

Age Diversity Management in Organizations Scale: Development and Evidence of Validity

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Abstract

This study aimed to develop the Age Diversity Management in Organizations scale for the Brazilian context and verify its evidence of validity. The process included five steps: proposal of its definition and development of the items according to the literature; content and semantic validity by judges; semantic validity by the target population; exploratory factorial analysis (EFA); and confirmatory factorial analysis (CFA). The EFA sample consisted of 674 workers from different organizations and the CFA of 722 workers. The final version of the scale was composed of 20 items ($\alpha=.91$), divided into four factors: retirement preparation practices (5 items, $\alpha=.93$); equal treatment for workers of different ages (6 items, $\alpha=.85$), training to promote age diversity (5 items, $\alpha=.81$), and management practices for older workers (4 items, $\alpha=.72$). The theoretical and practical implications as well as the limitations of this measure are discussed.

Keywords: Test construction; Factor analysis; Organizational psychology; Age diversity

Escala Gestão da Diversidade Etária nas Organizações: Desenvolvimento e Evidências de Validade

Resumo

Este estudo objetivou desenvolver e identificar os indícios de validade da escala Gestão da Diversidade Etária nas Organizações (GeDEO) para o contexto brasileiro. Esse processo incluiu cinco etapas: proposição do conceito e redação dos itens à luz da literatura; validade de conteúdo e semântica por juízes; validação semântica pelo público-alvo; análise fatorial exploratória (AFE) e análise fatorial confirmatória (AFC). A amostra da AFE foi composta por 674 trabalhadores de diversas organizações e, a da AFC, por 722. A versão final possui 20 itens ($\alpha = 0,91$), com quatro fatores: práticas de preparação para aposentadoria (5 itens, $\alpha = 0,93$); tratamento equânime a trabalhadores de diferentes idades (6 itens, $\alpha = 0,85$); treinamento para promoção da diversidade etária (5 itens, $\alpha = 0,81$) e práticas de gestão de pessoas a trabalhadores mais velhos (4 itens, $\alpha = 0,72$). As implicações teórico-práticas e as limitações desta medida são discutidas.

Palavras-chave: construção do teste, análise fatorial, psicologia organizacional, diversidade etária

Escala Gestión de la Diversidad de Edades en las Organizaciones: Desarrollo y Evidencias de Validez

Resumen

El objetivo fue desarrollar e identificar las evidencias de validez de la escala de Gestión de la Diversidad de Edades en las Organizaciones para el contexto brasileño. Este proceso incluyó cinco pasos: propuesta del concepto y desarrollo de los ítems; validez de contenido y semántica por los jueces; validez semántica por parte de la población objetivo; análisis factorial exploratorio (AFE) y análisis factorial confirmatorio (AFC). La muestra de AFE consistió en 674 trabajadores de diferentes organizaciones, y la de AFC, en 722. La versión final contiene 20 ítems ($\alpha = 0,91$), divididos en cuatro factores: prácticas de preparación para la jubilación (5 ítems, $\alpha = 0,93$); igualdad de trato para los trabajadores de diferentes edades (6 ítems, $\alpha = 0,85$), capacitación para promover la diversidad de edades (5 ítems, $\alpha = 0,81$) y prácticas de gestión para trabajadores mayores (4 ítems, $\alpha = 0,72$). Se discuten las implicaciones teóricas y prácticas, así como las limitaciones de esta medida.

Palabras clave: Construcción de test; Análisis factorial; Psicología organizacional; Diversidad de edad

Introduction

Gray tsunami is a term that demographer José Eustáquio Diniz Alves chose to characterize the strong and rapid population aging in Brazil. According to estimates by the World Health Organization (WHO), while France took 145 years to double the older adult population, this is happening in Brazil in just 25 years. This tsunami has several consequences, including this portion of the population remaining in the labor market for longer (Alves, 2018).

According to the National Household Sample Survey, at the end of 2019, analyzing Brazilians of working age, that is, 14 years of age or older: 7.3% were aged between 14 and 17 years; 12.9% were people between 18 and 24 years; 27.7% represented the portion between 25 and 39 years of age and 32.3% were between 40 and 59 years. Those considered older adults by the WHO for developing countries, 60 years of age or older, represented 19.8% (PNAD, 2019).

The portions of the population that have the greatest difficulty in entering and remaining in the

labor market are the youngest and the oldest. While younger people suffer from the prejudice of lack of experience and low commitment, many managers have the belief that keeping older workers is financially costly. In fact, some studies have found that older workers are more likely to suffer serious and fatal injuries in the workplace and are the least likely to return to work after having an accident. With age, the occurrence of chronic diseases such as diabetes, cancer, hypertension and respiratory diseases also increases (NIOSH, 2018).

Conversely, there are studies that indicate that the relationship between age and other variables related to safety, health and well-being at work is uncertain, gradual and complex. There are also studies that have identified that the diversity of knowledge and experiences, intrinsic motivation, and job satisfaction tend to increase with age (Ng & Feldman, 2008), while counterproductive work behaviors tend to decrease in older workers (O'Driscoll & Roche, 2015).

Organizations have a fundamental role in relation to attracting, retaining and recognizing workers of different ages and, therefore, the international literature has advocated the implementation of people management practices and interventions in the work environment that are friendly to workers of all ages, known as age-friendly work practices, age-friendly workplaces or age management (Barabasch et al., 2012; Mazur-Wierzbicka, 2018). Although a group of Brazilian scholars have opted for the term Age Management (Cepellos, 2018; Cepellos & Tonelli, 2017), in this study, policies, practices and actions of people management aimed at the recognition, integration and training of a collective of diverse workers with regard to age are being called Age Diversity Management in Organizations (*Gestão da Diversidade Etária nas Organizações* - GeDEO).

