

Youthfuls, Matures, and Veterans: Subtyping Subjective Age in Late-Career Employees

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ABSTRACT

Subjective age research is on the rise, and the term has become an overarching way of describing how individuals idiosyncratically experience the aging process (“How old one feels”). Furthermore, the theory of aged heterogeneity posits that interindividual variability of similarly aged adults increases over time, suggesting that subjective age may become more variable in later life. Subjective aging has usually been investigated in a *variable-centered* manner—which over-assumes homogeneity among people’s aging experience—producing mixed evidence regarding the utility of single subjective age constructs in different populations. Person-centered approaches, in contrast, acknowledge interindividual heterogeneity in the aging experience, providing an alternative angle of investigation, and enable insights into how variables operate conjointly within persons. Therefore, the current research uses a latent profile analysis to investigate various conceptualizations of subjective age among late-career employees. Using a time-lagged design with a sample of 229 older workers (aged 50–66 years), we uncover three distinct subjective age profiles: *Youthfuls*, *Matures*, and *Veterans*. Moreover, we investigate how person-related correlates of subjective aging differ between the uncovered profiles, and how, in turn, these profiles are related to work engagement and organizational citizenship behavior. Through a person-centered approach, we receive valuable insights on the concurrent interplay of various subjective age concepts in a highly heterogeneous population and provide a better understanding of subjective age in late career.

In recent years, growing scholarly interest has emphasized *subjective age*—that is, how old one feels, looks, and behaves—in the work domain (Kunze, Raes, & Bruch, 2015; Schwall, 2012). Originally rooted in gerontology, organizational research has increasingly included subjective age to explain differences in various work-related outcomes, such as retirement intentions (Cleveland, Shore, & Murphy, 1997), organizational commitment (Ng & Feldman, 2010), goal accomplishment and company performance (Kunze et al., 2015), and work motivation (Akkermans, de Lange, van der Heijden, Kooij, & Jansen, 2016).

At the same time, critical voices have challenged the utility of the subjective age concept (e.g., Brothers, Miche, Wahl, & Diehl, 2015; Fasbender, Deller, Wang, & Wiernik, 2014; Zacher & Rudolph, 2019). One of the critiques is that researchers use the term “subjective age” too broadly in describing how individuals experience the aging process, thereby overlooking its distinct, nuanced underpinnings (Brothers et al., 2015). Indeed, the majority of subjective age research is *variable-centered*, incorporates only one subjective age measure, and largely ignores the multifaceted nature of the construct (Barrett & Montepare, 2015). Furthermore, variable-centered analyses assume that the

population is homogenous (Laursen & Hoff, 2006), focusing on associations among variables found to a similar degree in all members of the investigated population. As a result, this approach has yielded mixed evidence regarding the utility of the subjective age construct in different populations. In contrast, a *person-centered* approach acknowledges both interindividual differences—that is, not assuming homogeneity among the population—as well as intraindividual variation in the interplay between different underlying factors. Therefore, the current investigation focuses on how subjective age differs within as well as between older workers. In doing so, we utilize latent profile analysis (LPA) as a person-centered technique (Wang & Hanges, 2011).

Our approach offers at least three main contributions. First, we scrutinize different forms of subjective age proposed by previous research (i.e., feel-, act-, interests-, look-, cognitive-, physical-, private life-, and work-age), examining how they simultaneously combine to form distinct subjective age profiles in late-career employees. Second, we investigate how person-related correlates of subjective aging (health status, perceived work ability, core self-evaluations, and attitudes toward own aging) differ between the uncovered subjective age

profiles. Third, we examine how the uncovered subjective age profiles relate to work-relevant behaviors (i.e., work engagement and organizational citizenship behavior [OCB]). Through our person-centered investigation, we introduce insights into how different facets of subjective age combine to form distinct profiles in late-career employees. In so doing, we simultaneously highlight how different subjective age variables are related to each other and function in a similar way within individual subgroups.

AGED HETEROGENEITY AND SUBJECTIVE AGING IN LATE-CAREER EMPLOYEES

The study of subjective age originated in gerontology, focusing on older adults only (for a review, see Kotter-Gruehn, Kornadt, & Stephan, 2016). In contrast, researchers in work and organizational psychology usually research the subjective age concept across the entire working lifespan (e.g., Akkermans et al., 2016; Kunze et al., 2015; Zacher & Rudolph, 2019). Although subjective age might be relevant throughout the whole lifespan, evidence suggests that subjective age takes on different meanings at different life stages: For instance, perceptions of growing older may involve fairly benign physical changes in one's younger years, but more serious losses in physical health or functional independence in older years (Brothers et al., 2015). In line with this, previous research (Zacher & Rudolph, 2019) has found that in some cases (i.e., regarding emotional exhaustion), subjective age matters for older, but not for younger employees and that subjective age dimensions work differently for younger, mid-aged, and older workers (e.g., Zaniboni, Bertolino, & Steiner, 2019).

The theory of aged heterogeneity (Nelson & Dannefer, 1992) posits that interindividual variability of similarly aged adults increases over time. This means on one hand that there is an increased need for variables, in this case subjective age, to explain relationships between chronological age and work outcomes; but on the other hand, also that subjective age becomes more variable in later life, representing the heterogeneity among late-career employees. Studies examining older populations usually focus on measures of central tendency and mean-level differences, paying little attention to dispersion within the given age group (Dannefer & Sell, 1988). Although generalizations are necessary and useful for many purposes, normative patterns represent an increasingly oversimplified picture as individuals age (Nelson & Dannefer, 1992). In older individuals, measures of central tendency become less typical and less meaningful as between-subject variation increases. Even though an aging workforce necessitates increased understanding of the general relationship between chronological age and work outcomes, the inherent within-individual variance of the aging process requires acknowledging heterogeneity among late-career employees. Therefore, a specific focus on subjective age in the late-career phase seems necessary.

SUBJECTIVE AGE AS A MULTIFACETED CONSTRUCT

Prior research conceptualizes "subjective age" in a multitude of ways, to the point of comprising an overarching term to describe various ways in which individuals experience the aging process (Brothers et al., 2015). As a result, the subjective age literature has evolved in a rather fragmented way, spanning diverse disciplines (e.g., gerontology, marketing research, and work and organizational psychology).

For example, various constructs have been labeled subjective age in different literatures, such as attitudes toward own aging (Akkermans et al., 2016; Brothers et al., 2015) or awareness of age-related changes (Brothers et al., 2015), and variables measured very similarly (by asking participants how old they feel) are being referred to in a variety of ways, that is, functional age (Kastenbaum, Derbin, Sabatini, & Artt, 1972), cognitive age (Barak, 1987), age identity (Barak, 2009; Teuscher, 2009), or psychological age (Barnes-Farrell & Petery, 2018; Barnes-Farrell, Rumery, & Swody, 2002). The disparity in theoretical approaches and labels has rendered subjective age an increasingly popular literature, but one requiring greater construct synthesis.

Moreover, some researchers utilize the four-item, multidimensional measure of SA (feel-age, look-age, interests-age, and act-age based on Kastenbaum et al.'s "ages of me" conceptualization) and create a composite score (e.g., Teuscher, 2009), whereas others just use a one-item measure (e.g., Barnes-Farrell & Petery, 2018). Although certain advantages exist for using a composite score (e.g., enables calculating indicators such as internal consistency and inter-item correlations), it has been criticized by previous research for "lump[ing] together items that are not necessarily measuring the same thing" (Kotter-Gruehn et al., 2016, p. 12). As a result, a gap persists in understanding the multidimensionality of subjective age: How a person looks, what they do, or what they are interested in—as measured by the commonly used composite score (Barak, 1987) with the dimensions of look-, feel-, act-, and interests-age—likely differ from their felt-age (Kotter-Gruehn et al., 2016). Also, felt-age itself presumably varies across domains such as cognition versus physical functioning (Kleinspehn-Ammerlahn, Kotter-Gruehn, & Smith, 2008) or between different life domains, such as at work compared to one's leisure time (Kotter-Gruehn et al., 2016). As previous research usually includes only one of these subjective age measures in their analyses or created the composite score of the single dimensions, we lack knowledge on how comparable the different forms of subjective age are, how they relate to each other, and to what extent individuals differ on the various dimensions. We address this issue by acknowledging the different conceptual approaches and showing how they are empirically linked to each other in forming distinct subjective age profiles.

PERSON-CENTERED INVESTIGATION OF SUBJECTIVE AGE IN LATE-CAREER EMPLOYEES

Subjective aging research usually utilizes a *variable-centered* approach, inspecting and describing associations among variables found to a similar degree in all members of a population. This line of research has produced mixed evidence regarding the utility of the subjective age construct (Zacher & Rudolph, 2019). Variable-centered approaches (e.g., regression, structural equation modeling) elucidate the relation between individuals' positions on latent dimensions, across individuals and are predicated on the assumption that the population is homogenous (Laursen & Hoff, 2006).

Person-centered approaches, in contrast, describe differences among individuals by highlighting how variables are related to each other and function in a similar way within persons, thereby identifying groups of individuals who share particular relations among attributes (Laursen & Hoff, 2006). As variables dynamically operate within a particular person, understanding the configuration and systematic connection of

the variables of interest provides an alternative angle of investigation. Therefore, a person-centered analysis is an effective way to simultaneously investigate the interplay of different subjective age constructs in late career as it provides critical insights into how sets of related constructs uniquely combine, thereby demonstrating how variables operate conjointly within as well as between persons (Gabriel, Campbell, Djurdjevic, Johnson, & Rosen, 2018).

Specifically, a person-centered approach acknowledges older worker subjective age heterogeneity in two respects: (a) *heterogeneity between older workers*, considering the idiosyncratic nature of the aging process and (b) *heterogeneity within subjective age*, comprising different domains (feel- vs. look-, act-, interests-age; cognitive vs. physical age; subjective age in the work vs. non-work domains). With the help of LPA, we can (a) examine the concurrent interplay of these variables in a highly heterogeneous population in a unique way, (b) receive insights on the interplay as well as comparability of different subjective age constructs, and (c) find out whether the different subjective age dimensions are equally representative of a common subjective age construct.

Typologies created by LPA consist of a classification of subgroups that have a similar configuration on a set of variables, while displaying a profile that is qualitatively and/or quantitatively distinct from other groups' profiles (Marsh, Lüdtke, Trautwein, & Morin, 2009). A qualitative difference means that resulting profiles have disparate relative standings on profile indicators; a quantitative difference, in contrast, signifies that the resulting profiles differ on the absolute levels of the indicators (Gabriel, Daniels, Diefendorff, & Greguras, 2015; Wang & Hanges, 2011).

