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Measuring Collective Action Intention Toward Gender Equality Across Cultures

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Original Article

Measuring Collective Action Intention Toward Gender Equality Across Cultures

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Abstract

We introduce the gender equality collective action intention (GECAI) scale, and examine its psychometric isomorphism and measurement invariance, using data from university students from 60 countries across 13 world regions (N = 31,686). Collective action towards gender equality could be understood as intentional and conscious civic behaviors that are focused on social transformation, questioning power relations and the promotion of gender equality through collective efforts. Collective action is a powerful tool for social change and is fundamental to women and girls' empowerment on a societal level. Although, various instruments to measure collective action intentions have been developed to our knowledge none of the published measures were subject to invariance testing. Our findings indicate that scalar measurement invariance for the GECAI scale allows for comparison of the countries' GECAI mean scores. Moreover, this metric psychometric isomorphism of the GECAI means that we can interpret scores at the country–level (i.e., as a group attribute) conceptually similar to individual attributes. Therefore, our findings provide an important addition to the growing body of literature on gender based collective action by introducing a methodologically sound tool to measure collective action intentions towards gender equality across cultures which we hope can be adopted by future studies.

Keywords: assessment, collective action, isomorphism, measurement invariance, cross–cultural psychology

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Measuring Collective Action Intention Toward Gender Equality Across Cultures

"Both men and women should feel free to be sensitive.
Both men and women should feel free to be strong"
Emma Watson, 2014, speaking for the HeForShe alliance

The many years of struggle for women's rights have resulted in the formal recognition of equality between human beings in the Human Rights Convention of 1945, the International Bill of Human Rights for Women of 1979, as well as multiple conventions and legislation that have tried to address the inequality between men and women over the last 75 years. Many calls for collective actions were directed at the mobilization of the support for gender equality around the world and the inclusion of men and boys as agents of social change. However, to measure willingness to act collectively on behalf of gender equality movements, reliable measures need to be developed.

Currently, little empirical knowledge is available about nation–level factors that correspond to people's intention to support this forms of collective action. One barrier to this empirical investigation may be the lack of a psychometrically sound and cross-culturally validated measurement scale for assessing intentions to act collectively toward gender equality. That is, there is a need for rigorously tested measures that will be established as cross-culturally valid. Therefore, this paper's aim is the psychometric evaluation of a scale developed to measure collective action intentions within the gender equality domain.

Collective action (CA) for gender equality might be defined as intentional and conscious civic behaviors that are focused on systemic causes of gender discrimination problems and the promotion of gender equality through collective efforts (see Alisat & Riemer, 2015). Constructing our measure we included items linked to low–level participatory

civic action (e.g., involvement with a group, or political party, focused on gender issues/gender equality).

Our main goal is to establish a cross-culturally validated measure allowing for multi-nation and multi-level analysis of predictors of collective action intentions to support gender equality. We focused on intentions and not actual behaviors for two main reasons: 1) research shows that intention, although not always strong, is indeed linked to behaviors and actions; 2) much research on intergroup relations and social change focuses on intentions, and links between predictors such as identification, efficacy, and injustice appraisal and both intentions to act and actual behaviors on behalf of the group is well-established (Agostini & van Zomeren, 2021).

Cross–cultural differences in collective action intentions

Most social psychological models of action imply that experiencing illegitimate negative group-based treatment, along with the resulting feelings of injustice, as well as strong group identification and group efficacy, are key triggers for collective action (Becker & Tausch, 2015). Research on the models of collective actions were conducted mostly with WEIRD (Western, Educated, Industrialized, Rich, Democratic) samples (Henrich et al., 2010). Although, in recent years more studies in different regions of the world have been conducted to explore predictors of CA in various cultural settings (e.g., Fischer et al., 2017; Thomas et al., 2018), there have not been many published attempts to validate measures across many nations.

Cultural dimensions are important in understanding variations of human behaviors. They provide a structured framework for understanding how different cultural values and practices shape actions, attitudes, and communication styles within societies (e.g. individualism vs. collectivism; Hofstede & Minkov, 2010; or tight and loose cultures;

Gelfand et al., 2011). People in various cultures differ in their tendency to act collectively and in important determinants of such actions. For example, Fischer et al. (2017) show that when faced with hostile sexism, German and Turkish female students choose collective action over indirect conflict management styles (e.g., avoiding confrontation). In contrast, Japanese female students prefer indirect conflict management over collective action. These results suggest that cultural dimensions are important in understanding the motivation to be involved in collective action for gender equality.

Additionally, Hu et al. (2014) focused on predictors of collective action based on the individualism-collectivism cultural dimension and the connectivity of the social system. They found that strong motivation to participate and connectivity of the social system play different role in in individualistic vs. collectivist cultures, and call for the inclusion of cultural factors in research on collective action (Hu et al., 2014). In a similar vein, van Zomeren (2016) outlined the need to include a cross-cultural view on collective action. He stressed that to understand collective action, one must consider various layers of determinants, including macro–social factors. Activist actions occur in each social system within a nation-specific cultural norms, laws, and institutions.

To achieve the above–mentioned goal and include the culture– and nation–level predictors more fully in the research on collective action, we need measurement tools validated across cultures and nations. We set out to address this gap and introduce a questionnaire for cross-cultural and multi-nation comparisons.

Measurement Invariance

To be eligible to test differences between countries in intention to act collectively toward gender equality, it is necessary to demonstrate the measurement invariance of the scale used to measure this variable in various cultures. Testing for measurement invariance ensures that any detected differences are genuine and not due to measurement anomalies,

validating the applicability of a measurement tool across multiple groups. Without demonstrating the measurement invariance of the gender equality collective action intention (GECAI) scale across countries, we cannot know with certainty whether the countries being compared are different on a collective action intention or whether/instead, observed score differences result from measurement bias that is related to a person's membership in a country (see Millsap, 2011). Measurement invariance means that the scale's psychometric properties in relation to the measured latent variable are the same across groups. In other words, demonstrating the measurement invariance of the scale in the context of cross-cultural research ensures that the scale measures the same construct consistently across all countries included in the study (Byrne & Matsumoto, 2021; Millsap, 2011; Milfont & Fischer, 2010). We are always obliged to control the correctness of the sources of our inference in multicultural research. Recent studies also show that invariance or non–invariance is not just an issue for cross-cultural comparisons but also for within–cultural comparisons, for instance, when looking at ideological differences (e.g., Republicans, Democrats). Brandt and colleagues (Brandt et al., 2021) have shown that while many effects remain similar, yet reduced sometimes, after accounting for non–invariance and bias, others clearly change, become non–significant, or even flip.

In the most cases, cross–cultural psychologists report results on three levels of measurement invariance (i.e., configural, metric, and scalar), which are defined by parameters that are constrained to be equal across countries or culture regions (e.g., Różycka-Tran et al., 2019; Rudnev et al. 2020). The first level, known as configural invariance, requires the same overall factor structure maintained across all national or cultural groups. This means that the pattern of factor loadings is identical, although the actual loadings may differ. The second level, known as metric invariance, requires that the factor loadings are equal across the nations or culture regions. This allows for meaningful comparisons of

relationships between latent constructs and observed variables across groups. Finally, the third level, known as scalar invariance, requires that both factor loadings and item intercepts are equal across the nations or culture regions. Achieving scalar invariance allows researchers to compare average latent scores across countries, as it indicates that the scale operates in the same way across these groups (see Milfont & Fisher, 2010). Partial invariance recognizes that some differences can still allow for meaningful group comparisons (Byrne et al., 1989).

