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## **Ageism in the Academic Career: a study with professors**

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**ABSTRACT – Ageism in the Academic Career: a study with professors.** Ageism is configured as discrimination against another person based on their age, occurring mainly in relation to the elderly. The phenomenon, despite being experienced by higher education teachers, is little studied in regards to Education, in Brazil. Seeking to contribute to the debate, this article aims to analyze ageism among professors at the Federal University of Piauí. Therefore, the Ageism Scale in the Organizational Context was applied to the professors, whose results were analyzed in a multivariate way (Exploratory Factor Analysis and multiple linear regression), in order to identify the predominant factors of ageism at the university. Two factors related to ageism were identified, one positive and one negative.

**Keywords: Aging. Ageism. Teaching Career. University.**

**RESUMO – Ageísmo na Carreira Acadêmica: um estudo com professores universitários.** O ageísmo se configura como uma discriminação em relação a outra pessoa em virtude de sua idade, ocorrendo principalmente em relação aos mais idosos. O fenômeno, apesar de vivenciado por professores de ensino superior, é pouco estudado em Educação, no Brasil. Buscando contribuir com o debate, este artigo objetiva analisar o ageísmo entre docentes da Universidade Federal do Piauí. Para tanto, foi aplicada a Escala de Ageísmo no Contexto Organizacional, junto aos docentes, cujos resultados foram analisados de modo multivariado (Análise Fatorial Exploratória e regressão linear múltipla), com intuito de identificar os fatores predominantes do ageísmo na universidade. Foram identificados dois fatores relacionados ao ageísmo, um positivo e outro negativo.

**Palavras-chave: Envelhecimento. Ageísmo. Carreira Docente. Universidade.**

## Introduction

Brazil, traditionally a young country, has also undergone significant demographic changes, which lead to an increase in the number of elderly people in relation to other age groups. The country experienced an increase of 4.8 million elderly people in five years, which corresponds to an 18% increase in this age range. Women are a significant majority in this group, with 16.9 million (56% of the elderly), while male elderly are 13.3 million (44% of the group) (Paradella; Barroso, 2018). According to projections by the Brazilian Institute of Geography and Statistics (IBGE), one in four Brazilians will be 65 years old or older in 2060 (Projection..., 2018), more precisely 25.5% of the total population, and this aging trend will make the country have more elderly people than children from 2039 onwards (Villas Bôas, 2018).

It is important to remember that the way society perceives the aging process is unique in each culture. Negative images of aging are instilled in society through language, religion, literature, media and practices of medical institutions and social services (Wilson; Parker; Kan, 2007).

The differences in the aging process also have occupational and organizational characteristics. This study seeks to deal especially with this issue in the university environment and in the academic career. In Brazil, such a career is marked mainly by teaching, as a primary activity. However, it is important to remember that the structure of the higher education teaching career, notably in public higher education institutions (HEIs), privileges research, postgraduate teaching and guidance, which expands the scope of professors' responsibilities, mainly those related to Graduate Programs. Melo and Serva (2014) indicate that a professor, throughout his/her career, as they become better known for their work, receives a very high level of demand, impacted by scientific capital. Unlike other professions, which allow the elderly to select and reduce activities throughout their careers – for example, Morato and Ferreira (2020) –, teachers, as they complete their doctorate and insert themselves in postgraduate and university courses and research, accumulate more activities. It is recognized, however, that there is another side to entering graduate school: it represents, by itself, a space of power and social recognition, allowing, for example, greater access to funding.

In a productivist context, such insertion, in addition to bringing greater responsibilities, brings greater demands and situations of prejudice, notably with older teachers. Such situations are marked by ageism – beliefs, attitudes, assumptions and negative stereotypes about age –, used to implicitly and explicitly support discriminatory behaviors that marginalize older adults (Palmore, Branch; Harris, 2005).

According to Palmore (1999), ageism translates a prejudice or form of discrimination, against or in favor of an age range. Older adults face age stigma in the form of either benevolent or hostile ageism (Chasteen; Cary, 2014). The ambiguity of feelings, in relation to the elderly,

generates paternalistic feelings, at first, positive, for instilling care; at the same time, they characterize the elderly as incapable or useless.

It is important to remember that, having age as a basis, ageism can manifest itself both in relation to young people and the elderly. Age discrimination can be defined as the harmful decisions that are based on age rather than individual skills or abilities (Arrowsmith; McGoldrick, 1997). UNECE (2019) exposes that ageism is implicit, subconscious and uncontested in current societies and stems from the perception that a person may be too old or too young to do something.

