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**Do We Act as Old as We Feel?
An Examination of Subjective Age and Job Crafting Behaviour of Late Career
Employees**

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Abstract

Ageing research calls for a focus on the mechanisms that can explain effects of ageing beyond the purely chronologic marker of age. To address this issue, the present study focuses on subjective age as a holistic construct that is related to various developmental and motivational processes and allows deeper insights into the interindividual variability of the ageing experience in older workers. Specifically, the current study examines on a sample of $N = 485$ late career employees (mean age 54 years), if subjective age is related to job crafting behaviours of older workers and whether job crafting is related to higher levels of work meaningfulness in late career. Results indicate that subjective age is significantly negatively related to job crafting behaviour over and above the effect of chronological age, self-rated health and workplace autonomy. Job crafting, in turn, significantly predicted work meaningfulness, above the effect of workplace autonomy. In sum, our study provides evidence for the utility of psychological representations of ageing to understand job crafting at work for an increasingly important segment of the working population.

Keywords: Subjective age; proactive work behaviour; job crafting; older workers; late career; work meaningfulness;

Do We Act as Old as We Feel?**An Examination of Subjective Age and Job Crafting Behaviour in Late Career Employees**

Older workers are a steadily growing segment of the population due to increasing longevity and decreasing birth rates in most developed countries which causes rising strains on retirement systems worldwide (Dittrich, Büsch, & Micheel, 2011; Hallberg, 2011; Van der Heijden, Schalk, & Van Veldhoven, 2008). Therefore, understanding factors that enable a meaningful and satisfying late career is of growing importance. Ageing research calls for a focus on the mechanisms that can explain effects of ageing (Schaie, 2016). Perceptions of time and ageing are hypothesized to be influential on human behaviour and attitudes (Kotter-Gruehn et al., 2016). Thus, subjective perceptions of ageing could provide a deeper understanding of the enabling factors of meaningful late careers and provide insights into differences in organizational behaviour beyond the effects of chronological age.

For employees to be able to maintain their health, motivation, and work ability over the lifespan the active creation of person-job fit between the changing self and the changing work environment is essential (Bindl & Parker, 2010; Grant & Ashford, 2008). Job crafting is a frequently suggested proactive workplace behaviour geared towards maintaining and creating an optimal person–job fit for late career employees (Kooij, Tims, & Kanfer, 2015). Although job crafting is proposed as a crucial mechanism by which older workers may exercise agency and foster successful ageing at work (Kooij et al., 2015; Lichtenthaler & Fischbach, 2016; Moghimi, Scheibe, Van Yperen, Pachana, & Thapa, 2015), meta-analytical evidence suggests that job crafting decreases with age (Rudolph, Katz, Lavigne, & Zacher, 2017). This finding is rather troubling given the proposed importance of job crafting for successful ageing at work. Hence, it seems important to better understand malleable factors that contribute to higher levels of job crafting in late career. Subjective age, we propose, could be such an alterable individual characteristic that helps explain between-person differences in job crafting among older workers. Subjective age is defined as the dimension of age that reflects age as experienced by the individual (Schwall, 2012). Consequently, we aim to investigate the effect of subjective age on job crafting, while

SUBJECTIVE AGE AND JOB CRAFTING

controlling for the potentially confounding influence of health status and chronological age (Hubley & Russell, 2009; Rudolph et al., 2017).

Furthermore, from a theory-driven perspective, job crafting is strongly linked to work meaningfulness as it increases person-job fit (Berg, Dutton, & Wrzesniewski, 2013; Wrzesniewski, 2003), which in turn leads to higher levels of work meaningfulness (Tims, Derks, & Bakker, 2016). Meaningful work is especially important for late career employees to age successfully at work and pursue a satisfying and sustainable late career (Froidevaux & Hirschi, 2015). In spite of that, the empirical link between job crafting and work meaningfulness in late career has not yet been established. Therefore, in our current study we investigate the relation of job crafting with work meaningfulness while controlling for possibly confounding variables proposed by previous research (Rudolph et al., 2017).

Summarized, the main contributions of our paper are the following: First, we shed light on the relation between subjective age and job crafting in late career employees while controlling for potentially confounding factors of participants' health and chronological age, as well as job autonomy. Second, we investigate job crafting behaviour of older workers, thereby adding empirical insight into the proactivity at work literature for an increasingly influential and significant segment of the population. Third, we inspect the theoretically hypothesized relation between job crafting and work meaningfulness of late career employees.

Subjective Age and its Relation to Job Crafting in Late Career Employees

Chronological age is usually assessed in studies of vocational behaviour and organizational psychology as a demographic control variable. As such, previous research in work and organizational psychology almost exclusively relied on chronological age when describing age effects (Schwall, 2012). Chronological age is an important marker of time and can have powerful effects on a person's working life irrespective of how old they feel: There are mandatory retirement ages in some countries, age limits in certain occupations (e.g. to be trained as a professional pilot) or biological effects of ageing which can be of relevance in some professions (e.g. professional athletes). Furthermore, chronological age is often linked to central life events and has a certain prescriptive character regarding people's development (such as when to enter and exit the workforce or start a family).

SUBJECTIVE AGE AND JOB CRAFTING

While these effects should not be trivialized, there is also a substantial amount of variation in life developmental patterns in today's societies: Lives and careers are increasingly idiosyncratic and often less determined by prescriptive timelines than they were in the last centuries (Van der Heijden, 2015). Moreover, according to the theory of aged heterogeneity (Nelson & Dannefer, 1992), people of similar age become increasingly heterogeneous with progressing age which means that a group of older workers is more disparate than a group of younger workers. This also means that chronological age loses predictive power with advancing age.

Present-day recommendations for studying older workers therefore call for the investigation of the diversity among late career employees (Zacher, Kooij, & Beier, 2018). As chronological age is per definition fixed among age-peers but subjective age is varying, investigating subjective age among age peers (employees aged 50 – 60) would comply with the beforementioned call for research and might help highlight and explain variance in ageing trajectories among older workers.