Psychometric Isomorphism

Collective action intention can be considered not only as an individual–level variable but also as a characteristic of a group or culture (i.e., country-level variable). According to the multi-level cross-cultural approach, an individual's experiences resulting from belonging to a given culture has an impact on shaping their opinions, beliefs, and behaviors (Kozlowski & Klein, 2000). The intentions towards gender equality collective action shared by group members, regardless of individual differences, determines the existence of this construct at a higher level. We can infer the value of the GECAI at the country level based on aggregated individual scores of countries' citizens. This method is correct, but only if the measure of the given variable demonstrates a psychometric isomorphism that describes the similarity of the construct properties across levels (Tay et al., 2014). Cross-level isomorphism in the context of cross-cultural research implies that a construct at the country level has the same meaning and properties as the same construct at the individual level (Fontaine, 2008; Van de Vijver et al., 2008; Van de Vijver & Watkins, 2006). Demonstrating isomorphism means the same idea at national and individual levels – a country/group can be open to new experiences, just like an individual. Lack of isomorphism means that the variable only exists at one level, for example,, the country level: countries differ in whether they are driving on the left/right side of the street, what a country's GDP is, etc. By establishing the GECAI's isomorphism, it can be assumed that scores collected at the individual level indicate a property attributable to the country with a

similar meaning. Demonstrating isomorphism of the GECAI is essential for the development of a multi-level theory on individual beliefs and behavioral intentions about gender equality.

Following the proposed simultaneous estimation in testing of psychometric isomorphism by Tay et al. (2014), both configural and metric isomorphism of the GECAI were tested. Configural isomorphism means that the same number of factors (weak configural) and the pattern of factor loadings (strong configural) are expected to be similar across levels. In contrast, metric isomorphism means that factor loadings are similar at the individual and county levels. As Tay et al. (2004) argue, "the presence of metric isomorphism would suggest that the interpretation of the common factors is similar across levels" (p. 94).

The Present Research

We set out to develop and validate a cross-culturally sound measure of collective action intention for gender equality. We examined whether the six item Gender Equality Collective Action Intention (GECAI) scale was equivalent across the 60 countries. Our first research question (RQ1) focuses on reliability across countries and aims to verify whether measurement invariance can be established for the GECAI scale.

The second research question (RQ2) relates to psychometric isomorphism. Here, we test if we can establish isomorphism of the GECAI scale and if GECAI mean scores can be interpreted at a country–level as a group attribute.

For the third research question, we investigated whether GECAI mean scores are related to two nation–level variables. First, we analyze the relation between GECAI scores and the Democracy Index (RQ3a), and secondly, its link to the Global Gender Gap Index (GGGI) (RQ3b). The Democracy Index is based on numerous indicators measuring civil liberties, pluralism, and political culture. In 2019, Norway had the highest score, and North Korea had the lowest. The Global Gender Gap Index indexes genders gender disparities across four key

dimensions (economic participation and opportunity, educational attainment, health and survival, and political empowerment). In 2020, Iceland had the highest score, and Yemen had the lowest.

Previous results on the above–mentioned relations are mixed. On the one hand, most research has been conducted in the WEIRD countries (Henrich et al., 2010), which, on average, are more democratic and gender egalitarian than non–WEIRD countries. The higher gender parity in these countries is related to past collective actions (e.g., suffragette activism) directed at changing the previous status–quo, and higher scores on the human development index are linked to lower gender inequality (Inglelhart & Norris, 2003) and weaker discriminatory beliefs (Napier et al., 2010). Thus, one could assume that people in more democratic and gender-egalitarian countries might be paying more attention to gender issues and are more willing to act against gender discrimination.

On the other hand, in more gender-egalitarian countries, gender discrimination could be less salient, and the necessity for collective action might be less mobilizing. People in more gender-egalitarian countries might believe that after advances in women's struggle for equality, they now live in a society where sexism and gender discrimination are no longer a problem (Radke et al., 2016). Citizens of these countries might be less focused on gender discrimination, as some level of parity has already been obtained. Moreover, some men may perceive women's empowerment and antidiscrimination efforts as a threat to men (Ruthig et al., 2017).

Because of mixed data and a lack of previous large cross-cultural research on the relationship between willingness to engage in collective action and indexes of democratization of the country and gender equality, we listed RQ3a and RQ3b as exploratory questions.

Method

Participants and Procedure

Data were collected between January 2018 and February 2020 as part of a large cross-national project (see: https://osf.io/fqd4p/?view_only=838833b1be71441694b8b15720b95843). All participants were undergraduate students in social sciences who (in most countries) received no compensation. IRB approval for each sample was obtained from the researchers' respective institutions. Informed consent was obtained from all participants, and participants were assured that their data would remain anonymous and confidential. We included data from 60 countries across 13 world regions (N = 31,686). Sample composition and descriptive statistics for the GECAI factor score and CFA model fit for each country are included in Table 1.

[Table 1 around here]

Measures

Gender Equality Collective Action Intentions (GECAI) scale. We based our items on chosen items from the scale by Alisat and Riemer (2015) on environmental actions. The GECAI scale contains descriptions of six actions undertaken to support gender equality, such as participating in a community event that focused on gender issues or using online tools (e.g., Instagram, YouTube) to raise awareness about gender issues/gender equality. Participants rated their intention to engage in this type of activity on a seven-point scale ranging from 1 = not likely at all to 7 = very likely. Responses for all six items were averaged to create a composite measure, in which higher scores reflect a greater intention to engage in solidarity-based CA for gender equality. Bilingual scholars used the back–translation procedure to create 29 language versions of the scale. All items were translated from English to the target language and then back translated. For translations of the GECAI scale in 29 languages and script, see: https://osf.io/84xz7/?view_only=66183e311ac54b0a88d048c9b05b9e1e.

The Democracy Index. This country–level measure is based on numerous indicators measuring civil liberties, pluralism, and political culture. The Economist Intelligence Unit compiles the index measuring the state of democracy for over 160 countries (the Economist Intelligence Unit, 2019). Countries are evaluated from 0 to 10 (with scores from 0 to 4 designating authoritarian regimes and scores from 6.01 to 10 describing flawed and full democracies). In 2020 the highest point was for Norway (9.81) and the lowest for North Korea (1.08).

Global Gender Gap Index (GGGI). We used GGGI scores as a macro–level indicator of gender equality. This index reflects a country's progress towards gender equality on a scale from 0 (disparity) to 1 (parity). GGGI describes gender–gaps in a given country and is based on data from four domains: economic participation and opportunity, educational attainment, health and survival, and political empowerment (World Economic Forum, 2020). In 2020 Iceland was the most gender-equal country in the world (.88), and Yemen was scored the most unequal (.49).

Results

The following sections present the psychometric properties of the GECAI scale by country, measurement invariance testing, psychometric isomorphism testing, and the relationship between GECAI and objective country-level indicators. All calculations and figures were prepared using the R environment (R Core Team, 2020) with the appropriate packages: lavaan (Rosseel, 2012) and nlme (Finch, Bolin & Kelley, 2014).

Item Analyses, Confirmatory Factor Analyses and Reliability of the GECAI Scores across 60 Countries

Before proceeding to primary analyses, we tested the one–factor structure and reliability of the GECAI scale in each national sample. The one–factor GECAI model, tested

with confirmatory factor analysis (CFA), was fitted using maximum likelihood estimation and evaluated with the commonly used models' goodness of fit criteria (i.e., CFI > 0.95; RMSEA < 0.08, and SRMR < 0.08) (Brown, 2015). We then estimated the internal consistency reliability of the GECAI measurement using the coefficient ω (McDonald, 1999).