In relation to the elderly, in the teaching career, this discrimination is associated with the very social representation of aging. In a study with university professors, Nascimento et al. (2016) point out that prejudice regarding age, for the interviewees, is a reflection of the changes that have occurred in the relationships of the individual and society, promoted by the transformations verified in the field of technology, economy, culture and work. The authors verified the existence of prejudice in relation to the teacher's age of 60 years-old or more. However, it was observed "[...] that the weaknesses resulting from age advancement, which sometimes makes them marginalized, do not prevent them from continuing to carry out their activities at work" (Nascimento et al., 2016).

With a view to contributing to this debate, notably in the academic environment, this article aims to analyze ageism among professors at the Federal University of Piauí. For this purpose, the Ageism Scale in the Organizational Context was applied to the professors, whose results were analyzed in a multivariate way (Exploratory Factor Analysis and multiple linear regression), with the aim of identifying the predominant factors of ageism at the university.

## **Aging and Teaching Career**

In November 2021, according to data from the Statistical Panel of Personnel of the Ministry of Economy (Brazil, 2021), only 0.88% of the effective professors of higher education in the federal public service were up to 30 years old, while, in the general staff, this value is 3.88%. The low entry of young people into the career can be explained, in part, by the requirement of a doctoral degree in most career entries through public examinations.

On a regular basis, academics tend to attend an undergraduate course for 4 years, a master's degree in up to 2 years, and a doctorate in up to 4 years, which would total around 10 years of training to enter a career as a doctor, after completing the high school degree. Students who do not have formal work records before entering the teaching career, even those financed by research grants, enter the career late, which forces them, in the face of new social security rules, to remain longer in the institution until they fulfill minimum retirement requirements.

It is important to remember that the meaning of work for the elderly professor directly reflects their physical, mental, and emotional well-being, considering that it allows them to remain productive before the family and society, in addition to the possibility of professional fulfillment, social inclusion and to provide them freedom of autonomy (Nascimento et al., 2016). Staying at work, therefore, absorbs aspects related to work and personal elements that distance themselves from the classroom.

Silva, Pletsh and Biavatti (2015) observed that the main reasons for the permanence of professors in graduation were, among others, love for the career, for teaching and research; interpersonal relationships; career path; personal and professional satisfaction; activity at a university; and finances. For Amaral and Torres (2017), continuity in work would be linked to material conditions of retirement influenced by economic and social policies and by internal factors, such as identification and working conditions, autonomy and freedom, pressure and internal disputes, and family support.

This permanence at work and in the teaching career does not, however, come without cost to the professor. Nascimento et al. (2016) highlight, for example, the existence of prejudice in relation to the age of sixty-year-old teachers and the weaknesses resulting from advancing age that, even if they still allow for the continuity of their activities, can make them marginalized. Professors at the peak of their careers must still comply with the workload required by the internal regulations of their HEI, tabulated in a minimum number of disciplines, guidelines, publications, and research. The link to postgraduate studies is driven by the career structure itself, and participation in other academic skills such as management and extension are also punctuated when reaching the peak of the career: full professor. University managers around the world allow people to specialize in areas in which they are most competent, but most faculty are still required to do all areas of academic work (Hotchings; Wilkinson; Brewster, 2020).

## **Discussing the Teaching Career and Activity in Brazil**

According to data from the Statistical Personnel Profile (Brazil, 2021), from November 2021, the Federal Executive has 605,055 active servants, 439,033 retirees and 242,114 pensioners, respectively 47.04%, 34.13% and 18.82% of the total of the Executive board. Of the active servers, the Ministry of Education (MEC) has the largest staff, with 293,873 servers, or 48.57% of the total staff of the Federal Executive (Brazil, 2021). Within the staff of MEC, Professor of Higher Education is the most significant position, making a total of 86,060 public servants.

Teachers of Basic Technical and Technological Education, linked to the Federal Teaching Institutes and Technical Colleges, appear as the fourth most significant category in the MEC, with a total of 44,241 teachers. Considering both careers, there are 130,301 teachers in the

federal public service, which means a total of 21.54% of all active public servants.

Teachers over 51 years old make up 37.26% of the general staff of teachers, while teachers up to 30 years old represent only 0.88%. This demonstrates the aging range of career assets for the coming years and the need for management policies aimed at aging teachers (Brazil, 2021).

Silva and Costa (2014) define a teacher as the subject who carries out teaching activities (necessarily), research, extension, and institutional development. Among the professor's main activities, the following stand out: teaching classes, preparing material, developing an evaluation system, correcting activities, guiding and assisting students (Melo; Serva, 2014), teaching undergraduate and graduate classes, providing guidance on the master's, doctorate and scientific initiation, extension, supervise internships, participate in committees and bibliographic production (Bernardo, 2014). Despite the view that only the task of "teaching classes" is up to the professor, the university environment fills him with other attributions, several of them unrelated to his/her training, such as administrative and representational responsibilities.

