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Utrecht-Management of Identity Commitments Scale (U-MICS): Greek adaptation and measurement invariance across time and ethnic groups

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ABSTRACT

The Utrecht-Management of Identity Commitments Scale (U-MICS) is one of the most-commonly used self-report scales to assess personal identity in studies of developmental processes. While it has been translated and validated in many countries around the world, evidence of its applicability in Greek is absent. The purpose of this study was to examine the factor structure of the Greek version of the U-MICS, and to test its measurement invariance across time and across ethnic groups living in Greece. Using data from 811 adolescents ($M_{\text{age}} = 12.57$, $SD_{\text{age}} = 0.49$ at Wave 1, 45.9% girls, 47.1% immigrant), Confirmatory Factor Analyses on the Greek U-MICS supported its well-established three-factor structure. Even though testing invariance of the educational U-MICS showed mixed results, the factor structure and the measurement properties of the interpersonal U-MICS were found to be comparable across ethnic groups, and across three years of junior high school. Finally, the bivariate associations of the three dimensions of the U-MICS with indices of adaptation (self-esteem, and emotional symptoms) partially supported the convergent validity of the scale. This study adds to the existing pool of studies supporting the applicability of the U-MICS in different languages and ethnic groups.


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KEYWORDS U-MICS; identity; longitudinal measurement invariance; Confirmatory Factor Analyses; adolescence

Introduction

During adolescence, young people are expected to start forming a personal identity, that is, a set of personal choices and goals for their future (Erikson, 1968). Forming a personal identity is an important

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 Supplemental data for this article can be accessed [here](#).

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developmental task of adolescence, because having a relatively well-formulated set of preferences and future goals serves as a compass for young people's unfolding life course (Erikson, 1968). Developing a personal identity is an age-appropriate developmental task for both immigrant and non-immigrant adolescents.

Several approaches to measuring personal identity during adolescence have been developed. While former models of personal identity development emphasized the role of two processes, namely exploration and commitment (Marcia, 1966), more recent models are multidimensional, providing a more detailed account of how identity develops. Such models postulate that personal identity development is a dynamic process that encompasses several sub-processes that dynamically affect each other.

In the last decade, increasing theoretical (Meeus, 2016; Van Doeselaar et al., 2018) and empirical attention has been drawn to Meeus and colleagues' three-dimensional model, which postulates that personal identity development results from the dynamic interactions of Commitment, In-depth Exploration, and Reconsideration of Commitments (Crocetti et al., 2008). Specifically, this model postulates that identity develops in two cycles. During the identity formation cycle, adolescents have some initial commitments (Commitment), which they might reconsider (Reconsideration of Commitments) when these initial commitments become less satisfactory. During the identity maintenance cycle, adolescents think actively and seek more information about the commitments they have (In-depth Exploration), which might strengthen their commitments. The Utrecht-Management of Identity Commitments Scale (U-MICS, Crocetti et al., 2008) is a self-report tool that has been designed to assess these three dimensions.

The Utrecht-Management of Identity Commitments Scale

The U-MICS is a 13-item self-report scale that was designed to assess Commitment, In-depth Exploration, and Reconsideration of Commitments (Crocetti et al., 2008). The items can be adapted to assess identity in several domains (e.g., education, interpersonal relationships), while by combining items across domains, researchers can get an overall assessment of identity (Crocetti et al., 2020). Because of its versatility, its brevity, and its good psychometric properties, the U-MICS is a popular self-report instrument to measure personal identity. It has been translated, validated, and used in many languages (Crocetti et al., 2015),

including Arabic and Hebrew (Crocetti et al., 2020), Albanian, Bulgarian, Czech, and Romanian (Dimitrova et al., 2018), but not Greek. The purpose of the present study was to test the factor structure of the Greek translation of the U-MICS, as well as to examine its longitudinal measurement invariance, and its measurement invariance across native Greek adolescents and immigrant adolescents.

The Greek context

Adolescent development in Greece presents both similarities and differences from adolescent development in other countries (Efklides & Moraitou, 2007). Despite being clearly influenced by western culture and values, families have a greater effect on adolescents' choices particularly regarding their education and future career, than is the case in other Northern European countries (Georgas, 2006).

