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Retirement is Associated with Change in Self-Esteem

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Both authors developed the study concept and design. Ted Schwaba performed the data analyses and interpretation under the supervision of Wiebke Bleidorn. Wiebke Bleidorn drafted the manuscript, and Ted Schwaba provided comments. Both authors approved the final version of the manuscript for submission.

R scripts that allow researchers with access to the LISS dataset to reproduce all results are available at <https://osf.io/za8d6/>

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Abstract

We examined the course of self-esteem during the transition to retirement in a sample of 690 retirees (ages 51-81) and a propensity-score matched comparison group of 515 non-retirees drawn from a nationally representative longitudinal study in the Netherlands. The average retiree decreased in self-esteem in the five years before retirement and remained stable in self-esteem in the five years following retirement. We also found significant individual differences in retirees' self-esteem trajectories but failed to identify moderators that may account for these individual differences. We discuss the implications of these results for theory and future research on lifespan self-esteem development.

Keywords: Self-Esteem; Retirement, Personality Development, Life Experiences

Self-esteem is associated with numerous important outcomes including educational success, health, and various forms of psychopathology (Orth & Robins, 2014). The recognized importance of self-esteem has led to considerable speculation about the factors that shape this trait throughout the lifespan. Theory and research suggests that life events can impact change in self-esteem. However, most of this research has focused on events that typically occur during early adulthood, such as college, marriage, or parenthood (e.g., Bleidorn et al., 2016; Chung et al.; 2014; van Scheppingen, Denissen, Chung, Tambs, & Bleidorn; in press). In contrast, we have a limited understanding of how life events affect self-esteem in late adulthood.

One of the most important late-life events is the transition to retirement (Kim & Moen, 2001). This transition is associated with various psychological, social, and economic changes that may impact retirees' self-esteem during the transition to retirement. The purpose of the present study was to examine the course of self-esteem as people prepare for, react to, and adapt to retirement. To do this, we used longitudinal data from a large representative sample of the Netherlands and compared the trajectories of retirees to the self-esteem trajectories of a matched comparison group of people who did not retire during the study period. We further examined the extent to which retirees exhibit individual differences in self-esteem development and tested a set of moderators that might explain some of these differences. Through these analyses, we aimed to provide a more complete understanding of how the transition to retirement may be associated with change in self-esteem.

Self-Esteem and Retirement

For most older persons, retirement does not only mark the transition from middle to late adulthood (65 and older) but is also associated with important psychological and interpersonal changes that may impact their self-esteem and well-being. Several theories of aging and lifespan

development have highlighted the role of retirement as a development milestone (e.g., Freund, Nikitin, & Ritter, 2009; Heckhausen, 2010; Kim & Moen, 2001; Loeckenhoff, 2009; Moen 2001). However, different perspectives have characterized retirement either in terms of losses or in terms of potential gains, and the pathways through which such losses and gains may impact retirees' psychological well-being and self-concept remain largely unclear.

On the one hand, perspectives that characterize retirement as a loss experience have emphasized the negative psychological implications of this life transition. For example, role theory has conceptualized the transition to retirement as a loss of an important social role (Kim & Moen, 2001). These perspectives argue that the experience of role loss can lead to psychological stress and potentially also to decreases in retirees' self-esteem, particularly for those who view their career as central to their identity. In a similar vein, Freund and colleagues (2009) have emphasized the loss of structure and social norms associated with retirement. The loss of structure provided by work may impede retirees' ability to plan their lives, set goals, and create meaning. As such, the relatively unstructured context of retirement may negatively impact people's sense of purpose and self-worth.

On the other hand, perspectives that characterize retirement in terms of gains have emphasized potentials to increase psychological adjustment and positive aging in the post-retirement years (Kim & Moen, 2001; 2002). For example, role-strain reduction theories have proposed that retirement can reduce work-related stress (e.g., Vandewater, Ostrove, and Stewart 1997). Older jobholders may experience diminished value, less mastery, and low self-esteem during the time preceding retirement, because of obsolete work skills, increased job demands, or physical challenges. Retirement from work-related demands can reduce psychological stress and

counteract the impact of negative job experiences on self-esteem (Kim & Moen, 2002; Moen, Kim, & Hofmeister, 2001).