From a qualitative perspective, we expect to uncover uniform as well as disparate subjective age profiles: Uniform profiles display comparable levels on the investigated subjective age dimensions, whereas disparate profiles display larger differences in magnitude amongst the single indicators (e.g., low levels of private life-age but high levels of work-age). From a quantitative perspective, within virtually any group of individuals, a range exists, such that some feel younger, others older, and still others about the same age as their chronological age (Kaufman & Elder, 2002). Hence, we expect to uncover "Youthfuls," with low levels of subjective age (younger than their chronological age), "Realists," characterized by medium levels of subjective age (the same age as their chronological age), and "Veterans," with high levels of subjective age (older than their chronological age).

Hypothesis 1: Quantitatively and qualitatively distinctive profiles of various subjective ages (feel-, look-, act-, interests-, physical-, cognitive-, work-, and private life-age) exist in late career employees.

METHODOLOGICAL ISSUES PERTAINING TO SUBJECTIVE AGE MEASUREMENT

Another issue regarding the comparability of different subjective age constructs is the answer format of items measuring subjective age. The most commonly used, "how old do you feel" question adopts different answer formats: A Likert-type answer format with multiple answer categories ranging between "much younger than my actual age"—"much older than my actual age" (e.g., Teuscher, 2009); versus free entry of an age decade the participant identifies with (e.g., Barak, 1987); versus free entry of a numeric value with the felt-age of the

study participant (e.g., Barnes-Farrell & Petery, 2018). Also, whereas some studies only use the subjective age variable for their analyses without any consideration of the chronological age of the participants (e.g., Barak & Schiffman, 1981), others control for chronological age in their further analyses (e.g., Zacher & Rudolph, 2019). Some researchers subtract chronological age from the numeric subjective age to arrive at a relative subjective age value (e.g., Kunze et al., 2015), yet others additionally divide this value by the chronological age of the respondents to create a proportional discrepancy score (e.g., Barnes-Farrell & Petery, 2018). This results in the predicament of the comparability of these measures: How do we know, whether a 5-year discrepancy between subjective and chronological age is rated by participants as "same as my age," "younger than my age," or "much younger than my age"? Therefore, the current research also aims to examine the relationship between the different types of subjective age measures in order to shed light on the variability between the answer categories.

Research Question 1: How do the emerging profiles (measured by subjective age items with a Likert-type answer format) relate to chronological age and the numeric-, relative-, and proportional values of subjective age in late career employees?

Person-Related Correlates of Subjective Age Profiles

Our study's second aim is to examine factors that distinguish between late-career employees' divergent subjective age profiles. Therefore, we draw on the lifespan-development literature on subjective aging in older individuals and selected variables that have been identified by previous research to foster subjective perceptions of aging, namely health status, perceived workability, core self-evaluations, and attitudes towards own aging.

Health.

Older individuals with poor health experience functional limitations and negative physical sensations, which may contribute to feeling older, as those sensations act as reminders of age and markers of age-related physical decline (Kotter-Gruehn et al., 2016; Spuling, Miche, Wurm, & Wahl, 2013; Teuscher, 2009). In line with this, good physical health is related to a youthful subjective age among older individuals (Bergland, Nicolaisen, & Thorsen, 2014), and generally speaking, a large portion of subjective age among older adults is explained by different combinations of health dimensions (Hubley & Russell, 2009). Therefore, we expect that older workers with good health will generally report younger subjective ages.

Hypothesis 2a: Health predicts subjective age profile membership of late career employees: *Youthfuls* will report better health compared to *Realists*, and *Realists* report better health than *Veterans*.

Perceived work ability.

Perceived work ability reflects employees' evaluation of the extent to which potential health-related issues restrict their ability to optimally function at work, and is a dimension of functional health (Hubley &

Russell, 2009). Previous research shows that functional health limitations play an important role in predicting subjective age in older individuals (Hubley & Russell, 2009). Therefore, and in line with the previous argumentation, we expect that older workers with high levels of perceived workability will generally report younger subjective ages.

Hypothesis 2b: Perceived workability predicts subjective age profile membership of late career employees: *Youthfuls* will report higher levels of work ability compared to *Realists*, and *Realists* report higher levels of workability than *Veterans*.

Core self-evaluations.

Core self-evaluations is an integrative trait indicated by self-esteem, generalized self-efficacy and emotional stability (Judge, 2009). Previous research has shown that people with high self-efficacy and mastery beliefs report relatively younger subjective ages (Kotter-Gruehn et al., 2016). Also, in lay theories of personality, characteristics such as self-efficacy, optimism, and mastery are attributed more strongly to younger adults, thereby fostering more positive social comparisons with their age group compared to older adults, resulting in younger subjective ages (Kotter-Gruehn et al., 2016; Teuscher, 2009). Furthermore, there is first evidence that younger subjective ages can be experimentally induced in older adults by increasing self-efficacy: For instance, Stephan, Chalabaev, Kotter-Gruehn, and Jaconelli (2012) showed that positive feedback on a handgrip task (independent from the actual handgrip performance) led to lower subjective age of participants, in comparison to the control group (Stephan et al., 2012). Taken together, these findings illustrate how perceptions of improved functioning and self-efficacy are related to feeling younger among older adults. Translating this to the workplace, we expect that older workers with high core self-evaluations will generally report younger subjective ages.

Hypothesis 2c: Core self-evaluations predict subjective age profile membership of late career employees: *Youthfuls* will report higher levels of core self-evaluations compared to *Realists*, and *Realists* report higher levels of core self-evaluations than *Veterans*.

Attitudes toward own aging.

Attitudes toward own aging is a global evaluation of a person's aging process, reflecting a general attitude toward aging (Brothers et al., 2015). Attitudes toward own aging significantly relate to subjective age: People with positive attitudes toward their own aging report significantly lower subjective ages than people with negative attitudes toward own aging (Brothers et al., 2015; Gwinner & Stephens, 2001; Teuscher, 2009). Therefore, we expect that older workers with negative attitudes toward own aging adopt older age identities (i.e., older subjective ages).

Hypothesis 2d: Attitudes toward own aging predict subjective age profile membership of late career employees: *Youthfuls* will report more favorable attitudes toward own aging

compared to *Realists*, and *Realists* report more favorable attitudes toward own aging than *Veterans*.

Subjective Age Profiles and Work-Related Attitudes and Behaviors

Research has shown how feeling younger than one's chronological age predicts various outcomes, many of them adaptive, among older adults. For example, Levy and Myers (2004) found that individuals who felt younger than their age took better care of their bodies and practiced more preventive health behaviors in the subsequent two decades. In the area of marketing research and consumer psychology, a stratification of older customers based on their subjective age is a common practice (Sudbury & Simcock, 2009): As early as the 1980s, research has found that older people identifying as younger than their age group belong to a younger target market, despite their chronological age (Barak & Schiffman, 1981). Furthermore, a younger subjective age in older individuals has been shown to be predictive of motivations for tourism as well as behavior as a tourist (González, Rodríguez, Miranda, & Cervantes, 2009; Muller & O'Cass, 2001); media selection and consumption (Stephens, 1991); and entrepreneurial behavior (Kautonen, Hatak, Kibler, & Wainwright, 2015). In the work context, a younger subjective age predicts proactive workplace behaviors among older workers (Nagy, Johnston, & Hirschi, 2019).

Therefore, as a third step, we investigate how older worker subjective age profiles predict work-related attitudes and behaviors. The theoretical framework of successful aging at work by Zacher (2015) identifies work motivation, job performance, job attitudes, and occupational well-being as important work-related outcomes when investigating successful aging at work. Building on this framework, we examine work engagement, and OCB as work-related outcomes of our uncovered subjective age profiles.

Work engagement.

Work engagement is a positive work-related motivation characterized by vigor, dedication, and absorption, and is considered to be the opposite of burnout (Schaufeli, Bakker, & Salanova, 2006). Specifically, work engagement describes employees' level of energy and fulfillment at work. Previous research finds that subjective age-related variables, such as future time perspective (i.e., perceived expansiveness of one's time remaining; Akkermans et al., 2016; Carstensen, 2006) or health, significantly predict work engagement (Kooij, de Lange, Jansen, & Dijkers, 2013; Kooij, Tims, & Akkermans, 2017), and that a more expansive future time perspective (i.e., younger subjective age) predicts work engagement, above and beyond the effect of chronological age and self-reported health (Rudolph, Kooij, Rauvola, & Zacher, 2018). Therefore, we expect that older workers with younger subjective ages are more engaged at work.

Hypothesis 3a: Subjective age profile membership is related to work engagement in late career employees: *Youthfuls* will report higher levels of work engagement than *Realists*, and *Realists* will report higher levels of work engagement than *Veterans*.

Organizational citizenship behavior.

OCB comprises prosocial employee actions that support the social and psychological environment in which task performance takes place and contributes to overall organizational effectiveness (Staufenbiel & Hartz, 2000). Examples of OCB are attending meetings that are not mandatory, but considered important (civic virtue); helping others with heavy workloads (altruism); or making suggestions for improving how things operate within the organization (taking charge). Prior work shows that a younger subjective age predicts higher life satisfaction in older adults (Stephan, Caudroit, & Chalabaev, 2011) and in a workplace context, higher satisfaction predicts OCB (Kuehn & Al-Busaidi, 2002). Furthermore, positive psychological and physical states, such as good health, high self-esteem, self-efficacy, and emotional stability, are enabling factors of prosocial acts (Huang, McDowell, & Vargas, 2015) and individuals high in self-esteem (Montepare, 1996), general self-efficacy (Boehmer, 2007), and personal control (Schafer & Shippee, 2010) tend to perceive themselves as subjectively younger. In contrast, individuals with poorer physical, mental, or social well-being tend to perceive themselves older than they actually are (Barrett, 2003), wherefore we expect that a younger subjective age in older employees will predict OCBs.

Hypothesis 3b: Subjective age profile membership is related to OCB in late career employees: *Youthfuls* will report higher levels of OCB than *Realists*, and *Realists* will report higher levels of OCB than *Veterans*.

METHODS

Sample and Procedure

Participants were recruited through an online-access, International Organization for Standardization (ISO, 2019) and ESOMAR (World Association for Social, Opinion, and Market Research, 2011) certified research panel company, where a sample of 277 participants were drawn from a pool of over 320,000 German registrants. Eligible participants had to be active in the workforce, working at least 20 hr per week, and be in their late-career phase (i.e., above age 50, following most definitions, see Fasbender, Wöhrmann, Wang, & Klehe, 2019; Kooij, de Lange, Jansen, & Dikkers, 2008). (We acknowledge that age and tenure are intertwined [North, 2019] and there are differences between workers aged 50+ regarding their career phase and career tenure. Despite this, age 50 is the traditional cutoff, wherefore we chose this threshold to operationalize our research question.) After the completion of the first survey (T1), participants were invited to fill out follow-up surveys 2 weeks later (T2; response rate: 85.56%). Antecedents and all profile indicators were assessed at T1, whereas the outcomes were assessed 2 weeks later, at T2, in order to temporally separate the profile indicators from the outcomes and reduce common method-bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Following the data collection, we conducted extensive data quality checks: We used direct and indirect, unobtrusive screens and calculated invariance as well as consistency indices as recommended by DeSimone, Harms, and DeSimone (2015). We excluded two participants who failed to correctly answer the instructed screening items and 13 participants whose response time was under 1.5 s/item and who were therefore identified as speeders (Zhang & Conrad, 2014).