As shown in Table 1, the GECAI scale demonstrated an excellent model fit considering the Comparative Fit Index (CFI ranged from 0.95 to 0.99) and the Standardized Root Mean Square Residual (SRMR < 0.050) in all countries. However, when analyzing the Root Mean Square Error of Approximation (RMSEA < 0.080), the fit was generally acceptable but showed exceptions. In the case of 18 countries, the RMSEA was unacceptably high, indicating a discrepancy between different fit indices.

The consequences of such a discrepancy are significant. While the model compares favorably against a null model (as indicated by the CFI) and its predicted correlations are close to the observed correlations (as indicated by the SRMR), it may still have issues adequately reproducing the observed data covariance matrix (as indicated by the RMSEA). This issue is further complicated by the simplicity of the model, indicated by a small number of degrees of freedom (df). Simple models with few df can sometimes yield misleading fit indices, as RMSEA can be sensitive to model complexity and might over-penalize simpler models. Kenny et al. (2014) recommend 'not computing the RMSEA for small df models, especially those with small sample sizes, but rather estimating parameters that were not originally specified in the model.'

Nevertheless, for these 18 countries, the discrepancy between different fit indices suggests that researchers should be cautious about the GECAI model's factor validity. Despite these issues, the GECAI scale demonstrated very good internal consistency reliability in all

countries, with ω ranging from 0.85 in Nigeria to 0.95 in Northern Ireland, Ukraine, the USA, and Wales.

Table 2 presents descriptive statistics for the GECAI scale items using the total sample, ICCs (intraclass correlation coefficients) and factor loadings. Observing skewness and kurtosis for scores of individual items did not reveal any significant deviations from the normal distribution. The confirmatory factor analysis results showed that all items strongly explain the GECAI latent variable – the lowest factor loading was 0.72 for item 4 'use online tools (e.g., Instagram, YouTube, Facebook, Wikipedia, blogs) to raise awareness about gender issues/gender equality'. Average items' ICC of 0.10 justifies using a multi–level approach in explaining the GECAI variance (see Dyer et al. 2005).

[Table 2 around here]

Measurement Invariance of the GECAI Scale across 60 Countries

The GECAI scale's cross–country equivalence (measurement invariance) was tested using multigroup confirmatory factor analysis (MGCFA). First, a configural invariance model was fitted to the data and evaluated with the commonly used models' goodness of fit criteria (i.e., CFI > 0.95 and RMSEA < 0.08) (Brown, 2015). Second, a metric invariance model, in which the factor loadings are constrained to be equal across countries, was fitted. To identify the metric measurement invariance, it was necessary to show that the model did not fit worse than the configural model. For this purpose, the cut–off criteria for large numbers of samples suggested by Rutkowski and Svetina (2014) were used (i.e., ΔCFI not greater than 0.02 and ΔRMSEA not greater than 0.03). Lastly, a scalar measurement invariance model was fitted, constraining equal factor loadings and item intercepts across all countries. For the evaluation of scalar invariance, we applied stricter cut-off criteria based on Chen (2007), specifically, a ΔCFI not exceeding 0.01 and a ΔRMSEA not exceeding 0.015. In the case that full invariance is not demonstrated at any level, we considered testing for

partial invariance. Partial invariance is established when the parameters of at least two indicators per construct are equal across groups (Byrne et al., 1989).

Global fit measures for the measurement invariance models of the GECAI scale are presented in Table 3. As can be seen, the CFIs for the three types of measurement invariance (configural, metric, and scalar) were all above 0.96. These results confirmed metric measurement invariance. However, the model testing scalar invariance fitted significantly worse (according to the adopted cut-off criteria) compared to the model testing metric invariance. Hence, we also fitted the model to accommodate partial scalar invariance, relaxing the requirement for equal intercepts across countries for items #1 and #4. This model was not significantly worse in fit compared to the metric level model, based on the established cut-off criteria.

[Table 3 around here]

Psychometric Isomorphism of the GECAI Scale

To test whether the GECAI demonstrates metric isomorphism across individual and country levels, we followed the steps outlined by Tay et al. (2014). A series of models were fitted to the data using confirmatory factor analyses (CFA) and multi-level confirmatory factor analyses (MCFA). First, the one–factor single-level GECAI model (Model 1) was tested. Second, the strong configural psychometric isomorphism of the one–factor GECAI model (Model 2: one–factor structure at both individual and country levels with the same pattern of factor loadings) was fitted. Third, the strong metric isomorphism of the one–factor GECAI model (Model 3: all loadings constrained to be equal across levels) was tested. Next, the strong metric isomorphism of the one–factor GECAI model controlling basic demographic variables at an individual level, i.e., gender and age (Model 4), was tested.

As with the measurement invariance testing, it was necessary to demonstrate the configural and metric psychometric isomorphism to show that the subsequent models did not

fit worse than the previous models. However, no commonly acceptable cut–off criteria have been established in psychometric isomorphism testing. To assess relative model fit, the BIC (with lower values indicating a better fit) was used, while CFI, RMSEA, and SRMR (both within–-group SRMRW and between–-group $SRMR_B$) were used to determine absolute model fit. Table 4 presents fit statistics for the previously mentioned models. As can be seen, all the first four models had exceptionally good fit measures, indicating that the GECAI demonstrates metric psychometric isomorphism (it has the same factor structure across levels), even when accounting for gender and age. Thus, the interpretation of the GECAI as a country–level variable (not only individual) is reasonable. Figure 1 presents a world map showing mean country–level GECAI factor scores. The countries with the highest level of gender equality collective action intention were Kosovo, India, Nigeria, and Portugal, while the lowest level was observed in Kazakhstan, Denmark, Slovakia, and Czechia.

[Table 4 around here]

[Figure 1 around here]

Correlations of GECAI with Country–Level Indexes

The last research question concerned whether GECAI as a country–level variable is related to a country's gender equality, democracy and helping actions. To answer this question, another three multi–level models were defined and tested. Model 5 is a replication of Model 4, except that it additionally includes the Global Gender Gap Index (GGGI) as a country–level GECAI covariate. Model 6 includes the Democracy Index (DI) as a covariate instead of the GGGI[1]. As can be seen in Table 4, Models 5 and 6 had very good fit measures. Correlations between country–level GECAI and both GGGI and DI (see Figure 2) were significant ($p < 0.05$) and negative ($r = –0.25$ and $r = –0.29$, respectively). The MCFA results

[1] A model that simultaneously included GGGI and DI was also fitted. However, due to the high correlation between these indicators ($r = 0.61$), their presence in the model weakens the significance of each of them.

of Model 6, as the final one (with DI as a strongest country–level predictor) are presented in Figure 2. As depicted in Figures 3 and 4, countries higher in GGGI and DI are lower in GECAI. The results support the notion that in more gender egalitarian and more democratic countries, participants declared less intention to act for gender equality.

[Figures 2, 3 & 4 around here]

Discussion

We investigated the measurement invariance and psychometric isomorphism of the gender equality collective action intention scale across 60 countries. The scale turned out to work equivalently in various nations. Comparison of the latent mean scores on the GECAI scale between these nations can be drawn. In the assessment of behavioral intentions directed at working toward societal gender equality, there is a growing awareness of the necessity to consider cultural factors (van Zomeren, 2016). Our study is in line with this reasoning and aims to establishing a valid tool for such cross–cultural comparisons.

