Development and Validation of the Ultra-Short Version of the Identity Style Inventory (US-ISI-5) Among Czech Adolescents

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Abstract: Adolescence and the transition to adulthood represent critical periods for identity formation, with a coherent and stable sense of identity being a key component of psychosocial development and functioning in different social roles throughout one's life. In their decision-making processes, individuals mainly employ three socio-cognitive strategies – informational, normative, and diffuse/avoidant – each of which can be measured by the Identity Style Inventory (ISI). However, the traditional version of this scale is too long and not particularly suitable for online surveys. This research note aims to develop and validate an ultra-short version of the ISI with a large sample of Czech adolescents aged 15–20 (N = 21,968). The analysis is based on data collected online from the first wave of the Czech Education Panel Survey (CZEPS), administered in autumn 2023. Exploratory (EFA) and confirmatory factor analyses (CFA) were conducted during the development process. The validation and psychometric properties were evaluated in terms of reliability, convergent and criterion-related validity, and measurement invariance across gender and type of study. The results showed that the ultra-short Czech version of the ISI scale with nine items achieved good psychometric and structural quality. EFA clearly supported the three-factor structure, which was confirmed by CFA with good model fit. The reliability assessment results were consistent with those of other studies, and in terms of validity, both convergent and criterion-related validity were demonstrated by weak but theoretically consistent and meaningful associations with other measures. In terms of measurement invariance, partial scalar invariance was achieved across gender and type of study. The newly developed ultra-short nine-item version of the ISI (US-ISI-5) has been validated as a psychometrically sound and useful instrument for measuring identity processing strategies among Czech adolescents.

Keywords: identity styles, Czech validation, development, psychometric analysis, short version, adolescents

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Introduction

The present research note focuses on testing the Identity Style Inventory (ISI) scale, which has been designed to measure identity processing strategies in adolescence. Specifically, its aim is to develop and validate an ultra-short version of the ISI (US-ISI-5) on a large sample of Czech adolescents. This endeavour is driven by the recognition that existing versions of the scale are excessively lengthy, cognitively demanding, and not yet validated for the Czech language.

Background

A coherent and stable sense of identity is a cornerstone of psychosocial development, as it shapes how individuals understand themselves and navigate social roles. Although identity formation continues throughout one's lifespan, adolescence and the transition to adulthood represent particularly critical periods for development (Arnett, 2000; McAdams, 2018). Within classical developmental theory, identity formation is conceptualised as a lifelong process, whereas adolescence is marked by the accelerated exploration and consolidation of self-concept (Erikson, 1968). In the neo-Eriksonian framework, the focus shifts from viewing identity as a fixed set of categories to understanding it as a dynamic and evolving process (Berzonsky, 1989; Meeus, 1996). In this vein, Berzonsky (1989) distinguished between three socio-cognitive strategies – *informational*, *normative*, and *diffuse/avoidant* – that individuals employ when making life decisions or responding to information that conflicts with their values or worldviews. While individuals may draw on aspects of all three strategies, the predominance of one in decision making and coping is referred to as an identity style.

Adolescents relying on an *informational strategy* tend to actively explore, elaborate on, and evaluate self-relevant information (Berzonsky, 1989). Conversely, those who adopt a *normative strategy* rely mainly on the prescriptions, standards, and expectations of significant others (Berzonsky, 1989). In contrast, individuals who use a *diffuse/avoidant strategy* are reluctant to deal with identity issues and seek to avoid identity conflict (Berzonsky, 1989). Overall, adolescents who rely mainly on informational and normative identity strategies tend to make meaningful identity commitments, although through different approaches, whereas individuals who maintain a diffuse/avoidant strategy have a weak sense of commitment (e.g., Berzonsky, 1989; Berzonsky et al., 2003, 2013).

Identity strategies are associated with several individual and collective psychosocial functioning and adaptation traits. The *informational strategy* has been related to self-esteem (Soenens et al., 2016), self-concept clarity and meaning in life (Eryigit & Kerpelman, 2009), optimism/efficacy and fewer hopelessness feelings (Phillips & Pittman, 2007), and higher psychological well-being and autonomy (Berzonsky & Cieciuch, 2016; Crocetti & Shokri, 2010; Czyżowska, 2022). People using this strategy are also more open to new thoughts and experiences (Berzonsky et al., 2011; Berzonsky & Sullivan, 1992). They may sustain pro-diversity and

pro-equality values (Erentaitė et al., 2019); have a low need for cognitive closure, while also possessing high empathy (Berzonsky et al., 2011; Soenens et al., 2005); and engage in prosocial behaviour and other-oriented support (Smits et al., 2011).

