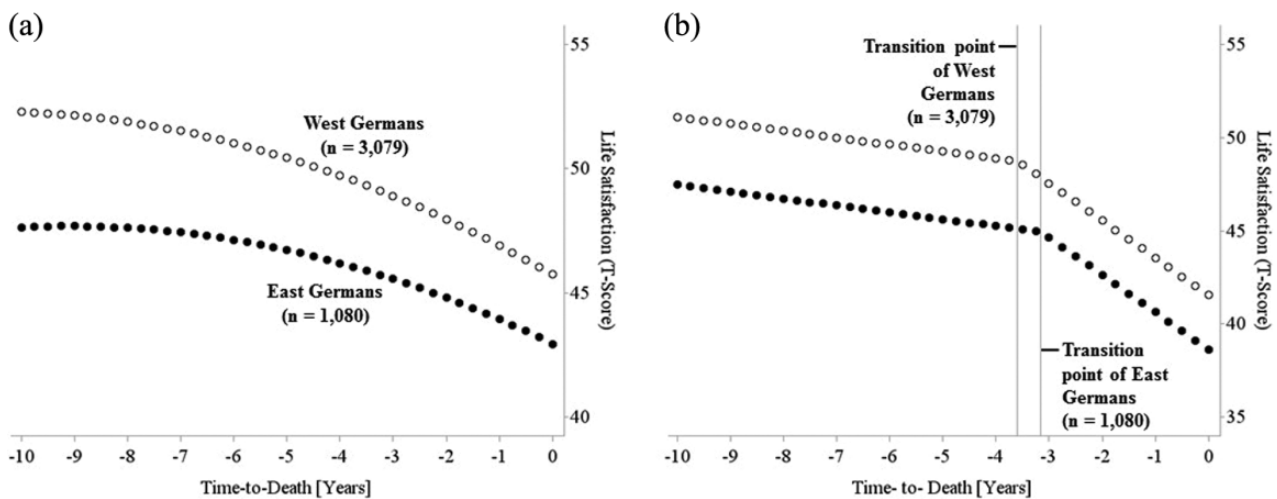


Figure 2. Panel A: Single-phase model-implied trajectories of life satisfaction over time-to-death in the last 10 years of life, residualized for time spent in reunification. West Germans (open circles) reported initially higher life satisfaction than East Germans (closed circles), but East Germans experienced less late-life declines. As a consequence, earlier differences diminish with approaching death.

Panel B: Multi-phase model-implied trajectories of life satisfaction over time-to-death in the last 10 years of life, residualized for time spent in reunification. East Germans (closed circles) enter the terminal phase of life satisfaction 5 months later than West Germans (open circles). The multi-phase model concurs with the single-phase model in that the gap between both regions shrinks with approaching death.

Most relevant for our research question, there were some regional differences in the relation between individual characteristics and terminal decline in well-being. East Germans who died at older ages ($\gamma_{014} = 2.23$; CI = 0.34, 4.12) and died in recent years ($\gamma_{012} = 0.15$; CI =) reported higher levels in well-being than their West German peers. In addition, dying at older ages ($\gamma_{111} = 0.25$; CI = 0.02, 0.48) and being more educated ($\gamma_{113} = 0.08$; CI = 0.04, 0.13) was associated with shallower declines of life satisfaction for individuals from East than from West Germany.

We ran several follow-up analyses to check the robustness of results. First, checking whether the age of death category of those deceased at the age of 69 years and younger is too broad indicated that main results do not change if we include an additional age category denoting those deceased at the age of 55 years and younger. Following empirical findings regarding some of the more prominent differences between East Germany and West Germany (Goldstein, Kreyenfeld, Huinink, Konietzka, & Trappe, 2010; Mollenkopf & Kaspar, 2005), we examined the role of (a) living in rural or urban areas, (b) religious activity, and (c) social relationships (operationalized here as whether the respondent was living with a partner). In these follow-up analyses, we corroborated reports from earlier phases of adult life that considerable individual and East–West differences existed in these variables. For example, levels of religious activities were higher among West Germans ($M = 1.87$, $se = 0.02$) than among East Germans ($M = 1.32$, $se = 0.02$; $F = 2.49$, $p < .05$). These variables were also associated with late-life well-being. Greater religious activity (parameter estimate = 1.92, $se = 0.17$, $p < .05$) and living with a partner (parameter estimate = 1.58, $se = 0.30$, $p < .05$) were each associated with higher level of well-being. More important for the question under study, however, degree of urbanization, religious activity, and living with a partner accounted for a portion of the East–West differences in late-life well-being noted above. In single-phase analyses, these three controls had little effect on the East–West differences in level (γ_{01}) of well-being or the extent of convergence across time since

