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ORIGINAL PAPER

A Multiple Indicator Multiple Cause (MIMIC) model of the Self-Compassion Scale Youth (SCS-Y) and investigation of differential item functioning in China, Hong Kong and UK adolescents

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Abstract

Objectives Self-compassion allows one to accept themselves, lower self-criticism and self-judgement and view one's failures and setbacks in a balanced way. Self-compassion in adolescents is an important protective factor against mental distress. However, it is subject to gender and cultural influences. In light of the paucity of self-compassion scales in adolescents, it is crucial to explore measurement invariance of self-compassion measures in adolescents across cultures for its future clinical application in measuring the outcome of compassion-based interventions. The current study validated the Self-Compassion Scale for Youth (SCS-Y) in a large cross-cultural sample.

Method A community sample of 2881 of adolescents aged 12–18 years across Hong Kong, China and the UK were recruited through the online platform Qualtrics. Psychometric properties of the SCS-Y were examined including its reliability and concurrent validity, and a Multiple Indicator Multiple Cause (MIMIC) model was adopted to test measurement invariance of the SCS-Y while differential item functioning (DIF) was checked across gender and countries.

Results Examination of the SCS-Y revealed good psychometric properties including a high reliability, discriminant validity and concurrent validity with SCS. A MIMIC model yielded good model fit for a hypothetical 6-factor model fit (CFI = 0.980; TLI = 0.974; RMSEA = 0.038). Two items were detected for DIF across country.

Conclusion The study established good psychometric properties for SCS-Y including measurement invariance across gender and country. This analysis prepares the SCS-Y for subsequent evaluation of compassion-focused therapy for young people across cultures.

Preregistration This study was not pre-registered.

Keywords Self-compassion · Adolescents · Cross-cultural · Measurement invariance

Adolescence is a transitional period during which individuals gain independence, peer acceptance, and autonomy. Meanwhile, they may encounter personal difficulties that may develop into emotional challenges and mental health risks (Kazdin, 1993). Stressors, such as academic performance, social pressures, self-consciousness about their physical image, peer relationships and acceptance, physical appearance, or sexual attractiveness (Neff & McGehee, 2010; Zhang et al., 2013), increase adolescents' risk for depressive symptoms. Specifically, the prevalence of depressive symptoms among adolescents in China and Hong Kong is as high as 24.3% and 21%, respectively (Stewart et al., 2004; Tang et al., 2019), which is comparable to that in Western countries (20%) (Eapen & Crncec, 2012; Ng & Hurry, 2011), suggesting that adolescent depression is universal and severe.

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The benefits of self-compassion in managing and treating mental distress have garnered much interest recently. Self-compassion is an important component of compassion-focused therapy (Gilbert, 2014). It allows one to accept themself, lower self-criticism and self-judgment, and view their failures and setbacks with balanced judgment (Neff & McGehee, 2010). It supports parsimonious self-regulation in cognitive, emotional, and behavioral domains in individuals with psychiatric conditions (Finlay-Jones, 2017). Self-compassion, which is linked to Buddhist philosophy, comprises three major intertwining domains that each entails two opposite perspectives: self-kindness vs. self-judgment (being nonjudgmental toward oneself in pain or failure); common humanity vs. isolation (i.e., the ability to identify one's suffering as part of a larger human experience rather than an isolated event); and mindfulness vs. overidentification (i.e., the balanced awareness of the present moment without being overwhelmed by negative sentiments) (Neff, 2003a). The positive association between self-compassion and mental well-being and its protective role in combating mental distress has been extensively documented (Brenner et al., 2018; Zessin et al., 2015).

The Self-Compassion Scale (SCS) (Neff, 2003b) has been widely utilized in the literature to measure this psychological construct. The SCS traits and subscales were studied and have been translated into at least 17 languages, including Chinese, Greek, French, and English, for both adolescent and adult populations (Meng et al., 2019; Neff et al., 2019). Researchers have examined the psychometric properties of the six components of self-compassion established by the SCS developers (Costa et al., 2016; Cunha et al., 2016; Meng et al., 2019; Tóth-Király & Neff, 2021). Confirmatory factorial analyses supported the use of SCS as a multidimensional construct comprising six subscales (Huang et al., 2022; Meng et al., 2019; Neff et al., 2019). The distinctive poles of self-compassion have also sustained academic interest (Muris & Otgaar, 2022). These studies reported good internal reliability as well as good convergent and divergent validities (Cunha et al., 2016; Neff, 2003a).

