Validation of the Slovak Version of Tolerance Scale on a Sample of Young Adults and Adolescents

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As societies become more diverse, tolerance plays a crucial role in fostering peaceful coexistence, particularly in the context of global migration, where immigrants and refugees often face prejudice and discrimination. This study builds on Hjerm et al.'s (2020) conceptualization of tolerance, which emphasizes a value orientation towards difference, and its distinct nature from prejudice. The primary objective was to adapt the Tolerance Scale into Slovak and evaluate its psychometric properties among young adults and adolescents, with a total sample of 684 participants. The results demonstrated that the Tolerance Scale exhibited satisfactory psychometric properties, including measurement invariance across age groups. Additionally, we provided evidence supporting the discriminant validity of tolerance in relation to prejudice. This study contributes to the methodological and theoretical advancement of tolerance measurement within diverse cultural contexts.

Key words: tolerance, young adults, adolescents, Slovakia, validation

Introduction

As societies become increasingly diverse, tolerance is assuming a crucial and impactful role in fostering peaceful coexistence of various groups, cultures, and ethnicities. The unprecedented rates of global migration raise concerns about the successful integration of immigrants and refugees, who often face prejudice, discrimination, and hostility from the majority population. Lack of tolerance and respect has detrimental consequences for immigrants' and refugees' well-being (e.g., Schmitt et al., 2014), while also hindering their acculturation and integration efforts (Bourhis et al., 1997).

Two broad conceptualizations have emerged throughout the long history of studying tolerance (Hjerm et al., 2020). The first conceptu-

alization emphasizes the interconnectedness between tolerance and prejudice, suggesting that toleration requires that one first harbors dislike towards "specific beliefs, practices, and behaviours" (p. 5) of others (Verkuyten et al., 2023). To be tolerant, people must curb their true feelings and conform to social expectations, resulting in self-restrained behavior. Other authors argue that tolerance is practically indistinguishable from prejudice (e.g., Hjerm et al., 2020), as it does not capture the genuine recognition and appreciation of another, which is necessary for a truly inclusive society.

The second approach stresses the importance of diversity, suggesting that prejudice is not necessarily a "prerequisite" for people to be tolerant. This perspective aligns with the definition of tolerance in the Declaration of Principles of Tolerance published by UNESCO (1995), in which tolerance is defined as: "...respect, acceptance, and appreciation of the rich diversity of our world's cultures, our forms of expression and ways of being human" (p. 71).

This study builds on Hjerm et al.'s (2020) conception of tolerance that aims to improve the methodological and theoretical shortcomings of previous conceptualizations (such as high interrelatedness with prejudice, presence of items assessing attitudes towards a specific outgroup, etc.). This framework defines tolerance as "a value orientation towards difference" (p. 903) in general, without incorporating the concept of prejudice. They distinguish between three hierarchically ordered aspects of tolerance. The first, acceptance of difference (ACC), is based on the understanding of tolerance as mutual and permissive coexistence without interference. It is followed by respect for different beliefs and practice (RESP), which encompasses the belief in equality between groups on a moral or political level, despite differences in

culture. Third, at the top of the hierarchy, is appreciation or esteem of diversity in terms of recognizing a value in others' different beliefs and lifestyles (APP). Therefore, the three aspects of tolerance can be understood as a continuum, where one may accept diversity but not necessarily respect or appreciate it. Building on this conceptualization, Hjerm et al. (2020) proposed a new measure to assess these three aspects of tolerance.

The development of the original Tolerance Scale originated with a pool of 15-20 items that were subsequently downsized to a 9-item scale. However, due to limitations (e.g., the presence of a reverse-coded item worsening model fit in multigroup CFA), a further reduction was made by Hjerm et al. (2020), resulting in a final 8-item structure of three factors that corresponded to three distinct aspects of tolerance – acceptance, respect, and appreciation. The measure of tolerance was validated on general samples by Hjerm et al. (2020) in Australia, Denmark, Sweden, the United States, and the United Kingdom. The scale was further translated and validated in Spain by Cuadrado et al. (2021).

The aim of the present study was to adapt the measure of tolerance by Hjerm et al. (2020) to the Slovak language and examine its psychometric properties on a sample of young adults and adolescents. Unlike countries where the measure has already been validated, Slovakia is a less diverse environment, making it valuable to explore how this scale functions in this setting.

Methods

Sample Description

The psychometric properties of tolerance measure were examined in two samples. The first sample of 257 young adults (YA) – university students in Slovakia provided data in

October 2020. Participants with immigrant background (*n* = 11) were excluded from the study. We did not identify any participants engaging in inattentive responding. In total, we analyzed data from 246 university students. The sample included 50 men and 142 women, while 54 participants did not provide information regarding gender as they left the survey before completing the sociodemographic part. The average age was 21.42 (*SD* = 1.78) and ranged from 18 to 33 years.