reunification. However, they did account for some of the less steep decline in East Germans (γ_{11}). In multi-phase analyses, the three controls had little effect on the East–West gap in level of life satisfaction, but the differences in onset of terminal decline were accounted for by the religious activity and social relationship (living with a partner) variables. To further parse the possible role of a more general cumulative disadvantage from cultural differences, we matched (to the extent possible while maintaining sample size) a subset of East and West counties with similar levels of gross domestic product per capita (GDP; measured in 2001, the closest available year to the mean year of death, 2002). Only above-average counties in East Germany in GDP (Mean = 17.28, $n = 70$) and below-average counties in West Germany (Mean = 25.62, $n = 297$) were selected. Analyses with the 2,209 participants from these counties revealed lower levels of life satisfaction among those living in the richest counties in East Germany than those living in the poorest counties in West Germany (single-phase model: $\gamma_{01} = -2.75$, 95% CI = -3.98 , -1.51 ; multi-phase model: $\gamma_{01} = -3.55$, 95% CI = -4.66 , -2.44 , $p < .05$), whereas other differences were not apparent (e.g., comparable onsets of decline). In summary, follow-up analyses revealed two sets of results. First, for our major research questions a similar pattern of statistically significant results emerged. Second, a range of cultural, economic, and social factors contribute to the differences observed between residents in East Germany and West Germany in how well-being declines at the end of life.

Discussion

This study examined differences in terminal decline in well-being between two regional contexts: East and West Germany. Participants' well-being reports in both regions indeed followed a terminal decline trajectory, either indicated by accelerated decline (in single-phase models) or by relatively minor decline turning into steep decrements in the last years of life (in multi-phase models). Most important for our research question, East German participants reported lower well-being than their Western peers, but this gap

Table 3. Two-phase model for life satisfaction over time-to-death: Differences between regions East Germany and West Germany in the last years of life.

Parameter	Estimate	CI
Fixed effects		
Intercept, γ_{00}	48.74*	48.34, 49.14
Transition point, γ_{30}	-3.60*	-3.77, -3.42
Pre-terminal slope, γ_{20}	-0.37*	-0.42, -0.32
Terminal slope ² , γ_{10}	-2.00*	-2.24, -1.77
East Germany, γ_{01}	-3.81*	-4.50, -3.11
Time spent in reunification, γ_{02}	-0.11*	-0.16, -0.06
Time spent in reunification × East Germany, γ_{03}	0.06	-0.06, 0.19
East Germany × terminal slope, γ_{11}	0.28	-0.20, 0.76
Time spent in reunification × terminal slope \times , γ_{12}	-0.02	-0.05, 0.01
East Germany × transition point \times, γ_{31}	0.44*	0.17, 0.72
Transition point × Time spent in reunification, γ_{32}	0.02*	0.00, 0.04
Time spent in reunification × East Germany × Transition point, γ_{33}	0.05*	0.01, 0.10
Random effects		
Standard deviation intercept, σ_{u0}	9.52*	9.23, 9.81
Standard deviation pre-terminal linear slope, σ_{u2}	0.82*	0.77, 0.87
Standard deviation terminal linear slope, σ_{u1}	3.34*	3.04, 3.63
Correlation intercept, pre-terminal linear slope, r_{u0u2}	0.57*	0.52, 0.61
Correlation intercept, terminal linear slope, r_{u0u1}	-0.23*	-0.28, -0.17
Correlation terminal linear slope, pre-terminal linear slope, r_{u1u2}	-0.09	-0.18, 0.01
Residual variance, σ_e^2	62.03*	60.93, 63.13
AIC		248,814

