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PSYCHOMETRIC VALIDATION OF THE EPOCH MEASURE OF ADOLESCENT WELL-BEING IN CZECH HIGH SCHOOL STUDENTS

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ABSTRACT

Objectives. This study aimed to evaluate the psychometric properties of the EPOCH Measure of Adolescent Well-Being in a large sample of Czech high school students.
Sample and Settings. Data were collected from 2,967 adolescents (15 to 19 years old) as part of a broader school-based survey conducted across 13 secondary schools in the Czech Republic.
Hypotheses. The authors hypothesized that the Czech version of EPOCH would replicate the original five-factor structure and demonstrate good internal consistency and construct validity.
Analyses. Analyses included item-level descriptives, test–retest reliability, Mokken scaling, confirmatory factor analysis (CFA), measurement invariance across gender and age groups, and correlations with related constructs.
Results. The results confirmed the five-factor model with good fit indices and demonstrated adequate internal consistency (McDonald's ω ranging from .75 to .84). Multi-group CFA supported configural, metric, and scalar invariance, with partial support for strict invariance. EPOCH subscales correlated meaningfully with external variables, in line with theoretical expectations, supporting the instrument's nomological validity.
Limitations. The cross-sectional design represents a limitation, restricting conclusions about temporal stability and predictive validity. While the findings provide strong evidence that the Czech version of the EPOCH is a reliable and valid measure of adolescent well-being suitable for use in school-based research and practice, further studies are recommended to reinforce its nomological validity. Given the current selection of external validation measures – such as self-esteem, depressive symptoms, and satisfaction of basic psychological needs in physical education – future research should expand the scope of external variables to more comprehensively examine the theoretical network surrounding adolescent well-being.

key words:
well-being,
adolescents,
measurement invariance,
reliability,
factor analysis

INTRODUCTION

Adolescence is a critical developmental period during which fostering well-being can have lasting impacts on health and life outcomes. In recent years, researchers and policymakers have placed increasing emphasis on monitoring and improving adolescents' positive mental health and well-being (White & Kern, 2018). From a positive psychology perspective, well-being is more than the absence of problems—it involves cultivating strengths and helping youth flourish, often defined as "feeling

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good and functioning effectively" (Huppert & So, 2013, p. 839). The assessment of well-being in youth is therefore essential and provides a basis for interventions and policy efforts. However, defining and measuring "well-being" is complex. There are multiple theoretical frameworks of well-being, generally encompassing two broad dimensions: hedonic well-being, which emphasizes positive affect and life satisfaction, and eudaimonic well-being, which emphasizes positive functioning, personal growth, and meaning in life (Ryan & Deci, 2001). Contemporary approaches to well-being integrate both perspectives, recognizing that feeling good and functioning well are both vital (Seligman, 2011). Especially for youth, a multidimensional approach to well-being is recommended, capturing the range of positive feelings and functioning that contribute to a "good life" (Huppert & So, 2013; Lerner et al., 2005). Assessing adolescent well-being from this multidimensional standpoint is crucial, as it provides insight into youths' positive development and offers a counterbalance to deficit-focused mental health measures. Such assessments are increasingly used to guide interventions and educational programs, ensuring that efforts to improve youth well-being are grounded in evidence and have measurable impact.

One response to the need for a broader adolescent well-being measure was the EPOCH model, an integrative multidimensional framework proposed by Kern et al. (2016). The EPOCH model explicitly combines hedonic and eudaimonic perspectives to define well-being in adolescence. The model was inspired by Seligman's (2011) PERMA theory of flourishing in adults—which includes Positive Emotion, Engagement, Relationships, Meaning, and Accomplishment—but was adapted based on research suggesting a somewhat different factor structure in younger populations (Kern et al., 2016). The resulting EPOCH model comprises five dimensions of well-being characteristics that are especially salient for adolescents: Engagement, Perseverance, Optimism, Connectedness, and Happiness (forming the acronym EPOCH). Each EPOCH dimension represents a facet of positive functioning or feeling that contributes to an adolescent's overall well-being.

Engagement refers to being deeply absorbed and involved in activities—often described as a state of "flow," in which individuals lose track of time due to complete immersion, typically observed in academic, creative, or athletic pursuits. Perseverance captures the determination to pursue goals and overcome obstacles, reflecting grit and sustained effort that contributes to a sense of accomplishment and purpose. Optimism denotes a hopeful, forward-looking mindset characterized by the belief that good things will happen and that one's actions can positively shape future outcomes; it is associated with better coping, motivation, and self-efficacy. Connectedness reflects the quality of interpersonal relationships and the extent to which adolescents feel cared for and supported by others, highlighting the importance of social bonds with peers, family, and community for mental health. Lastly, Happiness encompasses enduring feelings of joy, life satisfaction, and emotional well-being—offering a stable sense that life is enjoyable and fulfilling. Together, these five domains form a comprehensive portrait of adolescent well-being.

To operationalize the EPOCH model, Kern et al. (2016) developed the EPOCH Measure of Adolescent Well-Being, a self-report questionnaire suitable for youth roughly 10–18 years old. The original EPOCH measure consists of 20 items, with four items assessing each of the five domains. In their seminal study, a pool of 60 candidate items was tested across ten different samples totalling 4,480 adolescents (ages 10–18) from the United States and Australia. Through iterative analyses of item performance, factor structure, and reliability, the measure was refined to a final set of 20 items (four per subscale) that best represented the five intended domains. Confirmatory factor

analyses (CFA) supported a clear five-factor solution corresponding to Engagement, Perseverance, Optimism, Connectedness, and Happiness, consistent with the theoretical model. The EPOCH subscales demonstrated acceptable internal consistency and convergent validity, correlating as expected with other indicators of youth well-being. Notably, higher scores on EPOCH dimensions were associated with a range of positive outcomes and inversely related to markers of psychological distress. For instance, adolescents who reported higher levels of Happiness on the EPOCH tended to report significantly fewer symptoms of depression. Similarly, negative correlations with anxiety and stress have been observed for the Optimism and Connectedness subscales. These findings underscore the value of assessing positive attributes in youth: not only do these traits form a coherent construct of well-being, but they also appear to buffer against mental health problems and predict better adjustment (Renshaw et al., 2015).