The second sample consisted of 489 Slovak adolescents (ADL). The data were collected between April and July 2021 in 20 schools (elementary, vocational, grammar) across Slovakia. Participants who failed both attention checks (*n* = 20), participants who were further identified as engaging in careless responding (*n* = 7), and participants with immigrant background (*n* = 24) were removed. The final sample consisted of 438 participants (100 boys, 258 girls) with an average age of 16.78 (*SD* = 1.57), ranging from 13 to 19 years.

Measures

The questionnaire was distributed via Surveymonkey. At the beginning of the survey, participants were given a definition of the term "immigrant", specifying it as someone who has left their home country to live in Slovakia. To ensure participants' attention, we included instructed response item checks at two different points in the survey. All items were rated on a 7-point Likert scale (1 – completely disagree to 7 – completely agree), unless otherwise noted. At the end of the survey, participants were presented with sociodemographic questions regarding gender, age, and nationality.

The scales of modern racism, social dominance orientation, and intergroup threat were all translated using the backtranslation method and additionally assessed in the cog-

nitive interviews (see description of Tolerance Scale for more details).

Tolerance Scale

We used the 8-item Tolerance Scale (Hjerm et al., 2020), assessing three factors – acceptance (3 items), respect (2 items), and appreciation (3 items). Furthermore, we also tested the original 9-item version of the scale (3 items per factor).

Translation process. The procedure for scale translation involved the backtranslation method and cognitive interviews (Popper & Petrjánošová, 2016; Willis, 2015). First, we translated the original items into the Slovak language, which were then backtranslated into English by a researcher who was not involved in the study and was unaware of the original wording. The original wording was then compared to the backtranslated version. Only one item had a slightly different meaning after being backtranslated ("App2. *I like people who challenge me to think about the world in a different way*"; the translation was "*who inspire me*"), which was then reworded to fit more closely to the original.

Our next step was to pretest the translated items using cognitive interviews to ensure a better validity of our measures. We used a diverse sample of adolescents from different regions of Slovakia (*N* = 11, aged 10-18 years), until the sample and information were saturated (Willis, 2015). The aim of cognitive interviews was to ensure that all the items and instructions were clear and to examine how participants understood the questions in the way the researcher intended (Willis, 2015). We used two methods: verbal probing and thinking-aloud (Willis, 2015). Participants were instructed to fill out the questionnaire while actively verbalizing their thoughts and raise any issues they might have with answering any of the questions. We also asked spe-

cific probing questions after each completed scale. Interviews were conducted online with approx. 50 minutes duration. All participants were compensated for their time with a 10 € bookstore gift card.

Prejudice

We assessed prejudice using multiple measures: Attitude towards immigrants, Social distance, and Modern Racism Scale.

Attitude towards immigrants. Feeling Thermometer was used to measure the attitude towards immigrants (Haddock et al., 1993). The attitude was assessed on a scale ranging from 0 (cold feelings towards immigrants) to 100 (warm feelings towards immigrants). The middle point 50 symbolized neutral feelings.

Social distance. We used a 3-item (e.g., "*How acceptable or unacceptable would you find the following situations: if a new student, who is an immigrant, is placed in your class*") Social Distance Scale that has been developed in Slovak as part of explicit measures of prejudice in the APVV project INTERMIN (Lášticová & Findor, 2016). The reliability of the scale was optimal (α = .93; ω = .93) with factor loadings of .88 and higher. This measure was used only in the ADL sample.

Modern Racism Scale. We used 3 items (e.g., "*If immigrants would only try harder, they could be as well off as Slovaks*") adapted from Mähönen et al. (2011). We used this measure only in the YA sample. The reliability was adequate (α = .72; ω = .74) with factor loadings ranging from .52 to .84.

Intergroup Threat

Perceived intergroup threat measure consisted of items adapted from Stephan et al. (1999) and Sinclair et al. (2005). The reliability of this 7-item (e.g., "*Immigrants increase crime rates*") scale was excellent (ADL: α =

.913; ω = .914; YA: α = .91; ω = .91). Higher values indicate higher perceived threat. In the YA sample, the factor loadings ranged from .62 to .84, and in the ADL sample, from .70 to .84.

Intergroup Contact

To assess intergroup contact, we used two single items capturing the frequency of intergroup contact ["*How often do you spend time with immigrants (people who moved to Slovakia from other countries)?*"] and quality of intergroup contact *("How do you usually feel about it")* on a 7-point scale (never – every day; very unpleasantly – very pleasantly).

Social Dominance Orientation (SDO)

We used 3 items from the Social Dominance Orientation Scale (e.g., "*Some groups of people are simply inferior to other groups*") by Pratto et al. (1994). This measure was collected only in the adolescent sample. The reliability of this scale was not satisfactory (α = .51; ω = .52) with factor loadings ranging from .43 to .56.

Data Analysis

The missing data were handled via multiple imputation by chained equations (MICE) procedures. Ordinal values were imputed by predictive mean matching, and categorical values by logistic regression.

