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Subjective Age and Attitudes Toward Own Aging Across Two Decades of Historical Time

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A large body of empirical evidence has accumulated showing that the experience of old age is "younger," more "agentic," and "happier" than ever before. However, it is not yet known whether historical improvements in well-being, control beliefs, cognitive functioning, and other outcomes generalize to individuals' views on their own aging process. To examine historical changes in such views on aging, we compared matched cohorts of older adults within two independent studies that assessed differences across a two-decade interval, the Berlin Aging Studies (BASE; 1990/1993 vs. 2017/2018, each $n = 256$, $M_{age} = 77$) and the Midlife in the United States Study (MIDUS; 1995/1996 vs. 2013/14, each $n = 848$, $M_{age} = 67$). Consistent across four different dimensions of individuals' subjective views on aging (age felt, age appeared, desired age, and attitudes toward own aging) in the BASE and corroborated with subjective age felt and subjective age desired in the MIDUS, there was no evidence whatsoever that older adults of today have more favorable views on how they age than older adults did two decades ago. Further, heterogeneity in views on aging increased across two decades in the MIDUS but decreased in BASE. Also consistent across studies, associations of views on aging with sociodemographic, health, cognitive, and psychosocial correlates did not change across historical times. We discuss possible reasons for our findings, including the possibility that individual age views may have become increasingly decoupled from societal age views.

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Lifespan psychological and life course sociological perspectives have long acknowledged that individual functioning and development are often profoundly shaped by the sociocultural conditions and historical contexts people are living in (Baltes et al., 2006; Elder, 1974; Schaie, 1965). Consistent with these notions, empirical evidence has accumulated to suggest that today's old age—those who are in their 60s and 70s in the beginning of the 21st century—is "younger" than old age was in prior eras (see Gerstorf et al., 2020, for overview). In addition, results from the Berlin Aging Studies (BASE) show, in line with reports from Schaie (2013) and many others (see Gerstorf et al., 2020, for overview), that today's 75-year-old Berliners are cognitively much fitter than the 75-year-old Berliners of 20 years ago and also report being happier, more satisfied with their lives, feeling less lonely, and perceiving their lives to be less controlled by others (Gerstorf et al., 2015, 2019; Hülür et al., 2016). Importantly, the effect size of these differences often lies in the moderate to large spectrum (e.g., $d = .85$ for cognitive functioning). Likewise, many aspects of physical and mental health have improved over the last decades, for example, in the area of functional health (Christensen et al., 2013; Zajacova & Montez, 2018).

However, it is not yet known whether these historical trends generalize to how people view their own aging processes. To move one step forward with the empirical examination of historical changes in views on aging, we provide a post hoc analysis of matched cohorts of older adults within two independent studies that do allow for an exploration of cohort effects in views on aging across two decades of historical time, the BASE (1990/1993 vs. 2017/2018, each $n = 256$, $M_{age} = 77$) and the Midlife in the United States Study (MIDUS; 1995/1996 vs. 2013/2014, each $n = 848$, $M_{age} = 67$).

Views on Aging

Views on aging address how people reflect on their own development and try to understand their own aging as they move through adulthood and old age (Brandtstädter & Rothermund, 2002). Aside from using their chronological age as a marker of their position in the life course (Settersten & Hagestad, 2015), individuals also draw on their perceptions and behavioral experiences with their own aging processes (Miche, Wahl, et al., 2014), to establish a sense of subjective aging as part of their aging self and identity (Diehl et al., 2014, 2021). Such personal views on aging are often distinguished from general views about aging that describe socially shared beliefs about processes of aging and how older people (as a group) are perceived and valued in a given society (e.g., age stereotypes; Hess, 2006; Levy, 2003, 2009; Wurm et al., 2017). It stands to reason that both personal and general age views may change with historical time, but our focus here in this study is on personal age views so as to better understand perceptions and behavioral experiences with one's own aging.

Subjective Age

One established concept to better understand how older adults experience and interpret their aging draws from the seminal work on *subjective age* (Kastenbaum et al., 1972). The subjective age concept and the respective vast previous work in this area (Debreczeni & Bailey, 2020; Kotter-Grühn et al., 2015; Pinquart & Wahl, 2021; Rubin & Berntsen, 2006; Stephan et al., 2013, 2015; Westerhof et al., 2014) rely on the assumption that feeling younger than one's chronological age functions as a psychological distancing effect in that individuals exclude themselves from the group of older adults (Weiss & Lang, 2012). Of note, additional dimensions suggested in the previous subjective age research include subjective age appeared ("look age") and subjective age desired (how old one would like to be in an ideal world; Montepare & Lachman, 1989).

Attitudes Toward Own Aging

A second widely used way to operationally define personal views on aging draws from the seminal work of Powell Lawton about the attitudes people hold toward their own aging, including how older adults feel about and evaluate their personal experience of getting older (Diehl et al., 2014; Hess, 2006; Lawton, 1975; Miche, Elsässer, et al., 2014; Westerhof et al., 2014). As part of the the Philadelphia Geriatric Center Morale Scale (PGCMS; Lawton, 1975), the attitude toward own aging subscale asks for a personal evaluation of age-related changes. In need of an internationally established measure, researchers in the field of subjective aging have used the subscale extensively as a stand-alone measure (e.g., Levy et al., 2002), though with different labels such as "aging satisfaction" (Kleinspehn-Ammerlahn et al., 2008), "self-perceptions of aging" (Levy et al., 2002), and "personal views about aging" (Kim et al., 2012).

The two conceptualizations share similarities and differences. To begin with, research has consistently shown that both more negative attitudes toward one's own aging and higher subjective age are associated with poorer subjective health, lower life satisfaction, impaired cognitive performance, and increased mortality hazards (Debreczeni & Bailey, 2020; Levy et al., 2002; Westerhof et al., 2014; Wurm et al., 2017). Likewise, Westerhof et al. (2014) found in their meta-analysis of longitudinal studies that the predictive effects of personal views on aging measures for health outcomes were highly comparable with those of subjective age measures. There are two major differences between the two conceptualizations. First, attitude toward one's own aging as a self-related attitude (Hess, 2006) comes with a strong self-evaluative component in that previous life time is compared with present life time ("Things keep getting worse as I get older"; see Miche, Elsässer, et al., 2014). Second, in contrast to subjective age, attitudes toward own aging were found to be more age-sensitive and become increasingly negative as people age (Kleinspehn-Ammerlahn et al., 2008; Miche, Elsässer, et al., 2014). Also, there is an ongoing debate whether feeling younger may be seen as a variant of ageism (Gendron et al., 2018) and nothing positive per se. In our work, we solely rely on the established relation of subjective age with a range of important end points. Subjective age thus echoes the youth orientation

existing in older adults and attitude toward own aging echoes the evaluation of the aging process per se. As we argue, using data on such duality is particularly promising to examine historical change in views on aging, because they indicate both, distancing from a primary societal marker of "being old," hence chronological age, *and* how age is personally valued.

Historical Change and Views on Aging: Mean-Level Differences

Conceptual Considerations

To better understand the underlying pathways for possible historical change in views on aging, we use the HIstorical Changes in Developmental Contexts (HIDECO) theoretical framework as an organizing scheme (Drewelies et al., 2019). HIDECO locates relevant factors for the understanding of cohort-related effects on human development at four levels of consideration: historical change in individual resources, social embedding, technology, and science (Drewelies et al., 2019). Applied to subjective views on aging, changes in key individual resources such as physical health, functional ability, and cognitive functioning suggest that old age seems to be getting "younger" (Gerstorf et al., 2020). As a consequence, personal views on aging may, on average, reflect this trend indicated by feeling young (subjective age) as well as valuing aging as a more positive experience than in the past (attitude toward own aging).

For social embeddedness, increases in life expectancy have produced a situation in which the overlapping lifetimes of consecutive generations is larger today than in the past. Following from the "contact hypothesis" according to which increased direct contact reduces prejudice, one may expect that the images the generations typically have of one another are more positive (Al Ramiah & Hewstone, 2013). In contrast though, it seems as if objective and direct contact is in fact lower today than in the past because social norms that generations should live at different places prevail (Levy, 2003).

Technological advances such as the internet is increasingly impacting also now on older adults' everyday life, but the stigma that older adults are not able to use digital technology also continues (Czaja et al., 2019). Hence, progressing digitalization and increasing need for smart technology use in day-to-day ecologies might have undermined subjective views on aging (Caspi et al., 2019).