In sum, retirement can be associated with both challenges and opportunities that may impact self-esteem. Past research suggested that late adulthood is characterized by minor declines in self-esteem as well as significant individual differences in individual trajectories (Orth et al., 2010; Wagner, Gerstorf, Hoppmann, & Luszcz, 2013; Wagner et al., 2015). Hence, we predicted that retirement may be associated with decreases in self-esteem. However, gains may outweigh losses for some retirees, which would result in significant individual differences in retirees' self-esteem trajectories (Reitzes et al., 1996).

More nuanced predictions regarding the impact of retirement on self-esteem require the consideration of two broader issues: *time* and *context*. We next turn to these considerations.

Time and Timing

Life-course approaches to retirement have highlighted the dynamic nature of this life transition (Kim & Moen, 2002; Moen, 1996). According to these perspectives, retirement should be thought of as a process that spans a period of *time*, rather than a discrete event. As such, there may be different psychological implications for the retiring individual as they prepare for, experience, and adapt to the transition to retirement (Kim & Moen, 2001; Schwaba & Bleidorn, in press). The potential impact of these different stages of the retirement process on self-esteem implies the need for longitudinal data. To further strengthen the conclusions that can be drawn from longitudinal data, researchers need to attend to two complexities concerning the *timing* of retirement.

First, change in self-esteem may already occur before retirement. As mentioned above, role-strain reduction perspectives state that jobholders may experience diminished value and low

self-esteem time preceding retirement, which may come to a halt as soon as people retire from these work-related stressors (Moen et al., 2001). According to this perspective, self-esteem should decrease *before* the transition to retirement and recover or even increase *after* people retire from work-related strain. To disentangle pre-retirement change from post-retirement change, longitudinal studies must measure self-esteem at multiple occasions before and after retirement occurs (Bleidorn, Hopwood, & Lucas, 2018; Luhmann, Orth, Specht, Kandler, & Lucas, 2014).

Second, self-esteem change during retirement may follow a discontinuous trajectory (see Figure 1). For example, retirees may experience sudden declines in self-esteem when they retire but may recover or even increase in self-esteem as they adapt to their new role as retiree (cf. Figure 1d). To model the precise trajectory before, during, and after the transition to retirement, researchers need information about the timing of retirement and data from multiple assessments throughout the retirement process (Luhmann et al., 2014; Schwaba & Bleidorn, in press).

Context and Resources

To isolate potential effects of retirement on self-esteem, researchers must also attend to the *context* of retirement in at least two important ways (Kim & Moen, 2001; Moen, 1996; Loeckenhoff, 2009). First, because experimental designs are not feasible, researchers must use alternative methods to account for the different contexts faced by retirees and non-retirees. In the present study, we used propensity-score matching to account for potential confounds (Thoemmes & Kim, 2011). With propensity-score matching, all participants in a sample who experienced an event are matched on a set of variables to a subset of participants who did not experience the event but are otherwise similar in propensity to experience the event. To the degree that the

trajectories differ between these groups, researchers can be more certain that changes are due to the event rather than other confounding influences (cf. van Scheppingen et al., 2016).

Second, contemporary models of retirement have highlighted the relevance of individuals' particular context and life situation (Kim & Moen, 2001; Loeckenhoff, 2009; Wang et al., 2011). These perspectives emphasize that retirement may have very different psychological implications depending on retirees' background and resources (e.g., Wagner et al., 2014). For example, life span theory (Baltes, 1987) asserts that the availability of age-specific resources can help protecting a sense of mastery when dealing with the challenges and demands of retirement. From this perspective, self-esteem can be understood as reflecting a positive evaluation of the resources available to the self in dealing with the demands associated with retirement. Such resources include retirees' health, social networks, personality, and financial situation.

In the present study, we examined several theoretically relevant resources (and risk factors) that may impact people's self-esteem trajectories during the transition to retirement: participants' gender, age, Big Five personality traits, financial hardship, volunteering, health, physical activity, and social integration. We next discuss the theoretical and empirical background for each of these moderator variables.

Gender. Past research has found little evidence for gender differences in self-esteem trajectories (Bleidorn et al., 2016; Orth et al., 2010). However, gender may moderate the impact of retirement on self-esteem to the degree that work is a different experience for women and men (Han & Moen, 1999). For this sample of retirees, born in the 1950's, men may have been more invested in their work roles and thus been more likely to experience retirement as a loss rather

than a gain. Hence, we predicted that men would experience more pronounced decreases in self-esteem during the transition to retirement.