Research stands out in teaching activities, especially as professors progress in their careers and enter postgraduate courses. Research, according to Sleutjes (1999), is the deepening of existing knowledge, born from the search for solutions and the new, from the taste for investigation and discovery, and is an excellent exercise in scientific-sociocultural maturity. Silva and Costa (2014) point out that the focus on competence for research is a consequence of the regulatory evaluation process that values intellectual production and research projects.

The insertion and permanence of professors in postgraduate studies in Brazil forces a new way of teaching, less involved with graduation and extension, and more focused on academic production, fed by the managing bodies of research and scientific innovation in the country. Andrade, Cassundé and Barbosa (2019) reinforce that, due to the appreciation of research and articles, other activities are impaired, such as extension and publication of books. Still in this context, Sguissardi (2009) indicates that the financing format of postgraduate research is subject to periodic evaluation both for penalties and for the distribution of grants or other aid amounts. This forces the permanence in postgraduate studies and in relation to research, regardless of age, to be subject to patterns of work activity that tend to increase as competition for such resources expands and the supply of resources becomes scarcer.

## **Ageism**

The term ageism, or age prejudice, was conceived by Butler (1969) as a process of systematically stereotyping and discriminating people based on age, affecting hiring decisions, medical care, and social policy (França et al., 2017). Like other types of prejudice, it can occur in a veiled and discreet way, but it can also occur in a systemic way.

Society has become more sensitive to various topics linked to diversity and inclusion, which has generated discussions, including political ones, in relation to discrimination and violence against minorities. Despite this trend, there is no significant movement in terms of awareness of age in Education, more specifically in relation to the elderly. It is important to highlight that there is a debate beyond education, which recognizes this issue as important – for example, Ayalon and Tesch-Römer (2018).

Palmore (2001) indicates that, in the West, ageism is the third most common form of discrimination, after racism and sexism.

Robert Butler (1969) coined the term ageism as a form of age-related discrimination and intolerance. Palmore (2004) defined the term as strong prejudice and discrimination against older people. The original concept of ageism has changed over time and broadened its understanding to something that is not only directed at the elderly, since, according to Butler (1969), it involves prejudice against any subject due to their age, whether children, adolescents, youth, adults, or seniors. Angus and Reeve (2006) defined it as prejudice or discrimination against or in favor of any age range.

Ageism can manifest itself in positive and negative behaviors towards the elderly, predominating the negative ones, which are related to stereotype, prejudice, social segregation, discrimination, and generational conflicts. Loth and Silveira (2014) point out as positive stereotypes broad knowledge, greater experience, respectability, wisdom, consideration, maturity, remaining energy, self-criticism, and credibility. Despite the positive characteristics found in the cited studies, Cary, Chasteen and Remedios (2017) emphasize that paternalistic behaviors and attitudes that seem benign, and perhaps even helpful, are associated with a series of negative outcomes.

There is no consensus regarding the relationship between education and age discrimination, as there are studies that do not report significant relationships (Rippon; Zaninotto; Steptoe, 2015; Ayalon; Gum, 2011; Kessler; Mickelson; Williams, 1999; Luo; Granberg; Wentworth, 2012), while there are others who positively associate the two variables (Gee, 2002; Van dem Heuvel; Van Santvoort, 2011). In the study by Rippon, Zaninotto and Steptoe (2015), when comparing England and the USA, there was an association between education and age discrimination in England, and no relationship was found in the USA.

In any case, Loth and Silveira (2014) warn about the plurality of causes of ageism, which cannot be dissociated from other forms of prejudice that, when associated, produce a new intensity of discrimination. This mixture of factors dispersed in society accumulates in organizational environments, further amplified by the pressure for productivity, goals and poorly defined management policies.



### *Ageism in the Workplace*

Ageism is present in the most diverse countries and in the most different ways, which includes organizations. According to the Ethos Institute (ETHOS; IBOPE, 2010), there is a positive correlation between age and high hierarchical levels in the 500 largest companies in Brazil. That is, in large companies, it is common for the highest levels to be occupied by older people, and this suggests resistance on the part of younger people regarding this condition, even more so when the direct consequence of this is that the remuneration of older individuals tends to also to be bigger. Duncan and Loretto (2004) evaluated discrimination between age groups and identified that young people felt discriminated against in wages and working conditions more often than older respondents, who indicated reduced training opportunities. The increase in the elderly population and its greater occupation brings direct consequences for companies, still little investigated (Loth; Silveira, 2014).

North and Fiske (2013) suggest that ageism in the workplace is predominantly among young people. There is still the prejudice of the elderly in relation to themselves and their age range. Loth and Silveira (2014) concluded that, even though the elderly report that they do not condone or carry out discriminatory practices directed at older people, by sharing certain stereotypes about old age and aging, they are contributing to perpetuate ageism. On the other hand, there are studies that point out that “[...] older bosses do not understand the way younger people work and cannot help the person to develop in the best way” (Beltramini, Cepellos; Pereira, 2020).