Subjective age comprises a subjective evaluation of how old one feels, looks, behaves, and expresses interests in different things and activities (Barak, 1987; Barak & Schiffman, 1981; Kastenbaum, Derbin, Sabatini, & Artt, 1972). Depending on the evaluation of these aspects of age, people may perceive that they are currently older, younger, or have the same subjective age as their chronological age. Subjective age has been researched in gerontology and marketing research for several decades (Montepare & Lachman, 1989), but evolved in a rather fragmented way in different fields which resulted in various constructs being labelled as subjective age as well as subjective ageing being measured in a multitude of ways. Whereas some researchers label related constructs, such as attitudes toward own ageing (Akkermans, de Lange, van der Heijden, Kooij, & Jansen, 2016) or awareness of age-related changes (Brothers, Miche, Wahl, & Diehl, 2015) as subjective age, subjective age is sometimes referred to as cognitive age (Barak & Schiffman, 1981), age identity (Barak, 2009), or personal age (Iskra-Golec, 2002). In our paper we focus on relative subjective age, which refers to the difference between one's subjective and chronological age in terms of feeling younger or older compared to one's chronological age (Kunze, Raes, & Bruch, 2015).

SUBJECTIVE AGE AND JOB CRAFTING

What all of these measures have in common is that they define subjective age as a holistic construct that relates to various developmental processes and thus allows for deeper insight into age and ageing. Consequently, subjective age can be a fruitful way of inspecting ageing because the perception of age resides within the individual (Schwall, 2012). Research showed that older adults on average feel younger than their chronological age, whereas younger adults (up to age 25) tend to feel older than their chronological age (Barak, 1987) and that this relation becomes more pronounced as people age (Rubin & Berntsen, 2006; Teuscher, 2009). However, there are substantial variations of subjective age within age groups, which implies that people experience ageing differently (Schwall, 2012). For example, there is first evidence that subjective age is related to late-life neurocognitive health and to the process of brain ageing (Kwak, Kim, Chey, & Youm, 2018). Therefore, subjective age could allow for important new insight into workplace behaviour because it is hypothesized to have added predictive value independently from chronological age. Also, there is conceptual and empirical evidence that subjective age can be influenced and improved (Kotter-Gruehn et al., 2016; Gabrian, 2017) and thus has the potential to improve ageing trajectories of late career employees.

Subjective age has often been included in marketing research because it allows for new insight into consumer behaviour (Barak & Schiffman, 1981). Conversely, there is a general lack of research on subjective age in the work context, even though there is a claim to increasingly include alternative age concepts in work and organizational psychology research (Schwall, 2012). Recent publications in work and organizational psychology therefore started to investigate the utility of subjective age in the work context, with promising results. For example, Kunze et al. (2015) investigated the effect of subjective age in relation to goal accomplishment of employees and found that companies, in which employees perceived themselves to be younger than their chronological age, had above-average individual goal accomplishment. The authors concluded that it is not employees' chronological age, but their subjective age that drives organizational performance outcomes. Another example of recent work in organizational psychology research, including subjective age, is from Akkermans et al. (2016). The authors (Akkermans et al., 2016) found that if they included subjective age in their model, chronological age was virtually unrelated to workers' intrinsic motivation, extrinsic motivation, and motivation

SUBJECTIVE AGE AND JOB CRAFTING

to continue work for one's organization. The effects of subjective age on (work) outcomes can be explained based on socioemotional selectivity theory (Carstensen, 2006), which posits that future time perspective becomes increasingly limited with age (Carstensen, Isaacowitz, & Charles, 1999). A more limited future time perspective is in turn related to an attempt to preserve the status quo and avoid further losses. In line with the premises of socio-emotional selectivity theory (Carstensen et al., 1999), we can thus expect that older employees with a younger subjective age have a more open-ended future time perspective compared to age peers with older subjective age and that such differences affect the extent to which older workers seek additional resources and challenges at work to attain their long-term developmental goals (Kooij, Tims, & Akkermans, 2017).

Job crafting is a form of proactive work behavior that is defined as the self-initiated changes regarding one's job which are aimed at optimizing the alignment of personal preferences, goals, and motives with one's job (Tims, Bakker, & Derks, 2012). An important aspect of job crafting is seeking additional challenges and resources, and we thus assume that late career employees with younger subjective ages will report higher levels of job crafting, than their counterparts with older subjective ages. In support of this, Kooij et al. (2017) investigated the effect of a limited vs. open-ended future time perspective on job crafting behaviour and found that participants with an open-ended future time perspective increased their challenging job demands as well as social- and structural job resources significantly more than participants with a limited future time perspective. We hence assume that subjective age is negatively related to job crafting in late career such that older workers who feel younger engage in more job crafting than older workers who feel older than their chronological age.

However, previous research has also questioned the incremental predictive validity of subjective age on work-related behaviours and outcomes. Specifically, two variables have been highlighted by previous research to be potential confounders: Chronological age (Hubley & Russell, 2009) and health status (Kotter-Gruehn, Kornadt, & Stephan, 2016). As a result, we control for the effects of chronological age in our analyses to test the notion that subjective age has explanatory power beyond chronological age on outcomes (Akkermans et al., 2016; Kunze et al., 2015). Based on such arguments, we expect that subjective age has an incremental validity over and above chronological age in explaining

SUBJECTIVE AGE AND JOB CRAFTING

variance in job crafting behaviour of late career employees. In addition, we control for self-rated health because it was shown by previous research that it is closely related to subjective age (Kotter-Gruehn et al., 2016). This means that the health status of individuals could drive the effects between subjective age and job crafting, making subjective age only a confounding variable in explaining the effects of one's health status on their job crafting behaviour. Assuming an incremental utility of subjective age, we test the assumption that subjective age is related to job crafting behaviours beyond self-rated health.

