

Master's thesis

Validation of the Workplace Intergenerational Climate Scale (WICS) for Portugal

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Abstract

The present study aims to adapt and validate the Portuguese version of the Workplace Intergenerational Climate Scale (WICS) (King & Bryant, 2017) exploring and confirming the factorial structure of the scale and exploring its psychometric properties (reliability, validity, and factorial invariance) with a group of Portuguese workers (N = 453, aged 18 to 65 years old, 36% were men, and 64% women). Based on this group of participants, exploratory and confirmatory factor analysis indicated a good fit of the five-factor model, same as in original scale after excluding one item and transferring another one from one subscale to another. The five factors of the scale are: Lack of Generational Stereotypes (LGS), Positive Intergenerational Affect (PIA), Intergenerational Contact (IC), Workplace Generational Inclusiveness (WGI), and Workplace Intergenerational Retention (WIR). Additionally, the WICS showed good indicators of reliability and construct, convergent (besides one subscale) and discriminant validity. However, factorial invariance across age was not confirmed. Thus, the WICS proved to be suitable for assessing employees' attitude and perceptions about workers of different ages in the workplace in Portuguese population. However, its additional improvement and adjustment will be needed for use in the Portuguese context. Implications, limitations, and suggestions for future research are discussed.

Key words: *Age diversity, organizational climate, workplace intergenerational climate, scale validation, WICS.*

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Introduction

Population aging is an unavoidable reality of today's societies, which is leading to important implications at different levels of intervention. Percentage of older workers among Europe's workforce is growing and will continue to increase (EC, 2018), specifically, the percentage of employees aged over 55 years is increasing markedly (Phillips & Siu, 2012), and working lifespan is becoming longer. This means that retaining older workers and maintaining their motivation and productivity have become challenges for organizations and managers (Fraccaroli & Deller, 2015; Zacher & Griffin, 2015). At the same time, new generations of younger workers are entering organizations generating workplaces with three or even four generations working together. Even though this can enrich organizations by, for example, fostering opportunities for sharing knowledge (Backes-Gellner & Veen, 2013), some factors such as stereotyping of subgroups based on age can impede those opportunities (Chiu et al., 2001). And in turn stereotypes and ageism can lead to decreasing job performance and to lower levels of job satisfaction (e.g., Snape & Redman, 2003; Taylor et al., 2013).

Thus, organizations need to manage age diversity to make it bring positive outcomes and eliminate or reduce the negative ones. In this context, research has shown that analyzing organizational climate oriented toward the development of intergenerational interaction at work can be an appropriate way to analyze how organizations can take advantage of age diversity at work (King & Bryant, 2017). It was demonstrated that under high levels of age diversity climate, age diversity is not related to heightened levels of age discrimination and reduced levels of performance (Kunze et al., 2013). Later King and Bryant (2017) introduced *intergenerational climate* as a climate related to employees' attitudes toward differently aged co-workers at the workplace involving all ages of employees as both respondents and targets (King & Bryant, 2017).

This climate was found to be positively related to higher levels of satisfaction among workers and decreased feelings of ageism (Lagacé, et al., 2019).

Setting the right diversity climate at work requires, first of all, appropriate instruments for diagnosing the situation in organizations and planning interventions. The Workplace Intergenerational Climate Scale – WICS (King & Bryant, 2017) has been developed to measure attitudes toward workers of a different generation and to measure intraorganizational intergenerational dynamics. As this instrument has been found to be a valid and reliable instrument to measure different dimensions of intergenerational climate and it can bring contribution in dealing with age diversity in organizational context (Lagacé, et al., 2019), in this study we aim to adapt and validate the Portuguese version of Workplace Intergenerational Climate Scale (King & Bryant, 2017), exploring its factorial structure, reliability, validity, and factorial invariance and provide organizations in Portugal an instrument to monitor and adjust intergenerational climate in the workplace.

This work firstly presents a theoretical background explaining the concept of age diversity and its potential benefits and threats in the context of work and then the importance of intergenerational climate for managing age diversity is justified. Then, the WICS instrument is described as well as its role in managing age diverse workplaces. The second part introduces data analysis: more specifically, the structure of the WICS is tested in Portuguese population, as well as different sources of validity of the instrument. This is followed by parts of the discussion that considers implications and limitations of the study, and directions for future studies.

Diversity in Organizations: Benefits and Drawbacks

Diversity is a multidimensional concept which has been drawing researchers' attention, especially interested in examining and explaining which impact it can bring in various contexts. It has been defined as "the distribution of differences among the members of a unit with respect to a common attribute, X, such as tenure, ethnicity, conscientiousness, task attitude, or pay" (Harrison & Klein, 2007, p. 1200). Literature and research in organizational psychology has made demographic variables more visible, which means that the most frequently studied variables are race and ethnicity, gender, age, disability, sexual orientation, cultural or national dimension (Landy & Conte, 2013; Shore et al., 2009). However, a diverse workplace includes much more than demographic variables, it also includes psychological characteristics such as values, abilities or experience of a person (Landy & Conte, 2013).

Workplace diversity is often thought to be beneficial for organizations as it can increase effectiveness (Guillaume et al., 2013), creativity, commitment or performance (Boehm & Dwertmann, 2015). For example, from a decision-making perspective, diversity seems to be more beneficial than homogeneity, because diverse groups can have a wider range of knowledge, skills or experience, although homogenous groups might be more creative in finding solutions and learn more from it (Guillaume et al., 2013). On the other hand, employees as individuals prefer homogeneity rather than diversity in their work groups, because in general people as individuals prefer to collaborate with those who share similar characteristics and opinions (Landy & Conte, 2013). Guillaume et al. (2013) state that, from a social perspective, in diverse groups members can be less identified and committed to the group, conflicts may occur more often, and can lead to lower performance than in homogenous work groups.

Thus, the data suggests association of diversity with both negative and positive outcomes (Boehm & Dwertmann, 2015). That means that the impact of diversity depends on different factors, for instance, on how organizations are dealing with it and if the management of a diverse workplace is well set. Thus, if organizations can manage diversity well, they probably can get a number of benefits from it and vice versa. More specifically, in this work we will focus on age diversity at the workplace, its possible effects and outcomes, and how this type of diversity can be managed.

Age Diversity and Its Outcomes

One of the factors which is contributing to diversity and nowadays brings more and more diversity to work context is age. Age diversity at work can be described as the diversity of age among employees, from young to old ones. Age is something we are all affected by, and our population is getting older every year due to increases in population longevity and decreases in birth rates (Kunze et al., 2011). Moreover, the retirement ages have been delayed in a number of countries during the last decades (for instance – 67 years instead of 65 years in Spain and France) (Peiró, et al., 2012), increasing the mean age of people in organizations. So, whether organizations want to increase age diversity or not, it is already a nowadays reality (Landy & Conte, 2013). It requires involvement of governments, employers, trade unions, and employees and, at the same time, requires human resource policies and practices at the organizational level to manage these changes. Development of positive intergenerational climates at the workplace can contribute to do so (Boehm & Dwertmann, 2015).

Companies now must deal with integrating older workers with younger ones, having more generations working together, which creates a more age-diverse workplace (Kunze et al., 2011; Kunze et al., 2013) and that means that people from different generations have to interact

effectively. In fact, despite of the difficulties that companies could have to face in age diverse teams, such as intensification of emotional conflicts or high turnover (Elfenbein & O'Reilly, 2007; van Knippenberg et al., 2004) age diversity can also be beneficial for organizations (Backes-Gellner & Veen, 2013).

According to Backes-Gellner and Veen (2013) the main benefits of age diversity are connected to three major processes: more diverse problem-solving capacities (age-diverse workforces possess different knowledge, values and preferences, so that they have a larger pool of knowledge and a larger problem-solving toolbox); better incentive structures (in homogeneous age groups career options can be diminished for up age group and this can demotivate young groups, and this is to be avoided in higher age diversity groups); and more effective transfer of specific know-how and norms from older to younger generations. Moreover age-diverse groups possess different resources (e.g., knowledge, skills or even access to different social networks), which can, for example, give access to more clients for organizations. In this sense, age diversity can not only bring some benefits, but be a key source of competitive advantage.