Finally, at the Zeitgeist and societal/cultural norm level, existing research provides support that societal views on aging have become increasingly negative over the past two centuries in the U.S. (Mason et al., 2015; Ng & Chow, 2020; Ng et al., 2015). Likewise, it appears as if multimorbidity, functional losses, and cognitive decrements that are often observed in very old age are increasingly dominating the public discourse on aging (Baltes & Smith, 2003; Wahl & Ehni, 2020).

As a consequence of these and further historical changes at the four levels identified in the HIDECO model, we conclude that conceptual considerations lead to conflicting predictions.

Empirical Research

Operationally defining views on aging as subjective age, Hueluer et al. (2016) have compared data in the BASE of matched cohorts of on average 75-year-older adults obtained in the early 1990s with those obtained in the mid 2010s. Results revealed no evidence that the gap between subjective age and chronological age would be closing. Operationally defining views on aging as attitude toward own aging, Henchoz et al. (2019) compared samples of on average 68-year-olds enrolled in 2004, 2009, and 2014 in Lausanne, Switzerland. The authors also did not observe historical change in attitude toward own aging over the 10-year period studied. Findings are also available for operationally defining views on aging as a multidimensional concept of aging experiences (e.g., physical loss, offering developmental growth). For example, Wurm and Huxhold (2012) compared personal views on aging between independent samples of middle-aged and older adults (40–81 years) in the German Aging Survey, measured in 1996 versus 2008. Participants in 2008 reported on average fewer physical losses and more developmental growth than their same-aged peers in 1996. Huxhold (2019) used data between 1996 and 2017 from the same study to corroborate these findings for developmental growth perceptions.

Historical Change and Views on Aging: Heterogeneity, Covariation, and Prediction

While the existing literature on historical change has focused almost entirely on how mean levels of function have changed, extension into examinations of change in the between-person differences (i.e., heterogeneity) may provide new insight into if, how, and when psychological "disparities" in individuals' views on aging emerge. Thus, in addition to analyzing cohort differences in mean levels, we also explore whether the extent of disparity is narrowing or widening (Dannefer, 2020; Ryder, 1965; Settersten, 2003). Three sets of history-graded changes may contribute to changes in heterogeneity. First, innovations in (communication) technologies and educational pathways have dramatically increased the amount of information and inputs individuals can use to form their views on aging—and may contribute to expanded heterogeneity in later-born cohorts (for recent evidence of event-related changes in the heterogeneity of personality, see Jackson & Beck, 2021; age-related differences in the heterogeneity of interpersonal transgression, see Allemand & Olaru, 2021). Second, deinstitutionalization of lifespan development (see already Held, 1986; Kohli, 2007) and the erosion of social structures that have historically guided individuals into a "normal life course" may expand the ways that later-born cohorts can "act their age" (Neugarten & Neugarten, 1986). Third, historical increases in social inequality (Dannefer, 2020; Settersten, 2003) may contribute to psychological inequality and widen the range of views on aging across social strata.

Finally, because previous research has consistently shown that more negative views and older subjective age are associated with poorer developmental outcomes, an important research question also is whether patterns of covariation and prediction have changed across historical times. For example, it is possible that because older adults today enjoy on average longer and healthier lives (Harper, 2014), health considerations may presumably be less important for today's views on aging. Unfortunately, we are not aware of any empirical research that has tested such questions about historical change in heterogeneity, covariation, and prediction.

The Present Study

The major goal of the present study is to examine historical change in multiple dimensions of personal views on aging using two independent studies (BASE and MIDUS) that each involve two independent samples tested about two decades apart. We test for differences in mean levels, heterogeneity, covariation, and prediction of views of aging indicators from sociodemographic, health, cognitive, and psychosocial variables. We note that the BASE has included a total of four different indicators of views on aging, but only two of these subjective age measures are indeed parallel between BASE and MIDUS. We decided to include the contrast between the studies so as to broaden the picture. Having two comparable indicators of views on aging in an independent data set strengthen the robustness of findings. We expect to obtain converging evidence across BASE and MIDUS because both samples come from highly developed Western nations that are known to have experienced similar historical trends among older adults (Gerstorf et al., 2020). We acknowledge though the post hoc nature of our endeavor that uses data sets not initially designed for tests of historical change in views on aging.

Considering historical change in mean levels, we acknowledge that a range of functional indicators in old age have improved across recent decades, yet we posit that neither conceptual reasoning nor previous empirical research allow for deriving a directional hypothesis. That is, a positive trend (Huxhold, 2019; Wurm & Huxhold, 2012; perceived growth, perceived physical loss) or stability (Henchoz et al., 2019, attitudes toward own aging; Hueluer et al., 2016, subjective age) seem equally likely.

Method

Participants and Procedure

We compared matched subsamples from two independent studies that had assessed one or more dimensions of views on aging in population-based samples at intervals two decades apart: data from (a) the BASE obtained in 1990/1993 and the BASE-II obtained in 2017/2018 and (b) from the MIDUS obtained in 1995/1996 and the MIDUS-Refresher (MIDUS-R) sample obtained in 2013/2014. Detailed descriptions of participants, variables, and procedures can be found in previous publications (BASE: Baltes & Mayer, 1999; BASE-II: Bertram et al., 2014; Gerstorf et al., 2016; MIDUS: Brim et al., 2004; MIDUS-R: Kirsch & Ryff, 2016). Given that both studies are well established in the previous literature, select details relevant to this report are given in the Supplemental Online Material, Part 1. The full BASE sample comprised 516 residents of former West Berlin districts randomly drawn from the obligatory city registry and stratified by age and gender (age at baseline: $M = 84.92$, $SD = 8.66$, range = 70–103; 50% women). For BASE-II, we use the data from older participants, aged 60 years and older. Included in the current analyses for MIDUS were MIDUS and MIDUS-R participants aged 60 years and older.

In the Supplemental Online Material, Part 1, we also report follow-up analyses that comprehensively describe sample selectivity for all four samples. Two aspects are of note. First, all samples are positively select. As a consequence, findings obtained may not necessarily generalize to less healthy population segments. Second and most important for our research questions, these selectivity analyses suggest that our case-matched control design (for details, see below) represents a fair, if not conservative test of cohort differences because either the amount of positive selection was comparable across the cohort samples or the earlier-born participants were even more positively select than the later-born participants.

Measures

Views on Aging

For the subjective age dimensions in BASE, we were able to rely on a set of one-item assessments (e.g., Diehl et al., 2014; Montepare, 2009; Pinquart & Wahl, 2021): *Subjective age felt* ("How old do you feel?"), *subjective age appeared* ("How old would you say you look in the mirror?"), and *subjective age desired* ("If you could pick out your age right now, how old would you like to be?"), with responses provided in years (e.g., 55 years, 56 years, . . .). In MIDUS, slightly differently phrased indicators of *subjective age felt* ("Many people feel older or younger than they actually are. What age do you feel most of the time?") and *subjective age desired* ("Imagine you could be any age. What age would you like to be?") were available from both cohorts. Please see Supplemental Online Material, Part 2, for more details on measures used to assess subjective age.

Attitudes toward own aging were only available in BASE and measured with five items from the corresponding subscale of the PGCMS (Lawton, 1975): "Things keep getting worse as I get older," "I have as much pep as I had last year," "As I get older, I am less useful," "As I get older, things are better than I thought they would be," "I am as happy now as I was when I was younger," answered on a 5-point Likert scale (BASE: 1 = *applies very well* to 5 = *does not apply*; BASE-II: 1 = *does not apply* to 5 = *applies very well*). Where necessary, responses were coded so that higher scores indicate more positive attitudes. Internal consistencies were acceptable in both studies (Cronbach's $\alpha = .74$ in BASE and $\alpha = .69$ in BASE-II).

Correlates

In BASE, we included sociodemographic, health, cognitive, and psychosocial correlates. Sociodemographic variables encompassed *chronological age*, one binary variable for *gender* (woman = 1, man = 0), and *education* measured as the number of years spent in formal schooling. In MIDUS, a number of correlates were directly comparable with BASE (*chronological age*, *gender*, and *education*), whereas others (e.g., health and psychosocial variables) were only partially comparable. Please see Supplemental Online Material, Part 3, for more details on measures used. Hence, although not fully comparable, we were able to consider established health and psychosocial measures in both data infrastructures.

Statistical Procedure

Matching

To equate each of the two historically differing samples as closely as possible on their age distribution, we used separately in the BASE and in MIDUS 1:1 propensity score matching procedures (Foster, 2010; Thoemmes & Kim, 2011) to select for each participant from the earlier-born cohorts ($n_{BASE} = 414$; $n_{MIDUS} = 6{,}273$) a "twin" participant from the later-born cohorts ($n_{BASE\text{-}II} = 1{,}112$; $n_{MIDUS\text{-}R} = 3{,}577$) who had the same (or as similar as possible) age at baseline.