From a contextual perspective, previous research has stated that workers with highly autonomous jobs are likely to seek challenging situations that promote mastery and learning (Bindl & Parker, 2010; Grant & Ashford, 2008), and are therefore more likely to engage in proactive workplace behaviours. Job crafting is a discretionary behaviour of employees whereby job autonomy—or more precisely, decision latitude—is suggested to be an important condition that stimulates this behaviour (Leana, Appelbaum, & Shevchuk, 2009; Lyons, 2008). We therefore consider decision-making autonomy as a control variable when examining job crafting behaviour of late career employees. We again aim to test the incremental value of subjective age in predicting job crafting behaviour while taking job autonomy into account. Consequently, our first proposed hypothesis is:

Hypothesis 1. Subjective age is negatively related to job crafting in late career employees above the effect of chronological age, self-rated health, and job autonomy.

Job Crafting and Work Meaningfulness in Late Career

The term work meaningfulness refers to work that employees believe is significant in that it serves an important purpose (Berg et al., 2013). Individuals have an inherent need for a work life that they believe is meaningful (Herzberg, Mausner, & Snyderman, 2011; Wrzesniewski, 2003). Meaningfulness is a deeper level of intrinsic motivation (Chalofsky & Krishna, 2009): Individuals who do not perceive the workplace as meaningful will not work up to their professional capacity (Maslow, 1971). Work meaningfulness is furthermore associated with positive work-related outcomes, such as increased job satisfaction, motivation, and performance (Maslow, 1971). Meaningful work thus provides richer, more satisfying, and more productive employment. Finding meaning in life and conducting meaningful work are particularly important in advanced age (McFadden, 2015;

SUBJECTIVE AGE AND JOB CRAFTING

Mor-Barak, 1995). Hence, meaningful work is especially important for late career employees to age successfully at work and to pursue a satisfying and sustainable late career (Froidevaux & Hirschi, 2015; Shacklock & Brunetto, 2011).

Job crafting already has been theoretically linked to work meaningfulness at the earliest conceptualization (Wrzesniewski & Dutton, 2001). In their seminal paper, Wrzesniewski (2003) linked job crafting to person–job fit, which, in turn, should increase the perceived meaningfulness of the job. For employees, to be able to maintain their health, motivation, and work ability, a continuous person–job fit between the changing worker and changing work is required (Moghimi et al., 2015). This dynamic person–job fit could be facilitated by job crafting which thereby should lead to increased work meaningfulness (Moghimi et al., 2015; Tims et al., 2016).

However, despite the close theoretical link between job crafting and work meaningfulness (Moghimi et al., 2015), there is a lack of empirical studies to confirm this proposition. We have found only one quantitative empirical study that links the two concepts and confirmed work meaningfulness as an outcome of job crafting: Tims et al. (2016) investigated job crafting as an antecedent of work meaningfulness in their longitudinal diary study and confirmed the theoretically proposed link in their highly age-diverse sample. Although this research offers valuable insight into within-individual changes and consequences of weekly job crafting behaviour, our study aims to test the link between job crafting and work meaningfulness in a time-lagged study of between-person effects in late career employees.

Moreover, previous empirical research on the job crafting–work meaningfulness link did not consider alternative explanations of the tested relations. We intend to fill this gap and include several potentially relevant controls in our model. When investigating job crafting and work meaningfulness, previous research suggested that job characteristics are important antecedents of proactive work behaviour (Bindl & Parker, 2010; Grant & Ashford, 2008). Autonomy has been highlighted in recent inquiries to be an antecedent of job crafting because proactive behaviour is more likely to occur in situations with high autonomy (Rudolph et al., 2017). Furthermore, autonomy has also been highlighted to affect employee attitudes and motivation (Hackman & Oldham, 1976), and specifically to influence perceived work meaningfulness. This notion is supported by meta-analytic

SUBJECTIVE AGE AND JOB CRAFTING

research, which shows a positive relation between job autonomy and experienced work meaningfulness (Humphrey, Nahrgang, & Morgeson, 2007). Therefore, in order to establish the incremental utility of job crafting for work meaningfulness among late career employees, we control for autonomy at work in our model. Hence, our proposed second hypothesis is:

Hypothesis 2. Job crafting is positively related to perceived work meaningfulness in older workers beyond the effect of job autonomy.

Method

Sample and Procedure

Participants were recruited through a German online-access research panel company. Our chosen panel company was ISO certified and a member of the ESOMAR (European Society for Opinion and Marketing Research), the BVM (Association of German Social- and Market Research / Berufsverband Deutscher Markt- und Sozialforscher), and the DGOF (German Society for Online-Research / Deutsche Gesellschaft für Online-Forschung). All respondents were selected with a double-opt-in procedure, first signing up for the service, then receiving a confirmation mail with a DOI, and finally explicitly confirming registration and participation. Registered participants receive incentives for diligently completed questionnaires and are allowed to fill out a maximum of two questionnaires per week to ensure data quality.

A random sample of 899 participants corresponding to our selection criteria was drawn from a pool of over 320,000 German registrants. Recruited participants had to be employed in private industry (excluding students, self-employed, trainees and interns, and civil servants), working at a minimum of 50% of a full-time position, and between 50–60 years old. We limited the age span to this range, as employees 50+ represent older workers according to most definitions (Kooij, de Lange, Jansen, & Dijkers, 2008) but are not immediately facing retirement, as the mandatory retirement age is 65 years in Germany. To avoid potential confounding effects of retirement planning and immanent retirement transitioning (Froidevaux, 2018) on our study variables, we therefore focused on this group of active older workers.