Age. Although most people retire in their 60s (the statutory retirement age in the Netherlands is currently 65 years), there is some variation in age at retirement. While some early retirees may decide to exit their career early to pursue other hobbies or activities, others may be forced into early retirement due to health issues or economic reasons outside their control. Others may retire later than age 65. Given the multitude of reasons and unique challenges associated with early and late retirement, we had no specific predictions regarding the impact of age on self-esteem during the transition to retirement.

Personality. Past research has repeatedly shown that self-esteem is positively associated with the Big Five personality traits of emotional stability, extraversion, openness, agreeableness, and conscientiousness (e.g., Robins, Tracy, Trzesniewski, Potter, & Gosling, 2001; Wagner et al., 2015). We examined whether retirement-related decreases in self-esteem were buffered by more positive Big Five profiles, as indicated by higher levels of emotional stability, extraversion, openness, agreeableness, and conscientiousness.

Financial Hardship. Retirement can bring considerable financial challenges. Past research has indicated that financial problems predict dissatisfaction and psychological maladjustment in retirement (Kim & Moen, 2002). Moreover, decreases in income have been related to decreases in self-esteem in late adulthood (Orth et al., 2010). Hence, we predicted that retirees who experienced financial hardship would experience more pronounced decreases in self-esteem.

Volunteering. Volunteering offers an opportunity to spend time generatively, giving back to community and society (Son & Wilson, 2011). As such, volunteering may allow retirees to

stay socially engaged and to experience mastery. Volunteering may thus buffer negative effects of retirement on self-esteem.

Health and Physical Activity. Declines in subjective and objective health have been associated with decreases in self-esteem (Orth et al., 2010; Wagner et al., 2014). An important indicator of health is the degree to which older adults stay physically active. While some retirees may decrease their level of physical activity, others may maintain or even increase the time they spend exercising. We predicted that physically active and healthy retirees would be less impacted by negative effects of retirement on self-esteem.

Social Integration. Social relationships are a main source of self-esteem (Leary & Baumeister, 2000). Specifically, theory and research have associated feelings of social inclusion and positive social interactions with higher self-esteem throughout the life span, including the retirement years (Wagner et al., 2015). We predicted that a stable social networks and feelings of social integration may buffer potentially negative effects of retirement on self-esteem. In contrast, those who become less socially connected in retirement may be more likely to experience decreases in self-esteem.

Summary

We examined the course of self-esteem as people prepare for, experience, and adapt to the transition to retirement. To do this, we used multi-wave longitudinal data from a nationally representative sample of Dutch retirees and compared their self-esteem trajectories to the trajectories of a matched sample of non-retirees. We further investigated the extent to which retirees exhibited individual differences in self-esteem trajectories and test a set of moderators that may explain these differences. We predicted that retirement is associated with an average decrease in self-esteem but that individual trajectories will be moderated by individuals' specific

life situation and resources. Through these analyses, we aimed to provide a more complete understanding of how retirement affects self-esteem development.

Method

Sample

Data for this study came from the Longitudinal Internet Studies for the Social Sciences (LISS) panel, which has followed a representative sample of the Dutch population from 2008 to 2016. The panel is based on a true probability sample of households drawn from the population register (Scherpenzeel, Das, Ester, & Kaczmirek, 2010). LISS participants complete yearly internet surveys on various topics. Participants who did not have a computer or internet connection were provided with one so that they could complete surveys. The initial cohort completed the personality survey, which includes a self-esteem questionnaire, at six occasions, in 2008, 2009, 2011, 2013, 2014, and 2015. A second cohort completed the self-esteem questionnaire at five occasions, in 2010, 2011, 2013, 2014 and 2015. A third cohort completed the self-esteem questionnaire at four occasions, in 2012, 2013, 2014, and 2015. A fourth cohort completed the self-esteem questionnaire in 2014 and 2015. All cohorts completed each of the other surveys used in this study (work and school, health, income, and social integration and leisure) annually from 2008 to 2015. Other published work has used the same data, in part, as was used in the present manuscript. These publications can be viewed at <http://dataarchive.lissdata.nl/publications>. In two recent studies, we have used the LISS data to examine the associations between Big Five personality development and life events including the transition to retirement (Denissen, Luhmann, Chung, & Bleidorn, in press; Schwaba & Bleidorn, in press). None of these works have analyzed the development of self-esteem across the transition to retirement, which is the focus of this manuscript.