Matching on sex was not necessary because the samples did not differ on sex to begin with. Using the between-groups distance matrix of logit-transformed propensity scores (Rosenbaum & Rubin, 1985), we matched nearest neighbors with a caliper-matching (maximum allowable distance between matched participants; Austin, 2014) algorithm that was continuously increased by steps of 0.001 until cohort differences in age were no longer reliably different from 0 at $p < .05$ ($c_{BASE} = 0.18$ *SD*; $c_{MIDUS} = 0.09$ *SD*). A suitable neighbor could be identified for 248/256 BASE and 848 MIDUS participants, resulting in the final sample sizes for the current analyses. The slight differences in sample size emerged because across the four views on aging dimensions, several participants had missing data on one or two of the dimensions but valid data on others. Descriptive statistics for study measures are given in Table 1 for the BASE studies and in Table 2 for MIDUS separately for the matched cohorts. For example, while the original age ranges of BASE and BASE-II vary considerably (70–103 vs. 61–88 years), the selected subsamples of either study resulted in a final, common age range of 70–92 years. We also note that several of the correlates that we examined could have alternatively been included as part of the propensity score matching procedure. However, we faced a considerable trade-off between the number of variables included in the matching and the resulting sample size. Balancing the potential to examine how views on aging were related to multiple correlates with statistical power considerations based on sample size, we only matched based on age.

Statistical Procedure

We used a multivariate structural equation modeling framework (Loehlin, 1987) to test our research questions (see Supplemental Online Material, Part 6, for Figure S1). We examined group differences in means (μ_{aa}, μ_{sf}, μ_{sa}, and μ_{sd}), variances (σ_{aa}, σ_{sf}, σ_{sa}, and σ_{sd}) and covariances ($\rho_{aa,sf}$, $\rho_{aa,sa}$, $\rho_{aa,sd}$, $\rho_{sf,sa}$, $\rho_{sf,sd}$, and $\rho_{sa,sd}$) among *Positive attitudes on aging*, *Subjective age felt*, *Subjective age appeared*, and *Subjective age desired*, and how the four variables were uniquely related to sociodemographic, health, cognitive, and psychosocial correlates ($\beta_{a,aa}$ through $\beta_{1,sd}$). We tested differences between groups with nested multigroup models in which parameters describing the earlier-born cohort (BASE, MIDUS) and the later-born cohort (BASE-II, MIDUS-R) were constrained equal or allowed to differ. Following usual practice (Grimm et al., 2016, Chapter 6), we compared four models, ordered to allow for more cohort group specificity. The first model (M1) is an invariance model that estimates all parameters as identical across cohort groups. This model has the fewest parameters (simplest model) and maps onto Figure S1 in the Supplemental Online Material with one set of parameters describing the full sample, without any cohort specificity. The second model (M2) follows the logic of commonly utilized statistical models that test group-level mean differences (e.g., analysis of variance [ANOVA] and independent samples *t*-test) and allows the means of the views on aging variables to vary across cohorts estimating these separately for each group, while all other parameters remain invariant. The third model (M3) allows the variances and covariances of the views on aging variables to vary across cohorts and estimates these separately for each group (as per the move from ANOVA to multivariate analysis of variance [MANOVA]). In a fourth model (M4), we examine whether the noted cohort differences in sociodemographic, health, cognitive, and psychosocial correlates carry through to the views on aging dimensions and/or the relations between these correlates and the views on aging dimensions. Following earlier reports of cohort differences, we allowed in each of the models tested the means and variances of the correlates to differ across cohort groups. At each

Table 1
Intercorrelations for the Variables Under Study in the Berlin Aging Studies

Main study variable	Intercorrelations												
	1	2	3	4	5	6	7	8	9	10	11	*M*	(*SD*)
1. Subjective age felt (−0.76 to −0.26)	1	.46*	.32*	−.28*	.00	.11	−.03	−.05	−.05	.01	.06	−0.14	(0.13)
2. Subjective age appeared (−0.76 to −0.32)	.69*	1	.31*	−.20*	−.15*	.17*	−.04	−.06	.06	−.09	−.05	−0.08	(0.10)
3. Subjective age desired (−0.92 to −0.15)	.24*	.25*	1	−.03	−.06	.21*	−.02	−.08	.05	−.10	−.08	−0.28	(0.22)
4. Positive attitudes toward aging (1–5)	−.32*	−.28*	.07	1	−.17*	−.21*	.17*	.29*	.23*	−.16*	−.39*	3.49	(0.81)
5. Chronological age (70–92)	−.14*	−.17*	−.13*	−.02	1	.08	−.07	−.35*	−.30*	.19*	.12*	77.49	(4.45)
6. Women	.00	.01	.10	−.03	−.05	1	−.29*	−.75*	−.03	−.03	.14*	52%	
7. Cohort-normed education (−2.70 to −3.50)	−.13*	−.10	.08	.08	.11	.02	1	.28*	.30*	−.11	−.22*	0.11	(0.99)
8. Grip strength (0–100)	−.06	−.04	−.05	.13	−.05	−.78*	−.04	1	.20*	−.10	−.15*	40.58	(25.57)
9. Digit Symbol (3–76)	.08	.08	−.07	.06	−.09	.26*	−.06	−.18*	1	−.27*	−.22*	29.22	(10.13)
10. External control beliefs (1–4.75)	.18*	.10	.01	−.23*	.11	−.19*	−.04	.15*	−.12	1	.05	2.38	(0.90)
11. Loneliness (1–4.14)	.17*	.17*	.08	−.21*	.10	−.07	−.03	.00	−.03	.14*	1	2.06	(0.63)
M	−0.13	−0.09	−0.28	3.52	77.49	51%	−0.06	43.80	42.60	1.68	1.58		
(*SD*)	(0.10)	(0.08)	(0.17)	(0.76)	(3.92)		(1.04)	(12.49)	(10.99)	(0.67)	(0.63)		

Note. Subjective age felt, subjective age appeared, and subjective age desired all represent the standard proportional difference score based on chronological age. Grip strength is percent of maximum possible (POMP) scaled. Intercorrelations among participants in the Berlin Aging Study (BASE; born 1898–1922, data obtained in 1990/1993) are presented above the diagonal, intercorrelations among participants in the Berlin Aging Study II (BASE-II; born 1925–1947, data obtained in 2017/2018) are presented below the diagonal. In the analyses, the sociodemographic correlates were centered using the means of the earlier-born BASE sample, and all other variables were z-standardized also using the BASE cohort as the reference.
* $p < .05$.

Table 2
Intercorrelations for the Variables Under Study in the Midlife in the United States Study

Main study variable	Intercorrelations								
	1	2	3	4	5	6	7	*M*	(*SD*)
1. Subjective age felt (–0.98 to –0.61)	1	.06	.03	−.04	−.06	.25*	.16*	−0.19	(0.14)
2. Subjective age desired (−0.97 to −0.57)	.12*	1	−.12*	.16*	.12*	−.11*	−.11*	−0.41	(0.20)
3. Chronological age (60–75)	.04	.01	1	.03	−.04	.12*	.07	66.99	(4.25)
4. Women	.01	.13*	.04	1	−.12*	.17*	.16*	50%	
5. Education (6–20)	−.07	.17*	−.13*	−.12*	1	−.15*	−.18*	13.43	(2.80)
6. Functional limitations (1–4)	.26*	−.09*	.10*	.20*	−.30*	1	.27*	1.92	(0.89)
7. Perceived constraints (1–7)	.21*	−.17*	.02	.04	−.26*	.33*	1	2.81	(1.38)
M	−0.19	−0.40	67.00	50%	15.02	2.06	2.59		
(*SD*)	(0.17)	(0.21)	(4.27)		(2.64)	(0.96)	(1.22)		

Note. Subjective age felt represents the standard proportional difference score based on chronological age. Intercorrelations among participants in the Midlife in the United States Study (MIDUS; born 1920–1936, data obtained in 1995/1996) are presented above the diagonal, intercorrelations among participants in the MIDUS-Refresher (MIDUS-R; born 1938–1954, data obtained in 2013/14) are presented below the diagonal. In the analyses, the sociodemographic correlates were centered using the means of the earlier-born MIDUS sample, and all other variables were z-standardized also using the MIDUS cohort as the reference.
* $p < .05$.

step, if the omnibus tests indicated that the cohorts differed, we engaged a series of one-parameter tests to identify which specific parameters differed across cohorts.