Since its introduction, the EPOCH measure has been translated and validated across a wide range of cultural and linguistic contexts, including Chinese, Indonesian, Turkish, German, Swedish, Persian, and Malay. These adaptations consistently support the five-factor structure and demonstrate strong psychometric properties. For instance, Zeng and Kern (2019) validated a Chinese version with nearly 18,000 students, confirming good model fit, high internal consistency (overall $\alpha = 0.95$), and meaningful correlations with well-being (but not ill-being) indicators, supporting its convergent and discriminant validity. Similar results were reported in Malaysian (Yusoff et al., 2024), Turkish (Demirci & Ekşi, 2015), Iranian (Taheri et al., 2022), Indonesian (Simanjuntak et al., 2023) and Swedish (Maurer et al., 2021) samples, with all subscales showing acceptable reliability (composite reliability > 0.70). A German-school-specific version (Buerger et al., 2023) further confirmed the five-factor structure along with a higher-order well-being factor. Collectively, these findings highlight EPOCH's robustness and cross-cultural applicability for assessing adolescent well-being.

In the Central European context, the EPOCH measure has been examined in Slovakia—a country linguistically and culturally similar to the Czech Republic. Šeboková et al. (2019) conducted a validation study of the EPOCH questionnaire (Slovak version) with a sample of 1,009 adolescents. Their study provides a useful point of reference for the current research, as the Slovak version of EPOCH was grounded in the same theoretical framework of flourishing and measured the identical five characteristics in youth. Šeboková et al. (2019, p. 287) reported that the Slovak EPOCH demonstrated adequate reliability and validity across both secondary-school and university student samples. CFA supported the original five-factor structure, which "fit the data well and was equivalent for both genders and age groups," indicating that the construct held consistently for boys and girls and for younger versus older adolescents in their sample. This evidence from a Slovak sample suggests that the EPOCH model of well-being is applicable in the Central European cultural context. However, to date there has been no published validation of the EPOCH measure in the Czech adolescent population. Given subtle linguistic differences and potential cultural distinctions between Slovak and Czech settings, it cannot be assumed that the Slovak findings automatically generalize to Czech youth. A dedicated study in the Czech context is needed to confirm the scale's psychometric properties, establish local norms, and ensure that the instrument is appropriate for use with Czech-speaking adolescents.

Present study

The present study addresses this gap by validating the EPOCH measure of adolescent well-being in the Czech context. Using data from Czech secondary school students, we

conducted a comprehensive psychometric evaluation of the translated EPOCH scale to examine its structural validity, reliability, and applicability within this population. First, we examine the factorial validity of the measure using CFA, testing whether the hypothesized five-factor structure (Engagement, Perseverance, Optimism, Connectedness, Happiness) emerges clearly in the Czech data. We also assess the internal consistency (reliability) of each subscale. Second, we investigate measurement invariance across gender and age groups—determining whether the factor structure is equivalent for male and female students, and across mid-adolescent (e.g. 15–16 years) versus late-adolescent (17–19 years) groups. Establishing invariance is important to ensure that any observed differences are not due to measurement bias. Third, we evaluate the nomological validity of the Czech EPOCH by exploring its relationships with external constructs that theoretically should be linked to well-being. In this study, we focus on two sets of criteria: (1) domain-specific need satisfaction in the context of physical education (PE) classes, and (2) broader indicators of mental health, namely depressive symptoms and self-esteem. Self-determination theory posits that satisfaction of basic psychological needs (for autonomy, competence, and relatedness) is a driver of well-being in adolescents, even in specific domains like school or physical education (Eime et al., 2013). We therefore expect students with higher EPOCH well-being scores to report greater satisfaction of their needs in PE classes. At the same time, higher well-being should correlate with *lower* depression and *higher* self-esteem, given past findings that flourishing youth tend to exhibit fewer internalizing problems and more positive self-regard (Jang et al., 2020). By testing these associations, we can situate the EPOCH measure within a network of related constructs, providing evidence of its nomological validity in the Czech context. In sum, this study offers a rigorous evaluation of the EPOCH measure in a Czech adolescent sample—addressing a notable research gap—and aims to contribute to the growing cross-cultural literature on adolescent well-being assessment. The validation of a Czech EPOCH questionnaire stands to benefit both research and practice, enabling educators, psychologists, and policymakers in the Czech Republic to reliably assess and track the positive development of young people using a scientifically grounded instrument

METHODS

Participants and procedures

This cross-sectional investigation draws on data collected during the initial wave of a broader three-year longitudinal study exploring links between physical education (PE) motivation and cognitive functioning in Czech high school students. For sampling, the Czech Republic's 14 administrative regions were clustered into five broader geographic zones. Within each zone, one large secondary school (with more than 450 students) and one or two smaller institutions (fewer than 450 students) were randomly selected. School administrators were individually invited to join the study, and after six schools declined, recruitment concluded with a total of 13 schools participating—providing balanced representation across the five geographic zones.

Information about the study was disseminated to students via flyers and classroom announcements, along with an online link to the survey. To encourage participation, each school organized a raffle for a gift card, in which students who completed the survey could enter. Participation rates varied significantly between schools, ranging from 10% to 86.7%, with an overall average of 53.7%.

The final analytic sample included 2,967 high school students (mean age = 16.62, SD = 1.18). The sample was 52.5% female, and the majority (94.3%) identified as

Czech nationals. Smaller proportions identified as Ukrainian (2.3%), Slovak, Roma, Vietnamese, or other (each under 1%). Roughly 63% of respondents reported living in a two-parent household, with an average household size of 3.84 individuals (SD = 1.10).

Ethical approval was granted by the institutional review board (IRB# 142/22, Ethics Committee, FTVS UK). An online informed assent was obtained from all participants, who were made aware of the study's objectives and their rights as participants. Participation was anonymous and entirely voluntary, with the option to withdraw at any time without consequence.