The *normative strategy* is similar to the informational strategy, in that it is associated positively with self-esteem, optimism/efficacy, well-being, and hopelessness (Phillips & Pittman, 2007). However, it differs from the informational strategy in its connection with a lower meaning of life (Czyżowska, 2022), higher collective esteem (Crocetti et al., 2009), and a stronger sense of commitment to collective identity (Berzonsky, 2003). Conversely, a positive relation to conservatism characterises the normative identity strategy (Berzonsky et al., 2011; Berzonsky & Papini, 2014; Berzonsky & Sullivan, 1992; Duriez et al., 2012). Adolescents using predominantly normative strategies have also been found to have lower empathy (Berzonsky et al., 2011; Miklikowska, 2012) and a strong need for cognitive closure (Berzonsky et al., 2011). This identity strategy can also lead to extremism (Ozer et al., 2022), right authoritarianism (Duriez et al., 2005; Miklikowska, 2012), prejudice, and lower support for democratic values (Miklikowska, 2012).

The *diffuse/avoidant strategy* is related to several indices of maladjustment, such as low self-esteem (Crocetti et al., 2009), low optimism/efficacy, higher delinquent attitudes, and feelings of hopelessness (Phillips & Pittman, 2007). Additionally, individuals using this strategy have reported negative effects on their psychological well-being and challenges in searching for meaning in life (Beaumont, 2009; Czyżowska, 2022). Similar to the informational strategy, adolescents predominantly using a diffuse/avoidant strategy are open to change (Berzonsky et al., 2011; Berzonsky & Sullivan, 1992) but characterised by low empathy (Duriez & Soenens, 2006; Soenens et al., 2005). Additionally, other studies have revealed a positive relationship between diffuse/avoidant identity strategy and aggression (Smits et al., 2011) and extremism (Ozer et al., 2022). Further support for radicalism was noted to be associated with the diffuse/avoidant identity strategy, especially among members of ethnic minorities (Ozer et al., 2022).

To explore identity processing strategies, the Utrecht Management of Identity Commitments Scale (U-MICS) has been utilised, with a focus on specific domains, such as education and relationships. However, Berzonsky's approach is more general in nature. The diverse effects of Berzonsky's identity processing strategies on adolescents' socio-psychological functioning, value systems, and decision making highlight the importance of incorporating this construct into research on youth and ensuring its accurate measurement. Accordingly, Berzonsky developed several versions of the ISI to assess socio-cognitive identity processing strategies (e.g., Berzonsky, 1989, 1992a; Berzonsky et al., 2013). These scales have been translated into multiple languages and applied across diverse cultural contexts, including several European countries, such as Italy (Crocetti et al., 2009), Lithuania (Žukauskienė et al., 2018), and France (Zimmermann et al., 2012), as well as non-European countries, such as Iran (Crocetti & Shorki, 2010) and Turkey (Eryigit & Kerpelman, 2009). However, the overall length of the full 40-item scale presents certain limitations. First, in multidisciplinary surveys, in which questionnaires must cover a wide range of topics, there is often pressure, particu-

larly in sociology, to reduce the length of instruments. Incorporating the complete scale without modification in such contexts can be challenging. Second, the scale is primarily designed for adolescents and young adults, but these groups are actually more accustomed to consuming fast-paced, visually engaging content. Sustaining their attention during lengthy self-report questionnaires may therefore be difficult.

Therefore, this study aims to develop an ultra-short version of the original ISI scale (US-ISI-5) for measuring identity processing strategies among Czech adolescents and to test its psychometric properties, including reliability, validity, and measurement invariance across gender and type of study. To our knowledge, this validation study is the first of its kind to be conducted in the Central European region.

Methods

Sample and data

This study was based on data collected through an online questionnaire (CASI method) in October and November 2023 within the first wave of the longitudinal Czech Education Panel Survey (CZEPS) project (Kudrnáč et al., 2024). The respondents were first-year secondary school students aged 15 to 20 (mean age 15.6 years) from the Czech Republic. The research sample (*N*) consisted of 21,968 students, of whom 10,908 (49.7%) were male, and 11,060 (50.3%) were female.

Measures

Revised Identity Style Inventory (ISI-5; Berzonsky et al., 2013)

The original ISI-5 is composed of 27 items forming three subscales: informational style (IS), normative style (NS), and diffuse/avoidant style (DAS). Each subscale has nine items, which respondents rate on a 5-point Likert scale ranging from 1 (*not at all like me*) to 5 (*very much like me*). The ISI-5 has been translated into Czech through the TRAPD approach (Harkness et al., 2003), which has been considered the most suitable and widely used translation method in recent years. TRAPD is an acronym for translation (T), review (R), adjudication (A), pretesting (P), and documentation (D). In this case, three independent experts translated the items into Czech, followed by a review and assessment, and the most appropriate wording was selected. Then, pilot testing of the Czech translation was conducted among 74 students from two secondary schools via an online questionnaire. All stages of the translation process were documented. Based on the pilot testing results, the main study applied a short version with five items for each identity style. The original version and the final Czech translation of the short version are shown in Table 1.

