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Wilckens, Max; Wöhrmann, Anne Marit; Deller, Jürgen; Wang, Mo

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Organizational Practices for the Aging Workforce: Development and Validation of the Later Life Workplace Index

Max R. Wilckens¹, Anne M. Wöhrmann^{2,1}, Jürgen Deller¹, and Mo Wang³

1. Institute for Management and Organization, Leuphana Universität Lüneburg, Lüneburg, Germany

2. Division 1 Policy Issues and Programmes, Federal Institute for Occupational Safety and Health (BAuA), Dortmund, Germany

3. Department of Management, Warrington College of Business, University of Florida

ABSTRACT

The present three studies focused on the development and validation of a multifaceted measure of organizational practices for the aging workforce, the Later Life Workplace Index (LLWI). The first study developed a comprehensive item pool based on expert interview evidence from Germany and the United States. Two further studies among workers across industries in Germany ($N = 609$, $N = 349$) provided psychometric evidence. The LLWI comprises nine distinct domains of organizational practices for the aging workforce, namely an age-friendly organizational climate and leadership style, certain work design characteristics, health management, individual development opportunities, knowledge management, the design of the retirement transition, continued employment opportunities, and health and retirement coverage. The final LLWI consists of 80 items in total. In addition, the studies demonstrated that the LLWI measures correlated with older workers' work outcomes such as stress level, workability, person-organization fit, and post-retirement work intentions in meaningful ways. Applications for the LLWI in research and practice are discussed.

In the wake of increased retirement ages and an aging “baby boom” generation, most developed countries face an aging workforce (OECD, 2017). Extended working lives require organizations to employ older individuals successfully, that is, healthy, motivated, and productive. Researchers have named a variety of different organizational practices that may drive successful employment of an older and increasingly age-diverse workforce (e.g., Armstrong-Stassen & Lee, 2009; Göbel & Zwick, 2013; Parker, Andrei, & Wang, 2020; Wöhrmann, Deller, & Pundt, 2018). However, validated measures with thorough conceptual coverage of organizational practices relevant to the context of aging at work remain limited (Boehm, Kunze, & Bruch, 2014).

Given that age-related organizational practices are often multifaceted (e.g., Kooij, Jansen, Dijkers, & de Lange, 2014; Van Dalen, Henkens, & Wang, 2015), multidimensional measures with a thorough conceptual coverage are required in order to facilitate a better understanding of these organizational practices in research and to allow for differentiated analyses of organizations in practice. Organizational practices relevant to the context of aging differ from general organizational practices in that employees' individual needs and circumstances

change throughout the lifespan due to individual life courses and aging processes (Kooij et al., 2014; Zacher, 2015). Lifespan theory thereby adds to the general and widely supported reasoning that organizational practices—particularly those attributable to strategic human resources management—influence employees' attitudes and behaviors, which in turn affects work outcome gains (e.g., Huselid, 1995).

In this article, we report three studies focusing on the development of a comprehensive measure assessing organizational practices relevant in the context of aging at work. This Later Life Workplace Index (LLWI) is a multifaceted measure to facilitate disentangling and understanding the variety of relevant organizational practices. Our aim was to develop a measure that is suitable for field research and for identifying potential improvements in practice. The measure stems from a conceptual framework that we recently developed and published and that is based on qualitative evidence from Germany and the United States (Wilckens, Wöhrmann, Adams, Deller, & Finkelstein, 2020; Wöhrmann et al., 2018). This framework comprises nine domains of organizational practices relevant to the context of aging at work. The present article describes the LLWI's operationalization and its validation.

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Correspondence concerning this article should be addressed to Max Wilckens, Institute for Management and Organization, Leuphana Universität Lüneburg, Universitätsallee 1, 21335 Lüneburg, Germany. E-mail: max.wilckens@leuphana.de

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The new measure contributes to the body of existing literature in several ways. First, by building upon qualitative evidence from 27 expert interviews in Germany and assessments of 61 companies in the United States, the LLWI is characterized by a broad and thorough conceptual coverage. The measure is suitable for a wide range of contexts and applications because it is neither tied to a specific context nor focused on a specific selection of practices related to the aging workforce (e.g., developmental practices only). Second, the LLWI is multidimensional and thereby facilitates a more granular understanding of organizational practices for the aging workforce. Existing measures have suggested positive effects of organizational practices in general (e.g., Boehm et al., 2014; Taneva & Arnold, 2018) but suffer from a unidimensional factor structure or limited psychometric evaluation. The multidimensionality of the new measure, in contrast, allows different organizational practices to be distinguished. Third, the measure not only focuses on explicit human resources programs (e.g., existence of a mentoring program) but also addresses informal practices and norms (e.g., older and younger employees pass on their knowledge to other generations), which is important for capturing the work environment as experienced by the workers (Boselie, Dietz, & Boon, 2005; Wright & Boswell, 2002). Depending on the respondents, the measure assesses both practices as designed or implemented if assessed via human resource managers or general managers and practices as experienced if assessed via affected workers. Workers' experiences of the practices capture to what extent offered practices reach the individual worker. This is a key prerequisite as most practices are effective either by shaping the work environment for the workers or by influencing the workers' attitudes and behavior to improve their aging (Nishii, Khattab, Shemla, & Paluch, 2018; Zacher & Yang, 2016). The measure can be easily administered, which is of particular importance when conducting research on organizations and employees during their work time. Finally, the new measure not only supports research but also contributes to workplace improvement. Results generated by this measure can serve organizations as a foundation for interventions on various practices. A detailed evaluation of the status quo helps management identify specific areas for improvement and allocate resources effectively. This cannot be achieved with a lump-sum assessment that does not differentiate between practices.

EXISTING MEASURES IN THE LITERATURE

We conducted a review of the existing literature and identified several measures of organizational practices for the aging workforce. The existing measures are of three types. First, several measures assess organizational practices in a unidimensional manner. Unidimensional measures of organizational practices facilitate research on practices in general. However, they are too broad to disentangle organizational practices and thus do not allow for diagnoses regarding specific practices. For example, Taneva and Arnold (2018) developed an eight-item scale on organizational practices based on qualitative interviews among older workers. Their scale includes items on whether employees have "challenging and meaningful tasks" and whether the "significant role mature employees can play" is recognized. Each of the eight items covers a different content aspect, but reliable assessment of specific practices is not possible. Another unidimensional measure of "age-inclusive human resources practices" was developed by Boehm et al. (2014). The five-item measure primarily addresses age-inclusive recruiting activities and development opportunities. The

authors showed positive organizational-level effects of the practices on a four-item "age-diversity climate" measure assessing inclusion, good management of people of different ages, and equal opportunities for developmental growth, regardless of age. Similarly, Zacher and Yang (2016) proposed the construct of an organizational climate for successful aging, defined by them as "employees' shared perceptions of the extent to which their organization enables successful aging." The authors operationalized the construct by assessing respondents' perceptions of the organization's understanding for age-related changes, responsiveness to age-related changes, and supportiveness of all age groups. All these measures assess practices in a unidimensional way. However, given the wide range of organizational practices, work outcomes are not unidimensionally affected by all organizational practices in the same way (Kooij, Jansen, Dikkers, & De Lange, 2010). Moreover, within an organization, certain factors may be present and effective, while others are not. Unidimensional measures are capable of assessing the overall nature of an age-friendly organizational work environment, but they are incapable of differentiating specific practices.

Second, human resources management research investigated organizational practices using multifaceted measures (e.g., Armstrong-Stassen & Templer, 2006; Kooij et al., 2014). These measures incorporate a wide range of different practices and most often assess their availability within the organization (Boselie et al., 2005). For example, Kooij (2014) proposed bundles of human resource practices, following Baltes and Baltes's (1990) lifespan theory of selection, optimization, and compensation. However, the practices were measured by a dichotomous response format, which does not allow the intensity, saturation, and quality of the practices to be assessed (Boselie et al., 2005; Vandenberg, Richardson, & Eastman, 1999). Moreover, these kinds of measures are lists of practices, which assess each practice with a single item. But the implementation and framing of practices differ from organization to organization. Thus, a single item per practice seems insufficient for reliably capturing the constructs of interest (DeVellis, 2017). For instance, a single item assessing ergonomic adjustments of the workplace may be conceptualized very differently by the respondents. Using several items rather than one to address the main components of ergonomic workplace adjustment in a multi-item scale would provide more adequate conceptual coverage and more reliable assessment of the construct.

Third, our review revealed two measures that assess organizational practices for the aging workforce in a multifaceted, multi-item manner. However, these measures fall short either in terms of the evaluation of the psychometric measurement quality or in terms of thorough conceptual coverage. One measure was proposed and used by Armstrong-Stassen (2008), who listed 28 organizational practices and grouped them into seven strategies (flexible working options, training and development, job design, recognition and respect, performance evaluation, compensation, pre- and post-retirement options). Armstrong-Stassen asked the participants to rate their employer's engagement in listed practices and obtained acceptable coefficient alphas for the seven strategies. However, she did not examine the factor structure underlying the 28 items and whether the strategies were sufficiently distinct, thereby neglecting to evaluate the measurement quality. Another measure that was proposed and used by Armstrong-Stassen and Lee (2009) assessed four organizational practices (training and development for older workers, training for the managers, recognition of older workers, and pre- and post-retirement options) with two to five items each. This measure was jointly tested with three further

constructs (contribution to the organization, perceived respect shown by workgroup members, and whether workers were treated with respect) in a confirmatory factor analysis (CFA), which revealed a good fit. However, this four-dimension measure does not comprehensively cover organizational practices for the aging workforce: It does not, for instance, cover job design.

In conclusion, the measures obtained from the literature are either too broad, lack comprehensive conceptual coverage, or have not been sufficiently shown to be of sound psychometric quality. Our aim was to overcome these shortcomings while also responding to calls from the literature such as that by Zacher and Yang (2016, p. 9), who emphasized the need for developing a “multidimensional model [...], which includes shared perceptions of more specific age-related organizational policies, norms, practices, and procedures related to topics such as recruitment, training, performance appraisal, and promotion.”

CONCEPTUAL FRAMEWORK OF THE LLWI

The conceptualization of the LLWI is rooted in qualitative, empirical evidence on organizational practices for the aging workforce from Germany and the United States (Wilckens et al., 2020). In particular, the initial qualitative framework was developed by Wöhrmann et al. (2018), based on 27 semi-structured expert interviews in Germany. These interviewees were asked to “elaborate on aspects that they thought were characteristic of good organizational management practice involving employees aged 60 and older” (p. 79). Interviewees had a wide range of expertise and various backgrounds in research, practice, and politics. Researchers covered the fields of demographics, economics, gerontology, human resources management, and psychology. Practitioners were human resource executives; older workers, including some who had already reached retirement age; and representatives of strategic and operational management in various industries.

The experts had either dealt with an aging workforce as part of their job responsibilities or could share personal experience from later life employment. Wöhrmann et al. (2018) systematically derived the initial taxonomy of the LLWI using qualitative content analysis (Mayring, 2010). Subsequently, Wilckens et al. (2020) amended the taxonomy to incorporate organizational practices relevant in the United States. These practices had previously been identified by the *Age Smart Employer Award* honoring businesses in New York City that successfully engage and retain older employees (Finkelstein, Roher, & Owusu, 2013). Thus, the LLWI comprises an interculturally validated and comprehensive set of practices for “good organizational management of later life work” (Wilckens et al., 2020, p. 70).

As shown in Figure 1, the taxonomy of the LLWI consists of nine domains covering age-inclusive organizational climate and leadership as well as age-related practices and age-friendly organizational conditions pertaining to work design, health management, individual development, knowledge management, transition to retirement, continued employment options, and health and retirement coverage. Each of the nine domains is further broken down into two to four facets (e.g., *the organizational climate* by *equality of opportunities* for all age groups, a *positive image of age*, and *open and target group-specific communication*). Despite the complexity of the model, intercoder reliability results confirmed that the individual aspects are well-differentiated (Wilckens et al., 2020). A detailed definition of each facet can be obtained from Appendix A.

Given the broad range of disciplines contributing to its conceptualization, the LLWI comprehensively reflects the diverse spectrum of research on “how [employers can] make an aging work staff work” (Henkens et al., 2018, p. 809). Some researchers, for example, explored which organizational practices encourage older employees to prolong their careers (e.g., Armstrong-Stassen, 2008). Others focused on gains in older employees’ work outcomes from an organizational perspective. For instance, Göbel and Zwick (2013) found positive effects of

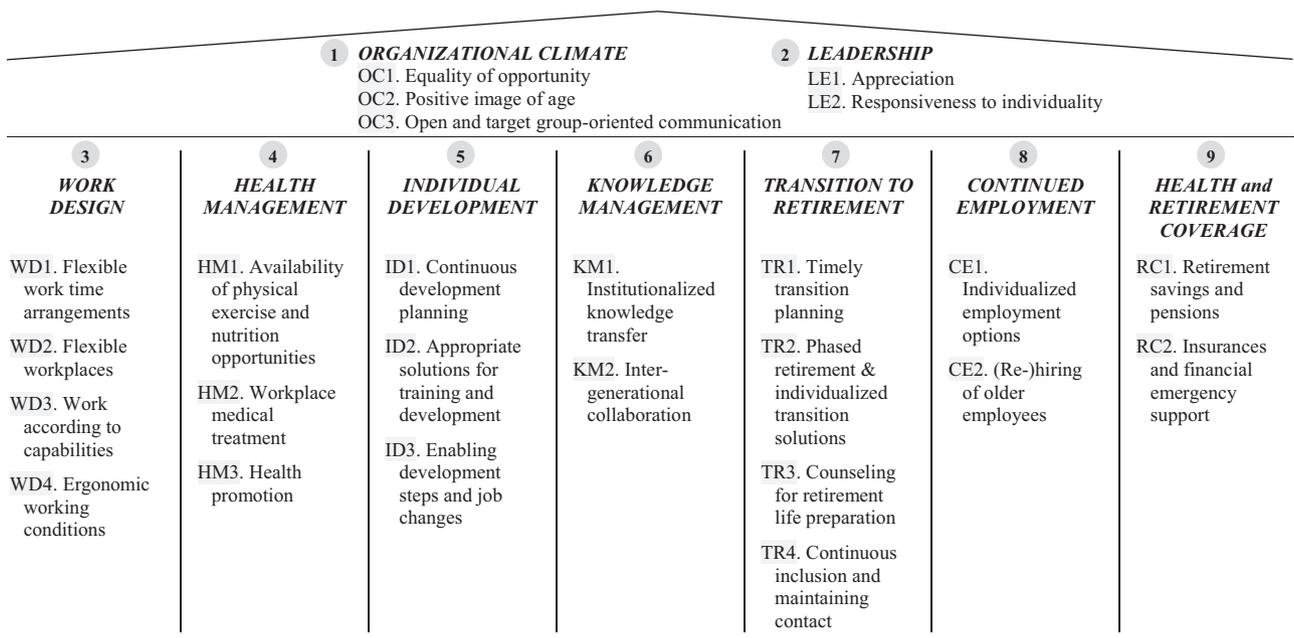


Figure 1. Domains and underlying facets of the Later Life Workplace Index. First published by Wilckens et al. (2020). Published with permission of © Max R. Wilckens, Anne M. Wöhrmann, Jürgen Deller 2019. All Rights Reserved.

specific trainings for older employees, adaptations of the workplace, and mixed-age teams on labor productivity; the effect increased with age. More generally, research identified organizational practices from a broad range of domains including leadership, organizational climate, health promotion, knowledge management, and work design that positively affect work outcomes (Armstrong-Stassen & Lee, 2009; Armstrong-Stassen & Templer, 2006; Börsch-Supan & Weiss, 2016; Klaffke, 2014; Kunze, Boehm, & Bruch, 2013; Naegele & Walker, 2006; Schuett, 2014; Tisch, 2015; Zacher & Yang, 2016).

Organizational practices for the aging workforce are not limited to practices explicitly addressing older employees (e.g., specific trainings for older workers). Rooted in personnel diversity research, Boehm et al. (2014) found that age-inclusive practices (e.g., equal access to training for all age groups) positively influenced work outcomes independent of the worker's age. Qualitative research on organizational antecedents of older workers' work outcomes supports the notion that both practices specific to older employees and those generally supporting age-inclusiveness in the organization are relevant (Taneva & Arnold, 2018). A sole focus on age-specific practices may even negatively impact the organizational climate by devaluing older employees, even if those practices are also implemented to accommodate older employees (Hennekam & Herrbach, 2015). The LLWI comprehensively integrates both age-specific and age-inclusive practices. Moreover, qualitative studies identified not only these two forms of practices, but also aspects attributable to organizational climate and leadership style (e.g., leaders' recognition of work outcomes and supervisor support; Silver, Settels, Schafer, & Schieman, 2019; Taneva & Arnold, 2018). This triad of organizational practices, climate, and leadership, has previously been proposed by Boehm and Dwertmann (2015) and is covered by the framework of the LLWI.

In summary, the conceptual framework of the LLWI builds upon qualitative evidence and covers the breadth of the existing research streams on organizational practices for the aging workforce. Thereby, the framework provides a thorough and precise conceptualization as emphasized by scale development research to achieve a substantively valid measure (Clark & Watson, 1995; Hinkin, 1998; Worthington & Whittaker, 2006). We conducted the current studies to operationalize the measure as conceptualized.

THE CURRENT STUDIES

To create a valid and reliable measure, we followed widely applied and theoretically derived recommendations for the scale development and score validation process by Clark and Watson (1995) and Hinkin (1998). The three studies reported in this article are outlined in Table 1.

Table 1. Content of Each Study

Study 1 (Item Generation)	Study 2 (Scale Development)	Study 3 (Cross-Validation)
Item style and response format definition	Item selection for the final scales based on item distributions, explorative and confirmatory factor analysis	Construct validation based on confirmatory factor analysis
Initial item pool development	Construct validity assessment	Criterion validity assessment regarding older employees' work outcomes
Item revision based on topic-level experts' assessment	Convergent validity assessment regarding organizational practices and climate measures	
Initial item selection based on pre-tests	Discriminant validity assessment regarding positive and negative affect	

Study 1 addressed the generation of an initial item pool based on the qualitative framework of the LLWI. We explicitly set the goal of maintaining the comprehensive content coverage of this qualitative framework within the operationalized measure. The multifaceted structure of the LLWI should enable researchers and practitioners to disentangle organizational practices for the aging workforce. Thus, the operationalization closely followed the qualitatively derived definitions of the nine LLWI domains and the underlying facets. For the item development, we opted for a Likert-scale type measure, consulted topic-level experts to review proposed items, and pre-tested the item set on several small samples.

Study 2 covered the development of the scale. We administered the item set to employees in Germany to derive the factor structure, built several subscales accordingly, and iteratively removed items not fitting proposed scales. Worthington and Whittaker (2006) presented empirically derived best practices for the combined use of explorative and confirmatory factor analysis techniques, which we incorporated throughout the study. The study also provided initial evidence for discriminant and convergent validity of the LLWI scales. To ensure wide applicability of the new measure in research and practice, the sample comprised responses across industries of various organizational size.

Study 3 cross-validated previous results regarding the fit of the scales to the LLWI model in a second sample of older workers across industries in Germany. Moreover, the study provided validity evidence on the basis of several criterion variables, such as older workers' health, workability, well-being, work engagement, perceived stress, and person-job fit.

STUDY 1: ITEM GENERATION

In their recommendations and outline for a thorough scale development process, Clark and Watson (1995) emphasized the importance of an exhaustive item pool. The qualitative framework of the LLWI supplies detailed definitions of each domain and the indicating facets relevant in the context of aging at work (see Appendix A for the final scale, including the conceptual definitions; Wilckens et al., 2020). These definitions formed the starting point for our approach. The purpose of this first study was to review the literature for each domain, identify measurable indicators, and develop a comprehensive item pool as a foundation for the LLWI scales.

Method

Procedure.

