

# Getting Objective About Subjective Age: Introduction to a Special Issue

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## ABSTRACT

Researchers have become increasingly interested in age-related constructs other than chronological age, which has been found to explain only small amounts of variance in many important work outcomes. In this editorial that accompanies our special issue of *Work, Aging and Retirement* on “the multitude of age constructs,” we seek to attain three related goals: First, we provide an overview of our editorial process. Second, we offer brief summaries of the five papers that are included in this special issue. Third, and perhaps representing our most substantive contribution here, we present answers to six “big picture” questions about subjective age to inform future scholarly work. We conclude that, although many important questions about alternative age constructs remain to be answered, the papers in this special issue represent excellent examples of novel work in this arena and suggest several opportunities for how future research could more rigorously and critically apply these constructs to the study of work, aging and retirement.

Researchers have increasingly called for attention to alternative age constructs—those indicators of one’s age that are more or less related to, but conceptually distinct from, one’s chronological age (i.e., time elapsed since birth). Given the recent push toward studying these ideas, we thought that the time was right to convene a special issue to highlight current thinking, methodological innovation, and critical perspectives on this broader notion of alternative age constructs. Moreover, as researchers of topics related to work, aging, and retirement, we (the guest editors) each approached this idea of alternative age constructs from slightly different perspectives. Indeed, each of us has published on this topic, to some extent (e.g., Kunze, Raes, & Bruch, 2015; Rudolph & Baltes, 2017; Zacher & Rudolph, 2019a,b). Through our work, we have adopted various (sometimes critical) perspectives on these and related issues. Affording this diversity of opinions represents a particular strength of this special issue because it has allowed us to curate a collection of papers that showcase both the strengths and limitations of alternative age constructs and in particular subjective age.

That being said, at the outset, it is interesting to note that although we originally framed this special issue around “...the multitude of age constructs,” the collection of papers that we ultimately include here predominantly focus on one such construct, specifically upon subjective age. Thus, perhaps we are not doing this idea of a “multitude” of alternative age constructs due justice with this title (or with the papers included herein). While interesting to note, nonetheless, our focus

here will be primarily on subjective age, given the central role it plays across the studies that are included in this special issue. That said, we will revisit this “gap” in our understanding in our discussion of future directions, below.

In crafting this editorial that accompanies our special issue, we sought to achieve three related goals. First, in service of transparency, we provide a detailed overview of our editorial process. Second, we give high-level summaries of the five papers that are included in this special issue. Finally, third, in the spirit and tradition of scholarly back-and-forth debates regarding popular-yet-controversial topics, we offer a moderated discussion on six outstanding “big picture” questions about subjective age. Through this discussion, we outline broad observations about how research on alternative age constructs can move forward, and offer specific guidance for future theory development and research to enhance our understanding of these phenomena.

## OVERVIEW OF THE EDITORIAL PROCESS

We began by publicizing an open call for proposals in late August of 2017. We received 12 proposals, which were each vetted independently by all three guest editors. Proposals that were supported by at least two of the editors were then invited for full papers; nine total proposals were thus invited (75% initial invitation rate). We provided authors of invited papers substantive feedback, including suggestions for how to craft their full submissions to reflect currently understood best

practices in research methods and statistical analyses for the study of age at work (e.g., [Bohlmann, Rudolph, & Zacher, 2018](#)). Of these nine invited papers, four withdrew their submissions or declined to submit a full manuscript. Thus, five full manuscripts were ultimately submitted, and each of these manuscripts was subsequently sent by one of the guest editors to independent peer review by two experts. Following peer review, two of these manuscripts were rejected, and three were ultimately accepted for publication (25% final acceptance rate).

In addition, we invited eight experts from the field of work and aging to write commentaries and/or short review papers that highlight key areas of inquiry within research on subjective age. Three experts immediately declined, and two never responded to our invitation. Three initially agreed to contribute, and two ultimately submitted such papers. These invited papers were reviewed independently by each of the three guest editors and the Editor in Chief, with comments offered, and revisions provided before acceptance. Ultimately, our published collection of works includes five contributions, excluding this accompanying editorial.