Demonstrating the measurement invariance of the tool used, was an important step in the analysis of our study. Although this type of analysis has found more and more applications for many years, it is still not a commonly used practice (Boer et al., 2018). There are also voices aimed at depreciating this stage of multi–group data analysis (including cross–cultural data; Welzel et al., 2021). The analysis of measurement invariance has been used in our approach in a very classic way: we are privileged to work with a scale that, with such an extensive research plane in so many groups, has proved to be scalar invariant. However, it should be emphasized that we are witnessing an intensive development of this segment of psychometric analysis, and where the classical approach does not work, other methods can be used (Fischer et al., 2021; Byrne & Matsumoto, 2021).

Moreover, the GECAI scale demonstrates configural and metric isomorphism across individual and country levels. Thus, the willingness to act collectively toward gender

equality, as measured by the GECAI scale, means similar things at the individual and national levels. This is an important result for the assessment of collective action intention, as well as for cross-cultural research on the predictors and correlates of collective action in general. The established isomorphism allows for analyses of correlates between country–level GECAI scores and other country-level variables.

Our results suggest that country-level scores on people's intention to act collectively on behalf of equality are correlated negatively with the democracy index and gender gap index. However, sample bias may play a role here. Specifically, the negative relationship reported here might result from a self–selected sampling bias as we have more data from countries at the middle/higher end of the democracy index. More countries would have to be included – also from the lower end of the democracy index – to establish whether the relationship may actually be curvilinear. It is possible that the pattern of the result might be weaker in countries at the lowest and high ends of this metric (but for vastly different reasons).

Considering whether the declared willingness to join actions to support gender equality is stronger in countries ranking high vs low in gender equality indices, our findings suggest that the former is more likely to be true –the higher the gender equality of the country, the lower the intention to support gender equality. It is a limitation that our data are correlational, and no casual relations can be established. This notwithstanding, zero-order correlations are insightful, as they point toward barriers to future engagement in actions for gender equality in societies in which gender equality has already been achieved to some extent. Radke and colleagues (2016) argued that one important barrier to engagement on behalf of women's equality is the postfeminist perception of gender equality: The relative success of the women's movements for social change and equality in some countries (mostly in the global North) might influence individuals not to perceive differences of status between

the genders. Many people may believe that sexism and gender–based discrimination is no longer a problem in their country. Thus, the fight for gender equality does not mobilize as many people as it used to. Our cultural cross-cultural research seems to strengthen this assumption by showing a lower readiness to fight for gender equality in more gender-equal countries.

To our knowledge, this study is the first to thoroughly examine and establish a cross-culturally valid measure of collective action intention. Findings are promising and suggest that the GECAI scale can be used for cross-cultural research, with the scale working equivalently in various regions and with psychometric isomorphism established. Nevertheless, some limitations should be highlighted. First, we only presented a correlation between the GECAI scale and chosen macro-level indicators. As our main goal of this paper is to present and validate the measurement tool, we did not concentrate on exploring various links between the GECAI scale and cultural– and national–level variables. Second, it is important to note that the current sample consisted of a relatively small and specific subgroup of the general population. We based our analyses on university undergraduate students, mostly from psychology and social sciences. Third, although our analyses included data from over 60 nations, there are parts of the world that are underrepresented: There are relatively fewer participants from Africa, the Middle East, and East Asia. Moreover, when it comes to large nations, we did not always have multiple investigators, and in some cases, we based our analyses on one sample from one region.

Limitations notwithstanding, our findings provide an important addition to the growing body of literature on collective action. Based on a large dataset covering over 60 nations, we introduce a methodologically sound tool that is cross-cultural equivalent in assessing collective action intentions, which we hope can be adopted by future studies on gender equality.

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Open Science

We report how we determined our sample size, all data exclusions (if any), all data inclusion/exclusion criteria, whether inclusion/exclusion criteria were established prior to data analysis, all measures in the study (under OSF link), and all analyses including all tested models. If we use inferential tests, we report exact p values, effect sizes, and 95% confidence or credible intervals.

Open Data: The information needed to reproduce all of the reported results are openly accessible (https://osf.io/84xz7/?view_only=66183e311ac54b0a88d048c9b05b9e1e).

*Open Materials: I confirm that there is sufficient information for an independent researcher to reproduce all of the reported methodology (*https://osf.io/84xz7/?view_only=66183e311ac54b0a88d048c9b05b9e1e*).*

Preregistration of Studies and Analysis Plans: This study was not preregistered.

*Open Analytic Code: I confirm that all the scripts, code, and outputs needed to reproduce the results are provided (*https://osf.io/84xz7/?view_only=66183e311ac54b0a88d048c9b05b9e1e*).*

Table 1. Sample composition, descriptive statistics for the GECAI factor score, and CFA model fit for each country.

Country	N	% women	% men	Age		GECAI (CFA scores)			CFA model fit		
				M	*SD*	*M*	*SD*	*ω*	CFI	RMSEA	SRMR
Albania	241	59	37	23.00	4.89	0.71	1.76	0.94	0.99	0.011	0.015
Argentina	428	50	47	32.28	12.28	0.16	1.86	0.94	0.99	0.042	0.016
Armenia	280	32	45	20.03	1.91	-0.84	1.63	0.93	0.99	0.032	0.020
Australia	666	64	34	29.91	11.22	-0.32	1.66	0.94	0.98	0.112	0.028
Belgium	1958	49	46	21.61	6.10	-0.14	1.46	0.92	0.99	0.070	0.019
Bosnia	224	44	41	23.04	5.96	-0.20	1.58	0.93	0.99	0.063	0.024
Brazil	1158	62	30	23.99	7.67	0.85	1.70	0.94	0.99	0.066	0.019
Canada	912	68	31	19.87	3.26	-0.58	1.57	0.93	0.99	0.077	0.026
Chile	186	58	36	21.74	5.11	0.31	1.68	0.91	0.98	0.092	0.039
China	189	59	40	19.34	1.24	-0.10	1.26	0.94	0.99	0.001	0.029
Colombia	620	55	36	21.49	4.94	0.48	1.66	0.93	0.99	0.066	0.020
Croatia	362	68	20	23.16	5.81	-0.10	1.59	0.94	0.98	0.100	0.026
Czechia	425	24	69	28.11	8.55	-0.98	1.41	0.92	0.97	0.109	0.029
Denmark	253	59	39	25.43	4.78	-1.03	1.54	0.94	0.99	0.057	0.019
England	743	58	39	22.28	7.46	-0.16	1.53	0.94	0.99	0.042	0.013
Finland	320	80	11	26.44	7.33	0.21	1.64	0.93	0.99	0.096	0.028
France	431	79	17	22.30	6.72	0.37	1.52	0.91	0.99	0.056	0.021
Georgia	205	44	48	21.68	3.45	0.16	1.59	0.93	0.99	0.001	0.021
Germany	1385	62	36	29.83	10.45	-0.48	1.51	0.92	0.97	0.127	0.033
Ghana	324	58	37	20.23	2.59	0.83	1.60	0.90	0.99	0.001	0.015
Greece	291	69	27	26.43	9.12	0.43	1.65	0.93	0.98	0.103	0.027
Hungary	765	73	17	22.35	4.29	-0.42	1.54	0.93	0.99	0.080	0.021
India	380	57	36	22.17	5.06	1.06	1.22	0.89	0.99	0.052	0.031
Indonesia	250	46	41	21.02	3.73	0.63	1.18	0.91	0.95	0.105	0.049
Ireland	571	53	45	19.83	3.70	-0.62	1.47	0.93	0.99	0.042	0.019
Italy	2441	64	33	22.82	5.33	0.33	1.60	0.93	0.99	0.070	0.016
Japan	221	55	38	21.65	3.66	-0.73	1.48	0.94	0.99	0.048	0.019
Kazakhstan	344	55	43	20.22	3.82	-1.06	1.47	0.92	0.98	0.090	0.039
Kosovo	435	56	37	20.27	3.85	1.20	1.58	0.93	0.99	0.031	0.013
Lebanon	134	66	28	19.61	0.85	0.84	1.63	0.94	0.99	0.076	0.023
Lithuania	357	59	29	23.77	6.72	-0.50	1.58	0.93	0.99	0.084	0.028
Luxembourg	181	62	34	24.61	5.43	-0.03	1.54	0.92	0.99	0.063	0.026
Malta	260	64	35	26.91	10.17	-0.06	1.65	0.94	0.99	0.074	0.024
Mexico	341	52	45	23.69	8.93	0.21	1.57	0.92	0.99	0.049	0.022
Morocco	289	51	46	29.24	9.78	0.34	1.74	0.94	0.98	0.110	0.033
Nepal	219	59	37	22.45	5.96	0.88	1.30	0.86	0.99	0.054	0.037
Netherlands	882	66	32	20.66	3.42	-0.81	1.32	0.92	0.99	0.041	0.015
New Zealand	215	70	29	19.00	2.34	-0.06	1.47	0.93	0.97	0.131	0.033