The invariance screening resulted in the removal of eight participants, due to insufficient individual response variability (IRV); however, no longstrings have been detected in the data. Finally, we excluded 17 respondents based on consistency indices, displaying insufficient values of Mahalanobis D. The resulting sample consisted of $N = 229$ participants at T1 and $N = 197$ participants at T2, 50.6% female, aged 50–66 years ($M = 55.85$; $SD = 4.05$).

Respondents came from a large variety of industry sectors and occupations, with organizational tenures ranging from less than a year (4.2%) to more than 25 years (32.9%), with the majority of participants (13.9%) working in their current organization for 5–10 years. Participants weekly work hours ranged from 20 to 25 hr per week (1.3%) to over 45 hr per week (6.8%), while the majority of participants reported to work 35–40 hr per week. The educational level of our sample is representative of the working population in Germany and ranged from no vocational training (2.1%) to postgraduate education (11.8%). The majority of participants completed vocational training (49.4%) while one quarter (24.5%) reported a high school degree as highest attained level of education.

Measures

We used previously validated German language versions of measures, when available. Where a validated translation was not available, we independently translated scales from their original English version into German, formulating the final German items after reconciling differences in the translations to ensure correct connotation and comprehensibility of the items (in line with the recommendations of Van de Vijver & Leung, 1997). The internal consistency of all measures was satisfactory (Cronbach's $\alpha > .80$; see Table 1).

Chronological age.

Chronological age was measured with a one-item question asking the participants to indicate their age in years.

Numeric subjective age.

The numeric version of subjective age was measured with one item: "How old do you feel (in years)?" and had to be answered with a free entry of the respondents' felt-age in years (see also Barnes-Farrell & Piotrowski, 1989; Caudroit, Stephan, Chalabaev, & Le Scanff, 2012).

Relative subjective age.

We calculated an absolute discrepancy score of subjective age (SA) and chronological age (CA) for each participant using the following formula: Relative subjective age = $SA - CA$. This approach additionally considers the chronological age of the respondents when examining SA (Kunze et al., 2015).

Proportional subjective age.

The proportional discrepancy score was calculated by taking into consideration the effect that chronological age has on the magnitude of the discrepancy between chronological and subjective age, using the following formula: Proportional subjective age = $(SA - CA) / CA$ (Barnes-Farrell & Petery, 2018). The proportional discrepancy controls for the artificial constraint that CA places on the potential magnitude of negative SA values and represents the percentage an individual feels related to their CA (Barnes-Farrell & Petery, 2018).

Table 1. Descriptive Statistics, Reliability Coefficients, and Correlations of the Study Variables ($N = 229$ at T1, $N = 197$ at T2)

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Chronological age	55.85	4.06	—																			
2. Feel-age	2.81	1.15	-.11	—																		
3. Act-age	2.68	1.03	-.03	.62**	—																	
4. Look-age	2.96	0.97	-.10	.67**	.51**	—																
5. Interests-age	2.75	0.98	-.00	.49**	.55**	.29**	—															
6. Work-age	3.17	1.21	-.06	.58**	.50**	.40**	.40**	—														
7. Private life-age	2.75	1.08	-.07	.68**	.62**	.45**	.64**	.53**	—													
8. Physical age	3.52	1.33	-.09	.67**	.54**	.47**	.44**	.54**	.65**	—												
9. Cognitive age	2.57	1.12	-.14*	.42**	.49**	.36**	.48**	.45**	.47**	.43**	—											
10. Numeric SA	48.41	7.25	.41**	.58**	.50**	.33**	.48**	.47**	.51**	.47**	.41**	—										
11. Relative SA	-7.44	6.68	-.16	.69**	.56**	.43**	.52**	.54**	.59**	.56**	.52**	.83**	—									
12. Health	3.40	0.85	-.00	-.50**	-.33**	-.29**	-.23**	-.36**	-.41**	-.66**	-.23**	-.38**	-.41**	—								
13. Work ability	2.46	0.61	-.08	-.43**	-.26**	-.16*	-.14*	-.35**	-.30**	-.53**	-.20**	-.34**	-.36**	.65**	—							
14. Core self-evaluations	3.70	0.56	.07	-.41**	-.33**	-.33**	-.26**	-.33**	-.37**	-.41**	-.26**	-.31**	-.38**	.47**	.33**	.87						
15. Attitudes toward aging	4.48	1.09	-.05	-.53**	-.44**	-.35**	-.31**	-.44**	-.45**	-.64**	-.34**	-.48**	-.49**	.59**	.49**	.70**	.82					
16. Work engagement	5.00	1.34	.02	-.25**	-.24**	-.26**	-.24**	-.46**	-.31**	-.26**	-.28**	-.19**	-.22**	.21**	.20**	.40**	.37**	.96				
17. In-role behavior	6.34	0.68	-.19**	-.13	-.09	-.09	-.13	-.24**	-.12	-.01	-.06	-.20**	-.11	.07	-.00	.36**	.25**	.45**	.82			
18. Civic virtue	5.38	1.29	-.08	-.17*	-.18*	-.20**	-.19**	-.23**	-.16*	-.16*	-.18*	-.22**	-.19**	.07	.09	.30**	.30**	.55**	.47**	.84		
19. Altruism	5.72	1.08	-.08	-.11	-.14*	-.18*	-.12	-.23**	-.16*	-.11	-.19**	-.17*	-.15*	.10	.02	.26**	.27**	.53**	.51**	.65**	.91	
20. Taking charge	5.09	1.26	.04	-.21**	-.26**	-.18*	-.20**	-.35**	-.28**	-.22**	-.29**	-.21**	-.26**	.09	.13	.32**	.31**	.60**	.41**	.75**	.61**	.95

Note. Italic numbers in diagonal are Cronbach's alpha reliability coefficients. SA = subjective age; T1 = time 1 ($N = 229$); T2 = time 2 ($N = 197$).

* $p < .05$; ** $p < .01$.

Feel-, look-, act-, and interests-age.

The four common dimensions of subjective age (Kastenbaum et al., 1972) were measured using four items developed by Barak (1987), measuring the four facets of subjective age: Feel-, look-, act-, and interests-age. An example item is: “How old do you look?” and uses a 7-point Likert-type scale answer format ranging from 1 (*much younger than my age*) to 7 (*much older than my age*) (see also Teuscher, 2009).

Cognitive and physical age.

Cognitive and physical age were assessed by one item each, in a similar manner to the previous four dimensions, using a 7-point Likert-type scale answer format ranging from 1 (*much younger than my age*) to 7 (*much older than my age*), to ensure comparability of the different domains of subjective age (see also Kotter-Gruehn et al., 2016).

Work- and private life-age.

Work- and private life-age were also assessed with one item each, using a 7-point Likert-type scale answer format ranging from 1 (*much younger than my age*) to 7 (*much older than my age*) (see also Kotter-Gruehn et al., 2016).

Health.

Health was measured with one item: “How would you describe your current health?” adapted from the German Socioeconomic Panel (SOEP) (Schupp, 2012), and requiring a 5-point Likert response ranging from 1 (*very bad*) to 5 (*excellent*). One-item measures are common in assessing health status in population surveys (Bowling, 2005), strongly predicting help seeking behavior as well as health service use.

Perceived workability.

We measured perceived workability—operationalized as the presence of health issues that restrict ability to work—with one item, along a 3-point Likert-type scale: 1 (*very restricted*) to 3 (*not restricted*). This single-item question has a very strong relation to the seven-item work ability index (WAI; Ilmarinen, 2007), as well as comparable predictive validity in terms of similar magnitudes and patterns of associations with sick leave, general health state, and various symptoms as the seven-item WAI (Ahlstrom, Grimby-Ekman, Hagberg, & Dellve, 2010).

Core self-evaluations.

Core self-evaluations were assessed using the German-language Core Self-Evaluations Scale (Heilmann & Jonas, 2010; Judge, Erez, Bono, & Thoresen, 2003). The measure comprises 12 items, requiring a Likert-type response ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). An example item is: “When I try, I generally succeed.”

Attitudes toward own aging.

We measured attitudes toward own aging with the five-item subscale of the Philadelphia Geriatric Center Morale Scale (Lawton, 1975), a measure widely used in SA research (Brothers et al., 2015). The items reflect an overall evaluation of the own aging experience and had to be answered on a Likert-type scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). An example item is: “Things keep getting worse as I get older” (reverse coded).

Work engagement.

Work engagement was measured with the German language version of the Utrecht Work Engagement Scale (UWES-9; Schaufeli et al., 2006), validated by Sautier et al. (2015). The measure consists of nine items (e.g., “At my work, I feel bursting with energy”), which have to be answered on a 7-point Likert-type scale ranging from 1 (*never*) to 7 (*always*).

Organizational citizenship behavior.

We measured OCB, specifically in-role behavior, civic virtue, altruism, and taking charge at work with the OCB scale developed by Staufenbiel and Hartz (2000). The 23-item scale requires a 7-point Likert-type response ranging from 1 (*strongly disagree*) to 7 (*strongly agree*) and is widely used in German-speaking countries (Meynhardt, Brieger, & Hermann, 2018). The measure consists of four subscales measuring in-role behavior (4 items, e.g., “I fulfil the responsibilities specified in my job description”), civic virtue (4 items, e.g., “I attend functions that are not required, but that help the company image”), altruism (5 items, e.g., “I help others who have heavy workloads”), and taking charge (10 items, e.g., “I often try to correct a faulty procedure or practice”).

Analytic Approach

All of the analyses were performed with MPlus 8.0 (Muthén & Muthén, 1998–2017). We first performed a confirmatory factor analysis (CFA) with the core self-evaluations, attitudes towards own aging, work engagement, and OCB scales to confirm the factor structure of the measures. Model fit was assessed in line with the recommendations of Hu and Bentler (1999) by examining the following model fit indices: (a) the chi-squared (χ^2) test, (b) the comparative fit index (CFI), (c) the Tucker-Lewis Index (TLI), and (d) the root mean square error of approximation (RMSEA), and (e) the standardized root mean square residual (SRMR).