This study aims to present the process of construction and identification of the evidence of validity for the Age Diversity Management in Organizations Scale for the Brazilian population. The dimensions that compose the construct and measures identified in the literature are presented in the topic that follows.

Dimensions and Scales related to the Construct

Several dimensions have been discussed in the international scientific literature in relation to the promotion of age diversity management, namely: care for the physical and mental health of older workers; combating age prejudice; promoting intergenerational

learning and offering flexible working hours (Armstrong-Stassen, 2008; Barabasch et al., 2012; Cebulla & Wilkinson, 2019; Peiró et al., 2013; Truxillo et al., 2015).

Care for the physical and mental health of older workers can be promoted, for example, by offering preventive programs, such as Retirement Preparation Programs (RPPs). Those that prepare for retirement throughout their careers are better adapted to this stage of life (França et al., 2014; Mazur-Wierzbicka, 2018; Noone et al., 2009). The ergonomic adaptation of the workplace, the equipment and work materials represent another way of taking care of the health of these workers. After a certain age, the worker may have loss of visual acuity, hearing, or muscle tone, making it necessary to make ergonomic changes or relocate them to a position that does not require too much physical effort (Cebulla & Wilkinson, 2019; França et al., 2017; Truxillo et al., 2015).

Age discrimination can be combated by the equitable treatment of employees that is manifested from the recruitment and selection, to the rules of growth and functional progression until retirement and also through talks and awareness campaigns for managers and workers (França et al., 2017; Mazur-Wierzbicka, 2018). Work teams composed of people from different generations also contribute to combat demonstrations of ageism and encourage respect for age diversity (Choi et al., 2018; Peiró et al., 2012; Rudolph & Zacher, 2017).

The promotion of lifelong learning (continuous and intergenerational) represents another dimension indicated as fundamental for promoting age diversity management. Enabling older workers to act as mentors is a way of recognizing them for their skills, promoting integration between the generations and preserving the institutional memory. In addition, it is important to ensure equitable access to training opportunities and the continuous updating of learning gaps for all employees (Armstrong-Stassen, 2008; Mazur-Wierzbicka, 2018; Moen et al., 2017; Truxillo et al., 2015).

Several studies have also shown that workers that have a flexible working day - such as flexible working hours (being able to arrive late or leave early), part-time working hours, teleworking options (home office), and/or reduce the workload close to retirement (phased retirement) tend to postpone retirement and report greater job satisfaction (Arvola et al., 2017; Cebulla & Wilkinson, 2019; Choi et al., 2018; Moen et al., 2017). A study of workers with chronic illnesses (e.g., arthritis, cardiovascular disease, sleep disorders) found that those with flexible work options reported

less that their health problems were work-related (Vanajan et al., 2020).

These dimensions have been classified into two categories in the international scientific literature: age-neutral practices and age-specific practices. While the neutral practices are especially focused on promoting age diversity and are aimed at workers of all ages, specific ones aim to combat age prejudice towards older workers with a focus on attracting and retaining these professionals, both being complementary in terms of age diversity management (Cebulla & Wilkinson, 2019; Froidevaux et al., 2020).

When researching the measurement instruments that contemplate the dimensions mentioned in the scientific literature, we found a people management practices scale aimed at mature workers in Canada (Armstrong-Stassen, 2008). The measure has 28 items divided into seven facets: flexible work options, job redesign, training for mature workers, training for managers, different performance evaluation practices, specific benefits system and, finally, practices of recognition and respect. The instrument has good psychometric qualities, however, it reflects the Canadian reality and would not make sense if fully adapted to the reality of another country, such as Brazil (Armstrong-Stassen, 2008). A measure with only five items was developed by Swiss researchers that included concepts such as: age-neutral recruitment practices; equitable offer of training to workers of different ages; opportunities for functional growth and progression, regardless of age; training and educating managers on how to deal with an age-diverse workforce; and promoting an age-friendly organizational culture. The measure's reliability index, however, was low (.66) (Boehm et al., 2014).

A measure identified in the Brazilian literature, called Age Management Practices, has 27 items divided into four dimensions developed from responses of HR managers: recruitment and selection, training and learning, health and retirement, and benefits (Cepellos & Tonelli, 2017). Despite the dimensions proving to be adequate and a reported single-factor internal consistency index of .88, the factor reliability indices, the results of the exploratory factor analysis and other validity indices were not presented, aspects that limit the quality of this scale. Furthermore, it is answered only by managers.

Despite the contributions and the innovative character of the three instruments presented, socio-cultural, methodological and psychometric limitations indicate the relevance of developing and identifying the

evidence of validity of a scale for managing age diversity in organizations in the Brazilian context. Accordingly, the present study consisted of five steps to achieve this objective, the first three being related to the scale construction process and, the final two, to the identification of indications of validity and reliability: (a) proposition of the concept and development of the factors and items of the scale; (b) submission of these to content and semantic validity by judges; (c) performance of semantic validation by the target audience; (d) analysis of the results of the exploratory factor analysis (EFA); (e) verification of the factorial solution through confirmatory factor analysis (CFA).