Validation variables

For the validation study, we selected six variables based on two criteria: first, their relevance to adolescents' individual and collective functioning, and second, the comparability of the findings with validation studies conducted in other countries.

Empathy: To measure empathy, two of the three subscales of the widely used Interpersonal Reactivity Index (IRI; Davis, 1983) were applied, which included empathic concern (EC) and perspective taking (PT). EC was measured by four items and PT by five items, with the total score calculated as the sum of these items for each subscale. Respondents provided their answers on a 5-point Likert response scale ranging from 0 (*Does not describe me well at all*) to 4 (*Describes me well*). The McDonald's omega of EC was 0.774 and 0.647 for PT.

Self-esteem: Self-esteem was measured using a single-item scale ('I have high self-esteem'). Students evaluated the extent to which the statement described them on a 7-point scale ranging from 1 (*Does not describe me well at all*) to 7 (*Describes me well*). Single-item measures of self-esteem have been shown to correlate highly with the Rosenberg Self-Esteem Scale (RSES) and are considered appropriate when brevity is necessary, and participant burden needs to be minimised (Robins et al., 2001). Our sample's mean self-esteem score was 3.91 (SD = 1.68).

Prejudice: The Feeling thermometer (Haddock et al., 1993), which is used mainly in research assessing ethnic prejudice (for a review, see Crocetti et al., 2021), was applied to measure prejudice. This measure asked participants to rate how much they liked or disliked different outgroups (i.e., Slovaks, Ukrainians, Russians, Vietnamese, and Roma) on a scale ranging from 0 (*Not at all*) to 100 (*Very much*). In this case, the groups chosen were the largest minority groups in Czechia, according to CZSO (2023). A total attitude score was computed using the mean level of liking expressed for these five outgroups, which ranges from 0 to 500, where higher scores represent more positive attitudes. The mean value for the present study was 283.71 (SD = 103.19).

Well-being: Hanzlová and Kudrnáč's (2024) original Czech version of the Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS; Stewart-Brown et al., 2009) was used to measure well-being. The SWEMWBS consists of seven positively worded items covering the two central aspects of mental well-being, feeling good and functioning well, which respondents rated on a 5-point Likert scale: 1 (*None of the time*), 2 (*Rarely*), 3 (*Some of the time*), 4 (*Often*), and 5 (*All of the time*). The total score, calculated as the sum of the responses, ranges from 7 to 35 (the higher the score, the higher the level of mental well-being). The McDonald's omega for the SWEMWBS was 0.818.

Political efficacy: Internal and external political efficacy were measured using a five-item scale adapted from the National Election Studies (NES; Niemi et al.,

Table 1. Final Czech translation of the ISI-5

Item	Original English-language version	Czech-language translation
a	I automatically adopt and follow the values I was brought up with.	Automaticky přebírám a řídím se hodnotami, v nichž jsem byl/a vychován/a.
b	I'm not sure where I'm heading in my life; I guess things will work themselves out.	Nevím, kam a k čemu ve svém životě směřuji. Řekl/a bych, že se to nějak vyřeší samo.
c	It doesn't pay to worry about values in advance; I decide things as they happen.	Nemá smysl si předem lámat hlavu s tím, co má a co nemá cenu. Prostě se rozhodnu, až když situace nastane.
d	When facing a life decision, I take into account different points of view before making a choice.	Než udělám životní rozhodnutí, vezmu v potaz různé úhly pohledu.
e	I spend a lot of time reading or talking to others trying to develop a set of values that makes sense to me.	Své životní hodnoty si ujasňuji čtením nebo povídáním si s různými lidmi.
f	I am not really thinking about my future now; it is still a long way off.	O své budoucnosti teď opravdu vůbec nepřemýšlím, ta je ještě daleko.
g	When facing a life decision, I try to analyse the situation in order to understand it.	Když stojím před životním rozhodnutím, snažím se analyzovat situaci, abych ji co nejlépe pochopil/a.
h	I think it is better to adopt a firm set of beliefs than to be open-minded.	Myslím si, že je lepší přijmout pevně stanovené hodnoty, než být otevřený/á změnám a novým myšlenkám.
i	I think it's better to hold on to fixed values rather than to consider alternative value systems.	Myslím, že je lepší držet se osvědčených zásad a hodnot než zvažovat nějaké jiné.
j	When personal problems arise, I try to delay acting as long as possible.	Snažím se na své problémy nemyslet a nezabývat se jimi, dokud to jen jde.
k	I prefer to deal with situations in which I can rely on social norms and standards.	Upřednostňuji situace, ve kterých platí zavedená společenská pravidla a vím tak, jak se mám chovat.
l	I try to avoid personal situations that require me to think a lot and deal with them on my own.	Snažím se vyhnout situacím, ve kterých musím hodně přemýšlet a řešit je po svém.
m	When making important decisions, I like to have as much information as possible.	Mám rád/a co nejvíce informací, když mám učinit důležité rozhodnutí.
n	When I make a decision about my future, I automatically follow what close friends or relatives expect from me.	Když se rozhoduji o své budoucnosti, automaticky se řídím tím, co ode mě očekávají blízcí přátelé nebo příbuzní.
o	It is important for me to obtain and evaluate information from a variety of sources before I make important life decisions.	Je pro mě důležité získávat a vyhodnocovat informace z různých zdrojů, než udělám důležité životní rozhodnutí.

