

# Organizational Age Scale: New Lenses to Assess the Ageing of Workers

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## Abstract

Few studies have focused on the ageing process within the specific context of organizations (Thomas, Hardy, Cutcher and Ainsworth, 2014), due to a lack of adequate measures assessing age. This paper introduces such a measure, namely the Organizational Age Scale (OAS) comprised of subjective age-related indicators stemming from the work context (Kooij, Peeters, de Lange, Jansen and Dikkers 2008; McCarthy, Heraty, Cross and Cleveland 2014 ; Sterns & Doverspike, 1989). More specifically, the OAS measures the individual's perception of his-her own ageing as a worker along five dimensions: *career stage, obsolescence, age norms, time remaining in the workplace, and opportunities for professional development*. Such a tool helps identify workers at risk of embodying negative age-based stereotypes and thus may counter the negative consequences that can result from self-ageism.

Older workers are increasingly encouraged to extend their professional lives for many reasons, amongst others, to counter the labour shortages that many industrialized countries are currently facing (OECD,

2019). However, in Canada, workers of 55 years old and over are overrepresented in long-term unemployment statistics (ESDC, 2021). Indeed, older workers still encounter several obstacles to recruitment, participation, and retention in the workplace.

Such obstacles may be partly explained by ageism (Luo, Xu, Granberg and Wentworth, 2012), while initially defined by Butler (1975) as negative stereotyping and age-based discrimination particularly targeting adults 50 or older. For example, older workers may be stereotyped as unmotivated to learn new things, unwilling to invest in training, unable to adapt to fast-paced changing situations, and costly for organizations, compared to younger workers (Posthuma & Campion, 2009). Furthermore, when exposed to such stereotypical notions about their group, individuals may internalize those stereotypes, and create an embodiment of those stereotypes according to the stereotype embodiment theory (Levy, 2009), which can have a negative impact on their self-esteem (Marquet, Chasteen, Plaks and Balasubramaniam, 2019).

Although, these misconceptions do not reflect reality, they negatively impact workers' intentions to retire (Marer,

Barbeite, Weiss, and Lippstreu, 2008). In the same vein, there is empirical evidence that retention in the workplace is partly impacted by the association between perception of negative stereotypes and self-categorization (as an "older worker" or a "younger worker") (Bal et al., 2015). Thus, being able to determine who in the workplace, identifies as an older or younger worker, is an important process in regard to the professional trajectory of workers. Unfortunately, as it stands, no measure can accurately assess such an ageing identity process.

Indeed, existing measures in the literature fail to assess the complexity of the ageing process in the workplace. The ageing process in the workplace is often measured with unidimensional indicators such as chronological age or tenure (De Lange et al., 2006; Thomas et al., 2014). However, such measures lack the ability to assess the ageing process precisely (Settersten & Mayer, 1997), and fail to capture the individual's perception of their own ageing. Indeed, two workers may have the same chronological age and yet have very different perceptions of their age as a worker. Furthermore, research and existing tools on self-perception of ageing lack the ability to seize the specific challenges of the workplace. Few

studies have focused on the ageing process within the specific context of organizations (Thomas et al., 2014), due to a lack of adequate measures to assess who is really an older worker.

The current study aims to fill this gap by developing a new scale, based on the concept of organizational age (OA), which aimed to define who is an "old worker" based on age-related indicators specific to the workplace (Kooij et al., 2008; McCarthy et al., 2014; Sterns and Doverspike, 1985). This article proposes new lenses to assess ageing at work by creating a new tool that measures the self-perception of ageing as a worker, with the organizational age scale.

The concept of OA was originally defined by Sterns and Doverspike (1989) to explain the process of ageing in the workplace and to determine when someone subjectively identifies as an older worker. OA comprised different indicators of ageing that have been explored in the literature such as the worker's career stage, obsolescence, and age norms (De Lange et al., 2021; Kooij et al., 2008; McCarthy et al., 2014; Sterns & Doverspike, 1989). There's also mention of indicators related to the concept of retirement (De Lange et al., 2021; Kooij et al., 2008; McCarthy et al., 2014). To this date, no instrument has ever been created based on organizational age.

### Career Stage

The career stage was one of the first indicators considered in defining OA (Sterns & Doverspike, 1985). This concept is key to understanding the ageing process because of its ability to capture the evolution of the worker's career. However, according to Super (1954), career stages should not be considered as a linear process, but rather according to their context. Such a description is in line with the complexity of the ageing process in the workplace. Originally, the taxonomy developed by Super (1954) identified four principal career stages: exploration, establishment, maintenance, and disengagement of the individual from their work.

The final stage of disengagement could help predict if a worker perceives or him or herself as an old worker and thus has a high OA. Indeed, it refers to a deceleration and reduction of working hours, the beginning of retirement planning and thus a gradual disengagement from working life (Brown, 2002; Super, 1988). A worker's engagement (or disengagement) also seems to have a strong influence on their ageing process, because it can help predict retirement (Jimenez, 2020). Thus, as suggested by Sterns and Doverspike (1985), this study will retain the disengagement stage as a dimension of OA.