Age, gender, and education were effect-coded/centered; all other variables were *z*-standardized in an effect size metric using the earlier-born cohort as the reference ($M = 0$, $SD = 1$). Models were fit to the data using M*plus* (Muthén & Muthén, 1998–2017). Missing data were low (<3%) and accommodated via full-information maximum likelihood (FIML) estimation and missing at random assumptions (Little & Rubin, 1987).

Results

Descriptive Findings

Tables 1 and 2 report descriptive statistics and intercorrelations in the BASE and MIDUS studies for the measures under study, separately for each of the two cohort samples. Five aspects are of note. First, the matched MIDUS participants were on average about 10 years younger than the matched BASE participants (67 years vs. 77 years). We note that the large majority of participants in the matched BASE samples were between ages 70 and 80 years (81%) and in the matched MIDUS samples between 60 and 70 years (74%). None of the BASE participants and only very few BASE-II participants were younger than age 70 years. Second, the four views on aging dimensions show only moderately sized intercorrelations in the BASE studies. With the exception of one instance (tested and discussed later), all intercorrelations were in part considerably below $r = .50$, ranging from $r = –.03$ between positive attitudes toward aging and subjective age desired among the earlier-born cohort to $r = .46$ between subjective age felt and subjective age appeared among the earlier-born cohort. This suggests that the four views on aging dimensions are interrelated, yet distinguishable facets of the larger concept space.

Third, in both BASE and MIDUS studies, views on aging were related to the sociodemographic, health, cognitive, and psychosocial factors by and large in expected ways. For example, among the earlier-born BASE cohort, older age, being a woman, lower cohort-normed education, poor performance on grip strength, and the Digit Symbol Test as well as reporting more external control beliefs in powerful others and loneliness were each significantly associated with less positive views on aging. Likewise, among the earlier-born MIDUS cohort, more functional limitations and reporting more perceived constraints were each significantly associated with older subjective age felt. Fourth, associations with the correlates tended to be stronger in the BASE studies for attitudes toward aging than for the three subjective age dimensions. In a similar vein, subjective age felt in MIDUS was not associated with any of the sociodemographic variables. Finally, as one would expect, the correlates themselves showed in part substantial associations with one another. For example, the grip strength and Digit Symbol Tests in the BASE studies exhibited sizeable intercorrelations with one as well as with chronological age. By and large, the pattern of correlations indicates that in both studies, the measures mostly behave as expected from the prior literature.

Historical Change in Views on Aging: Differences in Mean Levels

Results of the multigroup nested model comparisons are reported in Table 3 (upper portion: BASE; lower portion: MIDUS). The baseline invariance model, which assumes that the earlier-born and later-born cohorts are from a single population (i.e., are not different), did not fit the data well (e.g., BASE: RMSEA = 0.158). Successive models examined how the cohort groups differed in each study.

In the BASE, the improvement in model fit when we allowed the means of the views on aging variables to differ across cohorts was not statistically significant ($\Delta\chi^2 = –7.70$, $df = 4$, $p > .10$), suggesting that, on average, earlier-born older adults who provided data in 1990/1993 did not differ from same-aged later-born older adults who provided data in 2017/2018 on any of the four views on aging dimensions. Likewise, there was also no statistically significant improvement in model fit in the MIDUS samples when we allowed the means of the two views on aging variables to differ across cohorts ($\Delta\chi^2 = –1.68$, $df = 2$, $p > .10$). Mean-level comparisons are presented in Figure 1 (subjective age felt in BASE vs. BASE-II and MIDUS vs. MIDUS-R), Figure 2 (subjective age desired in

Table 3
Results of Nested Model Comparisons That Allow for More and More Cohort Group Specificity

Model	Goodness-of-fit indices				
	$\chi^2(df)$	$\Delta\chi^2(df)$	RMSEA	AIC	CFI
Berlin Aging Studies					
Zero-order models					
M1: Invariance	103.03 (14)	—	0.158	5,048.22	0.721
M2: Means views on aging allowed to vary	95.33 (10)	−7.70 (4)	0.183	5,048.51	0.733
M3: (Co)variances views on aging allowed to vary	0.00 (0)	−95.33 (10)*	0.000	4,973.19	1.000
Correlates included					
M1: Invariance	157.06 (42)	—	0.103	14,806.14	0.738
M2: Means views on aging allowed to vary	136.95 (38)	−20.11 (4)*	0.101	14,794.04	0.775
M3: (Co)variances views on aging allowed to vary	42.67 (28)	−94.28 (10)*	0.045	14,719.75	0.967
M4: Prediction allowed to vary	0.00 (0)	−42.67 (28)	0.000	14,733.08	1.000
Midlife in the United States Study					
Zero-order models					
M1: Invariance	24.24 (5)	—	0.067	9,960.96	0.000
M2: Means views on aging allowed to vary	22.56 (3)	−1.68 (1)	0.088	9,963.28	0.000
M3: (Co)variances views on aging allowed to vary	0.00 (0)	−22.56 (3)*	0.000	9,946.72	1.000
Correlates included					
M1: Invariance	38.19 (15)	—	0.043	39,233.93	0.923
M2: Means views on aging allowed to vary	37.81 (13)	−0.38 (1)	0.047	39,237.55	0.918
M3: (Co)variances views on aging allowed to vary	16.33 (10)	−21.48 (3)*	0.027	39,222.07	0.979
M4: Prediction allowed to vary	0.00 (0)	−16.33 (10)	0.000	39,225.74	1.000

Note. RMSEA = root-mean-square error of approximation; AIC = Akaike information criterion; CFI = comparative fit index; M = model. Means and variances of and covariances among the correlates were estimated freely across groups.
* $p < .05$.

BASE vs. BASE-II and MIDUS vs. MIDUS-R), and Figure 3 (positive attitudes toward aging in in BASE vs. BASE-II). Findings for subjective age appeared in BASE versus BASE-II are presented in Supplemental Online Material, Part 6, Figure S2.

To put our findings in larger perspective, we replicated previous findings that our later-born cohorts of older adults in the BASE are slightly better in grip strength as a measure of upper body functioning, $F(1, 489) = 3.12$, $p = .0779$, $d = 0.16$, perform substantially better on the cognitive functioning test of perceptual speed,(Digit Symbol: $F(1, 502) = 202.33$, $p < .0001$, $d = 1.27$, perceive their lives to be considerably less determined by powerful others, $F(1, 508) = 96.49$, $p < .0001$, $d = 0.87$, and also report considerably lower levels of loneliness, $F(1, 498) = 70.93$, $p < .0001$, $d = 0.75$, than same-aged earlier-born cohorts of older adults. Despite these mean-level improvements in functioning on central correlates of successful aging, the two cohorts did not differ on any of the four views on aging dimensions considered in our study.

Historical Change in Views on Aging: Differences in Heterogeneity, Covariation, and Prediction