Method

Proposition of the Concept and Presentation of the Pre-empirical Version of the Scale

Age Diversity Management in Organizations (GeDEO, in Portuguese) was defined as people management policies and practices aimed at the recognition, integration and training of a diverse group of workers with regard to age. The concept of the construct precedes the operational definition of the dimensions and the wording of the items (Pasquali, 2012).

Taking into account the literature cited in this article, the international (Armstrong-Stassen, 2008; Boehm et al., 2014) and national (Cepellos & Tonelli, 2017) measurement instruments referring to the construct, and the professional experience of the first author on the topic, the initial version of the measure was developed, including 40 items, divided into seven dimensions: 1. Flexibility of working hours (7 items); 2. Retirement preparation practices (7 items); 3. Informational support (4 items); 4. Skills and tasks update (5 items); 5. Professional growth (4 items); 6. Recognition of older workers (6 items); and 7. Integration of workers of different ages (7 items). We chose to present this first stage of the study in the Method section, since it preceded the other empirical procedures.

Content Validity and Semantics by Judges

The analysis of content and semantic validity evidence was conducted by seven expert judges: two professors and researchers on retirement, two specialists in the construction of psychological instruments and three professionals responsible for conducting Retirement Preparation Programs. The literature indicates the importance of an odd number of judges to facilitate any possible tiebreaker. As this construct is

still very new, even for specialists, an item was considered adequate when at least 70% agreed on the assessed dimension (Pasquali, 2012).

Semantic Validity by Target Audience

The second semantic analysis consisted of applying the measure to the target population to assess the clarity and comprehension of the items. A total of 34 workers, men and women, of different ages, educational levels and positions of a public government institution participated in this stage in a face-to-face way.

Identification of Validity and Reliability Evidence

To identify the validity evidence of the final version of the scale, workers 40 years of age or older were invited to participate in a study on retirement and related variables, including this measure and sociodemographic questions. After excluding omissions and extreme cases, 1396 responded to the GeDEO scale. This sample was randomly divided into two, so that 674 people comprised the sample for the exploratory factor analysis (EFA) and 722, for the confirmatory (CFA).

EFA and CFA: Participants

The EFA sample consisted of 674 workers from different organizations. The criterion of at least 10 cases per item for performing the EFA was fulfilled (Tabachnick & Fidell, 2019). Most participants were male (58.1%), aged 40 to 72 years ($M=49.5$; $SD=6.4$), 60.3% were married, 75.0% had an income of at least eight times the minimum monthly salary and 83.6% lived in Brasília, Distrito Federal. Regarding the level of education, 79.6% had at least completed higher education and a specialization. Regarding the type of organization, 49.7% worked in a mixed economy company, 36.8% in public organizations, 9.8% in public companies, 3.3% in private companies and 0.5% in third sector organizations. A total of 34.0% had held the same position for at least 15 years and 65.3% had worked in the same organization for at least 15 years.

Among the 722 people that made up the CFA sample, more than half of the participants were men (56.3%), with ages ranging from 40 to 74 years ($M=49.3$; $SD=6.8$) and the majority were married (58.3%). Regarding monthly income, 72.2% received at least eight monthly minimum wages and 88.3% lived in Brasília. Concerning the level of education, 78.5% had completed higher education and a specialization (of these, 13.6% had a Master's degree and 7.2% had a Doctoral degree). Furthermore, 53.7% worked in a

mixed-capital company and 33.0% in public organizations. Regarding the length of time in the position, 28.4% had occupied the same position for at least 15 years and 60.1% had been in the same organization for at least 15 years.

EFA and CFA: Instrument

Respondents were asked to indicate how much they agreed or disagreed with the 39 statements about the existence of a specific people management practice in the organization/company where they were working when they responded to the questionnaire according to a 5-point Likert-type scale (1=totally disagree to 5=totally agree). It was highlighted in the instruction that the practice did not need to be institutionalized, that is, the respondent had to report whether they observed that management practice and not about its standardization.

EFA and CFA: Procedures

The questionnaire was stored in the Qualtrics online survey software, which was disseminated through email lists and social networks. The study was approved by the Ethics Committee for Research in Social and Human Sciences of the University of Brasília (Authorization No. 2.183.771). The first page of the questionnaire contained the consent terms, with the description of the aims of the study, the length of time for the response, the voluntary and anonymous nature of the study, the report that the project was approved by the Research Ethics Committee, and the contacts and institutional affiliation of the researchers.

EFA and CFA: Data analysis

After analysis and treatment of missing data and extreme cases, the correlation matrix, the Kaiser-Mayer-Olkin (KMO) criterion and Bartlett's sphericity test were inspected to verify whether the data matrix was factorable (Tabachnick & Fidell, 2019). The number of factors was defined through main component analysis and considered multiple criteria: the scree plot analysis, the Kaiser-Guttman criterion (factor retention with eigenvalue >1), the explained variance percentage and the parallel analysis (comparison of empirical and random eigenvalues). The Principal Axis Factoring extraction method (Promax rotation) was chosen and the EFA was performed using the SPSS version 22 software. The parallel analysis was performed using free software: <https://analytics.gonzaga.edu/parallelengine/>

The CFA was carried out using the AMOS 21.0 software (Analysis of Moment Structures), adopting the maximum likelihood estimation. The following indicators of a confirmatory model with a good fit were used: weighted chi-square (ratio of chi-square to degrees of freedom, χ^2/df) less than 5; CFI (*Comparative Fit Index*) and GFI (*Goodness-of-Fit Index*) equal to or greater than .90; NFI (Normed Fit Index) greater than .95; and SRMR (Standardized Root Mean Residual) and RMSEA (Root Mean Square Error of Approximation) less than .08 (Byrne, 2010). In addition, average variance extracted and composite reliability were calculated in order to verify other reliability indicators (Valentini & Damásio, 2016).