To develop an item pool for the LLWI measure, we followed a four-step process for each of the nine LLWI domains. First, we identified relevant scales from the literature that measure content areas similar

Table 2. Confirmatory Factor Analysis and Reliability Results Study 2

Model	Number of Subscales	Number of Items	α (All Items)	α (First-Order Scales)	Chi-Square	df	RMSEA	RMSEA 90% CI	CFI	SRMR
1. Organizational climate	3	10	.92	.88–.91	99.5	32	.06	[.05, .07]	.98	.02
2. Leadership	1	6	.95		37.2	9	.07	[.05, .10]	.99	.01
3. Work design	4	14	.91	.78–.86	256.9	71	.07	[.06, .07]	.96	.04
4. Health management	3	9	.92	.77–.90	114.1	24	.08	[.06, .09]	.97	.03
5. Individual development	1	8	.90		84.4	20	.07	[.06, .09]	.97	.03
6. Knowledge management	2	7	.89	.80–.88	67.0	13	.08	[.06, .10]	.97	.03
7. Transition to retirement	4	14	.94	.86–.94	202.5	71	.06	[.05, .07]	.98	.03
8. Continued employment	2	7	.84	.76–.86	68.0	13	.08	[.07, .11]	.96	.05
9. Health and retirement coverage	2	5	.90	.86–.87	7.6	4	.04	[.00, .08]	1.00 (.998)	.01
10. Overall hierarchical model		80			6309.6	3,024	.04	[.04, .04]	.91	.07
11. Second-order model with first-order scale means					1587.1	491	.06	[.06, .06]	.92	.06

Note. $N = 609$. α = Cronbach's alpha; RMSEA = root mean squared error of approximation; CI = confidence interval; CFI = comparative fit index; SRMR = standardized root mean square residual.

to those described by the LLWI construct definitions (see Appendix B for a list of identified instruments). For many content areas, however, the literature did not provide adequate measures. That was particularly the case for the age-specific aspects related to retirement and continued employment. Moreover, none of the items within the identified measures were directly suitable to the LLWI. Thus, we developed new items based on the content areas covered by existing measures. Second, we consulted the LLWI construct definitions to add to the item pool. To enrich the content base, we also consulted the original qualitative interview transcriptions on which the LLWI framework is based. We then compared these aspects stated in the definitions and the interviews with the items developed in the first step. For aspects not yet covered by the items, we developed additional items. This resulted in an overall item pool of about 200 items. Following recommendations by Chan (1998), we selected the organization as referent of the LLWI measure (e.g., "In our organization..."). When assessing the practices, we intended to not rely on the policies that are officially in place within an organization, but instead set out to capture each of the practices by means of its level of implementation throughout the organization. In particular, we asked participants to rate the availability of these practices to them and their colleagues. The LLWI thereby captures the availability and participants' awareness of the practices. Assessing respondents' awareness of organizational practices surpasses the assessment of practices as officially offered by the organization. Officially offered practices are most likely not as effective for the workers as originally intended (Boselie et al., 2005; Wright & Boswell, 2002). Organizational barriers such as an adverse institutional context or a lack of resources for implementing the practices can significantly shape the extent to which these practices are available for the workers, even if those practices are officially espoused (Nishii et al., 2018). Moreover, workers' awareness of the practices also captures informal work arrangements between older workers and their (local) managers, which might not be officially offered. Thus, to identify both needs for improvement as well as the antecedents and effects of practices, workers' awareness of practices can more validly reflect the actual practices and workers' exposure to them. Third, we asked four experts from the field of human resources management and organizational age management to revise and amend the item pool for overall comprehensiveness. Two of the experts provided detailed written feedback; the other

two were interviewed while responding to the questionnaire. On the basis of their valuable input, we revised the item pool and agreed on the item style and response format. In the fourth step, we tested the item pool to revise items and subscales with poor psychometric characteristics (e.g., skewness and reliability). Given the large number of items, we split the item pool and administered it to four different samples (see next section for details).

Participants.

We used four samples to test the items in the item pool. The first sample consisted of 174 employees from three medium-sized organizations in the service sector, the logistics industry, and the public sector, respectively. Using this sample, we tested the items developed for *organizational climate* and *leadership*. The sample was 57% female; 57% of participants were at least 45 years of age. For these two overarching domains (*organizational climate* and *leadership*), it was acceptable to test them in a small number of organizations because we expected within-organization variability between different departments. However, the other domains covering more specific practices can be assumed to be more strongly and directly affected by managerial decisions (Wöhrmann et al., 2018) and are likely to show less within-organization variance. Thus, a second sample of 76 human resource representatives and general managers from different companies was used to test items developed for the domains *work design*, *knowledge management*, *continued employment*, and *health and retirement coverage*. The sample was 62% female; 36% of participants were aged 40 and above. It covered service organizations (45%) and industrial organizations (55%), with organizations ranging in size from 23 to 28,000 employees. Third, we administered the items for *health management* and *individual development* domains to a sample of 38 human resource and health management managers. The sample was 45% female; 39% were aged 40 and above. Again, the sample covered small to very large organizations from the service sector (66%) and the industrial sector (34%). Finally, the fourth sample contained 42 human resources managers, among whom we tested the items developed for the *transition to retirement* domain. The sample was 38% female, 67% of the participants were aged 40 and above, and 43% of the participants worked for service organizations, with the remaining 57% in the industrial sector. Again, the sample covered small to very large organizations.

Results

Item style and response format.

After acquiring subject matter experts' opinions on the initial questionnaire, we discussed potential response formats. To capture different levels of quality or saturation of the practices within the organization (Boselie et al., 2005), we adopted a multiresponse format. At the same time, to keep the cognitive load for respondents as low as possible (in particular because the experts emphasized that the broad scope of the LLWI can be demanding in itself), we opted for a Likert-type response format that can be repeated across all LLWI domains (DeVellis, 2017). In consideration of an expected skewness of the items for the *organizational climate* and *leadership* domains (cf. other age-related climate measures by, e.g., Boehm et al., 2014; Zacher & Yang, 2016), these items had a 7-point response format to capture sufficient detail despite agglomeration of responses on the upper half of the scale (Garner, 1960; Green & Rao, 1970). The other seven domains had a 5-point response format to limit respondents' cognitive load (Weijters, Cabooter, & Schillewaert, 2010).¹ The response categories ranged from "does not apply at all in our organization" to "does fully apply in our organization." In the preface of the questionnaire, we instructed participants to think of both the intensity and the coverage within their organization (Boselie et al., 2005).

Initial item selection.

Administration of the initial item pool to the four samples yielded initial evidence on item quality and on necessary modifications. We excluded selected items according to three principles. First, several pairs of items showed intercorrelations in excess of .80. For each of these pairs, we either developed a new overall item replacing the pair or dropped one of the two items to eliminate redundant items in the pool if the item content was very similar. Second, items with a high share of "don't know" answers were removed from further analysis. For the LLWI, the share of "don't know" answers is important because it indicates how well practices are communicated within the organization. During scale development, however, items with an extraordinarily high share of "don't know" answers may also indicate unclear wording and irrelevant practices. Third, analysis of reliability for each facet and item-total correlations provided input for the authors' iterative discussions on reducing the pool to a manageable number of items. However, in the process, we gave priority to the comprehensive content coverage of the instrument over any gains in reliability. The final LLWI inventory consisted of 102 items.

STUDY 2: SCALE DEVELOPMENT

The purpose of Study 2 was twofold: First, we conducted descriptive and exploratory analyses to assess the psychometric properties and the factor structure underlying the developed inventory. From these analyses, we selected a subset of items to form the LLWI scales. Second, we provided initial construct validity evidence for the newly developed scales by assessing both convergence with existing age-friendly

organizational climate and human resource practice measures and divergence from participants' positive and negative affect as a key source of common rater variance (Podsakoff, Ahearne, & MacKenzie, 1997). Because the LLWI is an intentionally broad construct, we also assessed discriminant validity among the index domains and underlying facets.

Method

Procedure.

To achieve as highly diverse a sample as proposed for scale development (Clark & Watson, 1995), we administered the 102 LLWI items obtained from the previous study in an online questionnaire through a panel provider in Germany. Employees aged 25 to 65 were invited to participate. However, we invited employees aged 50 and above with higher frequency to ensure that about half of the sample was of an age at which they could be affected by the practices researched. Participants had to be working at least 10 hr a week for a single employer with more than 30 employees. We defined the lower limit of 30 employees in line with previous research (e.g., Shaw, Delery, Jenkins, & Gupta, 1998) to ensure the availability of human resource management in general, a prerequisite for meaningful assessment of the LLWI items. Participants were asked to evaluate the newly developed LLWI items with regard to their particular employer. Participants received a Three-Euro Incentive for taking part in the research.

Participants.

We received responses from 34% of the invited employees, resulting in 609 usable questionnaires.² The sample was 55% female, and 32% of participants had a management or supervisory position. Almost half of the participants (48%) were aged 50 and older. Accordingly, the majority of participants (81%) had been working for more than 5 years for their current employer. The sample was well distributed across small, medium, and large organizations³ and represented economic sectors in Germany, with almost 50% service organizations, 24% public institutions, and 19% industrial organizations.

Measures.

In addition to the 102 LLWI items, age-diversity climate and age-friendly human resource practices with German item sets by Boehm et al. (2014) were measured as organizational level scales. To show convergent validity of the new LLWI measure, we expected the climate measure of these scales to be particularly strongly correlated with the LLWI climate and the leadership domains (i.e., Pearson correlations stronger than .5; Cohen, 1988). For the human resources practices measure, we hypothesized strong positive correlations in particular with the *individual development* domain of the LLWI because most of the items in the practices measure by Boehm et al. (2014) address developmental practices (sample item: "Our company offers equal opportunities to be promoted, transferred, and to make further career

¹ Based on the subject matter experts' response and our experience when seeking for acceptance from organizations to take part in employee surveys a 5-point response format is more accepted than a 7-point format. As the LLWI is intended to be used in organizational level research and as a self-assessment tool in practice, we generally seek for a 5-point response format and consequently conducted the validation studies accordingly.

² We included five attention check questions and conducted outlier analysis to remove participants with careless response patterns as those are frequent, in particular in online surveys (Meade & Craig, 2012). Participants who answered one of the three easiest questions incorrectly were removed from further analysis (33%). Assessment of the response times revealed that, on average, excluded participants answered 32% faster than participants who passed the attention checks.

³ The sample included 39% small organizations of 30 to 499 employees, 29% medium-sized organizations with 500 to 4,999 employees, and 23% large organizations of 5,000 and more employees.

steps irrespective of one's age.”). But we also expected moderate to strong correlations with the other LLWI domains because organizations typically engage in multiple practices to achieve the same goal, meaning that the LLWI domains of practices should be correlated with each other.

Additionally, we assessed positive and negative affect to show discriminant validity of the newly developed items from participants' individual mood. We used the Positive and Negative Affect Schedule (PANAS) by Watson and Clark (1988) in a shortened 10-item version by Thompson (2007), translated to German by Breyer and Blümke (2016). Because LLWI items are self-rated and assess organizational practices that are generally considered positive (no reverse coded items), we did not expect the LLWI items to be independent of affect. However, we hypothesized positive affect to be weakly positively correlated and negative affect to be weakly negatively correlated with the LLWI domains ($r < \pm .3$). To measure affect least influenced by the measurement itself, we administered the affect measure first, followed by the LLWI domains and, finally, the scales for convergent validity (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). For all measures, reliability was acceptable and can be obtained from Table 3.

Analytic strategy.

We analyzed data in a four-step process. First, we reviewed the item distributions to drop items showing high skewness, kurtosis, or a high share of “don't know” answers. Second, we analyzed the factor structure of the remaining items. We tentatively allocated the items to the nine LLWI domains for which they were developed and iteratively conducted explorative factor analyses (EFA) to identify and improve the within-domain factor structure for each domain. To identify and resolve cross-factor structure coefficients between LLWI domains, we conducted EFAs with the overall modified item sets. We then performed a CFA per domain and computed modification indices to further improve derived models and the unidimensionality of identified factors (cf. Gerbing & Anderson, 1988). Third, we conducted an overall hierarchical CFA to ensure sufficient fit of the overall model prior to cross-validation in Study 3. Fourth, we computed correlations between the developed LLWI scales and the scales for convergent and discriminant validity.

For the EFAs, the factor structure was assessed with oblique rotation and minimum residuals extraction.⁴ Oblique rotation was appropriate because the domains and facets measured were expected to be correlated (Worthington & Whittaker, 2006). To determine the number of factors, we used parallel analysis and retained factors with eigenvalues in excess of the 95th percentile of eigenvalues in randomly resampled data (Humphreys & Montanelli, 1975; Longman, Cota, Holden, & Fekken, 1989). In the cases of eigenvalues being close to the cutoff value, we also investigated the scree plot to verify the determined number of factors. Appropriateness of the correlation matrices for factor analysis was ensured by the Kaiser-Meyer-Olkin test and the Bartlett's test of sphericity. To promote unidimensionality of the factor coefficients and to improve reliability, we iteratively removed items that showed either factor structure coefficients above .33 for multiple factors or coefficients below .35 for all factors (Stanton, Balzer, Smith,

Fernando Parra, & Ironson, 2001). We further identified strongly inter-correlated items within each factor ($r > .80$ and at least .15 above the average inter-item correlation among the respective factor's items) to avoid redundant items that might affect the validity (Clark & Watson, 1995). Taking into account the content coverage of the factor, the item characteristics, and the factor structure coefficients for the items, we retained only one item per pair in these cases. On the basis of the CFA results, we systematically analyzed within-factor or between-factor covariance of residuals and iteratively solved the cases of insufficient model fit by dropping selected items.

Results

Item distributions.

For the 102 items, skewness ranged from -1.09 to 1.10 and kurtosis from -1.44 to 1.15 . Results did not exceed recommended thresholds (Curran, West, & Finch, 1996), so that all items were retained for further analysis. Furthermore, missing value analysis revealed that, on average, 57 participants (9%) chose the “don't know” answer option. The share of “don't know” answers was higher for the retirement-related domains *transition to retirement* and *continued employment* (19%) than for the more general domains (6%). This indicates that—particularly for retirement-related practices—organizations lack proper communication of the practices so that workers are partially unaware of their organization's offerings. For three items, the number of “don't know” answers was extraordinary high (larger than three times the interquartile range above the median number of missing values in the items' domain). To promote applicability and ease of completion of the measure, we dropped these three items⁵ from further analysis. A full list of item characteristics can be obtained from Appendix C.

Domain level factor analyses.

Following our analytic strategy, we analyzed each of the nine LLWI domains individually. After multiple iterations of EFA and CFA per domain, we then removed a further 19 items in total to achieve obliquely rotated factor solutions without cross-factor structure coefficients in excess of .33 and acceptable model fit in CFA for each domain.

Organizational climate for the aging workforce.

The developed item pool contained 12 items assessing an age-friendly organizational climate. Parallel analysis revealed three factors explaining 24%, 24%, and 20% of the variance, respectively. In the rotated EFA solution, four items loaded primarily on the first factor, four items on the second, and three items on the third. One item showed factor structure coefficients in excess of .33 for the first and the third factor (.47 and .37) and was therefore dropped from further analysis. Moreover, two items from the first factor were highly correlated ($r = .87$; factor structure coefficients of .93 and .95) and addressed a very similar aspect, so that we dropped the item with a lower content contribution. The remaining 10 items were simply structured, with primary factor structure coefficients ranging from .78 to .95.

CFA yielded good fit of the three-factor model ($\chi^2 = 99$; $df = 32$; RMSEA = .06; CFI = .98). Content-wise, the three-factor structure

⁴ Since the data is partially skewed and non-normally distributed, a minimum residuals extraction was more appropriate than a maximum likelihood extraction (Briggs & MacCallum, 2003; Zygmunt & Smith, 2014).

⁵ The three items covered to what extend managers are specifically prepared for dealing with older employees (e.g., training), whether employees may take additional unpaid leave at certain intervals, and whether the organization offers its employees immediate financial support in case of family and private emergencies (e.g., advance on salary).

Table 3. Means, Standard Deviations, and Correlations Study 2

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	Avg. <i>r</i> With LLWI (1-9)		
1. Organizational climate	5.15	1.21	(.92)																					
2. Leadership	4.82	1.35	.71**	(.95)																				
3. Work design	2.76	0.84	.40**	.59**	(.91)																			
4. Health management	2.53	1.04	.26**	.40**	.60**	(.92)																		
5. Individual development	3.24	0.91	.65**	.72**	.64**	.55**	(.90)																	
6. Knowledge management	2.98	1.01	.49**	.60**	.56**	.56**	.72**	(.89)																
7. Transition to retirement	2.37	1.02	.43**	.55**	.66**	.70**	.67**	.65**	(.94)															
8. Continued employment	3.19	0.87	.55**	.50**	.38**	.35**	.57**	.50**	.55**	(.84)														
9. Health and retirement coverage	2.63	1.13	.33**	.44**	.57**	.67**	.56**	.53**	.75**	.41**	(.90)													
10. Positive affect	3.32	0.76	.26**	.29**	.26**	.17**	.23**	.29**	.28**	.20**	.21**	(.84)												.24
11. Negative affect	1.42	0.56	-.24**	-.23**	-.15**	-.05	-.17**	-.17**	-.08	-.07	-.04	-.17**	(.82)											-.13
12. Age-diversity climate	3.72	0.89	.73**	.73**	.43**	.33**	.72**	.58**	.48**	.58**	.38**	.20**	-.23**	(.87)										.55
13. Age-inclusive HR practices	3.18	0.95	.69**	.66**	.49**	.43**	.73**	.60**	.55**	.60**	.46**	.21**	-.16**	.77**	(.89)									.58
14. Participants' chronological age	47.23	10.14	-.06	-.09*	-.12**	-.02	-.15**	-.03	-.23**	-.14**	-.11**	.04	-.08	-.06	-.10*	-								-.10
15. Participant is manager/ supervisor	0.32	0.47	.10*	.18**	.14**	.08	.17**	.23**	.18**	.11*	.10*	.30**	-.03	.11**	.11**	-.02	-							.14
16. Organizational size	6.43	1.60	-.00	.00	.06	.25**	.09*	-.01	.17**	-.05	.22**	.04	.01	.02	.08	-.01	-.07	-						.08
17. Industry dummy: service organization	0.42	0.49	.02	.02	.03	.00	.02	.04	-.03	.11*	.05	.01	.03	-.02	.01	.03	.04	-.08	-					.03
18. Industry dummy: industrial organization	0.20	0.40	-.04	.04	.10*	.10*	.03	.08	.12*	-.03	.08	-.05	-.03	.03	.00	-.01	.05	.09*	-.42**	-				.05
19. Industry dummy: public organization	0.25	0.43	-.03	-.07	-.06	-.04	-.05	-.09*	-.09	-.15**	-.10*	-.03	.02	-.05	-.06	.02	-.12**	.01	-.49**	-.29**	-			-.07

Note. *N* = 609. *M* and *SD* are used to represent mean and standard deviation, respectively. *Organizational size* is measured as number of employees on an ordinal nine-point scale ranging from "less than 10" to "50,000 and above." Internal consistency coefficients, Cronbach's alphas are reported in the parentheses on the diagonal. **p* < .05. ***p* < .01.

complies with the three facets proposed by the qualitative framework of the LLWI: *positive image of age* (first factor, three items), *open and target group-oriented communication* (second factor, four items), and *equality of opportunity* (third factor, three items). We formed three scales, which showed good internal consistency of .88, .90, and .90, respectively.

Leadership for the aging workforce.