Any instruments not previously validated in Czech underwent a structured translation and cultural adaptation procedure based on established guidelines (e.g. Behling & Law, 2000). Three independent bilingual translators first produced forward translations, which were harmonized during a consensus meeting involving the translators and one co-author. The linguistic and conceptual suitability of the draft was reviewed with a secondary school teacher. This version was then cognitively pretested with a small pilot group (n = 6; balanced by gender). Feedback was collected through item-level verbal probing to identify ambiguities or issues with comprehension. Only minor edits were needed to enhance clarity, and the final version was used for all subsequent psychometric analyses.

Measures

Adolescent well-being

Well-being was assessed using the EPOCH Measure of Adolescent Well-Being (Kern et al., 2016), a 20-item instrument designed to capture five positive psychological traits: Engagement, Perseverance, Optimism, Connectedness, and Happiness. Each subscale consists of four items rated on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). The EPOCH has shown strong psychometric properties across diverse adolescent samples and was evaluated for structural validity in the current study.

Psychological need satisfaction in physical education

Students' perceived satisfaction of basic psychological needs during physical education (PE) was measured using 15 items adapted from established instruments (McAuley et al., 1989; Richer & Vallerand; 1998 Standage et al., 2003) validated in PE settings (e.g. Standage et al., 2006). *Autonomy* was assessed through five items capturing students' sense of volition and personal choice in PE (e.g. "I have some choice in what I want to do"), with good internal consistency ($\alpha = 0.84$). *Relatedness* was measured using a modified version of the acceptance subscale from the Need for Relatedness Scale, adapted for the PE context (e.g. "With the other students in my PE class, I feel supported"), with excellent reliability ($\alpha = 0.90$). *Competence* was evaluated using adapted items from the Perceived Competence subscale of the Intrinsic Motivation Inventory (e.g. "I am pretty skilled at PE"), also showing strong reliability ($\alpha = 0.89$). Responses were given on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Depressive symptoms

Symptoms of depression were assessed using six items from the Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001), translated into Czech by Daňsová et al. (2016) and introduced with the stem: "How often have you been bothered by the following over the past 2 weeks?" Items were rated on a 4-point scale (0 = not at all to 3 = almost every day). The shortened scale demonstrated good reliability in the pre-

sent sample (α = 0.81). Three original PHQ-9 items (6, 8, and 9) were excluded due to ethical considerations. These items assess more severe symptoms such as psychomotor agitation, feelings of worthlessness, and suicidal ideation, which may be distressing in anonymous school-based research where clinical follow-up is not feasible. Their exclusion reflects a conservative and ethically responsible approach to mental health screening in adolescents.

General self-esteem

Five positively worded items from the Rosenberg Self-Esteem Scale (Rosenberg, 1965) were used to assess general self-esteem (e.g. "I take a positive attitude toward myself"). Responses were made on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), with internal consistency of α = 0.85. The Czech version used in this study has been previously validated (Osecká & Blatný, 1997).

Analyses

We began by conducting basic descriptive analyses of the EPOCH items to evaluate their distributional characteristics, item-total correlations, and clustering of participants within schools using intraclass correlation coefficients (ICCs). To assess temporal stability, we examined 14-day test-retest reliability for each EPOCH item and subscale using an independent subsample of adolescents (n = 35), recruited separately from the main validation sample due to logistical constraints related to in-school follow-up. Although modest in size, this subsample provided preliminary evidence on the consistency of EPOCH scores over time and aligned with best practices in scale validation research.

We further explored the internal structure of the EPOCH subscales using a nonparametric item response theory (IRT) method—the Mokken monotone homogeneity (MH) model—which is suitable for assessing unidimensionality among ordinal items (Mokken, 1971). Loevinger's scalability coefficients (Hi; Loevinger, 1948) were computed for each item within the five EPOCH dimensions using the R package "mokken" (Van der Ark, 2007). Consistent with recommendations, items with Hi values below 0.30 were considered weak contributors to the construct, and a threshold of Hi > 0.40 was applied to flag items with stronger support for inclusion.

CFA was used to examine the factorial validity of the EPOCH. Multi-group CFA was also performed to assess measurement invariance across gender and age cohorts. Model fit was evaluated using standard indices: Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR). Model comparisons were guided by changes in CFI and RMSEA, as well as χ^2 difference tests (Cheung & Rensvold, 2002). Acceptable model fit was defined as CFI and TLI > 0.90 and RMSEA and SRMR < 0.07 (Hu & Bentler, 1999). CFA models were estimated using Mplus version 8.11 (Muthén & Muthén, 2017) with robust maximum likelihood estimation (MLR) to account for potential non-normality in item responses.

To support the scale's nomological validity, Pearson correlations were computed among the EPOCH subscales and with external measures theoretically linked to adolescent well-being, including psychological need satisfaction in PE, engagement, and depressive symptoms. Between group differences were tested using an independent-sample t-test and Cohen's d with 95% confidence interval was used as a measure of effect size.

RESULTS

Basic descriptives for EPOCH items and subscales

Descriptive analyses of the EPOCH items and subscales showed acceptable distributional characteristics across all five well-being domains (Table 1). Subscale means ranged from 3.20 (Perseverance) to 4.05 (Connectedness), with most items displaying minimal skewness and kurtosis. Internal consistency was satisfactory across subscales, supported by item-total correlations and Loevinger's scalability coefficients, which exceeded the recommended threshold of 0.40 for all items. Test–retest reliability over a two-week interval (n = 35) was acceptable for Happiness (r = .80), Connectedness (r = .70), Optimism (r = .61), and Perseverance (r = .61), while Engagement showed lower temporal stability (r = .51). ICCs suggested minimal clustering within schools (all ICCs ≤ 0.05), indicating that student-level variation dominated item responses.

Factor structure and measurement invariance of EPOCH

CFA confirmed the expected five-factor model of EPOCH with excellent fit in the full sample (χ^2_{160} = 1323.07, CFI = 0.935, TLI = 0.922, RMSEA = 0.049, SRMR = 0.045; Table 2). The standardized factor loadings from the CFA (Table 1) ranged from a low of $\lambda = 0.52$ (item P_2) to a high of $\lambda = 0.86$ (item E_3) and further supported the structural coherence of each dimension.