1991). For example, one item stated, 'I feel that I have a pretty good understanding of the important political issues facing our country.' Respondents indicated their level of agreement with each statement on a 5-point Likert scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*). The McDonald's omega for our sample was 0.645.

Intention of radicalisation: The intention of radicalisation was measured using a set of three items (e.g., 'I would continue to support an organisation that fights for my group's political and legal rights, even if the organisation sometimes breaks the law') representing the radicalisation dimension in the Activism and Radicalism Scale (Moskalenko & McCauley, 2009). Respondents were invited to indicate their degree of agreement with the statements presented using a 7-point Likert scale ranging from 1 (*Not at all agree)* to 7 (*Totally agree)*. For our sample, the McDonald's omega of this scale was 0.827, and the average radicalisation score was 8.35 (SD = 4.31).

Statistical analysis plan and methods

The development process was conducted in several steps. First, descriptive statistics were calculated. Subsequently, exploratory factor analysis (EFA) was performed to create an ultra-short ISI-5 (US-ISI-5) version. This newly developed US-ISI-5 was evaluated through confirmatory factor analysis (CFA). In the next step, its reliability and validity were assessed. Finally, the measurement invariance of the US-ISI-5 across gender and type of study was tested by multiple-group confirmatory factor analysis (MGCFA). The data were analysed using the statistical software SPSS version 29 (in terms of descriptive statistics, EFA, reliability, and validity) and Mplus 8.11 (CFA, MGCFA).

Results

Descriptives

Table 2 shows the descriptive statistics, the results of testing normality for each item of the original ISI-5, and the reliability scores for each subscale. The lowest average value was for *item n* (2.52), and the highest was for *item m* (3.77). The results for each subscale demonstrated that the subscale for DAS had the lowest average value (2.71), followed by the NS subscale (2.88), and the IS subscale had the highest value (3.47). Reliability testing showed that the IS subscale achieved the best results (α = 0.722, ω = 0.724), followed by the DAS subscale (α = 0.616, ω = 0.619), and the lowest values were obtained by the NS subscale (α = 0.584, ω = 0.582). These results are consistent with those reported in previous studies (e.g., Crocetti & Shokri, 2010; Crocetti et al., 2009; Monacis et al., 2016; Zimmermann et al., 2012). In terms of normality, the limit value for both skewness ($\leq |2|$) and kurtosis ($\leq |7|$) was not exceeded for any item (West et al., 1995).

Table 2. Descriptive statistics and normality testing for the ISI-5 (N = 21,968)

	M	*SD*	Skewness	Kurtosis	r_{it}
Informational style (IS): α = 0.722, ω = 0.724	3.47	0.76	−0.29	−0.06	
item_d	3.63	1.11	−0.55	−0.42	0.53
item_e	2.90	1.18	0.04	−0.85	0.32
item_g	3.64	1.03	−0.46	−0.31	0.56
item_m	3.77	1.12	−0.67	−0.31	0.48
item_o	3.39	1.06	−0.23	−0.44	0.54
Normative style (NS): α = 0.584, ω = 0.582	2.88	0.64	−0.03	0.27	
item_a	3.36	1.04	−0.32	−0.33	0.28
item_h	2.55	1.05	0.27	−0.32	0.38
item_i	2.66	0.97	0.16	−0.18	0.47
item_k	3.29	1.04	−0.20	−0.39	0.35
item_n	2.52	1.14	0.36	−0.64	0.26
Diffuse/avoidant style (DAS): α = 0.616, ω = 0.619	2.71	0.78	0.21	−0.26	
item_b	2.74	1.31	0.25	−1.05	0.45
item_c	2.90	1.26	0.10	−0.98	0.38
item_f	2.38	1.25	0.58	−0.70	0.43
item_j	2.78	1.24	0.21	−0.96	0.32
item_l	2.77	1.14	0.24	−0.66	0.29

Note: *M* mean, *SD* standard deviation, r_{it} corrected item-total correlation, α Cronbach's alpha, ω McDonald's omega.