However, as Kunze et al. (2011) stated, as long as age can become a category for formation of subgroups, the organizational context plays a role in the actual development of such subgroups. So, when organization becomes heterogeneous in terms of age, it can increase the salience of age as a category for in-group-out-group formation, thus making it more likely that employees discriminate against each other based on their age-group membership (Kunze, 2011)

Thus, as we can see, age diversity is becoming a challenge for organizations nowadays and it is important to realize possible correlates and consequences of that and how it can be managed to bring benefits and prevent negative outcomes.

Outcomes of age diversity

In order to understand the issues that organizations have to face concerning age diversity, it is important to note that there are many stereotypes, prejudices and ageism with regard to age. Social psychology has generally considered a triple attitudinal component related to stereotypes, prejudice and discrimination. Ageism is a “set of attitudes that fits into this tripartite model of attitudes, consisting of cognitions, affect and behavioural dispositions” (Solem, 2016, p. 161), which are based on age categories such as older worker or senior. The tripartite model may serve to explore how stereotypes (the cognitive element) and prejudice (the affective element) relate to discrimination (the behavioural element), and how counteracting stereotypes and prejudices may reduce discrimination.

Stereotypes are defined as “cognitive structures that store our beliefs and expectations about the characteristics of members of social groups” (Cuddy & Fiske, 2002, p.4) and they can be both positive and negative. There are a number of stereotypes with regard to age in the work context, and usually these stereotypes are negative. Some studies have found individuals to attribute such positive features to older people, as being seen as more reliable, more committed and better socially skilled (Dordoni & Argentero, 2015), but unfortunately older employees are mostly viewed in a negative perspective (Liebermann et al., 2013). For instance, Ng and Feldman (2012) mentioned some stereotypes related to older people, such as that these groups of people are less motivated, less willing to participate in training and career development, more resistant to change, less healthy or more vulnerable to work-family imbalance. On the other hand, there are also stereotypes about younger employees, for example, being seen as less conscientious, less reliable, more neurotic, and less motivated (Bal et al., 2011, Finkelstein et al., 2012; North & Fiske, 2012; Truxillo et al., 2012). Stereotypes, as a result, not only influence a behaviour of the

individuals with stereotypical beliefs but also a behaviour of stereotyped individuals. For instance, it can negatively affect worker's performance, due to their fear of confirming the stereotypes about them (Barber, 2017; Fowler & Gasiorek, 2020).

Prejudice is representing the affective element in the tripartite model and can be defined as “aversive or hostile attitude toward a person who belongs to a group, simply because he belongs to that group, and is therefore presumed to have the objectionable qualities ascribed to that group.” (Allport, 1954, p.7). In the work context, age prejudice is seen, for example, in the dislike of recruiting older workers (Solem, 2016). Prejudice can be not only negative, but also positive. For instance, some people think that they become happier “in the golden years”, after they have retired (Palmore, 1999).

Age discrimination, which is the behavioural component of ageism, is a broad concept referring to prejudices against any age group that leads to bias and unfair treatment based on being too young or too old (Kunze et al., 2011). In working life, age discrimination can be related to recruitment and appointment (by disregarding applicants above a certain age from the interview or choosing to hire younger applicants), incidents at the workplace (by excluding older workers from promotion or from training), or the exit from the organization (by violation of the seniority principle by downsizing, or by informal pressures through mandatory retirement age) (Furunes & Mykletun, 2010). According to Wanberg et al. (2016), workers over 50 years old have a smaller number of job offers, less probability of reemployment and, consequently, of staying for a longer period in unemployment. Investigations pointed out mostly discriminations against older people, but more recent investigations on age discrimination have emphasized that it can happen to any age, especially when viewed as too young or too old in a group (Fowler & Gasiorek, 2020, von Hippel et al., 2019). Kunze et al. (2011) added that age discrimination can be viewed as an

organizational variable, being related to people's perceptions about the organization's age related treatment.

Research found that people who experienced ageism at the workplace are more likely to feel undervalued by an organization and its members (Snape & Redman, 2003); to have decreasing levels of motivation to act on behalf of organization (Kunze et al., 2011); to have increased level in depressive symptoms and overall (self-rated) health in older employees (Marchiondo et al., 2017); lower positive well-being and higher level of psychological distress (Yuan, 2007). Negative effects of experiencing ageism on work were also found in engagement, learning, development, as well as promotion intentions and positive effects on intentions to resign (Weber et al., 2019).

On the other hand, correlates of age diversity could exist at the organizational level, so several researchers are (e.g., Ellwart et al., 2013; Scheid et al., 2016; Van Knippenberg et al., 2004) investigating if there are differences between age diverse and non-diverse teams, and if age diversity brings positive outcomes for organizational performance and other team variables, or there are no difference or even outcomes are negative. For example, some authors report a positive effect of age diversity on performance, for instance operationalized as processing time (Ellwart et al., 2013) or total revenues (Ellwart et al., 2013). According to Van Knippenberg et al. (2004) age diversity may also improve performance to the extent that task performance requires information-processing like creative and innovative idea generation, or problem solving.

In general, it was found by most of the authors (e.g., Ellwart et al., 2013; Scheid et al., 2016) that age diversity seems to be of little relevance for team outcomes, as it was neither positively nor negatively related to team outcomes. And, at the same time at the individual level, as we saw above, age diversity can be related to prejudice and discrimination and, as a result, it can lead to reducing engagement and satisfaction. This brings to the idea that there could be some

mediators or moderators which influence the relationship between age diversity at the workplace and organizational and individual outcomes.

Boehm and Dwertman (2015) and Taneva et al. (2016) stated that the factors which can foster positive effects of age diversity and prevent negative effects are leadership behaviour, diversity climate and age-inclusive HR-practices. More specifically, diversity climates are expected to reduce the influence of processes, such as in-group/out-group distinctions and discrimination while fostering the positive informational value of diversity (Kunze & Toader, 2019). Such climates are based on the idea that communication between people of different ages is reducing negative thoughts, attitudes and, as a result, behaviour towards each other (Kunze et al., 2013).

Organizational Climate and Its Role in Age Diversity Management

Organizational climate can be defined as employees' shared perceptions of the policies and acceptable practices and procedures within an organization, as well as their perceptions of the less formal social aspects of the organization (Reichers & Schneider, 1990). In other words, the organizational climate is inferred when employees witness what goals the organization pursues, and how the organization goes about its daily business (Schneider et al., 1996).

Organizational climate is considered a multilevel construct as it can be studied in different levels. On the one hand, climate exists at the individual level, or in other words, how work environments are cognitively appraised and represented in terms of their meaning for individual employees in organizations. Jones and James (1979) proposed that individual level studies should be called studies of psychological climate. At the same time, climate can be studied at the unit or group level. In this case it reflects aggregated and shared employees' perceptions about organizational policies and practices. Micro-approach (climate on an individual level) explores

meaningful individual differences, while macro-approach (climate on a group level) address contextual factors that can significantly influence individual behaviour (Liao & Chuang, 2004), so both approaches bring their own contribution.

Age diversity climate is a specific form of diversity climate which was defined by Boehm et al. (2014) as “organizational members’ shared perceptions of the fair and nondiscriminatory treatment of employees of all age groups with regard to all relevant organizational practices, policies, procedures, and rewards” (p. 671). The authors underlined that this type of climate reflects an age-neutral behaviour not only toward old people, but toward all groups, so both younger and older employees feel free from discrimination based on age.