Stereotypes simplify cognitive processes, help deal with complexity and allow you to interpret and act more quickly, especially if information about a worker is ambiguous (Pinto, 2015). Voss, Bodner and Rothermund (2018) argued that the existence of stereotypes does not imply their practical activation for everyone and not in every situation, as there are associations of people and situations that would not induce negative behaviors. The type of mentality (Sassenberg; Moskowitz, 2005) and the common goals (Moskowitz et al., 1999) would work, for example, as inhibitors of negative stereotypes.

Even when a candidate highlights positively valued characteristics and skills, if such a candidate invokes stereotypes of old age, it is possible that implicit beliefs are created that the candidate is “older” than others, and this can put him at a disadvantage in relation to other candidates. candidates stereotyped as young (Abrams; Swift; Drury, 2016). This understanding is due to other aspects, such as initiative, strength, willingness, and vigor, which can positively influence productive performance. In the workforce, problems of hiring, promotion, and compulsory retirement of older workers result in institutionalized aging (Butler, 1980). In fact, the expectation that the elderly people have cognitive and physical deficits can weaken the elderly in terms of self-esteem and performance (Nelson, 2005). That is, the realization of a



negative expectation is not due to predictable concrete factors, but to the decline in morale on the part of the older employee.

There are studies that point out particularities in the teaching aging process. Dambros (2019), in a qualitative study on the influence of professional identity on the aging process of teachers, from the perspective of biopolitics, indicates the need for higher education institutions to have clear policies regarding the end of the teaching career, to be transparent about these definitions, and reformulate programs to prepare for leaving the institution. The author considers that there are specificities in these professionals that differentiate them from the others. Such questions, linked to the intellectual work itself, and to the permanent and intense relationship with students and with knowledge, influenced the quality of the teaching aging process.

### **Methodological Path**

This is an applied, exploratory, and descriptive research, whose data were analyzed quantitatively.

The research data were collected through the application of the Scale for Ageism in an Organizational Context (EACO), validated by França et al. (2017), which is the only validated instrument in which ageism is analyzed in the organizational context. It was decided to focus on professors at the Federal University of Piauí for reasons of accessibility and to understand that the results of the investigation can be extrapolated to other HEIs of the federal public service, and even to other bodies that have similar personnel characteristics.

In the questionnaire sent electronically, in addition to specific EACO questions, questions about the personal profile were added: gender, date of birth and marital status; about functional data: center/campus of capacity, course of capacity, work regimen, functional level and permanence bonus; and on employment data: member of the post-graduate program, permanent member or collaborator, number of programs with affiliation, course with main affiliation; in addition to an open question at the end for criticism, suggestions or any kind of observation. For the characterization and delineation of the population, data from the Statistical Panel of Personnel (PEP), of the Ministry of Economy, of August/2020, in which 1562 professors were identified, including permanent staff and visitors (Brazil, 2021). The sample calculation by proportion in the finite population, with a confidence level of 95%, margin of error of 5%, concluded that a sample of 265.44 (266) respondents was necessary.

Due to the Covid-19 pandemic and the institution's remote work regimen, it was decided to build and distribute the form electronically via *Google Forms*. Initially, a pre-test was carried out in January/2021, with some servers, both to assess the understanding of the Free Consent Form and to measure the understanding of the questions. The result of the pre-test indicated necessary adjustments to the Free Consent Form,

which needed to be reduced and even adapted to the current reality of the impossibility of physically exchanging signed documents and adequacy of the meaning of some phrases of the instrument, particularly regarding personal profiles and functional.

For the distribution of the questionnaires, the professors' e-mails were requested from the University's Personnel Management Unit. 720 e-mails were made available on 02/08/2021, since there are servers that do not have e-mails registered in the Integrated Human Resources Administration System (SIAPE), and there are professors who have registered personal e-mails, who cannot be informed; therefore, only institutional e-mails were made available. The questionnaires were sent in two stages, one by email and the other via WhatsApp.

In all, 694 emails were sent and not returned, between 02/09/2021 and 02/16/2021, of which 33 questionnaires were answered, generating a response rate of 4.76%. Between 02/18/2021 and 02/22/2021, the EACO form link was sent via WhatsApp. 288 electronic messages were sent, and some professors even replicated such messages to other close co-workers. In total, after the two stages, 319 questionnaires were answered.

Regarding the responses, initially, questionnaires answered twice and with unanswered questions were eliminated, resulting in 295 valid questionnaires.

A descriptive analysis was carried out, through the *Statistical Package for the Social Sciences* (SPSS), version 27, and the Exploratory Factor Analysis, to verify the factors extracted to explain the phenomenon.

Multiple regression was also performed to identify personal, functional, and work variables that could explain the respective generated factors. In multiple regressions with all independent variables at the same time, the *stepwise* method was used, which according to Hair et al. (2009), considers the inclusion of each variable before the development of the equation and selects only the strongest relationships within the data set.