Multi-group CFA demonstrated measurement invariance across gender and age groups. For both comparisons (male vs. female; younger vs. older students), configural, metric, and scalar invariance models showed acceptable fit, with only minor decreases in incremental fit indices. Overall, despite statistically significant chi-square differences in some cases, the minimal changes in CFI, TLI, RMSEA, and SRMR across all models (< 0.01) indicate that a strict level of invariance is achieved for both gender and grade groups and that the EPOCH functions equivalently across the demographic groups.

Internal structure, reliability and nomological validity of EPOCH subscales

Table 3 presents intercorrelations among the five EPOCH dimensions and their associations with external constructs. Internal consistency estimates based on McDonald's omega (ω) ranged from 0.75 for Perseverance to 0.84 for Happiness, indicating satisfactory to strong reliability across all subscales. The highest inter-factor correlations were observed between Optimism and Happiness (r = 0.68), and between Optimism and Perseverance (r = 0.51), suggesting substantial shared variance among these traits. Overall, the pattern of associations supports the view that the five dimensions represent related but distinguishable aspects of adolescent well-being, with Engagement showing more modest correlations with the other subscales (r = 0.29–0.47), and Connectedness emerging as the most distinct factor (mean r = 0.34 with other subscales).

Correlations with external criteria further supported the construct validity of the EPOCH dimensions. In line with theoretical expectations, psychological need satisfaction in PE and self-esteem were positively associated with all five well-being traits, particularly with Optimism (r = 0.28–0.67) and Happiness (r = 0.32–0.68). As expected, depressive symptoms were negatively associated with EPOCH dimensions, most strongly with Happiness (r = –0.41) and Optimism (r = –0.31), indicating the protective nature of these traits. The relatively weaker correlations for Engagement (e.g. r = –0.05 with depressive symptoms) suggest its unique role within the well-

Table 1 EPOCH subscale and item descriptives

Scale/Item	mean	SD	skew	kurt	ICC	item-total r	H_i	test retest$^+$	λ_i*
Engagement (E)	3.36	0.85	-0.21	-0.13	0.02	-	0.56	0.70	-
E1 Stává se mi, že se úplně ponořím do toho, co dělám.	3.52	1.04	-0.04	-0.29	0.03	0.53	0.49	0.59	0.56
E2 Když se učím něco nového, ztrácím pojem o čase.	3.27	1.01	-0.20	-0.32	0.01	0.70	0.60	0.66	0.84
E3 Když se učím něco nového, ztrácím přehled, kolik času uběhlo.	3.29	1.05	-0.26	-0.38	0.01	0.71	0.60	0.66	0.86
E4 Některé aktivity mě pohltí tak, že zapomenu na všechno ostatní.	3.35	1.11	-0.32	-0.56	0.03	0.63	0.55	0.62	0.66
Perseverance (P)	3.20	0.76	-0.09	0.13	0.02	-	0.46	0.70	-
P1 Dokončím vše, co začnu.	3.37	1.01	-0.21	-0.30	0.02	0.60	0.50	0.65	0.74
P2 Věnuji se věcem do školy, dokud nemám vše hotové.	2.84	1.04	0.11	-0.46	0.01	0.46	0.42	0.57	0.52
P3 Jakmile si naplánuji, že něco udělám, dodržím to.	3.29	0.94	-0.20	-0.02	0.01	0.60	0.50	0.60	0.71
P4 Jsem dříč.	3.30	1.05	-0.18	-0.38	0.03	0.50	0.42	0.60	0.64
Optimism (O)	3.29	0.82	-0.31	0.20	0.01	-	0.55	0.75	-
O1 Jsem optimistický ohledně své budoucnosti.	3.30	1.13	-0.29	-0.53	0.01	0.64	0.56	0.54	0.75
O2 Myslím, že se mi budou stávat dobré věci.	3.26	1.02	-0.24	-0.17	0.01	0.65	0.57	0.50	0.76
O3 Věřím, že se věci vyřeší, ať se zdají sebevíc těžké.	3.52	0.99	-0.46	-0.04	0.01	0.59	0.54	0.55	0.68
O4 V nejistých časech očekávám to nejlepší.	3.07	1.03	-0.06	-0.37	0.02	0.57	0.52	0.60	0.64
Connectedness (C)	4.05	0.78	-0.86	0.62	0.05	-	0.57	0.70	-
C1 Když se mi přihodí něco dobrého, mám ve svém životě lidi, se kterými to chci sdílet.	3.97	0.98	-0.91	0.57	0.04	0.61	0.55	0.66	0.71
C2 Mám kamarády, na kterých mi opravdu záleží.	4.21	0.95	-1.19	1.06	0.05	0.60	0.55	0.71	0.66
C3 V mém životě jsou lidé, kterým na mně opravdu záleží.	4.11	0.95	-0.98	0.57	0.04	0.68	0.59	0.72	0.77
C4 Když mám problém, mám někoho, kdo je tady pro mě.	3.91	1.03	-0.83	0.22	0.03	0.65	0.57	0.71	0.76
Happiness (H)	3.44	0.91	-0.37	-0.13	0.02	-	0.60	0.72	-
H1 Užívám si hodně zábavy.	3.70	1.06	-0.56	-0.17	0.01	0.57	0.54	0.71	0.66
H2 Cítím se šťastně.	3.29	1.12	-0.29	-0.45	0.01	0.71	0.63	0.63	0.79
H3 Miluji život.	3.29	1.19	-0.31	-0.62	0.02	0.71	0.62	0.72	0.80
H4 Jsem veselý člověk.	3.47	1.07	-0.38	-0.30	0.01	0.68	0.61	0.71	0.76

Note. skew – skewness, kurt – kurtosis, ICC – intraclass correlation coefficient, Hi – Scalability coefficient, abbreviated item content is presented in the table, $^+$ – test-retest reliability assessed with a sample n = 35, * – standardized factor loading, Czech wording of the items is provided in the table, original English wording can be found here: https://www.peggykern.org/uploads/5/6/6/7/56678211/epoch_measure_of_adolescent_well-being_102014.pdf