### Obsolescence

Obsolescence is another indicator of organizational ageing (Kooij et al., 2008). It represents the incongruence between the responsibilities of a role and the worker's actual level of knowledge, abilities, and skills (Fossum, Arvey, Paradise and Robbins, 1986). As indicated by Kooij et al. (2008), obsolescence is an important indicator of OA because the skills and knowledge of a worker may change and eventually decrease with tenure and time (Pool, Poell and Ten Cate, 2013). Thus, it is expected that workers feeling obsolete would also consider themselves as having a high OA.

### Age Norms

Cleveland and Shore (1992) suggested that age norms could contribute to defining what constitutes an older worker. Age norms are defined as a shared judgment of a standard or typical age that individuals should have in a certain role or a certain context (Lawrence, 1988). In their qualitative study, McCarthy et al. (2014) also mentioned age norms as indicators of OA that can manifest differently according to the context (organization, industry, etc.); Thus, the older a worker perceives him or herself to be according to the age norms in their workplace, the higher their OA will be.

### *Retirement – Time Remaining in the Workplace and Opportunities for Professional Development.*

Some authors have observed that the closer workers are to their retirement, the older they are considered to be, leading to the notion that retirement planification is an age-related indicator of OA (McCarthy et al., 2014). Nevertheless, OA's aim is not to assess if the worker had planned well his retirement or how he's planned it (financially or otherwise). The measure of OA should capture the complexity of what leads to the act of leaving a job for retirement, what leads to the end of a career.

In this vein, this article took inspiration in the concept of occupational future time perspective (OFTP) to measure this perception of closeness to retirement to assess an organizational age. It describes how much time workers believe they have remaining to work in the future, as well as how they perceive that time (Zacher & Frese, 2009). Considering the conceptual needs of this indicator of OA described earlier, this concept has been chosen because, by definition, OFTP is better suited to measure the closeness to retirement, than other concepts only looking at organizational and planned aspects of retirement. It also has a clear association with age, motivation to continue working beyond retirement age and retirement intentions (Henry et al., 2007; Rudolph et al., 2018; Zacher and Yang,

2016; Topa and Zacher, 2018). This concept is divided into two subdimensions: the perception of time remaining in the workplace, and the perception of remaining opportunities for professional development in the workplace. Based on the premise that people focusing on opportunities perceive their future on a more positive side than individuals with a strong focus on limitations (Cate and John, 2007). Thus, two subdimension were created based on these concepts. They anticipated that the less time and opportunities for professional development within their organization a worker perceives remaining, the higher their OA will be.

### **Study Objectives**

In sum, in recent years, advances have been made in conceptualizing the process of ageing in the workplace in all its complexity, thus overcoming more reductionist conceptions such as chronological age and tenure. The literature on OA has identified four main indicators of ageing. However, to date, no single questionnaire has been developed to measure these four dimensions and the concept of OA as a whole. Thus, the goal of the present study is to develop and validate a suitable questionnaire to assess the self-perception of age in the workplace, the Organizational Age Scale (OAS) with an exploratory factor analysis (EFA).

### **Method**

Data were collected from September 2020 to February 2021. Due to public health measures associated with the COVID-19 pandemic, a recruitment method that enabled social distancing was required. Data were thus collected through an online questionnaire that took approximately 20-30 minutes to complete. The questionnaire was built in French and diffuse to a French speaking population. The plan was to collect a sample of at least 245 participants because the first draft of the scale contained 49 items and a ratio of 5 participants per observable item is recommended when performing an EFA (Tabachnick et Fidell, 2001). Two main recruitment methods were used to obtain a total sample of 298. In 65.4% of cases (n=195), the data were collected through an ad developed by the research team and posted on social media (Facebook, LinkedIn) our research team and shared by email or on social media by organizations that advocate for seniors' rights (e.g., The network FADOQ, one of the biggest organism for elders in Canada). Those platforms of diffusion were chosen because of the accessibility to a large public and the possibility to target the population under study. Participants recruited through this method received no compensation. Considering the small number of participants collected with this method (n=195) and the risk of insufficient statistical power to run the analysis, a second

round of recruitment took place with a new technique with the aim to reach the goal of 245 participants. Thus, the second method of sampling allowed to collect  $n=103$  participants. The data were collected through the platform prolific (a random pool of participants from a data bank of approximate 250 individuals corresponding to our criteria), which required that participants receive financial compensation for their participation<sup>1</sup>.