Participants

Retirees

Of all participants who provided self-esteem data, 2,195 participants responded yes to either of the questions “*I have taken early retirement,*” or “*I am a pensioner,*” and no to the question “*I perform paid work,*” at one or more measurement occasions. These participants were then asked, “*In what year/month did you stop working?*” We selected the 859 participants who indicated that they stopped working within 60 months of that assessment wave. To better isolate the temporal effect of retirement, we excluded 166 participants who indicated that they stopped working at multiple different dates. We further excluded 3 participants who indicated that they retired but were younger than 50 years old. Our final sample of retirees included 690 participants who completed 1,916 self-esteem questionnaires in total (Wave 1 $N = 690$, Wave 2 $N = 533$, Wave 3 $N = 367$, Wave 4 $N = 209$, Wave 5 $N = 103$, Wave 6 $N = 14$). These participants ranged in age from 51-81 ($M = 64.41$, $SD = 3.61$).

Non-retirees

A total of 8,231 participants who provided self-esteem data responded yes to “*I have performed paid work in the past.*” and no to both “*I have taken early retirement*” and “*I am a pensioner*” across all assessment waves. To create a comparison group of non-retirees from this pool, we estimated propensity to retire from 22 measured psychological, demographic, and health variables (see Table S1 in the online supplemental materials). Propensity-score matching requires complete data, so we used the R package mice (Royston & White, 2011) to impute missing values. We removed these imputed scores for all other analyses.

We then predicted participants’ eventual retirement status based on their responses to these 22 variables at first measurement occasion using the R package MatchIt (Ho, Imai, King, &

Stuart, 2006) and selected the non-retirees who were most similar in their propensity to retire to those in the retirement group. To maximize the size of this propensity-score matched sample, we matched each retiree to the four most similar non-retirees, with replacement. To ensure that matches were sufficiently similar to retirees, we pruned matches with a caliper distance of .2 or greater (Thoemmes & Kim, 2011). Our final comparison sample of non-retirees was composed of 515 participants who completed 1,086 self-esteem surveys in total (Wave 1 N = 515, Wave 2 N = 249, Wave 3 N = 160, Wave 4 N = 209, Wave 5 N = 103, Wave 6 N = 14). These participants ranged in age from 17-90 ($M = 59.07$, $SD = 7.06$).

Measures

Self-Esteem

Self-esteem was measured using the 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965). Responses were measured on a 7-point Likert scale, ranging from 1 (*totally disagree*) to 7 (*totally agree*). The scale's internal consistency (α) ranged from .85 to .91 in the retirees group, and .82 to .91 in the non-retirees group (See Tables S2 and S3 in the online supplemental materials). To facilitate the interpretation of the results, we standardized scores using the overall grand mean of the retiree and propensity-score matched non-retiree groups to a mean of 0 and a standard deviation of 1.

Moderators

We examined the moderating effects of one time-invariant covariate: participants' biological sex (1 = male, 2 = female) and 11 time-varying covariates: age, time spent volunteering (*Considered all together, how much time do you spend on voluntary work per week?*; we omitted 19 responses of participants who indicated that they volunteered 16 or more hours per day because these values are implausibly high), subjective health (*How would you*

describe your health, generally speaking? 1 = *poor* – 5 = *excellent*), days per week performing strenuous physical activities (*If you look back on the last 7 days, on how many of those days did you perform a strenuous physical activity such as lifting heavy loads, digging, aerobics or cycling?* 0 – 7 days), social connectedness (a composite of six items; sample question: *there are enough people to whom I feel closely connected* 1 = *yes* - 3 = *no*; reverse scored; $\alpha = .77$), financial hardship, (*How easy is it for you to live off your current income?* 0 = *very hard* – 10 = *very easy*; reverse scored), and scores on each of the Big Five personality traits openness to experience, conscientiousness, extraversion, agreeableness, and emotional stability, each trait domain measured with 10 items using the 50-item International Personality Item Pool Big Five scale (IPIP-50, Goldberg, 1992). Means and standard deviations of all moderator variables are presented in the online supplementary materials (Tables S2 and S3).

Statistical Analyses

We conducted multilevel model analysis in R version 3.3.3 (R core team, 2017) using the package nlme (Pinheiro, Bates, DebRoy, & Sarkar, 2014) and Maximum Likelihood Estimation. We visualized results using the R package ggplot2 (Wickham, 2016). To compare fits of nested models, we used -2 loglikelihood difference tests. To compare fits of non-nested models, we used the Bayesian Information Criterion (BIC; Duncan et al., 2013).