Results

Content Validity and Semantics by Judges

Five items were unanimously classified by the experts (100%), thirteen items had a content validity index (CVI) of 85.7% and 9 of 71.4%. In other words, 27 items were maintained and 13 were re-analyzed based on the theory and on the indications made by the judges, to decide whether they would be excluded or not. Regarding semantic validation, five judges marked all 40 items in the first version of the scale as understandable. Two marked four items as incomprehensible, and adjustments in the wording of these were accepted. No judge indicated suggestions for improvement in the definition of the age diversity management construct or in the instrument's instructions.

Semantic Validity by Target Public

Among the 34 participants, 20 marked the items as very or fully understandable and did not indicate any suggestion for changes. Among the 14 participants that indicated one or a few changes, most of them were accepted because they improved the items' clarity and comprehension. The informational support factor, which referred to whether the organization has any doubts about the legal criteria for retirement and whether booklets or information on this subject are distributed, was incorporated into the retirement preparation factor.

After analyzing the contributions of the judges and workers, two items were excluded and one item was added, with the second version including 39 items divided into six dimensions. Table 1 presents the names, operational definitions and number of items for each of the dimensions of the proposed version prior to being submitted to factor analysis.

Results of the EFA

The factor analysis of the 39 items revealed KMO=.94, rated as excellent by Pasquali (2012), with Bartlett's test being significant ($\chi^2=14552.62$; $p < .01$). The majority (95%) of item-item correlations were also significant ($p < .05$), however, only 44% exceeded .30. The assumptions of normality, linearity and multicollinearity were verified and fulfilled. The Kaiser-Guttman criterion indicated the existence of up to seven dimensions, however, the percentage of explained variance for

Table 1.

Names, Definitions and Number of Items for each Factor of the First Version of the GeDEO

Name	Operational definition	Items
F1 - Retirement preparation practices	Offer and dissemination of talks, events, programs and/or materials that aim to help workers plan for retirement.	11
F2 - Professional growth	Equal opportunities for career growth, as well as for occupying management positions.	4
F3 - Recognition of older workers	Practices aimed at the recognition of older workers.	7
F4 - Update of skills and tasks	Offers of training and adjustments in the nature of tasks in order to make work more attractive to older workers.	6
F5 - Integration of workers of different ages	Practices that promote the mixing of workers from different generations.	5
F6 - Flexibility of hours	Flexible work options for workers, especially those close to retirement.	6
Total		39

factors five, six and seven was less than 4%. The scree plot and the parallel analysis indicated the existence of five factors because the empirical eigenvalue of the sixth factor (1.15) was lower than the corresponding random eigenvalue (1.29). The factorial solutions (Principal Axis Factoring, Promax rotation) with six, five and four factors were analyzed and it was found that the four-factor solution presented the dimensions indicated in the literature more clearly.

The four-factor solution explained, in total, 52.45% of the variance of the data, a percentage that represents a high explanation of the construct. The search for parsimony and greater practicality of the instrument led the researchers to decide on a more concise version. Accordingly, the items were reevaluated prioritizing the exclusion of those that: (a) presented factor loadings below .40; (b) had a factor loading in two or more factors; and (c) were criticized by the judges in the content and semantic analysis process. After this analysis process, 19 items were excluded. Table 2 shows the factor loadings of the four-factor solution, with 20 items, in English and in Portuguese from Brazil.

The Cronbach's alpha of the global GeDEO scale, a single factor solution, was .91, considered an excellent indicator of internal consistency. Analyzing the factors, there was one factor with excellent internal consistency (F1=.93), two good (F2=.85 and F3=.81) and one acceptable (F4=.72) (Pasquali, 2012). This version was then submitted to confirmatory factor analysis in order to test the structure found.

Results of the CFA

The four-factor, 20-item model presented an adequate fit, with indices that met the requirements indicated by Byrne (2010): $X^2(163, N=722)=700.43$, $p < .001$, $X^2/df=4.30$, CFI=.93, GFI=.91, NFI=.91, SRMR=.071 and RMSEA=.068. Reliability indicators were also verified, representing indicators of the quality of the structural model of this scale: the composite reliability and the average variance extracted by factor (Valentini & Damásio, 2016).

Confirmatory factor analysis revealed that Jöreskog's rho of the complete model had the same value ($\rho=.91$) as the Cronbach's alpha of the global scale. In addition, the composite reliability values for each factor were: factor 1=.95, factor 2=.96, factor 3=.88 and factor 4=.81. As all values were greater than .70, it appears that the instrument has good levels of reliability. The average variance extracted from each of the GeDEO

factors were as follows: factor 1=1.50, factor 2=3.89, factor 3=0.77 and factor 4=0.65. All being higher than 0.50 indicates that they are adequate, as each factor was explained by more than half of the variance (Valentini & Damásio, 2016).

To examine the discriminant validity, Pearson's correlation coefficients between the factors were analyzed. The lowest correlation was between factor 1 and factor 4 (.332) and the highest correlation was between factors 2 and 3 (.591), with $p < .01$ in all of them. With all values being less than .70, it can be said that the factors are different from each other. Whether the average variances extracted from the factors exceeded the square of the correlation between them was also verified, since the construct should explain its items better than another construct. The average variances extracted from the GeDEO factors varied between 0.65 and 3.89, exceeding the square of their correlations (which varied between 0.11 and 0.35), corroborating another discriminant validity index.

