A Validation Study of the Korean Version
of the Workplace Intergenerational Climate Scale(K-WICS)[*]

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Due to recent demographic changes, employees from diverse generations now work together in organizations. Thus, there is a need for research on intergenerational cooperation. However, the lack of valid and reliable measures to capture intergenerational climate in the workplace is an obstacle to research. Therefore, we translated the Workplace Intergenerational Climate Scale(WICS) into Korean and validated it with a sample of 1,052 Korean full-time employees. Firstly, we conducted an exploratory factor analysis by using sample 1($N = 460$) and revealed a five-factor solution. Secondly, the confirmatory factor analysis(sample 2; $N = 592$) showed a good model fit of the correlated five-factor model. Thirdly, the scale's discriminant and convergent validity was supported by negative correlations with four types of existing ageism scales and by positive correlations with trust, organizational commitment, work engagement, psychological safety, intention to remain, job satisfaction, and communication satisfaction. Moreover, it further demonstrated significant incremental validity in predicting positive outcome variables even when controlling for pre-existing agism scales. Lastly, we confirmed strict measurement invariance of the scale between the age groups(below 40 versus above 40). The findings support the reliability and validity of the Korean version of WICS among Korean employees. The scale will be broadly applied to measure intergenerational climate of organizations and provide practical implications for HR management.

Key words : K-WICS(Korean version of workplace intergenerational climate scale), scale validation

Many countries, particularly in the developed world, have recently experienced dramatic demographic changes(Nagarajan et al., 2019). As a result, employees from diverse generations now work in the same organizations(Wegge & Meyer, 2020), and the importance of intergenerational cooperation in the workplace has increased. When considering positive outcomes of intergenerational cooperation such as increased job satisfaction(King & Bryant, 2017) and work engagement(Burmeister et al., 2021), it is imperative to examine strategies to enhance cooperation between employees from different age groups.

However, fostering cooperative climate in organizations is quite challenging since employees have unique characteristics depending on their generations(Lyons & Kuron, 2014). According to Meredith et al.(2002), significant events are known to reformulate a society's values. Since its independence, South Korea has undergone unprecedently rapid economic growth(Le et al., 2016) and a variety of political events, including military dictatorship(Park, 2007). Thus, the case is worse in South Korea. People in South Korea hold distinct social values from generation to generation, in turn, the gap between generations became wider than in other countries due to the dramatic changes. For example, Koreans traditionally have respected the role and status of the elderly in society and families based on Confucianism(Sung & Kim, 2003). However, Confucian-based social values have greatly weakened due to the dominance of Westernized culture(Hyun, 2001), resulting in younger Koreans tending to hold weaker traditional values. In the workplace, older generations tend to sacrifice themselves for their company's growth(Park & Park, 2018), follow the organizations' established rules, and respect their leaders(Park & Kim, 2001). In contrast, younger generations value individualism(Park, 2007) and consider work-life balance more important than devoting themselves to their companies(Kim et al., 2022). This value incongruency has been pointed out as a major cause of conflicts between generations in organizations(Chung et al., 2022). In fact, according to the report on the generation gap in organizations, 63.9% of respondents answered experiencing intergenerational differences and 41.9% believed that these differences have negative impacts on their work(Korea Chamber of Commerce and Industry, 2020). Moreover, due to the gaps, employees are less likely to communicate with their coworkers from other generations(Chung et al., 2022). As a result, there is a need for research on intergenerational cooperation in organizations(Goh et al., 2021).

In this situation, the lack of a valid scale to measure intergenerational climate in the work setting is an obstacle to developing further research. Even though some scales measure related concepts such as ageism, age stereotypes, and age discrimination, these measures have several limitations. Previous measurements such

as the Fraboni Scale of Ageism(FSA; Fraboni et al., 1990) and the Relating to Older People Evaluation scale(ROPE; Cherry & Palmore, 2008) only reflect ageist attitudes or behaviors in general circumstances. Some researchers have developed scales that can be applied specifically to work settings(e.g., Furunes & Mykletun, 2010; Gringart et al., 2013; Marchiondo et al., 2016), but these scales only reflect ageist attitudes toward older workers. North and Fiske(2013) developed the Succession, Identity, and Consumption scale(SIC) to capture stereotypes toward both older and younger people. However, this scale did not address intergenerational dynamics within the workplace.

Moreover, some scales have several psychometric problems such as unstable factor structures and low factor loadings of items. For example, Fraboni et al.(1990), based on responses from a Canadian sample, demonstrated that FSA consisted of three factors: antilocution, avoidance, and discrimination. Rupp et al.(2005) identified different factors: stereotypes, separation, and affective attitudes. Since then, many studies have been conducted in various cultures, such as China(Fan et al., 2020), Israel(Bodner & Lazar, 2008), South Korea(Kim et al., 2012), and Turkey(Kutlu et al., 2012), and have identified the factor structures of FSA that varied with the samples. Additionally, researchers have consistently deleted several items due to low factor loadings and reliability(i.e., Cronbach's alpha coefficient). Regarding the limitations of

the existing measures discussed above, a reliable and valid measure is required to assess intergenerational dynamics within the workplace.

In South Korea, there are only a handful of valid ageism scales(e.g., Kim, 2012; Kim et al., 2012; Kim et al., 2020), and they only capture ageist attitudes toward older people in general settings(e.g., Kim, 2012) or are developed for adolescents(e.g., Kim et al., 2020). Thus, they are not appropriate instruments for conducting research on intergenerational cooperation in the workplace.