Table 2 CFA and measurement invariance model fit indices

Model	χ^2 (df)	CFI	TLI	RMSEA	SRMR	Δ p	Δ CFI	Δ TLI	Δ RMSEA	Δ SRMR
Full sample (n=2967)										
5-factors	1323.07 (160)	0.935	0.922	0.049	0.045	---	---	---	---	---
Gender: Males (n=1348) vs Females (n=1558)										
Configural	1521.4 (320)	0.933	0.920	0.051	0.047	---	---	---	---	---
Metric	1556.87 (335)	0.932	0.922	0.050	0.049	0.007	0.001	-0.002	0.001	-0.002
Scalar	1694.56 (350)	0.925	0.918	0.051	0.051	<0.001	0.007	0.004	-0.001	-0.002
Strict	1863.70 (370)	0.916	0.914	0.053	0.060	<0.001	0.009	0.004	-0.002	-0.009
Age: 15+16 years old (n=1475) vs 17+18+19 years old (n=1438)										
Configural	1491.33 (320)	0.934	0.921	0.050	0.047	---	---	---	---	---
Metric	1519.16 (335)	0.933	0.924	0.049	0.049	0.088	0.001	-0.003	0.001	-0.002
Scalar	1563.84 (350)	0.931	0.925	0.049	0.049	0.001	0.002	-0.001	0.000	0.000
Strict	1587.38 (370)	0.931	0.929	0.048	0.052	0.261	0.000	-0.004	0.001	-0.003

Note. df – degrees of freedom, CFI – comparative fit index, TLI – Trucker-Lewis index, RMSEA – root mean square error of approximation, SRMR – standardized root mean square residual, Δ - difference between two adjacent models, where more restricted model is always compared to a less restricted model (e.g. metric versus configural; scalar versus metric and strict versus scalar).

Table 3 Correlations and McDonald's omega for study variables

	E	P	O	C	H	ω
Well-being						
Engagement (E)	1					0.83
Perseverance (P)	0.47	1				0.75
Optimism (O)	0.39	0.51	1			0.80
Conectedness (C)	0.29	0.27	0.45	1		0.82
Happiness (H)	0.35	0.38	0.68	0.54	1	0.84
External measures						
Autonomy satisfaction	0.34	0.23	0.28	0.16	0.32	0.84
Relatedness satisfaction	0.29	0.26	0.37	0.38	0.44	0.90
Competence satisfaction	0.41	0.37	0.42	0.29	0.40	0.89
Self-esteem	0.35	0.44	0.67	0.48	0.68	0.83
Depressive symptoms	-0.05	-0.19	-0.31	-0.10	-0.41	0.82

Note. Correlations of mean-composite scale score estimates are displayed, correlations larger than 0.05 in absolute values are statistically significant at $\alpha = 0.05$.

being framework, possibly reflecting its situational variability or domain-specific influences. Taken together, the pattern of intercorrelations and external associations provides robust support for the EPOCH's structural and nomological validity in this adolescent sample.

Gender and age differences in EPOCH subscales

Table 4 presents the means and statistical comparisons for gender and age groups across the five EPOCH dimensions.

Table 4 Gender and age differences in EPOCH subscales

Gender	**Males**	**Females**	**p**	**ES**
Engagement (E)	3.40 (0.86)	3.34 (0.82)	**0.035**	0.08 (0.01-0.15) / very small - small
Perseverance (P)	3.23 (0.75)	3.19 (0.76)	0.187	0.05 (-0.02-0.12) / none - very small
Optimism (O)	3.36 (0.83)	3.26 (0.80)	**0.001**	0.12 (0.05-0.19) / very small - small
Conectedness (C)	3.93 (0.82)	4.17 (0.72)	**<0.001**	0.32 (0.25-0.40) / small - medium
Happiness (H)	3.53 (0.94)	3.38 (0.86)	**<0.001**	0.16 (0.09-0.24) / very small - small
Age	**15+16 years**	**17+18+19 years**	**p**	**ES**
Engagement (E)	3.34 (0.86)	3.38 (0.83)	0.267	0.04 (-0.03-0.11) / none - very small
Perseverance (P)	3.19 (0.77)	3.21 (0.75)	0.612	0.02 (-0.05-0.09) / none - very small
Optimism (O)	3.26 (0.82)	3.30 (0.82)	0.182	0.05 (-0.02-0.12) / none - very small
Conectedness (C)	4.01 (0.79)	4.09 (0.77)	**0.005**	0.11 (0.03-0.18) / very small - small
Happiness (H)	3.42 (0.92)	3.45 (0.90)	0.345	0.04 (-0.04-0.11) / none - very small

Note. Values represent means, with standard deviations shown in parentheses. Group differences were tested using independent samples t-tests. Effect sizes are reported as Cohen's d.

Females reported significantly higher levels of Connectedness, with a small to medium effect size ($p < 0.001$, Cohen's $d = 0.32$), and slightly lower scores in Engagement, Optimism, and Happiness compared to males. These differences were statistically significant (p-values ranging from 0.001 to 0.035), though effect sizes were in the very small to small range (Cohen's $d = 0.08–0.16$). No significant gender difference was observed for Perseverance. Comparisons between younger (15–16 years) and older adolescents (17–19 years) yielded minimal differences. A small but statistically significant increase in Connectedness was observed among older adolescents ($p = 0.005$, Cohen's $d = 0.11$). All other dimensions showed non-significant differences with negligible effect sizes.

DISCUSSION

Summary of key findings

This study validated the EPOCH Measure of Adolescent Well-Being in a large Czech youth sample, providing robust evidence for its psychometric soundness. CFA replicated the instrument's intended five-factor structure—Engagement, Perseverance, Optimism, Connectedness, and Happiness—consistent with the original model (Kern et al., 2016) and subsequent validations. All five latent factors emerged as distinct yet interrelated dimensions of well-being, mirroring findings from prior studies in diverse cultures. The internal consistency of each subscale was excellent ($\omega > 0.75$), indicating that items within each EPOCH domain reliably measure a common construct. This aligns with earlier research showing high reliability for both the overall scale and individual subscales (e.g. Kern et al., 2019). Moreover, the EPOCH subscales in our Czech sample demonstrated a pattern of intercorrelations that supports both their conceptual distinctiveness and a shared underlying well-being factor. For example, perseverance (a goal-oriented trait) correlated only moderately with connectedness (a social trait), underscoring that these domains capture different facets of well-being. At the same time, all subscales were positively interrelated, and especially Optimism and Happiness showed strong links with one another and in the expected directions with external criteria—notably, adolescents with higher optimism and happiness reported significantly fewer depressive symptoms, consistent with theoretical expectations about the protective effects of positive outlook and affect (Ciarrochi et al., 2007). Likewise, all five EPOCH dimensions were positively associated with indicators of positive functioning (e.g. greater self-esteem and satisfaction of psychological needs) and inversely related to distress indicators (e.g. depression), reinforcing the measure's convergent and discriminant validity. This empirical profile confirms that the EPOCH instrument captures a multifaceted yet coherent picture of adolescent well-being, with each subscale contributing unique information while collectively reflecting an overarching wellness construct.