Despite abundant evidence of self-compassion in adult populations, empirical evidence for self-compassion in adolescents is relatively scarce. However, adolescents are prone to self-criticism, feeling isolated, and emotional vulnerability, which are mediated by abstract thinking (e.g., Piaget, 1950) and self-focus (e.g., Elkind, 1967). They may reflect on themselves and be preoccupied with what others think of them. They could be subject to the illusion of being under the spotlight and regard their experience and feelings as unique (Elkind, 1976). In a group of Hong Kong adolescents, boys reported a greater amount of isolation (Sun et al., 2016). Self-critical adolescents are more vulnerable to depression, but self-compassion could be an important countermeasure against self-criticism (Zhang et al., 2019). A meta-analysis reported a strongly negative association between self-compassion and psychological distress in young people aged 10–19 across 19 studies (Marsh et al., 2018).

Neff et al. (2020) later developed a 17-item SCS for youth from the SCS, primarily for younger individuals in the age range of 10–14. It addresses the paucity of well-validated self-compassion scales for adolescents and research on self-compassion in adolescents, as well as the scarcity of research on self-compassion in adolescents. The original SCS was shortened and items such as "the human condition," "flaws and inadequacies," and "balanced view of the situation" were modified to make an age-appropriate scale suitable to adolescents' comprehension. SCS-Y also demonstrated good psychometric properties, including high internal consistency, test–retest reliability, and factorial validity (Neff et al., 2020).

However, self-compassion varies across genders and cultures. In particular, women reported a slightly lower level of self-compassion than men in North America (Yarnell et al., 2015), and this difference is consistent in college and community samples (Yarnell et al., 2018). Similarly, women are reported to be more self-critical (Cheng & Furnham, 2004), ruminate more (Johnson & Whisman, 2013), and have lower levels of mindfulness than men (Alispahic & Hasanbegovic-Anic, 2017). Although women are more empathetic toward others than men (Löffler & Greitemeyer, 2021), the pattern may not be generalized to how they treat themselves. Indeed, further studies supported that it is not gender but gender role orientation that is a better predictor of self-compassion. Masculine women and men tended to report the highest level of self-compassion (Yarnell et al., 2018). In addition, a variation in the level of self-compassion has been reported across different countries. For example, Korean undergraduates reported a higher level of self-compassion than their Western counterparts. Among adults, Australian, Brazilian, Hungarian, Italian, and Spanish adults were found to have the highest level of self-compassion, whereas the lowest self-compassion was reported among adults from the France, United Kingdom, and Greece, with the United States and Germans being in between (Tóth-Király & Neff, 2021). Comparing Chinese and American undergraduates, both scored similarly in their Self Compassion Scale total scores but Chinese students were found to experience more intense extremes of self-compassion. Their levels of positive self-compassion (i.e., self-kindness, acceptance, and common humanity) and negative self-compassion (i.e., self-criticism and isolation) are higher than in US students (Birkett, 2013). The strong impact of cultural factors on self-compassion was also demonstrated in individualistic countries, such as the UK and the US, and in collectivistic countries, such as Korea and Japan. (Montero-Marin et al., 2018) among adult populations. A greater likelihood of self-enhancement has been reported in individualistic cultures (United States), whereas greater self-criticism has been reported in collectivistic cultures

(Japan) (Kitayama et al., 1997). This suggests that close and emotionally interdependent social relations can heighten self-criticism (Kitayama & Uchida, 2003) by helping to overcome personal shortcomings and promoting harmonious relationships with others. Neff et al. (2008) also reported differences in self-compassion across Taiwan, Thailand, and the United States. The results demonstrated that self-compassion is greatest in Thailand and lowest in Taiwan, with the United States being in the middle.