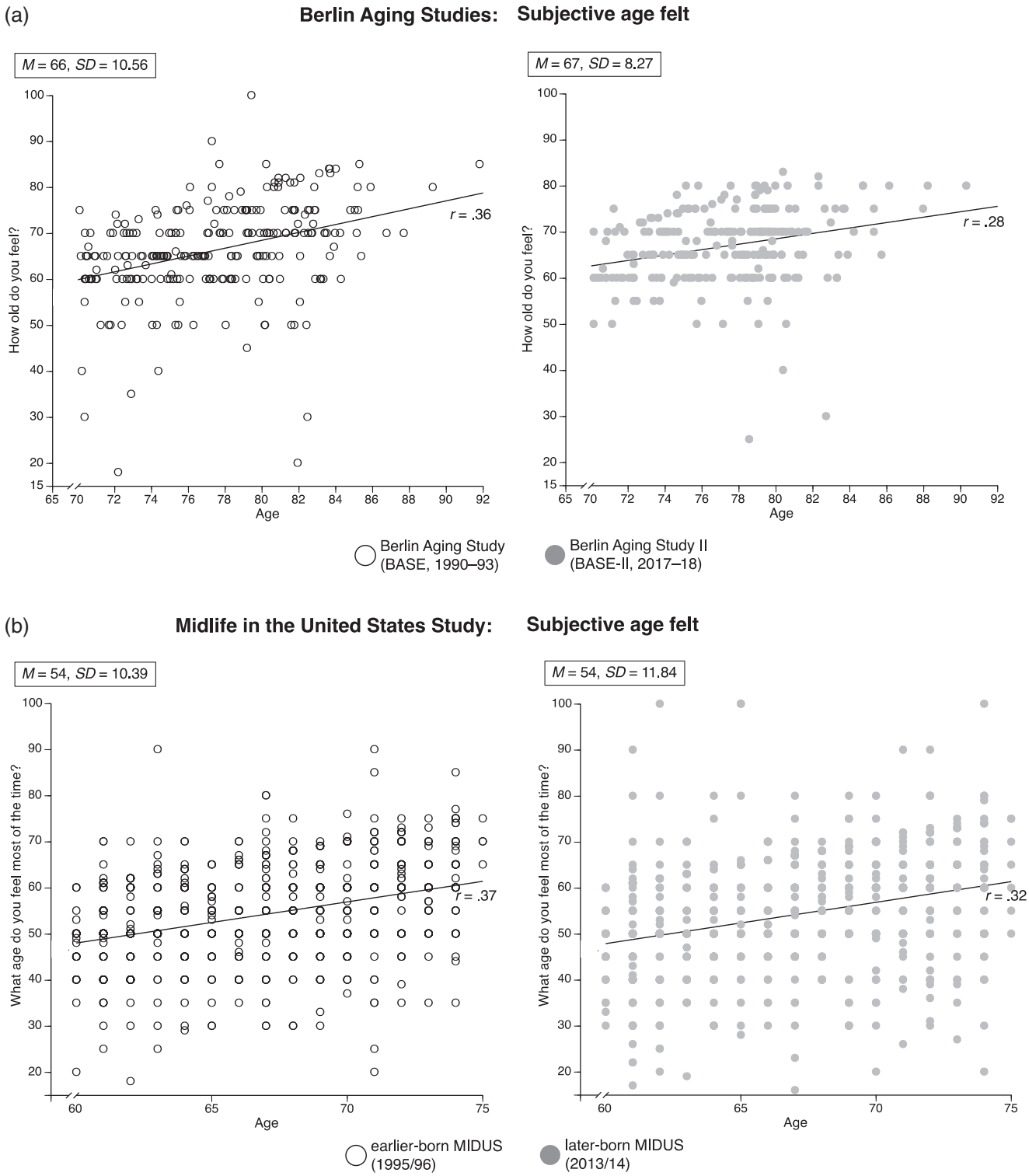
For this step of our analysis, we allowed the group-level variances and covariances to differ. In both studies, the improvement in fit was statistically significant (BASE: $\Delta\chi^2 = -95.33$, $df = 10$, $p < .0001$; MIDUS: $\Delta\chi^2 = -22.56$, $df = 3$, $p < .0001$), suggesting that the groups differed in the extent of between-person differences or in relations among the views on aging variables. We then probed those differences more specifically.

In the next series of analyses, we probed for cohort group differences in each of the elements of the variance–covariance structure of views on aging. These formal tests indicated that in the BASE, the size of between-person differences differed between cohort groups on subjective age felt (relative to model M2 in Table 2 that allows the means only to vary across groups: $\Delta\chi^2 = -32.49$, $df = 1$), subjective age appeared (zero-order level: $\Delta\chi^2 = -56.45$, $df = 1$), and subjective age desired (zero-order level: $\Delta\chi^2 = -15.30$, $df = 1$, all ps $< .0001$), but not on attitudes toward aging (zero-order level: $\Delta\chi^2 = -1.90$, $df = 1$, $p > .10$). Figure 4 reports all parameter estimates for a model that allows for cohort group specificity in means, variances, and covariances at the zero-order level. Inspection of parameter estimates reported in the upper portion of the figure reveals that for all three subjective age dimensions in BASE, between-person heterogeneity was larger among the earlier-born cohort of older adults than among the later-born cohort (e.g., subjective age felt at the zero-order level: 1.00 vs. 0.656). For subjective age appeared and subjective age desired, individual differences were almost twice as large in the early 1990s (1.00 for both) than in the mid-to-late 2010s (0.538 and 0.571).

In BASE, we also probed for cohort differences in how the four views on aging dimensions were interrelated with one another. Inspection of Figures 4 and 5 indicates that these covariances were very similar across cohorts, with one exception. The intercorrelation between subjective age felt and subjective age appeared was considerably higher in the later-born cohort of older adults ($r = .69$) than these were in the earlier-born cohort ($r = .46$). Nested model comparisons corroborated that the difference in the

Figure 1

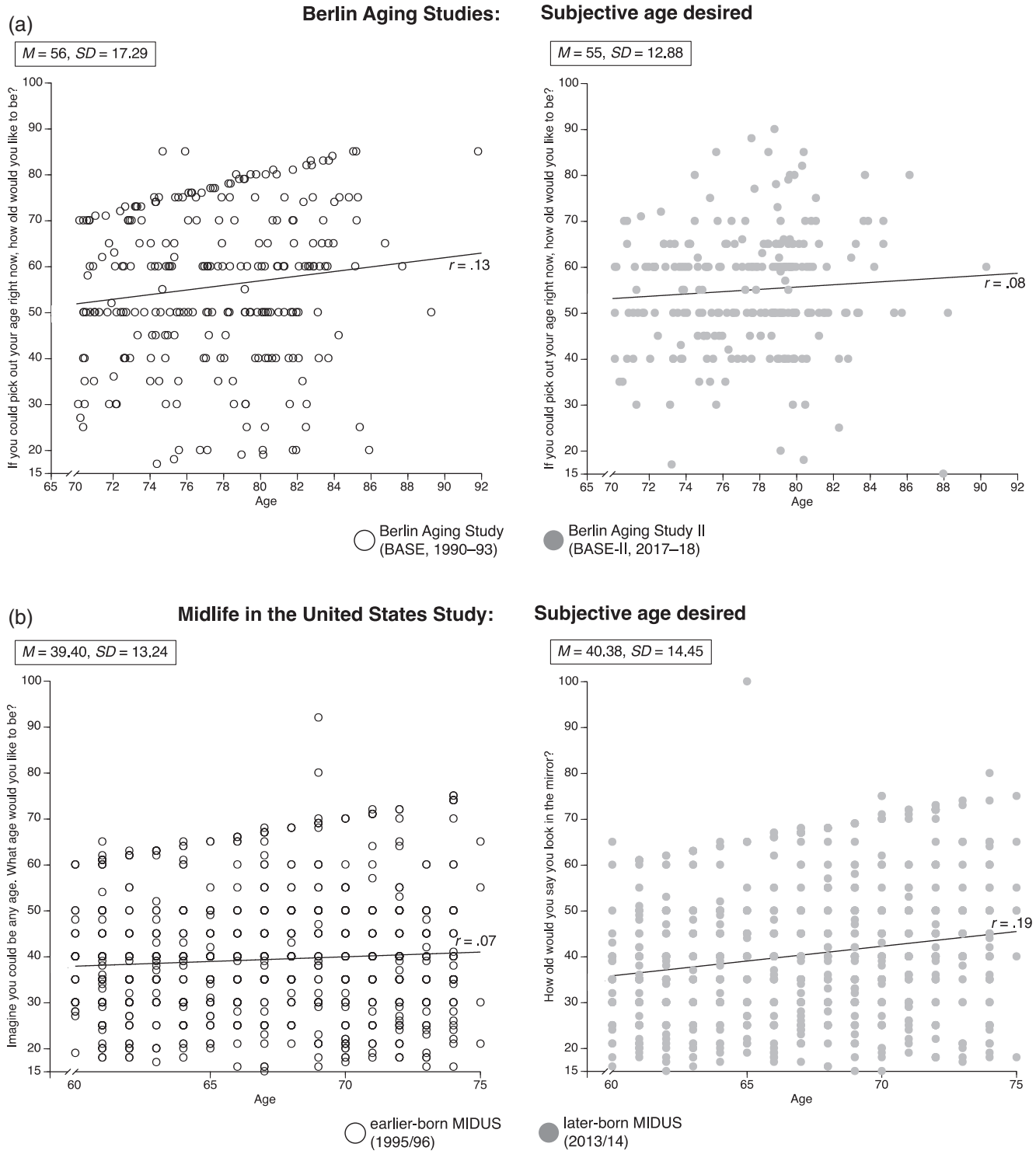
Illustrating Average Cohort Differences and Individual Differences in Subjective Age Felt in the Berlin Aging Studies (Upper Panel A) and the Midlife in the United States Study (Lower Panel B)



Note. The dots are raw data from participants in the matched Berlin Aging Study (BASE; open circles) and Berlin Aging Study II (BASE-II; closed gray circles) samples. Same for Midlife in the United States Study (MIDUS; open circles) and MIDUS-Refresher (MIDUS-R; closed gray circles) samples. Means and standard deviations for subjective age felt for each cohort are displayed separately on the y-axis. Note that analyses were carried out with age proportional subjective age scores. On average, no differences whatsoever were observed between data obtained in 1990/1993 versus 2017/2018 in BASE/BASE-II. Same for contrast 1995/1996 versus 2013/2014 in MIDUS/MIDUS-R.