Cross-cultural validation in context

Our study adds to a growing body of evidence that the EPOCH measure is cross-culturally valid, and it situates the Czech findings in the context of prior validations across the globe. Consistent with our results, the five-factor EPOCH structure has been confirmed in numerous cultural contexts, including North America, East Asia, and Europe. For example, studies in Chinese adolescent samples (Kern et al., 2019) found that the 20-item Chinese EPOCH version retained the same five distinct factors and high internal consistencies, with configural and metric invariance upheld across different genders and age groups. In Malaysia (Yusoff et al., 2024), a Malay-language

adaptation demonstrated adequate model fit (RMSEA = 0.07, CFI = 0.91) and satisfactory reliability for all subscales (composite reliabilities > 0.70). The Malaysian study further showed that EPOCH scores correlated positively with positive coping (cognitive reappraisal r = 0.21–0.31) and negatively with emotional distress—for instance, total EPOCH and most subscales had significant inverse correlations with depression, anxiety and stress (r = –0.14 to –0.54). Likewise, in Turkey, Demirci and Ekşi (2015) validated the Turkish EPOCH form in high schoolers and reported an acceptable five-factor fit and strong reliabilities for all subscales. These convergent findings across Asian and Muslim-majority contexts (China, Malaysia, Turkey, Iran) underscore the cultural robustness of the EPOCH model—adolescents universally seem to differentiate engagement, perseverance, optimism, connectedness, and happiness as separate components of well-being, and each component shows good internal consistency even with translation.

Findings from European contexts similarly mirror these patterns. A recent German-language adaptation for use in Austrian schools (Buerger et al., 2023) found the five EPOCH factors to be well-replicated and even supported a hierarchical model with a second-order general well-being factor encompassing the five first-order factors. This Austrian study confirmed that the EPOCH instrument can be reliably translated into German and yields valid measurements across genders and across early to late adolescence. In neighbouring Slovakia, researchers likewise verified the Slovak EPOCH version's factor structure, reliability, and validity (Šeboková et al., 2019). Their analyses indicated a good fit for a five-correlated-factor model and measurement invariance across sex and age cohorts. All subscales in the Slovak sample had Cronbach's α above 0.70 (in some samples above 0.80), comparable to the English original (though Engagement was marginally lower in younger subgroups). Importantly, the pattern of correlations in Slovakia aligned with theory and our findings: EPOCH dimensions showed positive associations with related well-being constructs and negative associations with ill-being, confirming concurrent validity across school-age and university students. Taken together, the evidence paints a consistent picture: the EPOCH measure's five-dimensional structure and positive psychology content hold up well across diverse cultural settings, with generally minimal modifications needed and psychometric indices (factor loadings, reliabilities, factor intercorrelations) falling in similar ranges.

Despite this overall consistency, some cultural nuances and points of divergence have been noted. For example, in one multi-country study of older adolescents (Kern et al., 2016), the Engagement subscale showed slightly lower internal consistency (α = = 0.65) in certain countries. Researchers have speculated that the idea of "engagement" (being absorbed and interested in activities) might be understood somewhat differently depending on educational and cultural norms, which could affect how consistently youth respond to those items. However, it is notable that in our Czech sample all subscales, including Engagement, were well above this threshold (ω > 0.75), and other validations (e.g. Sweden, Iran) also report acceptable to good reliability for every domain. Thus, any cross-cultural differences in EPOCH performance have been minor and do not undermine the overall framework—they instead offer opportunities to fine-tune the measure's use (for instance, ensuring translation clarity for "engagement" or investigating gender norms around social connectedness in different cultures). Overall, the conceptual structure of adolescent well-being indexed by EPOCH appears highly stable across cultures, even as each context adds a specific "noise" to how these positive traits manifest.

Demographic factors such as gender and age appear to play a modest role in shaping specific dimensions of adolescent well-being. Females in our sample reported

higher levels of Connectedness, while males scored slightly higher in Engagement, Optimism, and Happiness. Although these differences reached statistical significance, the corresponding effect sizes were generally small, suggesting limited practical relevance. Age-related comparisons revealed even smaller differences. These patterns are consistent with prior research (e.g. Šeboková et al., 2019) indicating that certain psychosocial constructs—particularly connectedness—may be more sensitive to demographic variation, whereas other dimensions remain relatively stable across groups.

Implications for practical use

The present study carries important implications for using the EPOCH measure as a culturally valid tool in Czechia. To date, most assessments of well-being in Czech youth have typically relied on general indicators like life satisfaction, affect balance, or quality of life surveys. Our validation provides a new, empirically supported instrument for this region that captures a multidimensional profile of well-being rather than a single summary metric. The successful replication of EPOCH's five factors in the Czech sample—together with parallel results from Slovakia—indicates that the constructs of engagement, perseverance, optimism, connectedness, and happiness are meaningful and salient for Central European adolescents, not only for youth in English-speaking or Asian cultures.

Practically, this means psychologists, educators, and youth counsellors in the Czech context can confidently use the EPOCH scale to gain a well-rounded understanding of adolescent well-being. The measure's brevity (20 items) and encompassing of multiple positive domains make it an efficient yet comprehensive tool. Moreover, using EPOCH in this region promotes a shift toward positive assessment in line with the broader movement of positive psychology in Europe (Wissing & Schutte, 2024). Rather than focusing solely on psychopathology or risk behaviors, practitioners can utilize EPOCH to monitor positive development—in approach that may help balance the emphasis between mitigating problems and building competencies. As a culturally appropriate tool, EPOCH also provides researchers and policymakers in Czechia with a valuable means of evaluating youth programs and educational initiatives in terms of well-being and flourishing, rather than relying solely on indicators of dysfunction or distress.