To be eligible to participate in the study, participants had to understand French because the tool was created in this language. Furthermore, the participants needed to be 50 years old or older. The chronological age of 50 was selected since this threshold is used in most definitions of older workers (OECD, 2006) and one whereby ageist behavior is noted to emerge (Luo et al., 2012). Participants also had to work at least part time (15 hours per week) to be part of the study. Since the

1 An independent t-test was conducted to assess the difference in the mean score of the OAS between participants recruited through prolific ( $n=100$ ) and those recruited on social media ( $n= 177$ ). On average, the participants recruited through social media scored slightly higher on the OAS ( $M=63.49$ ,  $SE= 14.97$ ) than those recruited through prolific ( $M=63.10$ ,  $SE= 13.12$ ). This difference was not significant ( $t(228.68) = .23$ ,  $p= 0.818$ ), indicating that all responses were similar, independent of the recruitment method.

**Table 1**  
*Sample Characteristics (N= 298)*

Sex	
Men	115 (38.6%)
Women	183 (61.4%)
Chronological age	
50 - 54	85 (29.1%)
55-59	99 (33.5%)
60-64	66 (22.3 %)
65-69	35 (11.8%)
70 +	10 (0.03%)
Matrimonial status	
Married or in union	191 (64.1%)
Divorced, widowed ou separated	59 (19.8%)
Alone	47 (15.8%)
Scolarity	
Without diploma	15 (5%)
High school degree	25 (8.4%)
Professional diploma	26 (8.7%)
Collegial diploma (pre-university or technic) *Specific in Quebec, otherwise known as CEGEP	46 (15.4%)
University degree	186 (62.4%)
Perception of economic status compared to others of the same age	
I consider myself as financially secure	86 (29.2%)
I consider that I have sufficient income	172 (57.7%)
I consider myself poor	36 (12.1%)
I consider myself as very poor	1 (0.003%)
I don't know	2 (0.007%)
Country of origin	
Canada	182 (61.1%)
United-states	9 (3.0%)
United kingdom	40 (13.4%)
Portugal	6 (2.0%)
France	5 (1.7%)
Italy	4 (1.3%)
Other	10 (3%)
N.A.	34 (11.4%)
Status of the job	
Professional	91 (30.5%)
Manager	66 (22.1%)
Technical profession	58 (19.5%)
Support employee	42 (14.1%)
Working hours	
35 hours or less	154 (52.6%)
36 to 40 hours a week	99 (33.79%)
More than 40 hours a week	40 (13,6%)



**Table 2**

*Matrix Table of the Age Repartition According to Gender*

Chronological age	Men	Women	Total
50 - 54	26 (30.59%)	59 (69.41%)	85
55-59	39 (39.39%)	60 (60.61%)	99
60-64	27 (40.91%)	39 (59.09%)	66
65-69	17 (48.57%)	18 (51.43%)	35
70 +	6 (0.6%)	4 (0.4%)	10
Total	115 (38.98%)	180 (61.02%)	295

goal was to obtain information on the ageing process specific to the work context, it was necessary to recruit workers employed at least part-time on a regular basis. The threshold of 15 hours was chosen because the average worked hours of part-time workers of 55 years or older in Canada is between 16 and 17 hours between 2018 and 2022 (Statistics Canada, 2023). To assure the inclusion of most part-time workers, the hours have been rounded down to 15. The final sample was composed of 298 workers aged 50 to 79 years old, 115 of them were men and 183 were women, more detailed about the description of the sample can be observed in Table 1 and Table 2. All participants completed the OAS questionnaire, as well as questionnaires assessing their subjective age and AAQ.

To assess the temporal stability of the OAS, a second sample of 198 participants was recruited. The inclusion criteria were the same as those used for the first sample and participants were recruited through an ad posted on social media (Facebook and LinkedIn) between September 2020 and February 2021.

Participants had to complete the OAS twice within a three-week interval, inter-administration was kept the same through time.

**Measures**

*Demographic Characteristics*

Participants were asked to answer questions regarding their gender, country of origin, occupation, marital status, and socioeconomic status (see Table 1).

*Attitude To Aging Questionnaire (AAQ)*

The French version of the AAQ was used to assess older adults' attitudes regarding their own ageing process (Marquet et al., 2016). This scale consisted of 24 items, divided into three subscales. The first subscale focuses on physical change, with items such as "It is important to exercise at any age." The second subscale relates to psychological growth and is composed of items such as "As people get older, they are better able to cope with life." The final subscale, on psychosocial

loss, consists of items such as "I see old age mainly as a time of loss." All items were measured on a 5-point Likert scale, ranging from "strongly disagree" or "not at all true" to "strongly agree" or "extremely true." The score for each subscale ranges from 8 to 40 and a higher score on both physical change and psychological growth scales indicates a positive appraisal of one's own ageing process (Marquet et al., 2016). The psychosocial loss subscale indicates a negative appraisal of one's own ageing process (Marquet et al., 2016). A global score of AAQ is obtained based on the sum of all items (including the inverted scores of the psychosocial loss subscale). A higher total score reflects a positive attitude towards one's own ageing process (Marquet et al., 2016). The overall scale has an acceptable internal consistency and homogeneity, with a Cronbach's coefficient of 0.70 (DeVellis & Thorpe, 2021) and corrected item-total correlations of 0.20 (Streiner & Norman, 2008).