### SUMMARY OF SPECIAL ISSUE ARTICLES

With an understanding of our editorial process, we next turn our attention to a summary of the five contributions that comprise this special issue. We first review empirical papers (presented in alphabetical order by first author's last name) that were vetted through the proposal, invitation, and peer review process. Then, we discuss the two invited papers (again, presented in alphabetical order by first author's last name).

Grounded in theories of social identification, [Marcus, Fritzsche, and Ng \(2019\)](#) tested hypothesized interactive effects of sex, chronological age, subjective age, and organizational age on a variety of important work outcomes (i.e., age-based stereotype ratings, psychological well-being, and behavioral self-reports of perceived unfair age and sex discrimination). Using a large, multinational sample, they find that subjective and organizational age interact with chronological age to predict such outcomes and that differential patterns of such relationships are observed for men and women. Importantly, although "older" subjective age was found to generally benefit chronologically older workers, such effects were also observed to be relatively less beneficial for older women, compared with older men.

[Nagy, Fasbender, and North \(2019\)](#) use a latent profile analysis framework to investigate various conceptualizations of subjective age among a sample of late-career employees. Specifically, three distinct subjective age profiles were observed in a sample of older workers who participated in a time-lagged study. Differences between profile members in terms of person-related (e.g., core self-evaluations) and work-related outcomes (work engagement organizational citizenship behavior) were likewise investigated.

Using data from three waves of the Midlife in the United States (MIDUS) study, [Shane, Hamm, and Heckhausen \(2019\)](#) examined longitudinal relationships between subjective age, perceived control, and motivational investment in the work domain, specifically modeling how changes in subjective age relate to changes in perceived control and motivational investments at work. Supporting this model, subjective age was associated with increased levels of domain-general perceived control capacity and selective primary control striving over time, which, in turn, positively affected both perceived control over and motivational investment in one's work situation.

Finally, two invited works provide broader perspectives on various age-related constructs that are relevant to the workplace. The first, a commentary by [North and Shakeri \(2019\)](#), outlines how [North's \(2019\)](#) GATE Model opens up new opportunities for researchers to consider the role of subjective age via a closer examination of various similar, age-related, and work-relevant variables. The second, a review by [Weiss and Weiss \(2019\)](#), provides an integration of theoretically relevant mechanisms that explain the existence of subjective age bias, specifically focusing on the motivational and social-cognitive mechanisms that explain how subjective age bias affects developmental and work outcomes.

### ANSWERS TO SIX QUESTIONS ABOUT SUBJECTIVE AGE

With an introduction to the "big picture" ideas offered by the five papers included in our special issue, we now turn our attention to some broader questions regarding the nature of subjective age, its definition(s), and its implications for the study of work, aging, and retirement. We approach these questions by following the tradition of similar back-and-forth commentaries or "letters" between scholars with sometimes differing opinions on popular topics (e.g., [Antonakis, Ashkanasy, & Dasborough, 2009](#); [Sternberg & Vroom, 2002](#)). More specifically, C.W.R. posed six questions, independently, to F.K. and H.Z. Each was given approximately 250 words to respond, then CR provided a summary of the most critical points of each (interjected with his own opinions and perspectives), in an attempt to find middle ground between (possibly) opposing opinions, and as a means of guiding future research that attempts to answer these and related questions.

#### Question #1: Does Subjective Age Predict Work Outcomes?

F.K.: This is still an open empirical question. There is currently a debate in the literature, whether subjective age is "just a mirage," because its effects on relevant empirical outcomes are captured by other umbrella constructs, such as core self-evaluations ([Zacher & Rudolph, 2019a,b](#)), or whether subjective age perceptions indeed relate to various work outcomes at different levels of analysis. Given the state of the literature, I am rather in favor of the latter assumption, as previous research has shown effects and/or correlations of subjective age with work motivation ([Akkermans et al., 2016](#)), employee absenteeism ([Goecke & Kunze, 2018](#)), and company performance ([Kunze et al., 2015](#)). Also, this special issue provides further evidence for relations of subjective age with important work outcomes, such as work engagement ([Nagy, Fasbender, & North, 2019](#)), perceived control and motivation to work ([Shane, Hamm, & Heckhausen, 2019](#)), as well as burnout perceptions and perceived discrimination ([Marcus et al., 2019](#)). Still a caveat of these current findings is that they are mostly based on cross-sectional data and thus cannot rule out reversed causality effects of work outcomes (e.g., motivation and performance) on subjective age perceptions. As such, I would encourage more research with multiple measurement points, as executed by the [Shane and colleagues' \(2019\)](#) study in this special issue or even experimental designs to account for this current limitation of the literature.