Confirmatory factor analysis was carried out to examine several structure solutions of the tolerance scale: a) the originally proposed three-factor structure; b) one-factor model (+ residual correlations among items belonging to the relevant factor). We applied maximum likelihood with a robust standard error estimation procedure due to non-normally distributed manifest variables. To ensure the

identification of the model, the variance of latent variables was fixed to 1.

Model fit evaluation relied on the traditional benchmark values of the most commonly used fit indexes such as χ^2, *RMSEA* (<.08), *SRMR* (<.08), *CFI* (>.90/.95), *TLI* (>.90/.95). Dynamic cut-off scores were applied as well. Additionally, the fit of the model was diagnosed visually via trace plot displaying the model-implied slope between a pair of indicators against a regression line, and disturbance-dependence plot to investigate the presence of remaining association between items after extracting model fit.

The reliability of the Tolerance Scale was assessed by Cronbach's α and McDonald's ω and their corresponding 95% confidence intervals (CI).

The convergent validity with scales assessing conceptually and theoretically similar constructs to tolerance was established by Pearson's product-moment correlation coefficient.

To establish the discriminant validity of the proposed measure of tolerance several techniques were used. Based on the review and recommendations of Rönkkö and Cho (2022), we primarily used the CI_{CFA} (sys) approach in which the (absolute) value of 95% upper CI of a latent correlation (95 % lower CI in the case of negative correlation) between pair of measures is compared to the proposed classification system by Rönkkö and Cho (2022). Absolute values < .8 were considered as non-problematic. Values between .8 and .9 signalized a marginal problem, values between .9 and 1 reflected a moderate problem and values > 1 implied a severe problem. Subsequently, the χ^2 (sys) approach in which previously categorized level discriminant validity severity is further verified by using the nested model χ^2 test. Specifically, in instances of established marginal problems with discriminant validity, the nested model χ^2 test compares a model with freely estimated correlation between a pair of measures and model with fixed latent correlation between two measures to a prespecified threshold (-).9. In the case of a moderate problem, the same approach is used with a threshold of (-)1. Finally, a heterotrait-monotrait correlation ratio (HTMT2) was used. Values of HTMT2 under .9 indicated the presence of measures distinctiveness.

The measurement invariance of the tolerance scale across sample (age) was explored. The magnitude of noninvariance on an item level was quantified by d_{MACS} (Nye & Dragsow, 2011).

All analysis were conducted in R (v. 4.3.2.; R Core Team, 2023). The CFA was conducted with *lavaan* (Rosseel, 2012), and *flexplavaan* (Fife et al., 2023). Data and code are available at osf.io/uvzht.

Results

Descriptive Statistics

Table 1 contains descriptive statistics for tolerance items in both samples. The items intercorrelations after MICE are presented as well.

Figure 1 shows the response distribution with a noticeable preference of agreeable responses for majority of the items, a phenomenon especially pronounced in the YA sample. Most disagreements were recorded for items 7 and 8 (> 20% in the ADL sample), while for the remaining items the proportion of disagreement was below 10%.

Factor Structure

Three-factor structure. While this initially proposed structure with 9 items exhibited adequate model fit in the young adult sample, excluding the reverse-coded item improved the model fit in both samples (Table 2). However,

Table 1 *Descriptive statistics of individual items and items' intercorrelations*

	ADL: Mean (SD)	YA: Mean (SD)	T1	T2	T3	T4	T5	T6	T7	T8	T9
T1	5.93 (1.24)	5.91 (1.14)	**1**	.74***	.55***	.27***	.22***	.26***	.22***	.27***	.34***
T2	6.14 (1.02)	6.10 (1.00)	.64***	**1**	.50***	.31***	.26***	.31***	.21***	.27***	.42***
T3	6.41 (1.05)	6.46 (.98)	.45***	.49***	**1**	.20**	.14*	.29***	.23***	.29***	.24***
T4	5.88 (1.03)	5.94 (.92)	.32***	.45***	.36***	**1**	.56***	.35***	.31***	.24***	.33***
T5	5.40 (1.33)	5.64 (1.04)	.22***	.32***	.20***	.52***	**1**	.28***	.38***	.25***	.34***
T6	5.98 (1.20)	6.12 (1.09)	.24***	.38***	.35***	.33***	.30***	**1**	.39***	.28***	.40***
T7	4.93 (1.30)	5.14 (1.35)	.28***	.29***	.16**	.27***	.28***	.24***	**1**	.43***	.38***
T8	4.83 (1.70)	5.64 (1.44)	.16**	.18***	.15**	.22***	.40***	.18***	.33***	**1**	31***
T9	5.43 (1.34)	5.55 (1.31)	.36***	.41***	.37***	.31***	.29***	.36***	.33***	.33***	**1**