*Chronological Age and Subjective Age*

Participants had to indicate their chronological age in number, and also had to answer a single item ("I don't feel old")<sup>2</sup> on a Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree." This item was part of the AAQ (Marquet et al., 2016), but was also observed individually in 2 The question was originally asked in french " Je ne me sens pas vieux".

this study to assess the subjective age of the respondent. Similar single items are used in the literature to assess the subjective age (Kotter-Grühn, Korndadt and Stephan 2016).

### *Organizational Age Scale*

#### **Questionnaire**

**Development.** The French items of the first version of the Organizational Age Scale (OAS) were created based on the literature on OA and existing scales related to its indicators. A total of 49 items were created to cover the dimensions of OA. These items were submitted to a committee of experts to examine the content validity of the questionnaire. The committee was composed of older workers (n=2), experts in ageing (n=2), an expert in psychology (n=1) and an observer (n=1). After their review, the 49 items were adjusted and rephrased according to their comments and suggestions.

Participants had to answer each item on a 7-point Likert scale, where 1 represents “Totally disagree” and 7 represents “Totally agree”. For each subscale, specific instructions were given: “Please indicate on a scale of 1 to 7, the extent to which you perceive your actual situation at work to be linked to the following statements.”

The first dimension, career stage, contained six items inspired by the theory and existing questionnaire developed by Super (1988), which more specifically targets the disengagement stage.

This dimension was measured with items such as “The more important events in my life concern my job” (reversed item). Half of these items were reversed.

For the obsolescence dimension, a total of 12 items was created to determine whether it is induced by either the natural biological ageing process of the individual or by the environment (e.g., “These changes interfere with the performance of my tasks at work.”). Half of these items were reversed.

The age norms dimension was assessed with 12 items inspired by the concept of age norms (Lawrence, 1988; McCarthy et al., 2014). These items measured age norms according to different contexts (the organization, the job itself): [e.g., “I have the appropriate age to occupy this job” (reversed item)]. Half of these items were reversed.

Finally, items to measure aspects of retirement planning were inspired by the concept of occupational future time perspective developed by Zacher and Frese (2009). Six items were related to the perception of opportunities for professional development, such as “There are few things that await me in my future at work”, and six items about perceived time remaining in the workplace: “I have the impression that I have a lot of time remaining before my retirement” (reversed item). Half of these items were reversed, and assessed the absence of opportunities for professional development and the short window of time remaining in

the workplace.

### **Results**

#### **Analyses**

The data were analyzed with SPSS Version 26. A preliminary analysis was conducted to determine the distribution of the data, missing values, extreme data and normality of the data. Then, an exploratory factor analysis (a factorization by principal axis) with varimax rotation was conducted to examine the factor structure of the OAS. Correlations were noted to examine the convergent and divergent validity of the scale. Finally, the test re-test reliability and the internal consistency of the scale were examined with correlations between the two-time measures and Cronbach’s alpha.

#### **Sample Characteristics**

Participants’ characteristics are presented in Table 1. The majority of the participants were female (61.4%), had a university degree (62.4%), and were married or with a common-law partner (64.1%). Most participants were in professional or management positions (52.6%). They worked on average 34 hours per week, with 52.6% working 35 hours per week or less, 33.8% working between 36 and 40 hours per week and 13.6% working more than 40 hours per week. Finally, most participants perceived themselves as having sufficient income or being financially comfortable

compared to other individuals of the same age (86.9%).

### Preliminary Analysis

The assumption of normality was respected for most items, with asymmetry and kurtosis > 1.96, and a sample of more than 250 participants (Kim, 2013). However, four items of the obsolescence subscale demonstrated a distribution problem, with kurtosis between 3 and 5.2. A logarithmic adjustment was applied to these items. Factorial analysis was also performed with and without these four items, to ensure that they did not have an undue influence on the results. There was no significant difference between the EFA with the normal and adjusted items. Nevertheless, these items were not retained in the final solution due to item reduction. The histogram distribution for the other items and for the global score of the OAS showed visual normality. The asymmetry and kurtosis of the final items of the OAS are shown in Table 3.