H.Z.: Subjective age seems to be negatively associated with favorable employee experiences and behaviors, such as work engagement

and job crafting, when controlling for chronological age (e.g., Nagy, Johnston, & Hirschi, 2019). A potential reason for this may be that these relationships are confounded by fundamental evaluations that people make about themselves, that is, core self-evaluations (Zacher & Rudolph, 2019a,b). People with high core self-evaluations “feel younger” than those with low core self-evaluations, and core self-evaluations are a well-established predictor of favorable employee outcomes, such as job satisfaction and performance (Judge, 2009). People with high core self-evaluations might “feel younger,” because relatively younger ages are typically associated with higher primary control capacity than relatively older ages (Heckhausen, Wrosch, & Schulz, 2010), whereas relatively older ages may be perceived more negatively due to common negative age stereotypes (Posthuma & Campion, 2009). We need to better understand how people mentally construct their assessments of subjective age; how do they come up with a specific “felt age” or a rating indicating that they feel younger or older than their chronological age? I argue that their evaluations regarding subjective age are influenced by their thoughts and feelings about their control over things happening in their lives, their physical health, their affective states – and, as suggested by Weiss and Weiss (2019), a mental comparison of their personal characteristics with their beliefs about how people of a certain age should be like in terms of control, health, affect, and so forth.

C.W.R.: I think the points raised here about core self-evaluations bear a bit more consideration. On the one hand, our research (Zacher & Rudolph, 2019a,b) indeed shows that we can completely account for the effects of subjective age on a number of work outcomes with core self-evaluations. On the other hand, no studies included in our special issue were able to control for core self-evaluations, so their influence among this set of studies is undetermined (n.b. Nagy, Fasbender, et al., 2019; construe core self-evaluations as a predictor of latent profile membership, however, do not control for core self-evaluations as a confound; I would be very interested to see a re-analysis of these data construed as such). Moreover, in our previous work, we have assumed that core self-evaluations are the confounding mechanism. However, to my knowledge, no studies of core self-evaluations have similarly controlled for subjective age, and I do not think that core self-evaluations researchers would be very happy if I attempted to argue the other side of this coin. However, given the limited nature of statistical control to this end, both could be likely explanations for these effects. Perhaps the suggestion to consider experimental designs would be helpful to this end. For example, experimental vignette methodologies could be used to manipulate target characteristics (e.g., traits associated with core self-evaluations; target subjective age). Given the arguments put forth by North and Shakeri (2019), person perception processes are likely at play in how subjective age operates in work contexts. Such a design would allow for control over extraneous factors, while affording the ability to parse the relative contribution of core self-evaluations and target subjective age from such evaluations.

I think that, at the least, it would behoove researchers to more closely consider the specific causal processes at play between subjective and core self-evaluations, especially including investigations of their reciprocal nature over time. Indeed, it may be that one or the other variable (i.e., subjective age or core self-evaluations) is a very “close” (i.e., proximal), albeit somewhat lagged predictor of the other. Cross-sectional designs or even longitudinal designs with wide time lags would not be well-gearred to capture or tease apart such close-term

processes. Thus, I think we need to move toward momentary assessments, capturing both mechanisms along with the specific conditions that give rise to both. In addition, to further differentiate the role of these two constructs, it will be important for future research to demonstrate cases in which both have independent effects on work outcomes, and to explain when and why this is possible.

## Question #2: Subjective Age Is Often Touted as a Construct That “Makes up for” the Limitations of Chronological Age. Is That So?