## Data Analysis

The first phase of data analysis is descriptive, in which the profiles of the respondents will be outlined, in comparison with the population of professors at the university. The results indicated the following:

**Table 1 – Comparison between Population and Sample Percentages**

<i>Descriptive Indicator</i>		<i>Population (%)</i>	<i>Sample (%)</i>
<i>Gender</i>	Female	48,3	45
	Male	51,7	54
<i>Age Range</i>	Up to 44 yrs.-old	51,2	46,4
	45 to 59 yrs.-old	32,9	37,6
	Over 60 yrs.-old	15,7	15,9
<i>Work regimen</i>	20 hours	6,9	1,7
	40 hours	6,7	8,1
<i>Graduate studies</i>	Exclusive Dedication	86,3	90,2
	Post-graduation member	29,51	39,3

Source: Prepared by the authors themselves, based on information from the Statistical Panel of Personnel (Brazil, 2021) and SPSS.

As for being permanent members or collaborators of postgraduate programs, the sample has 39.3% of permanent members and 12.5% of collaborating members and may have coincident subjects in both tables. In the studied population, 29.5% of the professors are affiliated with graduate programs, therefore, the sample has similar percentages to the population studied.

**Chart 2 – Permanent Members and Collaborators in Graduate Programs**

	No		Yes	
	Frequency	Percentage	Frequency	Percentage
<i>Permanent Member of the Program</i>	179	60,7	116	39,3
<i>Contributing Member of the Program</i>	258	87,5	37	12,5
<i>Receives Permanence Bonus</i>	261	88,5	34	11,5

Source: Prepared by the authors themselves.

Only 11.5% of the sample has already fulfilled the retirement requirements and receive the permanence bonus, remaining in active duty. When crossing this information with the percentage of 15.9% of the sample over 60 years old, it is clear that most of the teachers over this age have already fulfilled the retirement requirements and remain active or rejoin the institution as volunteer teachers. In the view of Ribeiro

et al. (2018), the importance of work after retirement influences good physical and mental fitness and a sense of usefulness and well-being. The authors also concluded that seniors with higher education tend to have access to more qualified occupations and, for this reason, choose to remain in the labor market, motivated both by income and by satisfaction with work and its achievements.

Lima (2017) highlights wage losses at the time of retirement of civil servants, as they no longer receive food allowance, unhealthy work additional, transportation allowance, vacation third and permanence allowance. Such losses, depending on the individual context, force teachers to remain active. Carvalho (2009) explains that, to the extent that they can support themselves and help with the family budget, they also guarantee their freedom and autonomy. Cepellos, Tonelli and Aranha Filho (2013) point out that the motivations for working after retirement are diverse, from being characterized as an active person to financial issues.

Antunes and Moré (2014) point out that the transition to retirement constitutes one of the main critical events of adult life, and is endorsed by Bressan et al. (2013) when emphasizing that well-being in retirement has financial planning, health and family relationships as key factors. Schneider and Irigaray (2008) argue that retirement is a heterogeneous and complex experience, which can range from a social shutdown to a pleasant social life.

### *Exploratory Factor Analysis of the Scale for Ageism in the Organizational Context*

The Scale for Ageism in an Organizational Context (EACO) was developed by França et al. (2017); in which its first version had 46 items grouped into 7 dimensions, and, after improvement, resulted in an EACO with 14 items, grouped into two dimensions: D1, negative attitudes (cognitive and health aspects), and D2, positive attitudes (affective aspects). It was decided to use the reduced scale with 14 items, since it presented satisfactory results regarding *eigenvalues*, factor loadings and commonalities. The scale was developed in research with workers from different regions of the country and, despite being validated, it was decided to apply it to a specific public and compare it with the results achieved by the authors, both to measure the validity of the instrument and to identify the object of study, ageism, with the professors.

Exploratory factor analysis was performed, with the extraction of principal components to verify matrix factorability and *Equamax* rotation. This extraction method that was used in improving EACO tends to distribute variables more evenly across factors than *varimax*, and therefore is less likely to strengthen overall factors (Mulaik, 2010). The total explained variance was 48.2% with two factors: D1 (negative attitudes) and D2 (positive attitudes). Own values, or *Eigenvalues*, refer to the variance explained by the factor, before and after the rotation pro-

cedure, and, by default, components with total eigenvalues greater than 1 are displayed (Ribas; Vieira, 2011).