### Factor Structure

An exploratory factorial analysis (a factorization by principal axis) with varimax rotation was carried out with the original 49 items. This analysis revealed a determinant of matrix lower than 0.000001, indicating that there might be multicollinearity in the data (Field, 2018). Consequently, one item for each pair of items with a high

**Table 3**

#### *Distribution of Items*

Items	<i>n</i>	Asymmetry	Kurtosis	Mean	<i>SD</i>
1	287	.831	-.232	2.77	1.66
2	288	.803	-.183	2.75	1.64
3	286	.673	-.448	2.94	1.64
4	287	.048	-1.122	3.99	1.83
5	284	-.541	-.421	4.94	1.61
6	285	-.213	-.910	4.48	1.57
7	286	-.105	-.732	3.96	1.74
8	289	-.474	-.669	4.74	1.60
9	289	-.425	-.726	4.76	1.64
10	288	-.018	-1.032	3.91	1.72
11	288	.535	-.377	2.43	1.58
12	289	-.185	-.874	4.17	1.71
13	289	-.59	-.986	4.01	1.77
14	288	-.014	-.979	4.24	1.74
15	288	1.157	.833	2.32	1.40
16	287	.957	.491	2.61	1.48
17	288	.172	-.695	3.36	1.56
OAS	277	.118	-.259	63.35	14.31

correlation of 0.8 or more was extracted ( $n=4$ ) as recommended by Field (2018). Furthermore, to avoid communalities lower than 0.2, some items were removed ( $n=3$ ), in line with the recommendation made by Samuels (2017). Finally, items were removed iteratively to avoid factor loadings lower than 0.3, and cross-loadings between factors ( $n=25$ ) (Field, 2018; Samuels, 2017). A final model with 17 items was obtained (Table 4). The Kaiser-Meyer-Olkin showed a good fit of the model  $KMO=0.781$  (Kaiser & Rice, 1974). The Bartlett test was statistically significant ( $X^2 = 2139.82$ ;  $ddl = 136$ ;  $p < 0.00$ ), which confirms

the factorability of the matrix. All individual KMO values were higher than 0.592, as expected (Kaiser & Rice, 1974). The scree plot inflections and eigenvalues higher than one indicated a five-factor matrix (Fabrigar, Wegener, MacCallum & Strahan, 1999; Field, 2018), which is in line with the dimensions and subdimensions of OA identified in the literature. The combination of these factors explained 70.28% of the variance. The first factor corresponded to the obsolescence dimension, while the second related to the retirement planning dimension, but only the subdimension of perception of time remaining. The third factor corresponded to

**Table 4**

*Resume of the Factors Loading for the Solution with Five Factors and Varimax Rotation for the OA scale— Exploratory Factorial Analysis*

Items	Rotated factor loadings					Alpha Cronbach*
	1	2	3	4	5	
Obsolescence						0.907
1	<b>.899</b>					0.834
2	<b>.896</b>					0.834
3	<b>.730</b>					0.926
Perceived time left						0.776
4		<b>.774</b>				0.661
5		<b>.564</b>				0.769
6		<b>.600</b>				0.739
7		<b>.684</b>				0.704
Disengagement stage						0.766
8			<b>.779</b>			0.695
9			<b>.889</b>			0.653
10			<b>.442</b>			0.778
11			<b>.564</b>			0.708
Perceived opportunities of development						0.815
12				<b>.696</b>		0.772
13				<b>.734</b>		0.749
14				<b>.753</b>		0.713
Age norms						0.787
15					<b>.592</b>	0.740
16					<b>.861</b>	0.664
17					<b>.632</b>	0.726
OAS						0.827
Eigenvalues	4.81	2.55	1.88	1.47	1.24	
% Variance	28.27%	14.98%	11.05%	8.66%	7.31%	

Note. To facilitate interpretation, only loadings above the threshold of 0.4 are displayed

Factor 1: obsolescence

Factor 2: Perceived time left

Factor 3: Disengagement stage

Factor 4: Perceived opportunities of development

Factor 5: Age norms.

\*Value observed for each subscale if the item were extracted.



Table 5

Correlation of Pearson Among Study Variables

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. CA	58.26	5.64	1											
2. SA_ATT	3.80	1.04	.014	1										
3. ATT_PG	40.57	6.03	.037		1									
4. ATT_PL	25.51	5.37	-.075		.395**	1								
5. ATT_PC	18.37	3.70	.053		.490**	.311**	1							
6. ATT	79.12	10.84	-.002		.855**	.774**	.683**	1						
7. OAS_DS	16.87	4.98	-.079	.017	.002	.085	.016	.043	1					
8. OAS_OB	8.46	4.48	-.022	-.217**	-.204**	-.308**	-.164**	-.284**	.004	1				
9. OAS_T	17.35	5.21	.256**	-.018	.059	-.175**	-.014	-.052	.187**	.233**	1			
10. OAS_OP	12.43	4.46	.022	-.132*	-.200**	-.298**	-.215**	-.300**	.229**	.270**	.374**	1		
11. OAS_N	8.29	3.73	.095	-.285**	-.296**	-.264**	-.274**	-.346**	.153*	.428**	.278**	.225**	1	
12. OAS	63.35	14.31	.101	-.183**	-.176**	-.294**	-.185**	-.272**	.529**	.601**	.693**	.684**	.633**	1

Note. Chronological age (CA), Item Subjective age in the Attitude towards aging scale (SA\_ATT), Attitude towards aging - psychological growth (PG), Attitude towards aging – Physiological loss reverse recoded (PL), Attitude towards aging- Psychosocial change (PC), Attitude towards aging questionnaire (AAQ), Organizational age – Disengagement scale (DS), Organizational age – Obsolescence (OB), Organizational age – Perceive time left (T), Organizational age – Age norms (N), Organizational age scale (OAS).