Figure 2

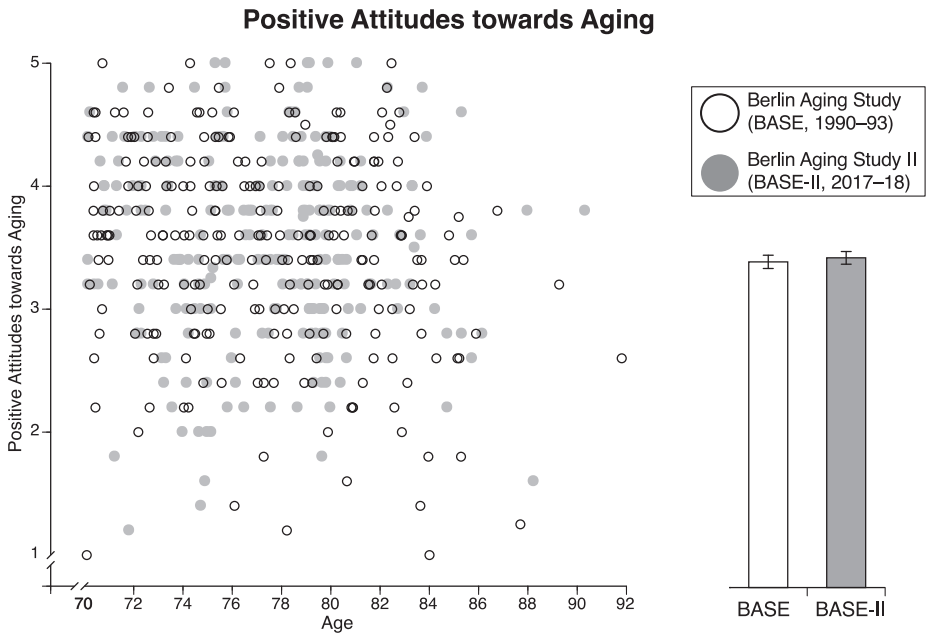
Illustrating Average Cohort Differences and Individual Differences in Subjective Age Desired in the Berlin Aging Studies (Upper Panel A) and the Midlife in the United States Study (Lower Panel B)



Note. The dots are raw data from participants in the matched Berlin Aging Study (BASE; open circles) and Berlin Aging Study II (BASE-II; closed gray circles) samples. Same for Midlife in the United States Study (MIDUS; open circles) and MIDUS-Refresher (MIDUS-R; closed gray circles) samples. Means and standard deviations for subjective age felt for each cohort are displayed separately on the y-axis. Note that analyses were carried out with age proportional subjective age scores. On average, no differences whatsoever were observed between data obtained in 1990/1993 versus 2017/2018 in BASE/BASE-II. Same for contrast 1995/1996 versus 2013/2014 in MIDUS/MIDUS-R.

Figure 3

Illustrating Average Cohort Differences and Individual Differences in Positive Attitudes Toward Aging in the Berlin Aging Studies



Note. The dots are raw data from participants in the matched Berlin Aging Study (BASE; open circles) and Berlin Aging Study II (BASE-II; closed gray circles) samples. Sample means and standard errors for each cohort are displayed separately. It can be obtained that on average, no differences whatsoever were observed between data obtained in 1990/1993 versus 2017/2018 on this key dimension of views on aging.

association was statistically significant (relative to model M2 in Table 2 that allows the means only to vary across groups: $\Delta\chi^2 = -46.10$, $df = 1$, $p < .0001$).

In MIDUS, the formal tests indicated that the size of between-person differences differed between cohort groups on subjective age felt (relative to model M2 in Table 2 that allows the means only to vary across groups: $\Delta\chi^2 = -17.30$, $df = 1$, $p < .0001$), but not on subjective age desired (zero-order level: $\Delta\chi^2 = -2.65$, $df = 1$, $p > .10$). Nested model comparisons also indicated that the size and direction of the correlation between subjective age felt and subjective age desired did not differ between the two cohorts (relative to model M2 in Table 2 that allows the means only to vary across groups: $\Delta\chi^2 = -0.75$, $df = 1$, $p > .10$). Parameter estimates for MIDUS are reported in the lower portion of Figure 5. These indicate that the pattern of differences in variability for MIDUS is reversed to that observed in BASE, with the individual differences being about one third larger in the mid-2010s (1.345) compared to the mid-1990s (1.000).

Finally, models that included the sociodemographic, health, cognitive, and psychosocial correlates are reported in Table 2 in the last rows for each study. Allowing in BASE the 28 regression parameters from the correlates to the views on aging outcomes to differ across groups did not improve model fit in statistically significant ways when applying some minimal form of Bonferroni correction ($\Delta\chi^2 = -42.83$, $df = 28$, $p > .01$). Substantively the same pattern was obtained for MIDUS, with no improvement in model fit when the prediction effects were allowed to vary across cohort groups ($\Delta\chi^2 = -16.33$, $df = 10$, $p > .10$).

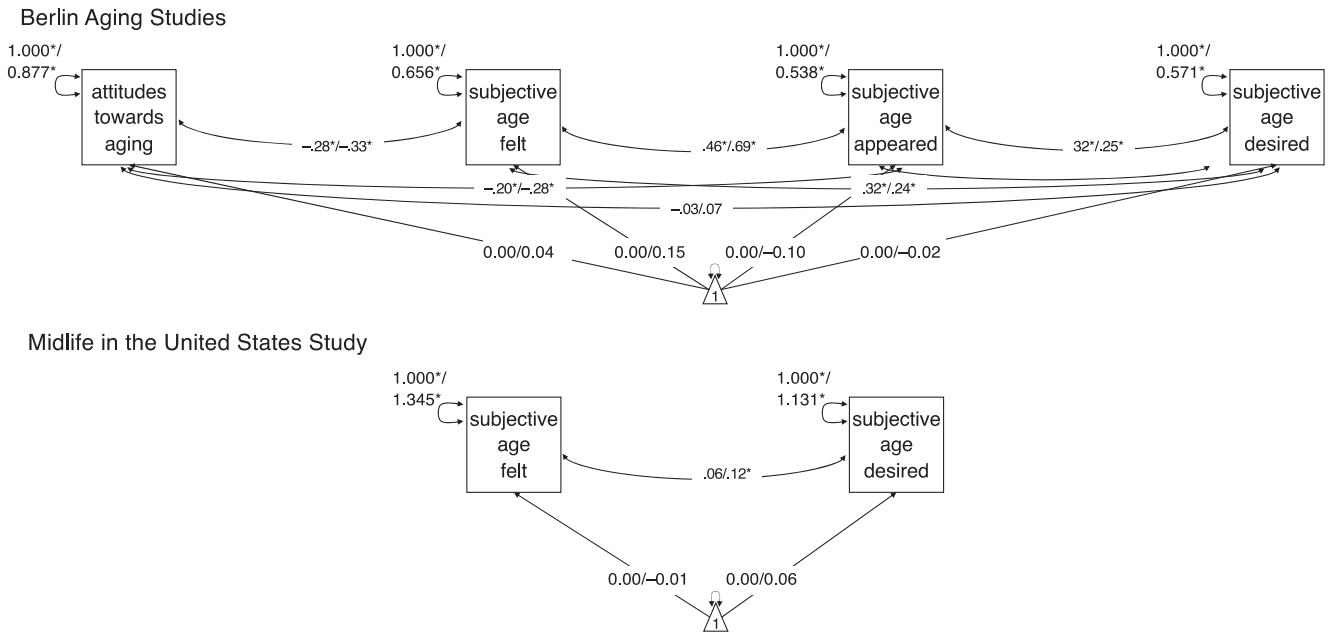
In BASE, when well-known cohort differences in the correlates were taken into account (and particularly differences on external control beliefs and loneliness were removed), the intercepts of the two cohorts differed on attitudes toward aging (relative to the invariance model M1 in Table 2: $\Delta\chi^2 = -10.13$, $df = 1$, $p < .0001$), whereas the three subjective age dimensions did not differ at $p < .001$. Inspection of the intercepts reported in Figure 5 indicates that once cohort differences in the correlates were accommodated, later-born cohorts reported lower levels of positive attitudes toward aging (–0.39) and older subjective age felt (0.36) relative to earlier-born cohorts (0.00).