F.K.: Chronological age and subjective age are clearly related constructs as, for example, shown in the large-scale study by Chopik, Bremner, Johnson, and Giasson (2018) with more than 500,000 participants that indicates a correlation of  $r_{xy} = .74$  between chronological and subjective age. In fact, it is often theoretically meaningful to measure subjective age in relation to a person’s chronological age and therefore to combine both measures for an effective operationalization. As such, I would consider subjective age as an extension rather than a substitute for chronological age. This extension has, however, the potential to tell us more about the consequences of the aging processes at the workplace than chronological age alone. Not surprising, given its objective nature, chronological age per se shows only small effects on work performance (Ng & Feldman, 2008) and small to medium effect sizes with regard to job attitudes (Ng & Feldman, 2010). Integrating subjective age with chronological age has the potential to account for more of the unexplained variance in relevant work outcomes, as it adds a psychological and perceptual perspective that might affect other cognitive and emotional processes and ultimately also employee behavior. Furthermore, subjective age has also the potential to introduce new perspectives for a proactive management of the demographic change in companies. Although chronological age of incumbent employees is a factor that has to be taken as a given, the subjective age of employees might be malleable through organizational practices (e.g., human resource management) or leadership behaviors and thus opens up a new perspective for successfully dealing with aging workforces.

H.Z.: Chronological age is not a limited construct per se; in fact, it is a very practical metric to assess the time that has passed since a person’s birth (Schwall, 2012). However, chronological age itself does not directly “cause” important work outcomes and meta-analyses show that it is only very weakly associated with employee attitudes and performance (Ng & Feldman, 2008, 2010). As researchers interested in the role of age in the work context, we need to focus more on psychological constructs that change within persons across the adult life span, such as physical, cognitive, and emotional abilities, personality and motives, as well as behavioral strategies (Ng & Feldman, 2013; Zacher, 2015). Subjective age “predicts” employee outcomes above and beyond chronological age because it is associated with other psychological constructs that affect these outcomes, including core self-evaluations, health, and affect. If we measure subjective age in years, it is important to control for chronological age, as older people will be more likely to indicate a higher subjective age than younger people. The differences between people’s chronological and subjective ages are likely due to individual differences in more fundamental psychological constructs such as core self-evaluations. Thus, I would argue that the incremental effects of subjective age on work outcomes, above and beyond chronological age, are due to the fact that individual differences in subjective age are associated with individual differences in

fundamental and already well-established individual difference predictors of work outcomes.

C.W.R.: An underappreciated issue regarding chronological age–work outcome relationships is that we often fail to understand that linear models of such relationships are not always tenable. For example, the cited [Ng and Feldman's \(2008\)](#) meta-analysis shows weak linear relationships between age and work performance. However, an earlier work by [Sturman \(2003\)](#) shows that this relationship is more likely to be nonlinear (i.e., demonstrating an inverted U-shape). Very similar meta-analytic relationships between age and the attitude of career commitment have recently been shown by [Katz, Rudolph, and Zacher \(2019\)](#). So, although I completely agree that we need to explore theoretically relevant mechanisms linking age to work outcomes, we also need to make sure that we are properly theorizing and parameterizing the effects of age on such outcomes in the first place. A similar methodological recommendation has been offered by [Bohlmann and colleagues \(2018\)](#).

Moreover, I think that, given our limited understanding of the exact mechanisms that explain why subjective age exerts its influence on work outcomes, it may be premature to suggest that organizations take steps to modify workers' subjective ages. Related to my first point just above, to my knowledge, the zero-order effects between subjective age and work outcomes can be at least as “weak” as, and, in many cases, weaker than the same relationships between chronological and such outcomes (e.g., see [Zacher & Rudolph, 2019a](#), Tables 1, 4, and 8). Thus, although I am sympathetic to the desire to improve the quality of the working experience through purposeful psychosocial interventions, I think the evidence at this point is too scattered to warrant efforts toward this end. Assuming that this area of research moves forward, and pending the accumulation of new evidence in support of designing purposeful interventions, it will be important to contrast the efficacy of subjective age interventions against meaningful active controls. These controls should particularly include other psychosocial mechanisms that have been shown through randomized controlled trials to have bearing on important work outcomes, including health and well-being (e.g., selection, optimization, and compensation strategies; [Maatouk et al., 2018](#); [Müller, Heiden, Herbig, Poppe, & Angerer, 2016](#)).

### Question #3: How Stable Is Subjective Age (i.e., Is It More “Trait-” or “State-” Like), and How Has Research Accounted for This?