SUBJECTIVE AGE AND JOB CRAFTING

Participants received EUR 2.00 per survey for filling out the questionnaires. After completing the first survey (T1), these participants were invited to complete follow-up surveys six (T2) and twelve months later (T3), with a response rate of 77.61% at T2, of which 86.13% again participated at T3. Subsequently, as recommended by Wolke et al. (2009), we compared the participants who only filled out T1 to the rest of the sample on all T1 variables and socio-demographics with t-tests. The t-tests did not reveal any significant differences between the two groups wherefore we assumed that no systematic dropout occurred (Wolke et al., 2009). Within the resulting sample of 596 participants, we conducted extensive data quality checks concerning streamlining, carelessness and speeding. Streamlining was investigated with the calculation of longstrings and Mahalanobis D, carelessness with trap questions, and speeding with time tracking variables in the questionnaires, in line with the recommendations for data cleaning by DeSimone and Harms (2017). Based on these checks, 111 respondents were removed, resulting in the final sample of $N = 485$, with a mean age of 54.09 years ($SD = 2.76$), 45.1% female. The respondents came from a large variety of industry sectors and worked, on average, 35.0 hours per week. Respondents' educational level was representative of the working population in Germany and ranged from no vocational training (4.5%) to doctoral graduates (0.2%). The majority of participants had completed vocational training as their highest education (45.7%), whereas 17.1% of the participants held a university degree. As is customary in Germany, race was not assessed, but almost all (98.1%) of the participants were German citizens. Subjective age, demographic variables (highest level of education and organizational tenure in years) and the control variables chronological age and self-rated health were assessed at T1, job crafting and job autonomy were assessed at T2, and work meaningfulness was assessed at T3.

Measures

Unless otherwise indicated, scales were independently translated from their original English version into German by the authors. The final German items were formulated after reconciling differences in the translations. This procedure is often preferable over a back-translation procedure because it ensures naturalness, connotation, and comprehensibility of the items (Van de Vijver & Leung, 1997). The internal consistency of all measures was

SUBJECTIVE AGE AND JOB CRAFTING

satisfactory (all alphas $> .80$). Means, standard deviations, inter correlations, and Cronbach's alpha estimates for all scales are reported in Table 1.

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

Subjective age. Subjective age was measured in the form of *relative subjective age*. The instrument consists of four items measuring the four facets of subjective age: feel, look, act, and interests age (Barak, 1987; Teuscher, 2009). These four dimensions are then aggregated into an overall subjective age value. An example item is: "How old do you feel?" and uses a 5-point Likert-type scaled answer format ranging from 1 (*much younger than my age*) to 5 (*much older than my age*). This measure has been extensively used in marketing research, and has demonstrated its utility in explaining consumer behaviour beyond demographic variables (Szmigin & Carrigan, 2001). Supporting the variability and thus usefulness of this variable even within the used age-restricted sample, the scale scores ranged from 1 to 4 with median of 2.25.

Self-rated health. Self-rated health was measured with one item: "How would you describe your current health?" from the German Socioeconomic Panel (SOEP) (Schupp, 2012) and had to be answered on a 7-point Likert-type scale ranging from 1 (*very bad*) to 7 (*excellent*). This one-item measure is used in most well-known population surveys and has been shown by previous research to be a strong and significant predictor of mortality, help seeking behaviour, and health service use (Bowling, 2005).

Job crafting. Job crafting was assessed with the German translation of the job crafting scale (Tims et al., 2012). We assessed three of the four sub dimensions: increasing structural job resources (e.g., "I try to develop my capabilities"), increasing social job resources (e.g., "I ask my supervisor to coach me"), and increasing challenging job demands (e.g., "I regularly take on extra tasks even though I do not receive extra salary for them"). Although researchers occasionally analyse the job crafting dimensions separately, we use them as equal indicators of an overall job crafting factor, as often done in previous research (Rudolph et al., 2017). This overall conceptualization is consistent with the idea that job crafting represents the orchestration of related proactive behaviours that are jointly enacted (Rudolph et al., 2017). We omitted the fourth dimension of the measure (i.e., decreasing hindering job demands) because that dimension showed the lowest standardized

SUBJECTIVE AGE AND JOB CRAFTING

factor loading across all sub dimensions and was identified to be treated with caution when generating composite scores (Rudolph et al., 2017). Participants answered on a 5-point Likert-type scale ranging from 1 (*never*) to 5 (*often*). This scale is the most commonly used approach to measure job crafting (Rudolph et al., 2017), with significant relations to proactive personality and personal initiative (Tims et al., 2012).

Autonomy. We measured decision-making autonomy with the scale of Morgeson and Humphrey (2006) translated to German and validated by Stegmann et al. (2010). The scale consists of three items (e.g., “The job gives me a chance to use my personal initiative or judgment in carrying out the work”). Participants had to answer on a 5-point Likert-type scale ranging from 1 (*never*) to 5 (*often*). (Morgeson & Humphrey, 2006) provided support for the construct validity of the scale in terms of significant correlations with training and compensation requirements.

Work meaningfulness. Meaningful work was assessed with the work meaningfulness scale of Bunderson and Thompson (2009). The scale consists of five items (e.g., “The work that I do is meaningful”) with a Likert-type answer format ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). This work meaningfulness measure has been shown to be significantly related to calling and occupational identification (Bunderson & Thompson, 2009). Following Bunderson and Thompson (2009), who found that their model was substantially improved when one of the five work meaningfulness items was dropped (Item 3: “The work that I do makes the world a better place”), we also calculated a CFA without this item and could also substantially improve our model fit from $\chi^2 = 462.833$, $df = 5$; CFI = 0.762, TLI = 0.523; RMSEA (90% CI) = .435 [.402; .468] to $\chi^2 = 7.486$, $df = 2$; CFI = 0.996, TLI = 0.988; RMSEA (90% CI) = .075 [.023; .136], $\Delta CFI = 0.234$. Therefore, we decided not to include this item in our further analyses.

Results

Preliminary Analyses

Confirmatory factor analyses. To confirm dimensionality and structure of the job crafting scales as well as provide support for the distinctness of the autonomy scale from the job crafting scales, we conducted confirmatory factor analyses (CFAs). We used *Mplus*

SUBJECTIVE AGE AND JOB CRAFTING

(Version 7.3; Muthén & Muthén, 2010) and the robust maximum likelihood estimation method (MLR; Satorra & Bentler, 2001) for all the CFAs and the analyses testing the hypotheses. Several model fit indices were examined: (1) the Chi-squared (χ^2) test, (2) the comparative fit index (CFI), (3) the Tucker-Lewis Index (TLI), (4) the root mean square error of approximation (RMSEA), and (5) the standardized root mean square residual (SRMR). Acceptable model fit is defined by the following criteria; above .90 for CFI and TLI (Kline, 2011), an RMSEA value of .05 or less, with values less than .08 also considered as acceptable (Cheung & Rensvold, 2002; Vandenberg & Lance, 2000), and values less than .08 for SRMR (Hu & Bentler, 1999). For model comparisons, a change in CFI of greater than .002 suggests that models are statistically different (Meade, Johnson, & Braddy, 2008).