The item pool contained eight items describing a leadership style characterized by appreciation of all age groups and responsiveness to workers' individual needs. Parallel analysis suggested two factors. However, four pieces of deviating evidence led us to determine a one-factor solution as most appropriate. First, the scree plot showed a flat plateau starting at the second factor. Second, the two factors identified by oblique rotation showed a strong correlation of .87. Third, the second factor explained four percent of the variance only, compared with 74% for the first factor. Fourth, only two items loaded highest on the second factor. Contrary to the qualitative framework that proposed two facets, we thus proceeded with a one-factor solution. In addition, two items were highly correlated ($r = .90$), so that we dropped the one with lower content contribution. The subsequent EFA with the remaining items revealed sufficiently high factor loadings for the single-factor solution, which ranged between .77 and .90. CFA for the one-factor solution revealed further need of improvement ($\chi^2 = 93$; $df = 14$; RMSEA = .10; CFI = .98). Systematic analysis of the residuals disclosed positive covariance of residuals for two items (indicating redundancy) so that we again dropped the item with the lower content contribution. An additional CFA with the remaining items showed acceptable model fit ($\chi^2 = 31$; $df = 9$; RMSEA = .06; CFI = .99). With the remaining six items, we formed a scale that showed an excellent internal consistency of .95.

Work design for the aging workforce.

The work design domain was represented by 16 items from the item pool. Parallel analysis revealed four factors explaining 19%, 15%, 14%, and 6% of the variance, respectively. In the rotated EFA solution, five items loaded primarily on the first factor, four items on the second, four items on the third, and three items on the fourth. The rotated solution did not reveal any cross-factor structure coefficients in excess of .33. The primary factor structure coefficients ranged from .43 to .89.

However, the EFA of the overall item set across all nine LLWI domains revealed substantial covariance of two items with other domains of the LLWI. The first, an item addressing ergonomic work design, showed covariance with the *health management* domain. The second, an item addressing managers' consideration of older workers' individual capabilities while designing their work, showed covariance with the *leadership* domain. To support discriminant validity among developed scales, we removed both items from further analysis.

Reassessment of the EFA with the remaining 14 items supported the four-factor solution. We thus formed four scales accordingly and conducted a CFA. Results showed good fit of the four-factor model ($\chi^2 = 257$; $df = 71$; RMSEA = .07; CFI = .96). Moreover, the four-factor structure complies with the four facets proposed by the qualitative framework of the LLWI content-wise: *ergonomic working conditions* (first factor, four items), *work according to capabilities* (second factor, three items), *flexible work time arrangements* (third factor, four items),

and *flexible work places* (fourth factor, three items). The scales showed good to adequate internal consistency of .86, .86, .78, and .84, respectively.

Health management for the aging workforce.

We obtained 12 items for the health management domain from Study 1. Parallel analysis revealed three factors explaining 28%, 19%, and 7% of the variance, respectively. In the rotated EFA solution, six items loaded primarily on the first factor, four items on the second, and two items on the third. The primary factor structure coefficients ranged from .49 to .88. The rotated solution did not reveal any cross-factor structure coefficients in excess of .33. However, the CFA yielded an insufficient model fit ($\chi^2 = 303$; $df = 51$; RMSEA = .09; CFI = .95) and the third factor incurred primary factor loadings for two items only. To resolve the issue, we removed three items from the scales. First, we removed one redundant item that was .84 correlated with a second item from the same factor (coefficients of .88 and .86) and contributed less content to the overall scale. Second, systematic analysis revealed covariance of residuals of three items from the first factor with the third factor. We dropped two of these items, reallocated the third item to the third factor, where it better fit content-wise, and increased this factor's number of items to three. CFA reassessment yielded an acceptable fit of the three-factor model ($\chi^2 = 114$; $df = 24$; RMSEA = .08; CFI = .97). The three-factor structure complies with the three facets proposed by the qualitative framework of the LLWI content-wise: *health promotion* (first factor, three items), *availability of physical exercise and nutrition opportunities* (second factor, three items), and *workplace medical treatment* (third factor, three items). The scales showed good to adequate internal consistency of .90, .82, and .77, respectively.

Individual development for the aging workforce.

Parallel analysis of the *individual development* domain (13 items) suggested four factors explaining 16%, 13%, 13%, and 11% of the variance, respectively. However, the third and fourth factor incurred rotated structure coefficients in excess of .35 for only two items each. Both item pairs were intercorrelated by .87 and .72, respectively, indicating potentially redundant items and an overly narrow operationalization (Clark & Watson, 1995). Moreover, two items showed cross-factor structure coefficients in excess of .33 for the first and second factor, impeding the achievement of simple structure. All this evidence suggested tentatively pursuing a single-factor solution for the *individual development* domain. Factor structure coefficients ranged from .67 to .81.

Moreover, factor analyses of the overall item set across all nine LLWI domains revealed substantial covariance of two items with other domains of the LLWI. One item addressing the organization's development support for older workers compared with younger workers showed covariance with the *equality of opportunities* factor of the *organizational climate* domain. Another item, addressing managers' engagement in individual development planning, showed covariance with the *leadership* domain. To support discriminant validity among developed scales, we removed both items from further analysis.

CFA for the one-factor solution revealed further need of improvement ($\chi^2 = 706$; $df = 44$; RMSEA = .16; CFI = .84). Systematic analysis of the residuals showed positive covariance of residuals for three pairs of highly correlated items (indicating redundancy). For

each pair, we dropped the items with the lowest content contribution. An additional CFA with the remaining eight items showed acceptable model fit ($\chi^2 = 84$; $df = 20$; RMSEA = .07; CFI = .97). Using these items, we formed a scale that showed a good internal consistency of .90.

Knowledge management for the aging workforce.

The item pool contained eight items for the operationalization of age-friendly knowledge practices. Parallel analysis disclosed two factors explaining 27% and 24% of the variance, respectively. In the rotated EFA solution, four items loaded primarily on the first factor and four items on the second. One item loading primarily on the second factor also showed structure coefficients in excess of .33 for the first factor. However, removal of the item caused cross-factor structure coefficients for two further items. Thus, we formed two scales allocating the items according to their primary structure coefficients and the CFA results. Systematic analysis of the residuals revealed positive covariance among two items from the second factor, of which one also had a very low communality of .31 in the EFA (“younger and older employees work together a lot”). Reassessment of the EFA without that item did not show any cross-factor structure coefficients exceeding .33. The same four items as in the initial EFA loaded highest on the first factor (structure coefficients of .40 to .78), the other three items on the second (structure coefficients of .69 to .88). Reassessment of the CFA indicated acceptable model fit ($\chi^2 = 67$; $df = 13$; RMSEA = .08; CFI = .97). The two-factor structure complies with the two facets proposed by the qualitative framework of the LLWI content-wise: *institutionalized knowledge transfer* (first factor, four items) and *intergenerational collaboration* (second factor, three items). The scales showed good internal consistency of .80 and .88, respectively.

Transition to retirement for the aging workforce.

The *transition to retirement* domain was represented by 16 items from the item pool. Parallel analysis revealed four factors explaining 20%, 14%, 14%, and 13% of the variance, respectively. In the rotated EFA solution, four items loaded primarily on the first factor, four items on the second, four items on the third, and three items on the fourth. One item showed factor structure coefficients in excess of .33 for the second and the third factor. We thus dropped that item from further analysis. Moreover, one item was removed following the subsequent factor analysis of the overall item set across all nine LLWI domains. This item, loading on the third *transition to retirement* factor, showed substantial covariance with the *continued employment* domain and thus impeded discriminant validity between developed scales. Reassessment of the EFA with the remaining 14 items supported the four-factor solution found previously. Thus, we formed four scales. CFA results show good fit of the four-factor model ($\chi^2 = 202$; $df = 71$; RMSEA = .06; CFI = .98). Moreover, the four-factor structure complies with the four facets proposed by the qualitative framework of the LLWI content-wise: *continuous inclusion and maintaining contact* (first factor, four items), *counseling for retirement life preparation* (second factor, three items), *phased retirement and individualized transition solutions* (third factor, four items), and *timely transition planning* (fourth factor, three items). The scales showed good to excellent internal consistency of .94, .92, .86, and .89, respectively.

Continued employment for the aging workforce.

The item pool contained eight items for the *continued employment* domain. Parallel analysis revealed three factors explaining 31%, 23%, and 4% of the variance, respectively. Given the limited explanatory contribution of the third factor and that none of the items showed primary structure coefficients for the third factor in the rotated solution, we nevertheless determined a two-factor solution to be more appropriate. In the two-factor rotated solution, four items loaded primarily on the first factor (structure coefficients of .59 to .90) and four items on the second (structure coefficients of .48 to .87). No items showed cross-factor structure coefficients in excess of .33. Accordingly, we formed two scales and computed CFA. Results revealed further need of improvement ($\chi^2 = 114$; $df = 19$; RMSEA = .09; CFI = .94). Systematic analysis of the residuals showed positive covariance of residuals for one item of the second factor with the first factor. Because the item does not contribute indispensable content, we dropped it from further analysis. An additional CFA with the remaining items showed acceptable model fit ($\chi^2 = 68$; $df = 13$; RMSEA = .08; CFI = .96). Content-wise, the two-factor structure complies with the two facets proposed by the qualitative framework of the LLWI: *individualized employment options* for workers at retirement age (first factor, four items) and *(re-)hiring of older workers* (second factor, three items). The scales showed good to adequate internal consistency of .86 and .76, respectively.

Health and retirement coverage for the aging workforce.

The *health and retirement coverage* domain was operationalized by six items. Parallel analysis revealed two factors explaining 33% and 28% of the variance, respectively. In the rotated EFA solution, three items loaded primarily on the first factor (structure coefficients of .60 to .90) and two items on the second (structure coefficients of .72 and .97). We removed one item showing factor structure coefficients in excess of .33 for both factors. Accordingly, we tentatively formed two scales and conducted CFA. Results revealed an unacceptably high root mean squared error (RMSEA = .11). After item removal during EFA, the two-factor submodel comprised five items only. Analysis of residuals showed error covariance between two out of three items from the first factor. To retain at least three items for the factor's subscale while also resolving the error covariance, one of the covaried items was replaced by an item that was initially dropped because of cross-factor structure coefficients. The cross-factor structure coefficients for the picked-up item did not persist when re-examining EFA with the modified item set⁶. These modifications made in response to the CFAs required us to re-examine the EFAs with the reduced item set, but the previously reported simple factor structure was not affected. An additional CFA with the revised item set showed acceptable model fit ($\chi^2 = 8$; $df = 4$; RMSEA = .04; CFI = .998). However, because the second factor now only comprised two items, CFA yielded a wide confidence interval for the RMSEA. Content-wise, the two-factor structure complies with the two facets proposed by the qualitative framework of the LLWI: *retirement savings and pensions* (first factor, three items) and *insurances* (second factor, two items). Financial emergency support, as described by the qualitative framework, could not be operationalized because the

⁶ We acknowledge potential impairments for discriminant validity between the two factors within the *health and retirement coverage* domain due to including an item, which initially showed cross-factor structure coefficients.

respective item did not fit the scale. The scales showed good internal consistency of .88 and .86, respectively.

Overall confirmatory factor analysis.

In the wake of our analyses, 80 items remained in the LLWI item set (see Appendix F for the selected German items and Appendix A for an English translation). We integrated the developed models for the nine LLWI domains into an overall hierarchical model with second-order latent variables for the nine domains and the 22 identified factors as first-order latent variables. CFA yielded an acceptable model fit ($\chi^2 = 6310$; $df = 3024$; RMSEA = .04; CFI = .91). Furthermore, we computed scale means for each first-order construct and estimated a CFA with the second-order model only. CFA likewise supports the overall model's fit ($\chi^2 = 1587$; $df = 491$; RMSEA = .06; CFI = .92). As a tentative initial configuration, we thus formed the LLWI as a set of nine measures accordingly. All subscales yielded coefficient alphas above .76 and item-total correlations above .72.⁷ We computed nine latent variables by averaging the factor means for each of the nine LLWI domains. The variance inflation factors of the computed variables ranged from 1.79 to 3.66 ($M = 2.67$; $SD = 0.60$); multicollinearity thus did not appear to be a major concern.⁸ All this evidence suggested that the qualitatively derived model of the LLWI with nine domains was most appropriate. Table 2 summarizes the fit statistics, including RMSEA confidence interval and SRMR for the overall model, the second-order model, and each submodel, as well as reliabilities of the scales (for detailed reliability results, see Appendix E).

Convergent and divergent validity evidence.

For the present study, our validity goals were to assess divergence of the LLWI scales from affect and their convergence with existing measures for age-friendly organizational climate and human resource practices. A correlation matrix among the second-order LLWI measures and all validation measures appears in Table 3.

To assess the convergent validity of LLWI measures, we correlated them to two established measures: age-diversity climate and age-diversity human resource practices (Boehm et al., 2014). With regard to age-diversity climate, we found an average correlation of .55 and a median correlation of .58 to the nine LLWI measures. Correlation was weakest for *health management* (.33) and, as hypothesized, strongest for *organizational climate* and *leadership* (both .73). With regard to age-diversity human resource practices, we found an average correlation of .58 and a median correlation of .60 to the nine LLWI measures. The weakest correlation was again observed for *health management* (.43), and the strongest correlation for the *individual development* (.73) domain. All this evidence indicates good convergent validity for the new measures.

We then evaluated the divergent validity of our measures by inspecting their correlations with positive affect and negative affect. All nine LLWI measures were sufficiently independent of both positive affect (.24 average correlation; .26 median correlation) and negative affect (−.13 average correlation; −.15 median correlation). The highest

correlation (.29) was observed between the LLWI measure *knowledge management* and positive affect. Results suggest sufficient discriminant validity regarding neurotic traits (Clark & Watson, 1995) and resilience regarding common method biases (Podsakoff et al., 1997).

STUDY 3: CROSS-VALIDATION

The purpose of Study 3 was to cross-validate results from Study 2 and provide additional validity evidence for the developed LLWI measurement model. We performed CFAs to further improve confidence in the measurement models identified in Study 2. To assess criterion validity of the LLWI scales, we included individual-level outcome measures such as health status, stress level, and work engagement, and narrowed the studied population to the target group of measured practices, employees aged 50 and older.

Method

Procedure.

An online questionnaire was administered to employees aged 50 and beyond by a panel provider in Germany to capture a highly diverse sample of different organizations. To lower the risk of sampling participants that had already participated in Study 2, we selected a different panel provider. Analysis of potential duplicates revealed duplicate sociodemographic and employer characteristics for three percent of participants only. Participants received a Three-Euro Incentive after completion of the questionnaire.

Participants.

We received 349 useable responses⁹ at a response rate of 35%. Participants were 57% male, and 40% had a management or supervisory position. With an age range of 50 to 67 (67 is the standard retirement age in Germany), the sample comprised employees nearing retirement age and likely to benefit from the LLWI practices. Moreover, we restricted participants to those working at least 32 hr per week for the evaluated employer to ensure sufficient exposure to the LLWI practices and relevance to their everyday life. Over half of the participants had been working for their employer for more than 20 years, which is typical for that age group in Germany. Similar to Study 2, the sample represented economic sectors in Germany (service sector: 45%, public sector: 24%, industry: 17%) and comprised a broad range of organizational sizes.¹⁰

Measures.

In addition to the LLWI scales, criterion measures were administered that captured various criteria for successful integration of older employees into the workforce. We hypothesized moderate correlations between those criterion measures and the LLWI domains (i.e., Pearson correlations stronger than .3; Cohen, 1988) because the LLWI domains were supposed to capture a small part of all potential antecedents of our criteria. First, person-organization fit and person-job fit were measured by three items each, developed by Cable and DeRue

⁷ Due to short scales of two to nine items, we did not correct the item-total correlation by dropping the respective item prior to averaging the scale. Doing so results in a minimum item-total correlation of .54.

⁸ The highest VIFs were observed for the domains *transition to retirement* and *individual development*.

⁹ Data were cleaned as in Study 2. Twenty percent of participants failed to answer the attention checks correctly. Analysis of response times supported the removal of those participants as they answered 32% faster than attentive participants on average.

¹⁰ The sample included 36% small organizations of 30 to 499 employees, 28% medium-sized organizations with 500 to 4,999 employees, 36% large organizations of 5,000, and more employees.

(2002; sample item: “The job that I currently hold gives me just about everything that I want from a job.”). These measures are suitable criteria for the assessment of the LLWI measure because person-environment fit has been argued to be an important driver of post-retirement work (cf. theory of work adjustment; Dawis & Lofquist, 1984; Harper & Shoffner, 2004) and also because this fit is an important outcome for sustainable employment and job satisfaction of older workers (Kooij, 2015; Rauvola, Rudolph, Ebbert, & Zacher, 2019). Second, we measured general well-being with five items from the World Health Organization (Topp, Østergaard, Søndergaard, & Bech, 2015; sample item: “Over the past 2 weeks I have felt cheerful and in good spirits.”) and work engagement with a three-item version of the Utrecht Work Engagement scale (Sautier et al., 2015; Schaufeli, Shimazu, Hakanen, Salanova, & De Witte, 2019; sample item: “I am enthusiastic about my job.”). Self-rated perceived health status was assessed with four items from Adams and Beehr (1998; sample item: “My health is better than most people my age.”). In addition, we assessed work ability, because it is an important mediator between work characteristics and work outcomes (Cadiz, Brady, Rineer, & Truxillo, 2019). We used a self-rated perceived work ability measure comprised of four items by McGonagle et al. (2015). The four items address work ability with respect to physical, mental, interpersonal, and overall work demands on a 10-point scale (sample item: “Thinking about the physical demands of your job, how do you rate your current ability to meet those demands?”). In addition, we asked participants about the number of days they had been absent from work due to illness in the last 12 months (WAI-Netzwerk, 2015). For the number of sick days, we did not expect the correlations with the LLWI to be high. However, even a weak effect (i.e., Pearson correlations stronger than .1; Cohen, 1988) reducing the number of sick days is of high importance. Third, we assessed occupational future time perspective (Zacher & Frese, 2009; sample item: “My occupational future is filled with possibilities.”), for which we hypothesized a moderate correlation with the LLWI domains. Fourth, researchers have emphasized the role of work-related stressors in the employment of older workers (Barnes-Farrell, 2005). To validate a negative correlation of the LLWI measures with stress, we administered the Stress in General Scale measuring two facets of work-related stress, pressure and threat (Stanton et al., 2001; sample item: “How is your job most of the time? Nerve-wracking.”). We hypothesized moderated negative correlations with threat because high levels of the LLWI domains—in particular the leadership domain—should correspond to less stressors for older workers (Boehm & Dwertmann, 2015). For pressure, our expectations were indecisive. On the one hand, organizational practices may support older workers in coping with stressful situations. On the other hand, they might induce additional stress if perceived as an additional burden to the worker.

In addition to situational perception criteria, we included two behavioral intention measures. First, we measured turnover intentions with three items (sample item: “I occasionally think about leaving this organization.”). These three items were selected by Kim and Stoner (2008) from a four-item scale initially developed by Nissly, Mor Barak, and Levin (2005). Given the study background with the relatively strict standard retirement age of 65 to 67 in Germany, we then administered three items developed by Wöhrmann, Deller, and Wang (2013) to measure participants’ intention to continue working for their current employer after becoming eligible for retirement (sample

item: “I would like to continue to work for my current employer in retirement.”). We hypothesized the LLWI domains to be negatively associated with turnover intentions and positively associated with the intention to continue working after reaching retirement age. However, we expected these to be only weak correlations because the relation between organizational practices and attitudinal reactions such as work engagement is more proximal and is a prerequisite for subsequent behavioral intentions and, ultimately, actions (Nishii et al., 2018).

Finally, we administered the Nordic Age Discrimination Scale (Furunes & Mykletun, 2010) to complement convergent validity assessments started in Study 2 (sample item: “Elderly workers do not have equal opportunities for training during work time”). Here we expected the measure to correlate strongly with the climate domain of the LLWI but also moderately with the other domains, as age-friendly climate is interrelated with organizational practices (Boehm et al., 2014; Zacher & Yang, 2016). All measures not available in the German language were translated using back-translation (Brislin, 1970). For all measures, reliability was acceptable and can be obtained from Table 5.