Results

Self-Esteem During the Transition to Retirement

To estimate a mean-level trajectory of self-esteem development during the transition to retirement, we first rescaled time by months and centered retirees' scores on the month at which they retired. We then estimated 8 multilevel models (see Figure 1) in which measurement

occasions were nested within participants over time and selected the model that best fit the data using model comparison tests.

Specifically, we first estimated a no-change model 1a, in which the sole parameter was a random intercept. We compared the fit of this model to the fit of model 2a, which included both a random intercept and a second random parameter that estimated a linear change trajectory during the transition to retirement. We next estimated models 1b and 2b, which added a second random intercept parameter to models 1a and 2a. These models estimated the extent to which there was a sudden shift in levels of self-esteem occurring in the month after retirement. We next estimated models 1c and 2c, which added a second random slope parameter to models 1a and 2a. These models estimated the extent to which a person's self-esteem trajectory after retirement was different from their trajectory before retirement. Finally, we estimated models 1d and 2d, which estimated change in both intercept and trajectory after retirement.

Model comparison tests (see online supplemental materials, Table S3) indicated that self-esteem development was best described by model 2c (see Figure 2), suggesting that self-esteem decreased about one fifth of a standard deviation in the 5 years before retirement (monthly $B = -.003$, $p = .042$), but remained stable after retirement ($B = -.000$, $p = .975$).¹

¹ We restricted our analyses to linear change models for three reasons. First, although our models allowed us to examine quadratic change and including these parameters improved model fit in some cases, no quadratic fixed effects were significant at $p < .05$. Second, including quadratic parameters in our models hampered our ability to compare the developmental trajectories across the groups of retirees and non-retirees; and third, we did not have sufficient power to test for interactions between our moderator variables and quadratic change effects.

Comparing Self-Esteem Trajectories of Retirees and Non-Retirees

We next examined the trajectories of the propensity-score matched sample of non-retirees. We scaled time by months into study and estimated linear and quadratic change models. To facilitate comparisons with the retiree group, we centered time at month 18, the median month of retirement in our sample of retirees. We found that the propensity-score matched group of non-retirees decreased in self-esteem by about one eighth of a standard deviation over a 5-year period ($B = -0.002, p = .049$). Results are shown in Table 1 and Figure 2. We then compared the trajectories between retirees and non-retirees. These comparisons suggested that, although 95% confidence intervals around the parameter values overlapped, retirees and non-retirees experienced different developmental trajectories throughout the study period, as retirees experienced a change in self-esteem trajectory following retirement.

Individual Differences in Self-Esteem During the Transition to Retirement

We next estimated individual differences in self-esteem change before, during, and after the transition to retirement. To do this, we used model comparison tests in which we fixed each random effect in our piecewise growth curve model to zero and compared the fit of these constrained models to the fit of an unconstrained model. Results suggested that there were significant individual differences in self-esteem change both before and after retirement (see Table 2).

Moderators of Self-Esteem Change During the Transition to Retirement

For our final set of analyses, we examined whether individual differences in self-esteem trajectories before and after retirement were moderated by 1) age ($N = 677$), 2) gender ($N = 677$), 3) financial hardship ($N = 641$), 4) volunteering ($N = 678$), 5) subjective health ($N = 609$), 6) physical activity ($N = 609$), 7) social connectedness ($N = 614$), and 8) each of the Big Five

personality traits ($N = 690$). To do this, we added each moderator as a covariate to the best-fitting self-esteem model, which allowed us to examine the covariate's associations with self-esteem at the month participants retired. In addition, we added parameters that estimated the interaction between each covariate and change in self-esteem before and after retirement. All covariates besides gender were modeled as random effects to account for their within-person variance across time. To account for the number of model comparison tests being conducted, we set a threshold of $p < .01$ for statistical significance. Results suggested that each of the Big Five personality traits were positively associated with self-esteem at time of retirement ($r = .223$ to $r = .493$, $p < .001$). Consistent with past research, retirees high in self-esteem tended to be more open, conscientious, extraverted, agreeable, and emotionally stable than retirees low in self-esteem. No other moderator variables were associated with self-esteem at time of retirement. More importantly, none of the 11 moderator variables was associated with self-esteem change before or after retirement (see Table 3).