To establish the presumed hierarchical structure of the job crafting scale, we applied CFA to test three competing models: The first model (M1) reflected the assumed structure of three distinct factors (increasing structural resources, increasing social resources, increasing challenging job demands) that loaded onto a higher-order job crafting factor. The second model (M2) represented a two-factorial model where the items assessing increase of resources (increasing structural resources, increasing social resources) load onto one factor and the items assessing increasing challenging job demands onto the other factor. The third model (M3) represented a one-factorial model where all items loaded onto a single job crafting factor. The results of the factor analyses are presented in Table 2. In our sample, Model 1 was the best fitting model. When looking at model comparisons, all the $\Delta\chi^2$'s were significant, and the Δ CFI was greater than .002, showing that Model 3 and Model 2 fit significantly worse than Model 1. These results favour a hierarchical model over the other models. Construct validity of the factors was further supported by high standardized factor loadings for each scale ($M = 0.72$) in Model 1.

Furthermore, to confirm that autonomy is a distinct construct from job crafting, we conducted two CFAs. In the first solution (Model 1), we modelled job crafting and autonomy as separate constructs, each indicated by their respective items. In the second solution (Model 2), we modelled all autonomy and job crafting items as loading on a single factor. The results showed that Model 1 was a significantly better fit compared to Model 2; Model 1: $\chi^2 = 1034.430$, $df = 134$; CFI = 0.829, TLI = 0.805; RMSEA (90% CI) = .118

SUBJECTIVE AGE AND JOB CRAFTING

[.111; .124]; Model 2: $\chi^2 = 2222.618$, $df = 135$; CFI = 0.604, TLI = 0.551; RMSEA (90% CI) = .179 [.172; .185]. Therefore, we confirmed that autonomy is a separate construct from job crafting.

Finally, we tested our full measurement model by CFA, including all of our latent study variables (subjective age, job crafting, autonomy and work meaningfulness). This resulted in good model fit: $\chi^2 = 941.047$, $df = 343$; CFI = 0.922, TLI = 0.914; RMSEA (90% CI) = .060 [.055; .065].

Consideration of control variables. In addition to self-rated health and autonomy, we considered several other potentially relevant control variables, including highest education level, organizational tenure, and gender. Based on human capital theory (Becker, 1994), it can be argued that higher education and longer tenure may lead to greater accumulated general knowledge, as well as job knowledge, which, in turn, can facilitate job crafting behaviour (Rudolph et al., 2017). Regarding gender differences in job crafting behaviour, previous research has produced conflicting results. Nevertheless, a recent meta-analysis has found that there are small, yet significant, gender differences in job crafting behaviour, namely that women engage in job crafting to a greater extent than do men (Rudolph et al., 2017). Bivariate correlations among the final sample (see Table 1) showed that educational level was positively correlated with job crafting, whereas job tenure and gender were not significantly correlated to job crafting. However, hypothesis tests yielded identical results regardless of whether control variables were included. We therefore report the results without control variables because of parsimony and to maximize power and offer more interpretable results (Bernierth & Aguinis, 2015).

Hypothesis Testing

As the bivariate correlations in Table 1 show, chronological age and self-rated health were significantly negatively related to subjective age. This is in line with our expectations, as older adults generally perceive themselves as younger than their actual age and the difference between chronological and subjective age is becoming more pronounced with advancing chronological age (Montepare, 2009). Autonomy was significantly correlated with job crafting as well as work meaningfulness. Job crafting was significantly positively related to work meaningfulness. However, subjective health was not significantly correlated with job crafting or work meaningfulness.

SUBJECTIVE AGE AND JOB CRAFTING

To test the proposed hypotheses and explore the unique effect of subjective age on job crafting in late career employees, we computed a Structural Equation Model (SEM) with subjective age, chronological age, and self-rated health at T1, job crafting and job autonomy at T2, and work meaningfulness at T3 (Figure 1). The following modification was included in the model: We allowed the two subjective age items *look* and *feel* to correlate because those two items are conceptually closely related and expected to co-vary (Barak & Schiffman, 1981). To make the model more appropriate, we also included direct paths from chronological age and self-rated health on subjective age to account for the assumption that subjective age is partially a function of these two variables. Along the same rationale, we included direct paths from autonomy to job crafting as well as work meaningfulness, although if these direct paths were removed, the main effects did not change significantly. Our model showed good fit: $\chi^2 = 898$, $df = 339$, $RMSEA = .058$ (CI = .054 - .063), $CFI = .927$, $TLI = .919$, $SRMR = .081$. Subjective age was a significant predictor of job crafting, but chronological age and self-rated health did not significantly predict job crafting. Therefore, our first hypothesis was supported: Subjective age significantly negatively predicted job crafting behaviour of older workers, over and above the effect of chronological age and self-rated health.

Regarding our second assumption, job crafting significantly predicted perceived work meaningfulness and had an incremental effect above autonomy, supporting our second hypothesis. The results further showed that autonomy significantly positively predicted job crafting and also had an incremental effect on work meaningfulness beyond job crafting.

Test of potential indirect effects. We did not propose a direct link between subjective age and work meaningfulness because we did not see an evident direct theoretical link between subjective age and work meaningfulness. However, following the suggestion of the editorial team, we calculated indirect effects, where job crafting mediated the relation between subjective age and work meaningfulness. As in our case path *a* is positive and path *b* is negative (and path *c* is negative, but not significantly) we proceeded to test a competitive mediation (Zhao, Lynch Jr, & Chen, 2010). The results uncovered that there is no competitive mediation present in our model and hence we conclude that in our case we have a no-effect nonmediation (Zhao et al., 2010), total effect = -0.062 ($p = 0.439$),

SUBJECTIVE AGE AND JOB CRAFTING

indirect effect = -0.031 ($p = 0.087$). In the case of a no-effect nonmediation there is no evidence for a hypothesized mediator and the presence of an omitted mediator is also unlikely (Zhao et al., 2010).