Considering the gender and cultural influence of self-compassion, it is important to validate the SCS-Y and clarify the factor structure and measurement invariance of the SCS-Y across cultural groups before its implementation to quantify the emerging interest in self-compassion in adolescents across cultures. The current study adopted a cross-cultural design with a large sample to study the psychometric properties of SCS-Y in adolescents aged between 12 and 18 in Hong Kong, China, and the UK. It also examined measurement invariance to determine whether the scales had a stable factor structure that is independent of group membership across gender and cultures.

The survey participants were categorized as UK and Chinese for comparison. The study examined the reliability and validity of SCS-Y across countries. It also established the measurement invariance of SCS-Y across gender and country. A China vs. UK comparison was selected due to the large contrast between the two countries on Hofstede's individualism vs. collectivism (IDV) index (UK 89 vs. China 20), which suggests a salient discrepancy of individual vs. group identity. The contrast can assist in comparing self-compassion in a highly collectivistic and individualistic society (Han, 2014). This study was also part of a larger study by scholars in China and the UK on self-compassion comparisons in adolescents, with collaborators from both countries.

Method

Participants

A total of 2881 participants aged 12–18 were recruited from China (including Hong Kong) and the UK via the online platform, Qualtrics. The sample consisted of 1777 Chinese participants (61.7%) and 1104 UK participants (38.3%). The inclusion criteria were participants aged 12–18, whereas the exclusion criteria were illiteracy of written English (for UK participants) and traditional and simplified Chinese (for Chinese participants). Demographic details are reported in the Results section below.

Procedure

Participants were recruited from the UK and China (including Hong Kong) through a partnership with Qualtrics. The Qualtrics network of participant pools, known as the Marketplace, comprises hundreds of providers who utilize various recruiting methods (A. Taylor; personal communication). Samples were obtained from pre-existing pools of research panel members who had consented to being approached for research purposes. By incorporating multiple sources into the sampling process, Qualtrics guarantees that the sample is representative of the population. The responses could be sourced through ads and promotions across various digital networks, word of mouth and membership referrals, social networks, online and mobile games, affiliate marketing, banner ads, TV and radio ads, and offline mail-based recruitment campaigns.

Prospective survey respondents were recruited based on demographic inclusion criteria of age 12–18, as disclosed in their user profiles (e.g., race and age). Panelists were recruited and opted in by clicking on a survey link that sent them to the research permission page and survey instrument. Ineligible respondents, those who provided a response that did not match inclusion criteria or exceeded predefined quotas (i.e., a priori quotas for race or household income group were previously reached), were immediately removed from the survey.

Qualtrics assured data quality through (i) attentiveness checks (i.e., survey questions instructing respondents to deliver a particular answer) and (ii) speeding checks (i.e., respondents whose survey duration was one-third the median survey time). Respondents who failed either quality check were barred from participating in the final sampling. The two surveys were similar in terms of survey time and participant compensation. Qualtrics charged investigators $6.50 per completed survey answer (Miller et al., 2020).

Each respondent answered an online survey of self-reported measures of SCS, SCS-Y, and demographic variables (age, gender, and country, and history of mental illness and medication) on the Qualtrics platform. Adolescents with a history of mental illness and medication were also included in the study to increase the heterogeneity of the community sample and the representativeness of the sample. Informed consent from the participants and parental consent were sought in the consent paragraph of the online survey and through Qualtrics, without which they would be barred from access to the survey. Participation was anonymous, and personal details were not collected during the survey. The study was approved by the university ethics committee.

Measures

Self-Compassion Scale for Youth (SCS-Y)

The SCS-Y (Neff et al., 2020) is a 17-item self-reported instrument for measuring self-compassion in adolescents, with a total score range of 17–85. Like SCS, it has 6 subscales: self-kindness, mindfulness, common humanity, self-judgment, isolation (each represented by three items), and over-identification (represented by two items). Each item is rated from 1 (*almost never*) to 5 (*almost always*) on a 5-point Likert scale. The factor structure of the general self-compassion score and its 6 scales were validated by Neff et al. (2020) after its development. The scale has also been found to have good test-retest reliability and construct validity (Neff et al., 2020), and the scores were significantly related to mental well-being and life satisfaction (Jensen de López et al., 2023; Pyszkowska & Rönnlund, 2021).