Note. Item 6 (T6) is reverse-coded. Values above the diagonal represent correlations within the young adult sample, while those below the diagonal represent the correlations within the sample of adolescents.
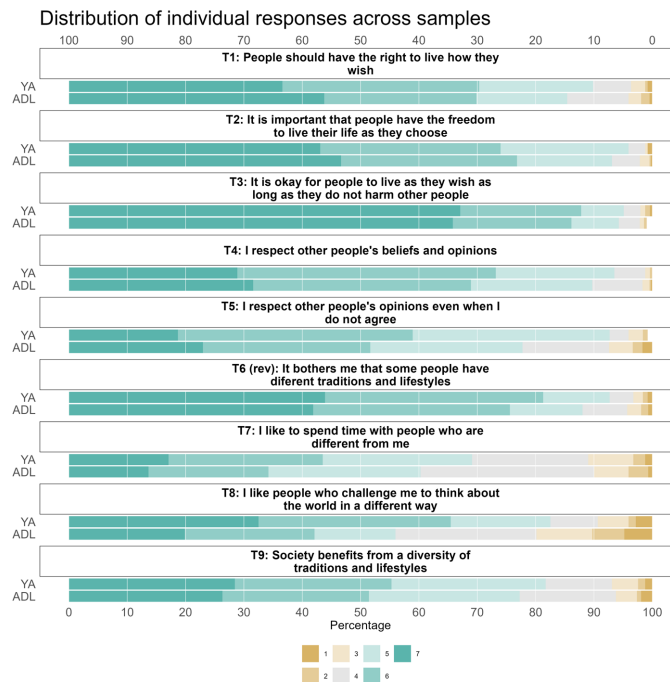*p < .05; **p < .01, ***p < .001

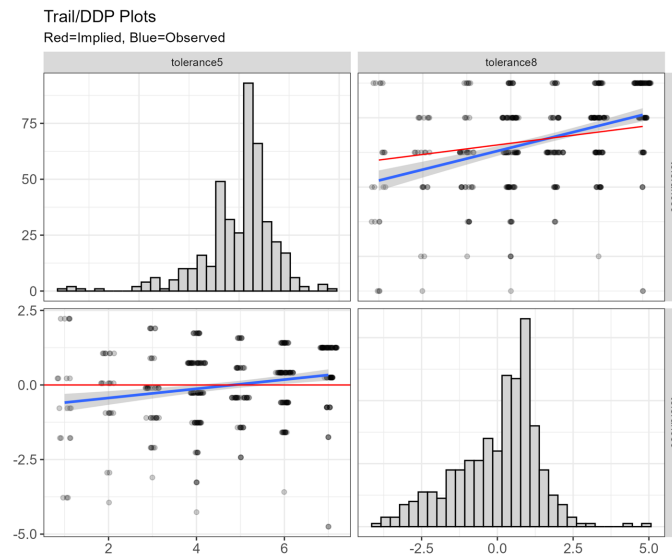*Figure 1* Response distribution across individual tolerance scale items.

Figure 2 Trail and disturbance-dependence plot for items 5 and 8.

this model did not fit the data satisfactorily in the adolescent sample. The model fit was inadequate even when compared to level-2 dynamic fit indexes cut-offs[1] ($SRMR_{cutoff}$ = .034, $RMSEA_{cutoff}$ = .061, CFI_{cutoff} = .979). When compared to traditional benchmarks, the TLI value provided a weak support of the proposed model against the null model. Moreover, the upper 95% CI RMSEA undermined the adequacy of the three-factor model. The SRMR value was acceptable (< .08), but the discrepancy between the model-implied and observed correlation matrix revealed a high residual correlation ($r_{r5.8}$ = .174) between items 5 and 8. The trail plot in Figure 2 (above diagonal) highlighted the discrepancy between the model slope and regression line, implying that the model underestimated the relationship between these items. The disturbance-dependence plot in Figure 2 (below diagonal) showed that extracting model fit resulted in nonzero slopes, suggesting the presence of

a remaining association between these indicators not explained by the model. By adding this residual correlation into the model, the model fit was expectedly improved (scaled χ^2 (scaling factor) = 32.88 (1.225), *df* = 17, *p* = .012, CFI = .981, TLI = .968, RMSEA = .049, 90% CI [.015, .078], SRMR = .035). This model fit the data well against level-2 dynamic fit indexes cutoffs ($SRMR_{cutoff}$ = .033, $RMSEA_{cutoff}$ = .065, CFI_{cutoff} = .980). Factor loadings were reasonably high, ranging from .50 to .86, with strong correlations between latent factors (.62 to .65).

In the sample of young adults, the three-factor model with 8 items provided a good fit. However, slightly worrisome is the upper 90% CI RMSEA exceeding the benchmark value. The model fit is satisfactory even when compared to Level-0[2] dynamic fit indexes cutoffs ($SRMR_{cutoff}$ = .044, $RMSEA_{cutoff}$ = .057, CFI_{cutoff} = .970). This model with standardized factor loadings is displayed in Figure 3.

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[1] Corresponding to fit indexes in the presence of model misspecification (two omitted cross-loadings).