Explaining the mechanisms behind this climate, Boehm et al. (2014) stated that the age diversity climate leads to high perceptions of social exchange among the employees. So, in organizations where such climate is experienced by employees, they perceive the organization as fair, supportive and just, as a result it leads to trust in the organization and then it leads to higher performance and organizational commitment (Boehm et al., 2014). Also, Kunze et al. (2013) demonstrated in their study that with age diversity climate age diversity does not relate to heightened levels of age discrimination and reduced level of performance.

Another way of looking at the age diversity climate is to focus on how interactions of people of different ages are taking place in the workplace and they contribute to reducing age-based stereotyping and ageism in the workplace. According to intergroup contact theory (Allport, 1954) intergroup contact can decrease prejudice. This can be explained by the fact that when members of different social groups interact with one another (e.g., when younger and older workers collaborate together), the feeling of uncertainty resulting from perceived differences is outbalanced by increased feelings of familiarity (Pettigrew & Tropp, 2008). As a result, intergroup

contact reduces prejudice at the cognitive (learning and reappraising), behavioural (attitudes and practices), and affective (friendship and positive emotions) levels. Based on this, King and Bryant (2017) introduced the concept of intergenerational climate meaning employees' attitudes toward differently aged co-workers in the workplace and involving all ages of employees as both respondents and targets. The main difference from previous concepts is that they focused on attitudes toward workers of a variety of generations and on intraorganizational intergenerational dynamics.

The importance of this climate was tested in the study conducted by Lagacé et al. (2019). Based on the sample of 415 Canadian older workers, results revealed that a positive intergenerational climate is linked to higher levels of satisfaction among workers and that this link is mediated by older workers' perception of not being the target of ageist attitudes and practices, from a human resources' perspective. The authors also showed that the perception of a positive intergenerational workplace climate seems to decrease feelings of ageism and increase satisfaction as well as successful aging at work. Moreover, they showed that a positive intergenerational climate influences knowledge donating and collecting practices (which refers to collection and reception of information of the know-how to collaborate between workers) and this, in turn, leads to increased feelings of successful aging at work. This study provided empirical evidence that positive intergenerational climate can play a role in preventing ageism at the workplace, and that it also can lead to increasing satisfaction of employees. That proved the significance and importance of such climate.

As far as we saw the contribution of organizational climate aimed for managing age diversity, it is necessary to help organizations to manage it. And the first step to work on developing appropriate climate in age diverse organizations should be to have valid and reliable

measures to get the full picture of different dimensions of the climate. That is why having appropriate instruments aimed for this goal is crucial for organizations which are dealing with age diversity. There are some specific measures to evaluate ageism at the workplace. For example, Aging Semantic Differential (ASD; Rosencranz & McNevin, 1969), Fraboni Scale of Ageism (FSA; Fraboni et al., 1990), the Relating to Older People Evaluation scale (ROPE; Cherry & Palmore, 2008) or a measure of stereotypes about older workers with the Attitudes toward Older Workers Scale (AOWS; Gringart et al., 2013). But all these scales were aimed to measure attitudes only towards elderly people and did not focus on the other age groups. Taking this into account, North and Fiske (2013) developed a prescriptive intergenerational-tension ageism scale: Succession, Identity, and Consumption (SIC). This scale was an initial attempt at measuring ageism from this broadened intergenerational perspective, but the authors did not take into account intergenerational dynamics within organizations, which is interaction between generations on different levels (affective, cognitive and behavioural), including cooperative contact and knowledge transmission (King & Bryant, 2017).

Trying to fill this gap, King and Bryant (2017) based on their concept of intergenerational climate developed the first instrument which is aimed to measure age-related dynamics from an organizational perspective: Workplace Intergenerational Climate Scale (WICS).

Workplace Intergenerational Climate Scale (WICS)

The WICS comprises 20 items and it reflects five subscales: intergenerational contact, workplace intergenerational retention, positive intergenerational affect, workplace generational inclusiveness, and lack of generational stereotypes.

This instrument is intended to measure age-based attitudes in the workplace, applying the affective-behavioural-cognitive construction of attitudes to ageism. Differently from previous

constructs, the WICS includes five related subscales, so that it is providing a multidimensional view of ageism and allowing for more precise use by organizations. Moreover, this scale allows for an exploration of intergenerational dynamics, or interaction between workers of different generations on different levels. Below the content and the importance of each dimension is described.

Lack of Generational Stereotypes (LGS)

This subscale measures cognitive components (stereotypes) of intergenerational attitudes. Utilizing individuating information has been shown to be fundamental to reducing prejudice (Brewer, 1996). That is why it is important to include such measures of cognitive components of intergenerational attitudes in a scale assessing a positive intergenerational climate. (An example item: “Co-workers outside my generation complain more than co-workers my age do”).

Positive Intergenerational Affect (PIA)

According to intergroup contact theory, when people have positive relationships, especially friendships, across intergroup boundaries, this may create the potential for better understanding of the outgroup (Pettigrew, 1998). This subscale measures how the respondent feels toward interaction with people of different generations, the positivity of which is vital in an organizational context (Joshi et al., 2011). (An example item: “I enjoy interacting with co-workers of different generations”).

Intergenerational Contact (IC)

Intergroup contact theory (Allport, 1954; Pettigrew, 1998) holds that, under the right conditions, contact can reduce intergroup prejudice. This subscale was developed to measure behavioural aspects of attitudes toward other generations by examining the degree of interaction

that exists between co-workers of different generations. (An example item: “How often do you have conversations with co-workers outside your generation?”)

Workplace Generational Inclusiveness (WGI)

When members of an in-group can reclassify out-group members into a larger category that encompasses themselves as well, a shared identity is created, leading to increased interdependence and less bias toward out-groups (Gaertner & Dovidio, 2000). That is why ingroup identity is an important indicator of a positive intergenerational climate, so it is necessary to measure perceived generational inclusiveness in the workplace. (An example item: “Workers of all ages are respected in my workplace”).

Workplace Intergenerational Retention (WIR)

The subscale is specifically dealing with behavioural aspect of perceived age discrimination – tensions regarding succession and intention to leave among generations, and not only toward older employees considering their intention to retire, but also towards younger employees and their intention to leave. Low scores in this dimension can signalize to management that, for example, resources should be devoted to emphasizing how promotions are merit-based, rather than seniority based, and how contributions of each employee are valued, regardless of how long they have worked there or how close they are to retirement. (An example item: “My co-workers make older workers feel they should retire”).

The construct measured in the WICS is aimed to reduce age discrimination in the workplace. According to King and Bryant (2017), workplace intergenerational climate positively affects job attitudes and reduces prejudice and discrimination. Thus, with positive intergenerational climate, organizations are supposed to have less tension between generations, and this should decrease prejudice and discrimination.

We reviewed the concept of the intergenerational climate and the instruments which were developed to measure diversity climate in an organizational context. The WICS is a new instrument and has not been validated to Portugal and to the best of authors knowledge there are no studies yet validating this scale in other countries or studies exploring its psychometric properties or age invariance. Based on the database *Scopus* we managed to find only 14 articles citing the original study about the WICS (King & Bryant, 2017), but the scale was validated only in the USA and Canada (Lagacé et al., 2019) in two studies, but there are no publications yet about validation of this scale in Portugal or even in another European countries.

Seeing the current trends in age diverse population as well as the potential threats which organizations can face in terms of ageism, we aimed in this work to adapt and validate the scale which can help organizations to manage the problems in the context of ageism. The problem of age discrimination is relevant for Portugal, and this was, for example, stated in the study of Bratt et al. (2018). The authors demonstrated that age discrimination towards younger people is even higher than towards older people in Portugal. But at the same time according to the approach of Yeatts et al. (2000) in working context Portuguese culture is more likely to adhere depreciation model (Hofäcker et al., 2010), meaning that in this culture older people are more likely to be promoted for exit organization, thus they can feel more pressure than younger employees. The WICS can become a useful instrument which can help to measure the climate in Portuguese organizations and reveal weak points in organizations in terms of intergenerational climate.