Self-Compassion Scale (SCS)

The SCS (Neff, 2003a) was used to assess the concurrent validity of the SCS-Y by checking the Spearman correlation. As the most widely used self-compassion questionnaire, it consists of 26 items of positive and negative components of self-compassion and 6 intercorrelated subscales of self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification (Cleare et al., 2018; Neff, 2016). Each item was rated on a 5-point Likert scale from 1 (*almost never*) to 5 (*almost always*). The total score ranged from 24 to 120. The scale demonstrates good concurrent validity, convergent validity, discriminate validity, test-retest reliability, and good internal consistency ($\alpha = 0.92$; Neff, 2003a). The Chinese version of SCS exhibited high internal consistency ($\alpha = 0.84$) and test–retest reliability ($\alpha = 0.89$; (Chen et al., 2011).

Chinese Translation of SCS-Y

As part of the study, the translation of SCS-Y was adopted from the Chinese version of SCS (Chen et al., 2011) and supplemented by the parallel back-translation procedure (Brislin, 1986), in which the 17-item SCS-Y was translated to Chinese by a Chinese–English bilingual psychologist. Another bilingual psychologist in the project team, who never saw the two scales, back-translated them into English. The Chinese phrases and vocabulary in the translated version were checked by a third bilingual expert, so the phrases were idiomatic to increase the readability of SCS-Y.

Data Analyses

In light of the aim of this study, the data were analyzed in several steps. In terms of reliability, as recommended for ordinal Likert-type scales, the internal consistency was examined using corrected item-total correlation for subscales and Cronbach's alpha. The ordinal Cronbach's alpha and composite reliability was also conducted by semTools and psych Packages (Revelle, 2015) in R version 4.2.1 (Revelle, 2017) as the equivalent of Cronbach's alpha coefficient, which, instead of the Pearson correlation matrix, is based on a polychoric correlation matrix (Gadermann et al., 2012). A correlation coefficient of 0.70 or higher was considered an acceptable level of internal consistency of the items (Cicchetti, 1994).

The discriminant validity was analyzed using the graded response model (Samejima, 1968), in MIRT 1.3 (Chalmers, 2012). The discrimination or "*slope*" parameter specified by "*a*" shows the extent to which an item is related to self-compassion and how well an item discriminates between people with different levels of the latent trait. Items with higher discrimination parameters provide more information about self-compassion. Item discrimination values between 0.01 and 0.34 are considered "*very low*'', values between 0.34 and 0.64 are interpreted as "*low*'', values between 0.65 and 1.34 are "*moderate*'', values between 1.35 and 1.69 are "*high*'', and values > 1.70 are considered "very high'' (Baker, 2001). Additionally, the discrimination ability of subscales was measured using an average variance extraction (AVE). A value above 0.50 corresponded to an acceptable discriminant validity, whereas an AVE < 0.50 is considered "questionable" because it implies that the variance due to measurement error exceeds the variance captured by the construct, and the discriminant validity of the individual indicators, as well as the construct, appears to be in question (Henseler et al., 2015). The SCS-Y was also compared against the SCS for concurrent validity using Spearman correlation.

Multiple indicator multiple cause (MIMIC) modeling (Masyn, 2017) is a modern approach to examining the presence of differential item functioning (DIF) in assessing measurement invariance across groups. Detecting DIF is crucial in scale development as it determines whether a scale can assess the same psychological construct in individuals with diversified demographic characteristics or at different time points. It resolves the measurement biases when an instrument behaves differently across populations and invalidates the comparisons. DIF would present when groups generate response bias at the item level under the same level of construct (Marsh et al., 2013; Tóth-Király et al., 2017). As a special form of structural equation modeling (SEM), a MIMIC model entails a measurement model that examines the association between a latent variable and its indicators (i.e., items on a scale). It also includes a structural model