To put our findings in larger perspective, we replicated previous findings from a smaller subset of BASE participants (Gerstorf et al., 2015; Hueluer et al., 2016) and found that our later-born cohorts of older adults in BASE-II are slightly better in grip strength as a measure of uppe body functioning, $F(1, 489) = 3.12$, $p = .0779$, $d = 0.16$, perform substantially better on the cognitive functioning test of perceptual speed, Digit Symbol: $F(1, 502) = 202.33$, $p < .0001$, $d = 1.27$, perceive their lives to be considerably less determined by powerful others, $F(1, 508) = 96.49$, $p < .0001$, $d = 0.87$, and also report considerably lower levels of loneliness, $F(1, 498) = 70.93$, $p < .0001$, $d = 0.75$, than same-aged earlier-born cohorts of older adults in the earlier BASE study. Despite these mean-level improvements in functioning on central correlates of successful aging, the two cohorts did not differ on any of the four views on aging dimensions considered in our study.

Further follow-up analyses tested the robustness of our findings. We first excluded those BASE-II participants who had resided prior

Figure 4

Parameter Estimates (Earlier-Born Cohort/Later-Born Cohort) for the Zero-Order Model That Allows for Cohort Group Specificity in Means, Variances, Covariances in the Berlin Aging Studies



Note. Means, covariances, and regression coefficients are standardized, variances unstandardized.

to 1989 (the Fall of the Berlin Wall) 1 year or more in the former German Democratic Republic (GDR) so as to increase comparability with the BASE sample. Results revealed effectively the same pattern as reported in the main text (see Supplemental Online Material, Part 4, Table S1). Second, we restricted the MIDUS/MIDUS-R samples to those aged 70 years and older so as to increase comparability with the BASE/BASE-II samples. Again, results revealed effectively the same pattern as reported in the main text (see Supplemental Online Material, Part 4, Table S2).

Discussion

Consistent across four different dimensions of views on aging (positive attitudes toward aging, subjective age felt, subjective age appeared, subjective age desired) in the BASE and corroborated with subjective age felt and subjective age desired in the MIDUS, our results revealed no evidence whatsoever that older adults today would on average have more favorable views on how they age as compared with their age peers several decades ago.

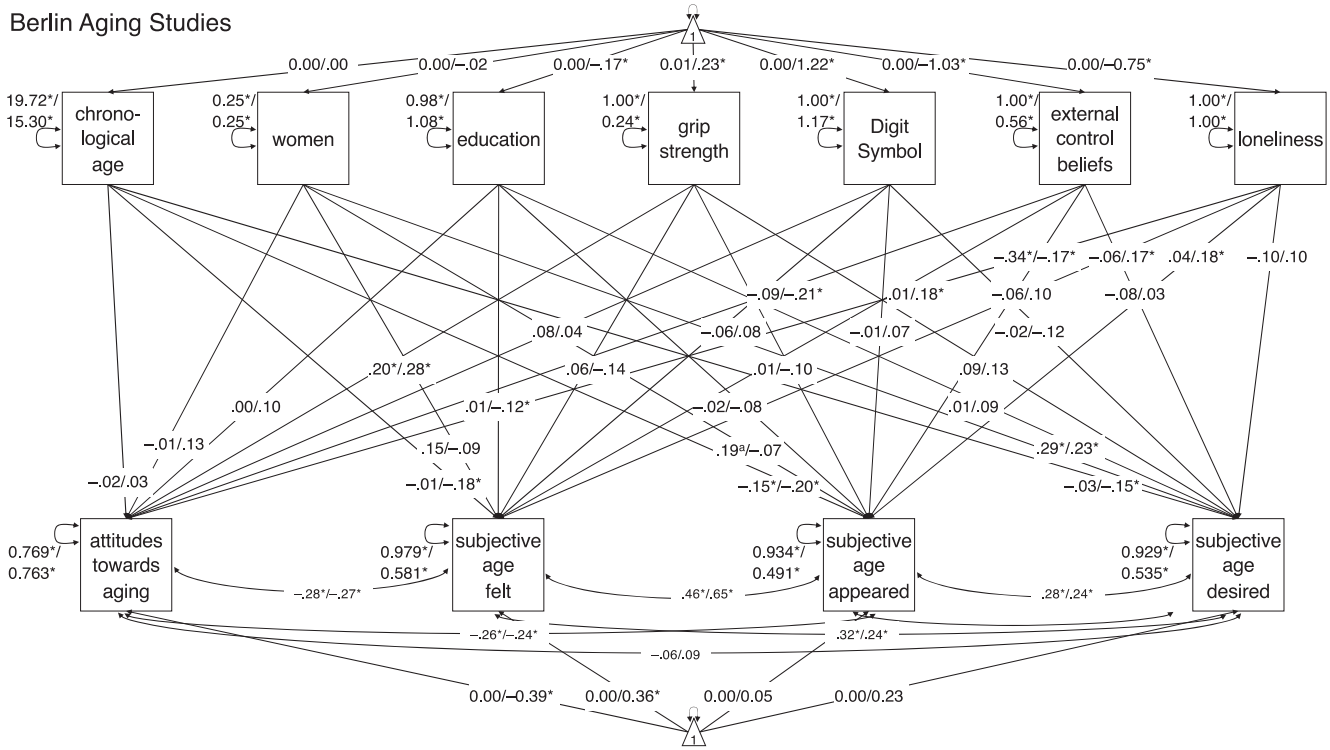
Historical Change and Views on Aging: Mean-Level Differences

It is well established that today's older adults are in many ways functioning better than older adults in the past (see Gerstorf et al., 2020, for overview). We have corroborated this general pattern of mean-level improvements in functioning on central correlates of successful aging with the current sample of older adults (see also Supplemental Online Material, Part 5). Still, the overall pattern observed instead was one of prevailing stability of views on aging across a total of four dimensions in a first set of studies (BASE and BASE-II) and of two dimensions in a second set of studies (MIDUS and MIDUS-R).

Are we witnessing, as Levy (2003) argued, a paradox in that historical improvements in different domains of functioning do not transfer into more positive views on aging because age stigma and negative age stereotyping is a continuing fact in our societies? On the one hand, given our finding of consistent historical stability across multiple indicators of subjective views on aging albeit a range of other indicators of "successful" aging has historically improved, our study might be seen as supporting such a paradox. On the other hand, we believe that other interpretations than solely continued societal ageism might be in place. First, capitalizing on the distinction between personal and general views about aging (Hess, 2006), research has shown general views on aging have become increasingly negative over the past two centuries (Mason et al., 2015; Ng & Chow, 2020; Ng et al., 2015). Against this backdrop, our finding of stability in personal age views across historical time as observed on multiple measures may indeed be seen as positive, because older adults have resisted general societal tendencies to continue downgrading aging. Such possible increased decoupling of individual age views from societal age views across historical time would also be predicted by the established theory of individualization in sociology (Dawson, 2012). Second, adding to this reasoning, we would like to echo Hueluer et al. (2016) who had argued that in the minds of older adults aged 65 years and older, today's old age may not necessarily be synonymous anymore with decline and deterioration. As a consequence, the classic "age bias" in that older adults feel overly younger than their chronological age persists, but is not getting larger in more recent cohorts. A third contributing factor refers to the difference between level and change and is illustrated best in relation

Figure 5

Parameter Estimates (Earlier-Born Cohort/Later-Born Cohort) for the Model With Correlates That Allows for Cohort Group Specificity in Means, Variances, Covariances, and Prediction Effects in the Berlin Aging Studies



Note. Means, covariances, and regression coefficients are standardized, variances unstandardized. For reasons of parsimony, intercorrelations among the correlates are not shown.

to educational attainment. Education has shown a steady increase across historical time and is positively associated with adult outcomes, such as cognitive ability. However, contrary to widely held assumptions, associations between education and *rates of cognitive decline* in adulthood and old age are negligible (Lövdén et al., 2020). In other words, whereas more education is associated with higher levels of cognitive functioning in early adulthood, there is no reliable association between individual differences in educational attainment and individual differences in cognitive change during adulthood and old age. Thus, some of the improvements in old age functioning might reflect the operation of historical changes that raise the level of functioning in early adulthood but do not affect rates of change in later periods of life. In such a situation, later-born individuals who compare their current state of functioning to earlier states may perceive the losses to be similar in magnitude as earlier-born individuals, and the resulting views of aging would remain constant across historical time.