Thus, the factors that the WICS instrument has been found to be a valid and reliable measure to evaluate intergenerational climate in English-speaking context (King & Bryant, 2019; Lagacé, et al., 2019) and it can help organizations to prevent ageism at the workplace, and that at

the same time a problem of age discrimination at work is stated in Portugal and that this scale still has not been validated in , explains the importance and relevance of our study.

Aim of the study

As an instrument which can contribute to manage age diversity in Portuguese companies, the aim of this study is to carry the Portuguese adaptation and validation of the Workplace Intergenerational Climate Scale (WICS) (King & Bryant, 2017), exploring and confirming the factorial structure of the scale, exploring its psychometric properties, such as reliability and different types of validity, and exploring factorial invariance across age groups. We assumed that the Portuguese scale would fit the original five-factor model of the scale. Additionally, we assumed that all the dimensions of the scale would have a significant negative correlation with perceived age discrimination. This assumption was made based on that fact that the WICS was developed to reduce age discrimination and ageism at the workplace (King & Bryant, 2017), the theoretical approach on which the concept of intergenerational climate based on the understanding that intergroup contact can decrease prejudice, meaning that with higher levels of intergenerational climate age discrimination is expected to be lower. Additionally, in the literature review (Kunze et al., 2013; Lagacé et al., 2019) we saw that positive intergenerational climate should prevent age discrimination or ageism. Therefore, we expected to see significant negative correlations of the WICS with perceived age discrimination.

Method

Participants

The group of participants included 453 workers from Portugal. The age range of participants was 18-65 years (mean age 41.2 years, SD 11.87). 36% of men, 64% of women participated in the study. Participants' work experience varied from 1 to 43 full years

(Mean=11.75, SD=10.46); 40 % among them were junior workers with work experience less than 5 years, 39% – established workers with work experience from 6 to 20 years, and 21% – senior workers with work experience more than 21 years. Among participants 16.5% held a managerial position. 14% participants worked in support functions, 6% – in HR department, 71% in production or services provision, and 9% in other departments. 59% worked in services sector, 27% – in industry and 14% in others. 31% participants worked in public organizations and 69% in private. The inclusion criterion was to be employed at least for 6 months and be older than 18 years.

Instruments

Sociodemographic questionnaire. This instrument was used to collect sociodemographic variables. Participants were asked to indicate their gender, age, education, type of the contract, professional category, tenure of working in the company, if they were holding a managerial position or not (if they were, additional information on the managerial position was collected), function, sector, and if the company is public or private. To reply about the age the participants had to write the number by themselves, not choosing between categories.

Workplace Intergenerational Climate Scale (WICS; King & Bryant, 2017). This instrument allows to provide an overall picture of workplace intergenerational climate, as well as a more nuanced examination of what must be improved (King & Bryant, 2017). Reliability analysis of the total scale in the original study showed Cronbach's $\alpha = .85$ (total scale). The scale contains 20 items and 5 related subscales, each of which contains four items: *Lack of Generational Stereotypes (LGS)*; *Positive Intergenerational Affect (PIA)*; *Intergenerational Contact (IC)*; *Workplace Generational Inclusiveness (WGI)*; *Workplace Intergenerational Retention (WIR)*. The examples of the items of each subscale are presented in the theoretical part in the chapter about

the WICS. Four of the subscales (WIR, PIA, LGS, and WGI) contain items asking participants to rate from 1 to 5 how much they agree with various statements (where 1 = I absolutely disagree; 5 = I absolutely agree); and the fifth subscale, IC, contains items asking participants to rate from 1 to 5 how often they have different types of contact with workers of different generations (where 1 = Never; 5 = Very often). This scale is measuring climate on the individual level as the employees are asked to share their individual perceptions while responding to the questions of this instrument.

The scale was directly translated by two Portuguese native speakers, the reverse translation was not conducted in this case. Both translators were proficient in English, and any disagreements in translation were discussed to reach consensus. The WICS is presented both in English and in Portuguese in the Annexes 1 and 2.

Perceived Age Discrimination Scale (Bayl-Smith & Griffin, 2014) was used to test construct validity. The scale contains 6 items that evaluate age discrimination in the context of work, including social aspects of prejudice using 5-point Likert scale from 1 (Strongly disagree) to 5 (Strongly agree). Cronbach's alpha of the scale was .92. In this questionnaire participants are asked whether, because of their age or in comparison with younger workers, they had been treated unfairly at work, been socially isolated, denied training and promotion opportunities, undergone increased scrutiny during performance appraisals, and lost desirable job assignments (Bayl-Smith & Griffin, 2014). An example item was "I have fewer training opportunities than those who are younger than me." The original scale was administered in English, so for the study it was translated into Portuguese. There was the same procedure of translating the scale as in the case of the WICS.

Procedure

The data was collected offline in paper with a snowball method, all the respondents participated in the study voluntarily and were informed of the research goals. Data collection was

performed from March to May in 2017 by Social Psychology faculty students at a university in the north of Portugal. The students were divided into groups, and each group had to collect at least 100 responses from respondents. They were doing it by passing the questionnaire to family members, friends, relatives, etc. Collection of data was conducted confidentially and anonymously; all ethical standards were applied (in accordance with Ordem dos Psicólogos Portugueses (2016) and with the Declaration of Helsinki (2001)).

The data was processed with Statistical Package for Social Sciences (IBM SPSS software, version 22) and Jeffreys's Amazing Statistics Program (JASP, version 0.12.2), a free and open source program for statistical analysis supported by the University of Amsterdam (JASP, 2020), to reach the goals of the study. Missing values in the data set were dealt with data imputation in SPSS.

The database was divided randomly into two subgroups in SPSS. Exploratory factor analysis was run in SPSS with half of the group of participants, and then confirmatory factor analysis was conducted in JASP with the other half to test the Portuguese factorial structure of the WICS in Portuguese, as previously obtained in EFA.

With regard to CFA, multiple fit indices were chosen to achieve a comprehensive evaluation of fit of the tested models: chi-square, the comparative fit index (CFI), the non-normed fit index (NNFI or TLI), the root mean squared error of approximation (RMSEA), and the standardized root mean square residual (SRMR). For the CFI and TLI, values above 0.90 are traditionally considered as indicating a reasonable model fit, and for the RMSEA and the SRMR – values below 0.08 (Hu & Bentler, 1999). Additionally, regarding χ^2/df , this ratio should be less than 3-5 for a good fit (Hu & Bentler, 1999).

To evaluate the internal consistency, different reliability indices were estimated: Cronbach's alpha coefficient (α), average variance extracted (AVE) and composite reliability (CR). The criteria which were applied as indicating good reliability are: Cronbach's alpha greater than 0.8 (Clark and Watson, 1995), AVE greater than 0.5, and CR greater than 0.7 (Hair et al., 2005).

Convergent and discriminant validity of the scale were also examined by using average extracted variance (AVE). According to Hair et al. (2009) the constructs' convergent validity evidence is assumed for values of $AVE \geq 0.5$. And to confirm the discriminant validity, the AVE square root must be larger than the correlations among the constructs (Fornell & Larcker, 1981; Marôco, 2014).

A series of multiple CFA were conducted in JASP to evaluate the instrument's invariance across age groups. Different nested models were tested to estimate structural equivalence (M1), invariance of factor loadings (M2) and invariance of factor loadings and intercepts (M3). To compare the nested models' goodness of fit, the incremental fit indices were compared. To compare the alternative models' goodness of fit, incremental fit indices were estimated. Regarding criteria for interpreting these indices, it has been suggested that a difference of 0.01 or less between values of CFI (Cheung & Rensvold, 2002; Dimitrov, 2010) and TLI (Dimitrov, 2010) reflect practically irrelevant differences between models. Similarly, Chen (2007) suggested RMSEA increases of less than 0.015 between alternative models indicate irrelevant differences.