that tests the direct effect of a covariate (e.g., country) on the factor means and factor indicators. When a significant direct effect is found, it implies that the factor mean or item mean is different at different covariate levels. MIMIC models have a few advantages: they facilitate maximum likelihood estimation for nonnormal data, which is usually obtained using Likert scales. The statistical power would also be greater than in multiple-group models. MIMIC models offer advantages over multigroup confirmatory factor analysis in testing for DIF (Raykov et al., 2013) as they require a smaller sample size. MIMIC models' flexibility also allows the inclusion of multiple covariates (country and gender) in the analysis to be simultaneously analyzed and interacted with. The MIMIC model was used in the current study to check the stability of the factor structure after adding the covariates of gender and country.

The MIMIC model was established for the SCS-Y model in the presence of covariates (grouping factor) of country and gender. The series of analyses together established measurement invariance across countries and genders for future implementation of these scales. To study how individual compassion items differ across groups for measurement invariance, DIF was detected when the underlying latent variable was the same across groups (e.g., cultures), but participants score differently on the observed variables.

To build a baseline model, two models were established and compared to those in the literature: the hypothetical 2-factor model (self-kindness and self-blame) (Brenner et al., 2017; Costa et al., 2016) and a 6-factor model of 3 positive and 3 negative factors (self-kindness, mindfulness, common humanity, self-judgment, isolation, and over-identification) (Bento et al., 2016; Mantzios et al., 2013; Neff et al., 2008). Upon identifying the baseline model, the latent variables were regressed on a covariate recoded in dummy variables. Significant regression coefficients would imply significant mean differences for latent variables across groups (i.e., DIF). At this level, direct paths between the covariates (e.g., culture) and observed indicator variables were fixed to zero. Next, the presence of DIF would be detected by modification indices (MIs) for the direct paths from the covariates to the MDAS items. The improvement in model fit was examined using MIs by adding paths to the model and reducing the chi-square by 3.84 or more (the critical value for the chi-square for 1 degree of freedom). However, in this analysis, a more conservative value of 5 was used to align with the recommendation (Murphy et al., 2019). By freely estimating paths with the largest MI and re-estimating, the subsequent model was obtained, and the process was repeated until no MI was greater than 5. The process involved the path with the largest MI being freely estimated in the model, and the model was re-estimated. A good model fit was indicated by the following parameters: the chi-square ($\chi 2$; desire $p > 0.05$), the Tucker–Lewis index (TLI > 0.95), the comparative fit index (CFI > 0.95), the standardized root mean square residual (SRMR < 0.08), the root mean square error of approximation (RMSEA < 0.06) (Bentler, 1990; Bentler & Bonett, 1980; Loehlin, 2004; MacCallum et al., 1996; Miles & Shevlin, 2007) and the Bayesian information criterion (BIC). The software MPlus 8.1 (Muthen and Muthen, 1998–2015) was employed for the performance of MIMIC model. In the current study, country was dichotomized to be (1 = *Chinese*, 2 = *UK*), gender (1 = *female*, 2 = *male*). All analyses achieved a statistical significance of 0.05. Type-1 error was also controlled by recruiting a relatively large and representative sample across countries to ensure adequate statistical power, which is negatively related to the probability of type-1 error.

Results

The demographic details of the sample are summarized in Tables 1 and 2. The sample consisted of 2881 participants living in China and the United Kingdom. There were 1777

Table 1 Descriptive statistics of participants from two countries

Variables	Chinese ($n = 1777$) 61.7 (%)	United Kingdom ($n = 1104$) 38.3 (%)	χ^2
Age			
Mean (S.D)	16.58 (1.32)	16.42 (1.30)	3.11**
	n (%)	*n* (%)	
Gender			110.40**
Female	1009 (56.8)	840 (76.1)	
Male	768 (43.2)	264 (23.9)	
Ethnicity			2153.92**
Asian	1740 (97.9)	148 (13.4)	
Caucasian	34 (1.9)	774 (70.1)	
Black	0 (0.0)	89 (8.1)	
Hispanic	0 (0.0)	18 (1.6)	
Others	3 (0.2)	75 (6.8)	
Mental disorders in the past two weeks			30.34**
Yes	292 (16.4)	274 (24.8)	
No	1485 (83.6)	830 (75.2)	
Taking psychiatric medication			6.03*
Yes	80 (4.5)	73 (6.6)	
No	1697 (95.5)	1031 (93.4)	