[2] Fitted model is assumed to be true (population) model.
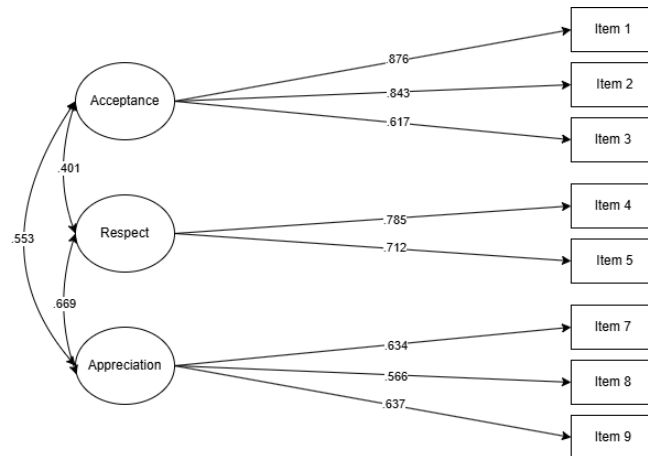
Figure 3 Factor structure of tolerance measure.

Table 2 *Fit indices of CFA*

Model	Sample	Scaled χ^2 (scaling factor)	df	p	TLI$_R$	CFI$_R$	RMSEA$_R$ (90% CI)	SRMR
F1I8	ADL	140.90 (1.383)	20	< .001	.735	.811	.142 [.120, .164]	.076
	YA	126.01 (1.413)	20	< .001	.636	.740	.175 [.146, .204]	.108
F1I9	ADL	164.60 (1.305)	27	< .001	.760	.820	.126 [.108, .145]	.069
	YA	176.33 (1.203)	27	< .001	.641	.731	.162 [.138, .188]	.099
F1I8 + residual cor.	ADL	59.871 (1.054)	13	< .001	.889	.948	.092 [.065, .121]	.044
	YA	15.078 (1.226)	13	.303	.995	.998	.020 [.000, 077]	.030
F3I8	ADL	61.24 (1.227)	18	< .001	.913	.944	.081 [.057, .107]	.047
	YA	25.78 (1.241)	18	.105	.978	.986	.043 [.000, .083]	.039
F3I9	ADL	91.43 (1.171)	24	< .001	.888	.926	.086 [.065, .108]	.051
	YA	51.50 (1.163)	24	.001	.932	.955	.071 [.040, .100]	.053

Note. Subscript *R* stands for robust. *F* stands for factor (e.g., F3 = three-factor model); *I* stands for item (e.g., I8 = 8 items).

A high residual correlation (>|.10|) between items 2 and 9 emerged, but due to good model fit, lack of theoretical support, and the goal to maintain parsimony, it was not modeled.

One-factor structure. The one-factor solution without residual correlations exhibited poor model fit in both samples. Incorporating residual correlations between items within the same factor significantly improved model fit. This model provided a near-perfect fit in the young adult sample, but TLI and RMSEA values indicated a suboptimal fit in the adolescent sample. Similar to the three-factor solution in the adolescent sample, a high residual correlation between items 5 and 8 ($r_{r5.8}$ = .23) was observed. Including this residual correlation led to an optimal model fit (scaled χ^2 (scaling factor) = 24.49 (1.105), df = 12, p = .018, CFI = .987, TLI = .969, RMSEA = .050, 90% CI [.022, .077], SRMR = .027). Standardized factor loadings were generally above .4, except for item 8 in the adolescent sample (λ_8 = .312), and item 3 in the young adult sample (λ_3 = .384). In both samples, residual correlations were highest for acceptance items, especially in the young adult sample, suggesting it may represent a separate factor.

Measurement Invariance

We assessed measurement invariance of the proposed measure across both samples using multigroup CFA (Table 3). First, we incorporated the residual correlation between items 5 and 8 into the model. Full measurement invariance was not supported, as the ΔCFI between metric and scalar levels exceeded the 0.01 criterion, indicating a lack of scalar invariance.

After exploring the effects of freeing individual item intercepts one at a time, the greatest improvement in CFI occurred when the intercept of item 8 was allowed to vary between samples. The dMACS value (.40) indicated moderate noninvariance for item 8. By allowing this intercept to be freely estimated, partial scalar invariance was achieved, with the intercept for item 8 being higher in the adolescent sample (*est.* = 5.65, *s.e.* = .09) compared to the young adult sample (*est.* = 5.00, *s.e.* = .11). However, strict invariance was not established.