Exploratory factor analysis

The EFA, respectively principal component analysis (PCA), was first conducted to reduce the number of items, given the research goal of shortening the measurement instrument. The number of factors was selected according to the Kaiser criterion (eigenvalue greater than 1), and Varimax rotation was used. The EFA for all 15 items conducted on the first half of the research sample (N = 11,023) resulted in a three-factor structure, which accounted for 44% of the total variance in the rotated solution. The results showed that some items exhibited low communalities and lower factor loadings – mainly two items in each factor (*items a, e, j, l, n*; for more details, see the Appendix). These items were consequently excluded, which resulted in the creation of the USI-ISI-5 comprising a total of nine items, with three items for each identity style subscale: *items d, g*, and *o* comprising the IS subscale; *items i, h*, and *k* comprising the NS subscale; and *items b, c*, and *f* comprising the DAS subscale. Furthermore, the exclusion of particular items also corresponded to the values of the corrected item-total correlation (see the last column in Table 2). Subsequently, the EFA for the USI-ISI-5 was performed and supported a three-factor solution, which explained 58% of the total variance in the rotated solution. All factor loadings were very high (0.6 and higher).

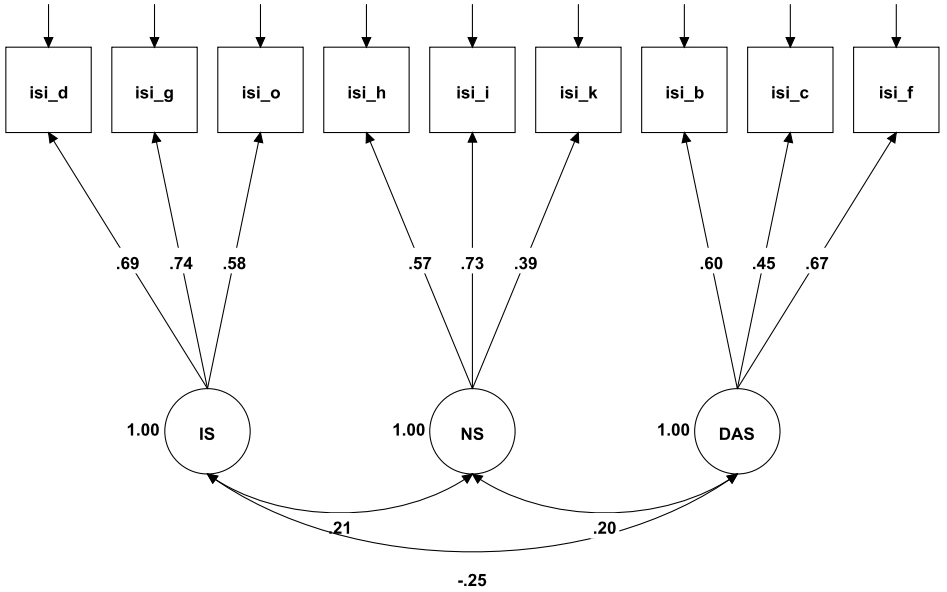
Reliability assessment

The internal consistency (reliability) of the newly developed US-ISI-5 was assessed using Cronbach's alpha (α) and McDonald's omega (ω) on the second half of the research sample (N = 10,945). As illustrated in Table 3, the values of both coefficients exhibited a slight decline compared to the original, longer 15-item version. It is worth noting that the IS subscale was the only one in which both coefficients attained the recommended threshold of 0.700 (Nunally, 1978). However, the lower and relatively unsatisfactory values for the NS and DAS subscales were consistent with the results of previous studies (e.g., Crocetti & Shokri, 2010; Crocetti et al., 2009; Zimmermann et al., 2012) and especially with the original version provided by Berzonsky (1992b).