Note. Unstandardized estimates and standard errors are presented. $N = 4,159$ ($N_{West} = 3,079$, $N_{East} = 1,080$) participants provided 33,908 ($N_{West} = 26,128$, $N_{East} = 7,780$) observations at 1-year intervals. Intercept centered at transition point. Life satisfaction scores were standardized to a T-metric ($M = 50$; $SD = 10$) based on 2002 SOEP sample ($M = 6.90$, $SD = 1.81$ on a 0–10 scale). Time spent in reunification was grand-mean centered. West Germans served as the reference. Bold font highlights effects of primary interest. CI = 95% confidence interval. AIC = Akaike Information Criterion. * $p < .05$.

narrows late in life and with passing time since reunification. Even when relevant individual difference characteristics and general trends towards convergence were taken into account, East Germans still reported approximately half a standard deviation lower life satisfaction 2 years before death. As relevant individual characteristics, we found that dying older than age 80, and being more educated, contributed to a shallower decline of life satisfaction among East Germans, but not so much among West Germans. We take these results as an indication that the context where people live and die profoundly shapes individuals' well-being. We found it particularly striking that after having experienced disadvantaged life circumstances for up to 40 years, East Germans who died in recent years reported higher life satisfaction than those who died shortly after reunification, thereby providing another indication of how malleable human development is, even at the very end of life.

Differences in terminal well-being decline between East and West Germany

We found partial support for our first research question that lifelong disadvantages experienced by East Germans reflected in all three

aspects of terminal well-being trajectories: lower levels, steeper rates of decline, and earlier onset of decline. East Germans reported considerably lower life satisfaction all the way until death. Our results go hand in hand with theoretical accounts of cumulative disadvantage (Ferraro & Shippee, 2009) suggesting that the effects of living conditions accumulate across life and shape functioning and development in key domains of life. East Germans' lower reports in well-being might be due to a myriad of disparities, including lower life expectancy, worse health infrastructure, and poorer health (Scholz & Maier, 2003) and show how large and long-lasting influences of environmental influences can be. However, East German participants' increased risk is not reflected in steeper slopes of decline, but they rather experienced shallower terminal decline compared to their West German peers: It appears as if with approaching death, existing disparities were narrowing. The gap between East and West Germany diminishes (over the last 10 years of life) by 40% (single-phase model) and 25% (multi-phase model).

East Germans do not enter terminal decline earlier but even later than their West German peers which points towards a diminishing discrepancy in well-being reports with approaching death. First, taking into account that East German participants in our sample died, on average, almost 2 years earlier, they spent almost the same proportion of their lifetime in the terminal decline phase (4.4% versus 4.9% for West Germans). Second, from a theoretical perspective, the finding might reflect that individuals in East Germany were capable of adapting to disadvantaged life circumstances because they have acquired higher resistance to stressors across their lifetime (Kastenbaum, 1980). Exposure to disadvantaged living situations might help individuals to learn to cope with disadvantaged situations, which in turn helps them to maintain their well-being; such buffering may also depend on the level of disadvantages a given individual has experienced.

Finally, our analyses indicate that East and West converge in their life satisfaction reports with passing time since reunification. Single-phase models convey that Germans who died in recent years reported slightly higher life satisfaction than those who died earlier in historical time. This result converges with multi-phase models in that East Germans' onset of terminal decline is delaying with passing time since reunification. In sum, our findings indicate that with passing time since reunification, individuals' experiences are malleable and experiencing more advantaged life circumstances in the last years of life contributes to a catch-up of well-being in East Germans. In general, with reunification, many efforts have been made to eliminate disadvantages, with West Germany providing huge financial support to eliminate pollution and improve health care quality. Empirical research has documented effects of these efforts. For example, Mand et al. (2013) find comparable treatment and prognosis for patients from both regions nowadays. These improved life conditions might be reflected in subjective perceptions: Frijters, Haisken-DeNew, and Shields (2004b) reported that life satisfaction rose in East Germans aged 20–60 years in the first 10 years after reunification and 35%–40% of the increase in well-being was due to higher household incomes. Despite efforts and the political goal of equality between both regions for a quarter-century, some disparities are still visible (e.g., identity as East or West German, unemployment rate), whereas others (e.g., subjective evaluations of one's quality of life) appear to converge.