*$p < 0.05$

**$p < 0.01$

Table 2 A summary of qualitative responses on mental issues in past 2 weeks

Self-report mental conditions	*n*(%)
Single condition	
Anxiety	146 (28.52)
Depressive mood	69 (13.48)
Eating Disorder	4 (0.78)
Sleeping problem	10 (1.95)
ADHD and autism	7 (1.37)
Suicidal	3 (0.59)
Psychosis	2 (0.39)
Comorbidity	
Depression and anxiety and others	72 (14.06)
Anxiety and others	15 (2.93)
Depression and others	2 (0.39)
Borderline Personality disorder and others	2 (0.39)
OCD and PTSD	8 (1.56)
Daily hassle	
School and exam	94 (18.36)
Interpersonal	20 (3.91)
Unspecified	58 (11.33)
Total	512 (100)

Table 3 Mean difference between SCSY total score across countries

SCS-Y total score by country	Mean (*SD*)	*t*-value
UK	45.83 (10.96)	16.74***
China	52.39 (8.92)	

*** $p < 0.001$

participants recruited from China (including Hong Kong), the mean age of the participants was 16.58 (standard deviation [*SD*] = 1.32), and there were 1009 (56.8%) female and 768 (43.2%) male participants. The major ethnic group of participants from China was Asian (97.9%). Further, 16.4% of participants from China had a history of mental disorders, compared to 24.8% of UK participants ($p < 0.01$).

The UK sample consisted of 1104 participants with a mean age of 16.42 (*SD* = 1.30), 840 (76.1%) female participants, and 264 (23.9%) male participants. The majority ($n = 774$, 70.1%) of participants who live in the United Kingdom identified as Caucasian. Two hundred seventy-four (24.8%) participants reported having a history of mental disorders, and 73 (6.6%) participants are currently taking psychiatric medication. The total scores for SCS-Y in the Chinese sample ($M = 52.39$, $SD = 8.92$) were significantly higher than in the UK sample ($M = 45.83$, $SD = 10.96$); $t(1988.33) = 16.74$, $p = 0.001$ (Table 3).

Reliability (Internal Consistency)

The two countries exhibited an acceptable level of Cronbach's alphas: 0.76 and 0.88 for China and the UK, respectively. A Cronbach's alpha value greater than 0.70 indicates good internal consistency of the SCS-Y scale across the two countries. In terms of ordinal alpha coefficients, which indicate the Likert scale reliability, all subscales reported a coefficient over 0.70, indicating an acceptable level of reliability.

Discriminant Validity

Item discrimination values for all SCSY items ranged between 1.70 and 2.74, suggesting a very high discrimination ability for the items (Baker, 2001). All subscales also reported an average variance extracted (AVE) higher than 0.50, corresponding to an acceptable discriminant validity (Henseler et al., 2015).

Concurrent Validity

Spearman's correlation between SCS-Y and SCS across the two countries was significantly positive: $r = 0.75$, $p < 0.01$ for China and $r = 0.84$, $p < 0.01$ for the United Kingdom. These strong and positive Spearman's correlations between SCS-Y and SCS suggested that the concurrent validity of SCS-Y across the countries was good (Table 4).

A baseline model was first built. Among the three models, the 6-factor model provided the best fit: $\chi^2(104, n = 2881) = 529.561$, $p < 0.001$; CFI = 0.980; TLI = 0.974; RMSEA = 0.038, BIC = 132695.139, SRMR = 0.029 (Table 5). Although the results of the chi-square test were statistically significant, the models should not be rejected because the power of the chi-square test is related to sample size (Tanaka, 1987). The six factors of self-compassion were then regressed on gender and country variables. The procedure allowed the direct effect of gender and country on the latent factors to be investigated.