Based on the need for research, the current study developed and validated the Korean version of the Workplace Intergenerational Climate Scale(WICS; King & Bryant, 2017), verifying the scale's psychometric properties. This scale captures 1) how often employees communicate with other coworkers, 2) how comfortable they are while communicating, and 3) how inclusive the atmosphere is for all employees from diverse generations. It is distinct from other existing measures in that it measures intergenerational dynamics in organizations and it is for every employee not only for employees from a specific generation. Han and Lee(2021) and Choi and Han(2022) translated the WICS and used it in their studies after performing EFA and CFA. However, there are several limitations in their studies. Firstly, 4 items in the subdimension named "intergenerational contact" were translated to declarative sentences even though they were interrogative sentences in

the original scale development study, and it caused cross-loadings between items. Secondly, unlike the original questions that measure attitudes toward "co-workers outside of my generation", Han and Lee(2021) slightly changed the question to ask about attitudes toward young employees in their 20s and 30s. Thus, the translated version is not appropriate to capture the comprehensive attitudes and perceptions of all employees from diverse generations. Thirdly, since relationships between the WICS and other associated variables were not confirmed in Han and Lee(2021)'s and Choi and Han(2022)'s study, it cannot be regarded as a strict validation process(Sousa & Rojjanasrirat, 2011). Lastly, they arbitrarily changed the Likert scale from the original 4-point scale to a 5-point scale. When considering the fact that the number of scale points might affect the mean and dispersion of the data(Dawes, 2008), chi-square fit indices in confirmatory factor analysis(Green et al., 1997), and reliability coefficients of the scale(Lissitz & Green, 1975), translated version which adopts scale points of the original measure is needed. For these reasons, an empirical validation study is necessary for improving future research in South Korea.

The purpose of this study is to confirm the validity of Korean version of the WICS(King & Bryant, 2017). Firstly, the study translated the scale into Korean and performed EFA to explore its number of factors. Secondly, we then conducted a CFA, comparing several CFA models and identifying the factor structure of WICS. Thirdly, we confirmed the various kinds of validity of the WICS. We evaluated construct validity(e.g., convergent and discriminant validity) by analyzing the expected relationships between WICS and the associated and non-associated psychological constructs. In addition, we also checked AVE and CR to test validity. We also examined the incremental validity of WICS by evaluating the change in variance explained(R^2) even after controlling for existing measures Finally, measurement invariance was tested across older and younger worker groups.

This study selected trust, organizational commitment, work engagement, psychological safety, intention to remain, job satisfaction, and communication satisfaction for validity testing based on previous research. Individuals who perceived a higher intergenerational climate tended to communicate with people in other generations more frequently(King & Bryant, 2017). Relationships built through intergenerational contact enhance trust among coworkers(Lin, 2007). Thus, we anticipated a positive correlation between intergenerational climate and trust. Previous research showed that age discrimination, which might be regarded as the inverse of intergenerational climate, is negatively related to organizational commitment. Thus, we also expected that intergenerational climate would be positively correlated with organizational commitment(Kunze et al., 2011) and work engagement(Bayl-Smith & Griffin,

2014). Furthermore, we predicted that intergenerational climate would be positively related to psychological safety because people perceive psychological safety when their organizations strive to integrate their diverse employees(Singh et al., 2013). Previous research also revealed that intergenerational climate could enhance the intention to remain and employees' job satisfaction, both directly and indirectly, by reducing ageism(Henry et al., 2015; King & Bryant, 2017; Lagacé et al., 2019). In line with the findings of these studies, we expected positive correlations between intergenerational climate and the variables related to employee well-being(i.e., job satisfaction, intention to remain, communication satisfaction).

Through the process, this study can provide a valid scale that can measure intergenerational climate in organizations. Moreover, the validated scale is expected to have practical contributions in fields. By utilizing the scale to measure the current climate of their organization, HR officers can develop strategies to deal with present problems between generations or enhance intergenerational cooperation.

Method

Participants and Procedures

We collected the participants through an online research company in South Korea to conduct an EFA(sample 1). Full-time employees were encouraged to participate in the survey, except those who work remotely or who work alone without coworkers. A total of 483 respondents participated in the survey and they received points that can be exchanged for cash as a reward. 23 of whom answered the same number to all 20 items including reversed items were excluded from the analysis. The final sample size was 460. Among 460 participants, 48.9% were male($N = 225$) and 51.1% were female($N = 235$). The average age of participants was 44.84($SD = 12.96$), ranging from 23 to 69 years.

We also collected data from full-time employees in South Korea to conduct a CFA and confirm the validity of this scale(sample 2). Data were collected through the same process as the previous data collection. A total of 592 participants completed the survey, and their average age was 43.67($SD = 12.81$), ranging from 22 to 69 years. Of the participants, 51.4% were male($N = 304$) and 48.6% were female($N = 288$).

Scale Translation

WICS comprises five subfactors: Lack of Generational Stereotypes(LGS; e.g., "Co-workers outside my generation are not interested in making friends outside their generation"); Positive Intergenerational Affect(PIA; e.g., "I feel comfortable when coworkers outside my

generation try to make conversation with me"); Workplace Generational Inclusiveness(WGI; e.g., "I believe that my work environment is a healthy one for people of all ages"); Workplace Intergenerational Retention(WIR; e.g., "My coworkers make older workers feel they should retire"); and Intergenerational Contact(IC; e.g., "How often do you have conversations with coworkers outside your generation?"). Each subscale consists of four items, and each item from the LGS, PIA, WGI, and WIR subscales was rated on a 4-point Likert scale ranging from 1(*strongly disagree*) to 4(*strongly agree*), while the other items from IC were rated on a 4-point Likert scale ranging from 1(*never*) to 4(*very often*).

Before starting the study, we obtained permission from the original author to translate and validate the scale in South Korea. We then translated the scale to develop the Korean version of the Workplace Intergenerational Climate Scale(K-WICS) following the translation and back-translation procedure(Cha et al., 2007). The authors first translated the scale into Korean, after which two bilingual researchers majoring in industrial and organizational psychology back-translated the items into English. Finally, the authors compared the original translated version and back-translated versions of the scale. To guarantee objectivity, the second author, who did not translate the scale, participated in a review process. If the key sentence component(i.e., predicate) of the

back-translated version was identical to the translated version, we selected it as the final version. To increase accuracy and reliability, the authors considered subtle differences in nuance and changed one reversed item to a non-reversed item during translation. Through this process, we constructed the final Korean version of WICS.