Nigeria	451	54	41	21.15	3.16	1.00	1.54	0.85	0.99	0.041	0.028
Northern Ireland	303	61	38	22.14	5.59	-0.29	1.67	0.95	0.99	0.041	0.011
Norway	217	52	41	23.08	4.09	-0.59	1.48	0.93	0.98	0.085	0.030
Pakistan	576	48	42	22.05	3.75	0.30	1.42	0.90	0.99	0.023	0.018
Philippines	472	48	47	19.79	2.00	0.41	1.45	0.93	0.99	0.075	0.022
Poland	844	49	38	22.95	4.68	-0.61	1.58	0.93	0.99	0.077	0.021
Portugal	174	80	18	22.13	4.90	0.99	1.41	0.92	0.97	0.110	0.039
Romania	252	58	41	22.85	4.64	-0.33	1.59	0.93	0.96	0.140	0.042
Russia	703	63	31	21.83	6.83	-0.77	1.65	0.93	0.99	0.068	0.020
Serbia	727	72	22	22.20	5.31	0.16	1.71	0.93	0.99	0.045	0.016
Slovakia	630	47	44	21.93	4.56	-0.99	1.45	0.93	0.99	0.031	0.014
South Africa	405	55	39	20.57	2.50	0.51	1.69	0.94	0.99	0.054	0.017
Spain	1237	58	34	25.69	8.73	0.61	1.58	0.94	0.99	0.067	0.016
Suriname	181	54	44	22.95	5.74	0.41	1.60	0.94	0.99	0.055	0.020
Sweden	673	50	48	26.22	7.37	-0.34	1.67	0.94	0.99	0.093	0.023
Switzerland	582	64	35	23.52	5.47	-0.36	1.54	0.92	0.98	0.105	0.029
Turkey	1506	64	31	22.25	4.00	0.42	1.68	0.94	0.99	0.064	0.016
Ukraine	282	62	35	19.16	1.44	-0.47	1.62	0.95	0.99	0.049	0.020
Uruguay	189	60	39	22.66	6.55	0.10	1.64	0.93	0.99	0.074	0.027
USA	782	67	30	20.38	4.44	-0.11	1.68	0.95	0.99	0.058	0.016
Vietnam	407	69	24	22.39	6.70	0.81	1.35	0.89	0.99	0.041	0.026
Wales	207	63	34	30.47	10.27	-0.25	1.74	0.95	0.98	0.114	0.030
Total sample	**31,686**	**59**	**36**	**23.13**	**6.91**	**0.00**	**1.66**	**0.99**	**0.99**	**0.063**	**0.015**

ω = McDonald's omega; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation;

SRMR = Standardized Root Mean Squared Residual.

Table 2. Descriptive statistics, ICCs, factor loadings and variances for the GECAI scale items using total sample.

Item	M	SD	Skew.	Kurt.	ICC	λ_S	θ_S
1. become involved with a group (or political party) focused on gender issues/gender equality (e.g., volunteer, summer job, etc.)	3.54	2.03	0.27	-1.20	0.09	0.84	0.29
2. consciously make time to work on gender issues/gender equality (e.g., working part-time for an organization, contributing to raise awareness about gender issues, choosing activities focused on gender issues over other leisure activities)	3.59	1.98	0.25	-1.13	0.11	0.88	0.23
3. participate in a community event which focused on gender issues	3.95	2.02	-0.01	-1.23	0.09	0.88	0.23
4. use online tools (e.g., Instagram, YouTube, Facebook, Wikipedia, Blogs) to raise awareness about gender issues/gender equality	4.04	2.15	-0.05	-1.38	0.10	0.72	0.48
5. participate in an educational event (e.g., workshop) related to gender issues/gender equality	4.19	2.05	-0.16	-1.25	0.09	0.84	0.29
6. spend time working with a group/organization that deals with the connection of gender issues/gender equality to other societal issues such as justice or inequality	3.82	2.01	0.08	-1.21	0.10	0.88	0.22

Note. N = 31,686; ICC = Intraclass Correlation Coefficient; λ_S - standardized loading estimate; θ_S - standardized residual estimate.

Table 3. Global fit measures in measurement invariance tests for the GECAI scale.

Level of invariance	χ^2	df	CFI	RMSEA	ΔCFI	ΔRMSEA
Configural invariance (equal form)	2,000.13	540	0.989	0.072	-	-
Metric invariance (equal factor loadings)	2,937.54	835	0.984	0.069	0.005	0.003
Partial scalar invariance (equal intercepts except for items #1 and #4)	4,333.40	1,012	0.975	0.079	0.009	0.010
Scalar invariance (equal intercepts)	5,586.26	1,130	0.967	0.086	0.017	0.017

Notes. 60 countries; $\chi 2$ = chi square; df = degrees of freedom; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation.

Table 4. Comparison of multilevel factor analysis models for GECAI.

Model	Fit statistics				
	BIC	CFI	RMSEA	$SRMR_W$	$SRMR_B$
Single-level structure (Model 1)	658575	0.993	0.063	0.015	–
Strong configural isomorphism (Model 2)	653183	0.986	0.059	0.016	0.010
Strong metric isomorphism: all loadings constrained to be equal (Model 3)	653167	0.986	0.053	0.016	0.025
With covariate at individual level: Age and Gender (Model 4)	600736[a]	0.983	0.053	0.019	0.009
With covariate at individual level and at county level: GGGI (Model 5)	600742[a]	0.983	0.048	0.019	0.019
With covariate at individual level and at county level: DI (Model 6)	600741[a]	0.983	0.048	0.019	0.023
With covariate at individual level and at county level: WGI (Model 7)	600941[a]	0.983	0.050	0.019	0.017

Note. N = 31,686; [a]N = 29,306; BIC = sample-size adjusted Bayesian Information Criterion; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; $SRMR_W$ = Standardized Root Mean Square Residual within covariance matrix; $SRMR_B$ = Standardized Root Mean Square Residual between covariance matrix.

Figure 1. World map showing mean country-level GECAI factor scores.