Discussion

We examined the course of self-esteem as people prepared for, experienced, and adapted to the transition to retirement. In doing so, we tested whether and how the transition to retirement was associated with change in self-esteem. In addition, we examined the potential impact of several resources and risk factors on retirees' individual self-esteem trajectories. Three findings stand out.

First, retirees decreased in self-esteem in the 5 years *approaching* retirement. We also found decreases in the propensity-score matched group of non-retirees suggesting that the observed pre-retirement declines in self-esteem may partly reflect maturational trends. However, for the sample of retirees, decreases in self-esteem came to a halt *during* the month of retirement,

and were followed by a stable trajectory in the 5 years *following* retirement. This discontinuous trajectory suggests that retirement attenuates normative decreases in self-esteem, a finding consistent with role-strain reduction perspectives (Moen et al., 2001). Role-strain reduction perspectives posit that older jobholders tend to experience increased stress and diminished value at work, harming their self-esteem and well-being. Retirement may be a relief from such work-related strains and thus counteract self-esteem diminishing processes. Retirement may also present new opportunities to invest in other meaningful roles outside the work domain, such as family or community member, further counteracting potential decreases in self-esteem (Wang et al., 2011). More generally, our results underscore the importance of assessing retirees at multiple stages during the transition to retirement to detect this discontinuous trajectory. Self-esteem showed different rates of change at different times before and after the transition to retirement. A short-term longitudinal study or a study with long intervals between assessment waves would have been unable to detect these nuanced changes in self-esteem development.

Second, we found substantial heterogeneity in individual self-esteem trajectories, with some decreasing and others increasing in self-esteem as they navigate this life transition. This result highlights that retirement may have different implications depending on retirees' physical, psychological, social, and financial resources (Wang et al., 2011). To fully understand retirement's impact on self-esteem, it is important to consider retirees' broader life contexts (Kim & Moen, 2001; Wagner et al., 2014; Wang et al., 2011).

To begin to address this issue, we examined several theoretically relevant covariates of self-esteem trajectories. With the exception of the well-established association between individual difference in self-esteem and Big Five personality traits at time of retirement (e.g., Wagner et al., 2015), we found no significant effects. Our third finding concerns this apparent

lack of evidence for contexts or resources that can explain individual differences in retirees' self-esteem trajectories. Notably, this finding does not imply that resources play no role in people's self-esteem development. Rather, accounting for such effects may require larger and more diverse samples of retirees. Alternatively, other resources not captured in the present study might be more relevant to retirees' self-esteem trajectories. For example, past research has suggested that romantic and family relationships can serve as social-relational resources in retirement adjustment (e.g., Kim & Moen, 2001).

Limitations and Future Directions

The strengths of the present study include a prospective design, a representative sample, and advanced statistical techniques to model change in self-esteem during retirement while ruling out potential confounds. However, there are also important limitations. First, the correlational nature of our data makes it impossible to draw causal conclusions. Second, we assessed global self-esteem with a common self-report measure. We cannot rule out that domain-specific or non-self-report measures might show different trends when applied to samples of retirees. Third, our selection of moderators was meant to be broad but not exhaustive. Future studies may be more successful in revealing resources and risk factors that shape individuals' self-esteem trajectories during the transition to retirement.

Conclusion

We studied the course of self-esteem as people prepared for, underwent, and adapted to the transition to retirement. We found that retirement attenuated normative declines in self-esteem. Consistent with role-strain reduction theories of retirement, self-esteem decreased during the years preceding retirement; this decrease came to a halt during the year of retirement and was followed by a stable trajectory in the years following retirement. Further, retirees differed

substantially in their self-esteem trajectories, possibly as a function of their individual resources and experiences during this life transition. Together, these results provide support for theories that emphasize the role of major life events in late-life self-esteem development.

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Table 1. *Parameter estimates for the best fitting model across the transition to retirement (Retiree N = 690, 1,916 observations; Non-retiree N = 515, 1,086 observations).*

Group	Parameter	B	95% CI	<i>p</i>	SD random effect
Retiree	Intercept	-0.013	[-.106, .034]	.777	0.902
	Linear Δ before	-0.003	[-.006, -.002]	.042*	0.012
	Linear Δ after	0.000	[-.002, .001]	.975	0.011
Non-retiree	Intercept	-0.006	[-.101, .042]	.895	0.897
	Linear Δ	-0.002	[-.003, -.001]	.049*	0.007

Notes. Time is in units of months. * = $p < .05$.