During the 1990's Greece became an immigrant receiving society. An estimated 10% of students in Greek schools have at least one parent born abroad. The largest immigrant group consists of people from Albania. Immigrants from Albania moved to Greece for economic reasons, often with their families. These young immigrants, just as their Greek counterparts, are expected to start forming a personal identity during the period of adolescence (Suárez-Orozco et al., 2018).

The 2008 financial crisis hit Greece particularly hard affecting significantly young people by destroying their prospects. According to Eurostat unemployment rates in Greece for youth under age 25 were 55.3% and 58.3% during 2012 and 2013, whereas at the same time the European-28 unemployment rates were 23.3% and 23.7% respectively.

These cultural, social and economic differences between Greece and Northern European countries render it imperative that we study identity development in Greece. For this purpose, valid and psychometrically sound instruments to assess identity development across ethnic groups, and across time are needed.

Measurement invariance across time and groups

Measurement invariance refers to examining the psychometric properties of a scale across time (longitudinal measurement invariance) and/or across groups (Van de Schoot et al., 2012). Several studies have tested and supported measurement invariance across gender and

ethnic groups, using many language versions of the U-MICS (Crocetti et al., 2015; Dimitrova et al., 2016; Morsunbul et al., 2014). Fewer studies have examined longitudinal invariance of the U-MICS, but those studies also supported invariance across days, weeks, and years (Becht et al., 2016; Hatano et al., 2020). Therefore, the U-MICS shows solid measurement properties, making it a suitable tool to investigate identity processes.

The present study

The purpose of the present study was to examine the psychometric properties of the Greek translation of the U-MICS for the educational and interpersonal domains, by testing: a) whether the three-factor structure of the U-MICS is supported in the Greek language, b) whether the three-factor structure is invariant across native Greek and immigrant adolescents from Albania, c) whether the U-MICS is longitudinally invariant and can meaningfully capture developmental changes in personal identity, and d) whether the U-MICS shows convergent validity with self-esteem, and emotional symptoms. Given the strong evidence for its psychometric properties in many languages (Crocetti et al., 2015), we expected to find support for the three-factor structure, and for the invariance across groups and time. We expected positive associations of Commitment with Self-esteem, and negative with Emotional Symptoms; negative associations of In-depth exploration with Self-esteem; negative associations of Reconsideration of Commitment with Self-esteem, and positive with Emotional Symptoms (Crocetti et al., 2020).

Method

Sample

The sample for this study consisted of 811 early adolescents ($M_{\text{age}} = 12.57$, $SD_{\text{age}} = 0.49$ at Wave 1, 45.9% girls, 47.1% immigrant; Greek: $N = 429$, Albanian: $N = 382$) who were followed for three years across junior high school (Grades 7–9), as part of a larger study of immigrant youth adaptation in 14 schools (50–58 classrooms across waves), in Athens, Greece. The analytic sample consisted of ethnic Greek and ethnic Albanian students. More information can be found in published studies from the [name

redacted for blinding purposes] longitudinal project [reference redacted for blinding purposes].

Measures

Identity

The Utrecht Management of Identity Commitments Scale (U-MICS; Crocetti et al., 2008) is a 13-item scale that assesses three processes of personal identity development, that is Commitment, In-Depth Exploration, and Reconsideration of Commitments. We measured these processes in the Educational and Interpersonal domains, using the same rephrased set of 13 items for each domain. The items are addressed on a 5-point Likert scale, from 1 (completely not true) to 5 (completely true). Example items are 'My education/best friend gives me certainty in life' (Commitment, 5 items), 'I think a lot about my education/best friend' (In-Depth Exploration, 5 items), 'I often think it would be better to try find a different education/best friend' (Reconsideration of Commitments, 3 items).

The translation of the U-MICS in Greek was conducted by four bilingual (Greek- and English-speaking) people independently. The four translations were then compared, and differences were discussed and resolved. For the purposes of this study the U-MICS was also translated in Albanian by a trilingual cultural psychologist. Even though the students could also choose to address the items in Albanian, none chose to do so. The instrument was translated during a time of a major reform in the Greek education system, a transition that rendered the educational choices for junior high school students vague. Thus, the phrase 'My education ...' in the English version of the educational U-MICS was translated into 'The things I learn at school ...'. This adjustment was only made on the items for the education domain.