In sum, results from single-phase and multi-phase models replicate well-established findings that West Germans report higher life satisfaction than East Germans (Frijters et al., 2004a; Westerhof & Keyes, 2006), but qualify such findings in two important ways:

Differences between both regions get smaller in late life and the effects of the natural experiment diminish with the time that has passed since its ending.

The role of individual difference factors

With the second research question, we examined the role of key individual characteristics and found that age at death, gender, education and disability only slightly attenuated the East–West differences. However, the gap in levels of well-being still remained despite the convergence trend late in life and with passing time since reunification. In both regions, dying at younger ages, being a woman, being less educated, and being disabled were each associated with lower well-being and disabled participants experienced steeper well-being declines. Our finding that dying in older ages was associated with higher life satisfaction in East Germans is in line with Vogt (2013) who concludes that it were particularly the older groups who benefitted from German reunification. Older East Germans also interpreted reunification-related changes more positively than their younger counterparts (Luhmann, Crayen, & Eid, 2010). We also found that higher education was more beneficial for East than West Germans: Being more educated (which also related to shallower declines) was associated with higher life satisfaction. This is in line with reports from earlier phases of adult life that higher education is associated with higher well-being (Cramm et al., 2013), particularly for disadvantaged groups. Interestingly, when including all covariates, the observed shallower decline of East Germans' well-being was only corroborated among those who died at younger or older ages and who were more educated. Follow-up analyses suggest that further cultural, economic, and social factors play into differences in the trajectory of terminal decline in life satisfaction.

Limitations and outlook

The data set used provided up to 16 repeated annual measures for a relatively large sample of participants. However, we examined only a limited set of relevant correlates and could not explore in detail the role of variables like housing and personal goals. Further factors on the societal level (e.g., perceived inequality, norms) could be contributing to disparities in late-life trajectories in well-being between East and West German residents, but were unfortunately not available in the SOEP. It is also possible that relevant variables have taken on a different meaning after reunification. To illustrate, after reunification many East Germans experienced societal disappointment and devaluation (e.g., with respect to professional expertise).

The Socio-Economic Panel Study allows us to examine late-life trajectories from deceased adults born across almost a century (1894–1988) across the study period 1990–2012 of which the last 5 years of the observation period still span 80 years of birth cohorts. However, when referring to time since reunification, we cannot rule out that these findings are confounded with cohort effects (e.g., younger cohorts reporting higher well-being than older cohorts: see Hülür, Ram, & Gerstorf, 2015). Our data are unique in that they span both East and West Germany, but—because of the stratification of the SOEP sampling scheme—the number of East Germans was only one-third the number of West Germans. Accordingly, the standard errors for East Germans were higher (although acceptable) and

may limit the generalizability for East Germany. In particular, East Germans with a disability might be underrepresented in our sample because of differential selection into the study or different classification systems (e.g., it could have been easier for West Germans to be officially registered as disabled and so receive the corresponding benefits). The nature of an individuals' death (e.g. cause, expected/unexpected) is highly relevant for the development of well-being in his or her last years of life. However, information about causes of death has only been added to the SOEP since 2009 and would thus reduce sample size to 10% (from $n = 4,159$ to $n = 422$) from which 18% may be 'accidents,' very broadly defined. Literature reviewing differences between East Germany and West Germany in causes of death and how these have changed since reunification suggests that considerable differences indeed existed at the time of reunification, but have been reduced ever since (Gaber, 2011). In particular, East German men die somewhat more frequently from both of the two most common causes of death among people aged 65 and older (cardiovascular diseases and cancer), whereas East German women die more frequently only from diseases of the cardiovascular system. It is well possible that our empirical findings according to which West Germans spent more time in the terminal decline phase than East Germans in part mirrors that East Germans (especially those younger than 65) had died more frequently from accidents than their West German peers. Thus, it seems that the full analyses may be a conservative estimate of the differences, given the 'selectivity' of the accidents towards East Germany.