For instance, school psychologists could administer EPOCH to screen for students' strengths and struggles across different areas – identifying a student who is low in Happiness and Optimism (potentially flagging risk for depressive outlook) versus another who is low in Connectedness (flagging social isolation). By pinpointing specific well-being dimensions that are lagging, targeted interventions can be designed (e.g. social skills groups to boost connectedness, mentorship programs to enhance engagement and perseverance). Conversely, strong EPOCH scores can highlight areas of resilience; for example, a youth high in Perseverance and Engagement may leverage those strengths to cope with academic challenges. In short, establishing the EPOCH measure's validity in the Czech cultural context opens the door for its practical application in schools, clinics, and positive youth development programs across the country, facilitating a more holistic understanding and promotion of adolescent well-being.

Limitations and future directions

Despite the strengths of this study—including a large, geographically diverse sample and rigorous psychometric analyses—several limitations should be acknowledged. Most notably, the research design was cross-sectional, capturing a single snapshot of adolescent well-being. As such, it limits our ability to draw conclusions about the temporal stability of EPOCH traits or their causal relationships with other psychologi-

cal variables. For example, while optimism and happiness were negatively associated with depressive symptoms, the directionality of this relationship remains unclear—whether optimism reduces the risk of depression, or vice versa, or whether both are influenced by shared contextual factors such as family environment or school climate. Similarly, the assessment of constructs like engagement or perseverance at only one time-point precludes insight into how these characteristics evolve during adolescence.

Given the current focus on a limited set of external validation measures—namely self-esteem, depressive symptoms, and the satisfaction of basic psychological needs within the context of physical education—it is evident that future research should broaden the range of examined variables. Expanding the scope of external indicators would allow for a more comprehensive exploration of the theoretical framework underpinning adolescent well-being and contribute to a deeper understanding of its multifaceted nature across diverse domains of functioning.

Although we included a test-retest reliability assessment using a separate subsample, this group was relatively small (n = 35), and the retest interval was limited to 14 days. While sufficient for estimating short-term consistency, this approach does not inform us about the long-term stability of the EPOCH dimensions. Future studies should address this gap by employing longitudinal designs with multiple follow-ups over longer timeframes. Such research could investigate how well-being traits develop across adolescence—whether certain traits (e.g. perseverance) increase with age and responsibility, or others (e.g. optimism) fluctuate during times of stress. Longitudinal data would also permit predictive analyses, for instance whether early levels of connectedness or perseverance forecast later academic, social, or emotional outcomes.

In addition to temporal designs, future research would benefit from experimental and intervention-based approaches. Testing whether targeted interventions can effectively enhance individual EPOCH dimensions—such as programs fostering social belonging or cognitive reframing—would provide insight into the malleability of these traits and their downstream benefits for youth development. Furthermore, extending validation efforts to include direct cross-cultural comparisons could help clarify the universality or cultural specificity of EPOCH constructs. Although our findings are consistent with previous international validation studies, few investigations have directly compared mean levels, correlational patterns, or measurement equivalence across cultural contexts. Regional collaborations (e.g. with Slovakia, Poland, or Hungary) would be particularly valuable in establishing shared tools for well-being assessment in Central Europe.

Finally, our results support the use of the EPOCH measure in practical applications, particularly in school and youth program settings. Future studies could explore how EPOCH profiles relate to educational or health outcomes, enabling the development of screening tools and interventions tailored to specific well-being domains. For instance, school counselors might use EPOCH data to identify students with low connectedness or optimism and offer targeted support. On a larger scale, EPOCH could serve as a tool for monitoring well-being at the population level—informing policymakers, educators, and mental health professionals about emerging trends in adolescent development and the effectiveness of youth programs.

In summary, while our cross-sectional design and limited test-retest sample impose constraints, the present findings provide strong initial evidence that the EPOCH Measure of Adolescent Well-Being is a valid and reliable tool in the Czech context. Future longitudinal, cross-cultural, and applied research will help to further establish its utility as a framework for understanding and fostering positive development among adolescents.

REFERENCES

Behling, O., & Law, K. S. (2000). *Translating questionnaires and other research instruments: Problems and solutions*. Sage Publications.

Buerger, S., Holzer, J., Yanagida, T., Schober, B., & Spiel, C. (2023). Measuring adolescents' well-being in schools: The adaptation and translation of the EPOCH Measure of Adolescent Well-Being—a validation study. *School Mental Health*, 15(2), 611–626. https://doi.org/10.1007/s12310-023-09574-1

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal, 9*(2), 233–255. https://doi.org/10.1207/S15328007SEM0902_5

Ciarrochi, J., Heaven, P. C. L., & Davies, F. (2007). The impact of hope, self-esteem, and attributional style on adolescents' school grades and emotional well-being: A longitudinal study. *Journal of Research in Personality, 41*(6), 1161–1178. https://doi.org/10.1016/j.jrp.2007.02.001

Daňsová, P., Masopustová, Z., Hanáčková, V., Kicková, K., & Korábová, I. (2016). Metoda Patient Health Questionnaire-9: Česká verze [The Patient Health Questionnaire-9: The Czech version]. *Československá psychologie*, *60*(5), 468–481.

Demirci, İ., & Ekşi, F. (2015). Five-dimensional model of adolescent well-being: Validity and reliability of the Turkish version of the EPOCH Measure. *Journal of Youth Research, 3*(3), 21–30.