Confirmatory factor analysis

The central part of the development process involved testing the factor structure of the newly created US-ISI-5. Here, CFA with maximum likelihood estimation with a robust standard errors (MLR) method was applied in the statistical software Mplus on the second half of the research sample (N = 10,945). The results indicated that the three-factor structure of the US-ISI-5 provided a good fit to the data (χ^2 (24) = 706.395, $p < .001$, CFI = 0.940, RMSEA = 0.051, SRMR = 0.044; West et al., 2012). The three-factor structure of the US-ISI-5 is presented in Figure 1. The IS subscale was positively correlated with the NS subscale and negatively

Fig. 1. Final model for the US-ISI-5 (standardised coefficients)



Note: IS Informational style, NS Normative style, DAS Diffuse/avoidant style.

correlated with the DAS subscale, which was also positively correlated with the NS subscale. These results follow those previously reported (Afzal et al., 2021; Muttaqin, 2021).

Validity testing

Convergent validity was tested by the average variance extracted (AVE) and composite reliability coefficient (CR; Fornell & Larcker, 1981) to determine the internal consistency of the items measuring each identity style (Bagozzi, 1981). As these indices were based on the CFA results, they were also calculated on the other half of the research sample (N = 10,945), as well as on the CFA itself. Although the AVE values did not reach the required 0.5, the CR values were 0.6 or higher (see Table 3), which allowed us to consider the convergent validity sufficient (Fornell & Larcker, 1981).

The criterion-related validity of the US-ISI-5 was investigated by testing its relation with other relevant measures, namely, some personality traits and collective characteristics. The analysis in Table 4 revealed a small but statistically observable relationship among almost all the tested variables, except for the relationship between self-esteem and political efficacy and the NS. In the case of the

Table 3. Reliability and convergent validity assessment of the US-ISI-5 (N = 10,945)

	Cronbach's alpha (α)	McDonald's omega (ω)	AVE	CR
Informational style (IS)	0.705	0.709	0.5	0.7
Normative style (NS)	0.562	0.587	0.3	0.6
Diffuse/avoidant style (DAS)	0.596	0.603	0.3	0.6

Note: AVE Average variance extracted, CR Composite reliability coefficient.

Table 4. Correlations of the US-ISI-5 with other relevant measures (N = 21,968)

	IS	NS	DAS
Empathic concerns (EC)	0.27	0.10	−0.10
Perspective taking (PT)	0.41	0.05	−0.12
Well-being	0.24	0.04	−0.07
Self-esteem	0.13	0.00	−0.08
Political efficacy	0.20	0.00	−0.11
Prejudice	0.09	−0.03	−0.03
Intention of radicalisation	−0.02	0.03	0.08

Note: Pearson correlation coefficient. All values are statistically significant at least at the $p < .05$ level (except for 0.00). IS Informational style, NS Normative style, DAS Diffuse/avoidant style.

IS, weak (self-esteem, political efficacy, prejudice) to moderately positive correlations (EC, PT, well-being) were found with all tested items, with only the tendency towards radicalisation showing a negative correlation. In contrast, the results for the DAS showed a weak negative correlation with all measured positive concepts and, conversely, a positive correlation in the case of radicalisation intentions. The NS showed a weak positive correlation with all measured concepts except prejudice, with which it showed a weak negative correlation. These results correspond to the theory (see Discussion) and confirm the conclusion that criterion-related validity was achieved.

Measurement invariance across gender and type of study

The measurement invariance of the US-ISI-5 across gender and type of study was tested on the whole sample (N = 21,968) using MGCFA, which is the traditional method for testing invariance (Davidov et al., 2014). The parameter estimates were obtained using the maximum likelihood robust (MLR) method. To assess whether a certain level of invariance (configural, metric, scalar) was achieved, global fit indices (CFI, RMSEA, SRMR), respectively, the change in model fit (Δ) were compared between more and less constrained models (Vandenberg & Lance, 2000). If the Δ is about 0.010 and 0.015 or less in CFI and RMSEA, the more constrained model may be accepted (Chen, 2007). As shown in Table 5, the results revealed both configural and metric invariance. However, full scalar invariance was not supported, since ΔCFI exceeded the criterion of 0.010. Therefore, partial scalar invariance was tested by freely estimating the intercept for problematic items in some groups. After releasing one intercept in the female group for gender (ΔCFI = 0.006) and one intercept in the secondary vocational school group for type of study (ΔCFI = 0.010), partial scalar invariance was achieved (Vandenberg & Lance, 2000). Based on these results, the latent means for each subscale could be compared.

Discussion

This study aimed to develop and validate the Czech version of the ultra-short ISI scale (US-ISI-5), since the original 40 and 27-item versions are too long and not suitable for use in online self-administered questionnaires. Furthermore, the officially validated Czech version of this scale has yet to be created.