To establish subjective age profiles, we performed LPA using the eight different subjective age measures (feel-, act-, interests-, look-, cognitive-, physical-, private life-, and work-age) as latent profile indicators at T1. We used a stepwise, inductive procedure to determine the number of latent profiles, as is customary in LPA research (Gabriel et al., 2015). We started with specifying two profiles and increased the number of profiles until the increase in model fit no longer merited the reduction in parsimony achieved by specifying another latent class. In each step, we examined the changes in multiple fit indices, that is, log likelihood (LL), Akaike information criterion (AIC), Bayesian information criterion (BIC), sample-size-adjusted BIC (SSA-BIC), Lo-Mendel Rubin Test (LMR), Bootstrap likelihood ratio test (BLRT), and entropy (in line with the recommendations of Foti, Bray, Thompson, & Allgood, 2012; Gabriel et al., 2015) to evaluate the resulting models. Whereas LL, AIC, BIC, and SSA-BIC values are preferably lower, entropy ought to be larger compared to alternative profile solutions. The LMR and BLRT statistics examine whether the k profile solution is a better fit than the $k - 1$ profile solution (Gabriel et al., 2018).

Person- and work-related correlates of the identified profiles were modeled using the automatic three-step approach by Asparouhov and Muthén (2014) by first enumerating the profiles, independently from the auxiliary variables, followed by obtaining the most likely class membership based on the posterior distribution from the previous

step, and finally the assessment of the auxiliary variables in relation to the profile solution, with consideration of the classification error rate as well as the most likely class membership (Gabriel et al., 2015). Auxiliary variables were modeled using the BCH command in *MPlus* (Asparouhov & Muthén, 2014; Bakk & Vermunt, 2016; Lanza, Tan, & Bray, 2013).

RESULTS

Primary Analyses

Means, standard deviations, correlations, and Cronbach's alphas are reported in Table 1. The results of the confirmatory factor analyses are presented in Table 2. Overall, the assessed measures showed an acceptable model fit, with comparatively high factor loadings of the items on their respective factors.

Hypothesis Testing

Fit statistics for the tested possible latent profile solutions are provided in Table 3. We investigated the fit statistics for solutions with two to six profiles and chose the three-profile solution as it attained low AIC, BIC, and SSA-BIC values, significant LMR and BLRT values as well as a high level of entropy. Although a possible four-profile solution would have provided lower values of AIC, BIC, and SSA-BIC, and a higher entropy, we decided in favor of three profiles due to nonsignificant LMR and the fact that the resulting fourth profile only contained three participants.

Figure 1 depicts the centered means of the single profile indicators for the three profiles. The resulting profiles were not exactly in line with our prediction, as no group with medium levels of subjective age ("Realists," feeling the same age as their chronological age) emerged. The first profile, including 47% of participants, was characterized by the lowest scores on all subjective age dimensions (subjectively youngest

group); we therefore labeled this profile, "Youthfuls." The second profile, containing 40% of participants displayed above-average levels of subjective age. Therefore, this group received the label "Matures." Finally, the third profile that emerged (13% of participants) displayed high to very high levels of subjective age (subjectively oldest group). We labeled this group "Veterans." In sum, our results confirmed our first hypothesis: We uncovered three distinct latent profiles (*Youthfuls*, *Matures*, and *Veterans*) based on various subjective ages in our sample of late-career employees. (In terms of demographic differences among latent profiles, *Youthfuls* were more likely to be male (46% females), whereas *Veterans* were more likely to be female [60% females]. No gender difference emerged for *Matures*. The latent profiles did not differ with regard to age and education.)

In terms of person-related correlates of the uncovered subjective age profiles, a comparison of the significance of the differences in mean levels of health, perceived workability, core self-evaluations, and attitudes toward own aging across profiles appears in Table 5, whereas Figure 2 displays the standardized means of these variables by latent class. The results show that all investigated variables significantly differentiated between the three profiles: Levels of health, perceived workability, core self-evaluations, and attitudes toward own aging were significantly higher in the group of *Youthfuls* than in the group of *Matures*, and significantly higher in the group of *Matures* than in the group of *Veterans*, thereby confirming our Hypotheses 2a–2d.

Regarding the work-related correlates of our uncovered profiles, a comparison of the significance of the differences in mean levels of work engagement and OCB across profiles can be found in Table 5. Figure 3 displays the standardized means of these variables by latent class. With regard to work engagement, profile membership significantly predicted differences in work engagement between *Youthfuls* and *Matures* as well as *Youthfuls* and *Veterans*, but not between *Matures* and *Veterans*.

Table 2. Model Fit for Confirmatory Factor Analyses of the Study Scales

	χ^2	df	CFI	TLI	RMSEA (90% CI)	SRMR
T1 Core self-evaluations	85.498	43	0.957	0.934	.066 (.045; .086)	.046
T1 Attitudes toward aging	4.554	4	0.999	0.996	.025 (.000; .105)	.019
T2 Work engagement	32.666	16	0.992	0.982	.073 (.036; .108)	.016
T2 In-role behavior	2.218	2	0.999	0.998	.024 (.000; .145)	.015
T2 Civic virtue	0.442	2	1.000	1.013	.000 (.000; .088)	.006
T2 Altruism	5.335	5	1.000	0.999	.018 (.000; .102)	.011
T2 Taking charge	72.028	29	0.977	0.964	.087 (.062; .112)	.026

Note. χ^2 = chi-squared test; CFI = comparative fit index; RMSEA = root mean square error of approximation; SRMR = standardized root mean square residual; T1 = time 1 ($N = 229$); T2 = time 2 ($N = 197$); TLI = Tucker-Lewis Index.

Table 3. Fit Statistics for the Two to Five Profile Solutions of Subjective Age Profiles

No.	LL	FP	AIC	BIC	SSA-BIC	LMR (p)	BLRT (p)	Entropy	Profile Prop.
2	−2479.876	25	5009.753	5095.596	5016.362	.0214	.000	.867	146 / 83
3	−2377.423	34	4822.846	4939.593	4831.835	.0691	.000	.888	107 / 92 / 30
4	−2330.546	43	4747.092	4894.742	4758.459	.065	.000	.913	107 / 3 / 88 / 31
5	−2302.328	52	4708.657	4887.210	4722.404	.294	.000	.887	100 / 80 / 11 / 3 / 35

Note. AIC = Akaike information criteria; BIC = Bayesian information criteria; BLRT = bootstrap likelihood ratio test; FP = free parameters; LL = log likelihood; LMR = Lo-Mendel Rubin Test; No. = number profiles; Profile Prop. = latent profile proportions ($N = 229$); SSA-BIC = sample-size adjusted BIC.

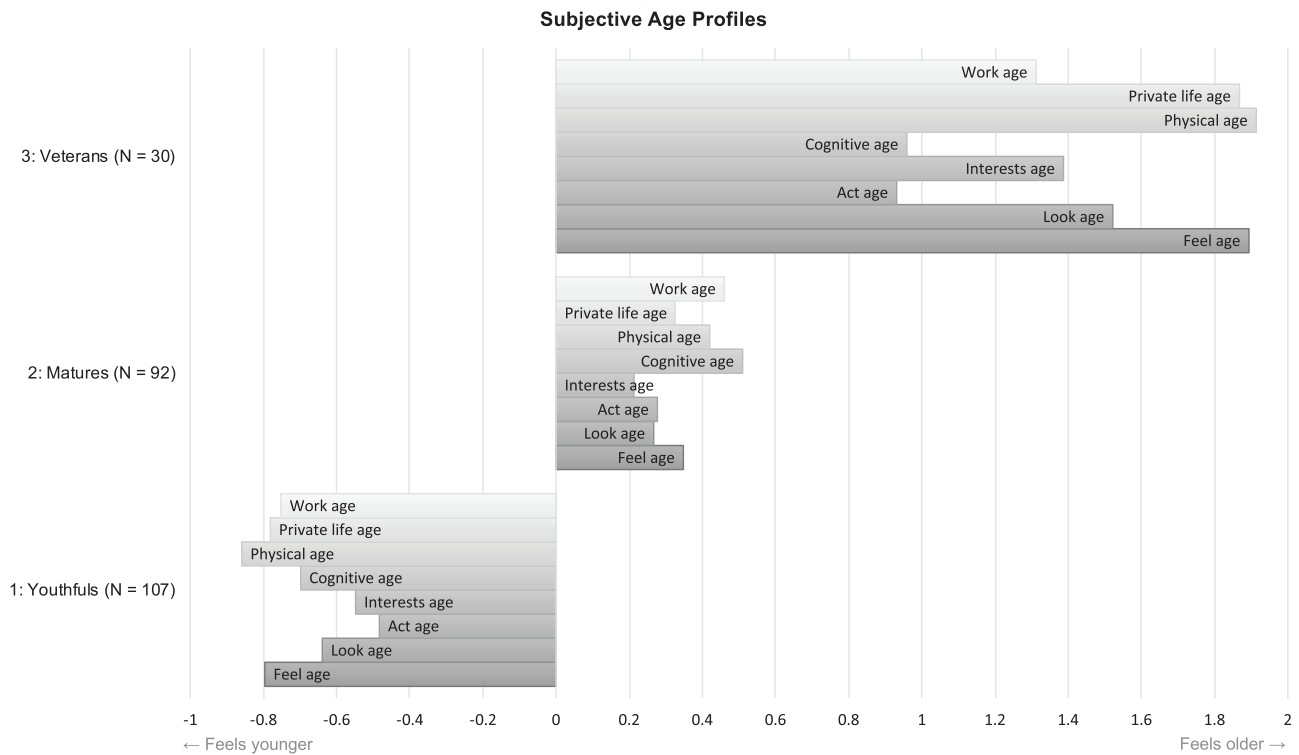


Figure 1. Estimated mean scores for the latent subjective age profiles ($N = 229$). SA = subjective age.