F.K.: The stability of the subjective age construct is, in my opinion, one of the most interesting questions in this research field. Currently, I am only aware of two studies that have looked at the micro-longitudinal variation of subjective age with diary study designs. First, [Kotter-Grühn, Neupert, and Stephan \(2015\)](#) reported daily fluctuations in individual subjective age perceptions in a sample of participants aged 60 and older and found that negative mood, health-related problems, and perceived stress at least partly accounted for this variation. Second, [Armenta, Scheibe, Stroebe, Postmes, and Van Yperen \(2018\)](#) showed in a worker sample that subjective age fluctuated over a 15-day time period and was triggered by certain work-events. Both studies thus clearly indicate that subjective age is definitely not a trait and is also not a fully stable individual state. I personally find the conceptual event perspective introduced by the [Armenta and colleagues' \(2018\)](#) paper very intriguing. Given the current state of research, I could imagine that subjective age of individuals is relatively stable in a certain time

corridor and that specific private and work-related events have the potential to trigger short-term fluctuation within this corridor.

H.Z.: Recent research suggests that subjective age varies within persons across days ([Armenta et al., 2018](#)). My own data from multiwave studies across several months also indicates that the stability of subjective age over time is only moderate. I would argue that subjective age is as stable or dynamic as the established psychological constructs that influence it. On the one hand, stable individual difference constructs such as trait neuroticism are likely associated with individual differences in the average subjective ages people report across time. On the other hand, more dynamic, momentary factors may influence subjective age assessments as well. For example, experience sampling studies show that employees' core self-evaluations fluctuate over short periods of time ([Debusscher, Hofmans, & De Fruyt, 2016](#))—people do not feel self-confident and “in control” to the same extent every day. Similarly, our subjective assessments of our health and work ability depend on day-specific factors; for example, they might be influenced by how we slept last night, whether we are feeling well, and which tasks we engage in. Thus, on days that we achieve our work goals and feel healthy and “in control,” we are more likely to report a relatively lower subjective age. In contrast, we will report a relatively higher subjective age on days that we receive negative performance feedback, are ill, or are in a negative mood.

C.W.R.: I completely agree that the within-person dynamicity in subjective age is among its most compelling aspects. Given the emerging evidence from daily diary studies regarding the notable amount of within-person (i.e., “state-like”) variability in subjective age, it is crucial for future research to appropriately model this influence. For example, one particularly interesting question that could be addressed by future studies surrounds the separation of within- versus between-person variability in subjective age, and what each independent component thereof “means” for the prediction of work outcomes. For example, I think that indexing people's typical level of subjective age across time (i.e., their “between person” average, separate from their episodic fluctuations from measurement-to-measurement) would allow for a much “cleaner” test of the notion of subjective age bias than any single assessment would afford. This is particularly important to consider given the notable variability in subjective age that appears to be present in diary studies. To better index subjective age bias, it would seem prudent to compare people's chronological age to their typical (i.e., person-level average) level of subjective age across multiple occasion. By doing so, one could classify those who are chronically subjectively older or younger than their actual age (i.e., trait-like subjective age bias) and simultaneously model the extent to which this is the case (i.e., the severity of such bias, in terms of the within-person fluctuations observed around person-level averages). Separating out the within-person variability from this more stable, trait-like estimate would likewise allow for the exploration of different predictions, at different levels of analysis. Of note, the recent [Armenta and colleagues' \(2018\)](#) diary study did not separately model between- and within-person sources of variability in subjective age in the way that I suggest here. However, perhaps these data could be re-analyzed to allow for an initial exploration of these ideas.

### Question #4: What Is the Etiology of Subjective Age? Is It a Developmental Phenomenon? A Psychosocial Phenomenon?

F.K.: Research on subjective age in the workplace is currently still lacking a consistent theory to explain its etiology. In this special issue,

Weiss and Weiss (2019) provide a first important step for a theoretical integration of the field by summarizing and integrating individual aging experiences (e.g., Montepare, 2009) and attempts of individuals to distance themselves from negatively stereotyped groups (Weiss & Lang, 2012) as potential explanations for varying subjective aging experiences between employees. I am personally more in favor of the lifespan framework proposed by Montepare (2009) that differentiates between distal and proximal reference points that help individuals to define reference points to adjust their subjective age. The workplace can be an environment for proximal reference points (i.e., negative age stereotypical treatment by the company through its human resource management or leadership practices) that affect the employees' subjective age perceptions. Besides these rather intra-individual perspectives of subjective age occurrence, I would also see large potential to view subjective age also from more social perspective. It seems plausible to assume that we define our subjective age also through social comparison processes (Festinger, 1954). In consequence, employees might adjust their subjective age perceptions based on the social environment of their workplace (i.e., a young start-up company with a low average chronological employee age and a "feeling young culture" compared with a traditional industrial firm with high average chronological age and "feeling old culture") to increase their self-enhancement. More conceptualization and research from this social angle of subjective age should be a worthwhile endeavor.