Measures

For sample 1, we only used the WICS. For sample 2, we used all the measures listed below.

Workplace intergenerational climate

The Korean version of the Workplace intergenerational climate scale(K-WICS) was adopted. It showed good internal consistency: WICS-overall($\alpha = .85$), LGS($\alpha = .73$), PIA($\alpha = .65$), WIR($\alpha = .87$), and IC($\alpha = .85$). Since Cronbach's α of the WGI factor was lower than .70, we calculated alternative reliability estimator, McDonald's omega(ω). McDonald's ω was .79 and it revealed that K-WICS is a reliable measure.

Ageism

Kim(2012)'s ageism scale, the Korean version of the Fraboni Scale of Ageism(Kim et al., 2012), and Kim et al.(2020)'s ageism scale were broadly used to measure ageism in general settings in South Korea. King and Bryant(2017) developed the Stereotype about Older Workers(St-O) and Stereotype about Younger

Workers(St-Y) scales to measure ageism in the workplace. These four scales were used in the study.

First, Kim's(2012) scale was applied to measure social perceptions and attitudes toward the elderly. We adopted this scale to measure the attitudinal aspect of ageism. The scale consists of 21 items with seven subfactors, of which we applied four items in the "stereotypes" subfactor. The responses were evaluated on a 5-point Likert scale(1 = *strongly disagree* to 5 = *strongly agree*). The Cronbach's α was .80 for the overall scale in Kim(2012) and .86 for stereotypes in this study.

Second, discrimination toward the elderly was measured using the Korean version of the Fraboni Scale of Ageism(K-FSA), developed by Fraboni et al.(1990) and validated by Kim et al.(2012). We used this scale because it is the sole validated ageism scale in South Korea and it is used for measuring the attitudinal aspect of ageism. The scale comprises three subfactors: avoidance(seven items, e.g., "Many elderly people are stingy and hoard their money and possessions"), discrimination(five items, e.g., "It's best that elderly people live where they won't bother anyone"), and stereotype(six items, e.g., "Many elderly people just live in the past"). Each item was rated on a 4-point Likert scale, ranging from 1(*strongly disagree*) to 4(*strongly agree*). We decided not to use the subdimension named discrimination due to low reliability(α = .27). The Cronbach' α was .86 in Fraboni et

al.(1990) and .82(avoid), .75(stereotype), and .84 (overall) in the present study.

Third, we adopted Kim et al.(2020)'s scale to measure ageism toward the elderly in South Korea. Because this scale reflects both behavioral and attitudinal aspects of ageism, we used it to compare with WICS. The scale consists of three subfactors: stereotype(four items), aging(four items), and discrimination(three items). The responses were assessed on a 5-point Likert scale(1 = *strongly disagree* to 5 = *strongly agree*). The Cronbach's α coefficients were .80 (stereotype), .79(aging), .82(discrimination), and .84(overall) in Kim et al.(2020) and .85 (stereotype), .79(aging), .88(discrimination), and .88(overall) in the current study.

Finally, we used Stereotype about Older Workers(St-O) and Stereotype about Younger Workers(St-Y) to measure stereotypes toward younger(four items, e.g., "Younger workers don't work as hard as older workers") and older(four items, e.g., "Older workers are difficult to train compared to younger workers") workers, respectively. Because the three scales reflect ageism in general settings, we used it to capture ageism in the workplace. Each item was evaluated on a 4-point Likert scale(1 = *strongly disagree* to 4 = *strongly agree*). St-Y and St-O were confirmed as reliable both in King and Bryant(2017)'s (α = .82 and α = .75, respectively) and this study(α = .70 and α = .74, respectively).

Trust

Trust was measured using an 11-item scale developed by McAllister(1995) and translated by Kim(2010). The scale includes two subfactors: cognition-based trust(six items, e.g., "This person approaches his/her job with professionalism and dedication") and affect-based trust(five items, e.g., "We have a sharing relationship, we can both freely share our ideas, feelings, and hopes"). Items were rated on a 7-point Likert scale, ranging from 1(*strongly disagree*) to 7(*strongly agree*). This scale showed high internal consistency in the original(McAllister, 1995) and current study(.91 and .88 for cognition-based trust, and .89 and .89 for affect-based trust, respectively). The overall Cronbach's α in this study was .92.

Organizational commitment

We adopted an eight-item scale developed by Allen and Meyer(1990) and translated by Ha(2013) to measure organizational commitment. Sample item includes "I would be very happy to spend the rest of my career with this organization." Each item was assessed on a 5-point scale(1 = *strongly disagree* to 5 = s*trongly agree*). The Cronbach's α was .87 in Allen and Meyer(1990)'s study and .79 in this study.

Work engagement

The short version of the Utrecht Work Engagement Scale(UWES-9) was adopted to measure work engagement. This scale was developed by Schaufeli et al.(2006) and validated by Kim et al.(2017). The scale comprises three subdimensions, each of which has three items. Examples include "At my work, I feel bursting with energy," "I am enthusiastic about my job," and "I feel happy when I am working intensely." Items were assessed on a 7-point Likert scale ranging from 0(*Never*) to 6(*Always*). The Cronbach's α were .91(vigor), .89(dedication), and .90(absorption) in Kim et al.(2017)'s study and .87(vigor), .83(dedication), .89(absorption) and .94(overall) in the present study.

Psychological safety

We adopted a 7-item scale developed by Edmondson(1999) and translated by Lee(2022) to measure psychological safety. The sample item is "It is difficult to ask other team members for help." Each item was evaluated on a 7-point Likert scale(1 = *very inaccurate* to 7 = *very accurate*). This scale was confirmed as reliable in Edmondson(1999)(α = .82) and in the present study(α = .87).