Discussion

Lifespan psychology literature suggests that late career employees need to take an active role in shaping their careers (Kooij, 2015). In order to continuously adjust work to intrapersonal changes that are part of the ageing process, proactive person–environment fit behaviours (e.g., job crafting) seem to be especially important for older workers for maintaining high work motivation and deriving meaning from their work (Kooij et al., 2015). Our study aimed at investigating the predictive power of the subjective age construct in regards to proactive workplace behavior in late career employees while controlling for potentially confounding factors of participants' health and chronological age, as well as job autonomy. Furthermore, we investigated job crafting behaviour of late career employees empirically, thereby adding insight into the proactivity at work literature for a growing segment of the workforce.

In line with previous research (Rudolph et al., 2017), our results showed a weak, negative relation between chronological age and job crafting, although this relation was not significant in our sample. Moreover, our study showed that older employees who feel younger than their age (i.e., report a lower relative subjective age) engage in significantly more job crafting behaviours. Although the uncovered effects were rather small in magnitude, these effects represent the incremental impact of subjective age over and above several control variables (chronological age, health, autonomy). Moreover, relatively small effect sizes are common in organizational research and seemingly small effects can have significant real-world consequences (Paterson, Harms, Steel, & Credé, 2016). Whereas previous research almost exclusively relied on chronological age when describing age effects, we extended this approach and examined subjective age as an antecedent of job crafting behaviours. The use of chronological age to examine attitudinal or behavioural patterns of the elderly has been recognized as problematic by previous research in gerontology (Kastenbaum et al., 1972) and marketing (Barak, 1987; Barak & Schiffman, 1981) because older individuals are increasingly heterogenous. Therefore, in the current paper we followed the recommendation that ageing research must focus on the mechanisms

SUBJECTIVE AGE AND JOB CRAFTING

that can explain effects of ageing (Nielsen & Reiss, 2012; Schaie, 2016). Subjective age is such an explanatory mechanism as it is a psychological representation of the individual ageing process, and perceptions of time and ageing are hypothesized to be influential on human behaviour and attitudes (Brothers, 2016; Kotter-Gruehn et al., 2016; Sargent-Cox, 2017; Schaie, 2016). In support of this notion, we provided an indication of the incremental explanatory value of this alternative age concept, over and above chronological age, in predicting job crafting behaviour of late career employees.

Furthermore, by controlling for autonomy as an important contextual antecedent of job crafting, we also took into consideration potential environmental influences on proactive workplace behaviour. According to our results, even though autonomy was positively related to job crafting, it did not diminish the effect of subjective age on job crafting behaviour. This is an important insight given that it enhances the generalizability, and therefore the external validity, of our findings.

Although job crafting has been suggested as an important mechanism to help create and maintain an optimal person-job fit for late career employees, previous research has shown that job crafting generally decreases as people age. As late career employees are susceptible to person-job misfit due to their often relatively long tenure and intrapersonal changes over the lifespan (Bindl & Parker, 2010), this group of employees would especially benefit from crafting their jobs. In this regard, the current research takes an important step in the direction of understanding the facilitating factors of job crafting in late career employees.

Given the growing importance of meaningful work as people age (Kooij, De Lange, Jansen, Kanfer, & Dikkers, 2011), our research aimed to inspect the facilitating factors of personally meaningful work for late career employees. Job crafting is seen as a process by which employees redefine and reimagine their jobs in personally meaningful ways (Berg et al., 2013; Wrzesniewski & Dutton, 2001). Therefore, by crafting their jobs, employees can actively shape the meaningfulness of their work. Our study confirmed this notion: We provide empirical evidence of the theoretically proposed link between job crafting and work meaningfulness in late career employees. Moreover, we established this link while accounting for the effect of autonomy on work meaningfulness. This is an important finding considering that past empirical research neglected to investigate the link between

SUBJECTIVE AGE AND JOB CRAFTING

job crafting and work meaningfulness, despite its theoretical importance. As employees age, they perceive their remaining time in life as shorter and therefore prioritize emotionally meaningful goals, as described by socioemotional selectivity theory (Carstensen et al., 1999). Therefore, it is of increased importance in late career to be engaged in personally meaningful work. As our results suggest, job crafting is a well-suited tool for older employees to help align their jobs with their preferences and needs, thereby creating more meaningfulness at work. Given a steadily ageing workforce and a rising need for agency and proactivity in career development due to today's fast-paced environments (Van der Heijden, 2015; Van der Heijden et al., 2008), our results contribute to the facilitation of meaningful and sustainable late careers.

Limitations and Future Research

Although the current study provides a valuable first step in examining the utility of subjective age and job crafting among late career employees, the present results do not allow probative causal conclusions. The temporal separation of our investigated variables was aimed at the reduction of common-method bias and not at assessing change in the investigated variables (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Hence, we cannot rule out endogenous effects and reverse causality of our described relations: It is possible, for example, that working in a more meaningful job makes people feel younger and/or leads to more active job crafting. Furthermore, it is possible that our inspected relations function in a circular manner insofar as younger subjective ages lead to more job crafting and work meaningfulness, and at the same time, highly meaningful work revitalizes late career employees who therefore feel younger and engage in more job crafting. Therefore, future research should examine changes and reverse causation in these variables with longitudinal designs which allow for cross-lagged analyses to determine change effects. Because subjective age is rather stable over time in advanced age (Kleinspehn-Ammerlahn, Kotter-Grühn, & Smith, 2008; Kotter-Gruehn, Kleinspehn-Ammerlahn, Gerstorf, & Smith, 2009) such an endeavour should preferably encompass an examination of change over several years.