H.Z.: Subjective age is a developmental construct in that when it is measured in years (e.g., "How old do you feel in years?"), it changes with chronological age. Correlations range between .60 and .80 in our data (Zacher & Rudolph, 2019a). That said, I think the reasons for differences between chronological and subjective age are psychosocial in nature. As noted above, people come up with an assessment of their subjective age by comparing their perceptions of their psychological characteristics, including their core self-evaluations, health, and affect, with their beliefs about how a typical person of their chronological age should be (see Weiss and Weiss, 2019). If this comparison is favorable for them, they "feel younger," if it is not favorable for them, they "feel older," because in our society being younger is still mostly associated with positive features (e.g., high levels of control, vitality), whereas being older is still mostly linked to negative characteristics (e.g., reduced control, lower performance). Some studies have shown that it is possible to influence people's subjective age through experimental manipulations (Armenta et al., 2017; Weiss & Lang, 2012). I argue that these manipulations are really changing people's more fundamental self-evaluations which, in turn, influence subjective age.

C.W.R.: I completely agree that one barrier to work in this area is the lack of formalized theory to explain "why" subjective age matters (although the review by Weiss & Weiss [2019] provides an excellent foundation for such theory to be elaborated upon). Further developing such a theory is well beyond the scope of this editorial, but I think the answers we have provided here give some hints at "what" such a theory needs to include. Notably, such a theory needs to consider alternative individual difference mechanisms (e.g., core self-evaluations, health, functional capacity) and the specification of relationships at different levels of analyses (e.g., at between- and within-person levels, and perhaps at higher levels of aggregation, such as workgroups or organizations). One thought that I had after considering the responses above, is that it is possible that the confounding effects of core self-evaluations

that we observe in our past research "work" because they account only for relationships among between-person subjective age and work outcomes at the same level of analysis. However, perhaps within-person variation in subjective age is not susceptible to such confounding or perhaps there is notable covariation between trajectories of momentary subjective age and core self-evaluations. For the sake of space, I will reserve additional speculation to this end; however, I hope that my thoughts here beg for richer theorizing to address how such relationships "fit together."

### Question #5: How Should We Measure Subjective Age?

F.K.: In my opinion, the theoretical question at hand should guide the applied measurement strategy for subjective age. If subjective age is treated as an identity formation or individual self-reflection process (e.g., Barak, 2009), it should always be operationalized in relation to the chronological age of an individual. Currently, this is mainly done by allowing classifications into categorical variables (e.g., feeling younger, middle aged, or older; Cleveland & Shore, 1992) or by forming discrepancy scores between the absolute chronological age and the perceived subjective age in absolute years (e.g., Armenta et al., 2018; Kunze et al., 2015; see also Nagy, Fasbender, et al., 2019; Shane et al., 2019, both in this special issue). Comparing these two approaches the latter one is clearly desirable, as it restores the full variance of both age scales for the respective analysis. Nonetheless applying difference scores has been criticized for organizational behavior and management research, in general, due to several methodological drawbacks (Edwards, 2001). In consequence, it is superior to either inspect the interactive effect of chronological and subjective age on work outcomes (see, e.g., Goecke & Kunze, 2018, or the paper by Marcus et al., 2019, in this special issue) or apply polynomial regression techniques (Edwards & Parry, 1993). Although I am not aware of any subjective age study applying polynomial regression techniques, I would highly encourage future studies to do so. Another interesting and open question is whether subjective age is a single item measure (as executed in most current research) or a multifaceted measure following the "ages of me" conceptualization, with subjective age including feel-age, look-age, do-age, and interest-age (Kastenbaum, Derbin, Sabatini, & Artt, 1972; see also the paper by Nagy et al. in this special issue). Here again the theoretical perspective should guide the selection of the appropriate measurement, but it might be interesting to explore in future studies if a multifaceted measurement of subjective age has an increased predictive validity over a single-item measure on work outcomes.