This study included participants who died across adulthood. Because the magnitude, onset and duration of regional disadvantages are relevant (Ferraro & Shippee, 2009), it would be informative to investigate more precisely how life stage, experience and social roles at and during German separation (1949) and reunification (1990) may have shaped well-being. For example, Diwald, Huinink, and Heckhausen (1996) reported that those aged 50 at the time of reunification (birth cohort 1939–1941) reported the lowest self-esteem and self-efficacy, and we would expect that this cohort also reports low life satisfaction and is at risk for experiencing steep terminal decline in well-being. However, SOEP data provide too little pieces of information of individuals' location outside of the observation period to track the role of onset and duration of regional disadvantages.

Follow-up results examining possible cultural differences suggest that differences in late-life well-being between East Germany and West Germany result from a combination of cultural differences and cumulative disadvantages. Repeatedly reported cultural differences were for example East Germans' sense of injustice (e.g., in income) and different norms (e.g., redistributive preferences).

Although historical differences are nowadays diminished, further more mechanism-oriented work is needed to move towards designing possible interventions to equality between both parts. To illustrate, specific actions are needed to promote structural development or subventions to eliminate the income gap. These actions should consider that new regional trends on smaller regional units have emerged. For example, there are substantial differences within East and West Germany (e.g., fewer hospitals in some East German states, but not others). Thus, one of the next steps is to investigate the relevance of service, infrastructure and economic characteristics at smaller regional units (e.g., counties; Gerstorf et al., 2010).

Conclusions

This study sheds light on the role of geographic context for terminal decline in well-being. The regional context of East and West Germany offered a (quasi-) natural experiment to examine whether and how late life is experienced differently in the two regions. Our findings provide evidence that contextual embedding indeed plays a role and suggest that (a) differences even 25 years after reunification persist between East and West Germany, but (b) the effects of the natural experiment diminish, illustrating that the plasticity of human development still manifests in the last phase of life.