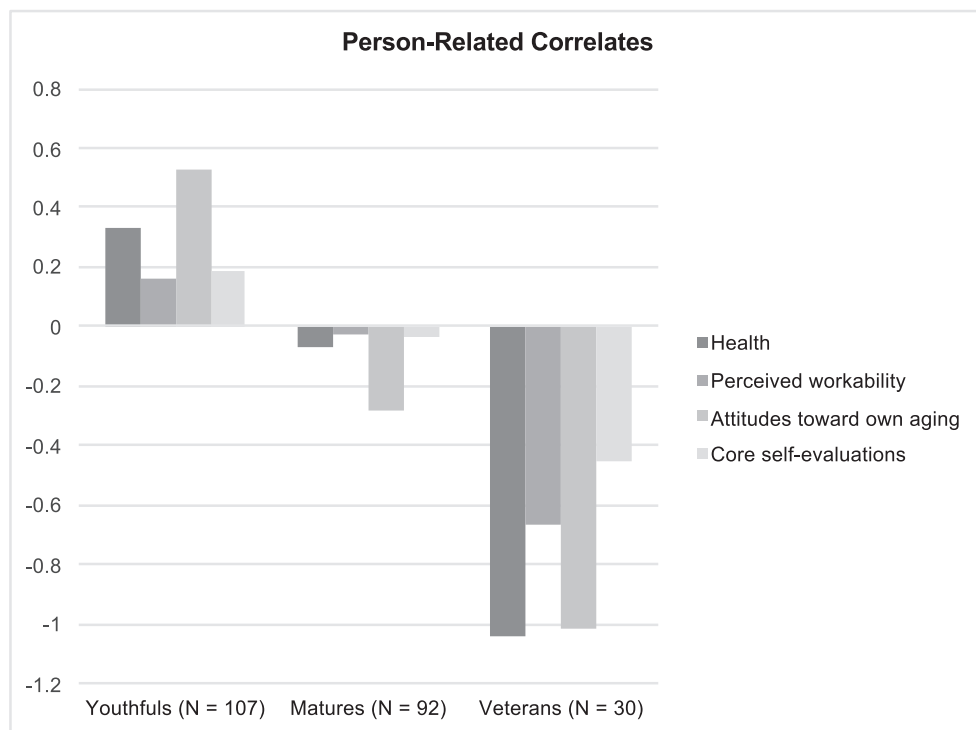


Figure 2. Centered means of person-related correlates by latent class ($N = 229$).

Youthfuls reported significantly higher levels of work engagement in comparison to the other two groups, thereby partially supporting our Hypothesis 3a.

There were no significant differences in in-role behavior between *Youthfuls*, *Matures*, and *Veterans*. With regard to civic virtue and altruism, profile membership significantly predicted differences, with

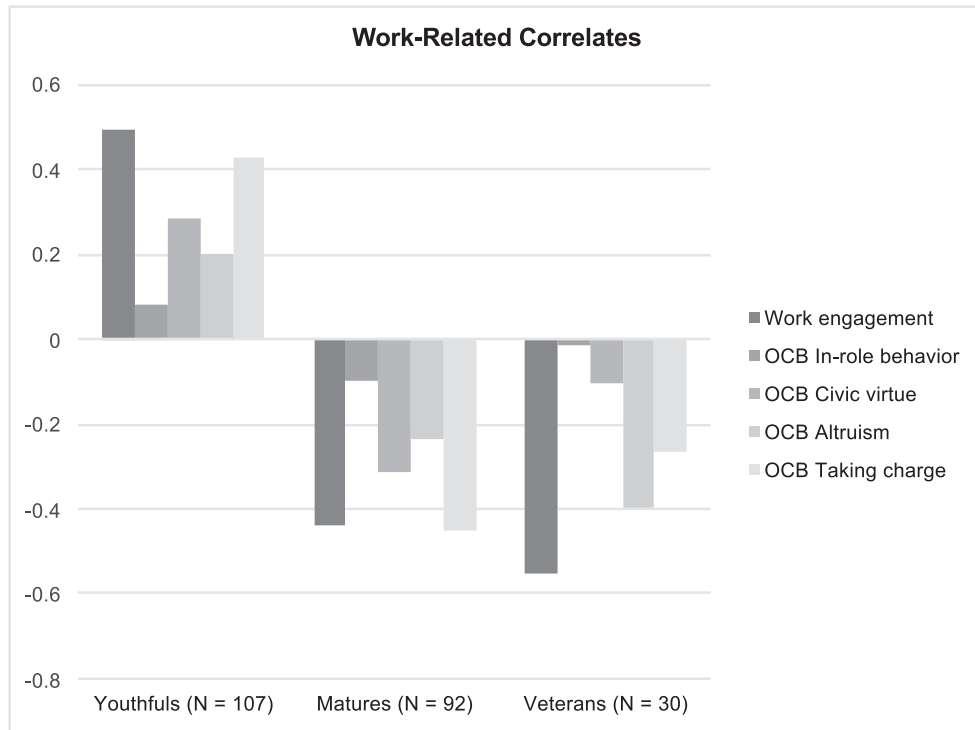


Figure 3. Centered means of work-related correlates by latent class ($N = 197$).

Youthfuls reporting higher levels of civic virtue and altruism than *Matures* and *Veterans*, whereas *Matures* and *Veterans* did not significantly differ. Finally, with respect to taking charge, profile membership significantly predicted differences between *Youthfuls* and *Matures* as well as *Youthfuls* and *Veterans*. *Youthfuls* reported significantly higher levels of taking charge in comparison to the other two groups whose levels did not significantly differ. In sum, our results partially support Hypothesis 3b: The group of *Youthfuls*, reported significantly higher levels of OCB (in the form civic virtue, altruism, and taking charge) than the groups of *Matures* and *Veterans*, but there were no significant differences between the three groups in regards to in-role behavior.

Answering Research Question 1

In addition to the investigated person- and work-related correlates, we further investigated the distribution of chronological age, and numeric, relative, and proportional subjective age as well as of the demographic variables within the whole sample and within the single profiles that emerged (see Table 4).

Regarding our research question, chronological age was comparable in the whole sample (mean age of 55 years) and the single profiles (*Youthfuls* = 56 years; *Matures* = 55 years, *Veterans* = 55 years), displaying that chronological age did not differ among the latent profiles. In terms of subjective age, *Youthfuls* felt on average 45 years old (11 years younger than their chronological age), *Matures* 49 years old (6 years younger than their chronological age), and *Veterans* 57 years old (3 years older than their chronological age). Regarding the comparisons between the Likert-type (with the options 1 = *much younger than my age*; 2 = *younger than my age*; 3 = *somewhat younger than my age*; 4 = *the same as my age*; 5 = *somewhat older than my age*; 6 = *older than my age*; 7 = *much older than my age*) and the numeric subjective age

measures, *Youthfuls*, who felt 11 years younger than their chronological age numerically (relative subjective age score), and 20% younger than their chronological age (proportional subjective age score), reported to feel “younger than my chronological age” ($M = 2.19$; $SD = 0.36$). *Matures*, who felt 6 years (11% proportionally) younger than their chronological age, reported to feel “somewhat younger than my chronological age” ($M = 3.25$; $SD = 0.32$). Finally, *Veterans*, who felt 2.5 years (5% proportionally) older than their chronological age, reported to feel “the same age as my chronological age.”

DISCUSSION

To the best of our knowledge, the current study is the first to identify different constellations of subjective age in late-career employees. Using a person-centered investigation, we uncovered subjective age profiles, which elucidate the relation of both person- and work-related correlates. In sum, the current paper contributes to the literature in at least three meaningful ways. First, we compared different measurements of subjective age (numeric-, relative-, proportional-, and Likert-type) and provide first insights on the comparability of these different forms of measurement. Second, we scrutinized different forms of subjective age proposed by previous research and examined how they simultaneously combine to form distinct subjective age profiles in late-career employees. Third, we investigated how person-related correlates of subjective ageing (health status, perceived work ability, core self-evaluations, and attitudes toward own aging) differentiate between the uncovered subjective age profiles. Finally, we examined how the uncovered subjective age profiles relate to work-relevant behavioral outcomes (i.e., work engagement and OCB). Through our person-centered investigation, we highlight the complexities of subjective age

in late career and urge future research to place higher importance on construct clarity and measurement issues.

Qualitative versus Quantitative Differences Between the Profiles

The three uncovered profiles are largely quantitatively different, but also display some qualitative differences (see Figure 1): A qualitative difference signifies that the resulting profiles have disparate relative standings on profile indicators, while different levels of the profile indicators denote a quantitative difference between the profiles (Gabriel et al., 2015). In terms of quantitative differences, the levels of profile indicators (i.e., the subjective age measures) in *Youthfuls* and *Matures* are relatively close to the overall mean, compared to *Veterans*, who deviate substantially from the overall mean, on most profile indicators. Regarding qualitative differences, the profile of *Veterans* shows a substantially more pronounced distribution of the disparate relative standings between the profile indicators, compared to the other two profiles. Although the single subjective age items function in a similar way within the groups of *Youthfuls* and *Matures* (those who feel younger also act younger, look younger, and have “younger” interests, younger work- and private life-ages, as well as physical and cognitive ages and

vice versa), the group of veterans indicated relatively large differences between their respective subjective ages, with high levels of feel-age, physical-age, and private life-age in contrast to their relatively younger cognitive- and act-ages. A potential reason for this could be that later life stages have more heterogeneity in general, wherefore the subjectively oldest *Veterans* have the largest differences among the single subjective age dimensions.

In terms of comparisons between the polar conceptualizations of private life- versus work-age, the single profiles display substantial differences: *Youthfuls* have comparable subjective ages both at work and in their private lives, whereas *Matures* feel younger in their private life than at work and *Veterans* feel substantially older in their private lives than at work. Regarding cognitive versus physical age, *Youthfuls* and *Matures* felt younger physically than cognitively, whereas *Veterans* felt substantially older physically than cognitively. With respect to the four most commonly investigated dimension of subjective age, *Youthfuls* had the lowest levels of subjective age on the feel-age facet and reported increasingly older subjective ages in the domains of looks and interests, with the oldest subjective age in regards to their actions. *Matures*, in contrast, display an opposite pattern, reporting the youngest subjective age on the interests-dimension, and increasingly older subjective ages

Table 4. Distribution of Chronological and Subjective Age Measures, and Demographic Variables in the Uncovered Profiles

	No.	Chronological Age	Subjective Age	Relative SA	Proportional SA	Gender	Relationship Status	Highest Education	Org. Tenure
All participants (100%)	229	$M = 55.85$ ($SD = 4.05$)	$M = 48.41$ ($SD = 7.25$)	$M = -7.44$ ($SD = 6.68$)	$M = -0.13$ ($SD = 0.12$)	49% female	35% single 24% relationship 42% married	$M = 2.82$ ($SD = 1.05$)	$M = 5.59$ ($SD = 2.24$)
1: Youthfuls (47%)	107	$M = 56.37$ ($SD = 4.39$)	$M = 45.13$ ($SD = 6.11$)	$M = -11.24$ ($SD = 4.73$)	$M = -0.20$ ($SD = 0.08$)	46% female	33% single 24% relationship 43% married	$M = 2.86$ ($SD = 1.09$)	$M = 5.59$ ($SD = 2.27$)
2: Matures (40%)	92	$M = 55.41$ ($SD = 3.76$)	$M = 49.15$ ($SD = 5.65$)	$M = -6.26$ ($SD = 4.88$)	$M = -0.11$ ($SD = 0.09$)	50% female	30% single 26% relationship 44% married	$M = 2.80$ ($SD = 1.07$)	$M = 5.50$ ($SD = 2.21$)
3: Veterans (13%)	30	$M = 55.30$ ($SD = 3.49$)	$M = 57.80$ ($SD = 6.57$)	$M = 2.50$ ($SD = 5.81$)	$M = 0.05$ ($SD = 0.11$)	60% female	53% single 17% relationship 30% married	$M = 2.73$ ($SD = 0.86$)	$M = 5.90$ ($SD = 2.29$)

Note. No. = number of participants; Org. tenure = organizational tenure; SA = subjective age. Relative SA = (SA – CA); Proportional SA = (SA – CA) / CA ($N = 229$).