Another important issue concerns the measurement and conceptual clarity of the subjective age construct: Future research should place higher importance on a more precise definition of the measured variable as currently a multitude of constructs are being labelled

SUBJECTIVE AGE AND JOB CRAFTING

as subjective age and the same measures are often being labelled differently, which creates a perceived disconnect between different literatures researching the same phenomena and leaves much unutilized potential of cross-fertilization between various fields of research (gerontology, marketing research, work- and organizational psychology, etc.).

In the lines of cross-field fertilization, subjective age has been shown to be closely related to the process of brain ageing which is a first evidence of a concrete neurobiological basis of subjective age and could make subjective age an important marker of late-life neurocognitive health (Kwak et al., 2018). Today there are medical tests available to measure people's estimated biological age as opposed to their chronological age, through various psychological and physiological measures (e.g., blood pressure, bodyfat, peak flow lung function, cognitive tests etc) and research has shown that estimated biological age can predict mortality more accurately than chronological age (Levine, 2012). Hence, it would be useful for organizational research to consider how biological correlates of subjective age could be integrated in future research.

Even though we aimed to control for a variety of potentially confounding factors in our proposed relations, the scope of our study did not allow for us to rule out all potential spurious factors. Regarding the subjective age–job crafting relation, such a possible confounding effect could be future time perspective (Akkermans et al., 2016) as well as core self-evaluations of employees (Zacher & Rudolph, in press). Future time perspective has been used as a proxy for subjective age in previous research. Akkermans et al. (2016) operationalized subjective age in terms of remaining opportunities and remaining time at work. Future research should clarify the role of future time perspective regarding the predictive validity of subjective age. Core self-evaluations are individual difference characteristics that reflect people's fundamental evaluations of themselves (Judge, 2009). People with high core self-evaluations feel in control of their lives, are confident about their abilities, and were also shown by previous research to feel younger than their chronological age (Zacher & Rudolph, in press). Therefore, future research should investigate the relation between core self-evaluations, subjective age, and relevant work-related behaviours and outcomes.

In line with this, the effect of various lifestyle variables (such as major life events and stressors) should be investigated as potential confounding factors of the subjective age

SUBJECTIVE AGE AND JOB CRAFTING

– job crafting relation, as such factors have been identified as antecedents of subjective ageing (e.g. Avidor, Benyamini, & Solomon, 2014; Bellingtier, Neupert, & Kotter-Grühn, 2015; Schafer, 2009) and might also affect the extent of crafting that employees engage in. It would also be interesting to research whether job crafting is more important for those with more difficult personal lives and whether job crafting could outbalance such impacts and would therefore be especially beneficial for employees with challenging life circumstances.

Finally, even though our sample of participants was from a variety of organizations, jobs, and positions, which ensured a high level of diversity of our participants, further research should investigate a broader age-span of employees to have a less limited variance of the chronological age variable. Such studies would be needed to compare effects of the relations between younger and older employees found herein, and to obtain a better understanding of the changes that occur in these relations as people move from younger to older age.

Theoretical Implications

Given the steadily growing segment of late career employees, it is of increased importance to research the enabling factors of a sustainable, fulfilling, and personally meaningful late career (Van der Heijden, 2015). Promoting a positive mindset toward ageing and highlighting the benefits of staying youthful in advanced age could be a factor that helps to enable career sustainability over the lifespan.

To the best of our knowledge, this is the first study examining subjective age as a predictor of job crafting. So, from a theoretical perspective, we provide evidence for a new antecedent of job crafting in late career employees. Also, the current study provides additional evidence to the theory of aged heterogeneity, as our results show that chronologically similarly aged employees report varying subjective ages and in turn different levels of job crafting.

Furthermore, we confirm the notions of socioemotional selectivity theory (Carstensen et al., 1999), which posits that future time perspective becomes increasingly limited with age which in turn motivates attempts to persevere the status quo and avoid further losses. In contrast, people with open-ended future time perspective seek additional resources and challenges at work to attain their long-term developmental goals (Kooij et

SUBJECTIVE AGE AND JOB CRAFTING

al., 2017). We theorized, that in line with the findings of Kooij et al. (2017), older workers with younger subjective ages will also seek more additional resources and challenges at work and our results confirmed this notion.

Practical Implications

The current study indicates that we do act as old as we feel and not necessarily as old as we chronologically are. Whereas chronological age is a constant that is unalterable (Schwall, 2012), subjective age encompasses underlying physiological and psychological factors, and can therefore provide deeper insights into the ageing process. Furthermore, and most importantly, subjective age is not fixed, but is intra- as well as inter-individually varying, and can be influenced. Previous experimental gerontology research has shown that subjective age can be manipulated (Gabrian & Wahl, 2017), and there are treatments available to induce change in subjective age (e.g., simulation of age-related gains and losses; portrayal of positive and negative age stereotypes; (Kotter-Gruehn, 2015; Kotter-Gruehn et al., 2016). Lower subjective ages are correlated with beneficial and desirable outcomes in elderly people: For instance, lower likelihood of Alzheimer's disease and higher levels of cognitive functioning (Kotter-Gruehn et al., 2016); or better resilience (Kleinspehn-Ammerlahn et al., 2008). From a practitioner perspective, this implies that providing interventions for more desirable and beneficial subjective ages in advanced age could constitute a fruitful way for the management of an ageing workforce. As previous research in gerontology on the antecedents of subjective age (Stephan, Sutin, & Terracciano, 2015) has shown, the extent to which individuals feel discriminated against because of their age is a significant social experience that contributes to how old or young people feel: With advancing age, people are increasingly exposed to negative stereotypes of ageing, which can translate into social devaluation and age discrimination, which, in turn, promotes harmful effects for physical and mental health, and has been shown to result in higher subjective ages (Stephan et al., 2015). Consequently, it would be important for management and HR to develop and ensure a non-discriminating and age-friendly climate.