Reliability

The reliability of the total scale was satisfactory in both samples (ω_{ya} = .76, α_{ya} =.79; $\omega_{ya.res}$ = .68; ω_{adl} = .77, α_{adl} = .78, $\omega_{adl.res}$ = .68). The reliability of individual factors of the Tolerance Scale varied significantly. First, a satisfactory level of reliability was found for the factor acceptance (ω_{ya} = .84, α_{ya} =.82; ω_{adl} = .78, α_{adl} = .77). Second, adequate reliability was recorded for the factor respect (ω_{ya} = .72, α_{ya} =.78; ω_{adl} = .67, α_{adl} = .67). Finally, the factor appre-

Table 3 *The results of measurement invariance across samples*

Model	AIC	BIC	CFI	TLI	RMSEA	SRMR	ΔCFI
Configural	15598	15840	.979	.966	.052	.037	
Metric	15593	15817	.983	.975	.045	.039	.004
Scalar	15617	15819	.963	.952	.061	.051	.020
Scalar (free est. of 8I's intercept)	15592	15799	.984	.978	.041	.040	.001
Strict	15630	15801	.957	.951	.062	.055	.027

ciation displayed a poorer level of reliability in both samples (ω_{ya} = .64, α_{ya} =.64; ω_{adl} = .57, α_{adl} = .59).

Convergent Validity

The total score of Tolerance Scale was positively associated with the Feeling Thermometer in both samples (YA: r = .50; ADL: r = .40). The closest association among individual factors of the Tolerance Scale with the Feeling Thermometer was found in the case of appreciation (YA: r = .51; ADL: r = .43). As expected, the total score of Tolerance Scale was more closely related to contact quality (YA: r = .47; ADL: r = .25) than to contact frequency (YA: r = .19; ADL: r = .19). According to our expec-

tation, higher level of acceptance, respect and appreciation were associated with lower levels of modern racism (ACC: r = -.31, RESP: r = -.26, APP: r = -.45). Detailed information regarding the convergent validity is presented in Table 4.

Discriminant Validity

Latent Correlation

In the young adult sample, the .8 threshold was surpassed for the following pairs: respect and appreciation (.871), appreciation and modern racism (.835), and appreciation and threat (.866). When the Tolerance Scale was modeled as a single factor with residual cor-

Table 4 *Correlation of Tolerance Scale and its factors with validation measures*

Measure	Sample	Total	ACC	RESP	APP
Immigrant Thermometer	ADL	.40*** [.32, 48]	.25*** [.16, .34]	.24*** [.15, .33]	.42*** [.34, .50]
	YA	.50 *** [.40, .59]	.31*** [.19, .42]	.31*** [.19, .42]	.51*** [.41, .60]
Contact Frequency	ADL	.18*** [.08, .27]	.06 [-.04, .16]	.13** [.04, .23]	.22*** [.12, .31]
	YA	.19** [.06, .31]	.11 [-.02, .23]	.07 [-.06, .20]	.23*** [.10, .35]
Contact quality	ADL	.25*** [.12, .36]	.12 [-.01, .25]	.22** [.09, .34]	.25*** [.13, .37]
	YA	.47*** [.36, .57]	.25*** [.11, .37]	.37*** [.24, .48]	.49*** [.38, .59]
Threat	ADL	-.52*** [-.58, -.44]	-.35*** [-.43, -.26]	-.35*** [-.43, -.26]	-.50*** [-.57, -.42]
	YA	-.55*** [-.63, -.46]	-.39*** [-.49, -.28]	-.27*** [-.39, -.15]	-.55*** [-.64, -.46]
Social distance	ADL	.43*** [.35, .51]	.17*** [.08, .26]	.36*** [.27, .44]	.48*** [.40, .55]
SDO	ADL	-.42*** [-.50, -.34]	-.23*** [-.32, -.14]	-.36*** [-.44, -.27]	-.41*** [-.48, -.33]
Modern racism	YA	-.46*** [-.55, -.35]	-.31*** [-.42, -.19]	-.26*** [-.38, -.14]	-.45*** [-.54, -.34]

Note. *p < .05;** p <.01; *** p <.001; if confidence intervals contain 0, then p > .05.

relations, the threshold was also exceeded for the threat measure (.812).

In the adolescent sample, the upper (lower) bound of 95% CI for latent correlation exceeded the .8 threshold for appreciation with threat (.820), and SDO (.917). When modeling the Tolerance Scale as a single factor with residual correlations, the .8 threshold was exceeded for appreciation and SDO (.868).

χ^2 Nested Model Test

In the young adult sample, latent correlation of appreciation with respect, modern racism, and threat was set to .9 one at a time. Statistically significant differences were observed via chi-square nested model tests for modern racism ($\Delta\chi^2$ = 11.52, p < .001), and threat ($\Delta\chi^2$ = 7.68, p = .006) indicating a marginal issue with the discriminant validity of the factor appreciation. Fixing the latent correlation between respect and appreciation resulted in non-positive definite covariance matrix of latent variables. To address this, all other measures were removed, leaving only tolerance factors. A significant chi-square test ($\Delta\chi^2$ = 6.39, p = .011) indicated a marginal discriminant validity issue between the two. When the tolerance scale was modeled as a single factor with residual correlations, a significant difference between the baseline and restricted models ($\Delta\chi^2$ = 16.11, p < .001) indicated marginal lack of distinctiveness between tolerance and threat measure.