Table 5. Comparison of the Person- and Organization-Related Correlates Across Profiles

Person-Related ($N = 229$)	A (Youthfuls)	B (Matures)	C (Veterans)	χ^2
Health	0.338 _{B,C}	-0.070 _{A,C}	-1.047 _{A,B}	73.325***
Perceived work ability	0.162 _{B,C}	-0.029 _{A,C}	-0.666 _{A,B}	35.565***
Attitudes toward own aging	0.524 _{B,C}	-0.287 _{A,C}	-1.019 _{A,B}	62.099***
Core self-evaluations	0.187 _{B,C}	-0.039 _{A,C}	-0.452 _{A,B}	33.442***
Organization-related ($N = 197$)				
Work engagement	0.494 _{B,C}	-0.441 _A	-0.554 _A	25.201***
In-role behavior	0.081	-0.096	-0.014	2.738
Civic virtue	0.282 _B	-0.316 _A	-0.106	8.106*
Altruism	0.200 _B	-0.235 _A	-0.040	5.911*
Taking charge	0.430 _{B,C}	-0.451 _A	-0.264 _A	21.109***

Note. The indicated values for all variables are scale means and the overall significance is a chi-square value with $df = 2$. Subscripts designate profiles that differ significantly. Significance for the overall effect is at $p < .05$. * $p < .01$; ** $p < .001$.

in the domains of act-, look-, and feel-age. Finally, *Veterans* reported the youngest subjective age in the act-domain, followed by interests-, look-, and feel-age.

Person-Related Correlates

With regard to the person-related correlates health, perceived workability, core self-evaluations, and attitudes toward own aging, all investigated variables, significantly predicted profile membership and differentiated between all three profiles (see Table 5 and Figure 2). *Youthfuls* reported to be in good health, have high levels of perceived workability, positive core self-evaluations, and positive attitudes toward own aging. *Matures* had below average levels on all indicators and *Veterans* far below average levels, signaling poor health, low perceived workability, negative core self-evaluations, as well as negative attitudes toward own aging. This clear distinction between the profiles shows that these variables are strong correlates of all subjective age dimensions, and—as suggested by previous research (Zacher & Rudolph, 2019)—potentially confounding factors of subjective age.

Work-Related Correlates

Regarding the work-related correlates work engagement and OCB, profile membership significantly predicted differences in work engagement as well as in taking charge (see Table 5 and Figure 3). *Youthfuls* reported significantly higher values of work engagement and taking charge in comparison to participants belonging to the other two profiles. These results point to the larger influence of subjective age on more proactive work behaviors. In regards to civic virtue and altruism, there was only a significant difference between *Youthfuls* and *Matures*, with *Youthfuls* reporting significantly higher levels of civic virtue and altruism than *Matures*. These results point to the beneficial effect of a substantially younger subjective age for these behaviors, in contrast to feeling slightly younger or somewhat older than one's age, both of which did not significantly influence these behaviors. There was no significant difference between the groups in terms of in-role behavior, indicating that all participants of our study report fulfilling their work responsibilities, irrespective of their subjective age profile.

In sum, our results show that subjective age profiles differentiate between central work-relevant outcomes and highlight how employees with comparable chronological ages show disparate levels of work engagement and OCB, to some extent related to their subjective ages. Although we cannot rule out any confounding variables in the relationship between subjective age and the investigated work outcomes, we can confirm that a younger subjective age was significantly related to higher levels of work engagement and OCB in our investigated sample.

The Utility of Subtyping Subjective Age Among Late-Career Employees

The first contribution of our study regards to the theory of aged heterogeneity: Our findings demonstrate how measures of central tendency become less typical, and therefore less meaningful, as employees grow older. Even within a relatively narrow chronological age span (50–66), the current results reveal that distinct subpopulations exist among late-career employees based on subjective age, with the largest group (*Youthfuls*) feeling subjectively the youngest, followed by a more moderate group (*Matures*) feeling subjectively older than *Youthfuls*, but still younger than their own chronological age, and a small group (*Veterans*) who feel subjectively older than their actual age. Our results

further highlight the importance of emphasizing heterogeneity in subjective age, both between older workers (in comprising these three distinct profiles of *Youthfuls*, *Matures*, and *Veterans*), and within the subjective age construct itself (comprising different subfactors, such as appearance-based vs. activity-based age).

A second contribution of our findings is identifying and describing the concurrent interplay of different subjective age dimensions in profiles of late-career employees. As noted, subjective age approaches often adopt a variable-centered view and conflate different conceptions of subjective age. By contrast, the current approach to subjective age utilizes a person-centered approach, which allowed us to, firstly, scrutinize different forms of subjective age proposed by previous research and to examine how they simultaneously combine to form distinct subjective age profiles in late-career employees. Secondly, to investigate how person-related correlates of subjective aging (health status, perceived work ability, core self-evaluations, and attitudes toward own aging) differentiate between the uncovered subjective age profiles. And, thirdly, to examine how the uncovered subjective age profiles are related to work-relevant behavioral outcomes (i.e., work engagement and OCB).

Evidence for Younger Subjective Age as a Control Strategy

Although the dominant view in the study of a younger subjective age has been age *denial*, in line with Barrett and Montepare (2015), the current evidence supports a lifespan developmental view, in which younger subjective age comprises a *primary control* strategy (Heckhausen & Schulz, 1995). A younger subjective age might reflect a compensatory secondary control strategy, which helps to maintain high levels of control despite decreasing primary control capacity (Heckhausen, 1997). Another explanation of the identification with younger subjective ages might be that older employees still have high levels of primary control and therefore feel younger than their chronological age. A finding that supports this supposition is that individuals who feel better about their aging have been shown to practice more preventive health behaviors, such as exercising, eating a balanced diet, as well as following directions for taking prescribed medications (Levy & Myers, 2004). This indicates that subjective age is also manifested in behavior: The subjective age of the investigated sample was predictive of these behaviors over the subsequent two decades, while controlling for the effects of chronological age, educational level, functional and self-rated health, gender, and race on preventive health behaviors (English, Bellintier, & Neupert, 2019; Levy & Myers, 2004).

These findings point to the conclusion that adopting younger subjective ages is not necessarily only a compensatory secondary control mechanism, but might also act as a strategy of primary control (Heckhausen, 1997). Furthermore, as noted by Hubley and Russell (2009), the relationship between subjective age and health is not clear-cut and likely to be reciprocal. An earlier finding that supports this conclusion is also that people at higher ages perceive that the prime of life is significantly later than people of younger ages (Heckhausen, 1997). Also, in our data, attitudes toward own aging was more pronounced (had higher levels) in the single profiles than core self-evaluations or perceived workability. Future research should therefore examine this possibility by investigating the relationship between primary and secondary control and subjective age in a sample of older workers.

Practical Implications

The present study offers relevant practical implications. In particular, we highlight meaningful differences within the group of late-career employees that relate to different work outcomes. This is of special interest to organizations, having an inherent interest in employees who show high levels of work engagement and OCBs. Because *Youthfuls* show both high levels in work engagement and OCBs, they can be considered the most “useful” employees for organizations, at least for tasks that require high levels of work engagement or OCBs. For example, *Youthfuls* are particularly fitting for leadership positions, because highly engaged employees typically show higher levels of effective leadership behaviors, such as transformational leadership or leader-member exchange (Christian, Garza, & Slaughter, 2011). Also, with regard to teamwork, which benefits from high levels of OCBs (Nielsen, Bachrach, Sundstrom, & Halfhill, 2012; Nielsen, Hrivnak, & Shaw, 2009), *Youthfuls* can help to increase team performance by supporting the productivity of their coworkers.

However, an aging workforce means that organizations must accommodate all types of late-career workers, including *Matures* and *Veterans*. As such, organizations may focus on the antecedents of SA profiles. In particular, organizations can implement occupational health programs targeted to support the health of their employees (for an overview, see Beehr, 2019). Also, organizations may be able to adjust job demands and resources to support their employees’ perceived work ability. For example, organizations can reduce time pressure or unfavorable body positions and provide specific job resources, such as autonomy, to support their employees’ perceived work ability (McGonagle, Fisher, Barnes-Farrell, & Grosch, 2015). In addition, organizations can also support more favorable attitudes toward own aging by creating an age-friendly climate and implementing age-inclusive HR strategies (Boehm & Dwertmann, 2015). Together, these practices can help organizations to deal with and support the different SA profiles in order to maximize organizational outcomes.

Limitations and Future Research

The most prevalent shortcoming of the current study is that, strictly speaking, it employs a cross-sectional design. Although data have been collected at two time points, the variables were only measured once, not repeatedly. This hinders (a) the causal interpretation of our study results regarding the person- and context-related correlates of the uncovered profiles, and (b) insights into the temporal stability and membership consistency of the profile solution. Future research should attempt to use a longitudinal design, if available, so that the stability of the subjective age constructs over time could be investigated and the profile solutions could be replicated over time. In line with this, it would be an interesting attempt to replicate our uncovered profiles with employees over the whole lifespan and investigate whether and how profiles would be replicated on a sample of younger workers versus a sample of workers over the whole working lifespan.

Our study further has the limitation to rely on self-report data which might have affected the identified relations among variables and limit the generalizability of our results. We attempted to reduce this limitation by selecting respondents from a variety of educational and professional backgrounds and utilizing a time-lagged design which is beneficial for reducing common-methods bias (Podsakoff et al., 2003).

Moreover, the current investigation focuses on late-career workers only; we acknowledge that subjective age heterogeneity likely exists within younger workers as well. Furthermore, in order to provide additional evidence for increasing heterogeneity over the lifespan, future research could examine subjective age profiles in stratified samples over the whole working lifespan and compare the number of extracted subjective age profiles within chronological age strata.

Finally, future work should take into account the role of age meta-stereotypes—that is, beliefs regarding the stereotypes that outgroup members hold about their group (Finkelstein, King, & Voyles, 2015)—when investigating subjective age in late-career employees. Even if older workers try to protect themselves from age stereotypes by younger subjective ages, age meta-stereotypes will pose a potential threat, as negative age meta-stereotype activation results in either a challenge or threat response (Finkelstein et al., 2015). Whereas a challenge is interpreted as a potentially achievable goal and motivates to disprove the belief, a threat is viewed as a hindrance accompanied by negative emotional reactions and the anticipation of confirming the meta-stereotype. Those with high core self-evaluations are especially likely to interpret the activation of the meta-stereotype as a challenge (Finkelstein et al., 2015) and thus try to disprove the negative age meta-stereotype by classifying themselves as younger than their chronological age. Future work should consider these challenges versus threat responses, if it is to fully elucidate subjective age subtypes of older workers.