In this study, the internal reliability coefficients were in line with past studies of the U-MICS (Crocetti et al., 2015), except for educational Reconsideration. Across time and groups, alpha's ranged from (educational/interpersonal domain).78-.85/.84-.91 for Commitment, .67-.70/.74-.79 for In-depth Exploration, and .43-.60/.79-.86 for Reconsideration (Table S2).

Self-esteem

The Rosenberg Self-Esteem scale (Rosenberg, 1965) is a 10-item self-report scale, with items addressed on a 5-point Likert scale, from 1

(*strongly agree*) to 5 (*strongly disagree*). It has been translated and adapted in Greek (Galanou et al., 2014). Example items are 'On the whole, I am satisfied with myself' and 'I take a positive attitude toward myself'. In this study, the fit of the scale was good across waves (Table S4) and the scale showed good internal reliability across time, α 's = .81-.86.

Emotional symptoms

We used the self-report version of the Strengths and Difficulties Questionnaire (SDQ; Goodman et al., 1998) to assess emotional symptoms. The SDQ is a 25-item self-report instrument including 5 items for emotional symptoms. The items are addressed on a 3-point Likert scale from 0 (*not true*) to 2 (*certainly true*). Example items are 'I worry a lot' and 'I am often unhappy, down-hearted or tearful'. In this study, the fit of the scale was good across waves (Table S4) and the scale showed good internal reliability across time, α 's = .72-.78, across time.

Attrition and missing values

Most ($N = 646$, 79.7%) students provided data at all three waves, many ($N = 105$, 13%) provided data at two waves, and a minority ($N = 60$, 7.4%) provided data at one wave. Item-level missing data ranged from 16.5% to 20.8%. T-test comparisons among students that participated in all three waves and students that dropped out at some time point revealed only four statistically significant differences. As shown in Table S3, students who dropped out scored higher in Interpersonal Reconsideration and Emotional Symptoms at Wave 1, as well as in Education Reconsideration and Interpersonal Exploration at Wave 2, with medium effect sizes ($.283 = < d = < .320$). To handle missing data we estimated 20 multiply imputed datasets with the *Amelia* v.1.7.6 package (Honaker et al., 2011) in R. We ran the SEM analyses described below using these imputed datasets with the *semTools* v.0.5-3 package (Jorgensen et al., 2020) in R.

Procedure

The study was approved by the Greek Ministry of Education. Trained research assistants along with the first author visited middle schools in the Athens metropolitan area. School principals were informed, parents were asked to sign informed consent, and students were asked to assent.

Questionnaire completion took place during three school hours, spread over two visits in each school.

Analytic plan

First, we tested the three-factor structure of the U-MICS applying Confirmatory Factor Analyses (CFA) treating the items as ordinal variables and applying the mean and variance adjusted DWLS estimator in *semTools* (Jorgensen et al., 2020), for the total sample, for each domain separately. In this and all following CFA analyses, we used schools as clusters to account for clustering effects. Second, we examined the measurement invariance of the U-MICS across Greek and Albanian students within each wave of study, for each domain separately, testing gradually stricter equality constraints for ordinal variables (Wu & Estabrook, 2016), starting from equality of factorial structure, then equality of item thresholds, then loadings, and finally item intercepts. Third, we tested the longitudinal measurement invariance of the U-MICS across the three waves of this study, for each domain, and for each ethnic group separately, following the same procedure with gradually stricter constraints. Finally, we tested the latent bivariate correlations of the three identity dimensions with the adaptation indices (self-esteem and emotional symptoms) for each wave, to examine the convergent validity of the U-MICS. All main analyses were performed using the R packages *lavaan* v.0.6–7 (Rosseel et al., 2018) and *semTools* v.0.5–3 (Jorgensen et al., 2020).

Results

U-MICS Factor structure

As seen in Table 1, the three-factor structure of the U-MICS fit the data well in both domains, and across waves, showing good or acceptable Comparative Fit Index (CFI) and Tucker-Lewis Index values (at or above .95 for 4 out of 6 models, and at or above .90 in the other two), and good Root Mean Square Error of Approximation (RMSEA) values (below .06). Table S1 (supplementary material) presents the standardized factor loadings of the U-MICS.