Results

Building on our results from Study 2, we formed nine hierarchical measurement models with 80 items in total. The first-order scales showed alpha reliabilities between .73 and .93, very similar to the values obtained from Study 2 (for detailed reliability results, see Appendix E). The means of the first-order scales were again averaged per domain to form the nine domain-level latent measures. Analysis of missing value pattern showed that a larger share of participants was able to answer items in the retirement-related domains (88% vs. 81% in Study 2).

Confirmatory factor analysis.

To cross-validate the measurement models, we conducted individual CFAs for the nine LLWI domains and an overall hierarchical model as in Study 2. The fit statistics appearing in Table 4 were acceptable for six out of the nine submodels (RMSEA < .08; CFI > .95). However, the single-factor models for *leadership* (six items) and *individual development* (nine items) yielded an RMSEA of .11 and .09, respectively, indicating some redundancy among the items. Nevertheless, the good CFI (> .97) and SRMR (< .03) of both models suggested that the proposed scales did not need to be modified. Moreover, the *health management* domain showed an RMSEA of .09, indicating an opportunity for improvement in future studies. All 22 subscales showed alpha coefficients above .72, and item-total correlations were above .71. Cross-validation of the overall hierarchical model yielded acceptable fit statistics as well. An RMSEA of .05 and a CFI of .89 suggested that the nine-domain model generally holds across studies.

Criterion validity evidence.

Clear patterns emerged from the correlation matrix that appears in Table 5. As expected, all nine LLWI domains were moderately positively correlated with person-job fit ($r = [.38; .61]$), person-organization fit ($r = [.43; .65]$), participants’ work engagement ($r = [.32; .47]$), and their well-being ($r = [.31; .48]$). Furthermore, we found positive correlations with participants’ perceived health status ($r = [.21; .32]$) and their occupational future time perspective ($r = [.19; .38]$). However, the hypothesized moderate relation was not found for all nine domains. As expected, the behavioral intention criteria showed weak to

Table 4. Confirmatory Factor Analysis and Reliability Results Study 3

Model	Number of Subscales	Number of Items	α (All Items)	α (First-Order Scales)	Chi-square	df	RMSEA	RMSEA 90% CI	CFI	SRMR
1. Organizational climate	3	10	.93	.89–.91	86.0	32	.07	[.05, .09]	.98	.02
2. Leadership	1	6	.95		48.7	9	.11	[.08, .14]	.98	.02
3. Work design	4	14	.90	.77–.86	180.9	71	.07	[.05, .08]	.96	.04
4. Health management	3	9	.91	.76–.87	89.9	24	.09	[.07, .11]	.96	.04
5. Individual development	1	8	.92		71.7	20	.09	[.06, .11]	.97	.03
6. Knowledge management	2	7	.90	.83–.87	38.5	13	.07	[.05, .10]	.98	.02
7. Transition to retirement	4	14	.94	.84–.93	228.1	71	.08	[.07, .09]	.96	.04
8. Continued employment	2	7	.86	.72–.89	30.3	13	.06	[.03, .09]	.98	.03
9. Health and retirement coverage	2	5	.91	.86–.89	7.4	4	.05	[.00, .10]	1.00 (.998)	.01
10. Overall hierarchical model		80			5348.1	3024	.05	[.04, .05]	.89	.07
11. Second-order model with first-order scale means					1240.4	491	.07	[.06, .07]	.92	.05

Note. $N = 349$. α = Cronbach's alpha; RMSEA = root mean squared error of approximation; CI = confidence interval; CFI = comparative fit index; SRMR = standardized root mean square residual.

moderate correlations: The LLWI domains were positively correlated with participants' intentions to continue working for their employer after becoming eligible for retirement ($r = [.10; .43]$) and negatively correlated with participants' intention to quit their job ($r = [-.21; -.34]$). For the number of days that participants had been absent from work due to illness, we found a weak negative relationship ($r = [-.10; -.21]$), which is nevertheless important. Finally, a threat from the job was moderately negatively related with most of the domains ($r = [-.22; -.47]$). Only for *health management* and *health and retirement coverage* was the association weaker than expected. Moreover, the LLWI domains were weakly negatively related to pressure from the job ($r = [-.15; -.35]$).

Convergent and divergent validity evidence.

Study 3 provided additional convergent validity evidence. Results showed that all nine LLWI scales were negatively correlated with the Nordic Age Discrimination Scale (NADS) by Furunes and Mykletun (2010). Among the LLWI domains, age discrimination was most represented by *organizational climate*, which comprises the *equality of opportunity* factor. Thus, we expected the NADS to be most strongly correlated with that domain. Results confirmed our expectations ($r = -.56$). However, the NADS was also strongly correlated with *individual development* ($r = -.48$) and *leadership* ($r = -.47$). Moreover, results of Study 3 confirmed convergent validity evidence regarding the human resources practices and age-diversity climate measure by Boehm et al. (2014), as had already been shown in Study 2.

Study 3 results also confirmed the independence of the LLWI scales from negative affect ($r = [-.06; -.19]$), which supported the LLWI measures' discriminant validity. For positive affect, correlations were slightly higher than in Study 2 ($r = [.21; .36]$), indicating a minor impairment due to common method variance within the study. Moderate correlations above .3 were found between positive affect and the domains *individual development*, *knowledge management*, and the three retirement-related domains. However, even for *knowledge management* ($r = .36$), the variance shared with positive affect was below 15%. The correlation table can be obtained from Table 5.

DISCUSSION

This article describes the development of the LLWI, a comprehensive, multifaceted measure of organizational practices for an aging workforce. Beginning with its theoretical roots in the aging at work literature, we built on qualitative evidence to conceptualize the measure. The constructs were operationalized by strictly following a rational and widely applied procedure. The LLWI scales comprise 80 items in a two-order hierarchical measurement model and thus allow for a differentiated assessment of relevant organizational practices. We provided extensive, repeated tests of the LLWI measure, its psychometric properties, the factor structure, and initial validity evidence.

Building the LLWI on extensive qualitative research (Wilckens et al., 2020; Wöhrmann et al., 2018) laid the foundation for a comprehensive measure. Its comprehensiveness was further enhanced by the extensive item pool generated in Study 1 and revised with the support of multiple human resource and age management experts. The samples for Studies 2 and 3 comprised individuals from the entire work population, covering a range of job titles and management levels. Respondents had highly diverse occupational backgrounds and were employed in small to very large organizations in various industries. Thus, the LLWI scales appear to be applicable across organizations with a variety of characteristics.

Being multifaceted, the LLWI is intended to contribute to the measurement of organizational practices for the aging workforce because answers to the question of how organizations can support an aging workforce remain limited without understanding the factorial structure. Thus, the LLWI measures nine distinct domains comprising several factors each. However, we were not able to successfully distinguish all facets that had been found and defined in the qualitative LLWI studies. The two LLWI domains covering aspects of age-friendly *leadership* and aspects of *individual development* initially comprised multiple facets, but the operationalization was not able to distinguish these facets. Instead, we operationalized each of the two domains using a single unidimensional scale. For the remaining domains, the EFAs and CFAs we conducted supported the multifactor solutions, although we did retain a few items with cross-factor structure coefficients when

Table 5. Means, Standard Deviations, and Correlations Study 3

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Avg. r with LLWI (1-9)		
1. Organizational climate	5.22	1.24	(.93)																										
2. Leadership	4.73	1.44	.75**	(.95)																									
3. Work design	2.68	0.82	.45**	.59**	(.90)																								
4. Health management	2.57	1.02	.30**	.45**	.59**	(.91)																							
5. Individual development	3.20	0.99	.69**	.76**	.67**	.55**	(.92)																						
6. Knowledge management	3.13	1.01	.51**	.63**	.55**	.57**	.81**	(.90)																					
7. Transition to retirement	2.26	0.98	.46**	.59**	.63**	.62**	.66**	.65**	(.94)																				
8. Continued employment	3.14	0.97	.46**	.47**	.42**	.29**	.49**	.50**	.56**	(.86)																			
9. Health and retirement coverage	2.61	1.20	.28**	.44**	.54**	.65**	.50**	.53**	.66**	.39**	(.91)																		
10. Person-job fit	4.94	1.47	.44**	.61**	.43**	.38**	.54**	.55**	.47**	.43**	.40**	(.94)																	.47
11. Person-organization fit	4.52	1.55	.50**	.65**	.48**	.46**	.61**	.57**	.53**	.43**	.46**	.75**	(.97)																.52
12. Well-being	3.04	1.18	.31**	.45**	.38**	.41**	.45**	.47**	.48**	.35**	.36**	.59**	.52**	(.93)															.41
13. Perceived health	4.08	1.03	.24**	.26**	.24**	.29**	.32**	.31**	.27**	.25**	.21**	.35**	.33**	.56**	(.90)														.27
14. Perceived workability	8.07	1.77	.34**	.33**	.27**	.24**	.31**	.28**	.28**	.27**	.16**	.40**	.34**	.56**	.69**	(.87)													.28
15. Sickness absence days	15.28	38.41	-.21**	-.20**	-.18**	-.10	-.19**	-.13	-.14*	-.20**	-.07	-.19**	-.15**	-.25**	-.41**	-.57**	-												-.16
16. Stress: threat	1.67	0.54	-.39**	-.47**	-.32**	-.26**	-.38**	-.33**	-.37**	-.34**	-.22**	-.56**	-.44**	-.57**	-.35**	-.47**	.20**	(.80)											-.34
17. Stress: pressure	2.27	0.64	-.27**	-.35**	-.30**	-.16**	-.24**	-.15**	-.24**	-.17**	-.09	-.27**	-.27**	-.38**	-.23**	-.32**	.11*	.67**	(.86)										-.22
18. Work engagement	4.98	1.03	.35**	.46**	.32**	.34**	.45**	.47**	.45**	.39**	.40**	.72**	.59**	.59**	.33**	.39**	-.15**	-.41**	-.11*	(.82)									.40
19. Occupational future time perspective	2.60	1.14	.19**	.31**	.25**	.25**	.33**	.33**	.37**	.38**	.35**	.33**	.29**	.35**	.23**	.17**	-.16**	-.19**	-.06	.39**	(.80)								.31
20. Turnover intentions	2.48	1.64	-.33**	-.34**	-.25**	-.25**	-.32**	-.22**	-.24**	-.24**	-.21**	-.37**	-.37**	-.25**	-.22**	-.36**	.13*	.34**	.17**	-.27**	-.08	(.74)							-.27
21. Post-retirement work intentions	2.51	1.23	.20**	.28**	.19**	.10	.21**	.23**	.22**	.43**	.15*	.38**	.38**	.21**	.10	.18**	-.08	-.26**	-.08	.35**	.29**	-.28**	(.90)						.22
22. Positive affect	3.43	0.69	.21**	.26**	.23**	.29**	.33**	.36**	.33**	.36**	.30**	.39**	.32**	.51**	.37**	.33**	-.19**	-.19**	-.02	.51**	.23**	-.14**	.21**	(.80)					.30
23. Negative affect	1.35	0.49	-.17**	-.16**	-.07	-.06	-.10	-.19**	-.17**	-.09	-.06	-.26**	-.20**	-.37**	-.20**	-.30**	.20**	.37**	.25**	-.18**	-.11*	.08	-.05	-.09	(.77)				-.12
24. Nordic age discrimination scale	2.10	0.87	-.56**	-.47**	-.30**	-.20**	-.48**	-.34**	-.35**	-.36**	-.20**	-.31**	-.32**	-.18**	-.20**	-.25**	.11	.30**	.27**	-.22**	-.11*	.25**	-.17**	-.09	.09	(.81)			-.36
25. Participants' chronological age	55.87	4.12	.04	.06	.11*	.11*	.11*	.10	.08	-.03	.11	.06	.07	.06	-.08	-.07	.03	.04	-.02	.01	-.21**	.08	.11*	.04	-.03	-.01			.08

Note. N = 349. M and SD are used to represent mean and standard deviation, respectively. Internal consistency coefficients, Cronbach's alphas are reported in the parentheses on the diagonal. *p < .05. **p < .01.

these items made important content contributions to the scales. Studies 2 and 3 also provided evidence for the construct validity of the overall hierarchical, multidimensional model covering all nine content domains with 22 subscales in total. This finding is particularly important because previous studies largely measured organizational practices with unidimensional scales.

Results showed that the LLWI is a reliable measure. Alpha coefficients and item-total correlations yielded acceptable values for all 22 subscales of the LLWI. At the same time, reliability was sufficiently low, indicating low levels of redundancy among items in the set. Study 2 further provided evidence for the LLWI's independence from positive and negative affect. Thus, the LLWI measure appears to be sufficiently distinguished from respondents' mood, a major source of common method variance. Various pieces of criterion validity evidence from Study 3 showed that the factors measured by the LLWI were positively correlated with a number of work outcomes present in the aging at work literature, such as work ability, person-job fit, work engagement, occupational future time perspective, and post-retirement work intentions. Furthermore, the LLWI scales were negatively correlated with stress due to perceived threat and pressure, turnover intentions, and illness-related days absent.

Although the nine domains identified were positively correlated among each other and thus share common variance, we did not form a single latent LLWI variable (such as *the organization's age-friendliness*). In line with [Jarvis, MacKenzie, and Podsakoff \(2003\)](#), an overall single latent variable for the nine domains had to be formed formatively because the LLWI domains (e.g., age-friendly leadership, work design, health management) are not indicators for an underlying causing factor but are instead independent fields of managerial decisions that jointly induce age-friendliness. Depending on the outcome of interest, one or the other domain may be of higher importance, which could not be modeled by a single reflective latent variable. Each of the nine LLWI domains, however, is measured reflectively by a set of indicators—the measured practices and circumstances within the organization, which causally follow from the LLWI domain. As a consequence, we created the LLWI measure as a set of reflective measurement models, which can be integrated into an overall formative measurement model.

Implications

The operationalization of the LLWI created a multifaceted and comprehensive set of psychometrically sound measures to assess organizational practices for the aging workforce. The nine domains covered by the LLWI enable different organizational practices to be distinguished. The domains comply with a general managerial understanding of organizational levers, such as *health management* or *work design*, which eases application in practice. Practitioners and organizational researchers may find the sets of scales and subscales provided to be useful tools for deepening their understanding of processes and contextual factors of aging at work and for identifying organizational improvement potential to better facilitate aging at work. The LLWI enables organizations to assess their capabilities in managing, engaging, and retaining an aging and age-diverse workforce. Clearly, organizations differ in terms of room for change and resources to invest into practices. Small organizations with limited resources, for example, may be restricted to a certain number of practices. Manufacturing organizations with shift work may have less flexibility for work time and workplace arrangements than others. However, the LLWI can support decision makers

in setting priorities, which is particularly important under scarce resources. Benchmarking is recommended, where the peer organizations need to be carefully selected to match the characteristics of the organization in question. Thereby, the LLWI assessment illuminates deficits, which may, in turn, trigger innovative and often low-cost solutions. Future benchmark studies based on the LLWI should address different organizational characteristics and identify domains of particular relevance for particular organizational settings.

Besides benchmarking among comparable organizations, the LLWI can also unfold within-organization differences in the practices. Different rating sources may perceive the availability of practices differently. This may be due to different subunits within the organization, but also due to different levels of knowledge regarding the practices. For example, managers and human resources representatives may be well aware of certain practices, whereas the organization's older workers are not. Assessing the LLWI from the perspective of human resource representatives is more likely to capture policies or practices as intended by the management, while the assessment from the perspective of older workers captures how practices reach the workers' level. Consequently, LLWI results can inform communication issues regarding the practices in the organization by leveraging different rating sources. Moreover, above average shares of don't know answers may indicate insufficient communication of practices, if these are actually offered.

The multifactor, Likert-scaled LLWI measure appears to improve on existing measures in two ways. First, unlike unidimensional measures, the LLWI differentiates multiple organizational facets and provides better construct coverage. Second, unlike assessment by lists of practices, the LLWI improves the measurement by providing thoroughly developed items, construct validity, and internal consistency of each subscale.

For researchers in the field of aging at work, the LLWI provides opportunities to tap into specific organizational practices. For example, the concept of successful aging at work, conceptualized by [Kooij et al. \(2015\)](#) as “the maintenance of workers' health, motivation, and working capacity or work ability now and in the future,” upholds the importance of organizational contextual factors for individual aging processes and coping strategies (e.g., [Kooij, 2015](#); [Zacher, 2015](#)). Those factors may facilitate, trigger, or obstruct individuals' constant adaption to age-related changes and may even reduce the need for resourceful coping actions ([Rudolph, 2016](#)). However, to further understand the influence of particular organizational practices on individual and organizational level outcomes, it is important to disentangle the practices of interest. As such, the LLWI creates the opportunity for sound empirical examination of the relationship between practices and successful aging in the future.

Applying the LLWI measuring all nine dimensions allows researchers to compare different domains of practices comprehensively. Results showed that all nine domains are correlated. However, it is important to capture relative differences between domains in order to understand how individual domains contribute to successful aging at work. For example, both research and practice can benefit from examining which of the nine domains are particularly relevant for older workers' health, commitment, or performance. The relevance of individual domains is also likely to depend on organizational conditions such as size or industry sector. To support practitioners in prioritizing the different domains of practices under unique organizational

conditions, evidence-based findings on the relative relevance of different domains of practices are required as well. Thus, the entire set of nine domains with 80 items can offer highly comprehensive information for both research and practice purposes.

At the same time, the developed scales for each domain may also be used separately in future research. Each of the nine scales showed satisfactory psychometric properties. Several of the scales operationalize organizational practices that have not been studied extensively in the literature. For example, the *transition to retirement* scale allows researchers to tap into and disentangle practices for the retirement transition, whose characteristics, processes, and effects are still relatively blurry (Henkens et al., 2018). Other scales, such as the ones for individual development and knowledge management, assess general organizational practices in light of workplace aging. In this respect, the scales are well-suited to further investigate how and to what extent specific domains of organizational practices influence aging processes and older workers' work outcomes. Consequently, the LLWI measure and its subscales promise to serve future research on aging at work research through thorough measurement.

Given that the 80-item measure is quite long, a shortened version of the LLWI would provide additional value. A short version with a compressed factor structure should be sufficient for capturing the overall construct of organizational practices for the aging workforce and providing researchers and practitioners with an overview of the status quo within the assessed organizations. As part of the initial diagnostic and need-analysis tool, norms and benchmarks could also be developed based on the short version of the measure that offers organizations comparative information regarding their peers.

Limitations and Future Directions

First, because cross-sectional data was used, presented studies are potentially limited by variance from a common-method and common-source bias. However, these biases do not affect identified low correlations between constructs, which result in identified factor structures and construct validity among the nine LLWI domains, because the biases generally elevate correlations within single-method or single-sourced samples (Campbell & Fiske, 1959). Hence, measured correlations tend to be too high than too low. To limit a potential common-source bias in the assessment of convergent and criterion validity, we clearly separated the LLWI items from the validation scales in the questionnaires (Podsakoff et al., 2003). Moreover, the limited correlations between affectivity and the LLWI suggest that the results are not affected by substantial common-method and common-source variance (Podsakoff et al., 2003).

Second, the quantitative evidence for the applicability of the LLWI is limited thus far to Germany, where we conducted the present studies. Nevertheless, the qualitative framework underlying the measure was initially developed on the basis of evidence from Germany and the United States (Wilckens et al., 2020). Thus, the framework is not tied to a single cultural or legal context. Moreover, we carefully sought to avoid legally or culturally specific items when developing items. International validations of the LLWI are planned for several countries and will provide opportunities for further research. This is particularly important because organizational practices for an aging workforce are subject to regulatory and cultural differences (Barnes, Smeaton, & Taylor, 2009). Additionally, the relevance of certain organizational practices may be subject to the organizational context. Study 2 results

showed small but significant correlations between some of the LLWI domains and both the organizations' industry sector and the number of employees (Table 3). The organizational context should thus be considered when using and interpreting the LLWI measure.