Table 2. *Model comparison tests to determine individual differences in self-esteem development during the transition to retirement (Retiree N = 690, 1,916 observations; Non-retiree N = 515, 1,086 observations).*

Base Model	df	-Log-likelihood	Random parameter removed	df	-Log-likelihood	X ² diff. test
All parameters random	10	2133.74	Δ before	7	2148.53	-29.58***
All parameters random	10	2133.74	Δ after	7	2147.07	-26.67***

Notes. * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Table 3. *Moderator analyses (Retiree N = 690, 1916 observations)*

Covariate	Parameter	<i>B</i>	95% CI	<i>p</i>
Age (N = 677)	Age	0.013	[-0.016, 0.028]	.390
	Age * Δ before	0.000	[-0.001, 0.000]	.247
	Gender * Δ after	-0.001	[-0.002, 0.000]	.103
Gender (N = 677)	Gender	-0.039	[-0.227, 0.057]	.686
	Gender * Δ before	-0.002	[-0.008, 0.001]	.475
	Gender * Δ after	-0.002	[-0.006, 0.000]	.374
Financial hardship (N = 641)	Fin. hardship	-0.004	[-0.042, 0.016]	.859
	Fin. hardship * Δ before	0.001	[0.000, 0.002]	.071
	Fin. hardship * Δ after	-0.002	[-0.003, -0.001]	.049
Volunteering (N = 678)	Volunteering	-0.003	[-0.014, 0.002]	.562
	Volunteering * Δ before	0.000	[-0.001, 0.000]	.789
	Volunteering * Δ after	0.000	[0.000, 0.000]	.677
Health (N = 609)	Health	-0.021	[-0.124, 0.032]	.691
	Health * Δ before	-0.001	[-0.005, 0.001]	.668
	Health * Δ after	0.004	[0.001, 0.005]	.017
Physical activity (N = 609)	Phys. activity	-0.007	[-0.050, 0.015]	.749
	Phys. activity * Δ before	0.000	[-0.001, 0.001]	.627
	Phys. activity * Δ after	0.002	[0.000, 0.002]	.017
Social integration (N = 614)	Soc. integration	0.327	[0.070, 0.457]	.013
	Soc. integration * Δ before	-0.003	[-0.012, 0.002]	.515
	Soc. integration * Δ after	0.003	[-0.004, 0.007]	.375
Openness (N = 690)	Openness	0.288	[0.213, 0.326]	<.001
	Openness * Δ before	0.000	[-0.003, 0.001]	.942
	Openness * Δ after	0.000	[-0.002, 0.001]	.938
Conscientiousness (N = 690)	Conscientiousness	0.353	[0.283, 0.389]	<.001
	Conscientiousness * Δ before	0.001	[-0.002, 0.002]	.656
	Conscientiousness * Δ after	0.000	[-0.002, 0.001]	.860
Extraversion (N = 690)	Extraversion	0.293	[0.214, 0.333]	<.001
	Extraversion * Δ before	0.000	[-0.003, 0.001]	.747

	Extraversion * Δ after	0.001	[-0.001, 0.002]	.217
Agreeableness	Agreeableness	0.223	[0.147, 0.261]	<.001
(N = 690)	Agreeableness * Δ before	0.000	[-0.003, 0.001]	.815
	Agreeableness * Δ after	0.001	[-0.001, 0.002]	.569
Emotional	Emotional Stability			
Stability		0.413	[0.344, 0.448]	<.001
(N = 690)	Emotional Stability * Δ			
	before	-0.001	[-0.003, 0.001]	.599
	Emotional Stability * Δ			
	after	0.001	[0.000, 0.002]	.103

Figure 1. Theoretical change models of self-esteem during the transition to retirement. Models adapted from Schwaba and Bleidorn (2017) and Doss et al. (2009). Dashed lines indicate timing of retirement and solid lines indicate possible trajectories of self-esteem. The depicted trajectories are examples; pre-and post-birth trajectories as well as sudden level shifts could have been positive or negative in direction in the fitted models.

Figure 2. Best fitting models describing self-esteem development during the transition to retirement. Scores are standardized to z-scores. The left panel depicts development in retirees (N = 690, 1,916 survey responses). The right panel depicts development in propensity-score matched non-retirees (N = 515, 1,086 observations). Solid lines represent parameters significant at $p < .05$. Dashed lines represent nonsignificant parameters. Dotted lines represent 95% confidence intervals.