Moreover, correlation analysis was conducted in SPSS to provide an evidence of criterion validity based on the relationship with another scale.

Results

Exploratory factor analysis

Although the WICS instrument was already developed (King & Bryant, 2017), because the instrument is new for Portugal, we carried out an EFA for cross-validation purposes. We randomly divided our group of participants into two parts and conducted EFA with the first half of participants, and CFA with the second.

Descriptive statistics (mean, standard deviation, skewness, and kurtosis) of all the items of the WICS are presented in Table 1. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.80, and the Bartlett test of sphericity was statistically significant ($p < 0.01$), indicating the suitability of these data for factor analytic procedures.

Table 2 shows the EFA results. Only factor loadings higher than 0.40 are presented in bold. Five factors had eigenvalues greater than 1 (5.02, 3.54, 1.89, 1.29, 1.13), explaining 64.38% of the variance together. Also, table 2 demonstrates distribution of the items among the factors. Almost all the factors are represented with the same items as in the original version of the scale. However, based on low factor loading item 8 (*People work best when they work with others their same age / As pessoas trabalham melhor quando trabalham com outras pessoas da mesma idade*) should be excluded, as it was the only item that presenting factor loading below 0.4. Moreover, the item 15 (*I am able to communicate effectively with workers of different generations / Sou capaz de comunicar eficazmente com trabalhadores de diferentes gerações*) based on EFA belongs in our group of participants to PIA subscale, not to WGI as in the original scale. Therefore WGI subscale in our Portuguese group of participants has three items instead of four. Eliminating item 8 also contributes to higher internal consistency of the scale (see Table 7).

Table 1
WICS items' descriptive statistics

Item	Mean	SD	Skewness	Kurtosis
1. Co-workers outside my generation are not interested in making friends outside their generation.*	3.47	1.26	-0.35	-0.88
2. Co-workers outside my generation complain more than co-workers my age do.*	3.12	1.26	-0.13	-0.98
3. Co-workers outside my generation usually talk about things that don't interest me.*	3.49	1.08	-0.23	-0.61
4. Co-workers outside my generation tend to work differently than co-workers my age do.*	3.07	1.17	-0.03	-0.65
5. I feel comfortable when co-workers outside my generation try to make conversation with me.	3.87	1.12	-0.88	0.17
6. I enjoy interacting with co-workers of different generations.	4.07	0.98	-1.00	0.58
7. My co-workers outside my generation are interesting and unique individuals.	3.44	1.08	-0.50	-0.07
8. People work best when they work with others their same age.*	3.37	1.15	-0.28	-0.52
9. How often do you have conversations with co-workers outside your generation?	3.45	1.03	-0.63	0.20
10. How often do you have conversations with co-workers outside your generation relating to things other than work?	3.32	0.99	-0.29	-0.07
11. How often do you talk with co-workers outside your generation about your personal lives?	3.02	1.09	0.08	-0.64
12. How often do you eat meals with co-workers outside your generation during the workday?	3.38	1.13	-0.22	-0.71
13. I believe that my work environment is a healthy one for people of all ages.	3.48	1.25	-0.52	-0.51
14. Workers of all ages are respected in my workplace.	3.86	1.03	-0.71	0.06
15. I am able to communicate effectively with workers of different generations.	4.15	0.97	-1.23	1.41
16. Working with co-workers of different ages enhances the quality of my work life.	3.91	1.01	-0.61	-0.26
17. My co-workers make older workers feel they should retire.*	3.85	1.16	-0.67	-0.54
18. I feel pressure from younger workers to step down.*	4.14	1.11	-1.13	0.38
19. I feel pressure from older workers to step down.*	4.23	0.99	-1.05	0.14
20. In my workplace, qualified younger workers tend to be overlooked for promotions.*	3.81	1.11	-0.51	-0.64

Note: * - reverse item

Table 2
Rotated factor matrix and factor variance

	Factor				
	1	2	3	4	5
19. I feel pressure from older workers to step down.*	0.85				
18. I feel pressure from younger workers to step down.*	0.83				
17. My co-workers make older workers feel they should retire.*	0.62				
20. In my workplace, qualified younger workers tend to be overlooked for promotions.*	0.58				
8. People work best when they work with others their same age.*					
6. I enjoy interacting with co-workers of different generations.		0.82			
7. My co-workers outside my generation are interesting and unique individuals.		0.67			
15. I am able to communicate effectively with workers of different generations.		0.62			
5. I feel comfortable when co-workers outside my generation try to make conversation with me.		0.54			
10. How often do you have conversations with co-workers outside your generation relating to things other than work?			0.84		
11. How often do you talk with co-workers outside your generation about your personal lives?			0.71		
9. How often do you have conversations with co-workers outside your generation?			0.63		
12. How often do you eat meals with co-workers outside your generation during the workday?			0.61		
3. Co-workers outside my generation usually talk about things that don't interest me.*				0.79	
2. Co-workers outside my generation complain more than co-workers my age do.*				0.72	
4. Co-workers outside my generation tend to work differently than co-workers my age do.*				0.66	
1. Co-workers outside my generation are not interested in making friends outside their generation.*				0.55	
14. Workers of all ages are respected in my workplace.					0.71
13. I believe that my work environment is a healthy one for people of all ages.					0.56
16. Working with co-workers of different ages enhances the quality of my work life.					0.44
Variance accounted for (%)	25.12	17.72	9.44	6.44	5.65

Note: * - reverse item

Confirmatory factor analysis and model adjustment

To confirm the structure, obtained in EFA, we ran CFA using the JASP program. Three alternative models were tested: a one-factor model and a five-factor model as in the original scale (with 20 items) and the model obtained in EFA (with 19 items). The first model hypothesized that the 20 items of the WICS were measuring a single dimension (intergenerational climate). The five-factor models considered the dimensions originally described in the scale (LGS, PIA, IC, WGI, WIR), but in the case of the third model we tested the model with 19 items (without item 8, which was eliminated in EFA, and with item 15 belonging to another subscale). To assess the models' fit, we examined several indices: χ^2/df , RMSEA, CFI, TLI and SRMR.

Fit indices of these three models are provided in the Table 3, showing that none of the models reached satisfactory fit indices, which is 3-5 for χ^2/df , higher than 0.9 for CFI and TLI, and less than 0.08 for RMSEA and SRMR (Hu & Bentler, 1999; Browne & Cudeck, 1993; Marsh et al., 2005). However, the indices of the adjusted model are better than of the one-factor model or the original one, and these indices are satisfactory.

JASP proposed some suggestions to improve the model. The program demonstrated that the items 13 (*"I believe that my work environment is a healthy one for people of all ages"* / *"Acredito que o meu ambiente de trabalho é saudável para pessoas de todas as idades"*) and 14 (*"Workers of all ages are respected in my workplace"* / *"Os trabalhadores de todas as idades são respeitados no meu local de trabalho"*) are correlated among residuals and the same is about items 10 (*"How often do you have conversations with co-workers outside your generation relating to things other than work?"* / *"Quantas vezes tem conversas com colegas que não pertencem à sua geração relacionadas com assuntos que não são de trabalho?"*) and 11 (*"How often do you talk with co-workers outside your generation about your personal lives?"* / *"Com que frequência*

conversa com colegas de trabalho que não pertencem à sua geração sobre as suas vidas pessoais?"). Based on these suggestions, we correlated residuals for these two pairs of the items (10th and 11th; 13th and 14th) and ran CFA again with these adjustments. As a result, we obtained the model with better and adequate indices (Table 3), which almost reached all the thresholds.