Intention to Remain

Intention to remain was measured by a 3-item scale developed by Armstrong-Stassen and Ursel(2009). The sample item is "If I were completely free to choose, I would prefer to continue working in this organization." A 5-point Likert scale(1 = *strongly disagree* to 5 = *strongly agree*) was used. This scale showed good

reliability in Armstrong-Stassen and Ursel(2009)'s study(α = .84) and this study(α = .92).

Job satisfaction

The Brief Index of Affective Job Satisfaction (BIAJS) developed by Thompson and Phua (2012) was utilized to measure job satisfaction. The scale comprises four items, and the example is "I find real enjoyment in my job." Each item was rated on a 5-point Likert scale, ranging from 1(*strongly disagree*) to 5(*strongly agree*). The internal consistency reliability was .81 for each sample in Thompson and Phua(2012) and .91 in this study.

Communication Satisfaction

A 2-item scale developed by Bousfield and Hutchison(2010) was adopted to measure communication satisfaction. Sample items were "How often do they have contact with elderly people?"(1 = *almost never* to 5 = *everyday*) and "How they would rate the quality of that contact?"(1 = *atrocious* to 5 = *very good*).

Clan Culture

We used Organizational Culture Assessment Instrument(OCAI) developed by Cameron and Quinn(2006). The instrument comprises 6 items, each of which was rated on a 5-point Likert scale, ranging from 1(*strongly disagree*) to 5(*strongly agree*). A sample item includes "The management style in the organization is characterized by teamwork, consensus, and

participation." The Cronbach's α of the scale was .90 in this study.

Demographic information

Gender, age, weekly remote working hours, weekly working hours, tenure, educational level, job position and category of business were collected as demographic information.

Results

Preliminary Analysis

First, we checked the normality assumption using SPSS 25.0. The skewness and kurtosis of each item were lower than the thresholds (absolute values of skewness and kurtosis < 2; Garson, 2012). Thus, the responses were normally distributed. Using the R 4.1.2 version GPArotation and psych packages, we next conducted the Kaiser-Meyer-Olkin test and Bartlett's test of sphericity. The Kaiser-Meyer-Olkin measure was .79 and Bartlett's test of sphericity was statistically significant(p < .001). Therefore, our sample was appropriate for factor analysis.

Exploratory Factor Analysis

Using the R 4.1.2 version GPArotation, psych, and paran packages, we conducted an EFA using the maximum likelihood method with

Table 1. Exploratory Factor Analysis Results

Items	F1	F2	F3	F4	F5
	Factor Loading				
Lack of Generational Stereotypes					
LGS1 Co-workers outside my generation are not interested in making friends outside their generation. 나의 동료들은 세대가 다른 구성원과 친하게 지내려고 하지 않는다.	**.57**	.00	.03	-.15	-.05
LGS2 Co-workers outside my generation complain more than co-workers my age do, 나와 세대가 다른 구성원은 나와 비슷한 연령대의 직원들보다 불평불만이 많다.	**.63**	.06	-.01	-.04	-.12
LGS3 Co-workers outside my generation usually talk about things that don't interest me. 나와 세대가 다른 구성원은 내가 관심이 없는 주제에 대해서만 이야기한다.	**.54**	.03	-.05	-.07	.07
LGS4 Co-workers outside my generation tend to work differently than co-workers my age do. 나와 세대가 다른 구성원은 나와 업무 방식이 다르다.	**.50**	.05	.03	.11	.04
Positive Intergenerational Affect					
PIA1 I feel comfortable when co-workers outside my generation try to make conversation with me. 나는 세대가 다른 구성원들과 대화하는 것이 편하다.	.09	**.67**	-.15	.02	.06
PIA2 I enjoy interacting with co-workers of different generations. 나는 세대가 다른 구성원들과 교류하는 것이 즐겁다.	.02	**.81**	-.13	.01	.01
PIA3 My co-workers outside my generation are interesting and unique individuals. 나와 세대가 다른 구성원들은 재미있고 개성있는 사람들이다.	.06	**.50**	.02	.00	.11
PIA4 People work best when they work with others their same age. 동료들은 세대가 다른 구성원들과 함께 일할 때, 가장 즐겁게 일한다.	.14	**.46**	.00	.21	.03
WGI4 Working with co-workers of different ages enhances the quality of my work life. 다양한 연령대의 구성원들과 일하는 것은 직장생활의 질을 향상시킨다.	-.06	**.47**	.14	-.11	-.14
Workplace Generational Inclusiveness					
WGI1 I believe that my work environment is a healthy one for people of all ages. 나는 회사가 모든 연령대의 구성원에게 쾌적한 업무 환경을 갖추고 있다고 생각한다.	.04	.03	**.51**	.18	-.04
WGI2 Workers of all ages are respected in my workplace. 회사에서는 모든 연령대의 구성원이 존중받는다.	-.03	-.08	**.86**	-.03	.04
Workplace Intergenerational Retention					
WIR1 My co-workers make older workers feel they should retire. 내 동료들은 나이가 많은 구성원들에게 퇴직을 압박하는 경향이 있다.	-.02	-.04	.12	**.88**	.01
WIR2 I feel pressure from younger workers to step down. 회사에서 젊은 구성원들에게 퇴직을 강요하는 경향이 있다.	.01	-.03	.12	**.84**	.05
WIR3 I feel pressure from older workers to step down. 회사에서 나이가 많은 구성원들에게 퇴직을 강요하는 경향이 있다.	-.03	-.04	.07	**.80**	-.01
Intergenerational Contact					
IC1 How often do you have conversations with co-workers outside your generation? 세대가 다른 구성원과 얼마나 자주 대화하나요?	-.11	.12	-.12	-.13	**.66**
IC2 How often do you have conversations with co-workers outside your generation relating to things other than work? 세대가 다른 구성원과 업무 외적인 주제에 대해서 얼마나 자주 대화를 나누나요?	.01	-.07	.02	.00	**.92**
IC3 How often do you talk with co-workers outside your generation about your personal lives? 세대가 다른 구성원과 개인적인 일상에 대해서 얼마나 자주 대화를 나누나요?	.08	-.10	.00	.10	**.77**
Eigenvalues	1.43	1.97	1.05	2.36	2.06
(Percentage of variance explained)	7%	10%	5%	12%	10%