Historical Change and Views on Aging: Heterogeneity, Covariation, and Prediction

We can only speculate about possible reasons why we have seen remarkably divergent trends between our German and U.S. samples with historical time in the heterogeneity of views on aging. Increasing diversity as found in the MIDUS may have resulted from historical changes in disparities—that is, greater divergence in the U.S. population in income, education, etc. Follow-up analyses (see Supplemental Online Material, Part 5) did not generally indicate differences in variances. Notably though, there was evidence of increased heterogeneity in functional limitations, need for money, difficulties to pay monthly bills, and for the views on aging worries question (which only asked women about anticipated menopausal change). The increased heterogeneity in financial challenges faced by the MIDUS-R sample may echo the social disparities that had emerged when those data were collected in the aftermath of the Great Recession. In contrast, the BASE samples exhibited decreased heterogeneity in the views on aging across historical time. Speculations about possible reasons includes the possibility that old age has moved from a "roleless role" period of life (Rosow, 1974) characterized by diverse goals and expectations to a period of life where individuals are driven by similar goals and norms such as maintaining bodily fitness, upholding mobility, and investing in social intimates (Carstensen, 2011; Coughlin, 2017).

Our results are also in line with earlier reports that the dimensions of views on aging are only moderately intercorrelated. For example, Brothers et al. (2017) reported that felt age and attitudes toward aging correlated at $r = .26$. We also replicated to a large extent the established relations in the literature in that feeling younger and having more favorable views on aging is associated with better functioning in other areas of life (e.g., Diehl et al., 2021; Wurm et al., 2017). Results from the current report are also consistent with earlier findings that of the different views on aging dimensions,

attitudes toward aging often exhibits stronger associations with correlates of successful aging such as health-related indicators than other dimensions such as subjective age (e.g., Brothers et al., 2017).

Finally, we are not aware of any previous study that had tested for historical change in predicting views on aging by a broad range of successful aging correlates. In our results, we did not find any evidence in either data source for historical change in how a range of correlates are related to views on aging. With the empirical evidence now available across a broad historical time frame (e.g., Debreczeni & Bailey, 2020; Westerhof et al., 2014), our inference is that across domain associations appear to be quite a robust characteristic of views on aging that is not subject to historical change. This also fits with recently accumulating evidence that subjective views on aging unfold their impact on behavior and various diseases via physiological pathways (Thyagarajan et al., 2019; Wurm et al., 2017).

Limitations and Outlook

We note a number of limitations of our samples, measures, and study design. First and foremost, we have conducted a post hoc analysis of data sets that were not initially designed to test for rigorous cohort analysis as has been the case in research on cognitive aging (Schaie, 1965). We thus acknowledge that the generalization of our findings is limited. Likewise, given that our results have been obtained from those in their 60s and 70s who comprised the majority of participants in the data infrastructures used, future research needs to explore whether and how very old adults in their (late) 80s and 90s today may hold different views on aging than their age peers several decades ago. We also acknowledge that the original BASE has been a study representative only for the former West Berlin and thus a very specific "frontline city" population, although we would not expect this specific situation to have influenced subjective views on aging (see also Supplemental Online Material, Part 5).

Next, with our German and North American samples, cultural heterogeneity is also limited (but existing; Westerhof & Barrett, 2005) and does not provide any generalization of the other cultures and ethnicities. In addition, our samples were relatively small and thus measurement error likely considerable. Also note that ideally, we would like to pool data across studies, conduct analyses using one conjoint sample, and selectively vary historical time and cultural background so as to examine how one factor contributes to differences over and above the other factor. However, pooling of data and independently varying culture and historical time is only possible in rare cases when studies are perfectly parallel and have collected data over many decades in multiple cultures. Such data are currently to the best of our knowledge not available in the area of views about aging. Although not perfectly in parallel on a number of different levels, we consider the approach used here a viable means to directly test the robustness of findings across independent samples and more feasible than possible alternatives (e.g., disregard more than half of the sample and measures available).

Setting aside the single-item nature of the subjective age measure used, another limitation is that the specific wording of the two parallel subjective age construct was somewhat different between studies (e.g., subjective age felt in BASE: "How old do you feel?" vs. MIDUS: "Many people feel older or younger than they actually are. What age do you feel most of the time?"). To the best of our knowledge, there currently exists no rigorous empirical analysis on whether such differences in phrasing make a notable difference in older adults' answering style. Still, it is true that the MIDUS wording offers a point of reference, that is, the person's age, whereas the BASE wording comes without such referencing. We know from research on subjective health that offering such references may come with different results as well as different variability explanations by correlates (Sargent-Cox et al., 2008). Still, it remains an open question whether this concern also applies to subjective age. As noted above, Pinquart and Wahl (2021) reported that the exact wording did not make a major difference in the nearly 300 studies examined for age biases and associations with correlates. Likewise, the meta-analyses of Westerhof et al. (2014) and Debreczeni and Bailey (2020) also merged studies with different wording in subjective age assessments when they tested relations with health outcomes.

We also acknowledge that the indicators of views on aging used in our analysis were originally formulated as general indicators, not as specific indicators for different functional domains (such as the AgeCog scales; Wurm & Huxhold, 2012) or gains and losses (such as the Awareness-of-Age-Related Change; AARC scales; Diehl et al., 2021). It is possible that that multidimensional measures may be more sensitive to the complexities of aging and historical change (see the Wurm & Huxhold's [2012] findings of historical decreases in perceived physical loss and increases in perceived developmental growth). We also note that it may be highly insightful for future inquiry to examine the role of further correlates, including social and family life. For example, we have only looked at loneliness, but earlier studies have shown that increased investment into new social relational structures such as friendship go hand in hand with more positive views on aging (Lamont et al., 2017; Menkin et al., 2017). With historical increases in nonkin relationships such as friendships (Huxhold, 2019), it would be intriguing to examine whether and how this may have shaped the views on aging people have. As further limitations in the context of correlates, in one of the four studies (BASE-II), control beliefs and loneliness were not measured concurrently with the views on aging, but at a preceding wave on average 3.89 years earlier.

We also acknowledge that our differential heterogeneity findings in views on aging still should be seen as first and preliminary exploration. Method effects may to some extent also played a role. In particular, it might have happened in principle that during the matching, an 88-year-old person is "twinned" with a 92-year-old person. The decisive factor is the so-called caliper matching, the maximum allowable distance between matched participants. This was systematically varied until cohort differences in age were no longer reliably different from 0 at $p < .05$ in either of the two samples. Comparing the size of the caliper across the two sets of studies revealed that the caliper is a bit larger in the BASE studies ($c_{BASE} = 0.18$ *SD*) than in the MIDUS studies ($c_{MIDUS} = 0.09$ *SD*).

Finally, as a limitation of our study design, we note that the cross-sectional nature of our studies did not allow addressing questions about, for example, temporal ordering or lead–lag associations of views on aging with the correlates. With our interest in better understanding individual and cohort differences in those views, we treated views on aging as outcomes. Moving ahead, it would be highly instructive to examine whether and how historical changes have occurred in the well-documented predictive effects of views on aging for subsequent outcomes such as transitions into poor physical

health, cognitive impairment, and increased mortality hazards (e.g., Debreczeni & Bailey, 2020; Westerhof et al., 2014).

Conclusions

Although how old age is viewed and evaluated is central to behavioral and social aging science, it is remarkable how scarce research on historical change has remained over the past decades. The present study enriches the empirical picture with using two independent studies that each allow comparing older adults who lived about 20 years apart. Taking all together, our conclusion is that subjective views on aging seem to be quite resistant to historical changes, which would make them rather unique in the cohort-related aging discourse compared to constructs such as cognitive functioning, well-being, loneliness, and control beliefs. Obviously, based on our data, we have to reserve this conclusion to two important indicators of views on aging, that is, subjective age and attitudes toward own aging. It is also true that some existing evidence based on other indicators such as the AgeCog scales suggests a decrease in perceived physical loss and increase in perceived growth and potential in old age (Huxhold, 2019; Wurm & Huxhold, 2012), though this trend was only found among older adults, whereas middle-aged adults exhibited negative cohort trends (e.g., fewer perceived growth with aging today than in the past). Therefore, we conclude that it seems that all progress made in aging science in terms of a differentiated view on aging and remaining strengths in old age, the robustness of findings showing historical improvement in health, functioning, and well-being, as well as changes at the policy level in that aging societies also viewed overall as coming with assets has mostly not translated to personal views on aging. In addition, changes observed in current older adults may no longer hold in future cohorts as the findings by Wurm and Huxhold (2012) suggest. That said, it may be very important in the future for aging science as well as policy to reconsider their ways of communicating findings and more positive images of aging to the public. This would mean that we certainly need more data from an increased diversity of cultural contexts and historical time periods at least as long as ours to further our knowledge of stability and change in views on aging across historical time, the contributing factors, and the consequences that may arise for individual and public health.

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