Table 3

Fit indices of the model

Model	χ^2	df	χ^2/df	CFI	TLI	RMSEA	SRMR
1F Model	1134.42	152	7.463	0.453	0.385	0.167	0.155
5F Model (original)	458.898	160	2.868	0.838	0.808	0.09	0.092
5F Model (adapted)	395.025	142	2.782	0.859	0.83	0.088	0.082
5F Model (adapted, with correlated residuals)	330.076	140	2.358	0.894	0.871	0.077	0.077

Note: RMSEA: 95% CI [LL, UL]

Additionally, all the items in CFA with the five-factor model with 19 items demonstrated factor loadings higher than 0.5 (Table 4), meaning that all the items contribute to the factors of the scale.

Table 4
Factor loadings

Factor	Item	Estimate
LGS	1. Co-workers outside my generation are not interested in making friends outside their generation. *	0.75
	2. Co-workers outside my generation complain more than co-workers my age do.*	0.87
	3. Co-workers outside my generation usually talk about things that don't interest me.*	0.89
	4. Co-workers outside my generation tend to work differently than co-workers my age do.*	0.78
PIA	5. I feel comfortable when co-workers outside my generation try to make conversation with me.	0.63
	6. I enjoy interacting with co-workers of different generations.	0.71
	7. My co-workers outside my generation are interesting and unique individuals	0.71
IC	15. I am able to communicate effectively with workers of different generations.	0.72
	9. How often do you have conversations with co-workers outside your generation?	0.77
	10. How often do you have conversations with co-workers outside your generation relating to things other than work?	0.98
	11. How often do you talk with co-workers outside your generation about your personal lives?	0.80
WGI	12. How often do you eat meals with co-workers outside your generation during the workday?	0.55
	13. I believe that my work environment is a healthy one for people of all ages.	0.94
	14. Workers of all ages are respected in my workplace.	0.59
WIR	16. Working with co-workers of different ages enhances the quality of my work life.	0.84
	17. My co-workers make older workers feel they should retire.*	0.72
	18. I feel pressure from younger workers to step down.*	1.00
	19. I feel pressure from older workers to step down.*	0.85
	20. In my workplace, qualified younger workers tend to be overlooked for promotions.*	0.79

Note: * - reverse item

LGS – *Lack of Generational Stereotypes*

PIA – *Positive Intergenerational Affect*

IC – *Intergenerational Contact*

WGI – *Workplace Generational Inclusiveness*

WIR – *Workplace Intergenerational Retention*

Factorial invariance across age groups

After obtaining the best-fitting model, we conducted additional analyses of multiple-group invariance across age groups to examine if statistically significant differences based on scale scores would reflect real differences across age groups, but not differences in factorial structure between these groups. We believe that this should provide more validity strength, as it is especially important to test if the factorial structure is the same for different age groups as it is measuring the contact between generations.

To evaluate invariance as a function of age, participants were divided into two groups by age. The original group of participants included 453 workers aged 18-65 years, with a median age of 41.2 years. We split the group into two parts – below or upper the median age: younger group (18-41 years) and older group (42-65 years).

Before performing the invariance analysis, the five-factor model was estimated for each subgroup (table 5). Then, at first, we tested configural invariance, which examines whether the data from subgroups are represented by the same factor structure. Next, we examined metric invariance, where factor loadings are constrained to be equivalent across subgroups. And, finally, we assessed scalar invariance, in which all intercepts are constrained to be equal in subgroups.

To compare the nested models' goodness of fit, the incremental fit indices were compared. Regarding criteria for interpreting these indices, it has been suggested that a difference of 0.01 or less between values of CFI (Cheung & Rensvold, 2002) and NNFI (Widaman, 1985) reflect practically irrelevant differences between models. Similarly, Chen (2007) suggested RMSEA increases of less than 0.015 between alternative models indicate irrelevant differences.

The five-factor model showed a better fit for younger participants than for older. But invariance was not proved even at the weak (configural) level, as the indices were not satisfactory

(CFI and TLI are less than 0.9 and RMSEA is greater than 0.08). Other levels of invariance were not confirmed respectively. From that, we could make a conclusion that the factorial structure of the WICS varies between age groups. Thus, it reveals the lack of invariance of factor loadings and item intercepts across age and further, meaning that factorial structure of the WICS can be different for younger and older participants. That means that the scale needs further exploration to reveal different structures for different age groups to make it a more reliable instrument.

Table 5

Goodness of fit indices for tested invariance models across age groups.

Model	Description	CFI	TLI	RMSEA	Δ CFI	Δ TLI	Δ RMSEA
M0 (younger)	Baseline (younger)	0.888	0.863	0.080			
M0 (older)	Baseline (older)	0.873	0.844	0.085			
M1 (age)	Configural	0.878	0.850	0.083			
M2 (age)	Metric	0.863	0.841	0.086	0.015	0.009	0.003
M3 (age)	Scalar	0.862	0.847	0.084	0.006	0.003	0.001

Reliability

Reliability was assessed to evaluate the internal consistency of the scale. Table 6 demonstrates that the consistency of the total scale is good according to Cronbach's alpha (0.83). Considering the subscales all of them had good consistency (above 0.7 or higher). Table 7 demonstrates the reliability of the scale if items were deleted, and only eliminating item 8 contributes to increasing internal consistency, and this element was already deleted based on low factor loading in EFA. Also, CR and AVE also met the criteria (greater than 0.7 for CR and greater than 0.5 for AVE) for all the subscales besides PIA subscale (AVE<0.5) (Table 6).

Table 6

Reliability of the WICS scale and subscales

	Cronbach's α	CR	AVE
Total scale	0.84	0.97	0.60
LGS	0.80	0.89	0.68
PIA	0.75	0.77	0.48
IC	0.82	0.82	0.54
WGI	0.77	0.80	0.58
WIR	0.85	0.91	0.71

Table 7

Item reliability statistics

	Cronbach's α if item dropped
1. Co-workers outside my generation are not interested in making friends outside their generation.*	0.830
2. Co-workers outside my generation complain more than co-workers my age do.*	0.839
3. Co-workers outside my generation usually talk about things that don't interest me.*	0.833
4. Co-workers outside my generation tend to work differently than co-workers my age do.*	0.839
5. I feel comfortable when co-workers outside my generation try to make conversation with me.	0.840
6. I enjoy interacting with co-workers of different generations.	0.832
7. My co-workers outside my generation are interesting and unique individuals.	0.834
8. People work best when they work with others their same age.*	0.845
9. How often do you have conversations with co-workers outside your generation?	0.831
10. How often do you have conversations with co-workers outside your generation relating to things other than work?	0.832
11. How often do you talk with co-workers outside your generation about your personal lives?	0.840
12. How often do you eat meals with co-workers outside your generation during the workday?	0.839
13. I believe that my work environment is a healthy one for people of all ages.	0.828
14. Workers of all ages are respected in my workplace.	0.833
15. I am able to communicate effectively with workers of different generations.	0.831
16. Working with co-workers of different ages enhances the quality of my work life.	0.827
17. My co-workers make older workers feel they should retire.*	0.838
18. I feel pressure from younger workers to step down.*	0.829
19. I feel pressure from older workers to step down.*	0.831
20. In my workplace, qualified younger workers tend to be overlooked for promotions.*	0.836

Note: * - reverse item

Convergent and discriminant validity

To assess the discriminant validity, the correlation analysis was run, and the AVE square root must be larger than the correlations among the constructs. Table 8 shows the correlations and AVE square roots for each of the five subscales of the WICS. The square root of the AVE for each factor exceeded its correlation with any other subscale. Thus, discriminant validity was confirmed as each factor shared more variance with its indicators than it shared with the other factors.

Table 8

Discriminant validity of the WICS: correlations among subscales and AVE square root

	LGS	PIA	IC	WGI	WIR
LGS	0.82				
PIA	0.03	0.69			
IC	0.08	.46**	0.73		
WGI	0.08	.54**	.35**	0.76	
WIR	.43**	.17**	0.05	.31**	0.84

Note: ($\sqrt{\text{AVE}}$) (in bold).