N = 460. Bolded values represent the items belonging to each factor.

a Promax rotation to investigate the scale's factor structure. According to the guidelines (Worthington & Whittaker, 2006), we checked the scree plot and eigenvalue of the data, which confirmed the original five-factor structure. Further, we evaluated each item according to the suggested criteria(Worthington & Whittaker, 2006): factor loading $\geq$ .40; cross-loading $\leq$ .32; and communality $\geq$ .40.

All except four items(WGI3, WGI4, WIR4, IC4) were classified in identical factors compared to the original scale of WICS(King & Bryant, 2017). WGI3("I am able to communicate effectively with workers of different generations"), WIR4("In my workplace, qualified younger workers tend to be overlooked for promotions"), and IC4("How often do you eat meals with coworkers outside your generation during the workday?") showed low factor loadings of less than .40. Thus, these three items were deleted. WGI4("Working with coworkers of different ages enhances the quality of my work life") was clustered on the PIA factor rather than the WGI factor. As a result, 16 items were clustered on the factors as confirmed by the original scale development study(King & Bryant, 2017), and the WGI4 item was clustered on the PIA factor. The results of EFA are displayed in Table 1.

Confirmatory Factor Analysis

We confirmed its factor structure again by

performing CFA using the R 4.1.2 version of the Lavaan package. We tested the following five CFA models: (a) a single-factor model, (b) a two-factor model(items from LGS, PIA, WGI, WIR represent the quality of interaction and the items from IC represent the quantity of interaction), (c) an uncorrelated five-factor model, (d) a correlated five-factor model, and (e) a higher-order model. When conducting CFA, we clustered WGI4 on WGI subfactor, which is its original subdimension. Even though WGI4 was clustered on PIA subdimension according to the EFA results, we decided to cluster WGI4 on WGI after considering the content of WGI4 and the ease of further utilization of the scale(e.g., to perform SEM, there must be at least three indicators).

We assessed the goodness of fit for each model by examining the following fit indices: χ^2, adjusted goodness of fit index(AGFI), comparative fit index(CFI), the Tucker-Lewis index(TLI), root mean square error of approximation(RMSEA), and standardized root mean square residual(SRMR). According to the criteria of Hu and Bentler(1999), CFI and TLI values greater than .95, SRMR values less than .08, and RMSEA values less than .06 indicate a good model fit. A model with CFI and TLI values greater than .90 is considered acceptable. AGIF value greater than .90 is regarded as acceptable(Bentler & Bonnet, 1980).

Table 2 shows the results of CFA. Similar to the results of the original scale(King & Bryant,

Table 2. Confirmatory Factor Analysis Results

Model	χ^2	df	Normed χ^2	AGFI	CFI	TLI	RMSEA	SRMR
Single-factor model	2039.634***	119	17.140	.57	.49	.41	.17	.13
Two-factor model	1434.062***	118	12.153	.66	.65	.59	.14	.11
Uncorrelated five-factor model	820.079***	119	6.891	.80	.82	.79	.10	.19
Correlated five-factor model	**310.892*****	**109**	**2.852**	**.91**	**.95**	**.93**	**.06**	**.05**
Higher order model	381.040***	114	3.342	.90	.93	.92	.06	.06

N = 592. Normed χ^2 = χ^2/ df; AGFI = Adjusted Goodness of Fit Index; CFI = Comparative Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = Standardized Root Mean Square Residual. ***p < .001. The final model is presented in boldface.

2017), both single- and two-factor models had a poor fit(χ^2(119) = 2036.63, p < .001, AGFI = .57, CFI = .49, TLI = .41, RMSEA = .17, and SRMR = .13 for the single-factor model, χ^2(118) = 1434.06, p < .001, AGFI = .66, CFI = .65, TLI = .59, RMSEA = .14, and SRMR = .11 for the two-factor model). The

uncorrelated five-factor model also showed a poor model fit, χ^2(119) = 820.08, p < .001, AGFI = .80, CFI = .82, TLI = .79, RMSEA = .10, and SRMR = .19. Both the correlated five-factor model and the higher-order model were found to have an acceptable model fit(χ^2(109) = 310.89, p < .001, AGFI = .91 CFI
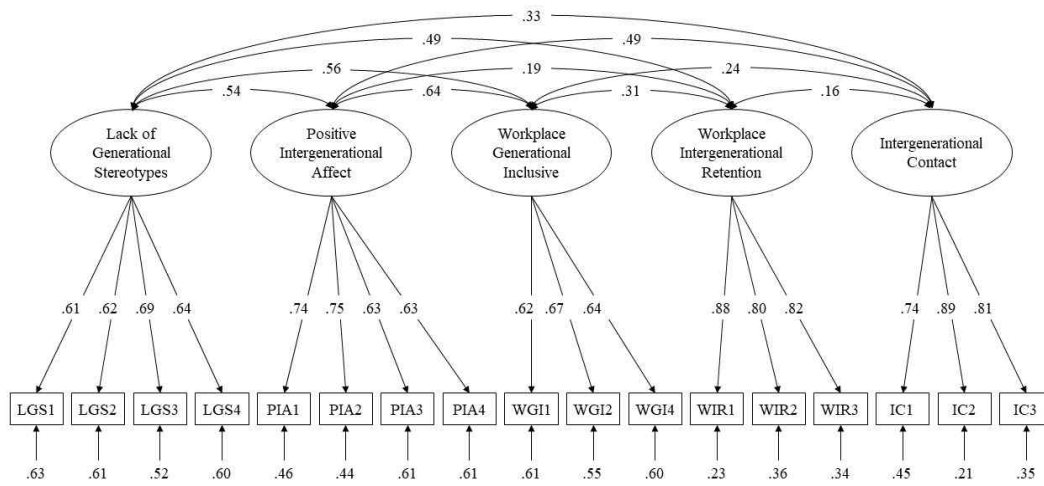

Figure 1. The Factor Structure of the WICS with Standardized Path Coefficients

= .95, TLI = .93, RMSEA = .06, and SRMR = .05 for the correlated five-factor model, χ^2 (114) = 381.04, p < .001, AGFI = .90, CFI = .93, TLI = .92, RMSEA = .06, and SRMR = .06 for the higher-order model).