\*\* Significant at 0.01 (bilateral).

\* Significant at 0.05 (bilateral).

the disengagement stage, the fourth to the subdimension of retirement planning that concerns opportunities for professional development. Finally, the fifth factor corresponded to age norms. In the pattern matrix produced by the five-factor solution (Table 4), all items loaded  $\geq 0.44$  with each corresponding factor.

**Validity**

The convergent validity of the OAS was confirmed with Pearson correlations between OAS with, respectively, chronological age, subjective age and AAQ. All correlations are presented in Table 5. Results indicated that the global OAS score correlated significantly and relatively

weakly with AAQ ( $r = -.272$ ,  $p < 0.01$ ). Furthermore, subjective age correlated significantly with OAS ( $r = -.183$ ,  $p < 0.01$ ). These correlations indicate that the OAS measures similar concepts as these two tools, while being distinct at the same time and thus adding to the convergent and divergent validity of the scale. However, only one dimension of the OAS correlated with chronological age, the perception of time remaining ( $r = .256$ ,  $p < 0.01$ ). The global scale did not correlate significantly with chronological age ( $r = .101$ ,  $p = 0.101$ ).

**Reliability**

Overall, the OAS showed strong internal consistency, with

a Cronbach’s alpha of 0.83. The internal consistency of each subscale varied between 0.70 and 0.90, showing moderate to high reliability (Table 4).

To assess the temporal stability of the OAS, a paired-sample t test was performed with the score of OAS at time one and the score of OAS at time two, three weeks later. On average, participants scored higher on the OAS at time one ( $M = 66.81$ ,  $SE = 16.33$ ) than at time two ( $M = 66.07$ ,  $SE = 16.34$ ). However, this difference, 0.74, BCa 95% CI [-.566, 2.030], was not significant  $t(195) = 1.11$ ,  $p = 0.269$ , indicating a stability of the instrument through time. Furthermore, the correlation between OAS at time one and time two was significant

and strong ( $r = .836^{**}$ ,  $p < 0.01$ ). Such results confirm the temporal stability of the OAS.

### Discussion

The goal of the present study was to develop and validate the OAS, a tool that assesses the perception of ageing in the workplace and determine the point at which a worker considers being an “old worker”. The scale was conceived based on indicators of OA identified in the literature (Sterns & Doverspike, 1989; Kooij et al., 2008; McCarthy et al., 2008) and more specific studies about these different indicators (*Super*, 1954; *De Grip & Van Loo*, 2002; *Rosen*, 1975; *Zacher & Frese*, 2009; *Lawrence*, 1988; *McCarthy et al.*, 2017), adding to its content validity. The exploratory factorial analysis revealed a scale with 17 items representing 5 different factors, namely obsolescence, perception of time remaining, disengagement, perception of opportunities for professional development, and age norms.

Interestingly, items did not all load on the expected factors. Indeed, the items related to the perception of time remaining in the workplace and those related to the perception of opportunity for professional development were expected to load on one factor, namely retirement planning. However, they loaded on two different factors, even though they were the most strongly correlated factors of the scale (Table 5). These two aspects of retirement planning seemed to represent two

distinct elements to consider when assessing OA. Their unexpected division into two components may add to the argument that the OAS components consider the complexity of the workplace with the worker’s ageing process from a multidimensional level.

Supporting its convergent validity, the global score of OAS was correlated to subjective age and the towards AAQ. However, the disengagement dimension was not correlated with these two measures. These results may be due to the more objective elements that inspired the creation of the items of this dimension (career stage, tenure, etc.). Nevertheless, this dimension of the OAS has significant positive correlations with three other dimensions of the OAS: perceived time remaining to remain employed, opportunities for professional development, and age norms. The disengagement dimension adds a level of complexity to the assessment of the evolutionary process of ageing in the workplace.