H.Z.: Subjective age is a multidimensional construct that includes, for instance, how old people feel, how old they think they look and act, and how old they believe they are based on their interests (Kastenbaum et al., 1972). Oftentimes, only "felt age" is assessed with a single item, which I think is fine because it is a rather clear and homogeneous construct. Also, researchers frequently combine single items on felt-age, look-age, do-age, and so forth into a composite, as the items are moderately to highly inter-correlated. We have developed a new multidimensional measure of subjective age and shown that the dimensions can be distinguished and relate differently to various antecedents and outcomes (see Zacher & Rudolph, 2019a). Studies also differ with regard to the response options used for questions on subjective age. Whereas some studies ask participants to indicate their subjective ages in years, others explicitly ask participants how old they feel compared to their actual, chronological age (e.g., younger,

older, about the same). Some studies create a difference score measure by subtracting chronological age from subjective age, creating a measure of “subjective age bias” or “relative subjective age” (e.g., Armenta et al., 2018; Kunze et al., 2015). However, difference scores are problematic from a methodological perspective (Edwards & Parry, 1993) and, therefore, it would be better to include subjective age and chronological age separately, as well as possibly their squared and product terms, as predictors of work outcomes in the analyses.

C.W.R.: I think the idea of multidimensional measures of subjective age is very interesting. On the one hand, we see some patterns of differential relationships between different dimensions of subjective age (e.g., “feel” vs. “look” vs. “do” vs. “interest”). On the other hand (and at the risk of “beating a dead horse”), these dimension-level differences more-or-less “go away” (i.e., are explained by) other individual differences (i.e., physical health, work ability, and core self-evaluations; Zacher & Rudolph, 2019a,b). So, I think a bigger issue for measurement to tackle here, is not the dimensionality of subjective age per se (e.g., one could feasibly construe multiple roles, domains, or behaviors for which different levels of subjective age could be attached, albeit, perhaps with diminishing returns on “unique” information gathered), but rather the scaling of subjective age itself. For example, the item “How old do you feel?” could be scaled by asking participants to provide an age value (i.e., a single numeric estimate), or with a more traditional scale, anchored with statements like: 1 = “much younger than my actual age” to 5 = “much older than my actual age scale” (see Rudolph & Baltes, 2017). To my knowledge, the relative utility of either scaling procedure against the other has never been thoroughly tested. Given that both types of scales can be found in the literature, this seems like an important open question to address.

Relatedly, I completely agree that we really need to move away from using difference scores to rescale subjective age. To this end, I think we would benefit greatly from construing chronological age and subjective age “fit” (i.e., congruence/incongruence) using polynomial regression techniques. However, given that such models are no more difficult to specify than standard ordinary least squares models with difference scores, I also suspect that there is a “file drawer” of studies that have attempted to model subjective age and chronological age using such methods, and which have yielded results that do not conform to one’s hypothesized expectations. I think this area of research would welcome well-designed and powered, preregistered studies of chronological age and subjective age “fit,” regardless of whether such models “work” (see Weiss & Weiss 2019 discussion of the “shifting optimal margin hypothesis”). Without such studies, we can only continue to speculate about the value of such a construal.

### Question #6: Given This Set of Papers, What Are the “Next Steps” in the Subjective Age Research Stream?

F.K.: Despite the increasing number of publications in recent years, research on subjective age is still in its infancy. Thus, based on the contributions in this special issue, and the general status of research in the field of subjective age in the workplace, I would see multiple avenues for future research. First, I would like to see a continuation of empirical research that looks at the dynamism of the construct and especially uncovers more work-related drivers and events that shape employees’ subjective age perceptions. Second, subjective age research can also profit from collective and multilevel perspectives, by for example

considering how the subjective age structure of a team or organization affects individual subjective age perceptions or its relations on individual-level outcomes. Furthermore, I also see great potential in integrating the concept of subjective age in age diversity research, and investigate, whether subjective age perceptions of team and/or organizational members drive social identity processes and outcomes (e.g., team and organizational performance) beyond chronological age diversity. Finally, I would find it worthwhile to extend the measurement of subjective age with a social perspective and for instance investigate, whether a congruence or incongruence of one’s self and others (e.g., colleagues or supervisor) perception of subjective age and related appearance and behavior affects the relationship between an employee’s subjective age and work outcomes.