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Supplemental Material

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References

- Baltes, P. B. (1987). Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. *Developmental Psychology, 23*, 611–626. doi:10.1037/0012-1649.23.5.611
- Baltes, P. B., & Smith, J. (2003). New frontiers in the future of aging: From successful aging of the young old to the dilemmas of the fourth age. *Gerontology, 49*, 123–135.
- Bauernschuster, S., & Rainer, H. (2012). Political regimes and the family: How sex-role attitudes continue to differ in reunified Germany. *Journal of Population Economics, 25*, 5–27. doi:10.1007/s00148-011-0370-z
- Brockmann, H., & Klein, T. (2004). Love and death in Germany: The marital biography and its effect on mortality. *Journal of Marriage & Family, 66*, 567–581. doi:10.1111/j.0022-2445.2004.00038.x
- Burkhauser, R. V., Giles, P., Lillard, D. R., & Schwarze, J. (2005). Until death do us part: An analysis of the economic well-being of widows in four countries. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences, 60*, 238–246.
- Busse, R., & Riesberg, A. (2004). *Health care systems in transition: Germany*. Copenhagen: WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies.
- Clarke, P., Morenoff, J., Debbink, M., Golberstein, E., Elliott, M. R., & Lantz, P. M. (2013). Cumulative exposure to neighborhood context: Consequences for health transitions over the adult life course. *Research on Aging, 36*, 115–142. doi:10.1177/0164027512470702
- Clarke, P., & Smith, J. (2011). Aging in a cultural context: Cross-national differences in disability and the moderating role of personal control among older adults in the United States and England. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 66*, 457–467. doi:10.1093/geronb/gbr054
- Cramm, J. M., van Dijk, H. M., & Nieboer, A. P. (2013). The importance of neighborhood social cohesion and social capital for the well-being of older adults in the community. *The Gerontologist, 53*, 142–152. doi:10.1093/geront/gns052
- Cudeck, R., & Klebe, K. J. (2002). Multiphase mixed-effects models for repeated measures data. *Psychological Methods, 7*, 41–63.
- Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist, 55*, 34–43. doi:10.1037/0003-066X.55.1.34
- Diewald, M., Huinink, J., & Heckhausen, J. (1996). Lebensverläufe und Persönlichkeitsentwicklung im gesellschaftlichen Umbruch [Life courses and personality development in social change]. *Kölner Zeitschrift für Soziologie und Sozialpsychologie, 48*, 219–248.
- Elder, G. H. (1974). *Children of the Great Depression*. Chicago, IL: University of Chicago Press.
- Federal Institute for Research on Building, Urban Affairs and Spatial Development. (2011). *Demografische Spuren des ostdeutschen Transformationsprozesses: 20 Jahre deutsche Einheit* [Demographic traces of the East German transformation process: 20 years of German reunification]. Bonn, Germany.
- Federal Statistical Office. (2004). *Datenreport 2004. Zahlen und Fakten über die Bundesrepublik Deutschland* [Data report 2004. Number and facts about Federal Republic of Germany]. Bonn, Germany.
- Ferraro, K. F., & Shippee, T. P. (2009). Aging and cumulative inequality: How does inequality get under the skin? *The Gerontologist, 49*, 333–343. doi:10.1093/geront/gnp034
- Frijters, P., Haisken-DeNew, J. P., & Shields, M. A. (2004a). Investigating the patterns and determinants of life satisfaction in Germany following Reunification. *The Journal of Human Resources, 39*, 649–674. doi:10.2307/3558991
- Frijters, P., Haisken-DeNew, J. P., & Shields, M. A. (2004b). Money does matter! Evidence from increasing real income and life satisfaction in East Germany following reunification. *The American Economic Review, 94*, 730–740. doi:10.1257/0002828041464551
- Frommert, D., & Himmelreicher, R. K. (2010). Angleichung oder zunehmende Ungleichheit? Alterseinkünfte in den alten und den neuen Bundesländern [Assimilation or growing inequality? Retirement income in East and West Germany]. In P. Krause & I. Ostner (Eds.), *Leben in Ost- und Westdeutschland: Eine sozialwissenschaftliche Bilanz der deutschen Einheit 1990-2010* [Living in East and West Germany: A review on German reunification 1990-2010 from a social science perspective] (pp. 351–372). Frankfurt am Main, Germany: Campus.
- Fujita, F., & Diener, E. (2005). Life satisfaction set point: Stability and change. *Journal of Personality and Social Psychology, 88*, 158–164. doi:10.1037/0022-3514.88.1.158
- Gaber, E. (2011). *Sterblichkeit, Todesursachen und regionale Unterschiede* [Mortality, causes of death and regional disparities]. Berlin, Germany: Robert Koch Institute.
- Gerstorf, D., & Ram, N. (2012). Late-life: A venue for studying the mechanisms by which contextual factors influence individual development. In S. K. Whitbourne & M. J. Sliwinski (Eds.), *Handbook of Adulthood and Aging* (pp. 49–71). New York, NY: Wiley.