Factors of the GeDEO in this Sample

The first factor (F1 in Table 2) was called Retirement Preparation Practices and the items express whether the organization offers workers the minimum expected in terms of retirement preparation practices (e.g., talks and specific actions, programs offered to workers near to retirement) or whether it offers a more prevention based program (for example, programs with several meetings and themes, open to all workers). Comparing the proposed version based on the literature (Table 1), with the version found after the analyses (Table 2), it was observed that Factor 1 remained and represents the strongest of the scale, as shown by the percentage of explained variance (32.06%). Factor 2 (F2 in Table 2) was named Equal Treatment for Workers of Different Ages and refers to equal opportunities for workers of different ages to grow and remain in their careers, to be promoted and to hold management positions. An important item is the respect observed by workers for those that have already fulfilled the legal criteria for retiring, however, choose to postpone it. Factor 2 of the final version included items from factors 2, 3 and 5 of the version initially proposed (Table 1).

Factor 3 (F3 in Table 2) was entitled Training for Age Diversity Promotion and reveals the importance of preserving institutional memory in the organization through the promotion of intergenerational learning. The items deal with updating the skills of older

Table 2.
Factorial Solution of the Age Diversity Management in Organizations (GeDEO) Scale

Items	Factors				R^2
	F1	F2	F3	F4	
My organization offers a retirement preparation program for workers that are close to retirement. A minha organização oferece programa de preparação para aposentadoria aos trabalhadores que estão próximos da aposentadoria.	.92				.80
My organization publicizes the talks, events or retirement preparation programs it offers. A minha organização divulga as palestras, eventos ou programas de preparação para aposentadoria que ela oferece.	.87				.71
My organization offers a retirement preparation program with several meetings and different topics. A minha organização oferece programa de preparação para aposentadoria com vários encontros e temas diversificados.	.86				.71
My organization provides talks or specific actions to prepare for retirement. A minha organização proporciona palestras ou ações pontuais de preparação para aposentadoria.	.86				.73
My organization offers a retirement preparation program for all workers. A minha organização oferece programa de preparação para aposentadoria a todos os trabalhadores.	.84				.75
My organization allows workers of all ages to grow in their careers equally. A minha organização permite que trabalhadores de todas as idades possam crescer na carreira de forma igualitária.		.77			.70
My organization provides equal opportunities for younger and older workers to occupy managerial positions. A minha organização proporciona oportunidades iguais para que os trabalhadores mais jovens e mais velhos ocupem cargos de chefia.		.76			.71
My organization offers equal opportunities for younger and older workers to be promoted. A minha organização oferece oportunidades iguais para que os trabalhadores mais jovens e mais velhos sejam promovidos.		.69			.62
My organization respects workers that can already retire, but choose to postpone it. A minha organização respeita os trabalhadores que já podem se aposentar, mas optam por adiá-la.		.62			.41
My work environment is pleasant for workers of all ages. O meu ambiente de trabalho é agradável a trabalhadores de todas as idades.		.55			.49
In my organization, work teams are made up of workers from different generations. Na minha organização, as equipes de trabalho são formadas por trabalhadores de diferentes gerações.		.46			.30
My organization provides training for older workers to acquire and/or update knowledge and skills related to the job. A minha organização disponibiliza treinamentos para que os trabalhadores mais velhos adquiram e/ou atualizem conhecimentos e habilidades relacionadas ao cargo.			.56		.53
My organization invites the most experienced workers to act as mentors, passing on their knowledge to those that will replace them in the future. A minha organização convida os trabalhadores mais experientes a atuar como mentores, repassando seus conhecimentos aos que irão substituí-los no futuro.			.47		.49
Managers encourage workers of different ages and backgrounds to learn from each other. As chefias incentivam trabalhadores de diferentes idades e experiências a aprenderem uns com os outros.			.45		.53

(Continued)

Table 2.
Factorial Solution of the Age Diversity Management in Organizations (GeDEO) Scale (Continuation)

Items	Factors				<i>I</i> ²
	F1	F2	F3	F4	
My organization offers training to managers on how to integrate workers from different generations. A minha organização oferece treinamentos aos gestores sobre como integrar trabalhadores de diferentes gerações.			.44		.55
In my organization, there are actions to raise awareness among the workers about the importance of respecting older workers. Na minha organização, há ações de sensibilização dos trabalhadores sobre a importância de respeitar os trabalhadores mais velhos.			.42		.54
Workers that apply for their retirement are granted a reduction in the number of hours. Trabalhadores que fazem o pedido de suas aposentadorias são contemplados com uma redução de carga horária.				.92	.44
Workers that apply for retirement may experience a reduction in the workload until their definitive departure. Trabalhadores que entraram com o pedido de aposentadoria podem ter redução de carga horária de trabalho até a saída definitiva.				.86	.49
My organization distributes tasks considering the knowledge and skills of the older workers. A minha organização distribui as tarefas considerando os conhecimentos e as habilidades dos trabalhadores mais velhos.				.58	.53
My organization allows older workers to be relocated according to their interests. A minha organização permite que os trabalhadores mais velhos sejam realocados em função dos seus interesses.				.52	.50
Number of Items	5	6	5	4	
% of explained variance	32.06	9.72	5.97	4.70	
Cronbach's alpha	.93	.85	.81	.72	

workers, the possibility of acting as mentors, and the offer of training to reduce age prejudice and encourage learning among workers of different ages. Factor 3 of the final version comprised items mainly from factor 4 of the previous version, with some from factors 3 and 5 of the proposed version (Table 1). Finally, factor 4 (F4 in Table 2), entitled People Management Practices for Older Workers, incorporated items from factors 6 and 4 of the initial version (Table 1). This factor deals with flexible working hours for workers that have applied for retirement, as well as the reallocation and distribution of tasks to older workers, considering their skills and interests.