Table 1. Fit indices for the three-factor model of the U-MICS for each domain and each year, for measurement invariance across groups for each domain and each time point, and across time points for each group and each domain.

	χ^2	<i>df</i>	CFI	TLI	RMSEA[90%CI]	Models Compared	Δ CFI	Δ RMSEA
<i>Education</i>								
Wave 1	167	61	.919	0.896	0.046[.038-.055]			
Wave 2	183	61	.948	0.933	0.050[.042-.058]			
Wave 3	101	61	.960	0.949	0.028[.018-.038]			
<i>Interpersonal</i>								
Wave 1	152	61	.966	0.957	0.043[.034-.051]			
Wave 2	164	61	.964	0.954	0.046[.037-.054]			
Wave 3	151	61	.957	0.945	0.043[.034-.051]			
Measurement Invariance Across Groups								
W1								
<i>Education</i>								
1. Configural	217	122	.920	0.898	0.044[.034-.053]			
2. Thresholds	242	148	.920	0.916	0.040[.030-.049]	M2-M1	.000	-.004
3. Loadings	254	158	.918	0.919	0.039[.030-.047]	M3-M2	-.002	-.003
4. Intercepts	271	168	.913	0.919	0.039[.030-.047]	M4-M3	-.005	.000
<i>Interpersonal</i>								
1. Configural	241	122	.957	0.945	0.049[.040-.058]			
2. Thresholds	261	148	.959	0.957	0.043[.035-.052]	M2-M1	.002	-.006
3. Loadings	285	158	.954	0.955	0.045[.036-.053]	M3-M2	-.005	.002
4. Intercepts	273	168	.962	0.965	0.039[.031-.048]	M4-M3	.008	-.006
W2								
<i>Education</i>								
1. Configural	214	122	.962	0.952	0.043[.034-.053]			
2. Thresholds	233	148	.965	0.963	0.038[.028-.047]	M2-M1	.003	-.005
3. Loadings	228	158	.971	0.972	0.033[.023-.042]	M3-M2	.006	-.005
4. Intercepts	272	168	.957	0.960	0.039[.030-.047]	M4-M3	-.014	.004
5. Partial Intercepts*	254	167	.964	0.967	0.036[.027-.044]	M5-M3	-.007	-.003
<i>Interpersonal</i>								
1. Configural	240	122	.960	0.948	0.049[.040-.058]			
2. Thresholds	266	148	.960	0.957	0.044[.036-.053]	M2-M1	.000	-.005
3. Loadings	281	158	.958	0.958	0.044[.035-.052]	M3-M2	-.002	.000
4. Intercepts	303	168	.954	0.957	0.045[.036-.052]	M4-M3	-.004	.001
W3								
<i>Education</i>								
1. Configural	176	122	.942	0.926	0.033[.021-.043]			
2. Thresholds	192	148	.953	0.950	0.027[.014-.037]	M2-M1	.011	-.006
3. Loadings	224	158	.929	0.930	0.032[.022-.041]	M3-M2	-.024	.005
4. Partial Loadings**	206	156	.946	0.946	0.028[.016-.038]	M4-M2	-.007	.001
5. Intercepts	272	168	.888	0.896	0.039[.030-.047]	M5-M4	-.058	.011
6. Partial Intercepts***	202	164	.959	0.961	0.024[.010-.034]	M5-M3	.013	-.004
<i>Interpersonal</i>								
1. Configural	196	122	.968	0.960	0.039[.028-.049]			
2. Thresholds	227	148	.966	0.964	0.036[.027-.045]	M2-M1	-.002	-.003
3. Loadings	227	158	.970	0.971	0.033[.023-.042]	M3-M2	.003	-.003

(Continued)

Table 1. (Continued).