In the adolescent sample, in both instances, the non-positive definite covariance matrix issues emerged. To address this, relevant measures were modeled individually alongside the three-factor Tolerance Scale. A significant difference between the baseline model and the model with fixed correlation between appreciation and threat ($\Delta\chi^2$ = 12.71, p < .001) signaled a marginal discriminant validity issue. For SDO, even after simplifying the model, the covariance matrix remained non-positive definite. When tolerance was modeled as a single factor with residual correlations, a marginal lack of distinctiveness with the SDO measure was observed ($\Delta\chi^2$ = 3.93, p = .047).

Heterotrait-Monotrait Ration of the Correlations (HTMT 2)

Finally, HTMT2 did not detect any lack of measurement distinctiveness in either sample. However, this criterion is generally considered the weakest form of evidence for discriminant validity among the analyses reported (Rönkkö & Cho, 2022).

Discussion

This study examined the psychometric properties of the Slovak adaptation of the recently proposed measure of tolerance (Hjerm et al., 2020) in two samples. A key strength of this measure lies in its ability to assess three dimensions of tolerance – acceptance, respect, and appreciation of diversity – without referencing specific social groups, behaviors, or values, thereby distinguishing it from prejudice. However, these factors are assessed rather narrowly, particularly in the case of acceptance, where the items are similarly worded. This issue is further exacerbated by the removal of a reverse-coded item in factor respect, leaving this factor with only two items – both beginning with "I respect" – which not only diminishes content validity but may also artificially inflate their correlation due to similar wording. Unfortunately, the decision to remove this item by Hjerm et al. (2020) was driven solely by the pursuit of better psychometric properties without providing theoretical justification, which paradoxically may reduce validity by limiting the scope and depth of the constructs being assessed. The primary focus of this discussion,

therefore, is the official 8-item version of the tolerance measure.

Overall, we did not fully replicate the sound psychometric properties of the Tolerance Scale reported in prior validation studies. Individual psychometric aspects of this measure will be discussed separately.

Factor Structure and Measurement Invariance

The proposed three-factor structure of Tolerance Scale was supported in the sample of young adults but underperformed in the adolescent sample. In the latter, a high residual correlation between items 5 and 8 emerged. That can be explained by the possibility that for adolescents, respecting others' differing opinions may naturally lead to viewing the world differently, as their beliefs and attitudes are still forming. Each encounter with differing perspectives is more likely to be perceived as a challenge due to their less crystallized views. In contrast, young adults, with more stable attitudes, might respect differing opinions without necessarily feeling that such encounters challenge their established viewpoints. Allowing this residual to covary improved the model fit, meeting both traditional and dynamic cut-off criteria.

We did not find evidence to establish full measurement invariance, as noninvariance at the scalar level was detected. However, partial invariance was achieved by allowing the intercept of item 8 to vary between samples. This difference in intercept may reflect the greater opportunities university students have for cross-cultural contact compared to younger participants.

University students are often exposed to diverse cultures through academic studies, exchange programs, and travel, which encourages them to broaden and challenge their perspectives. In contrast, given that adolescence is typically a period with increased need to belong (Allen & Kern, 2017), they are more likely to associate with peers who share similar interests, backgrounds, and personalities. Indeed, previous research has shown that adolescents tend to choose friends based on similarity (phenomenon known as homophily; e.g., Hafen et al., 2011). As individuals age, their tendency to interact with diverse groups may increase. Supporting this, we found a correlation ($r = .20$) between age and item 8 in the adolescent sample, the highest age-related correlation among the tolerance items.

Reliability

The original study (Hjerm et al., 2020), somewhat surprisingly, did not provide any evidence of reliability. In the follow-up validation study (Cuadrado et al., 2021), the evidence of reliability was mixed. In the current study, the reliability of the scale in both samples was found to be adequate. However, the reliability across individual factors fluctuated significantly and remained suboptimal. The highest reliability was observed for the acceptance factor, while satisfactory level of reliability was recorded for the respect dimension. Nevertheless, in both samples, the lower bound of 95% CI fell below the traditionally used benchmark of .70. In contrast, the appreciation factor exhibited poor reliability, a finding consistent with one of the studies conducted by Cuadrado et al. (2021). Conversely, Sandberg et al. (2024) reported optimal internal consistency of the total scale ($\alpha > .90$) in the Swedish sample of adolescents. Even in the instances of high reliability (e.g., acceptance), it can be argued that this was achieved at the expense of content validity, as the similar wording of items may have limited the measure's scope.

Convergent Validity and Discriminant Validity

Since Hjerm et al's. (2020) conception of tolerance emphasizes multiculturalism and diversity, in addition to attitudes towards immigrants, we selected scales measuring theoretically related constructs to assess convergent validity.