- Gerstorf, D., & Ram, N. (2013). Inquiry into terminal decline: Five objectives for future study. *The Gerontologist*, *53*, 727–737. doi:10.1093/geront/gnt046
- Gerstorf, D., Ram, N., Goebel, J., Schupp, J., Lindenberg, U., & Wagner, G. G. (2010). Where people live and die makes a difference: Individual and geographic disparities in well-being progression at the end of life. *Psychology and Aging*, *25*, 661–676. doi:10.1037/a0019574
- Gerstorf, D., & Wagner, G. G. (2010). Lebenszufriedenheit am Ende des Lebens in Ost- und Westdeutschland: Die DDR wirft noch einen langen Schatten [Life satisfaction at the end of life in East and West Germany: East Germany is casting a long shadow]. In P. Krause & I. Ostner (Eds.), *Leben in Ost- und Westdeutschland: Eine sozialwissenschaftliche Bilanz der deutschen Einheit 1990-2010* [Living in East and West Germany: A review of German Reunification 1990-2010 from a social science perspective] (pp. 429–445). Berlin, Germany: Campus.
- Goldstein, J., Kreyenfeld, M., Huinink, J., Konietzka, D., & Trappe, H. (2010). *Familie und Partnerschaft in Ost- und Westdeutschland* [Family and romantic relationship in East and West Germany]. Rostock, Germany: Max Planck Institute for demographic research.
- Headey, B., Muffels, R., & Wagner, G. G. (2010). Long-running German panel survey shows that personal and economic choices, not just genes, matter for happiness. *Proceedings of the National Academy of Sciences of the United States of America*, *107*, 17922–17926. doi:10.1073/pnas.1008612107
- Hülür, G., Ram, N., & Gerstorf, D. (2015). Historical improvements in well-being do not hold in late life: Birth-and death-year cohorts in the US and Germany. *Developmental Psychology*, *51*, 998–1012. doi:10.1037/a0039349
- Kastenbaum, R. J. (1980). Habituation as a model of human aging. *The International Journal of Aging & Human Development*, *12*, 159–170. doi:10.2190/BR5F-H8B7-2B9X-53U8
- Kotakorpi, K., & Laamanen, J.-P. (2010). Welfare state and life satisfaction: Evidence from public health care. *Economica*, *77*, 565–583. doi:10.1111/j.1468-0335.2008.00769.x
- Kroh, M., Pischner, R., Spieß, M., & Wagner, G. G. (2008). On the treatment of non-original sample members in the German Household Panel Study (SOEP). *Methoden - Daten - Analysen*, *2*, 179–198.
- Kroh, M., & Siegers, R. (2014). *Documentation of sample sizes and panel attrition in the German Socio Economic Panel (SOEP) (1984 until 2013)*. Berlin, Germany: DIW Berlin.
- Kumpmann, I., Gühne, M., & Buscher, H. S. (2012). Armut im Alter: Ursachenanalyse und eine Projektion für das Jahr 2023 [Poverty in old age: Causal analysis and prospect for the year 2023]. *Jahrbücher Für Nationalökonomie Und Statistik*, *232*, 61–83.
- Kunzmann, U., Little, T. D., & Smith, J. (2000). Is age-related stability of subjective well-being a paradox? Cross-sectional and longitudinal evidence from the Berlin Aging Study. *Psychology and Aging*, *15*, 511–526. doi:10.1037/0882-7974.15.3.511
- Lawton, M. P. (1982). Competence, environmental press, and the adaptation of older people. In M. P. Lawton, P. G. Windley & T. O. Byerts (Eds.), *Aging and the environment* (pp. 33–59). New York, NY: Springer.
- Little, R. J. A., & Rubin, D. B. (1987). *Statistical analysis with missing data*. New York, NY: John Wiley & Sons.
- Litwin, H. (2010). Social networks and well-being: A comparison of older people in mediterranean and non-mediterranean countries. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *65B*, 599–608. doi:10.1093/geronb/gbp104
- Lucas, R. E. (2007). Long-term disability is associated with lasting changes in subjective well-being: Evidence from two nationally representative longitudinal studies. *Journal of Personality and Social Psychology*, *92*, 717–730. doi:10.1037/0022-3514.92.4.717