The global score of OAS and four of its five dimensions were not significantly correlated to chronological age. This result supports the idea that chronological age is a unidimensional measure and is not sufficient to capture the complexity of the individual’s perception of their own ageing process (Settersten & Mayer, 1997). In this regard, it is interesting to note that, in the present study, chronological age was also not significantly correlated to subjective age (Table

5). Indeed, the data collected showed that some individuals over 50 subjectively felt old, while others did not. Similar results can be observed with the insignificant correlation between chronological age and AAQ (Table 5). On the contrary, subjective age and AAQ were significantly and moderately correlated with each other (Table 5). This is not surprising, considering that attitude towards ageing is seen as an expression of subjective ageing (Diehl et al., 2014). Overall, it is reassuring that the OAS, subjective age and the AAQ were correlated. Their similarity may reside in the fact that they all assess the individual’s ageing on a perceptual or subjective level. The ability to capture this perceptual perspective on ageing in the workplace is particularly important considering the stereotypical notion of being “too old” may have many negative consequences on an individual (e.g., lower self-esteem; Marquet et al., 2019). An assessment of one’s age in the workplace may help prevent or respond to such consequences. Indeed, by identifying on which dimension of the OAS (disengagement stage, obsolescence, perception of time remaining, opportunities for development, age norms) the worker feels a higher OA, the individual or their organization could have a clearer insight into why the individual felt “too old”.

## Practical Implications

The OAS could be useful in the workplace to prevent the early retirement or informed older workers and organizations about the subject. Indeed, a deeper interpretation of each dimension of the scale could be beneficial for older workers and organizations. For example, the interpretation of worker's responses on the obsolescence dimension could indicate that they have not received sufficient support or training during changes implemented in their organization and thus need additional resources. On the other hand, the dimension of perception of time remaining in the workplace could provide insight into the feeling of pressure to retire, while a high score on the dimension of age norms may be a sign that the culture of the organization is tinged with age stereotypes devaluating older individuals. Considering these results, an organization could try to offer training or awareness activities about ageism. Such actions could have a positive and direct impact on pressure felt by older workers and help change their preconceptions related to age and the workplace.

Furthermore, a high individual score on the disengagement dimension may indicate a more personal detachment from the work context. Based on the socioemotional selectivity theory, it is normal that the individual's goals change with time, and thus, that a detachment from professional life emerges

(Carstensen, 2006). Individuals who perceive themselves to be old subjectively tend to have goals that are less oriented towards knowledge acquisition (Zacher & Frese, 2009). Nevertheless, employers and organizations could address a high disengagement score by identifying the factors that may contribute to the worker's desire to engage in their work and considering the possibility of accommodating an individual's desire for change and flexibility in their working schedule. Wanting to invest more in one's personal life may not indicate a wish to retire from professional life.

Furthermore, such results could be analyzed in more depth by looking at results on the other dimensions. For example, the perception of opportunities remaining in the workplace may create disengagement for some workers. A simple way for the organization to act on this aspect is to search for new opportunities for this worker and, importantly, ask which kinds of opportunities they prefer. What represents an opportunity may be different for different individuals; one older worker may be attracted to opportunities for promotion or to acquire new knowledge, while another may prefer opportunities to give back to the younger generation of workers. In sum, by providing access to workers' perceptions of their ageing process at work, the OAS is likely to inspire a range of actions through which organizations can become more attentive to the needs and aspirations of older workers.

## Future Studies and Limitations

Considering its ability to capture the self-perception of ageing in the workplace, the OAS provides an opportunity for several new research avenues. Indeed, future studies should test the association between the OAS and its different dimensions with perceived ageism or the phenomenon of stereotype embodiment. As well, future studies should observe the practical impact in the workplace of workers having a high OAS score. For example, does a worker who perceives himself as having a high OA in the workplace experience less job satisfaction, and less psychological well-being in the workplace, or intend to retire earlier than their counterparts? Are there any differences in the gender of workers on those aspects?

Future research should also test the OAS among a wider range of older workers. Indeed, the mean age of our sample was young (58 years old). There is a growing need to observe the reality of older individuals and few studies have been conducted with a sample of individuals over 65 years old (Sewdas et al., 2017). Also, it may be important to observe how younger workers may differ in their response to this scale. Based on the hypothesis of the scale for older workers, the organizational age should be lower for younger workers. Although, it could be interesting to see if the correlation between age and OAS is still strong in a younger population or

if the correlation flattens as age lowers.

Furthermore, the context of the COVID 19 pandemic and the online distribution of our questionnaires may have influenced the results of this study. The reliability of the OAS should be examined, to verify that results were not biased by the social context. Finally, since the present study analyzed the OAS with an exploratory factor analysis, further analysis, for example, using confirmatory factor analysis, is needed to confirm the validity of the scale. Future studies using the OAS should also assess if the ranking of items have an impact on the answers of the respondents, to ensure the order of items does not influence responses.

### Conclusion

This article addresses the need for specific tools to assess the ageing process in the context of the workplace (Kooij et al., 2008, McCarthy et al., 2014). The OAS is a new tool, with few items, which can be used in organizations and future research to assess the self-perception of ageing among workers. This tool could help predict the retirement of workers but may also help understand the process of ageing at work, thereby preventing some workers from feeling old and reducing the negative impacts associated with ageism on them.