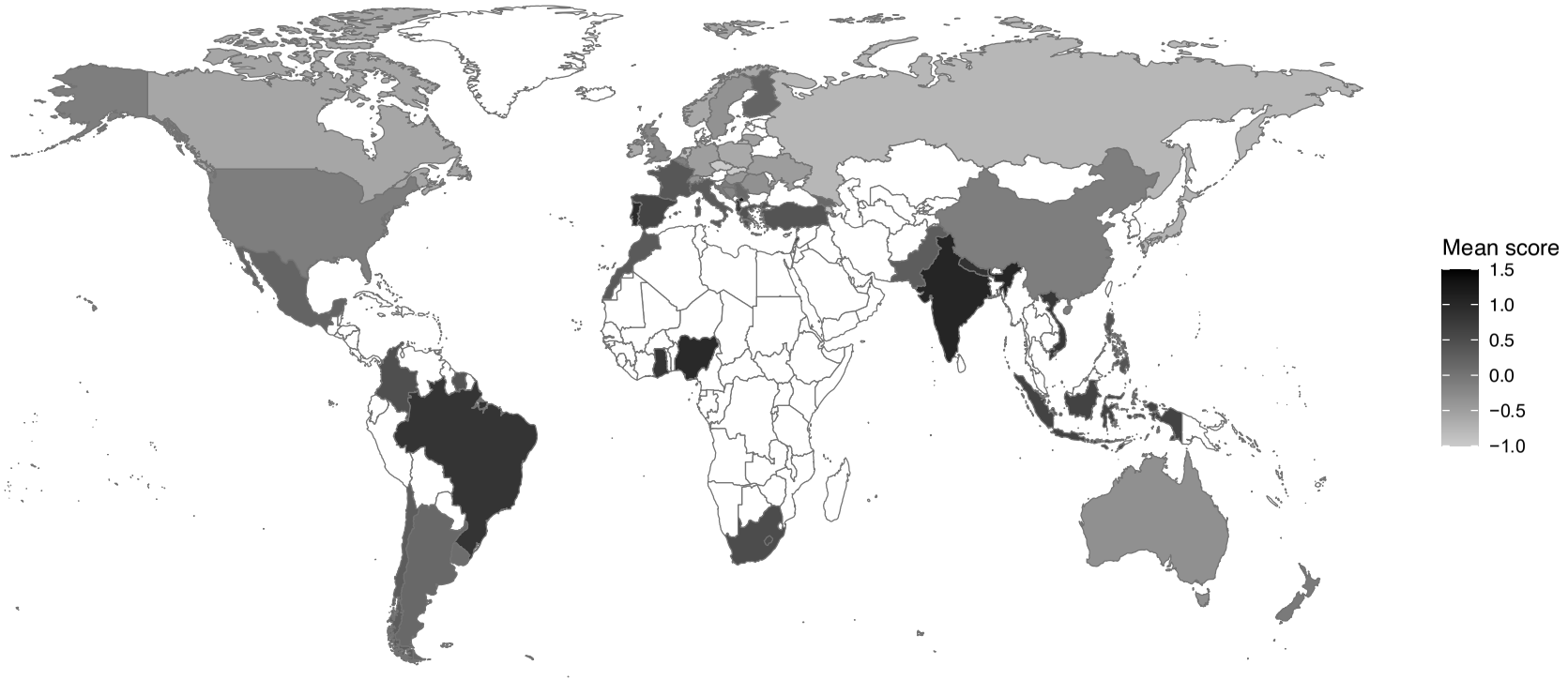
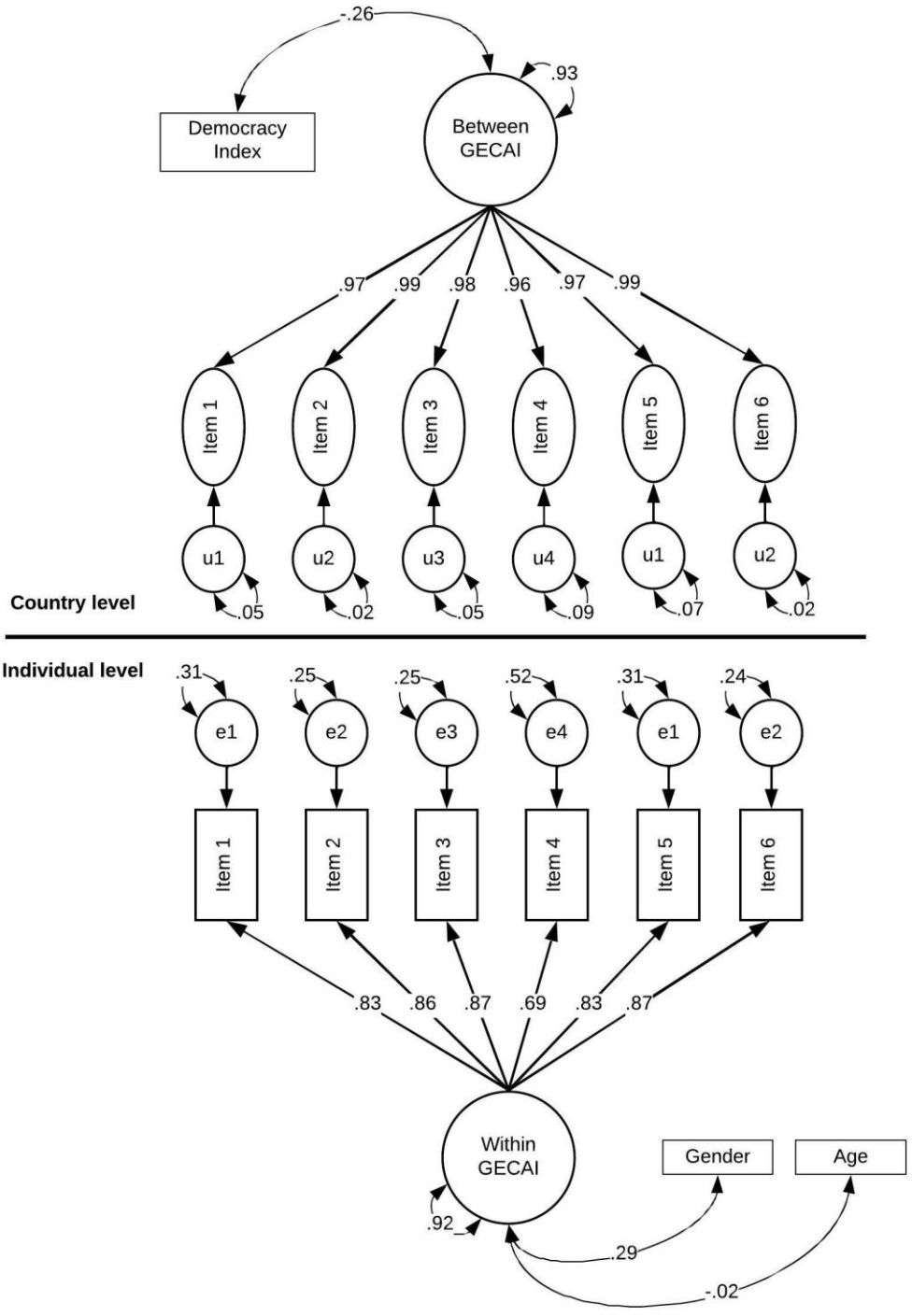


Figure 2. Two-level CFA results of the GECAI with covariate at individual level (Age and Gender) and at county level (Democracy Index).



Notes. Gender: 1 = Female

Figure 3. Relationship between the Country's Gender Equality (GGGI) and GECAI at the Country-Level.