Both the total and factor sum scores demonstrated sufficiently high correlations with validation measures, establishing the convergent validity of the proposed measure. Consistent with Cuadrado et al. (2021), stronger associations with validation measures were found for the *appreciation* factor, which represents the highest level of tolerance. However, this theoretically expected closeness very likely contributed to the lack of statistical distinctiveness observed primarily in the *appreciation* factor.

Prejudice

Prejudice was measured by three different methods. As expected, higher levels of tolerance were associated with warmer feelings towards refugees, smaller social distance, and lower level of modern racism, aligning with findings from Cuadrado et al. (2021). The strongest correlation with prejudice measures was observed for the factor appreciation, reflecting the hierarchical nature of the tolerance structure.

Regarding discriminant validity, the first conceptualization of tolerance assumes inseparability of and interconnectedness between prejudice and tolerance, making it essential to differentiate the two. In this study, we found sufficient evidence of distinctiveness between the Tolerance Scale (and its factors) and both the single-item Feeling Thermometer and the Social Distance Scale. However, a marginal issue was identified between the Tolerance Scale and the Modern Racism Scale. Despite this, the severity of the lack of discriminant validity is unlikely to impact the interpretation of the scales (Rönkkö & Cho, 2022). Overall, the three-factor Tolerance Scale demonstrated a promising level of discriminant validity, effectively distinguishing itself from all three prejudice measures.

Perceived Threat

Previous research has shown that perceived threat from outgroups is connected to decreased tolerance, which supports the findings in this study. For example, majority members are less likely to address discriminatory behaviors toward minorities or support inclusive strategies when they perceive a threat to their ingroup (Callens et al., 2019; Verkuyten & Martinovic, 2015).

In the young adult sample, we identified a marginal issue with discriminant validity, though this is unlikely to compromise the independent interpretation of the appreciation and the perceived threat measure.

Social Dominance Orientation

SDO, reflecting "the extent to which one desires that one's in-group dominate and be superior to outgroups" (Pratto et al., 1994, p. 742), is a stable predictor of prejudice (e.g., Kteily et al., 2011; Whitley, 1999) and people who tend to support hierarchical group relations are generally less tolerant of different customs and beliefs (Olonisakin & Idemudia, 2022; Verkuyten et al., 2023). We found a similar association between SDO and the Tolerance Scale. However, in the adolescent sample, a moderate issue with discriminant validity was found between SDO and appreciation.

Limitations and Future Direction

We identified several limitations in our study. First, tolerance is a closely related construct to prejudice. The complex relationships between these two constructs were not explored due to choosing short yet commonly used measures of prejudice, such as the single item Feeling Thermometer. Future studies should employ more complex measures of prejudice to establish stronger discriminant validity. Additionally, our measures were focused on immigration, however, tolerance is reflected also in relation to other ethnic and sexual minorities. Even though people that hold prejudice towards one outgroup are most likely prejudiced towards other outgroups as well (Zick et al., 2008), future research should examine the use of this measure while also considering the specifics of certain contexts, such as socially accepted forms of prejudice or intolerance associated with heteronormativism (Herek, 2007).

Second, unlike the original study, we used a seven-point Likert scale instead of a five-point scale. A brief evaluation of the item characteristic curves using the two-parameter logistic IRT model (see Supplements) indicated that some response options were not the most probable choice for the given level of the latent variable. Thus, a five-point response scale might have been sufficient.

Third, the limited size of young adult sample resulted in wider 95% CI estimates, which may have influenced the findings in the CI_{CFA} approach of discriminant validity.

Fourth, the SDO scale, used as a criterion measure for assessing convergent and discriminant validity, showed acceptable factor loadings (>.40), but low internal consistency likely due to the small number of items and weak inter-item correlations. This may stem from the abstract nature of the SDO items ad-dressing societal organization, which could be difficult for adolescents to interpret as they might not have had a fully crystallized opinion yet.

Fifth a strong tendency toward agreeable responses was observed across nearly all items in the tolerance measure. Likert-type response scales are inherently susceptible to social desirability bias and various response styles, such as acquiescence. However, tolerance is a construct where higher levels are typically expected among adolescents and young adults. Previous research conducted in Slovakia has shown that adolescents often frame their opinions in relation to their youth, implicitly drawing on traits commonly associated with younger age groups in everyday discourse – such as openness and tolerance (Poslon, 2022). Therefore, the elevated level of acquiescence observed in the data may be partially attributed to the age composition of the sample, which consisted primarily of young individuals rather than a broader population. Supporting this, younger people have also been shown to exhibit higher levels of acquiescence (Havan et al., 2024). Unfortunately, including a method factor to account for acquiescence bias resulted in model convergence failure. As a result of this response tendency, the items in the measure appear to be most informative for individuals with low to moderate levels of the latent trait, while offering limited information for those at higher levels. This is likely due to the absence of more "difficult" items that would effectively discriminate at the upper end of the trait continuum.

Finally, the psychometric evaluation relied on convenience sampling and was not representative of the Slovak population. Future studies should address this limitation and further examine measurement invariance across gender, which was not feasible due to the lower representation of men.

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