	χ^2	<i>df</i>	CFI	TLI	RMSEA[90%CI]	Models Compared	Δ CFI	Δ RMSEA
<i>Education</i>								
4. Intercepts	237	168	.970	0.972	0.032[.022-.041]	M4-M3	.000	-.001
Longitudinal Measurement Invariance								
Greek								
<i>Education****</i>								
1. Configural	514	519	1.00	1.00	0.000[.000-.015]			
2. Thresholds	552	567	1.00	1.01	0.000[.000-.013]	M2-M1	.000	.000
3. Loadings	569	585	1.00	1.01	0.000[.000-.013]	M3-M2	.000	.000
4. Intercepts	514	519	1.00	1.00	0.000[.000-.015]	M4-M3	.000	.000
<i>Interpersonal</i>								
1. Configural	654	624	.994	0.993	0.011[.000-.019]			
2. Thresholds	688	676	.998	0.997	0.006[.000-.016]	M2-M1	.004	-.005
3. Loadings	715	696	.996	0.996	0.008[.000-.017]	M3-M2	-.002	.002
4. Intercepts	753	716	.993	0.992	0.011[.000-.019]	M4-M3	-.003	.003
Albanian								
<i>Education****</i>								
1. Configural	402	519	1.00	1.12	0.000[.000-.000]			
2. Thresholds	441	567	1.00	1.12	0.000[.000-.000]	M2-M1	.000	.000
3. Loadings	473	585	1.00	1.10	0.000[.000-.000]	M3-M2	.000	.000
4. Intercepts	525	603	1.00	1.07	0.000[.000-.000]	M4-M3	.000	.000
<i>Interpersonal</i>								
1. Configural	623	624	1.00	1.00	0.000[.000-.016]			
2. Thresholds	676	676	1.00	1.00	0.000[.000-.016]	M2-M1	.000	.000
3. Loadings	712	696	.992	0.992	0.008[.000-.018]	M3-M2	-.008	.008
4. Intercepts	697	716	1.00	1.01	0.000[.000-.013]	M4-M3	.009	-.008

Items were specified as ordinal variables and the DWLS estimator with robust standard errors was used. Twenty multiply imputed datasets were created using the package Amelia (Honaker et al., 2011); analyses were ran and results were pooled using the semTools package (Jorgensen et al., 2020) in R.

* Intercepts of item 9 (translated in Greek as 'I often look for what others think about the education I get at school') were left free to vary across groups.

** Loadings of items 11, 12, 13 from the Reconsideration of Commitment in the education domain were left free to vary across groups.

*** Intercepts of items 9 (see translation above) and 10 (translated in Greek as 'I often talk with other people about the things I learn at school') were left free to vary across groups.

**** Item 11 from the education domain (translated in Greek as 'I often think it would be better to learn different things at school') was excluded at all three waves, for both Greek and Albanian longitudinal measurement invariance models, due to several cross-loadings.

Measurement invariance across ethnic groups and longitudinal measurement invariance

In the interpersonal domain the U-MICS showed full scalar invariance across ethnic groups at all waves. In the educational domain full scalar invariance was achieved only at Wave 1. At Waves 2 and 3 partial metric

and/or scalar invariance was achieved for the educational domain. Item 9 showed non-invariant intercept at Wave 2 (partial scalar invariance); items 11, 12, and 13 showed non-invariant loadings at Wave 3 (partial metric); items 9 and 10 showed non-invariant intercepts at Wave 3 (partial metric and scalar invariance) (Table 1).

Similarly, in the interpersonal domain the U-MICS showed full scalar longitudinal measurement invariance across the three waves and separately for each group. In the educational domain item 11 had to be completely removed due to aberrant cross-loadings across time; therefore, partial scalar longitudinal measurement invariance was achieved for both groups (Table 1).

Convergent validity

As seen in Table 2, the hypotheses regarding the bivariate associations of the three identity processes with Self-Esteem and Emotional Symptoms were only partially supported. Regarding Commitment, the hypothesized positive association with Self-Esteem was only supported for the educational domain, whereas the hypothesized negative association with Emotional Symptoms was not supported at all. Regarding In-Depth Exploration, the hypothesized positive association with Self-Esteem was not found, but we did find positive associations with Emotional Symptoms in both domains, which agrees with past research (Crocetti et al., 2010). Finally, regarding Reconsideration, the hypothesized negative associations with Self-Esteem and positive with Emotional Symptoms were fully supported for the interpersonal domain, but not supported for the education domain.

Discussion

In this study, we aimed at investigating the validity of the Greek translation of the U-MICS (Crocetti et al., 2008), testing its factor structure, its invariance across native Greek and immigrant students in Greece, as well as its longitudinal measurement invariance. The results differed across the two U-MICS domains.