The objectives of the study were achieved in several steps. In the initial phase, a concise nine-item ultra-short version was developed from the original 15-item ISI-5 through EFA and CFA. Based on EFA of the first half of the research sample (N = 11,028), the number of items was reduced to three items per subscale, and a final three-factor solution was identified, which was tested on the second half of the research sample (N = 10,945) through CFA. The results were found to be highly satisfactory; therefore, the scale's psychometric properties, including

Table 5. Results of measurement invariance of the US-ISI-5 across gender and type of study (N = 21,968)

	Chi-square (df)	CFI (ΔCFI)	RMSEA (ΔRMSEA)	SRMR
Gender (male, female)				
Configural	752.434 (48)	0.938	0.052	0.045
Metric	760.187 (54)	0.938 (0.000)	0.049 (0.003)	0.045
Scalar	948.056 (60)	0.921 (0.017)	0.052 (0.003)	0.047
Partial scalara	832.914 (59)	0.932 (0.006)	0.049 (0.000)	0.046
Type of study (gymnasium, secondary technical school, secondary vocational school)				
Configural	747.081 (72)	0.942	0.051	0.043
Metric	815.236 (84)	0.937 (0.005)	0.049 (0.002)	0.046
Scalar	1,037.270 (96)	0.919 (0.018)	0.052 (0.003)	0.050
Partial scalarb	943.154 (95)	0.927 (0.010)	0.049 (0.000)	0.049

a One intercept (item c) released in the female group.

b One intercept (item h) released in the secondary vocational school group.

Note: df Degree of freedom, CFI Comparative fit index, RMSEA Root mean square error of approximation, SRMR Standardised root mean squared residual.

reliability, various types of validity, and measurement invariance, were subsequently assessed.

Reliability evaluated using Cronbach's alpha and McDonald's omega achieved slightly worse results than the original ISI-5, with only the IS subscale achieving a higher value than the recommended threshold of 0.700 (Nunally, 1978). However, the overall results of the ultra-short version are comparable to those of previous studies (e.g., Crocetti & Shokri, 2010; Crocetti et al., 2009; Zimmermann et al., 2012). Identifying the causes of these low and unsatisfactory values seems to be relatively challenging, as these values have already been identified in the original studies conducted by the author himself (Berzonsky, 1992b).

In terms of validity, convergent validity was tested through AVE and CR, and criterion-related validity was tested through correlations with other measures. Based on the results, it can be concluded that both types of validity were achieved. As for convergent validity, although AVE did not reach the required value of 0.5, the CR value was 0.6 or higher, which is sufficient to achieve convergent validity (Fornell & Larcker, 1981).

To examine criterion-related validity, we assessed correlations between three identity formation strategies (informational, normative, and diffuse/avoidant) and a select cluster of personality traits and values (empathy, self-esteem, prejudice, well-being, political efficacy, radicalisation intentions). The results indicated that the *informational identity processing strategy* (IS), measured with three items from the newly developed scale, correlated positively with two individual characteristics: self-esteem and well-being. Weak to moderate positive correlations were found with most of the measured constructs. The weak positive association with self-esteem is consistent with Soenens et al.'s (2016) findings. Further, the moderate association with well-being corresponds with the results of numerous studies demonstrating that the informational strategy is positively associated with well-being, with individuals relying on this strategy reporting higher well-being compared to those using normative or diffuse/avoidant strategies (e.g., Berzonsky & Cieciuch, 2016; Crocetti & Shokri, 2010; Czyżowska, 2022). Regarding collective traits, we observed a moderate positive relationship with empathy and a strong positive association with perspective-taking ability. This is in line with Phillips and Pittman's (2007) results. In addition, informational processing was weakly and positively related to political efficacy (see Crocetti et al., 2009; Berzonsky, 2003) and very weak when considering more favourable attitudes towards members of ethnic minorities. These positive intergroup attitudes are consistent with traits such as openness to new experiences and ideas (Berzonsky et al., 2011; Berzonsky & Sullivan, 1992) and with the endorsement of pro-democratic and pro-diversity values (Erentaitė et al., 2019).

For the *normative identity processing strategy* (NS), we observed a non-significant relationship with self-esteem and well-being. However, this non-significant association is in line with Phillips and Pittman's (2007) findings. Regarding the collective characteristics, the NS was weakly positively associated with empathy and perspective-taking and very weakly negatively associated with attitudes to-

wards ethnic minorities (see Berzonsky et al., 2011; Miklikowska, 2012; Spitzerová et al., 2025). Moreover, the NS was very weakly positively related to a tendency towards radicalism, a pattern that corresponds with results reported by Duriez et al. (2005), Miklikowska (2012), and Ozer et al. (2022).