CONCLUSION

In accordance with the theory of aged heterogeneity, our findings demonstrate how age-based generalization and a focus on the average is especially problematic as individuals age, as measures of central tendency become less typical, while the amount of intersubject variation increases. Therefore, in order to consider the inherent variability in older workers as well as address different conceptualizations of subjective aging, we adopted a person-centered approach, hoping to address some of the limitations of variable-centered approaches. Thereby, we provide novel insights into how different facets of subjective age combine to form distinct profiles in late-career employees and describe differences among individuals by highlighting how different subjective age variables are related to each other and function in a similar way within subgroups of individuals. In so doing, we explored how subjective age identities differ between older workers, identified subtypes of late-career subjective age, and presented significant considerations for research on the aging workforce.

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REFERENCES

- Ahlstrom, L., Grimby-Ekman, A., Hagberg, M., & Dellve, L. (2010). The work ability index and single-item question: Associations with sick leave, symptoms, and health—a prospective study of women on long-term sick leave. *Scandinavian Journal of Work, Environment & Health*, 36, 404–412. doi:10.5271/sjweh.2917

- Akkermans, J., de Lange, A. H., van der Heijden, B. I., Kooij, D. T., & Jansen, P. G. (2016). What about time? Examining chronological and subjective age and their relation to work motivation. *Career Development International*, 21, 419–439. doi:10.1108/CDI-04-2016-0063
- Asparouhov, T., & Muthén, B. (2014). Auxiliary variables in mixture modeling: Three-step approaches using M plus. *Structural Equation Modeling: A Multidisciplinary Journal*, 21, 329–341. doi:10.1080/10705511.2014.915181
- Bakk, Z., & Vermunt, J. K. (2016). Robustness of stepwise latent class modeling with continuous distal outcomes. *Structural Equation Modeling: A Multidisciplinary Journal*, 23, 20–31. doi:10.1080/10705511.2014.955104
- Barak, B. (1987). Cognitive age: A new multidimensional approach to measuring age identity. *The International Journal of Aging & Human Development*, 25, 109–128. doi:10.2190/rr3m-vqt0-b9ll-gqdm
- Barak, B. (2009). Age identity: A cross-cultural global approach. *International Journal of Behavioral Development*, 33, 2–11. doi:10.1177/0165025408099485
- Barak, B., & Schiffman, L. G. (1981). Cognitive age: A nonchronological age variable. *Advances in Consumer Research*, 8, 602–606.
- Barnes-Farrell, J. L., & Petery, G. A. (2018). The moderating role of employment status and gender on relationships between psychological age and health: A two-wave cross-lagged panel analysis of data from the Health and Retirement Study. *Work, Aging and Retirement*, 4, 79–95. doi:10.1093/workar/wax019
- Barnes-Farrell, J. L., & Piotrowski, M. J. (1989). Workers' perceptions of discrepancies between chronological age and personal age: You're only as old as you feel. *Psychology and Aging*, 4, 376–377. doi:10.1037/0882-7974.4.3.376
- Barnes-Farrell, J. L., Rumery, S. M., & Swody, C. A. (2002). How do concepts of age relate to work and off-the-job stresses and strains? A field study of health care workers in five nations. *Experimental Aging Research*, 28, 87–98. doi:10.1080/036107302753365577
- Barrett, A. E. (2003). Socioeconomic status and age identity: The role of dimensions of health in the subjective construction of age. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 58, S101–S109.
- Barrett, A. E., & Montepare, J. M. (2015). "It's about time": Applying life span and life course perspectives to the study of subjective age. *Annual Review of Gerontology & Geriatrics*, 35, 55. doi:10.1891/0198-8794.35.55
- Beehr, T. A. (2019). Interventions in occupational health psychology. *Journal of Occupational Health Psychology*, 24, 1. doi:10.1037/ocp0000140
- Bergland, A., Nicolaisen, M., & Thorsen, K. (2014). Predictors of subjective age in people aged 40–79 years: A five-year follow-up study. The impact of mastery, mental and physical health. *Aging & Mental Health*, 18, 653–661. doi:10.1080/13607863.2013.869545
- Boehm, S. A., & Dwertmann, D. J. (2015). Forging a single-edged sword: Facilitating positive age and disability diversity effects in the workplace through leadership, positive climates, and HR practices. *Work, Aging and Retirement*, 1, 41–63. doi:10.1093/workar/wau008
- Boehmer, S. (2007). Relationships between felt age and perceived disability, satisfaction with recovery, self-efficacy beliefs and coping strategies. *Journal of Health Psychology*, 12, 895–906. doi:10.1177/1359105307082453
- Bowling, A. (2005). Just one question: If one question works, why ask several? *Journal of Epidemiology & Community Health*, 59, 342–345. doi:10.1136/jech.2004.021204
- Brothers, A. F., Miche, M., Wahl, H.-W., & Diehl, M. (2015). Examination of associations among three distinct subjective aging constructs and their relevance for predicting developmental correlates. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 72, 547–560. doi:10.1093/geronb/gbv085
- Carstensen, L. L. (2006). The influence of a sense of time on human development. *Science*, 312, 1913–1915. doi:10.1126/science.1127488
- Caudroit, J., Stephan, Y., Chalabaev, A., & Le Scanff, C. (2012). Subjective age and social-cognitive determinants of physical activity in active older adults. *Journal of Aging and Physical Activity*, 20, 484–496. doi:10.1123/japa.20.4.484
- Christian, M. S., Garza, A. S., & Slaughter, J. E. (2011). Work engagement: A quantitative review and test of its relations with task and contextual performance. *Personnel Psychology*, 64, 89–136. doi:10.1111/j.1744-6570.2010.01203.x
- Cleveland, J. N., Shore, L. M., & Murphy, K. R. (1997). Person- and context-oriented perceptual age measures: Additional evidence of distinctiveness and usefulness. *Journal of Organizational Behavior*, 18, 239–251. doi:10.1002/(sici)1099-1379(199705)18:3<239::aid-job794>3.0.co;2-a
- Dannefer, D., & Sell, R. R. (1988). Age structure, the life course and "aged heterogeneity": Prospects for research and theory. *Comprehensive Gerontology, Section B: Behavioural, Social, and Applied Sciences*, 2, 1–10.
- DeSimone, J. A., Harms, P. D., & DeSimone, A. J. (2015). Best practice recommendations for data screening. *Journal of Organizational Behavior*, 36, 171–181. doi:10.1002/job.1962
- English, A. N., Bellingtier, J. A., & Neupert, S. D. (2019). It's "the Joneses": The influence of objective and subjective socioeconomic status on subjective perceptions of aging. *European Journal of Ageing*, 16, 121–128. doi:10.1007/s10433-018-0475-2
- ESOMAR. (2011). European Society for Opinion and Marketing Research: World Research Codes and Guidelines. Retrieved from https://www.esomar.org/uploads/public/knowledge-and-standards/codes-and-guidelines/ESOMAR_Guideline-for-online-research.pdf
- Fasbender, U., Deller, J., Wang, M., & Wiernik, B. M. (2014). Deciding whether to work after retirement: The role of the psychological experience of aging. *Journal of Vocational Behavior*, 84, 215–224. doi:10.1016/j.jvb.2014.01.006
- Fasbender, U., Wöhrmann, A. M., Wang, M., & Klehe, U.-C. (2019). Is the future still open? The mediating role of occupational future time perspective in the effects of career adaptability and aging experience on late career planning. *Journal of Vocational Behavior*, 111, 24–38. doi:10.1016/j.jvb.2018.10.006
- Finkelstein, L. M., King, E. B., & Voyles, E. C. (2015). Age metastereotyping and cross-age workplace interactions: A meta view of age stereotypes at work. *Work, Aging and Retirement*, 1, 26–40. doi:10.1093/workar/wau002
- Foti, R. J., Bray, B. C., Thompson, N. J., & Allgood, S. F. (2012). Know thy self, know thy leader: Contributions of a pattern-oriented