**Chart 3 – Variance explained by Exploratory Factor Analysis**

<i>Total variance explained</i>									
<i>Own Initial Values</i>				<i>Extract Sums of Loads Squared</i>			<i>Rotating sums of loads squared</i>		
<i>Component</i>	Total	% variance	% Cumulative	Total	% variance	% Cumulative	Total	% variance	% Cumulative
1	4,165	29,749	29,749	4,165	29,749	29,749	4,162	29,732	29,732
2	2,584	18,457	48,206	2,584	18,457	48,206	2,586	18,474	48,206
3	0,946	6,758	54,964						
4	0,881	6,293	61,257						
5	0,764	5,457	66,714						
6	0,709	5,066	71,78						
7	0,668	4,768	76,549						
8	0,596	4,258	80,807						
9	0,527	3,765	84,572						
10	0,514	3,673	88,246						
11	0,46	3,286	91,531						
12	0,427	3,046	94,578						
13	,391	2,792	97,370						
14	,368	2,630	100,000						
<i>Extraction Method: Main Component Analysis.</i>									

Source: Created by the authors themselves.

The rotating matrix is the value of the factor loading of each item that makes up a given factor. Two factors were defined to explain the construct; 9 components were identified in the first factor and 5 components in the second factor. Here, a result like that found in the development of the instrument by França et al. (2017), factor 1 (FAC1\_1) has a negative connotation for the elderly, while factor 2 (FAC2\_1) has a positive connotation. It is noteworthy that the factors have the same items found in the original instrument, however, the factor loadings found in this research were higher.

**Chart 4 – Independent Variables by Factor**

<i>Rotating Component Matrix<sup>a</sup></i>		
	Component	
	1	2
<i>Older for Longer</i>	0,714	
<i>Elderly people get sick</i>	0,721	
<i>Elderly people miss work</i>	0,709	
<i>Young people concentrate</i>	0,687	
<i>Old people forget</i>	0,717	
<i>Old people are persistent</i>		0,592
<i>Productive Young People</i>	0,7	
<i>Committed old people</i>		0,768
<i>Old people knowledge</i>		0,698
<i>Capable old people</i>		0,74
<i>Aging affects</i>	0,656	
<i>Old people ability</i>		0,757
<i>Old people accident</i>	0,593	
<i>Young people understand</i>	605	

Note: Extraction Method: Principal Component Analysis; Rotation Method: Equamax with Kaiser Normalization; a. Rotation converged in 3 iterations.

Source: Prepared by the authors themselves.

To check the reliability of the scale, *Cronbach's Alpha* was used, with a result of 0.780, which demonstrates the internal reliability of the instrument applied with 14 items. Hair et al. (2009) state that the value of *Cronbach's Alpha* should be greater than 0.7.

**Chart 5 – Cronbach's Alpha: Factor Analysis Reliability Measure**

<i>Reliability Statistics</i>		
<i>Cronbach's alpha</i>	<i>Cronbach's alpha with personalized items</i>	<i>Number of items</i>
0,78	0,78	14

Source: Created by the authors themselves.

In view of the result of the factorial analysis, the adequacy of the sample is observed, through the measure *Kaiser-Meyer-Olkin* (KMO), with a result of 0,848. Hair et al. (2009) indicate that KMO's between 0.6 and 0.7 are fair, between 0.7 and 0.8 are average, and between 0.8 and 0.9 are good. Pallant (2007) suggests 0.6 as a reasonable limit. The value found is considered good and compatible with that found by the devel-

opers of the instrument 0.83. According to Lorenzo-Seva, Timmerman, and Kiers (2011), the KMO suggests the proportion of item variance that may be explained by a latent variable.

**Chart 6 – Adequacy of the Exploratory Factor Analysis: KMO and Bartlett**

<i>KMO and Bartlett's Test</i>		
Kaiser-Meyer-Olkin measure of sampling adequacy.		0,848
Sphericity test of Bartlett	Approx. Chi-square	1215,302
	df	91
	Sig.	,000

Source: Prepared by the authors themselves based on research data.

Bartlett's sphericity test indicated the inexistence of an identity matrix (*sig.* = 0.0000), which allows the continuation of data analysis. Bartlett's sphericity test values with  $p < 0.05$  significance levels indicate that the matrix is factorable (Tabachnick; Fidell, 2007), rejecting the null hypothesis that the data matrix is similar to an identity matrix.

The correlation matrix demonstrates the strength of association of a given variable with other variables. The values presented by the survey are predominantly less than 0.6, therefore, the variables that make up the factors have low correlation with each other. Reduced correlations suggest variables that are not under the influence of the same factor (Ribas; Vieira, 2011).

The anti-image matrix reveals variables that are disturbing the analysis. All items have significant values, the lowest is 0.699, in item 6 (older professors are more persistent), 0.917; in item 11 (aging affects productivity). This, combined with a KMO of 0.848, suggests that the factorial, using all 14 variables, is valid. As well as the study developed by França et al. (2017), no significant correlation was found between the factors, indicating that the scale is orthogonal.