Third, building on the consensus referent model (Chan, 1998), the LLWI intends to abstract from respondents' individual experience to their perception of the organization in general. However, we did not obtain multiple respondents per organization. The present studies therefore do not provide any evidence for within-organization consistency of the measurement. Study 2 showed criterion validity regarding an age-diversity measure and an age-inclusive human resources practices measure, which had previously been validated with good intraclass correlations on the organizational level (Boehm et al., 2014). For this reason, we expect the LLWI to show within-organization consistency, although further research is required to assess the organizational nature of the LLWI in greater detail.

Fourth, our rigid scale development process resulted in nine distinct yet moderately to highly correlated domains of organizational practices. In particular, two sets of domains with high interrelations emerged. The second-order constructs of the retirement-related domains—transition to retirement and health and retirement coverage—showed correlations around .7, as did the domains of organizational climate, leadership, and individual development. In both cases, however, the distinctiveness of the constructs was supported not only by the exploratory and confirmatory factor analyses but also by the correlations between the first-order constructs and items composing the domain scores. Generally, the correlations between the lower-order constructs across these domains did not exceed .7 (Appendix D), which supports the validity of the individual constructs. Theoretically, the close association between these constructs and also their distinctiveness is well justified. For example, developmental practices have been shown to influence age-diversity climate (Boehm et al., 2014) and are dependent on the leaders who implement the developmental practices. Leadership style may thus also influence the developmental practices offered. Overall, despite the interdependencies between the LLWI domains, distinguishing domains of practices in assessment is important in order to generate focused effort within organizations.

Drawing upon the limitations of the LLWI measure just outlined, we conclude with the scale development notion that a measure is never complete but requires constant refinement (Clark & Watson, 1995). This article provides initial reliability and validity evidence for the newly developed LLWI measure, without proposing a final measure. Additional research is needed to establish the efficacy of the measurement on the organizational level. In addition, organizational level research on aging at work—which is still limited and which we aim to foster by providing the LLWI—will likely provide improvements to the scales in the future.

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REFERENCES

- Adams, G. A., & Beehr, T. A. (1998). Turnover and retirement: A comparison of their similarities and differences. *Personnel Psychology*, 51, 643–665. doi:10.1111/j.1744-6570.1998.tb00255.x

- Armstrong-Stassen, M. (2008). Organisational practices and the post-retirement employment experience of older workers. *Human Resource Management Journal*, 18, 36–53. doi:10.1111/j.1748-8583.2007.00057.x
- Armstrong-Stassen, M., & Lee, S. H. (2009). The effect of relational age on older Canadian employees' perceptions of human resource practices and sense of worth to their organization. *The International Journal of Human Resource Management*, 20, 1753–1769. doi:10.1080/09585190903087156
- Armstrong-Stassen, M., & Templer, A. J. (2006). The response of Canadian public and private sector human resource professionals to the challenge of the aging workforce. *Public Personnel Management*, 35, 247–260. doi:10.1177/009102600603500307
- Baltes, P. B., & Baltes, M. M. (1990). Psychological perspectives on successful aging: The model of selective optimization with compensation. In P. B. Baltes & M. M. Baltes (Eds.), *Successful aging: Perspectives from the behavioral sciences* (pp. 1–34). Cambridge, U.K.: Cambridge University Press.
- Barnes, H., Smeaton, D., & Taylor, R. (2009). *An ageing workforce: The employer's perspective*. Brighton, United Kingdom: Institute for Employment Studies. Retrieved from www.employment-studies.co.uk/resource/ageing-workforce-employers-perspective
- Barnes-Farrell, J. L. (2005). Older workers. In J. Barling, E. K. Kelloway, & M. R. Frone (Eds.), *Handbook of work stress* (pp. 431–454). Thousand Oaks, CA: Sage.
- Boehm, S. A., & Dwertmann, D. J. G. (2015). Forging a single-edged sword: Facilitating positive age and disability diversity effects in the workplace through leadership, positive climates, and HR practices. *Work, Aging and Retirement*, 1, 41–63. doi:10.1093/workar/wau008
- Boehm, S. A., Kunze, F., & Bruch, H. (2014). Spotlight on age-diversity climate: The impact of age-inclusive HR practices on firm-level outcomes. *Personnel Psychology*, 67, 667–704. doi:10.1111/peps.12047
- Börsch-Supan, A., & Weiss, M. (2016). Productivity and age: Evidence from the assembly line. *The Journal of the Economics of Ageing*, 7, 30–42. doi:10.1016/j.jjeoa.2015.12.001
- Boselie, P., Dietz, G., & Boon, C. (2005). Commonalities and contradictions in HRM and performance research. *Human Resource Management Journal*, 15, 67–94. doi:10.1111/j.1748-8583.2005.tb00154.x
- Breyer, B., & Bluemke, M. (2016). Deutsche Version der Positive and Negative Affect Schedule PANAS (GESIS Panel) [German version of the positive and negative affect schedule]. *Zusammenstellung sozialwissenschaftlicher Items und Skalen*. doi:10.6102/zis242
- Briggs, N. E., & MacCallum, R. C. (2003). Recovery of weak common factors by maximum likelihood and ordinary least squares estimation. *Multivariate Behavioral Research*, 38, 25–56. doi:10.1207/S15327906MBR3801_2
- Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, 1, 185. doi:10.1177/135910457000100301
- Cable, D. M., & DeRue, D. S. (2002). The convergent and discriminant validity of subjective fit perceptions. *Journal of Applied Psychology*, 87, 875–884. doi:10.1037/0021-9010.87.5.875
- Cadiz, D. M., Brady, G., Rineer, J. R., & Truxillo, D. M. (2019). A review and synthesis of the work ability literature. *Work, Aging and Retirement*, 5, 114–138. doi:10.1093/workar/way010
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validity by the Multitrait-Multimethod Matrix. *Psychological Bulletin*, 56, 81–105.
- Chan, D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: A typology of composition models. *Journal of Applied Psychology*, 83, 234–246. doi:10.1037/0021-9010.83.2.234
- Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment*, 7, 309–319. doi:10.1037/1040-3590.7.3.309
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New York, NY: Routledge. doi:10.4324/9780203771587
- Collins, C., & Smith, K. (2006). Knowledge exchange and combination: The role of human resource practices in the performance of high-technology firms. *Academy of Management Journal*, 49, 544–560. doi:10.5465/AMJ.2006.21794671
- Curran, P. J., West, S. G., & Finch, J. F. (1996). The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods*, 1, 16–29. doi:10.1037/1082-989X.1.1.16
- Dawis, R. V., & Lofquist, L. H. (1984). *A psychological theory of work adjustment*. Minneapolis, MN: University of Minnesota Press.
- Della, L. J., DeJoy, D. M., Goetzl, R. Z., Ozminkowski, R. J., & Wilson, M. G. (2008). Assessing management support for work-site health promotion: Psychometric analysis of the Leading by Example (LBE) instrument. *American Journal of Health Promotion*, 22, 359–367. doi:10.4278/ajhp.22.5.359
- DeVellis, R. F. (2017). *Scale development: Theory and applications* (4th ed.). Los Angeles, CA: Sage.
- European Agency for Safety and Health at Work. (2015). *Second European survey of enterprises on new and emerging risks (ESENER-2): Technical report*. Retrieved from <http://www.hse.gov.uk/statistics/pdf/esener-technical-report.pdf>
- Finkelstein, R., Roher, S., & Owusu, S. (2013). *Compendium of strategies and practices*. New York, NY: The New York Academy of Medicine. Retrieved from http://aging.columbia.edu/sites/default/files/AgeSmartEmployer_Compendium.pdf
- Furunes, T., & Mykletun, R. J. (2010). Age discrimination in the workplace: Validation of the Nordic Age Discrimination Scale (NADS). *Scandinavian Journal of Psychology*, 51, 23–30. doi:10.1111/j.1467-9450.2009.00738.x
- Garner, W. R. (1960). Rating scales, discriminability, and information transmission. *Psychological Review*, 67, 343–352. doi:10.1037/h0043047
- Gerbing, D. W., & Anderson, J. C. (1988). An updated paradigm for scale development incorporating unidimensionality and its assessment. *Journal of Marketing Research*, 25, 186–192. doi:10.2307/3172650
- Göbel, C., & Zwick, T. (2013). Are personnel measures effective in increasing productivity of old workers? *Labour Economics*, 22, 80–93. doi:10.1016/j.labeco.2012.11.005
- Green, P. E., & Rao, V. R. (1970). Rating scales and information recovery. How many scales and response categories to use? *Journal of Marketing*, 34, 33–39. doi:10.2307/1249817
- Harper, M. C., & Shoffner, M. F. (2004). Counseling for continued career development after retirement: An application of the theory of work adjustment. *Career Development Quarterly*, 52, 272–284. doi:10.1002/j.2161-0045.2004.tb00648.x

- Henkens, K. (2005). Stereotyping older workers and retirement: The managers' point of view. *Canadian Journal on Aging / La Revue canadienne du vieillissement*, 24, 353. doi:10.1353/cja.2006.0011
- Henkens, K., Van Dalen, H. P., Ekerdt, D. J., Hershey, D. A., Hyde, M., Radl, J.,...Zacher, H. (2018). What we need to know about retirement: Pressing issues for the coming decade. *The Gerontologist*, 58, 805–812. doi:10.1093/geront/gnx095
- Hennekam, S., & Herrbach, O. (2015). The influence of age-awareness versus general HRM practices on the retirement decision of older workers. *Personnel Review*, 44, 3–21. doi:10.1108/PR-01-2014-0031
- Hinkin, T. R. (1998). A brief tutorial on the development of measures for use in survey questionnaires. *Organizational Research Methods*, 1, 104–121. doi:10.1177/109442819800100106
- Humphreys, L. G., & Montanelli, R. G. J. (1975). An investigation of the parallel analysis criterion for determining the number of common factors. *Multivariate Behavioral Research*, 10, 193–205. doi:10.1207/s15327906mbr1002_5
- Huselid, M. A. (1995). The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of Management Journal*, 38, 635–672. doi:10.2307/256741
- Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research*, 30, 199–218. doi:10.1086/376806
- Kalshoven, K., Den Hartog, D. N., & De Hoogh, A. H. B. B. (2011). Ethical leadership at work questionnaire (ELW): Development and validation of a multidimensional measure. *The Leadership Quarterly*, 22, 51–69. doi:10.1016/j.leaqua.2010.12.007
- Kim, H., & Stoner, M. (2008). Burnout and turnover intention among social workers: Effects of role stress, job autonomy and social support. *Administration in Social Work*, 32, 5–25. doi:10.1080/03643100801922357
- Klaffke, M. (Ed.). (2014). *Generationen-Management: Konzepte, Instrumente, Good-Practice-Ansätze [Management of generations: Concepts, instruments, and good-practices]*. Wiesbaden, Germany: Springer Gabler.
- Knies, E., Leisink, P., & van de Schoot, R. (2017). People management: Developing and testing a measurement scale. *The International Journal of Human Resource Management*, 31, 705–737. doi:10.1080/09585192.2017.1375963
- Kooij, D. T. A. M. (2015). Successful aging at work: The active role of employees. *Work, Aging and Retirement*, 1, 309–319. doi:10.1093/workar/wav018
- Kooij, D. T. A. M., Jansen, P. G. W., Dikkers, J. S. E., & De Lange, A. H. (2010). The influence of age on the associations between HR practices and both affective commitment and job satisfaction: A meta-analysis. *Journal of Organizational Behavior*, 31, 1111–1136. doi:10.1002/job.666
- Kooij, D. T. A. M., Jansen, P. G. W., Dikkers, J. S. E., & de Lange, A. H. (2014). Managing aging workers: A mixed methods study on bundles of HR practices for aging workers. *International Journal of Human Resource Management*, 25, 2192–2212. doi:10.1080/09585192.2013.872169
- Kunze, F., Boehm, S. A., & Bruch, H. (2013). Organizational performance consequences of age diversity: Inspecting the role of diversity-friendly HR policies and top managers' negative age stereotypes. *Journal of Management Studies*, 50, 413–442. doi:10.1111/joms.12016
- Longman, R. S., Cota, A. A., Holden, R. R., & Fekken, G. C. (1989). A regression equation for the parallel analysis criterion in principal components analysis: Mean and 95th percentile eigenvalues. *Multivariate Behavioral Research*, 24, 59–69. doi:10.1207/s15327906mbr2401_4
- Marchiondo, L. A., Gonzales, E., & Ran, S. (2016). Development and validation of the Workplace Age Discrimination Scale. *Journal of Business and Psychology*, 31, 493–513. doi:10.1007/s10869-015-9425-6
- Marcus, J., Fritzsche, B. A., Le, H., & Reeves, M. D. (2016). Validation of the work-related age-based stereotypes (WAS) scale. *Journal of Managerial Psychology*, 31, 989–1004. doi:10.1108/JMP-11-2014-0320
- Mayring, P. (2010). *Qualitative Inhaltsanalyse: Grundlagen und Techniken* (11th ed.) [Qualitative content analysis: foundations and methodology]. Weinheim, Germany: Beltz.
- McGonagle, A. K., Fisher, G. G., Barnes-Farrell, J. L., & Grosch, J. W. (2015). Individual and work factors related to perceived work ability and labor force outcomes. *Journal of Applied Psychology*, 100, 376–398. doi:10.1037/a0037974
- Meade, A. W., & Craig, S. B. (2012). Identifying careless responses in survey data. *Psychological Methods*, 17, 437–455. doi:10.1037/a0028085
- Naegele, G., & Walker, A. (2006). *Guide to good practice in age management*. Luxembourg: Office for Official Publications of the European Communities.
- Nishii, L. H., Khattab, J., Shemla, M., & Paluch, R. M. (2018). A multi-level process model for understanding diversity practice effectiveness. *Academy of Management Annals*, 12, 37–82. doi:10.5465/annals.2016.0044
- Nissly, J. A., Barak, M. E. M., & Levin, A. (2005). Stress, social support, and workers' intentions to leave their jobs in public child welfare. *Administration in Social Work*, 29, 79–100. doi:10.1300/J147v29n01_06
- Noack, C. M. G. (2009). *Age climate: Age stereotypes in organizations and older workers (Doctorial dissertation)*. Bremen, Germany: Jacobs University. Retrieved from <http://www.jacobs-university.de/phd/files/1261153946.pdf>
- OECD. (2017). *Pensions at a glance 2017: OECD and G20 indicators*. Paris, France: OECD Publishing. doi:10.1787/pension_glance-2017-en
- Parker, S. K., Andrei, D. M., & Wang, M. (2020). Include, individualize, and integrate: Organizational meta-strategies for mature workers. *Work, Aging and Retirement*, 6, 1–7. doi:10.1093/workar/waz009
- Podsakoff, P. M., Ahearne, M., & MacKenzie, S. B. (1997). Organizational citizenship behavior and the quantity and quality of work group performance. *Journal of Applied Psychology*, 82, 262–270. doi:10.1037/0021-9010.82.2.262
- Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88, 879–903. doi:10.1037/0021-9010.88.5.879
- van Quaquebeke, N., & Eckloff, T. (2010). Defining respectful leadership: What it is, how it can be measured, and another glimpse at what it is related to. *Journal of Business Ethics*, 91, 343–358. doi:10.1007/s10551-009-0087-z

- Rafferty, A. E., & Griffin, M. A. (2006). Refining individualized consideration: Distinguishing developmental leadership and supportive leadership. *Journal of Occupational and Organizational Psychology*, 79, 37–61. doi:10.1348/096317905X36731
- Rauvola, R. S., Rudolph, C. W., Ebbert, L. K., & Zacher, H. (2019). Person–environment fit and work satisfaction: Exploring the conditional effects of age. *Work, Aging and Retirement*, 6, 101–117. doi:10.1093/workar/waz011
- Rudolph, C. W. (2016). Lifespan developmental perspectives on working: A literature review of motivational theories. *Work, Aging and Retirement*, 2, 130–158. doi:10.1093/workar/waw012
- Sautier, L. P., Scherwath, A., Weis, J., Sarkar, S., Bosbach, M., Schendel, M., ... Mehnert, A. (2015). Assessment of work engagement in patients with hematological malignancies: Psychometric properties of the German version of the Utrecht Work Engagement Scale 9 (UWES-9). *Rehabilitation*, 54, 310–316. doi:10.1055/s-0035-1555912
- Schaufeli, W. B., Shimazu, A., Hakanen, J., Salanova, M., & De Witte, H. (2019). An ultra-short measure for work engagement. *European Journal of Psychological Assessment*, 35, 577–591. doi:10.1027/1015-5759/a000430
- Schuett, S. (2014). *Demografie-Management in der Praxis - Mit der Psychologie des Alterns wettbewerbsfähig bleiben [Demography management in practice - staying competitive through psychology of aging]*. Berlin, Germany: Springer.
- Shaw, J. D., Delery, J. E., Jenkins, G. D. J., & Gupta, N. (1998). An organization-level analysis of voluntary and involuntary turnover. *The Academy of Management Journal*, 41, 511–525. doi:10.5465/256939
- Silver, M. P., Settels, J., Schafer, M. H., & Schieman, S. (2019). Getting the hours you want in the preretirement years: Work hour preferences and mismatch among older Canadian workers. *Work, Aging and Retirement*, 5, 175–188. doi:10.1093/workar/way015
- Stanton, J. M., Balzer, W. K., Smith, P. C., Fernando Parra, L., & Ironson, G. (2001). A general measure of work stress: The Stress in General scale. *Educational and Psychological Measurement*, 61, 866–888. doi:10.1177/00131640121971455
- Taneva, S. K., & Arnold, J. (2018). Thriving, surviving and performing in late career: A mixed-method study of pathways to successful aging in organizations. *Work, Aging and Retirement*, 4, 189–212. doi:10.1093/workar/wax027
- Thompson, E. R. (2007). Development and validation of an internationally reliable short-form of the Positive and Negative Affect Schedule (PANAS). *Journal of Cross-Cultural Psychology*, 38, 227–242. doi:10.1177/0022022106297301
- Tisch, A. (2015). Firms' contribution to the internal and external employability of older employees: Evidence from Germany. *European Journal of Ageing*, 12, 29–38. doi:10.1007/s10433-014-0323-y
- Topp, C. W., Østergaard, S. D., Søndergaard, S., & Bech, P. (2015). The WHO-5 well-being index: A systematic review of the literature. *Psychotherapy and Psychosomatics*, 84, 167–176. doi:10.1159/000376585
- Valcour, M. (2007). Work-based resources as moderators of the relationship between work hours and satisfaction with work-family balance. *Journal of Applied Psychology*, 92, 1512–1523. doi:10.1037/0021-9010.92.6.1512
- Van Dalen, H. P., Henkens, K., & Wang, M. (2015). Recharging or retiring older workers? Uncovering the age-based strategies of European employers. *The Gerontologist*, 55, 814–824. doi:10.1093/geront/gnu048
- Vandenberg, R. J., Richardson, H. A., & Eastman, L. J. (1999). The impact of high involvement work processes on organizational effectiveness. *Group & Organization Management*, 24, 300–339. doi:10.1177/1059601199243004
- WAI-Netzwerk. (2015). WAI Manual: Anwendung des Work-Ability Index [WAI manual: Application of the work-ability index]. Retrieved from <http://wai-netzwerk.uni-wuppertal.de/picture/upload/file/WAI-Manual.pdf>
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070. doi:10.1037/0022-3514.54.6.1063
- Weijters, B., Cabooter, E., & Schillewaert, N. (2010). The effect of rating scale format on response styles: The number of response categories and response category labels. *International Journal of Research in Marketing*, 27, 236–247. doi:10.1016/j.ijresmar.2010.02.004
- Wilckens, M. R., Wöhrmann, A. M., Adams, C., Deller, J., & Finkelstein, R. (2020). Integrating the German and US perspective on organizational practices for later life work: The Later Life Work Index. In S. Czaja, J. Sharit, & J. James (Eds.), *Current and Emerging Trends in Aging and Work* (pp. 59–79). Cham, Switzerland: Springer International Publishing. doi:10.1007/978-3-030-24135-3_4
- Wöhrmann, A. M., Deller, J., & Pundt, L. (2018). Complementing AAI at the meso level: The silver work index. In A. Zaidi, S. Harper, K. Howse, G. Lamura, & J. Perek-Bialas (Eds.), *Building evidence for active ageing policies* (pp. 75–94). London, United Kingdom: Palgrave Macmillan. doi:10.1007/978-981-10-6017-5_5
- Wöhrmann, A. M., Deller, J., & Wang, M. (2013). Outcome expectations and work design characteristics in post-retirement work planning. *Journal of Vocational Behavior*, 83, 219–228. doi:10.1016/j.jvb.2013.05.003
- Worthington, R. L., & Whittaker, T. A. (2006). Scale development research: A content analysis and recommendations for best practices. *The Counseling Psychologist*, 34, 806–838. doi:10.1177/0011000006288127
- Wright, P. M., & Boswell, W. R. (2002). Desegregating HRM: A review and synthesis of micro and macro human resource management research. *Journal of Management*, 28, 247–276. doi:10.1016/S0149-2063(02)00128-9
- Zacher, H. (2015). Successful aging at work. *Work, Aging and Retirement*, 1, 4–25. doi:10.1093/workar/wau006
- Zacher, H., & Frese, M. (2009). Remaining time and opportunities at work: Relationships between age, work characteristics, and occupational future time perspective. *Psychology and Aging*, 24, 487–493. doi:10.1037/a0015425
- Zacher, H., & Yang, J. (2016). Organizational climate for successful aging. *Frontiers in Psychology*, 7(1007), 1–12. doi:10.3389/fpsyg.2016.01007
- Zygmunt, C., & Smith, M. R. (2014). Robust factor analysis in the presence of normality violations, missing data, and outliers: Empirical questions and possible solutions. *The Quantitative Methods for Psychology*, 10, 40–55. doi:10.20982/tqmp.10.1.p040