- approach to examining leader perceptions. *The Leadership Quarterly*, 23, 702–717. doi:10.1016/j.leaqua.2012.03.007
- Gabriel, A. S., Campbell, J. T., Djurdjevic, E., Johnson, R. E., & Rosen, C. C. (2018). Fuzzy profiles: Comparing and contrasting latent profile analysis and fuzzy set qualitative comparative analysis for person-centered research. *Organizational Research Methods*, 21, 877–904. doi:10.1177/1094428117752466
- Gabriel, A. S., Daniels, M. A., Diefendorff, J. M., & Greguras, G. J. (2015). Emotional labor actors: A latent profile analysis of emotional labor strategies. *Journal of Applied Psychology*, 100, 863–879. doi:10.1037/a0037408
- González, A. M., Rodríguez, C., Miranda, M. R., & Cervantes, M. (2009). Cognitive age as a criterion explaining senior tourists' motivations. *International Journal of Culture, Tourism and Hospitality Research*, 3, 148–164. doi:10.1108/17506180910962159
- Gwinner, K. P., & Stephens, N. (2001). Testing the implied mediational role of cognitive age. *Psychology & Marketing*, 18, 1031–1048. doi:10.1002/mar.1042
- Heckhausen, J. (1997). Developmental regulation across adulthood: Primary and secondary control of age-related challenges. *Developmental Psychology*, 33, 176–187. doi:10.1037/0012-1649.33.1.176
- Heckhausen, J., & Schulz, R. (1995). A life-span theory of control. *Psychological Review*, 102, 284–304. doi:10.1037/0033-295X.102.2.284
- Heilmann, T., & Jonas, K. (2010). Validation of a German-language Core Self-Evaluations Scale. *Social Behavior and Personality*, 38, 209–225. doi:10.2224/sbp.2010.38.2.209
- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6, 1–55. doi:10.1080/10705519909540118
- Huang, Y.-K., McDowell, J., & Vargas, P. (2015). How old I feel matters: Examining age-related differences in motives and organizational citizenship behavior. *Journal of Park and Recreation Administration*, 33, 20–39.
- Hubley, A. M., & Russell, L. B. (2009). Prediction of subjective age, desired age, and age satisfaction in older adults: Do some health dimensions contribute more than others? *International Journal of Behavioral Development*, 33, 12–21. doi:10.1177/0165025408099486
- Ilmarinen, J. (2007). The work ability index (WAI). *Occupational Medicine*, 57, 160. doi:10.1093/occmed/kqm008
- International Organization for Standardization (ISO). (2019). International Organization for Standardization. Retrieved from <https://www.iso.org/about-us.html>
- Judge, T. A. (2009). Core self-evaluations and work success. *Current Directions in Psychological Science*, 18, 58–62. doi:10.1111/j.1467-8721.2009.01606.x
- Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2003). The Core Self-Evaluations Scale: Development of a measure. *Personnel Psychology*, 56, 303–331. doi:10.1111/j.1744-6570.2003.tb00152.x
- Kastenbaum, R., Derbin, V., Sabatini, P., & Artt, S. (1972). "The ages of me": Toward personal and interpersonal definitions of functional aging. *Aging and Human Development*, 3, 197–211. doi:10.2190/TUJR-WTXK-866Q-8QU7
- Kaufman, G., & Elder, G. H. (2002). Revisiting age identity: A research note. *Journal of Aging Studies*, 16, 169–176. doi:10.1016/S0890-4065(02)00042-7
- Kautonen, T., Hatak, I., Kibler, E., & Wainwright, T. (2015). Emergence of entrepreneurial behaviour: The role of age-based self-image. *Journal of Economic Psychology*, 50, 41–51. doi:10.1016/j.joep.2015.07.004
- Kleinspehn-Ammerlahn, A., Kotter-Grühn, D., & Smith, J. (2008). Self-perceptions of aging: Do subjective age and satisfaction with aging change during old age? *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 63, 377–385. doi:10.1093/geronb/63.6.P377
- Kooij, D. T., de Lange, A., Jansen, P., & Dijkers, J. (2008). Older workers' motivation to continue to work: Five meanings of age: A conceptual review. *Journal of Managerial Psychology*, 23, 364–394. doi:10.1108/02683940810869015
- Kooij, D. T., de Lange, A. H., Jansen, P. G., & Dijkers, J. S. (2013). Beyond chronological age: Examining perceived future time and subjective health as age-related mediators in relation to work-related motivations and well-being. *Work & Stress*, 27, 88–105. doi:10.1080/02678373.2013.769328
- Kooij, D. T., Tims, M., & Akkermans, J. (2017). The influence of future time perspective on work engagement and job performance: The role of job crafting. *European Journal of Work and Organizational Psychology*, 26, 4–15. doi:10.1080/1359432X.2016.1209489
- Kotter-Gruehn, D., Kornadt, A. E., & Stephan, Y. (2016). Looking beyond chronological age: Current knowledge and future directions in the study of subjective age. *Gerontology*, 62, 86–93. doi:10.1159/000438671
- Kuehn, K. W., & Al-Busaidi, Y. (2002). Citizenship behavior in a non-western context: An examination of the role of satisfaction, commitment and job characteristics on self-reported OCB. *International Journal of Commerce and Management*, 12, 107–125. doi:10.1108/eb047446
- Kunze, F., Raes, A. M., & Bruch, H. (2015). It matters how old you feel: Antecedents and performance consequences of average relative subjective age in organizations. *Journal of Applied Psychology*, 100, 1511–1526. doi:10.1037/a0038909
- Lanza, S. T., Tan, X., & Bray, B. C. (2013). Latent class analysis with distal outcomes: A flexible model-based approach. *Structural Equation Modeling: A Multidisciplinary Journal*, 20, 1–26. doi:10.1080/10705511.2013.742377
- Laursen, B., & Hoff, E. (2006). Person-centered and variable-centered approaches to longitudinal data. *Merrill-Palmer Quarterly*, 52, 377–389. doi:www.jstor.org/stable/23096200
- Lawton, M. P. (1975). The Philadelphia Geriatric Center Morale Scale: A revision. *Journal of Gerontology*, 30, 85–89. doi:10.1093/geronj/30.1.85
- Levy, B. R., & Myers, L. M. (2004). Preventive health behaviors influenced by self-perceptions of aging. *Preventive Medicine*, 39, 625–629. doi:10.1016/j.jpmed.2004.02.029
- Marsh, H. W., Lüdtke, O., Trautwein, U., & Morin, A. J. (2009). Classical latent profile analysis of academic self-concept dimensions: Synergy of person-and variable-centered approaches to theoretical models of self-concept. *Structural Equation Modeling*, 16, 191–225. doi:10.1080/10705510902751010

- McGonagle, A. K., Fisher, G. G., Barnes-Farrell, J. L., & Grosch, J. W. (2015). Individual and work factors related to perceived work ability and labor force outcomes. *Journal of Applied Psychology*, 100, 376. doi:10.1037/a0037974
- Meynhardt, T., Brieger, S. A., & Hermann, C. (2018). Organizational public value and employee life satisfaction: The mediating roles of work engagement and organizational citizenship behavior. *The International Journal of Human Resource Management*, 29, 1–34. doi:10.1080/09585192.2017.1416653
- Montepare, J. M. (1996). An assessment of adults' perceptions of their psychological, physical, and social ages. *Journal of Clinical Geropsychology*, 2, 117–128.
- Muller, T. E., & O'Cass, A. (2001). Targeting the young at heart: Seeing senior vacationers the way they see themselves. *Journal of Vacation Marketing*, 7, 285–301. doi:10.1177/135676670100700401
- Muthén, L., & Muthén, B. (1998–2017). *Mplus user's guide* (8th ed.). Los Angeles, CA: Muthén & Muthén.
- Nagy, N., Johnston, C., & Hirschi, A. (2019). Do we act as old as we feel? An examination of subjective age and job crafting behaviour of late career employees. *European Journal of Work and Organizational Psychology*, 28, 373–383. doi:10.1080/1359432X.2019.1584183
- Nelson, E. A., & Dannefer, D. (1992). Aged heterogeneity: Fact or fiction? The fate of diversity in gerontological research. *The Gerontologist*, 32, 17–23. doi:10.1093/geront/32.1.17S
- Ng, T. W., & Feldman, D. C. (2010). Idiosyncratic deals and organizational commitment. *Journal of Vocational Behavior*, 76, 419–427. doi:10.1016/j.jvb.2009.10.006
- Nielsen, T. M., Bachrach, D. G., Sundstrom, E., & Halfhill, T. R. (2012). Utility of OCB: Organizational citizenship behavior and group performance in a resource allocation framework. *Journal of Management*, 38, 668–694. doi:10.1177/0149206309356326
- Nielsen, T. M., Hrivnak, G. A., & Shaw, M. (2009). Organizational citizenship behavior and performance: A meta-analysis of group-level research. *Small Group Research*, 40, 555–577. doi:10.1177/1046496409339630
- North, M. S. (2019). A GATE to understanding “Older” workers: Generation, age, tenure, experience. *Academy of Management Annals*, 13, 414–443. doi:10.5465/annals.2017.0125
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88, 879–903. doi:10.1037/0021-9010.88.5.879
- Rudolph, C. W., Kooij, D. T., Rauvola, R. S., & Zacher, H. (2018). Occupational future time perspective: A meta-analysis of antecedents and outcomes. *Journal of Organizational Behavior*, 39, 229–248. doi:10.1002/job.2264
- Sautier, L., Scherwath, A., Weis, J., Sarkar, S., Bosbach, M., Schendel, M., ... Mehnert, A. (2015). Assessment of work engagement in patients with hematological malignancies: Psychometric properties of the German version of the Utrecht Work Engagement Scale 9 (UWES-9). *Die Rehabilitation*, 54, 297–303. doi:10.1055/s-0035-1555912
- Schafer, M. H., & Shippee, T. P. (2010). Age identity in context: Stress and the subjective side of aging. *Social Psychology Quarterly*, 73, 245–264. doi:10.1177/0190272510379751
- Schaufeli, W. B., Bakker, A. B., & Salanova, M. (2006). The measurement of work engagement with a short questionnaire: A cross-national study. *Educational and Psychological Measurement*, 66, 701–716. doi:10.1177/0013164405282471
- Schupp, J. (2012). Das Sozio-oekonomische Panel (SOEP). *Bundesgesundheitsblatt-Gesundheitsforschung-Gesundheitsschutz*, 55, 767–774. doi:10.1007/s00103-012-1496-1
- Schwall, A. R. (2012). Defining age and using age-relevant constructs. In J. Hedge & W. Borman (Eds.), *The Oxford handbook of work and aging* (pp. 169–186). Oxford: Oxford University Press.
- Spuling, S. M., Miche, M., Wurm, S., & Wahl, H.-W. (2013). Exploring the causal interplay of subjective age and health dimensions in the second half of life. *Zeitschrift für Gesundheitspsychologie*, 21, 5–15. doi:10.1026/0943-8149/a000084
- Staufenbiel, T., & Hartz, C. (2000). Organizational citizenship behavior: Entwicklung und erste validierung eines meßinstruments. *Diagnostica*, 46, 73–83. doi:10.1026//0012-1924.46.2.73
- Stephan, Y., Caudroit, J., & Chalabaev, A. (2011). Subjective health and memory self-efficacy as mediators in the relation between subjective age and life satisfaction among older adults. *Aging & Mental Health*, 15, 428–436. doi:10.1080/13607863.2010.536138
- Stephan, Y., Chalabaev, A., Kotter-Grühn, D., & Jaconelli, A. (2012). “Feeling younger, being stronger”: An experimental study of subjective age and physical functioning among older adults. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 68, 1–7. doi:10.1093/geronb/gbs037
- Stephens, N. (1991). Cognitive age: A useful concept for advertising? *Journal of Advertising*, 20, 37–48. doi:10.1080/00913367.1991.10673353
- Sudbury, L., & Simcock, P. (2009). Understanding older consumers through cognitive age and the list of values: A UK-based perspective. *Psychology & Marketing*, 26, 22–38. doi:10.1002/mar.20260
- Teuscher, U. (2009). Subjective age bias: A motivational and information processing approach. *International Journal of Behavioral Development*, 33, 22–31. doi:10.1177/0165025408099487
- Van de Vijver, F. J., & Leung, K. (1997). *Methods and data analysis for cross-cultural research* (vol. 2). Needham Heights, MA: Allyn & Bacon.
- Wang, M., & Hanges, P. J. (2011). Latent class procedures: Applications to organizational research. *Organizational Research Methods*, 14, 24–31. doi:10.1177/1094428110383988
- Zacher, H. (2015). Successful aging at work. *Work, Aging and Retirement*, 1, 4–25. doi:10.1093/workar/wau006
- Zacher, H., & Rudolph, C. W. (2019). Just a mirage: On the incremental predictive validity of subjective age. *Work, Aging and Retirement*, 5, 141–162. doi:10.1093/workar/wax031
- Zaniboni, S., Bertolino, M., & Steiner, D. D. (2019). Relating subjective age to work and non-work outcomes. *Psicologia Sociale*, 14, 39–56. doi:10.1482/92926
- Zhang, C., & Conrad, F. (2014). Speeding in web surveys: The tendency to answer very fast and its association with straightlining. *Survey Research Methods*, 8, 127–135. doi:10.18148/srm/2014.v8i2.5453