The correlation between the items that make up the EACO and independent variables was also carried out: gender, age group, marital status, capacity unit, work regimen, functional level, permanence bonus and about being a collaborating or permanent member of postgraduate programs. The correlations between the independent variables and the negative and positive factors were also carried out: in both cases, they were evaluated according to the Miles and Shevlin (2001) criteria, which indicate that values between 0.1 and 0.29 are low, 0.3 to 0.49 moderate, and above 0.5 are high. There is a predominance of low correlation in both negative and positive factors.

In general, the results found did not differ from the original instrument, both due to reduced commonalities and correlations, as well as the number of factors generated and the association of components with factors identical to the EACO by França et al. (2017). High internal reliability of the instrument demonstrated by Cronbach's Alpha, high



KMO and the significance of *Bartlett's* sphericity test support the possibility of continuing the analysis. Figueiredo Filho and Silva Junior (2010) indicate that Exploratory Factor Analysis can be used to create dependent or independent variables to be used in regression models.

### *Multiple Regression*

In this phase of the quantitative analysis, multiple regressions were performed to identify the behavior of personal, functional, and work variables - independent variables, in relation to each factor FAC1\_1 (negative attitudes) and FAC2\_1 (positive attitudes) of ageism - dependent variables, and thus, in addition to identifying ageism itself, being able to relate it to personal or professional aspects in greater depth.

The linear regression consists of carrying out a statistical analysis with the aim of verifying the existence of a functional relationship between a dependent variable and one or more independent variables. Hair et al. (2009) defines that the first phase of defining the regression model is the selection of dependent and independent variables. For this, it is necessary to observe the collinearity between the independent variables, since two independent variables that have a high correlation can distort their analysis on the dependent variable.

According to Hair et al. (2009), increasing the use of independent variables tends to improve the response on the dependent variable and, therefore, improve the regression model, as it increases the correlation between the independent variables included in the regression equation, which is called collinearity. Ribas and Vieira (2011) indicate that multicollinearity can distort the interpretation of results, because if two variables are highly correlated, they may be measuring essentially the same characteristic, making it impossible to identify which of the two is more relevant to the model.

**Chart 7 – Meaning of each Independent Variable**

<i>Independent Variables</i>	
Gender	What the respondent's gender is
Age Range	Dummy that grouped ages (1) to 45 years-old, (2) from 46 to 60 years-old; (3) over 60 years-old
Marital Status	What the marital status is
Downtown Campus	In which Center, Campus or College is located
Capita Countryside	Dummy that grouped the assignments between Capital or Countryside
Course Location	In which course or department they are assigned
Work regimen	Whether it is 20 hours, 40 hours, or full dedication
Functional level	If the professor is Auxiliary, Assistant, Deputy, Associate or Full
Bonus	Whether or not they receive a permanence bonus
Permanent	If they are a permanent member of any Program
Contributor	If they are contributing members of any Program
Programs Amount	How many programs they are members of
Course Post	To which main program they are linked

Source: Created by the authors themselves.

The identification of collinearity or multicollinearity requires that the data be examined in search of the existence of correlations around 0.8, although magnitudes close to the level of 0.7 can cause problems (Ribas; Vieira, 2011). Therefore, the first analysis to be carried out is the existing correlation between the independent variables.

Hair et al. (2009) indicates weak correlations up to 0.59 and, above 0.6, strong correlations. The first strong correlation highlighted is between Capital Countryside and Downtown Campus, which was already expected due to the Downtown Campus variable indicating the center or campus where the teacher is located, and Capital Countryside being a dummy variable, created to indicate which professors have a location in a center or campus of the capital or the interior, based precisely on data from Downtown Campus.

There is also a significant correlation between Programs Amount and Permanent, Course Post and Permanent and even between Course Post and Programs Amount, that is, these three independent variables have significant correlations with each other. Programs Amount reflects how many postgraduate programs the professor is a collaborating or permanent member. The Permanent variable indicates whether he is a permanent member of any program, and the Course Post variable indicates which program the professor considers as having the main link. The strong correlation between these three independent variables was also expected, because they are variables with the same response profile, including the fact that they have complementary response char-

acteristics. Therefore, in the multiple regression model, the collinear independent variables should not appear together: Capital Countryside and Downtown Campus; Programs Amount and Permanent; Course Post and Permanent, and Course Post and Programs Amount. All the following models will have a 95% reliability rating and Durbin-Watson residual analyses.

### *Multiple Regressions*

To determine which independent variables should compose the model with the negative factor of ageism (FAC1\_1), 4 multiple regressions were performed, the first with the complete sample, and the others by age range. By using the entire sample to identify the appropriate variables for the regression equation with *FAC1\_1*, the variables *Age Range* and *Gender* were found. It is identified that negative ageism appears as the age group reduces, while older professors have less influence of the negative factors of ageism. In addition, male professors perceive the negative factors of ageism with greater intensity.