APPENDICES APPENDIX A: FINAL LLWI SCALES (COPYRIGHTED BY THE AUTHORS)

Table A1. Final LLWI Scales (Copyrighted by the Authors. Approach the Authors for Permission to Use)

Code	English Items (Translated From the Validated German Items Using Back-Translation Procedure by Brislin, 1970)
OC Organizational climate	
The organizational culture dimension includes the set standards and actions of an employer shaped by the mission and values of the organization. An organizational culture that fosters good management of employees just before and in retirement age especially promotes equal opportunities and a positive image for all age groups. Subscales are:	
<i>OC1 Equality of opportunity:</i> Initial conditions should be the same for every employee regardless of age. Further, no discrimination or stigmatization due to age should occur. Each employee therefore has the same opportunities, e.g., participation in training and professional qualification or in the need of downsizing.	
OC1-1	In our organization, regardless of age, all employees have the same opportunities.
OC1-2	In our organization, regardless of age, all employees have the same opportunities for further training.
OC1-3	In our organization, regardless of age, all employees have the same opportunities to develop their career.
<i>OC2 Positive image of age:</i> Prevailing beliefs and attitudes regarding older employees are shaped by a positive attitude within the organization. Aging should be understood as an individual change process of competencies, motivation, values, and behavior. Opportunities should be recognized, valued and realized. For example, by identifying and assigning tasks which correspond to the specific competencies of older individuals.	
OC2-1	In our organization, there is a positive attitude towards older employees.
OC2-2	In our organization, older employees are perceived as being able to adapt well to changes.
OC2-3	In our organization, older employees are perceived as competent.
<i>OC3 Open and target group-oriented communication:</i> The organization is characterized by a differentiated image of age that is communicated through external and internal representation of the organization. This explicitly includes open and transparent exchange between employees and their managers regarding retirement and/or continued opportunities for work. Positive images representing all age groups within the employee magazine, on the intranet or website are another example.	
OC3-1	In our organization, the possibilities of working for older employees are openly communicated.
OC3-2	In our organization, "aging" is talked about openly.
OC3-3	In our organization, employees can openly talk about age-related challenges and issues (e.g., performance limitations, speed in using digital tools, changes in short-term memory).
OC3-4	In our organization, there is a great deal of understanding for the challenges of aging.
LE Leadership	
The leadership dimension includes the responsibility of organizational executives to harness the potential of employees at all ages and particularly just before and in retirement age. This is achieved through the consideration of each individual employee's strengths and by showing appreciation for their talents and contributions. The framework comprises two facets; however, the empirical data suggest unidimensionality:	
<i>Appreciation:</i> Managers of an organization should have an appreciative attitude towards their employees of all ages, manifested through a consistent demonstration of respect and kindness. Managers should reward the experience and achievements of their employees by offering higher levels of job autonomy and responsibility. Celebrating milestones and farewells are another way to convey gratitude, particularly when an employee is going into retirement.	
<i>Responsiveness to individuality:</i> Managers of an organization should be sensitive to individual needs and events that occur at different life stages. They should also take into account each individual's personality and performance capability. Managers are responsible for recognizing and harnessing individual potential regardless of age and for creating performance-enhancing conditions. Among other factors, this includes the consideration of employees' wishes and suggestions regarding the design of their work space as well as the consideration of individual life circumstances, such as the need to care for family.	
LE-1	Managers of our organization show appreciation both for current work results as well as for the overall performance of their employees.
LE-2	Managers of our organization give their employees freedom in designing their work.
LE-3	Managers of our organization invest time in their employees.
LE-4	Managers of our organization address the personal needs and living conditions of their employees.
LE-5	Managers of our organization sincerely support their employees in their professional and personal development.
LE-6	Managers of our organization are interested in the well-being of their employees.
WD Work design	
The work design dimension includes the adaptation of work location, times, and physical space to fit the individual needs and abilities of employees, relieve strain and increase job satisfaction and efficiency. Subscales are:	

Table A1. Continued

Code	English Items (Translated From the Validated German Items Using Back-Translation Procedure by Brislin, 1970)
	<i>WD1 Flexible work time arrangements:</i> The organization should allow employees to change their work time depending on individual needs. Specific solutions will depend on the nature of an employee's work. Options for flexibility could include a long- or short-term switch to part time, offering flextime, job sharing, the possibility of swapping shifts, and unpaid leaves.
WD1-1	Employees of our organization can adjust the beginning and the end of their daily working hours to their individual needs.
WD1-2	Employees of our organization can reduce or increase the number of hours specified in their work contract according to their individual needs.
WD1-3	Employees of our organization can adapt the timing and the length of their breaks to their individual needs.
WD1-4	Employees of our organization have enough flexibility in their working time organization to appropriately address unforeseen events in their private lives.
	<i>WD2 Flexible workplaces:</i> When possible, employees should be able to choose their work location based on their individual needs and what is most efficient. Examples include the facilitation and technical support of home-office-solutions or the installation of silent work places within the office.
WD2-1	Employees of our organization have the opportunity to work from home.
WD2-2	Employees of our organization have the opportunity to flexibly adapt where they work in the organization to their current needs (e.g., quiet workplaces, standing workstations, project workrooms).
WD2-3	Employees of our organization can choose their place of work to ensure a good balance between their work and private life (work-life balance).
	<i>WD3 Work according to capabilities:</i> Employees should have adequate jobs corresponding to their individual physical and mental performance capability and resilience. If not the case, this could be realized through a temporary or permanent change to another role that is less straining. Swapping jobs or reconsidering and adapting work flows should also be taken into consideration.
WD3-1	In our organization, managers change the tasks of their employees in the foreseeable future (e.g., within half a year) if the tasks no longer correspond to the employee's ability to perform and to withstand stress.
WD3-2	In our organization, job rotation (regular change of responsibilities) is provided in case of monotonous routines or high physical strain at the workplace.
WD3-3	In our organization, when tasks are cognitively over- or undemanding (e.g. asking employees to remember many things, to concentrate, to make difficult decisions) the assignment is changed in the foreseeable future (e.g., within half a year).
	<i>WD4 Ergonomic working conditions:</i> The workplace should be designed according to ergonomic requirements and should also take into account the individual circumstances of the employee. For example occupational safety measures should be taken and supportive equipment and/or tools should be provided.
WD4-1	In our organization, workplaces are designed according to ergonomic recommendations.
WD4-2	In our organization, proposals by employees for ergonomic improvements are taken up and implemented as far as possible.
WD4-3	In our organization, employees can adapt the lighting conditions at their workplace to their individual needs.
WD4-4	In our organization, employees use the most appropriate tools to reduce the physical strain of their work.
HM Health management	
The health management dimension includes all organizational activities that aim to maintain and promote employees' health and work ability. Health management should be characterized by a holistic approach addressing not only specific interventions but also health-promoting work design and leadership. Subscales are:	
	<i>HM1 Availability of physical exercise and nutrition opportunities:</i> Initiatives to strengthen health and work ability should be offered, such as company sports activities, active breaks and nutritional guidance.
HM1-1	Employees of our organization receive incentives and opportunities to eat healthy food (e.g., by lower prices or a greater variety compared to the less healthy alternatives).
HM1-2	Employees of our organization are encouraged to move as much as possible in the workplace (e.g., use the stairs, talk a walk during lunch break, sports during lunch break, use the bicycle to work).
HM1-3	Employees of our organization receive incentives and opportunities to do sports outside work (e.g., company sports groups, cooperation with gyms).
	<i>HM2 Workplace medical treatment:</i> Measures should be taken to help employees avoid medical conditions and assistance to aid in the recovery of sick employees should be offered. Examples include company doctors, on-site medical check-ups and physical therapy, along with wellness programs.

Table A1. Continued

Code	English Items (Translated From the Validated German Items Using Back-Translation Procedure by Brislin, 1970)
HM2-1	In our organization, employees regularly receive medical check-ups (e.g., vaccinations, stress tests, eye examinations, blood pressure).
HM2-2	In our organization, there are special programs to reintegrate employees into work after a long illness (e.g., medical therapies, mental or physical health therapies).
HM2-3	In our organization, employees receive therapeutic help in the workplace or in the immediate vicinity if required (e.g., physiotherapy in case of great physical stress and strain).
<i>HM3 Health promotion:</i> Measures should be taken to disseminate knowledge about healthy behaviors to help employees make responsible and healthy decisions. This could be done by providing information on healthy living. Moreover, managers should act as role models for healthy behaviors and promote a healthy work environment. This includes taking part in physical exercise, nutrition opportunities and related programs themselves, as well as encouraging a sustainable work-life balance.	
HM3-1	In our organization, employees are made aware of health-promoting behavior (e.g., through training, counseling, displays).
HM3-2	In our organization, managers and top management are committed to promoting a sustainable, healthy way of life and work for their employees.
HM3-3	In our organization, health aspects play an important role in organizational decisions (e.g., investment decisions or operational changes).

ID Individual development

Employees should be supported in their professional and personal development during their entire work life. A special emphasis is put on the importance of lifelong learning through continued education and training. There should also be opportunities for career development through internal advancement and promotions. The framework comprises three facets, however the empirical data suggest unidimensionality:

Continuous development planning: Planning for each individual employee's future should be done on an ongoing basis at all ages and stages of the work life. This could be done through individual meetings between managers and employees and by providing professional workshops that allow for self-reflection on abilities, competencies, and goals.

Appropriate solutions for training and development: The organization should provide further training and education aligned with the individual employee's professional, educational, and life experience as well as with organizational goals. Further, training content and methods should be targeted towards specific groups. Examples of appropriate training and development solutions are workshops, seminars and industry conferences, training for new technologies or equipment, cross-training, and internships for people of all ages. These training and development opportunities can be facilitated onsite or through reimbursement of tuition or fees.

Enabling development steps and job changes: Modifications to an employee's current position, function or job should be made possible to reflect the specific competencies and development interests of an individual. For example, this could be achieved by increasing job responsibilities, inclusion into other projects, or a horizontal or vertical change of position, which could also mean an additional apprenticeship or a new job within a different department.

ID-1	In our organization, development prospects and qualification requirements are identified for employees, regardless of age.
ID-2	In our organization, managers have regular conversations with their employees, regardless of age, about their personal and professional objectives (e.g., annual meetings to discuss their developmental goals).
ID-3	In our organization, employees, regardless of age, know about their potential for development.
ID-4	In our organization, older employees are offered training to learn new competencies and develop their expertise.
ID-5	In our organization, training methods are adapted to take into account the needs of older employees (e.g., more practical learning techniques instead of lecture formats).
ID-6	In our organization, employees, regardless of age, are involved in projects according to their competencies and developmental interests.
ID-7	In our organization, opportunities for career development into management or expert positions are possible for older employees.
ID-8	In our organization, employees move to a different job or position if it better suits their specific skills and abilities.

KM Knowledge management

The knowledge management dimension includes procedures for the transfer, exchange, and conservation of knowledge between different generations of employees. Subscales are:

KM1 Institutionalized knowledge transfer: Institutionalized structures that transfer knowledge from experienced employees to their successors should be in place. This can be achieved through mentoring and "buddy" programs or through a systematic knowledge transfer process before employees leave the organization for retirement.

KM1-1	In our organization, there are mentoring programs in which experienced employees support others with their knowledge.
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Table A1. Continued

Code	English Items (Translated From the Validated German Items Using Back-Translation Procedure by Brislin, 1970)
KM1-2	In our organization, there are processes/procedures to systematically pass on the knowledge and experience of older employees to their younger colleagues before they leave the organization.
KM1-3	In our organization, there are IT systems that are also used by older employees for the documentation and dissemination of knowledge.
KM1-4	In our organization, there are regular opportunities for every employee to exchange experiences and knowledge (e.g., in regular meetings).
<i>KM2 Inter-generative collaboration:</i> The organization should allow for mutual transfer of knowledge and experience between generations. This transfer goes in both directions, young to old, as well as old to young. Its structure is not necessarily determined by the organization. For example, collaboration can happen within intergenerational pairs or age-mixed teams.	
KM2-1	In our organization, older and younger employees are encouraged to share their knowledge and experience.
KM2-2	In our organization, managers support the exchange of knowledge between younger and older employees.
KM2-3	In our organization, employees pass on their knowledge to colleagues of other generations (younger or older).
TR Transition to retirement	
The transition into retirement dimension includes the necessary conversations, planning, and workplace solutions for any employee who is on the verge of retiring. Information and counseling should be provided to help the employee transition. Subscales are:	
<i>TR1 Timely transition planning:</i> Managers should talk with employees about their personal plans for entering the retirement stage, including a succession plan. Potential transition scenarios should be actively discussed to find individual solutions, for example, through annual employee interviews.	
TR1-1	In our organization, managers discuss early with their employees (e.g., from the age of 55) as to how to make the transition to retirement.
TR1-2	In our organization, managers take time to plan the transition to retirement for individual employees.
TR1-3	In our organization, succession planning for the employee who is retiring is begun long before the expected retirement date.
<i>TR2 Phased retirement and individualized transition solutions:</i> Generic solutions for the transition into retirement should be tailored according to employees' individual needs. Flexibility and imagination should be present when designing the employee's individual transition into retirement. Phased retirement through a gradual reduction of working time should be offered companywide. Phased retirement can take place over a shorter or longer period of time, depending on needs.	
TR2-1	In our organization, employees have the option to reduce their weekly working hours during the last years before retirement (phased retirement).
TR2-2	In our organization, employees have the option to work full time (with 50% pay), followed by a period of non-working (also with 50% pay) over a period of 2–3 years each before retirement.
TR2-3	In our organization, employees can adjust their working hours before retirement (e.g., flextime or, if shift work, no night shifts).
TR2-4	In our organization, the transition to retirement is flexibly shaped according to employee needs.
<i>TR3 counseling for retirement life preparation:</i> Organizations should support their employees in preparing mentally for the life change of retirement by providing advising and counseling. Employees should be motivated to actively design their retirement life prior to transition. For example, individual preparation can be fostered through a structured approach that reflects individual expectations and plans. There may also be opportunities to establish alternative activities beyond employment.	
TR3-1	Our organization offers counseling to employees who are about to retire so they can reflect upon their expectations and plans for retirement.
TR3-2	Our organization encourages employees who are about to retire to develop alternative activities for a meaningful daily routine after retirement (e.g., family, volunteering, traveling).
TR3-3	Our organization provides employees with information about retirement (e.g., articles, brochures, books, internet/intranet sites).
<i>TR4 Continuous inclusion and maintaining contact:</i> Tools should be in place to maintain contact with employees even after their retirement and to help them stay engaged as part of the organization. This could be facilitated through an active management of relationships by means of an alumni network, invitations to organizational events or by allowing for voluntary work.	
TR4-1	Our organization maintains active contact with retired employees (e.g., by an alumni network).
TR4-2	Our organization informs retired employees about current developments in the organization (e.g., newsletter, alumni newsletter).
TR4-3	Our organization allows retired employees to catch up with each other regularly (e.g., at meetings of an alumni network).
TR4-4	Our organization is still in active contact with most of its former employees, even 5 years after their retirement.

Table A1. Continued

Code	English Items (Translated From the Validated German Items Using Back-Translation Procedure by Brislin, 1970)
CE Continued employment	
The continued employment dimension includes the organizational design and employment options for employees at retirement age. This includes former employees of the organization as well as external employees looking for continued employment. Subscales are:	
<i>CE1 Individualized employment options:</i> Employment options for individuals, who would otherwise be fully retired, should be offered systematically. To ensure employment options are meaningful for both the organization and the employee, integration of those employees into the organization should be strategically planned. For example, they might be brought in on a temporary basis at peak production times. Tasks and work time should be adaptable to the individual employee. This can be achieved through alternative contract forms such as consulting and mentoring work or flexible work time arrangements with generally fewer hours than a full-time position.	
CE1-1	In our organization, employees may work beyond the conventional retirement age if they wish so.
CE1-2	In our organization, employment opportunities for people in retirement age are clearly defined and structured (e.g., by integration into strategic workforce planning).
CE1-3	In our organization, managers are well-informed about the possibilities of working beyond the conventional retirement age.
CE1-4	In our organization, working conditions (time and type of activity) for employees in retirement age are flexibly adapted to their wishes.
<i>CE2 (Re-) hiring of older employees:</i> Older individuals, particularly including already and almost retired employees should be specifically addressed by job marketing, hiring and re-employment processes. This is achieved through age-friendly communication of job offers and the use of alternative marketing paths to address external as well as internal individuals. This explicitly includes employees with long careers in other industries or companies.	
CE2-1	In our organization, older applicants are hired as well.
CE2-2	In our organization, age-neutral language is used in recruitment (e.g., job advertisements).
CE2-3	In our organization, people of all ages apply for job vacancies.
RC Health & retirement coverage	
Organizations should support their employees with retirement savings and insurance coverage, if not sufficiently provided by public systems. Requirements vary due to different regulations and social systems. The support may be a direct financial benefit or put into practice as individual planning and assistance. Subscales are:	
<i>RC1 Retirement savings and pensions:</i> Employees should be offered options for retirement savings, if not sufficiently covered by public systems. Organizations may include pensions and retirement saving accounts into their full compensation packages, offer optional saving possibilities to be opened by the employees individually, and support their employees in timely planning and organization of their retirement savings.	
RC1-1	Our organization thoroughly informs employees about the components of a retirement plan (e.g., federal or state retirement systems, retirement plans offered by employer, private savings and investments, continued employment during retirement).
RC1-2	Our organization offers employees comprehensive opportunities to save money for their retirement.
RC1-3	Our organization offers employees good personal advice on financial security in later life.
<i>RC2 Insurances and financial emergency support:</i> Organizations should offer health-related insurance coverage, if not sufficiently covered by public systems. This includes (additional) health-, disability-, care- or life insurances, which particularly cover risks that increase with age. Additional financial support may be offered in case of family emergencies, as e.g., in a case of nursing care or child sickness.	
RC2-1	Our organization keeps employees well-informed about meaningful private supplemental insurance covering age-related risks (e.g., supplements to health or long-term care insurance, occupational accident insurance).
RC2-2	Our organization offers employees private supplemental insurance as part of the total remuneration package (e.g., additions to health or long-term care insurance, occupational disability).