H.Z.: The papers in this special issue, including the two expert commentaries, clearly demonstrate an increased interest in gaining a better understanding of how subjective age can enhance our understanding of work and organizational psychology phenomena. What I really like is that the empirical papers use advanced methodologies such as growth curve modeling, latent profile analysis, and cross-cultural comparisons. At the same time, I think research needs to be more critical about why subjective age has effects on work outcomes, such as work engagement and job attitudes. If subjective age effects on work outcomes can be explained by well-established individual difference constructs such as core self-evaluations, we could stop including subjective age as a predictor in our studies. At the same time, subjective age as an outcome may be more interesting to lifespan psychologists than to work and organizational psychologists. More broadly, I think it will be interesting to better understand why a low subjective age, or feeling younger than one actually is, seems to be a more desirable outcome than a high subjective age, or feeling older than one actually is. After all, we now know that getting older is not only associated with losses, but also several gains in functioning, for instance, increases in some emotional competencies (Doerwald, Scheibe, Zacher, & Van Yperen, 2016). Still, most people seem to associate being older with a loss of control and other undesirable developments and, thus, prefer to feel younger than they actually are.

C.W.R.: As I have already alluded to, given the compelling results of recent daily diary studies, I think a great deal could be learned about the nature of subjective age through extensions thereof, for example, via the application of measurement “burst” designs. Such designs use collected numerous repeated measurement within a relatively short period of time (e.g., across several days), and these “bursts” are then repeated longitudinally across wider intervals (e.g., annually). The advantages to this type of design, particularly against more traditional methods of ecological momentary assessment, is the ability to model (intra)individual differences in terms of both short-term variability and long-term changes.

Moreover, I find the idea of studying subjective age in workgroups to be compelling (see also Weiss & Weiss, 2019), but also would caution that research that considers subjective age at different levels of analyses, particularly as aggregate phenomena, needs to more explicitly address the composition of subjective age (i.e., Chan, 1998). For example, at the workgroup or organizational level, it will be important to, through theory, justify whether or not subjective age is necessarily homologous/isomorphic across levels of analysis. Thus, the question is how we understand the aggregation of subjective age, and of equal importance, what the *meaning* of this aggregation is. As discussed already,

this issue of the composition and meaning of subjective age at different conceptual levels of analysis has yet to be thoroughly addressed by the few diary studies that model within-person variation in subjective age (e.g., how do we understand the notion of subjective age as between-person “trait,” vs. as a within-person “state”).

Finally, as noted in the introduction, the studies included in this special issue almost exclusively focus on subjective age as an “alternative age construct.” Considering different typologies and models of such alternative constructs (e.g., Kooij, de Lange, Jansen, & Dikkers, 2008; Pitt-Catsouphes, Matz-Costa, & James, 2012), it is clear that there are notable gaps in our understanding of these phenomena, and the various age-related concepts considered in the commentary by North and Shakeri (2019) likewise speaks to this. However, I would caution future researchers that the same confounding issues that we find with other related constructs (e.g., core self-evaluations, physical health, and work ability) are likely to be present. Thus, if future research is to consider alternative constructs further, a more thoughtful consideration of the common underlying structure of these variables is necessary, as are considerations of the sensitivity of one’s conclusions regarding such constructs to these alternative explanations.

## CONCLUSION

Putting together a collection of papers for a special issue is always an interesting and rewarding endeavor. Overall, we are very pleased with the contributions that the five papers we have curated here bring to our understanding of alternative age-related constructs, and in particular to subjective age. At the same time, it is clear from our back-and-forth correspondence that many “big questions” about this topic remain to be satisfactorily answered. The good news is that it is also clear that there are ample opportunities to do so. Thus, our hope is that through this special issue, newly informed programs of research will emerge concerning work and the multitude of age constructs. We are optimistic that future researchers will consider this collection of papers and the suggestions offered here as a challenge to more rigorously and critically consider how these concepts can be applied the study of work, aging, and retirement.

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