The correlated five-factor model displayed best fit to the data and it also resembles the factor structure proposed in the original study even though WGI4, which showed lower factor loading than the criteria according to the result of EFA, was clustered on its original factor. Therefore, we selected correlated five- factor model as the final. Detailed results are presented in Figure 1.

Construct and Incremental Validity

We performed Pearson correlational analysis using SPSS 25.0. to test the validity of the WICS total score. We assessed discriminant validity by investigating the relation between the WICS total score and other relevant but distinct constructs. The WICS total score showed a negative correlation with stereotypes toward older(r = -.19, p < .001) and younger workers(r = -.13, p < .01). Moreover, the WICS total score was negatively associated with previous ageism scales(Kim(2012)'s scale: r = -.29, p < .001; K-FSA: r = -.27, p < .001;

Table 3. Descriptive Statistics and Correlations of Study Variables for Construct Validity Testing

Variables	M	SD	1
1. Workplace Intergenerational Climate	2.77	.35	
2. Stereotype Toward Older people	2.76	.48	-.19***
3. Stereotype Toward Younger people	2.48	.79	-.13***
4. Ageism1 (Kim (2012)'s scale)	2.84	.78	-.29***
5. Ageism2 (FSA; Kim et al., 2012)	2.48	.39	-.27***
6. Ageism3 (Kim (2020)'s scale)	3.06	.66	-.28***
7. Clan Culture	3.13	.75	.48***
8. Trust	4.64	.81	.46***
9. Organizational Commitment	2.16	.59	.38***
10. Work Engagement	3.20	.98	.37***
11. Psychological Safety	4.46	.92	.49***
12. Intention to Remain	3.48	.98	.31***
13. Job Satisfaction	3.30	.82	.34***
14. Communication Satisfaction	3.42	.67	.61***

N = 592. ***p < .001.

Kim et al.(2020)'s scale; $r = -.28$, $p < .001$). In contrast, the relationship between the WICS total score and clan culture was positive($r =.48$, $p < .001$).

We verified the convergent validity of the WICS total score. All variables were significantly related to the intergenerational climate in the predicted directions. The WICS total score was positively correlated with trust($r = .46$, $p < .001$), organizational commitment($r = .38$, $p < .001$), work engagement($r = .37$, $p < .001$), psychological safety($r = .49$, $p < .001$), intention to remain($r = .31$, $p < .001$), job satisfaction($r = .34$, $p < .001$), and communication satisfaction($r = .61$, $p < .001$). The detailed results are shown in Table 3.

Additionally, following the recommendations of Fornell and Larcker(1981), we tested validity of the WICS by utilizing the results of CFA. Fornell and Larcker(1981) suggested three ways to confirm construct validity: 1) average variance extracted(AVE) value which is greater than .50

Table 4. Standardized Factor Loadings, AVE, and CR for Convergent Validity Testing

Items		β	AVE	C.R
Lack of Generational Stereotype	LGS1	.609***	.410	.735
	LGS2	.620***		
	LGS3	.692***		
	LGS4	.637***		
Positive Intergenerational Affect	PIA1	.736***	.473	.781
	PIA2	.749***		
	PIA3	.629***		
	PIA4	.627***		
Workplace Generational Inclusiveness	WGI1	.624***	.414	.680
	WGI2	.670***		
	WGI4	.635***		
Workplace Intergenerational Retention	WIR1	.875***	.690	.870
	WIR2	.801***		
	WIR3	.815***		
Intergenerational Contact	IC1	.744***	.664	.885
	IC2	.889***		
	IC3	.805***		

$N = 592$. ***$p < .001$.

Table 5. Comparison between AVE and Squared Correlation Coefficients for Discriminant
Validity Testing

	LGS	PIA	WGI	WIR	IC	AVE
LGS		.162	.158	.153	.067	**.410**
PIA	.403***		**.240**	.023	.155	.473
WGI	.397***	.490***		.057	.037	.414
WIR	.391***	.150***	.239***		.023	.690
IC	.258***	.394***	.192***	.151***		.664

$N = 592$. ***$p < .001$. The values above the diagonal line represent the squared correlation coefficients and the value below the diagonal line represent the correlation coefficient. The biggest squared value of correlation coefficient and the smallest value of AVE were presented in boldface.

supports the convergent validity, 2) construct reliability(CR) which exceeds .70 provides support for convergent validity, and 3) AVE value which is larger than squared correlation coefficients between subdimensions of the measure supports the discriminant validity. The results revealed that values of AVE and CR mostly met the criteria except for some cases. The detailed results are provided in Table 4 and Table 5.