Note. Items were rated on a 5-point Likert response format, except for *organizational climate* and *leadership*, for which a 7-point format was used. The Likert response format was anchored at “Does not at all apply in our organization (for no employee or to no extent)” (1) and “Does fully apply in our organization (for all employees to the fullest extent)” (5 or 7). For *leadership* and *individual development* results did not support the hypothesized factorial model with subscales, so that a unidimensional scale was developed. Construct definitions initially published by Wilckens et al. (2020). Published with kind permission of © Max R. Wilckens, Anne M. Wöhrmann, Julia S. Finsel, and Jürgen Deller 2020. All Rights Reserved.

**APPENDIX B: MOST RELEVANT EXISTING SCALES CONSIDERED DURING ITEM GENERATION
IN STUDY 1**

Table B1. Most Relevant Existing Scales Considered During Item Generation in Study 1

Measures, Scales, and Inventories	Authors
General age-related human resources practices	
Human resources practices specifically tailored to employees 50 and over	Armstrong-Stassen & Lee (2009)
Human resources activities directed at recruiting and retaining older managerial and professional employees	Armstrong-Stassen & Templer (2006)
Human resources practices for the post-retirement employment experience of older workers	Armstrong-Stassen (2008)
Bundles of human resources practices for aging workers	Kooij, Jansen, Dijkers, & de Lange (2014)
Age-diversity human resources practices	Boehm, Kunze, & Bruch (2014)
Human resource practices that late-career workers find valuable	Taneva & Arnold (2018)
Age discrimination and climate	
Work-related age-based stereotypes (WAS)	Marcus, Fritzsche, Le, & Reeves (2016)
Psychological Age Climate Scale (PACS)	Noack (2009)
Opinions about the characteristics of older workers	Henkens (2005)
Workplace Age Discrimination Scale (WADS)	Marchiondo, Gonzales, & Ran (2016)
Nordic Age Discrimination Scale (NADS)	Furunes & Mykletun (2010)
Leadership	
Respectful leadership	van Quaquebeke & Eckloff (2010)
Ethical leadership	Kalshoven, Den Hartog, & De Hoogh (2011)
Developmental leadership	Rafferty & Griffin (2006)
Content area-specific human resources practices	
Work-time control measure	Valcour (2007)
People management scale	Knies, Leisink, & van de Schoot (2017)
European survey of enterprises on new and emerging risks (ESENER 2)	European Agency for Safety and Health at Work (2015)
Worksite Health Promotion	Della, DeJoy, Goetzel, Ozminkowski, & Wilson (2008)
Knowledge exchange and combination scale	Collins & Smith (2006)

APPENDIX C: LLWI ITEM STATISTICS FROM STUDY 2

Table C1. LLWI Item Statistics From Study 2

Code	N	M	SD	Likert-Scale Range	Skew	Kurtosis	Final Scale EFA Factor Coefficient
OC—Organizational climate							
OC1-1	596	5.27	1.52	1–7	–0.78	0.27	.78
OC1-2	590	5.37	1.58	1–7	–0.86	0.22	.81
OC1-3	586	4.94	1.60	1–7	–0.45	–0.39	.95
OC1-4	587	5.54	1.41	1–7	–0.80	0.23	-
OC2-1	593	5.48	1.34	1–7	–0.80	0.56	.83
OC2-2	586	5.28	1.41	1–7	–0.75	0.51	.85
OC2-3	597	5.92	1.16	1–7	–1.07	1.09	.83
OC2-4	599	5.93	1.13	1–7	–1.03	1.05	-
OC3-1	529	4.60	1.89	1–7	–0.38	–0.55	.85
OC3-2	573	4.32	1.84	1–7	–0.21	–0.81	.80
OC3-3	549	4.72	1.74	1–7	–0.43	–0.43	.85
OC3-4	558	4.70	1.71	1–7	–0.39	–0.40	.83
LE—Leadership							
LE-1	602	4.97	1.54	1–7	–0.63	–0.07	.86
LE-2	603	5.03	1.50	1–7	–0.72	0.26	.77
LE-3	600	4.74	1.50	1–7	–0.33	–0.36	.91
LE-4	601	4.80	1.53	1–7	–0.50	–0.23	.88
LE-5	598	4.77	1.49	1–7	–0.46	–0.17	.88
LE-6	602	4.61	1.52	1–7	–0.42	–0.22	.90
LE-7	603	5.00	1.51	1–7	–0.58	–0.10	-
LE-8	602	4.89	1.43	1–7	–0.49	–0.06	-
LE-9	502	3.21	1.84	1–7	0.37	–0.53	-
WD—Work design							
WD1-1	603	3.06	1.36	1–5	–0.19	–1.12	.78
WD1-2	595	3.09	1.22	1–5	–0.19	–0.79	.55
WD1-3	598	2.91	1.35	1–5	–0.01	–1.15	.75
WD1-4	596	3.29	1.21	1–5	–0.33	–0.67	.82
WD1-5	502	2.83	1.33	1–5	0.09	–0.76	-
WD2-1	604	2.24	1.30	1–5	0.64	–0.75	.70
WD2-2	595	2.48	1.23	1–5	0.33	–0.88	.58
WD2-3	593	2.52	1.21	1–5	0.26	–0.85	.54
WD3-1	537	2.62	1.06	1–5	0.22	–0.19	.71
WD3-2	521	2.45	1.22	1–5	0.43	–0.42	.79
WD3-3	520	2.45	1.15	1–5	0.34	–0.41	.87
WD3-4	573	3.09	1.08	1–5	–0.21	–0.50	-
WD4-1	588	3.09	1.24	1–5	–0.15	–0.84	.86
WD4-2	577	3.07	1.18	1–5	–0.21	–0.63	.87
WD4-3	589	2.86	1.27	1–5	–0.03	–0.96	.52
WD4-4	566	3.10	1.15	1–5	–0.26	–0.40	.75
WD4-5	567	2.70	1.31	1–5	0.11	–1.03	-
HM—Health management							
HM1-1	588	2.29	1.33	1–5	0.66	–0.73	.65
HM1-2	589	2.53	1.28	1–5	0.32	–0.96	.78
HM1-3	592	2.61	1.44	1–5	0.28	–1.25	.72
HM1-4	585	2.40	1.31	1–5	0.52	–0.86	-
HM2-1	592	2.95	1.50	1–5	–0.08	–1.40	.54
HM2-2	553	2.95	1.47	1–5	–0.04	–1.23	.50
HM2-3	561	2.17	1.26	1–5	0.78	–0.34	.60
HM2-4	574	2.47	1.15	1–5	0.33	–0.53	-

Table C1. Continued

Code	N	M	SD	Likert-Scale Range	Skew	Kurtosis	Final Scale EFA Factor Coefficient
HM3-1	573	2.49	1.23	1–5	0.31	–0.81	.64
HM3-2	574	2.40	1.25	1–5	0.46	–0.74	.92
HM3-3	534	2.37	1.20	1–5	0.40	–0.60	.86
HM3-4	559	2.51	1.35	1–5	0.40	–0.91	-
ID—Individual development							
ID-1	567	3.12	1.16	1–5	–0.24	–0.53	.77
ID-2	593	3.34	1.34	1–5	–0.36	–0.98	.66
ID-3	582	3.39	1.11	1–5	–0.43	–0.22	.79
ID-4	576	3.47	1.16	1–5	–0.52	–0.28	.79
ID-5	536	2.81	1.19	1–5	0.07	–0.58	.76
ID-6	586	3.45	1.11	1–5	–0.50	–0.16	.73
ID-7	564	3.24	1.19	1–5	–0.31	–0.50	.76
ID-8	576	3.05	1.11	1–5	–0.20	–0.46	.67
ID-9	586	3.28	1.15	1–5	–0.38	–0.46	-
ID-10	584	3.47	1.12	1–5	–0.47	–0.29	-
ID-11	571	3.43	1.18	1–5	–0.51	–0.32	-
ID-12	517	2.70	1.20	1–5	0.09	–0.54	-
ID-13	555	3.01	1.08	1–5	–0.12	–0.24	-
KM—Knowledge management							
KM1-1	548	2.61	1.30	1–5	0.30	–0.77	.78
KM1-2	543	2.59	1.30	1–5	0.33	–0.77	.76
KM1-3	541	2.89	1.37	1–5	0.03	–1.00	.40
KM1-4	579	2.82	1.33	1–5	0.10	–1.02	.50
KM2-1	590	3.30	1.30	1–5	–0.38	–0.83	.86
KM2-2	577	2.98	1.28	1–5	–0.05	–0.87	.69
KM2-3	595	3.54	1.13	1–5	–0.62	–0.13	.88
KM2-4	595	4.15	0.94	1–5	–1.09	1.15	-
TR—Transition to retirement							
TR1-1	484	2.40	1.32	1–5	0.49	–0.51	.78
TR1-2	488	2.43	1.31	1–5	0.42	–0.59	.99
TR1-3	536	2.67	1.31	1–5	0.22	–0.80	.61
TR2-1	519	3.20	1.34	1–5	–0.29	–0.66	.81
TR2-2	478	2.81	1.44	1–5	0.11	–0.79	.75
TR2-3	505	2.55	1.34	1–5	0.29	–0.75	.69
TR2-4	498	2.53	1.27	1–5	0.28	–0.57	.54
TR2-5	484	2.13	1.35	1–5	0.84	–0.03	-
TR3-1	459	2.25	1.30	1–5	0.66	–0.08	.73
TR3-2	477	1.97	1.21	1–5	1.10	1.04	.76
TR3-3	488	2.03	1.21	1–5	0.89	0.35	.92
TR3-4	479	2.25	1.29	1–5	0.59	–0.35	-
TR4-1	511	2.33	1.33	1–5	0.57	–0.50	.88
TR4-2	495	2.10	1.30	1–5	0.91	0.20	.82
TR4-3	503	2.10	1.28	1–5	0.83	–0.02	.91
TR4-4	496	2.20	1.30	1–5	0.71	–0.17	.89
CE—Continued Employment							
CE1-1	500	3.13	1.34	1–5	–0.20	–0.64	.59
CE1-2	448	2.50	1.30	1–5	0.34	–0.34	.87
CE1-3	449	2.70	1.27	1–5	0.14	–0.36	.89
CE1-4	473	2.80	1.24	1–5	0.03	–0.32	.73
CE2-1	562	3.46	1.11	1–5	–0.46	–0.18	.60
CE2-2	496	3.68	1.25	1–5	–0.70	0.10	.58
CE2-3	518	3.81	1.02	1–5	–0.67	0.49	.90
CE2-4	488	3.19	1.23	1–5	–0.28	–0.27	-

Table C1. Continued

Code	<i>N</i>	<i>M</i>	<i>SD</i>	Likert-Scale Range	Skew	Kurtosis	Final Scale EFA Factor Coefficient
RC—Health and retirement coverage							
RC1-1	562	3.01	1.29	1–5	–0.11	–0.84	.75
RC1-2	556	3.05	1.32	1–5	–0.18	–0.87	.88
RC1-3	546	2.66	1.28	1–5	0.18	–0.82	.84
RC1-4	572	3.65	1.44	1–5	–0.75	–0.66	-
RC2-1	552	2.43	1.31	1–5	0.45	–0.79	.99
RC2-2	540	2.33	1.36	1–5	0.57	–0.74	.62
RC2-4	454	2.75	1.41	1–5	0.10	–0.70	-

Note. *N*, *M*, and *SD* are used to represent the number of non-“don’t know” responses, mean, and standard deviation, respectively. Missing factor coefficients indicate items, which were removed from the scales during the analyses. Exploratory factor analysis (EFA) was conducted with oblique rotation.

APPENDIX D: LLWI INDICATOR CORRELATION TABLES

Table D1. LLWI Indicator Statistics From Study 2

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29			
1. OC	5.15	1.21	(.92)																															
2. OC1	5.20	1.44	.87	(.91)																														
3. OC2	5.56	1.18	.87	.69	(.88)																													
4. OC3	4.60	1.58	.87	.59	.64	(.90)																												
5. LE	4.82	1.35	.71	.60	.61	.67	(.95)																											
6. WD	2.76	0.84	.40	.28	.30	.48	.59	(.91)																										
7. WD1	3.09	1.06	.30	.21	.25	.32	.43	.79	(.84)																									
8. WD2	2.41	1.04	.21	.14	.16	.27	.36	.84	.62	(.78)																								
9. WD3	2.50	1.01	.39	.27	.27	.52	.53	.79	.42	.52	(.88)																							
10. WD4	3.03	1.02	.41	.31	.31	.46	.57	.80	.46	.53	.61	(.86)																						
11. HM	2.53	1.04	.26	.19	.12	.37	.40	.60	.36	.48	.53	.61	(.92)																					
12. HM1	2.48	1.16	.23	.17	.11	.32	.36	.56	.36	.48	.47	.54	.91	(.82)																				
13. HM2	2.70	1.18	.18	.12	.06	.28	.30	.48	.29	.37	.40	.50	.89	.69	(.78)																			
14. HM3	2.42	1.12	.31	.23	.17	.41	.46	.61	.35	.44	.58	.64	.92	.77	.73	(.90)																		
15. ID	3.24	0.91	.65	.57	.49	.63	.72	.64	.41	.42	.60	.63	.55	.46	.44	.58	(.90)																	
16. KM	2.98	1.01	.49	.39	.38	.55	.60	.56	.31	.38	.58	.57	.56	.50	.44	.60	.72	(.89)																
17. KM1	2.72	1.06	.43	.32	.29	.51	.53	.57	.34	.41	.56	.57	.63	.57	.50	.65	.67	.92	(.81)															
18. KM2	3.28	1.11	.49	.41	.40	.51	.59	.46	.25	.30	.50	.48	.41	.35	.31	.45	.65	.93	.70	(.88)														
19. TR	2.37	1.02	.43	.30	.27	.57	.55	.66	.44	.47	.65	.62	.70	.61	.60	.71	.67	.65	.67	.53	(.94)													
20. TR1	2.49	1.19	.47	.34	.33	.58	.57	.57	.33	.39	.59	.55	.58	.48	.48	.62	.65	.65	.63	.58	.88	(.90)												
21. TR2	2.77	1.15	.38	.28	.22	.48	.45	.61	.48	.46	.52	.52	.59	.51	.52	.57	.56	.50	.54	.40	.84	.68	(.87)											
22. TR3	2.08	1.15	.29	.17	.14	.45	.39	.57	.35	.42	.56	.54	.64	.57	.54	.64	.51	.52	.59	.37	.88	.70	.66	(.92)										
23. TR4	2.18	1.21	.36	.25	.26	.46	.46	.52	.33	.35	.53	.50	.60	.55	.51	.60	.56	.56	.57	.46	.85	.65	.56	.68	(.94)									
24. CE	3.19	0.87	.55	.49	.44	.53	.50	.38	.23	.20	.45	.36	.35	.30	.28	.37	.57	.50	.44	.48	.55	.52	.49	.41	.46	(.84)								
25. CE1	2.77	1.11	.46	.35	.34	.52	.47	.39	.23	.21	.47	.34	.38	.35	.30	.39	.53	.50	.47	.46	.60	.52	.51	.49	.54	.88	(.87)							
26. CE2	3.65	0.93	.50	.48	.42	.38	.38	.22	.14	.08	.24	.24	.15	.12	.13	.18	.42	.30	.26	.32	.30	.32	.29	.17	.21	.83	.47	(.76)						
27. RC	2.63	1.13	.33	.25	.19	.42	.44	.57	.40	.44	.51	.54	.67	.60	.58	.65	.56	.53	.57	.42	.75	.65	.64	.68	.61	.41	.43	.21	(.90)					
28. RC1	2.91	1.16	.35	.29	.21	.42	.47	.54	.38	.40	.46	.51	.61	.61	.54	.59	.57	.52	.54	.42	.68	.62	.61	.59	.55	.40	.37	.27	.92	(.88)				
29. RC2	2.37	1.26	.24	.18	.12	.35	.34	.49	.33	.38	.46	.46	.61	.54	.54	.60	.45	.44	.44	.49	.34	.70	.58	.68	.55	.35	.39	.13	.93	.73	(.87)			

Note. N = 609. M and SD are used to represent mean and standard deviation, respectively. Internal consistency coefficients, Cronbach's alphas are reported in the parentheses on the diagonal.

Table D2. LLWI Indicator Statistics From Study 3

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29					
1. OC	5.22	1.24	(.93)																																	
2. OC1	5.27	1.45	.86	(.90)																																
3. OC2	5.57	1.22	.89	.67	(.89)																															
4. OC3	4.81	1.55	.89	.59	.72	(.91)																														
5. LE	4.74	1.44	.75	.62	.65	.71	(.95)																													
6. WD	2.68	0.82	.45	.35	.34	.50	.59	(.90)																												
7. WD1	3.00	1.11	.32	.26	.22	.37	.43	.80	(.84)																											
8. WD2	2.33	1.04	.19	.17	.12*	.23	.36	.82	.66	(.77)																										
9. WD3	2.40	0.99	.41	.31	.33	.45	.53	.70	.29	.39	(.84)																									
10. WD4	2.95	1.04	.45	.32	.39	.48	.55	.79	.45	.47	.53	(.86)																								
11. HM	2.57	1.02	.30	.22	.23	.35	.45	.59	.36	.43	.48	.60	(.91)																							
12. HM1	2.41	1.19	.23	.15	.19	.29	.37	.53	.33	.41	.42	.52	.90	(.81)																						
13. HM2	2.84	1.16	.23	.19	.18	.27	.31	.46	.27	.33	.36	.48	.86	.62	(.77)																					
14. HM3	2.45	1.10	.34	.26	.27	.39	.50	.58	.35	.41	.50	.58	.90	.74	.65	(.87)																				
15. ID	3.20	0.99	.69	.61	.59	.63	.76	.67	.44	.42	.58	.63	.55	.44	.44	.57	(.92)																			
16. KM	3.13	1.01	.51	.38	.45	.49	.63	.55	.29	.35	.53	.58	.57	.47	.43	.59	.81	(.90)																		
17. KM1	2.85	1.10	.44	.34	.39	.44	.57	.55	.29	.38	.53	.54	.57	.47	.45	.57	.79	.94	(.83)																	
18. KM2	3.44	1.05	.53	.42	.49	.51	.64	.49	.25	.27	.48	.53	.45	.38	.32	.51	.71	.93	.76	(.87)																
19. TR	2.26	0.98	.46	.33	.39	.49	.59	.63	.39	.45	.64	.56	.62	.53	.49	.66	.66	.65	.64	.59	(.94)															
20. TR1	2.33	1.15	.44	.32	.38	.48	.56	.56	.29	.37	.63	.50	.49	.42	.37	.53	.63	.65	.64	.59	.87	(.89)														
21. TR2	2.65	1.15	.38	.28	.30	.41	.48	.59	.48	.40	.46	.49	.53	.42	.45	.53	.57	.51	.50	.47	.83	.65	(.85)													
22. TR3	1.90	1.09	.36	.27	.30	.38	.44	.54	.31	.44	.55	.44	.54	.47	.41	.60	.51	.51	.51	.44	.86	.67	.59	(.89)												
23. TR4	2.16	1.21	.35	.25	.31	.38	.47	.49	.28	.37	.53	.39	.55	.50	.40	.57	.50	.52	.51	.47	.85	.63	.56	.68	(.93)											
24. CE	3.14	0.97	.46	.35	.40	.46	.47	.42	.28	.25	.46	.34	.29	.28	.20	.31	.49	.50	.46	.48	.56	.57	.39	.45	.47	(.86)										
25. CE1	2.69	1.23	.43	.30	.37	.46	.46	.35	.19	.21	.50	.26	.27	.24	.18	.32	.45	.51	.46	.48	.59	.55	.38	.51	.49	.90	(.89)									
26. CE2	3.64	0.97	.38	.33	.35	.34	.37	.38	.29	.24	.27	.35	.26	.25	.19	.26	.42	.37	.34	.35	.36	.38	.28	.22	.28	.85	.53	(.72)								
27. RC	2.61	1.20	.28	.19	.22	.34	.44	.54	.33	.41	.51	.47	.65	.57	.56	.62	.50	.53	.54	.47	.66	.59	.51	.60	.59	.39	.39	.27	(.91)							
28. RC1	2.88	1.24	.30	.22	.24	.33	.43	.50	.32	.35	.46	.48	.64	.54	.56	.61	.51	.55	.55	.48	.64	.55	.52	.53	.56	.37	.34	.30	.93	(.89)						
29. RC2	2.41	1.31	.23	.14*	.17	.30	.37	.47	.27	.38	.47	.38	.57	.51	.48	.53	.41	.43	.44	.38	.59	.54	.43	.57	.53	.37	.38	.20	.94	.75	(.87)					

Note. N = 349. M and SD are used to represent mean and standard deviation, respectively. Internal consistency coefficients, Cronbach's alphas are reported in the parentheses on the diagonal.