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## Appendix

## Index of Organizational Age Scale

The following section presents a list of statements describing how people may perceive themselves in their workplace. By reflecting on a change, you have experienced at work IN THE LAST YEAR (e.g., new task, new software to use, tool to learn, the addition of responsibilities, telecommuting, etc.) *Please indicate on a scale of 1 to 7 how well you perceive the following sentences to correspond to your situation.*)

(OFV : La section qui suit présente une liste d'énoncés décrivant comment les gens peuvent se percevoir dans leur milieu de travail. En réfléchissant à un changement que vous avez vécu au travail DANS LA DERNIÈRE ANNÉE (ex : nouvelle tâche, nouveau logiciel à utiliser, outil à apprendre, l'ajout de responsabilités, télétravail, etc.) *Veillez indiquer sur une échelle de 1 à 7 à quel point vous percevez que les phrases suivantes correspondent à votre situation.*)

(1)	(2)	(3)	(4)	(5)	(6)
Totally disagree (OFV : Totalement en désaccord)	Disagree (OFV : En désaccord)	Moderately disagree (OFV : Plutôt en désaccord)	Neither agree or disagree (OFV : Ni en accord, ni en désaccord)	Moderately agree (OFV : Plutôt en accord)	Agree (OFV : En accord)

#	Item
1	Because of these changes, it is more difficult to occupy my position. (OFV : <i>À cause de ces changements, il est plus difficile d'occuper mon poste.</i> )
2	These changes interfere with the performance of my tasks at work. (OFV : <i>Ces changements nuisent à la réalisation de mes tâches au travail.</i> )
3	These changes makes it harder for me to do my job well. (OFV : <i>Ces changements rendent plus difficile ma capacité à bien faire mon travail.</i> )

Reflecting on your work over the past four weeks, please indicate how much you agree with each statement. *'Please indicate on a scale of 1 to 7 how well you perceive the following sentences to correspond to your current situation at work.'*

(OFV : En réfléchissant à votre travail au cours des quatre dernières semaines, veuillez indiquer à quel point vous êtes en accord avec chaque énoncé. « *Veillez indiquer sur une échelle de 1 à 7 à quel point vous percevez que les phrases suivantes correspondent à votre situation actuelle au travail.* »)

OFV = Original french version. All items were administered in french. The english translation is only for communication purpose.  
R= Reverse item

## Cotation key

Disengagement stage : Items 8,9,10,11

Obsolescence : Items 1,2,3

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Totally disagree (OFV : Totalement en désaccord)	Disagree (OFV : En désaccord)	Moderately disagree (OFV : Plutôt en désaccord)	Neither agree or disagree (OFV : Ni en accord, ni en désaccord)	Moderately agree (OFV : Plutôt en accord)	Agree (OFV : En accord)	Totally agree (OFV : Totalement en accord)
#	Item						
4	I perceive that I should soon retire. (OFV : <i>Je perçois que je devrais bientôt prendre ma retraite</i> ).						
5	I feel like I should start planning for my retirement. (OFV : <i>J'ai l'impression que je devrais commencer à planifier ma retraite</i> ).						
6 R	I feel like I have plenty of time before I retire. (OFV : <i>J'ai l'impression que j'ai beaucoup de temps avant de prendre ma retraite</i> ).						
7	I perceive that my time at work is almost up. (OFV : <i>Je perçois que mon temps au travail est bientôt écoulé</i> ).						
8 R	The most important events in my life concern my work. (OFV : <i>Les événements les plus importants de ma vie concernent mon travail</i> ).						
9 R	Most of my personal goals are focused on my job. (OFV : <i>La plupart de mes objectifs personnels sont axés sur mon emploi</i> ).						
10	My job is less important right now in my life. (OFV : <i>Mon travail a moins d'importance en ce moment dans ma vie</i> ).						
11	My work occupies an essential place in my life. (OFV : <i>Mon travail occupe une place essentielle de ma vie</i> ).						
12	There are few things that await me in my future at work. (OFV : <i>Il y a peu de choses qui m'attendent dans mon avenir au travail</i> ).						
13	My work offers me few opportunities to develop myself in the future. (OFV : <i>Mon travail m'offre peu d'opportunités pour me développer dans le futur</i> ).						
14 R	My future at work is filled with opportunities for development. (OFV : <i>Mon avenir au travail est rempli de possibilités de développement</i> ).						
15	I am no longer old enough to do my job. (OFV : <i>Je n'ai plus l'âge pour faire mon travail</i> ).						
16 R	I have the right age for this job. (OFV : <i>J'ai l'âge adéquat pour occuper cet emploi</i> ).						
17 R	I have the ideal age for my position. (OFV : <i>J'ai l'âge idéal pour occuper mon poste</i> ).						

Perceive time left : 4,5,6,7

Perceived opportunities of development : Items 12,13,14

Age norms : Items 15,16,17

#### Cotation procedure

Scores by dimension and/or total score may be used. Dimensional or total scores are obtained by additionning the items corresponding to the dimension and/or the total scale.