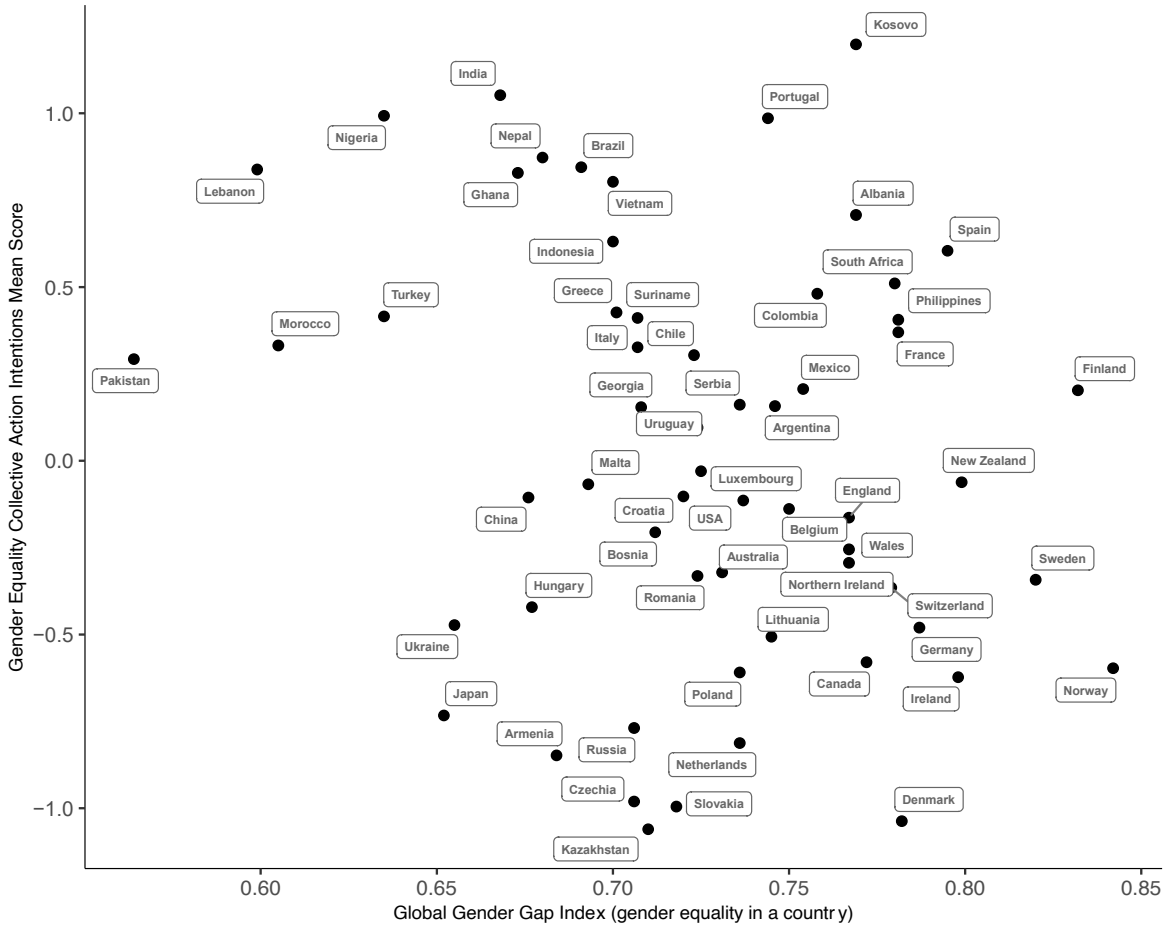
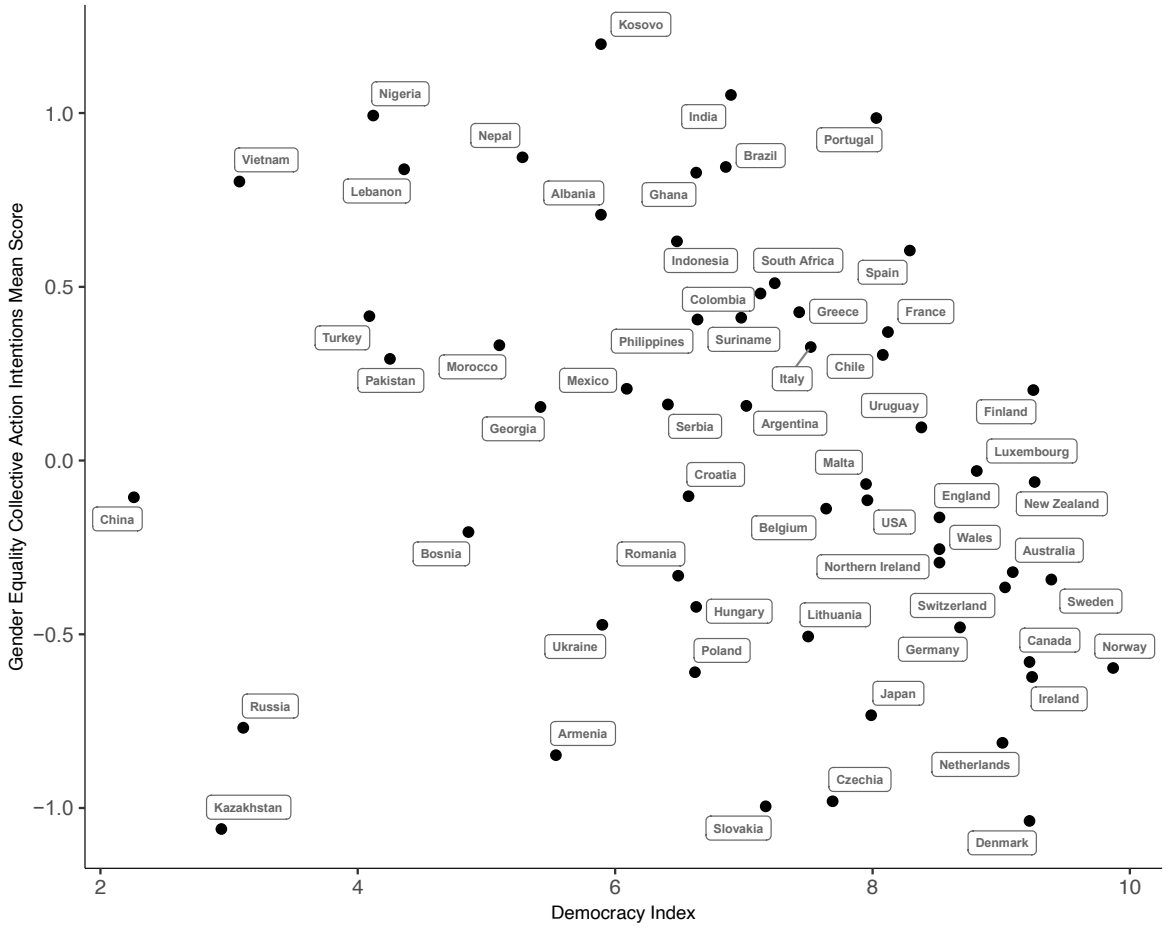


Figure 4. Relationship between the Country's Democracy Index and GECAI at the Country-Level.



Measuring Collective Action Intention Toward Gender Equality Across Cultures

Supplementary Materials

In response to the reviewers' suggestions, we have conducted additional analyses to further elucidate the relationships and contextual factors relevant to our study on the Gender Equality Collective Action Intention (GECAI) scale across countries. These supplementary materials aim to provide a comprehensive understanding of the association between the GECAI and various country-level and individual-level variables. This detailed examination enhances the robustness and depth of our findings, offering greater insight into the complex dynamics of gender attitudes and beliefs across different cultural contexts.