APPENDIX E: LLWI INDICATOR CORRELATION TABLES

Table E1. Cronbach's Alpha Confidence Intervals

Scale	Study 2		Study 3	
	Cronbach's α	95% CI (2000 Bootstrap Runs)	Cronbach's α	95% CI (2000 Bootstrap Runs)
1. OC	.92	[.91; .94]	.93	[.92; .94]
2. OC1	.91	[.89; .92]	.90	[.87; .92]
3. OC2	.88	[.86; .91]	.89	[.87; .91]
4. OC3	.90	[.88; .92]	.91	[.88; .93]
5. LE	.95	[.94; .96]	.95	[.94; .96]
6. WD	.91	[.90; .92]	.90	[.88; .91]
7. WD1	.84	[.82; .86]	.84	[.80; .87]
8. WD2	.78	[.75; .82]	.77	[.72; .82]
9. WD3	.88	[.85; .90]	.84	[.80; .88]
10. WD4	.86	[.84; .88]	.86	[.84; .89]
11. HM	.92	[.91; .93]	.91	[.89; .92]
12. HM1	.82	[.78; .85]	.81	[.76; .85]
13. HM2	.78	[.74; .81]	.77	[.72; .81]
14. HM3	.90	[.88; .92]	.87	[.84; .90]
15. ID	.90	[.89; .92]	.92	[.90; .93]
16. KM	.89	[.87; .90]	.90	[.88; .92]
17. KM1	.81	[.77; .83]	.83	[.79; .86]
18. KM2	.88	[.86; .90]	.87	[.84; .89]
19. TR	.94	[.94; .95]	.94	[.92; .95]
20. TR1	.90	[.87; .92]	.89	[.85; .91]
21. TR2	.87	[.85; .89]	.85	[.81; .87]
22. TR3	.92	[.90; .94]	.89	[.84; .92]
23. TR4	.94	[.93; .95]	.93	[.91; .95]
24. CE	.84	[.83; .87]	.86	[.83; .89]
25. CE1	.87	[.85; .89]	.89	[.86; .92]
26. CE2	.76	[.71; .80]	.72	[.64; .78]
27. RC	.90	[.89; .92]	.91	[.90; .93]
28. RC1	.88	[.86; .90]	.89	[.87; .92]
29. RC2	.87	[.83; .90]	.87	[.82; .91]

APPENDIX F: FINAL GERMAN LLWI SCALES (COPYRIGHTED BY THE AUTHORS)

Table F1. Final LLWI Scales in German (Copyrighted by the Authors. Approach the Authors for Permission to Use)

Code	German Items
OC Organisationsklima	
<i>OC1 Chancengleichheit</i>	
OC1-1	In unserer Organisation haben unabhängig vom Alter alle Beschäftigten die gleichen Möglichkeiten.
OC1-2	In unserer Organisation haben unabhängig vom Alter alle Beschäftigten die gleichen Chancen auf Weiterbildung.
OC1-3	In unserer Organisation haben unabhängig vom Alter alle Beschäftigten die gleichen Chancen auf Entwicklung ihrer Karriere.
<i>OC2 Positives Altersbild</i>	
OC2-1	In unserer Organisation herrscht eine positive Einstellung gegenüber älteren Beschäftigten.
OC2-2	In unserer Organisation werden ältere Beschäftigte als fähig wahrgenommen, sich Veränderungen gut anzupassen.
OC2-3	In unserer Organisation werden ältere Beschäftigte als kompetent wahrgenommen.
<i>OC3 Offene und zielgruppengerechte Kommunikation</i>	
OC3-1	In unserer Organisation werden Möglichkeiten des Arbeitens im Alter offen kommuniziert.
OC3-2	In unserer Organisation wird über das "Altern" offen gesprochen.
OC3-3	In unserer Organisation können Beschäftigte altersbedingte Herausforderungen und Probleme offen ansprechen (z.B. Leistungseinschränkungen, Schnelligkeit in der Bedienung digitaler Tools, Merkfähigkeit des Kurzzeitgedächtnis).
OC3-4	In unserer Organisation gibt es viel Verständnis für die Herausforderungen des Alterns.
LE Führung	
LE-1	Führungskräfte unserer Organisation zeigen Anerkennung sowohl für aktuelle Arbeitsergebnisse als auch für die Gesamtleistung ihrer Mitarbeiter.
LE-2	Führungskräfte unserer Organisation gewähren ihren Mitarbeitern Freiraum in der Gestaltung der Arbeit.
LE-3	Führungskräfte unserer Organisation nehmen sich Zeit für ihre Mitarbeiter.
LE-4	Führungskräfte unserer Organisation gehen auf persönliche Bedürfnisse und Lebensumstände ihrer Mitarbeiter ein.
LE-5	Führungskräfte unserer Organisation unterstützen ihre Mitarbeiter aufrichtig darin, sich beruflich und persönlich weiter zu entwickeln.
LE-6	Führungskräfte unserer Organisation sind an dem Befinden ihrer Mitarbeiter interessiert.
WD Arbeitsgestaltung	
<i>WD1 Flexible Arbeitszeiten</i>	
WD1-1	Die Beschäftigten unserer Organisation können den Beginn und das Ende ihrer täglichen Arbeitszeit an ihre individuellen Bedürfnisse anpassen.
WD1-2	Die Beschäftigten unserer Organisation können die Anzahl ihrer vertraglich vereinbarten Arbeitsstunden entsprechend ihrer individuellen Bedürfnisse reduzieren oder erhöhen.
WD1-3	Die Beschäftigten unserer Organisation können die Lage und die Länge ihrer Pausen an ihre individuellen Bedürfnisse anpassen.
WD1-4	Die Beschäftigten unserer Organisation haben ausreichend Flexibilität in der Arbeitszeitgestaltung, um auf unvorhergesehene Ereignisse im Privatleben angemessen reagieren zu können.
<i>WD2 Flexible Arbeitsorte</i>	
WD2-1	Die Beschäftigten unserer Organisation haben die Möglichkeit von zu Hause aus zu arbeiten.
WD2-2	Die Beschäftigten unserer Organisation haben die Möglichkeit, ihren Arbeitsort im Betrieb flexibel an ihre aktuellen Bedürfnisse anzupassen (z. B. stille Arbeitsplätze, Steharbeitsplätze, Projektarbeitsräume).
WD2-3	Die Beschäftigten unserer Organisation können ihren Arbeitsort so wählen, dass die Arbeit mit ihrem Privatleben gut zu vereinbaren ist (Work-Life Balance).
<i>WD3 Arbeit gemäß Leistungsfähigkeit</i>	
WD3-1	In unserer Organisation verändern Führungskräfte die Tätigkeiten ihrer Beschäftigten in absehbarer Zeit (z.B. innerhalb eines halben Jahres), sofern sie ihrer Leistungsfähigkeit und Belastungsfähigkeit nicht mehr entsprechen.
WD3-2	In unserer Organisation wird bei einseitigen oder hohen körperlichen Belastungen an Arbeitsplätzen auf eine entlastungsorientierte Rotation (regelmäßiger Arbeitsplatzwechsel) geachtet.
WD3-3	In unserer Organisation wird die Tätigkeit bei kognitiver Über- oder Unterforderung (sich viele Dinge merken, sich konzentrieren, schwierige Entscheidungen treffen müssen) in absehbarer Zeit verändert (z.B. innerhalb eines halben Jahres).

Code	German Items
<i>WD4 Ergonomische Arbeitsplatzbedingungen</i>	
WD4-1	In unserer Organisation werden Arbeitsplätze nach ergonomischen Empfehlungen gestaltet.
WD4-2	In unserer Organisation werden Vorschläge der Beschäftigten zu ergonomischen Verbesserungen aufgegriffen und möglichst umgesetzt.
WD4-3	In unserer Organisation können Beschäftigte die Lichtverhältnisse an ihrem Arbeitsplatz an ihre individuellen Bedürfnisse anpassen.
WD4-4	In unserer Organisation verwenden die Beschäftigten die am besten geeigneten Hilfsmittel, um körperliche Belastungen durch die Arbeit zu verringern.
HM Gesundheitsmanagement	
<i>HM1 Bewegungs- und Ernährungsangebote</i>	
HM1-1	Die Beschäftigten unserer Organisation erhalten Anreize und Möglichkeiten, sich gesund zu ernähren (z.B. über Vergünstigungen oder ein größeres Angebot im Vergleich zu den weniger gesunden Alternativen).
HM1-2	Die Beschäftigten unserer Organisation werden dazu ermutigt, sich möglichst viel am Arbeitsplatz zu bewegen (z.B. Nutzung der Treppen, Spaziergänge in der Mittagspause, kurzes Sportangebot in der Mittagspause, Nutzung des Fahrrads auf dem Arbeitsweg).
HM1-3	Die Beschäftigten unserer Organisation erhalten Anreize und Möglichkeiten, sich außerhalb der Arbeit sportlich zu betätigen (z.B. Betriebssportgruppen, Kooperationen mit Vereinen oder Fitnessstudios)
<i>HM2 Medizinische Angebote</i>	
HM2-1	In unserer Organisation erhalten die Beschäftigten regelmäßig medizinische Vorsorgeuntersuchungen (z.B. Schutzimpfungen, Belastungstests, Sehtest, Blutdruck).
HM2-2	In unserer Organisation gibt es spezielle Programme, um Beschäftigte nach längerer Krankheit gezielt wieder in den Beruf einzugliedern (z.B. medizinische oder therapeutische Angebote).
HM2-3	In unserer Organisation erhalten die Beschäftigten am Arbeitsplatz oder in der direkten Umgebung bei Bedarf therapeutische Hilfe (z.B. Physiotherapie bei körperlicher Überbeanspruchung oder Fehlbelastung).
<i>HM3 Gesundheitsförderung</i>	
HM3-1	In unserer Organisation werden die Beschäftigten für gesundheitsförderliches Verhalten sensibilisiert (z.B. durch Schulungen, Beratungsangebote, Aushänge).
HM3-2	In unserer Organisation setzen sich Führungskräfte und die Geschäftsführung für eine nachhaltig gesunde Lebens- und Arbeitsweise ihrer Mitarbeiter ein.
HM3-3	In unserer Organisation spielen gesundheitliche Aspekte in betrieblichen Entscheidungen eine relevante Rolle (z.B. bei Investitionsentscheidungen oder operativen Veränderungen)
ID Persönliche Entwicklung	
ID-1	In unserer Organisation werden für Beschäftigte jeden Alters Entwicklungsperspektiven und Qualifizierungsbedarfe identifiziert.
ID-2	In unserer Organisation führen Führungskräfte mit ihren Mitarbeitern jeden Alters regelmäßig Gespräche hinsichtlich ihrer beruflichen und persönlichen Perspektiven (z.B. Jahresgespräche).
ID-3	In unserer Organisation wissen Beschäftigte jeden Alters, wie sie sich weiterentwickeln können.
ID-4	In unserer Organisation werden auch älteren Beschäftigten Trainings zum Erlernen neuer Kompetenzen und Expertise angeboten.
ID-5	In unserer Organisation werden Trainingsmethoden so angepasst, dass auch die Bedürfnisse älterer Beschäftigter berücksichtigt werden (z.B. mehr praktische Lerntechniken anstelle von Vorlesungsformaten).
ID-6	In unserer Organisation werden Beschäftigte jeden Alters entsprechend ihrer Kompetenzen und Entwicklungsinteressen in Projekte eingebunden.
ID-7	In unserer Organisation sind bis ins hohe Alter Aufstiegsmöglichkeiten in Führungsfunktionen oder Spezialistenfunktionen möglich.
ID-8	In unserer Organisation wechseln die Beschäftigten in eine andere Tätigkeit oder Position, wenn diese ihren spezifischen Kompetenzen und Fähigkeiten besser entspricht.
KM Wissensmanagement	
<i>KM1 Institutionalisierte Wissenstransfer</i>	
KM1-1	In unserer Organisation existieren Mentoring Programme, in denen erfahrene Beschäftigte andere mit ihrem Wissen unterstützen.
KM1-2	In unserer Organisation existieren Prozesse / Abläufe, um die Kenntnisse und Erfahrungen älterer Beschäftigter vor ihrem Ausscheiden aus der Organisation systematisch an jüngere Kollegen weiterzugeben.

Code	German Items
KM1-3	In unserer Organisation existieren IT Systeme, die auch von älteren Beschäftigten für die Dokumentation und Verbreitung von Wissen genutzt werden.
KM1-4	In unserer Organisation gibt es für jeden Beschäftigten regelmäßig Gelegenheit, Erfahrungen und Kenntnisse auszutauschen (z.B. Erfahrungsaustauschrunden).
<i>KM2 Inter-generative Zusammenarbeit</i>	
KM2-1	In unserer Organisation sind ältere und jüngere Beschäftigte dazu angehalten, ihr Wissen und ihre Erfahrungen untereinander auszutauschen.
KM2-2	In unserer Organisation unterstützen die Führungskräfte den Wissensaustausch zwischen jüngeren und älteren Beschäftigten.
KM2-3	In unserer Organisation geben die Beschäftigten ihr Wissen an Kollegen anderer Generationen (jünger oder älter) weiter.
TR Übergang in den Ruhestand	
<i>TR1 Frühzeitige Übergangsplanung</i>	
TR1-1	In unserer Organisation besprechen Führungskräfte mit ihren Beschäftigten frühzeitig (z.B. ab einem Alter von 55 Jahren), wie der Übergang in den Ruhestand gestaltet werden soll.
TR1-2	In unserer Organisation nehmen sich Führungskräfte Zeit, um den Übergang in den Ruhestand einzelner Beschäftigter zu planen.
TR1-3	In unserer Organisation ist die Nachfolge für den Beschäftigten, der in den Ruhestand geht, frühzeitig geplant.
<i>TR2 Altersteilzeit und individuelle Übergangslösungen</i>	
TR2-1	In unserer Organisation haben Beschäftigte die Möglichkeit, die letzten Jahre vor Eintritt in den Ruhestand ihre wöchentliche Arbeitszeit zu reduzieren (Teilzeit).
TR2-2	In unserer Organisation können Beschäftigte durch geblockte Altersteilzeit früher in den Ruhestand gehen.
TR2-3	In unserer Organisation können Beschäftigte vor Eintritt in den Ruhestand ihre Arbeitszeit individuell gestalten (z.B. Gleitzeit oder bei Schichtarbeit keine Nachtschichten).
TR2-4	In unserer Organisation wird der Übergang in den Ruhestand flexibel nach den Bedürfnissen der Beschäftigten gestaltet.
<i>TR3 Beratung zur Vorbereitung des Lebens im Ruhestand</i>	
TR3-1	Unsere Organisation bietet Beschäftigten, die kurz vor dem Eintritt in den Ruhestand stehen, Beratungsangebote, um ihre Erwartungen und Pläne für den Ruhestand zu reflektieren.
TR3-2	Unsere Organisation ermutigt Beschäftigte, die kurz vor dem Eintritt in den Ruhestand stehen, alternative Aktivitäten für eine sinnvolle Tagesgestaltung im Ruhestand aufzubauen (z.B. Ehrenamt, Reisen, Familie).
TR3-3	Unsere Organisation bietet Beschäftigten Informationen zum Thema Ruhestand (z.B. Artikel, Broschüren, Bücher, Internet- / Intranetseiten).
<i>TR4 Fortlaufende Einbindung und Kontaktpflege</i>	
TR4-1	Unsere Organisation hält zu ehemaligen Beschäftigten im Ruhestand aktiven Kontakt (z.B. in Form eines Alumni Netzwerkes).
TR4-2	Unsere Organisation informiert ehemalige Beschäftigte im Ruhestand über die aktuellen Entwicklungen im Unternehmen (z.B. Newsletter, Alumni-Newsletter).
TR4-3	Unsere Organisation ermöglicht es ehemaligen Beschäftigten im Ruhestand sich regelmäßig auszutauschen (z.B. bei Treffen eines Alumni-Netzwerkes).
TR4-4	Unsere Organisation steht mit dem Großteil der ehemaligen Beschäftigten auch 5 Jahre nach deren Eintritt in den Ruhestand noch in aktivem Kontakt.
CE Weiterbeschäftigung nach Renteneintritt	
<i>CE1 Individualisierte Beschäftigungslösungen</i>	
CE1-1	In unserer Organisation können (ehemalige) Beschäftigte über das Rentenalter hinaus tätig sein, sofern dies ihrem Wunsch entspricht.
CE1-2	In unserer Organisation sind Beschäftigungsmöglichkeiten für Personen im Rentenalter klar definiert und strukturiert (z.B. durch Integration in die strategische Personalplanung).
CE1-3	In unserer Organisation sind Führungskräfte über die Möglichkeiten einer Weiterbeschäftigung ihrer Mitarbeiter im Rentenalter gut informiert.
CE1-4	In unserer Organisation werden die Arbeitsbedingungen (Zeit und Art der Tätigkeit) für Beschäftigte im Rentenalter flexibel an deren Wünsche angepasst.
<i>CE2 (Wieder-) Einstellung von älteren Beschäftigten</i>	
CE2-1	In unserer Organisation werden auch ältere Bewerber eingestellt.
CE2-2	In unserer Organisation wird in der Personalwerbung (z.B. Stellenausschreibungen) auf eine altersunabhängige Formulierung geachtet.
CE2-3	In unserer Organisation bewerben sich auf ausgeschriebene Stellen Erwerbstätige aller Altersgruppen.

Code	German Items
RC Versicherungen und Vorsorge	
<i>RC1 Altersvorsorge</i>	
RC1-1	Unsere Organisation informiert die Beschäftigten gut über die Bestandteile einer finanziellen Versorgung im Alter (z.B. gesetzlich, betrieblich, privat, Weiterbeschäftigung im Rentenalter).
RC1-2	Unsere Organisation bietet seinen Beschäftigten umfassende Möglichkeiten, Gelder für das Rentenalter anzusparen.
RC1-3	Unsere Organisation bietet den Beschäftigten eine gute persönliche Beratung zu ihrer finanziellen Versorgung im Alter an.
<i>RC2 (Kranken-) Versicherungen und finanzielle Unterstützung in Notlagen</i>	
RC2-1	Unsere Organisation informiert die Beschäftigten gut über sinnvolle private Zusatzversicherungen, die altersbedingte Risiken abdecken (z.B. Ergänzungen zu Kranken- oder Pflegeversicherung, Berufsunfähigkeitsversicherung).
RC2-2	Unsere Organisation bietet den Beschäftigten private Zusatzversicherungen als Teil des Gesamt-Vergütungspaketes (z.B. Ergänzungen zu Kranken- oder Pflegeversicherung, Berufsunfähigkeit).

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