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

In order to evaluate convergent validity evidence, the AVE coefficient (Average Variance Extracted coefficient) was used, which has to be greater than 0.50. The total scale had an AVE of 0.60, and AVE of all subscales besides PIA subscale met the criteria (LGS – 0.68, PIA – 0.48, IC – 0.54, WGI – 0.58, WIR – 0.71). Low meaning of AVE indicates that this construct is not close enough to other constructs of other subscales, so it probably measures a slightly different construct. So, this should be taken into account in future studies. Thus, convergent validity was confirmed as well, but for all subscales besides PIA.

Additionally, in this table we can observe correlations between the subscales and we can see that they are quite low, meaning that the construct of each subscale differs from other subscales. But as in the original study of King and Bryant (2017) there was no correlation analysis between the subscales, we did not expect specific results in terms of this analysis. Probably in future this should be also considered for adjusting the scale.

Evidence of validity based on relationships with perceived age discrimination

Correlation analysis with Perceived Age Discrimination Scale was conducted to test the criterion validity. Table 9 demonstrates the results of correlation analysis which revealed significant negative correlations of all the WICS subscales with Perceived Age Discrimination scale, which proves the criterion validity. The highest correlation was revealed with the WICS Workplace Intergenerational Retention subscale, which also goes in line with previous literature, but only considering older workers – that workers who feel discriminated at work based on age can feel pressure to retire earlier (Snape & Redman, 2003).

Table 9

Convergent and discriminant validity of the WICS: correlations among subscales with Perceived Age Discrimination

	LGS	PIA	IC	WGI	WIR
Perceived Age Discrimination	-.45**	-.29**	-.21**	-.24**	-.65**

. Correlation is significant at the 0.01 level (2-tailed).

. Correlation is significant at the 0.05 level (2-tailed).

Discussion

The aim of the present research was to adapt and validate the Workplace Intergenerational Climate Scale (WICS) in the Portuguese context, exploring and confirming the factorial structure of the scale, as an instrument which can contribute to management of age diversity. We examined the instrument's psychometric properties, reliability, and validity, finding its internal consistency to be satisfactory, and providing different sources of evidence to support its validity. Regarding evidence of validity based on internal structure, EFA and CFA confirmed the five-factor model which corresponds to the original scale. Thus, our results support previous research that has found five dimensions of this scale (King & Bryant, 2017). However, the specific content of two dimensions was slightly different. Thus, we had to adjust the model by eliminating one element from the Portuguese scale and another element was transferred from one subscale to another. Moreover, factorial invariance across age was not confirmed in Portuguese groups of participants, meaning that the instrument will need additional adjustment to reveal different factorial structures for different age groups to make it a reliable instrument to compare scores between different age groups.

Item 8 (*People work best when they work with others their same age / As pessoas trabalham melhor quando trabalham com outras pessoas da mesma idade*) which demonstrated the lowest factor loading has a different content if to compare it with other items from PIA subscale: first three elements contain affective components (“feel comfortable”, “enjoy”, “interesting”) and in the item 8 the generations are compared just from the point with whom it is better to work, so the content seems different from other three items. Moreover, this item is reversed, which can bring additional difficulties. In original scale this element proved good factor loading and is proved to be in PIA dimension, but in the case of translated scale tested on Portuguese group of participants

this did not work. It can be the difficulties in translation or in understanding emotions by different cultures (e.g., Paez & Vergara, 1995). We decided to test, in a qualitative way, the items' meaning and asked three Portuguese native speakers to divide items to the groups based on the dimensions, and they confirmed that in their opinion item 8 does not fit PIA dimension by its meaning. Thus, this element does not fit Portuguese model and there are proofs to eliminate it.

Another change was done with the same subscale (PIA) – item 15 (*I am able to communicate effectively with workers of different generations / Sou capaz de comunicar eficazmente com trabalhadores de diferentes gerações*) was moved from WGI subscale to PIA subscale. If to look at these 4 items (5, 6, 7, and 15) they all can be united as items describing communication between generations (*I feel comfortable when co-workers outside my generation try to make conversation with me; I enjoy interacting with co-workers of different generations; My co-workers outside my generation are interesting and unique individuals; I am able to communicate effectively with workers of different generations*). While items 13, 14, and 16 can be united by meaning inclusiveness at the workplace, as in the original scale. Probably later, if other studies confirm such structure, PIA subscale should be renamed to underline the accent on the communication aspect.

Considering the elements 10 and 11 (*How often do you have conversations with co-workers outside your generation?; How often do you have conversations with co-workers outside your generation relating to things other than work?*), they seem to be very similar in meaning and have a strong correlation between them in our model. The fact that these elements were not that correlated in original scale can be possibly explained by the difference of cultures – what can or cannot be discussed besides work and what people are ready to share with their colleagues. According to Hofstede's culture classification (Hofstede & Hofstede, 2005) cultures of Portugal

and USA (where the original scale was tested), are indeed drastically different in the dimensions individualism-collectivism and uncertainty avoidance (<https://www.hofstede-insights.com/>). The difference in the first mentioned dimensions can probably explain why these two questions are more similar for Portuguese collectivistic culture than for individualistic USA. According to this model, Portuguese people build strong relations in families and also at work. This probably can mean that they easily share information about their personal lives with their work colleagues. Thus, the content of the conversations (work-related or personal-related) does not make a difference in intergenerational interactions. Based on the high correlation between these two items we correlated its residuals.

We also had to correlate residuals of 13 and 14 items (*I believe that my work environment is a healthy one for people of all ages / Acredito que o meu ambiente de trabalho é saudável para pessoas de todas as idades; Workers of all ages are respected in my workplace / Os trabalhadores de todas as idades são respeitados no meu local de trabalho*) which are not that similar in English, but probably for Portuguese population being respected and have a healthy environment are much stronger correlated than for USA sample from original study. Also, this can be explained by the fact that in Europe health is more considered to be a right, thus, having a healthy environment is a measure of respect. In the United States where Health insurance is a commodity not guaranteed for everyone this could not be considered as a measure of respect (Janus & Minvielle, 2017). Qualitative test with native Portuguese speakers did not reveal that these items are too similar, but further research is needed to find out why these elements were covaried in our sample.

Reliability of the scale was confirmed, same as convergent and discriminant validity. Only for PIA subscale convergent validity was not confirmed, meaning that the construct of this subscale differs from the others and in future studies this should be taken into account.

The criterion validity was also supported by correlation analysis with Perceived Age Discrimination Scale. We expected significant negative correlation of all the WICS dimensions with perceived age discrimination, and the results confirmed this assumption. This supports previous research that has stated that intergenerational climate is reducing prejudice and age discrimination at workplace (Kunze et al., 2013, King & Bryant, 2017). Also, the strongest negative correlation was found with WIR dimension (Workplace Intergenerational Retention), which means that high level of discrimination can be associated with employees' desire and intention to leave organization. In previous studies there is a partial support in literature for this relation, for instance Snape and Redman (2003) found partial support for the hypothesis that older workers who feel that they have been discriminated against have a stronger intention to retire early. However, this question needs more deep exploration of this relation and potential mediators or moderators of this correlation.

Multigroup CFAs did not confirm the invariance of the WICS factor structure, factor loadings, and intercepts across age groups. This means that the results did not support the WICS factorial invariance (Meredith, 1993) as a function of age, meaning that different age groups have different representations of the construct of intergenerational climate. So, with this structure of the scale we cannot compare the meanings of the scale between age groups, as factorial structure for different age groups can be different. Future studies should explore more deeply this difference and probably create different factorial structures for different age groups. Also, the age groups can be divided into narrower categories, but not just into two groups as it was done in this study. Different representations of intergenerational scale partially go in line with the study of Bratt et al. (2017), which demonstrated that in Portuguese context age discrimination towards young people is even higher than towards older people in society in general, meaning that the construct of

intergenerational contact can be perceived differently as well. But at the same time in working context according to the approach of Yeatts et al. (2000), Portuguese culture is more likely to adhere depreciation model (Hofäcker et al., 2010), meaning that in this culture older people are more likely to be promoted for exit organization, thus they can feel more pressure than younger employees. However, the factors which influence the difference in perception of intergenerational climate between different generations should be explored more deeply.