For the interpersonal domain, the U-MICS showed solid psychometric properties, as we found good fit for the three-factor structure, good internal consistency coefficients, and clear evidence for invariance across groups and timepoints. For the educational domain, the Greek translation

Table 2. Concurrent bivariate latent correlations among the three U-MICS dimensions for each domain and adaptation indices.

	1	2	3	4	5	6	7
Wave 1							
1. Educational Commitment							
2. Educational Exploration	.72***						
3. Educational Reconsideration	.52***	.68***					
4. Interpersonal Commitment	.43***	.43***	.42***				
5. Interpersonal Exploration	.36***	.64***	.50***	.71***			
6. Interpersonal Reconsideration	.14**	.32***	.25***	-.05	.23***		
7. Self-Esteem	.19***	.09	.09	.12*	-.05	-.17***	
8. Emotional Symptoms	-.12*	.03	.02	.11*	.32***	.15**	-.51***
Wave 2							
1. Educational Commitment							
2. Educational Exploration	.74***						
3. Educational Reconsideration	.49***	.57***					
4. Interpersonal Commitment	.33***	.33***	.32***				
5. Interpersonal Exploration	.22***	.41***	.36***	.68***			
6. Interpersonal Reconsideration	.18***	.29***	.18**	-.09	.19***		
7. Self-Esteem	.16***	.03	-.06	.07	-.02	-.20***	
8. Emotional Symptoms	-.07	.11*	.12	.10	.28***	.17**	-.46***
Wave 3							
1. Educational Commitment							
2. Educational Exploration	.67***						
3. Educational Reconsideration	.41***	.58***					
4. Interpersonal Commitment	.31***	.25***	.18**				
5. Interpersonal Exploration	.14**	.33***	.27***	.66***			
6. Interpersonal Reconsideration	.09	.09	.06	-.19***	.07		
7. Self-Esteem	.19***	.01	.04	.06	-.13*	-.18***	
8. Emotional Symptoms	-.09	.14*	.14*	.05	.24***	.12*	-.46***

Twenty multiply imputed datasets were created using the package *Amelia* (Honaker et al., 2011); analyses were ran and results were pooled using the *semTools* package (Jorgensen et al., 2020) in R. * p <.05. ** p <.01. ***p <.001.

of U-MICS showed mixed evidence of usefulness in its current form. Even though the three-factor structure was again supported, the educational Reconsideration showed poor properties, like low Cronbach’s alphas, partly low standardized factor loadings, and only partial invariance across groups and timepoints.

The mixed findings regarding the educational domain most probably stem from the linguistic choice that was made, to translate ‘my education’ to ‘the things I learn at school’. This choice was made because in the Greek education system junior high school (Grades 7–9) is compulsory and there is no possible option between types of education at that stage. Therefore, students have no choice, which would make questions about looking for another education difficult to understand. Furthermore, the translation took place during a time of a major reform in the Greek education system, a transition that rendered the educational choices for junior high school students even more vague. In the Greek education system there have

been multiple controversies and distortions, which are characterized by intense inequality between public and private schools, spectacular intrusion of shadow education practices, and frequent – yet, unsuccessful – reforms of the educational laws and legislation (Bray, 2020), thus contributing to increased inconsistency and confusion. Therefore, the combination of the adjusted translation with the educational situation in Greece, might explain the questionable functioning of the educational U-MICS in its current form.

Limitations

The most important limitation of this study is that the Reconsideration subscale in the Education domain showed particularly low internal consistency coefficients, as well as low standardized factor loadings. Given the questionable translation in the educational domain, these results call for further research on the educational form of the U-MICS. Future research should test a slightly revised Greek translation of the U-MICS for the educational domain. Another limitation is that we only studied a limited number of convergent validity indices. Future studies might benefit by investigating broader indices of adaptation for convergent validity, as well as other types of validity of the U-MICS.

Conclusion

Because the items of the U-MICS can be adapted to a variety of domains by changing the target noun (e.g., best friend vs education), the solid evidence we found for the interpersonal version of the U-MICS proves that the U-MICS is a useful instrument to assess personal identity development with youth in Greece. This study establishes that the measurement properties of the interpersonal scale allow both cross-ethnic comparisons, and the investigation of longitudinal dynamics of personal identity development.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Data availability statement

The data that support the findings of this study are available from the corresponding author, [SM], upon reasonable request.

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