Another implication of our results is the beneficial effect of autonomy on work meaningfulness in late career. Therefore, when managing an ageing workforce, special emphasis should be put on providing autonomy for late career employees to facilitate meaningfulness at work. As work meaningfulness, in turn, promotes job satisfaction and

SUBJECTIVE AGE AND JOB CRAFTING

other positive work outcomes (Humphrey et al., 2007), this trend should be further encouraged by management. Furthermore, informing and educating older employees about the possibility and benefits of job crafting can provide important advantages in late career. Therefore, management and career counsellors could put increasing emphasis on the promotion of proactive workplace behaviours among older workers, especially as there are easily accessible and inexpensive online courses and interactive tools available, aimed at promoting job crafting behaviour (e.g., Job Crafting™ Exercise). The further promotion and use of these tools should therefore be encouraged and facilitated for late career employees.

Conclusion

In closing, our study implies that subjective age has incremental predictive utility for job crafting among late career employees above the effect of chronological age, health, and autonomy. This highlights the potential and possible utility of the inclusion of alternative age concepts in research on late careers. Furthermore, we added empirical insights to the proactivity at work literature for an increasingly influential and significant segment of the population and confirmed the theoretically hypothesized relation of job crafting and work meaningfulness. These results are of special purport given the growing importance of meaningful work as employees age. We hope that our work inspires further research on late careers and helps foster meaningful and sustainable careers throughout peoples' lifespan, through increased proactivity, impactful career counselling, and supportive and empowering management.

SUBJECTIVE AGE AND JOB CRAFTING

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SUBJECTIVE AGE AND JOB CRAFTING

Table 1
Descriptive Statistics, Reliability Coefficients, and Correlations (N = 485)

Variables	M	SD	1	2	3	4	5	6	7	8	9
1. T1 Chronological age	54.10	2.77	-								
2. T1 Gender	-	-	-.03	-							
3. T1 Education	2.17	0.48	.04	.03	-						
4. T1 Tenure	13.88	11.15	.09*	.14**	.04	-					
5. T1 Health	4.35	1.19	-.08	.02	.08	.00	-				
6. T1 Subjective age	2.39	0.57	-.11*	.09*	-.04	-.01	-.29**	<i>.80</i>			
7. T2 Job crafting	2.79	0.69	-.06	-.06	.19**	-.03	.15**	-.07	<i>.92</i>		
8. T2 Autonomy	3.43	1.06	-.03	.06	.15**	.10*	.21**	-.14**	.43**	<i>.95</i>	
9. T3 Work meaningfulness	3.39	0.84	.01	-.02	.04	.00	.12**	-.07	.42**	.32**	<i>.86</i>

Note. Italic numbers in diagonal are Cronbach's alpha reliability coefficients. Chronological age: Free entry (years); Gender: 1 = female, 2 = male; Education: 1 = no vocational training, 2 = vocational training, 3 = higher education; Tenure: Free entry of years working in current organization.

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

SUBJECTIVE AGE AND JOB CRAFTING

Table 2

Model Fit for Confirmatory Factor Analyses of the Job Crafting Scale

	χ^2	df	CFI	TLI	RMSEA (90% CI)	SRMR
Model 1	271.997	88	.949	.939	.066 (.057; .075)	.046
Model 2	798.177	89	.804	.769	.128 (.120; .136)	.081
Model 3	828.247	90	.796	.762	.130 (.122; .138)	.082

Note. χ^2 : Model 1: Three distinct factors (increasing structural resources, increasing social resources, increasing challenging job demands) that loaded onto a higher-order job crafting factor. Model 2: Two-factorial model, where the items assessing increase of resources (increasing structural resources, increasing social resources) load onto one factor and the items assessing increasing challenging job demands onto the other factor. Model 3: One-factorial model where all items load onto a single job crafting factor.

SUBJECTIVE AGE AND JOB CRAFTING

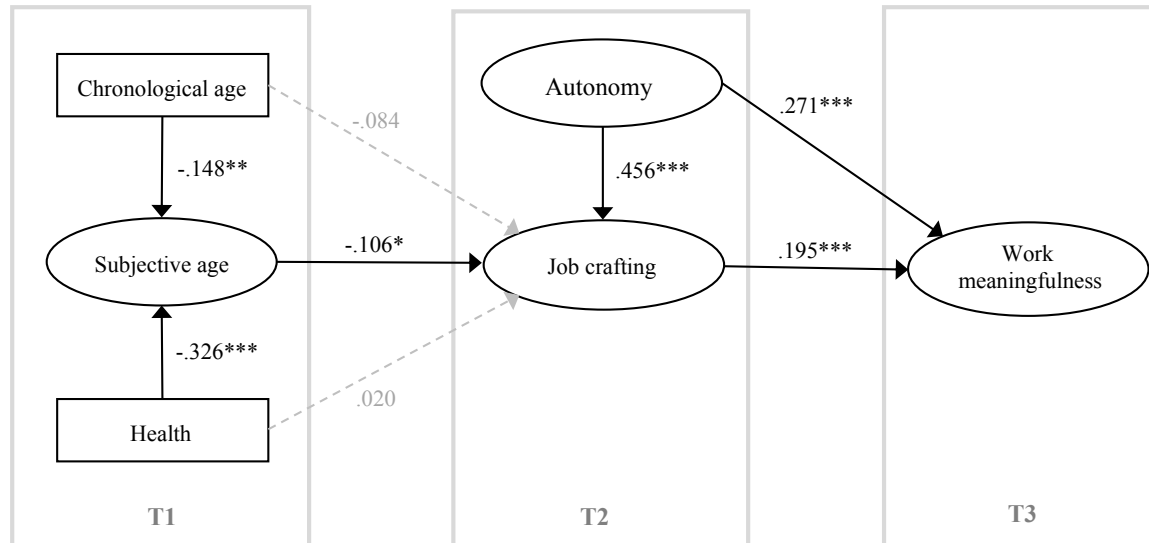


Figure 1. Structural equation model of subjective age at T1 predicting job crafting at T2, controlled for chronological age and self-rated health at T1 and job crafting at T2 predicting work meaningfulness at T3, controlled for chronological age at T1 and self-rated health at T1, as well as decision-making autonomy at T2 ($N = 485$). All variables except for chronological age and self-rated health were modelled as latent variables. For clarity, nonsignificant paths are shown as dotted lines. .

* $p < .05$; ** $p < .01$; *** $p < .001$.