- Luhmann, M., Crayen, C., & Eid, M. (2010). Entwicklung der Sorgen um die wirtschaftliche Situation in Ost- und Westdeutschland seit der Wiedervereinigung [Evolution of worries about the economical situation in East and West Germany since reunification]. In P. Krause & I. Ostner (Eds.), *Leben in Ost- und Westdeutschland: Eine sozialwissenschaftliche Bilanz der deutschen Einheit 1990-2010* [Living in East and West Germany: A review on German reunification 1990-2010 from a social science perspective] (pp. 751–766). Frankfurt am Main, Germany: Campus.
- Maier, H., & Scholz, R. (2004). Wiedervereinigung zeigt: Für ein langes Leben ist es nie zu spät. Ostdeutsche holen in Lebenserwartung auf [German reunification shows: It is never too late for a long life. East Germans are catching up in life expectancy]. *Demographische Forschung. Aus Erster Hand*, *1*, 1–2.
- Mand, C., Muller, T., Lefering, R., Ruchholtz, S., & Kuhne, C. A. (2013). A comparison of the treatment of severe injuries between the former East and West German states. *Deutsches Ärzteblatt International*, *110*, 203–210. doi:10.3238/arztebl.2013.0203
- Mollenkopf, H., & Kaspar, R. (2005). Ageing in rural areas of East and West Germany: Increasing similarities and remaining differences. *European Journal of Ageing*, *2*, 120–130. doi:10.1007/s10433-005-0029-2
- Motel-Klingebiel, A., Simonson, J., & Tesch-Römer, C. (2010). Alter und Altern in Ost und West: Zur Entwicklung der Lebensqualität alternder und alter Menschen seit der Vereinigung [Old age and ageing in East and West Germany: On the development of life quality of elder and elder growing people since reunification]. In P. Krause & I. Ostner (Eds.), *Leben in Ost- und Westdeutschland: Eine sozialwissenschaftliche Bilanz der deutschen Einheit 1990-2010* [Living in East and West Germany: A review on German reunification 1990-2010 from a social science perspective] (pp. 387–409). Frankfurt am Main, Germany: Campus.
- Nolte, E., Scholz, R., Shkolnikov, V., & McKee, M. (2002). The contribution of medical care to changing life expectancy in Germany and Poland. *Social Science & Medicine*, *55*, 1905–1921. doi:10.1016/S0277-9536(01)00320-3
- OECD. (2011). *Premature mortality*. In *Health at a Glance 2011: OECD Indicators*. Paris, France: OECD Publishing. Retrieved from http://dx.doi.org/10.1787/health_glance-2011-5-en
- Pruchno, R. A., Wilson-Genderson, M., & Cartwright, F. P. (2012). The texture of neighborhoods and disability among older adults. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *67*, 89–98. doi:10.1093/geronb/gbr131
- Ram, N., & Grimm, K. (2015). Growth curve modeling and longitudinal factor analysis. In W. Overton & P. C. M. Molenaar (Eds.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (7th ed.) (pp. 758–788). Hoboken, NJ: Wiley.
- SAS institute Inc. (2009). *SAS/STAT user's guide 9.2*. Cary, NC: SAS Institute Inc.
- Schimmack, U., & Oishi, S. (2005). The influence of chronically and temporarily accessible information on life satisfaction judgments. *Journal of Personality and Social Psychology*, *89*, 395–406. doi:10.1037/0022-3514.89.3.395
- Scholz, R., & Maier, H. (2003). German unification and the plasticity of mortality at older ages. *MPIDR Working Paper*, *31*.
- Thiel, C., & Heinemann, L. (1996). Nutritional behaviour differences in Germany. *Reviews on Environmental Health*, *11*, 35–40.

- Unger, R., & Rothgang, H. (2010). Häusliche Hilfe- und Pflegebedürftigkeit in Ost- und Westdeutschland [Domestic need of support and care in East and West Germany]. In P. Krause & I. Ostner (Eds.), *Leben in Ost- und Westdeutschland: Eine sozialwissenschaftliche Bilanz der deutschen Einheit 1990-2010* [Living in East and West Germany: A review on German reunification 1990-2010 from a social science perspective] (pp. 617–631). Frankfurt am Main, Germany: Campus.
- Vogt, T. C. (2013). How many years of life did the fall of the Berlin Wall add? A projection of East German life expectancy. *Gerontology, 59*, 276–282. doi:10.1159/000346355
- Westerhof, G. J., & Keyes, C. L. M. (2006). After the fall of the Berlin Wall: Perceptions and consequences of stability and change among middle-aged and older East and West Germans. *The Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 61B*, 240–247. doi:10.1093/geronb/61.5.S240