Table 3 presents the descriptive results of the factors and of the final version of the GeDEO. The means and medians below the midpoint of the scale reveal that these practices are still little adopted in Brazilian organizations, according to the participants' perception. The proximity of the mean and median values indicates the

homogeneous perception of the respondents, despite working in different organizations. Considering that factor 4 received the lowest mean, median and mode, it appears that the flexibility of hours represents a practice that is offered even less than the others. The standard deviation of factor 1 being the highest confirms that there are organizations that have been offering RPPs for some time, however, there are also those that have never offered them.

Discussion

This study developed the Age Diversity Management in Organizations (GeDEO) scale and investigated its evidence of validity. The scale consists of 20 items divided into four factors: retirement preparation practices; equal treatment for workers of different ages, training for age diversity promotion, and people management practices for older workers. Statistical analyses

Table 3.
Descriptive Statistics of the GeDEO and its Dimensions (N = 1396)

	Mean	Median	Mode	Standard deviation	Minimum	Maximum
F1 - Retirement preparation practices	2.94	3.00	4.00	1.04	1.00	5.00
F2 - Equal treatment for workers of different ages	3.33	3.33	4.00	0.77	1.00	5.00
F3 - Training for the promotion of age diversity	2.72	2.80	3.00	0.79	1.00	5.00
F4 - People management practices for older workers	2.23	2.25	2.00	0.70	1.00	5.00
GeDEO	2.86	2.90	3.00	0.64	1.00	5.00

revealed that the instrument has satisfactory levels of convergent, divergent and reliability validity and future studies may choose to apply its dimensions or the single factor version.

Leaner instruments allow studies to combine their application with that of other constructs and to test complex models. Therefore, we opted to propose a final version with half of the items that were initially proposed. The construction of the GeDEO was inspired and based on the scales available in the literature, including nine age-specific items, as adopted by Armstrong-Stassen (2008) and 11 age-neutral items, such as those that make up the instrument of Boehm et al. (2014). The mix of neutral and specific practices has been indicated by recent literature in the area (Froidevaux et al., 2020). The study also stands out due to the methodological rigor in the construction and identification of evidence of validity, as indicated by Pasquali (2012) and Valentini and Damásio (2016), which was not reported in national (Cepellos & Tonelli, 2017; França et al., 2014) or international (Boehm et al., 2014) publications.

The proposed measurement instrument highlights Brazilian legislation by indicating the offer of Retirement Planning Programs, which are required by the National Older Adult Policy, the Older Adult Statute (França et al., 2014; Murta et al., 2014) and by Ordinance No. 12 of November 20, 2018, which establishes the general guidelines for promoting retirement education for public employees. The difference is that the first two indicate the offer of RPPs at only one to two years prior to retirement. The Ordinance, on the other hand, presents a more preventive perspective, and indicates the offer of RPPs to people of all ages. Studies

reveal that preparing for retirement throughout the life cycle is more effective for achieving well-being and better quality of life in old age and in the post-career period (Noone et al., 2009).

The possibility of helping workers to prepare themselves in different dimensions for the post-career period is insufficient if it is not accompanied by other practices. The other dimensions that make up the GeDEO reveal fundamental aspects for promoting age diversity and combating ageism, such as opportunities for treatment, recognition, growth and learning for younger and older workers (Moen et al., 2017; Truxillo et al., 2015), as well as offering flexible working hours and practices (Choi et al., 2018; Vanajan et al., 2020).

Items that were worded similarly to others and that presented lower factor loadings were excluded. The following item proposed in the flexibility of working hours factor that did not remain in the final structure stands out: “My organization offers the possibility of telecommuting (working from home, remotely, remote work, home office)”. It is speculated that its factor loading was low because a large part of the sample in this study had little experience with telecommuting. However, several Brazilian organizations are beginning to adopt this flexible work options - especially after the demand for social isolation imposed by Covid-19 pandemic - with the literature also indicating its importance in the process of attraction and retention of older workers, as well as in the process of preparing for and adapting to retirement (Choi et al., 2018; França et al., 2017). Therefore, researchers can evaluate the benefits of including this item in future studies.

It is important to note that the term ‘generations’ is used in this measure to refer to people that belong

to the same age group. However, experts point out the need for caution when using the classifications created to designate generations since these categories (baby boomers, millennials, etc.) reflect a Eurocentric reality and must be adapted in other countries and cultures. In addition, considering that people of the same age group have similar behaviors, values and ways of working can reinforce stereotypes that are not scientifically proven, making it difficult to combat ageism (Rudolph & Zacher, 2017).

Concerning the limitations of the present study, it can be highlighted that some dimensions indicated by the literature were not considered in the measure. One of them refers to the adoption of ergonomic measures (through the redesign of the job description and work stations) considering the physical and cognitive changes arising from age, as indicated by França et al. (2017), Mazur-Wierzbicka (2018) and Truxillo et al., (2015). The items that contemplated this idea in the first version of the instrument did not remain. In addition to this, it was already expected that the target audience of this study would have a greater representation of public employees and, therefore, the “recruitment and selection practices to attract older workers” dimension was not included. In order to respect the reality of the private sector and to make the measure even more complete, it is suggested that future studies address these aspects (Froidevaux et al., 2020).