This study also conducted a hierarchical regression analysis to confirm the incremental validity of the WICS total score by testing whether the scale added more variance in the prediction of job satisfaction and intention to remain even after controlling for other existing ageism scales. First, in block 1, the demographic variables(age, tenure, weekly working hours) were entered. Second, the existing four ageism scales (King & Bryant's(2017) stereotypes toward older and younger workers scale, Kim's(2012) scale,

Kim et al.'s(2012) K-FSA, and Kim et al.'s(2020) scale) were entered in block 2. Lastly, the WICS was entered in block 3. The results indicated that the WICS explained the additional variance of job satisfaction($\triangle R^2 = .09$, $p < .001$) and intention to remain($\triangle R^2 = .08$, $p < .001$). Next, to confirm whether the WICS can also account for additional variance in communication satisfaction, this study performed a hierarchical regression analysis following the identical procedure described above, but job satisfaction was entered in block 3 before entering the WICS in block 4. The WICS added additional variance in communication satisfaction($\triangle R^2 = .21$, $p < .001$). The result indicated the scale has a unique explanatory power over previous scales when predicting positive outcomes. Table 6 provides the results of the hierarchical regression analysis.

Table 6. The Results of Hierarchical Regression Analysis for Incremental Validity Testing

	Job Satisfaction			Intention to Remain			Communication Satisfaction		
	β	R^2	$\triangle R^2$	β	R^2	$\triangle R^2$	β	R^2	$\triangle R^2$
Step 1									
Age	.255***			.369***			.092		
WH	.012	.065		.010	.093		.003	.014	
Tenure	.001			- .078			.028		
Step 2									
Ageism1	.068			.015			- .011		
Ageism2	- .147**			- .061			- .156*		
Ageism3	- .145**	.121	.056***	- .042	.112	.018**	- .057	.073	.059***
St-O	- .028			- .080			- .036		
St-Y	.070			.042			- .073		
Step 3									
WICS	.316***	.209	.088***	.306***	.194	.083***			
JS							.434***	.239	.166***
Step 4									
WICS							.512***	.446	.208***

$N = 592$. *$p < .05$, **$p < .01$, ***$p < .001$.

Measurement Invariance Testing

Finally, multigroup CFA was conducted using R 4.1.2 version Lavaan packages to test measurement invariance across age groups. Based on the previous literature, participants($N = 1,052$) were divided into two groups: the older worker group(whose age is over 40) and the younger worker group(whose age is under 40). Despite the lack of clear criteria for classifying older workers(Truxillo et al., 2015), according to Ng and Feldman(2008), previous studies defined older workers as over 40 years old(e.g., Weiss et al., 2022). Additionally, empirical evidence supports the validity of the criteria since employees under and over the age of 40 have consistently shown different psychological characteristics(e.g., Pillay et al., 2006).

This study sequentially assessed configural, metric, scalar, and strict invariance across age groups. Following Kline's(2016) guidelines, less- and more-constrained models were compared at each step. $\triangle$CFI, $\triangle$RMSEA, and $\triangle$SRMR were used as criteria for invariance testing. A

decrease in CFI, RMSEA, and SRMR less than the cut-off point from the less-constrained model indicates that invariance between groups is supported because cross-group equality constraints did not significantly worsen the model's fit(Chen, 2007).

Model 1(correlated five-factor model) is the baseline model without any constraints across the two groups. This model showed an acceptable fit to the data, $\chi^2(218) = 620.03$, $p < .001$, CFI = .93, TLI = .92, RMSEA = .06, and SRMR = .05. Thus, it was concluded that the factor structure was identical across the two groups. Factor loadings were constrained to be equal for the two groups in model 2, and the overall goodness of fit indices were acceptable, $\chi^2(230) = 641.54$, $p < .001$, CFI = .93, TLI = .92, RMSEA = .06, and SRMR = .05. Model 2 was compared with model 1, and the $\triangle$CFI(.002), $\triangle$RMSEA(.001), $\triangle$SRMR(.007) were less than cut-off point($\triangle$CFI $\leq$ .010, $\triangle$RMSEA $\leq$ .015, $\triangle$SRMR $\leq$ .025) of Chen(2007). Thus, metric invariance was supported, indicating that factor loading does not vary across groups. Next, this study tested model 3 after adding the constraint that item intercepts for the latent factors are equal. The model fit was acceptable, $\chi^2(242) = 693.33$, $p < .001$, CFI = .92, TLI = .91, RMSEA = .06, and SRMR = .05. When model 3 was compared with model 2, $\triangle$CFI(.006), $\triangle$RMSEA(.004), and $\triangle$SRMR(.008) did not

exceed the threshold($\triangle$SRMR $\leq$ .010). Therefore, scalar invariance was established, indicating that the intercepts and factor loadings are equal across groups. Finally, strict invariance(model 4), which refers to equal factor loading, intercepts, and residual variances across groups, was tested. Model 4 had an acceptable fit, $\chi^2(259) = 766.84$, $p < .001$, CFI = .91, TLI = .91, RMSEA = .06, and SRMR = .06. The $\triangle$CFI(.010), $\triangle$RMSEA(.002), $\triangle$SRMR(.001) do not exceed the threshold. Thus, strict invariance was also established.

Discussion

The results of this study indicated that the Korean version of WICS(K-WICS) is a reliable and valid measure. A correlated five-factor model was supported, which is aligned with the original factor structure(King & Bryant, 2017). It showed positive correlations with positive organizational variables, including trust, organizational commitment, work engagement, psychological safety, intention to remain, job satisfaction, and communication satisfaction. These results supported the convergent validity of the K-WICS, supporting that K-WICS can be used in future research. It also showed negative correlations with the four types of ageism scales. The WICS measures distinctive features compared with other scales. Existing

ageism scales only measure discriminatory behavior or negative stereotypes toward older people in general circumstances, whereas WICS measures how cooperative the organizations are and how comfortable employees are when they communicate with coworkers from different generations. Clan culture captures positive cultural aspects such as trusting and caring for others but does not specifically focus on intergenerational cooperation. Thus, WICS is more appropriate for researching ageism in the workplace than other scales that measure similar but distinct concepts. Finally, we confirmed strict measurement invariance of the scale between the age groups(below 40 versus above 40). This provides evidence of the measure to be commonly used between the age groups, and factor mean comparisons between the age groups are valid.