Correlation between Country-level GECAI and Human Development Index (HDI)

In this section, we present the analysis correlating the country-level GECAI with the Human Development Index (HDI). This comparison provides additional context about a country's development status beyond gender equality and democracy indicators. By integrating HDI, we offer a more nuanced perspective on how human development correlates with gender attitudes and cultural perceptions. To achieve this, we fitted multilevel factor analysis models for GECAI with covariates at both the individual level and the country level: HDI (Model 8; see Table 4 in the main text for previous models). The results of fitting this model are presented in Table S1. Correlations between country-level GECAI and HDI were significant ($p < 0.01$) and negative ($r = –0.66$). As depicted in Figure S1, countries with higher HDI

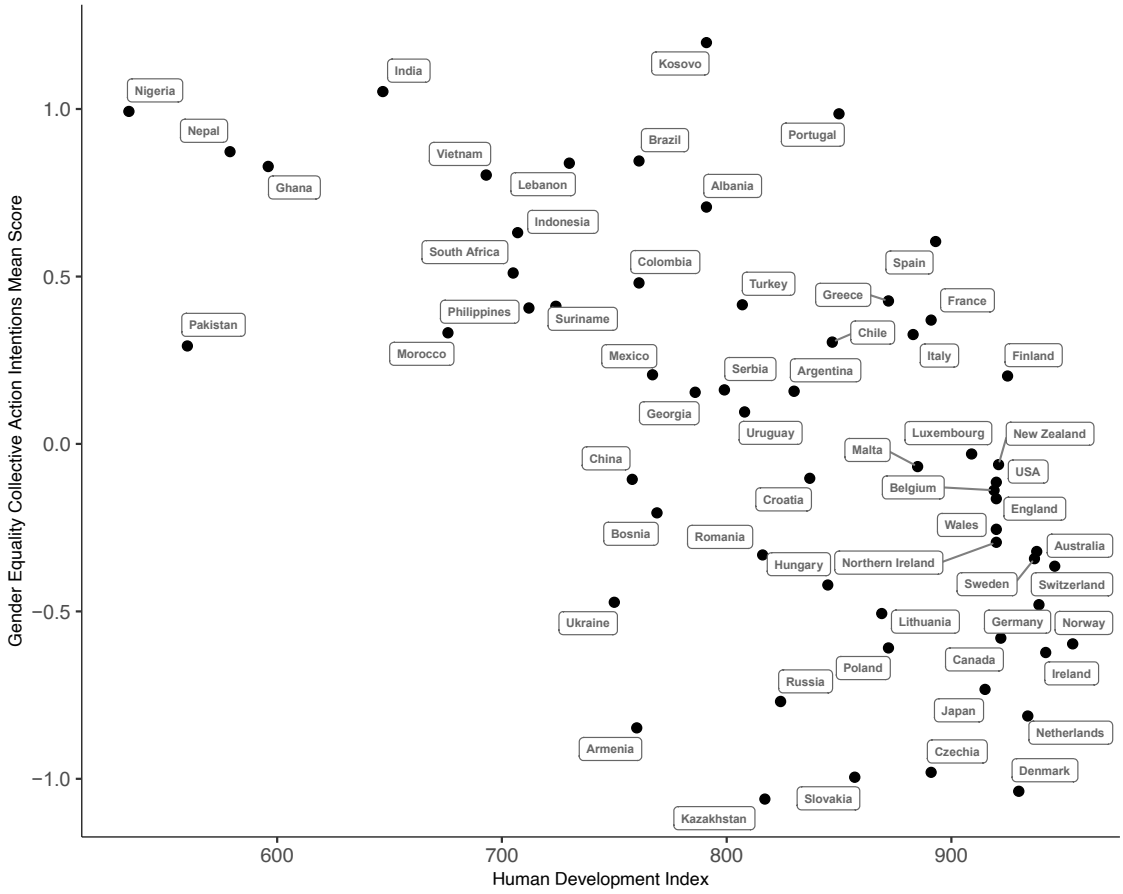
scores tend to have lower GECAI mean latent scores. These results support the notion that in more developed countries, participants declared less intention to act for gender equality.

Table S1. Multilevel factor analysis model for country-level GECAI and Human Development Index (HDI)

Model	Fit statistics				
	BIC	CFI	RMSEA	$SRMR_W$	$SRMR_B$
With covariate at individual level and at county level: HDI (Model 8)	600713	0.983	0.048	0.019	0.015

Note. N = 29,306; BIC = sample-size adjusted Bayesian Information Criterion; CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; $SRMR_W$ = Standardized Root Mean Square Residual within covariance matrix; $SRMR_B$ = Standardized Root Mean Square Residual between covariance matrix.

Figure S1. Relationship between the Country's HDI and GECAI at the Country-Level.



Analysis of Individual-level Variables Related to Gender Beliefs

This section details the expanded analysis of the relationship between GECAI and various individual-level variables related to gender beliefs. The variables analyzed include: Zero-Sum Perspective toward Gender Status, Hostile Sexism, Benevolent Sexism, and Gender Essentialism. These variables are all related to gender beliefs and attitudes that reflect traditional and often discriminatory views on gender roles. It is expected that there would be a negative correlation between these variables and gender equality collective action intention. This expectation is based on the premise that individuals who hold more traditional, sexist, or essentialist views about gender are less likely to support or engage in actions aimed at promoting gender equality. These attitudes inherently conflict with the goals of gender equality, as they reinforce the status quo and discourage progressive changes in gender dynamics.

Using the data collected in the project, we employed multilevel models to examine these relationships. These models account for the nesting of individuals within countries and partition the variance of the variables into within-country and between-country components. This approach allows for a detailed exploration of how individual beliefs about gender are affected by broader cultural and national contexts.

The results of the multilevel models, in which various individual-level variables related to gender beliefs were predictors of GECAI, are presented in Table S2. As shown, regardless of the country of origin and residence, the stronger the hostile sexism, the lower the willingness to engage in actions supporting gender equality. As predicted, a similar effect was noted for the other gender beliefs. These results can be considered as evidence of the validity of the GECAI measurement, based on the relationship between the measured variable and other theoretically related variables.

Table S2. Multilevel model results: Predictors of GECAI from individual-level gender beliefs

Independent variable	b	β	p-value	R2 (%)	
				Conditional	Marginal
Hostile Sexism	-0.44	-0.32	< 0.01	24	10
Benevolent Sexism	-0.23	-0.17	< 0.01	17	3
Zero-Sum Perspective toward Gender Status	-0.28	-0.16	< 0.01	15	3
Gender Essentialism	-0.31	-0.27	< 0.01	21	7

Note. N = 31,686; 60 countries.

Correlation between Country-level GECAI and World Giving Index (WGI)

As an additional indicator of helping behavior, we included the scores from the World Giving Index (WGI). It is an indicator that looks at three facets of giving behaviour in the past month. That is, it is focused on helping a stranger, donating money, and volunteering time to an organization. The WGI aims to provide insight into the scope and nature of giving worldwide, offering a unique perspective on global generosity trends. We acknowledge the relevance of the World Giving Index as a measure of social behavior related to generosity and giving, thus to other (than GECAI) forms of collective action. The highest scoring country in 2020 was Indonesia, and the lowest-scoring country was Japan.

There was no significant relation between GECAI scores on a country level and the World Giving Index (r = –0.10, p = 0.45).