Eime, R. M., Young, J. A., Harvey, J. T., Charity, M. J., & Payne, W. R. (2013). A systematic review of the psychological and social benefits of participation in sport for children and adolescents: Informing development of a conceptual model of health through sport. *International Journal of Behavioral Nutrition and Physical Activity, 10*(1), Article 98. https://doi.org/10.1186/1479-5868-10-98

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Huppert, F. A., & So, T. T. C. (2013). Flourishing across Europe: Application of a new conceptual framework for defining well-being. *Social Indicators Research, 110*(3), 837–861. https://doi.org/10.1007/s11205-011-9966-7

Jang, C.-Y., Cho, E.-H., Kwak, Y.-S., & Kim, T. (2020). The relationship between flourishing and depression in children in the U.S., using a socioecological perspective. *International Journal of Environmental Research and Public Health, 17*(21), 8246. https://doi.org/10.3390/ijerph17218246

Kern, M. L., Benson, L., Steinberg, E. A., & Steinberg, L. (2016). The EPOCH Measure of Adolescent Well-Being. *Psychological Assessment, 28*(5), 586–597. https://doi.org/10.1037/pas0000201

Kern, M. L., Zeng, G., Hou, H., & Peng, K. (2019). The Chinese version of the EPOCH Measure of Adolescent Well-Being: Testing cross-cultural measurement invariance. *Journal of Psychoeducational Assessment, 37*(6), 757–769. https://doi.org/10.1177/0734282918789561

Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine, 16*(9), 606–613. https://doi.org/10.1046/j.1525-1497.2001.016009606.x

Lerner, R. M., Lerner, J. V., Almerigi, J., Theokas, C., Phelps, E., Gestsdottir, S., Naudeau, S., Jelicic, H., Alberts, A., Ma, L., Smith, L. M., Bobek, D. L., Richman-Raphael, D., Simpson, I., Christiansen, E. D., & Von Eye, A. (2005). Positive youth development, participation in community youth development programs, and community contributions of fifth-grade adolescents: Findings from the first wave of the 4-H Study of Positive Youth Development. *Journal of Early Adolescence, 25*(1), 17–71. https://doi.org/10.1177/0272431604272461

Loevinger, J. (1948). The technique of homogeneous tests compared with some aspects of 'scale analysis' and factor analysis. *Psychological Bulletin, 45*(6), 507–529. https://doi.org/10.1037/h0055827

Maurer, M. M., Daukantaitė, D., & Hoff, E. (2021). Testing the psychometric properties of the Swedish version of the EPOCH Measure of Adolescent Well-Being. *PLOS One, 16*(10), e0259191. https://doi.org/10.1371/journal.pone.0259191

McAuley, E., Duncan, T., & Tammen, V. V. (1989). Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport, 60*(1), 48–58. https://doi.org/10.1080/02701367.1989.10607413

Mokken, R. J. (1971). *A theory and procedure of scale analysis*. De Gruyter Mouton. https://doi.org/10.1515/9783110813203

Muthén, L. K., & Muthén, B. O. (2017). *Mplus user's guide* (8th ed.). Muthén & Muthén.

Osecká, L., & Blatný, M. (1997). Struktura globálního vztahu k sobě: analýza Rosenber-

govy škály sebehodnocení—replikace [The structure of the global relation to self: the analysis of Rosenberg's scale of self-evaluation—the replication]. *Československá psychologie*, *41*(6), 481–486.
Renshaw, T. L., Long, A. C. J., & Cook, C. R. (2015). Assessing adolescents' positive psychological functioning at school: Development and validation of the Student Subjective Wellbeing Questionnaire. *School Psychology Quarterly, 30*(4), 534–552. https://doi.org/10.1037/spq0000088
Richer, S. F., & Vallerand, R. J. (1998). Construction et validation de l'échelle du sentiment d'appartenance sociale [Construction and validation of the Need for Relatedness Scale]. *Revue Européenne de Psychologie Appliquée, 48*(2), 129–137.
Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton University Press.
Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52*(1), 141–166. https://doi.org/10.1146/annurev.psych.52.1.141
Seligman, M. E. P. (2011). *Flourish: A visionary new understanding of happiness and well-being*. Free Press.
Simanjuntak, H., Maruli, S., & Silitonga, L. L. (2023). The EPOCH Measure of Adolescent Well-Being: Psychometric test of the Indonesian version. *Res Militaris*, 13(2), 5716–5726.
Standage, M., Duda, J. L., & Ntoumanis, N. (2003). A model of contextual motivation in physical education: Using constructs from self-determination and achievement goal theories to predict physical activity intentions. *Journal of Educational Psychology, 95,* 97–110. https://doi.org/10.1037/0022-0663.95.1.97
Standage, M., Duda, J. L., & Ntoumanis, N. (2006). Students' motivational processes and their relationship to teacher ratings in school physical education: A self-determination theory approach. *Research Quarterly for Exercise and Sport, 77*(1), 100–110. https://doi.org/10.1080/02701367.2006.10599336
Šeboková, G., Uhláriková, J., & Halamová, M. (2019). Faktorová štruktúra, reliabilita a validita dotazníka EPOCH na meranie well-beingu adolescentov [Factor structure, reliability, and validity of the EPOCH questionnaire for measuring adolescent wellbeing]. *Československá psychologie, 63*(3), 280–298.
Taheri, A., Pourshahriari, M., Abdollahi, A., & Hosseinian, S. (2022). Psychometric assessment of the Persian translation of the EPOCH measure among adolescent girls. *Current Psychology, 41*(7), 4961–4970. https://doi.org/10.1007/s12144-020-01013-7
Van der Ark, L. A. (2007). Mokken scale analysis in R. *Journal of Statistical Software, 20*(11), 1–19. https://doi.org/10.18637/jss.v020.i11
Yusoff, S. R., Hoesni, S. M., Rosharudin, N. A., & Muhammad, N. A. (2024). Validity study of the EPOCH Measure of Adolescent Well-being in Malaysian samples. *Psikohumaniora: Jurnal Penelitian Psikologi, 9*(1), 107–124. https://doi.org/10.21580/pjpp.v9i1.20541
White, M. A., & Kern, M. L. (2018). Positive education: Learning and teaching for well-being and academic mastery. *International Journal of Wellbeing, 8*(1), 1–17. https://doi.org/10.5502/ijw.v8i1.588
Wissing, M. P., & Schutte, L. (2024). Advancing positive psychology in Europe: Current trends and emerging themes. *Psychology*, *15*(4), 552–571. https://doi.org/10.4236/psych.2024.154033
Zeng, G., & Kern, M. L. (2019). The Chinese EPOCH Measure of Adolescent Wellbeing: Further testing of the psychometrics of the measure. *Frontiers in Psychology, 10*, 1457. https://doi.org/10.3389/fpsyg.2019.01457