Another limitation refers to the fact that the majority of workers that participated in the study had a high level of education, high income and worked in an organization in the banking sector (mixed economy) in the city of Brasília. The scale needs to be applied in different organizational contexts and with diverse populations, including workers with chronic diseases (Vanajan et al., 2020). Finally, it is important to mention that in the time between the scale being development and this paper accepted, two solid and complete measures related to age management practices were published by Tonelli et al., (2020): Age Management Practices, and by Wilckens et al. (2020): Later Life Workplace Index. Both of these were mentioned in the book chapter written by Seidl and Hanashiro (2021).

From the organization's perspective, the implementation of age diversity management provides benefits such as reducing turnover, increasing worker productivity, promoting knowledge management and institutional memory, and improving the organization's image and its competitive position in the market

(Mazur-Wierzbicka, 2018; Peiró et al., 2013). From the perspective of the mature workers, they feel greater satisfaction in remaining in the institution due to the possibility of teaching and learning throughout their careers and participating in preventive programs for retirement preparation. In addition, they are given the possibility to remain in employment until they reach the compulsory age, which, consequently, guarantees their financial conditions and their living standards for longer (Barbarasch, 2012; Mazur-Wierzbicka, 2018).

Despite the high demand, the absence and/or low implementation of age diversity management practices, as revealed in this study (Table 3), have also been observed in Brazilian (Cepellos, 2018; França et al., 2014), European (Cebulla, & Wilkinson, 2019; Peiró et al., 2013) and North American (Armstrong-Stassen, 2008; Moen et al., 2017) studies. A future research agenda could include the investigation of the reasons why these practices are not implemented in organizations (Armstrong-Stassen, 2008). The adoption of model tests with antecedents (organizational culture, leadership styles) and consequences (preparation for retirement, job satisfaction) of these management practices is also suggested.

The approval of social security reforms and the prolongation of older workers remaining in the market must be accompanied by policies and practices that respect and value this participation (Cebulla, & Wilkinson, 2019; França et al., 2017). The GeDEO is expected to be applied in different contexts and perfected by other scholars in order to offer respect, dignity and quality of life to workers of all ages, in particular to the fastest growing portion of the population in Brazil: mature and older adults (PNAD, 2019).

References

- Alves, J. E. D. (2018). *O envelhecimento populacional no Brasil*. Em II Congresso Nacional de Envelhecimento Humano (CNEH), Curitiba, 22 a 24 de novembro de 2018. Recuperado de: <https://bit.ly/2X0gPPc>
- Armstrong-Stassen, M. (2008). Human resource practices for mature workers - and why aren't employers using them? *Asia Pacific Journal of Human Resources*, 46(3), 334-352. doi:10.1177/1038411108091755 [https://doi.org/10.1177/1038411108091755]
- Arvola, R., Lutsoja, K., Kristjuhan, U., & Tint, P. (2017). Telework as an option to postpone the retirement for ageing people? *Safety of Technogenic Environment, Psico-USF, Bragança Paulista*, v. 27, n. 2, p. 251-263, abr./jun. 2022