This study made a theoretical contribution to intergenerational climate research by validating WICS in South Korea. Due to South Korea's unique history(Le et al., 2016; Park, 2007), Koreans of different age groups have developed distinct values. These value discrepancies between older and younger generations often result in intergenerational conflict(Park & Park, 2018), spurring a recent proliferation of research on intergenerational cooperation in organizations(Goh et al., 2021). However, the limited number of valid scales in South Korea is an obstacle to research on this topic. For example, the Korean version of the Fraboni Scale of Ageism(K-FSA;

Kim et al., 2012) exhibited the psychometric problem of extremely low reliability of the "discrimination" subdimension in this study. In addition, previous translated versions of the WICS(Choi & Han, 2022; Han & Lee, 2021) in South Korea have several problems. Thus, developing a valid and reliable scale will significantly contribute to future research in this area. Furthermore, when considering most of studies in South Korea have primarily concentrated on characteristic of aging(Lee & Cho, 2007) or generation gap in family domain(Kim et al., 2005; Nam, 2004), studies in organizations can be expected to expand the literature.

There are practical implications of the study results for organizations. The validated scale can be broadly used to precisely measure intergenerational climate of organizations. First, practitioners can utilize the K-WICS to explore the present situations of their organizations. This scale captures general cooperative climate between generations rather than focusing on a specific generation by asking respondents to think about coworkers outside one's generation. Thus, it is adaptable to measure general climate of organizations by applying the K-WICS. Second, practitioners will be able to examine more precise perceptions of employees by using surveys with detailed instructions. It could be possible that one might not have any negative stereotypes towards older generations and feel comfortable when they communicate with them

but feel uncomfortable when communicating with younger generations or vice versa. Therefore, to capture the detailed situations, practitioners should ask respondents to answer the questions while thinking about both older and younger coworkers. Additionally, it is also possible to carry out a survey after dividing the employees into groups based on a certain criterion(e.g., over/under 40) according to its purpose. Finally, utilizing a certain subdimension of the scale is possible since factor structure of the K-WICS was revealed to be a correlated five-factor model. The subfactors LGS and PIA can be utilized when investigating employees' individual perceptions. If they want to measure climate of organizations and perceptions towards organizations and coworkers, the subfactors WGI and WIR are adaptable. Based on the results of the survey which use the K-WICS, practitioners can establish HR practices such as improving organizations' problematic situations, providing coaching program to enhance intergenerational cooperation.

Limitations and future research suggestions are as follows. First, more studies are needed to confirm the factor structures of the WICS. Even though we carefully selected the correlated five-factor model as the final model while considering both theoretical and statistical aspects, it might be possible that other factor structure, such as higher-order model or bi-factor model, is more suitable than the correlated five-factor model since these three models all demonstrated acceptable fit indices in the study. Thus, it is recommended that further research should repetitively investigate the factor structure of the WICS. Moreover, examining its factor structure by adopting multidimensional item response theory(MIRT) and comparing the results of MIRT to the results of CFA might be helpful to draw a solid conclusion.

Second, future studies are recommended to re-examine the validity of the WICS. AVE value of some subfactors(i.e., LGS, PIA, and WGI) and CR value of a subdimension named WGI failed to meet the recommended criteria. Additionally, this study did not conduct alternative testing such as content/face validity or test-retest reliability testing. Thus, it is suggested for researchers to re-test the validity of the WICS when applying the scale in the future. Nevertheless, we can conclude that the WICS is quite a reliable and valid scale since the total score of the WICS is correlated with other constructs as we expected and the WICS was revealed to explain additional variance of outcomes.

Lastly, further research is suggested to examine whether the WICS can be applied equivalently across various groups such as employment status even though the study conducted measurement invariance testing and confirmed strict invariance across age groups (older/younger). Older employees who are in unstable employment status might be more sensitive to cooperative intergenerational climate.

Therefore, measurement invariance testing across groups(e.g., employement status) or detecting differential item functioning(DIF) based on item response theory is needed.

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한국판 세대친화적 조직문화척도(K-WICS) 타당화 연구

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최근 인구구조의 급격한 변화로, 다양한 세대의 구성원들이 같은 조직에서 함께 일해야 하는 상황이 많아져 세대 간 화합에 관한 연구의 필요성이 대두되었다. 하지만, 조직 안에서 다양한 세대의 구성원들이 서로 화합하는 조직문화를 측정할 수 있는 마땅한 척도가 없어 연구에 어려움이 있었다. 본 연구는 세대친화적 조직문화척도(WICS)를 한국어로 번안한 후, 정규직 직장인 1,052명을 대상으로 타당화 하였다. 첫 번째로, 탐색적 요인분석을 실시하였고($N = 460$) 본 척도는 5요인인 것으로 확인되었다. 두 번째로, 확인적 요인분석 결과($N = 592$) 상관 5요인 모형이 좋은 모형 적합도를 보였다. 세 번째로, K-WICS는 기존의 네 가지 연령주의 척도와는 부적 상관관계를 보이고, 신뢰·조직 몰입·업무 열의·심리적 안전감·조직에 남고자 하는 의도·직무 만족·의사소통 만족과는 정적 상관관계를 보여 변별/수렴 타당도가 확인되었다. 또한, K-WICS는 기존 연령주의 척도를 통제하고도 긍정적 결과변인 설명 시, 유의한 증분 설명량을 가지는 것으로 나타났다. 마지막으로, 나이가 많은(40살 이상) 그룹과 나이가 적은(40살 미만) 그룹 간의 엄격한 동일성을 확인하였다. 이러한 결과들은 K-WICS 척도가 갖는 신뢰도 및 타당도를 지지한다. 본 척도는 세대친화적 조직문화 측정 및 HR 운영방안 수립에 널리 활용될 것으로 기대된다.

주요어 : K-WICS(한국판 세대친화적 조직문화척도), 척도 타당화