Finally, the *diffuse/avoidant identity processing strategy* (DAS) was weakly and negatively associated with both self-esteem and well-being, which is in line with earlier findings (see Crocetti et al., 2009; Phillips & Pittman, 2007). In terms of collective characteristics, this strategy showed a positive relationship with radicalism, suggesting a tendency toward maladaptive behaviour, which is also consistent with the outcome reported by Ozer et al. (2022). At the same time, the DAS was very weakly negatively associated with political efficacy (Smits et al., 2011), low empathy (see Duriez & Soenens, 2006; Soenens et al., 2005), and positive attitudes towards minorities (see Spitzerová et al., 2025). Although the vast majority of relationships have been shown to be weak or very weak, they are based on solid theoretical foundations and are consistent with findings in other studies.

The last part of the psychometric evaluation was devoted to testing invariance across gender and type of study. The results revealed that it is possible to compare latent means across both gender and type of study, since partial scalar invariance was achieved after releasing one intercept for *item c* in the female group and another for *item h* in the secondary vocational school group.

Limitations and future research

While this study has several strengths, including a large, representative sample of Czech adolescents and its comprehensive validation of a newly developed ultra-short 9-item version of the ISI (US-ISI-5), several limitations should be acknowledged. First, the analysis is based on cross-sectional data; therefore, it is not possible to determine test–retest reliability, which can be used to evaluate the stability of identity processing strategies over time. This is of particular significance, given that adolescents are undergoing rapid developmental, attitudinal, and emotional changes. Second, this is a typical validation study conducted in one country on a specific target group, namely, Czech adolescents, without a control group, which restricts the generalizability of the results. Third, the assessment of reliability and validity did not yield the fully desired values. With regard to reliability, only the IS subscale exceeded the minimum recommended value. One potential solution would be to test the model with only two items for the subscale, as is the case with the NS and DAS subscales, where one item consistently demonstrated poor values. While this procedure is methodologically feasible, it is not suitable in theoretical or interpretative terms. The individual subscales are analysed independently; therefore, each subscale must have at least three variables. In the case of validity, weak but significant relationships were identified, which can be attributed to the large research sample. Moreover, for valid evidence of criterion-related validity, the Commitment Scale and others

directly focused on measuring identity strategies (e.g., U-MICS) are missing. Future studies should include these variables and assess the US-ISI-5 on different research samples, ideally from a longitudinal perspective.

Conclusions

This study has developed and validated an ultra-short nine-item version of the ISI (US-ISI-5) on a large sample of Czech adolescents. Based on the results, it can be concluded that the US-ISI-5 has been demonstrated to possess both psychometric and structural soundness, thus making it a useful tool for the measurement of identity strategies among Czech adolescents. Since the instrument has been shown to achieve satisfactory results in terms of reliability, validity, and measurement invariance, this Czech version can be used in future studies as an alternative to the original long version.

Statements and declarations

Data availability

Survey data are part of an ongoing project and are not yet publicly available. The data can be made available upon reasonable request. See Kudrnáč, A., Hanzlová, R., Spitzerová, M., Aslan, K., Bocskor, Á., & Petrúšek, I. (2024). *Czech education panel survey 1. Wave – student questionnaire* [Dataset]. https://doi.org/10.14473/CSDA/OM42GN

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Conflict of interest

The authors declare no conflicts of interest.

Ethics approval and consent to participate

Informed consent was obtained from all study participants. Parental consent regarding the students' participation was not required, given that all students were over 15 years old. The study was approved by the directors of all participating schools and by the Ethics Committee of the Institute of Sociology of the Czech Academy of Sciences.

Authors' contributions

RH designed the study, analysed and interpreted the data, and prepared the manuscript. MS designed the study, developed the theoretical component, and prepared the manuscript. All authors read and approved the final manuscript.

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Abbreviations

AVE	Average variance extracted
CASI	Computer-assisted self-interviewing
CFA	Confirmatory factor analysis
CFI	Comparative fit index
CR	Composite reliability coefficient
CZEPS	Czech Education Panel Survey
CZSO	Czech Statistical Office
DAS	Diffuse/avoidant style
EFA	Exploratory factor analysis
IS	Informational style
ISI	Identity Style Inventory
MGCFA	Multiple-group confirmatory factor analysis
MLR	Maximum likelihood estimation with robust standard errors
NES	National election studies
NS	Normative style
RMSEA	Root mean square error of approximation
RSES	Rosenberg Self-Esteem Scale
SRMR	Standardised root mean squared residual
TRAPD	Translation, review, adjudication, pretesting, and documentation
U-MICS	Utrecht Management of Identity Commitments Scale
US-ISI-5	Ultra-Short Identity Style Inventory Version 5