From a theoretical point of view, this study contributes by validating a measure in the Portuguese context. This extends the new concept of intergenerational climate to another cultural context. Our research contributed to establish the positive effect for reducing age discrimination (King & Bryant, 2017; Kunze et al., 2013) and it offers some indication to explore possible relationship between age management practices and differences in climate perceptions by age.

In this work the WICS is validated for Portuguese population and is confirmed as a good instrument because reliability and validity tests were met. But, at the same time, the instrument needs further exploration and adjustment, as there is no consistency yet in terms of factorial structure, and it was shown that factorial structures should be explored separately for different age groups. This means that the WICS has a potential to be suitable for assessing employees' attitude and perceptions about workers of different ages in the workplace in Portuguese population. And this will allow the companies in Portugal to use the instrument to help in management of age diversity by supporting and facilitating a healthy climate for workers of all generations, as far as it will allow them to diagnose the climate and to reveal weak points and plan interventions. Moreover, the information gained from using this instrument can be useful for politicians to see the situation in workplaces in general considering managing age diversity and its strengths and weaknesses. This scale can help to identify both the overall picture of workplace intergenerational

climate and more specific examinations of different dimensions in order to see where improvements are needed. However, as it was mentioned earlier, it is needed to adjust the instrument for Portuguese context first, because it still has some weak points.

Limitations

As with any research, this one presents some limitations that must be taken into account in order to interpret the results adequately. First, one possible limitation resides in the translation of the items. Although researchers worked on an accurate translation of the scale, this process missed a backward translation of the items in scale adaptation. This could influence the way respondents understand the questions. As we saw in the qualitative test with native Portuguese speakers, we revealed that item 8 (*People work best when they work with others their same age / As pessoas trabalham melhor quando trabalham com outras pessoas da mesma idade*) indeed has a different meaning for them. Probably the elimination of the elements would not be needed with more accurate translation. Later more deep analysis of translation can be provided with native speakers in order to see if some items should be adjusted.

Secondly, as we saw we had to delete one item and move another item from one subscale to another. Invariance of the scale structure among USA and Portuguese populations could be further explored in order to see if the differences between original and Portuguese scales are significant.

Also, in terms of validity, for one of the subscales convergent validity was not proved, and factorial invariance in terms of age was not confirmed, meaning that the instrument needs further improvements for Portuguese context. Moreover, the structure of the scale demonstrated heterogeneity in obtained data. For instance, in another study Brochado and Oliveira (2020) found a four-factors structure of the WICS instrument. As this instrument is new and its adaptation just

started in Portuguese context, for future studies it is recommended to include more specific groups of participants to test the difference between workers of different sectors or with different work experience.

Additionally, the scale is a self-report instrument, which means that it is measuring the climate at the individual level. So, based on our data and our design we cannot test the climate and make conclusions about it on a group level.

Conclusion

In summary, this research demonstrates that the WICS is a valid, reliable instrument for measuring employee's attitudes and perceptions about workers of different generations at the workplace in Portuguese population. In Portuguese version we propose to use the same structure of the scale as in its original version containing the same five factors, but with 19 elements instead of 20 and transferring one item from one subscale to another. All the dimensions of the scale were found to be negatively related to perceived age discrimination confirming its criterion validity. However, invariance of the scale across age groups was not confirmed, meaning that representations of the construct of intergenerational climate can vary among different age groups, so the instrument should not be used yet to make comparisons between age groups and should be improved and adjusted. Even though other sources of validity of the WICS were confirmed in the study, to make the instrument reliable, different factorial structures should be explored first.

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Annex 1: WICS Subscales and Items (Original Version in English)

* = reverse scored

Lack of Generational Stereotypes (LGS)

LGS1. Co-workers outside my generation are not interested in making friends outside their generation.*

LGS2. Co-workers outside my generation complain more than co-workers my age do.*

LGS3. Co-workers outside my generation usually talk about things that do not interest me.*

LGS4. Co-workers outside my generation tend to work differently than co-workers my age do.*

Positive Intergenerational Affect (PIA)

PIA1. I feel comfortable when co-workers outside my generation try to make conversation with me.

PIA2. I enjoy interacting with co-workers of different generations.

PIA3. My co-workers outside my generation are interesting and unique individuals.

PIA4. People work best when they work with others their same age.*

Intergenerational Contact (IC)

IC1. How often do you have conversations with co-workers outside your generation?

IC2. How often do you have conversations with co-workers outside your generation relating to things other than work?

IC3. How often do you talk with co-workers outside your generation about your personal lives?

IC4. How often do you eat meals with co-workers outside your generation during the workday?

Workplace Generational Inclusiveness (WGI)

WGI1. I believe that my work environment is a healthy one for people of all ages.

WGI2. Workers of all ages are respected in my workplace.

WGI3. I am able to communicate effectively with workers of different generations.

WGI4. Working with co-workers of different ages enhances the quality of my work life.

Workplace Intergenerational Retention (WIR)

WIR1. My co-workers make older workers feel they should retire.*

WIR2. I feel pressure from younger workers to step down.*

WIR3. I feel pressure from older workers to step down.*

WIR4. In my workplace, qualified younger workers tend to be overlooked for promotions.*

Annex 2: WICS Subscales and Items (Translated into Portuguese)

* = reverse scored, ^ = eliminated item from Portuguese scale

Ausência de Estereótipos Geracionais (LGS)

LGS1. Os colegas de trabalho que não são minha geração não estão interessados em fazer amigos fora de sua geração.*

LGS2. Os colegas de trabalho fora da minha geração reclamam mais do que os colegas da minha idade.*

LGS3. Os colegas de trabalho fora da minha geração geralmente conversam sobre assuntos que não me interessam.*

LGS4. Os colegas fora da minha geração tendem a trabalhar de forma diferente em relação aos colegas de trabalho da minha idade.*

Efeito Intergeracional Positivo (PIA)

PIA1. Sinto-me confortável quando colegas que não pertencem à minha geração tentam conversar comigo.

PIA2. Gosto de interagir com colegas de diferentes gerações.

PIA3. Meus colegas de trabalho fora da minha geração são indivíduos interessantes e únicos.

PIA4. As pessoas trabalham melhor quando trabalham com outras pessoas da mesma idade.*^

Contato Intergeracional (IC)

IC1. Quantas vezes tem conversas com colegas de trabalho que não pertencem à sua geração de sua geração?

IC2.Quantas vezes tem conversas com colegas que não pertencem à sua geração relacionadas com assuntos que não são de trabalho?

IC3.Com que frequência conversa com colegas de trabalho que não pertencem à sua geração sobre as suas vidas pessoais?^

IC4.Com que frequência toma refeições com colegas de trabalho que não pertencem à sua geração nos dias de trabalho?

Inclusão Geracional no Local de Trabalho (WGI)

WGI1. Acredito que o meu ambiente de trabalho é saudável para pessoas de todas as idades.

WGI2. Os trabalhadores de todas as idades são respeitados no meu local de trabalho.

WGI3. Sou capaz de comunicar eficazmente com trabalhadores de diferentes gerações.

WGI4. Trabalhar com colegas de trabalho de diferentes idades melhora a qualidade da minha vida profissional.

Retenção Intergeracional noLocal de Trabalho (WIR)

WIR1. Os meus colegas de trabalho fazem com que os trabalhadores mais velhos sintam que se devem reformar.*

WIR2.Sinto a pressão dos trabalhadores mais jovens para me demitir.*

WIR3.Sinto pressão dos trabalhadores mais velhos para me demitir.*

WIR4.No meu local de trabalho, os trabalhadores jovens qualificados tendem a ser negligenciados para promoções.*