- 8, 15-23. doi:10.1515/ste-2017-0003 [https://doi.org/10.1515/ste-2017-0003]
- Barabasch, A., Dehmel, A., & van Loo, J. (2012). Introduction: The value of investing in an ageing workforce. In *Working and ageing. The benefits of investing in an ageing workforce* (pp. 9-33). Cedefop, Publications Office of the European Union, Luxembourg. Recuperado de: https://bit.ly/3o2Tc4B
- 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(3), 667-704. doi:10.1111/peps.12047 [https://doi.org/10.1111/peps.12047]
- Byrne, B. M. (2016). *Structural equation modeling with Amos: Basic concepts, applications and programming* (3rd Ed.). Routledge, Taylor & Francis Group.
- Cebulla, A., & Wilkinson, D. (2019). Responses to an ageing workforce: Germany, Spain, the United Kingdom. *Business Systems Research, Sciendo*, 10(1), 120-137. doi: 10.2478/bsrj-2019-0009. [https://doi.org/10.2478/bsrj-2019-0009]
- Cepellos, V. M., & Tonelli, M. J. (2017). Envelhecimento profissional: percepções e práticas de gestão da idade. *Revista Alcance*, 24(1), 4-21. doi: alcance.v24n1 [https://doi.org/10.14210/alcance.v24n1.p004-021]
- Cepellos, V. M. (2018). Envelhecimento nas organizações: os grandes debates sobre o tema nos estudos de administração de empresas. *Teoria e Prática em Administração*, 8(1), 38-159. doi:10.21714/2238-104X2018v8i1-37614 [https://doi.org/10.21714/2238-104X2018v8i1-37614]
- Choi, E., Ospina, J., Steger, M. F., & Orsi, R. (2018). Understanding work enjoyment among older workers: The significance of flexible work options and age discrimination in the workplace. *Journal of Gerontological Social Work*, 61(8), 867-886. doi:10.1080/01634372.2018.1515140 [10.1080/01634372.2018.1515140]
- França, L. H. F. P., Nalin, C. P., Siqueira-Brito, A. R., Amorim, S. M., Rangel, T., & Ekman, N. C. (2014). A percepção dos gestores brasileiros sobre os Programas de Preparação para a Aposentadoria. *Estudos Interdisciplinares sobre o Envelhecimento*, 19(3), 879-898. doi:10.1007/978-3-319-64304-5_5 [https://doi.org/10.22456/2316-2171.50434]
- França, L. H. F. P., Rosinha, A., Mafra, S., & Seidl, J. (2017). Ageing in Brazil and Portugal and its impact on the organizational context. In E. R. Neiva, C. V. Torres & H. Mendonça (Eds.), *Organizational psychology and evidence-based management - What science says about practice* (pp. 81-101). Springer International Publishing. doi:10.1007/978-3-319-64304-5_5 [10.13140/RG.2.2.28446.79682]
- Froidevaux, A., Alterman, V., & Wang, M. (2020). Leveraging aging workforce and age diversity to achieve organizational goals: A human resource management perspective. In S. J. Czaja, J. James, J. Grosch, & J. Sharit (Eds.), *Current and emerging trends in aging and work*, (pp. 33-58). Springer. [10.1007/978-3-030-24135-3_3]
- Mazur-Wierzbicka, E. (2018). Age management in an organization. An employee over 50 – an opportunity or a limitation for companies? *Forum Scientiae Oeconomia*, 6(4), 95-106. doi:10.23762/FSO_VOL6_NO4_7 [10.23762/FSO_VOL6_NO4_7]
- Moen, P., Kojola, E., & Schaefers, K. (2017). Organizational change around an older workforce. *The Gerontologist*, 57(5), 847-856. doi:10.1093/geront/gnw048 [https://doi.org/10.1093/geront/gnw048]
- Murta, S.G., Leandro-França, C., & Seidl, J. (Eds.) (2014). *Programas de educação para aposentadoria: Como planejar, implementar e avaliar*. Sinopsys.
- Ng, T. W. H., & Feldman, D. C. (2008). The relationship of age to ten dimensions of job performance. *Journal of Applied Psychology*, 93(2), 392-423. doi:10.1037/0021-9010.93.2.392
- National Institute for Occupational Safety and Health (NIOSH, 2018). *Productive aging and work: A framework for creating an age-friendly workplace*. Workshop at the 2nd International Symposium to Advance Total Worker Health®, in Bethesda, Maryland, May 8th, 2018.
- Noone, J. H., Stephens, C., & Alpass, F. M. (2009). Pre-retirement planning and well-being in later life: A prospective study. *Research on Aging*, 31(3), 295-317. doi:10.1177/0164027508330718 [https://doi.org/10.1177/0164027508330718]
- O'Driscoll, M. P., & Roche, M. (2015). Age, organizational citizenship behaviors and counter-productive work behaviors. In N. A. Pachana (Ed.),

- Encyclopedia of Geropsychology* (pp. 1-11). Springer. [10.1007/978-981-287-082-7_196]
- Pasquali, L. (2012). *Análise fatorial para pesquisadores*. Lab-PAM/Universidade de Brasília.
- Pesquisa Nacional por Amostra de Domicílios Contínua (PNAD/IBGE, 2019). *Indicadores IBGE. Quarto Trimestre de 2019*. Recuperado de: <https://bit.ly/3aX42pc>
- Peiró, J. M., Tordera, N., & Potocnik, K. (2013). Retirement practices in different countries. In M. Wang (Ed.), *The Oxford handbook of retirement* (pp. 510-540). Oxford Library of Psychology.
- Rudolph, C. W., & Zacher, H. (2017). Considering generations from a lifespan developmental perspective. *Work, Aging & Retirement*, 3(2), 113-129. doi:10.1093/workar/waw019 [https://doi.org/10.1093/workar/waw019]
- Seidl, J., & Hanashiro, D. M. M. (2021). Etarismo e gestão da diversidade etária: conceitos e escalas. In M. H. Antunes, S.T.M. Boehs & A. B. Costa (Eds.), *Trabalho, maturidade e aposentadoria: estudos e intervenções* (pp. 49-66). Vetor.
- Tabachnick, B. G., & Fidell, L. S. (2019). *Using multivariate statistics* (7th ed.). Pearson Education.
- Tonelli, M. J., Pereira, J., Cepellos, V., & Lins, J. (2020). Ageing in organizations: A view of HR professionals on the positioning of mature managers and adoption of age management practices. *RAUSP Management Journal*, 55(2), 127-142. [https://doi.org/10.1108/RAUSP-08-2018-0062]
- Truxillo, D. M., Cadiz, D. M., & Hamer, L. B. (2015). Supporting the aging workforce: A review and recommendations for workplace intervention research. *Annual Review of Organizational Psychology and Organizational Behavior*, 2, 351-381. doi:10.1146/annurev-orgpsych-032414-111435 [https://doi.org/10.1146/annurev-orgpsych-032414-111435]
- Valentini, F., & Damásio, B. F. (2016). Variância média extraída e confiabilidade composta: indicadores de precisão. *Psicologia: Teoria e Pesquisa*, 32(2), 1-7. doi:10.1590/0102-3772e322225 [https://doi.org/10.1590/0102-3772e322225]
- Vanajan, A., Bültmann, U., & Henkens, K. (2020). Health-related work limitations among older workers - the role of flexible work arrangements and organizational climate. *The Gerontologist*, 60(3), 450-459. doi:10.1093/geront/gnz073 [https://doi.org/10.1093/geront/gnz073]
- Wilckens, M. R., Wöhrmann, A. M., Deller, J., & Wang, M. (2020). Organizational practices for the aging workforce: Development and validation of the Later Life Workplace Index. *Work, Aging and Retirement*, 1-35. [https://doi.org/10.1093/workar/waaa012]

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