**Chart 8 – Independent Variables Related to the Negative and Positive Factors of Ageism**

	<i>Negative Factors</i> (FAC1_1)	<i>Positive Factors</i> (FAC2_1)
	<i>Full Sample</i>	<i>Full Sample</i>
<i>Inserted variables</i>	<i>Age Range</i>	<i>Age Range</i>
<i>Inserted variables</i>	<i>Gender</i>	<i>Interior Capital</i>
<i>R</i>	0,25	0,384
<i>Squared R</i>	0,063	0,148
<i>Standard Error of Estimation</i>	0,97154068	0,9263448
<i>Durbin-Watson</i>	2,065	1,922
<i>Residual</i>	275,616	250,569
<i>Z</i>	9,738	25,306
<i>Sig.</i>	0	0
<i>B</i>	-0,287	0,555
<i>Sig.</i>	0	0
<i>B</i>	0,236	0,335
<i>Sig.</i>	0,04	0,012

Source: Created by the authors themselves.

In the multiple regression, to identify the independent variables that best explain the positive aspects of ageism, summarized in the fac-

tor *FAC2\_1*, only the variables *Age Range* and *Capital Interior* were shown to be significant in the model. It is identified that positive ageism appears as the age group increases, while older professors have less influence of the negative factors of ageism. In addition, professors working outside the capital perceive the positive factors of ageism more intensely.

Negative ageism is associated, according to Schwartz and Simmons (2001), with characteristics such as stubbornness, senility, loneliness, bad mood, forgetfulness, complaining, selfishness, slowness, and illness. Butler (1980) adds that negative ageism brings the idea of a useless person. Siqueira et al. (2007) highlighted that aging observed under the negative scope leads to characterizations such as isolation, loneliness, poverty, illness, inability to manage one's own life and physical and social dementia.

From the results presented, younger professors perceive negative ageism more intensely, which largely reflecting a possible clash of generations, in which younger professors denote negative aspects of ageism in relation to aging professors. The clash between generations and age segregation lead to barriers in relation to aging. According to Bytheway (2003), aging and age segregation mark clear distinctions between the self and the other.

In contrast, professors on a higher age range do not perceive negative ageism with such intensity. According to Loth and Silveira (2012), aging people value the identity resulting from the sense of belonging to the older group and reduce threatening characteristics to the older ones in the competition for organizational spaces. The feeling of belonging, or even the value of their work for the institution and the students, reduces the perception of the negative aspects of aging.

In this investigation, the research sample showed that men, more than women, identify negative aspects of ageism, which contradicts the findings of Duncan and Loreto (2004), who identified more women reporting negative experiences associated with aging, normally associated appearance, or sexuality. However, Lasher and Faulkender (1993) pointed out that men had higher levels of anxiety about aging than women. In this line, Rupp, Vodanovich and Credé (2005) point out that men are more ageist than women, which may reflect the research finding.

The results found regarding greater identification of aspects of ageism among male professors (compared to female professors) may be associated with the teaching work at the university. In a study with female professors, Sá and Wanderbroocke (2016) pointed out that the interviewees recognize the difficulties in the process of aging and retirement from the teaching career, but also envision positive possibilities in life after the end of their working career.

Several factors are positively associated with aging workers. Cepellos and Tonelli (2017) identified greater emotional balance, loyalty to the company, punctuality, and greater ability to diagnose problems.

Taylor and Walker (1998), on the other hand, attributed greater reliability, productivity, creativity, and less propensity to accidents at work. Couto et al. (2009) identified stereotypes, such as maturity and wisdom, associated with the elderly. Professors, as they expand the age range, point to positive aspects of ageism, which reflects that increasing age is not associated with negative aspects in the work environment.

Therefore, the positive perception of teacher aging increases as the age group and the number of postgraduate programs with links increase. This allows us to infer that the aging professor is positively positioned as he is inserted in more postgraduate programs.

## Final Remarks

Observing both factors, FAC1\_1 and FAC2\_1 together, the most representative independent variable is Age Range, which is compatible with the theory of ageism, which refers to discrimination based on age, presented in the database by this variable. Levy and Banaji (2002) define ageism as a feeling, belief, or behavior in response to the perceived chronological age of an individual or group. Therefore, the age range is certainly an element present in both positive and negative factors within the studied group.

The Ageism Scale in the Organizational Context indicated that there is ageism at the Federal University of Piauí, and that both factors, negative and positive, are dimensioned by age range. The higher the age range, the lower the perception of the negative aspects of ageism and, on the other hand, the higher the age range, the greater the perception of the positive aspects of ageism. It is inferred that the positive aspects outweigh the negative ones as professor age, and that work experience induces positive ageism among the professors.

Finally, it was observed that men perceive negative ageism more intensely than women, while professors working outside the capital are more sensitive to positive ageism among professors<sup>1</sup>.

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