The overall model fit differed little: $\chi^2(104, n = 2881) = 529.561$, $p < 0.001$; CFI = 0.980; TLI = 0.974; RMSEA = 0.038, BIC = 132695.139; SRMR = 0.028. An examination of the modification indices revealed that, if freely estimated, direct effects of the country variable on two items (E15, MI = 29.62 and E17, MI = 18.75) would enhance model fit. Accordingly, each direct effect was added to identify the presence of a significant DIF while adjusting for differences in the overall level of the latent factor across groups. The DIF item associated with country was Item 15 ("I try to be understanding and patient with myself even when I mess up.") and Item 17 ('When something upsets me, I try to notice my feelings and not get carried away by them."). The different effects of Items 15 and 17 were added, and the model was then

Table 4 Items mean, standard deviation, skewness, kurtosis, corrected item-total correlations, and reliability of SCSY

Subscale	Item No	*M*	*SD*	r^{cs}	*SK*	*KU*	CAID	Alpha coefficients	OACID	Ordinal Alpha coefficients	AVE	Item parameter estimates	Fit Index		
												a	χ^2	df	RMSEA
Self-Kindness	1	2.99	1.13	0.66	-0.09	-0.76	0.69	0.79	0.73	0.82	0.60	2.69	90.47	11	0.05
	9	2.97	1.15	0.66	0.04	-0.80	0.69		0.73			2.73	76.91	11	0.05
	15	2.94	1.09	0.58	0.04	-0.70	0.77		0.81			1.79	90.35	13	0.05
Self-Judgment	3	3.08	1.19	0.64	-0.01	-0.88	0.71	0.79	0.75	0.82	0.56	2.35	35.83	12	0.03
	7	3.25	1.19	0.65	-0.16	-0.87	0.70		0.74			2.59	64.63	12	0.04
	12	3.14	1.18	0.61	-0.07	-0.88	0.74		0.78			2.04	74.03	13	0.04
Common Humanity	4	2.91	1.11	0.59	0.02	-0.73	0.68	0.76	0.72	0.79	0.51	2.08	55.32	12	0.04
	8	2.92	1.11	0.62	0.08	-0.69	0.65		0.68			2.47	72.84	11	0.04
	13	3.13	1.12	0.56	-0.10	-0.71	0.71		0.75			1.81	83.34	12	0.05
Isolation	2	3.08	1.17	0.60	-0.04	-0.85	0.74	0.79	0.78	0.82	0.55	1.97	57.39	13	0.03
	10	3.08	1.19	0.65	-0.07	-0.91	0.68		0.72			2.74	60.79	11	0.04
	16	3.08	1.16	0.62	-0.04	-0.82	0.71		0.75			2.25	67.45	13	0.04
Mindfulness	6	3.04	1.11	0.53	-0.02	-0.71	0.69	0.74	0.73	0.77	0.49	1.70	225.48	13	0.08
	11	3.02	1.10	0.60	-0.01	-0.66	0.61		0.65			2.47	47.65	11	0.03
	17	3.15	1.11	0.56	-0.10	-0.72	0.65		0.69			1.94	59.31	12	0.04
Over-Identification	5	2.72	1.24	0.57	0.21	-0.96	0.61	0.73	0.62	0.77	0.58	2.25	61.63	12	0.04
	14	3.20	1.17	0.57	-0.15	-0.84	0.55		0.62			2.43	72.01	13	0.04

M Mean, *SD* standard deviation, *SK* skewness, *KU* kurtosis, r^{cs} corrected item-total correlation for subscales' items, *CAID* Cronbach's alpha if item deleted, *OACID* Ordinal Alpha coefficient if item deleted, *VAE* Average Variance Extracted, *a* item discrimination

reanalyzed with the item freely estimated. The model fit of each reanalyzed model is listed in Table 6. The final DIF-corrected model was X2 (124, $n = 2881$) = 560.894, $p < 0.001$; CFI = 0.980; TLI = 0.972; RMSEA = 0.035, BIC = 132248.659, SRMR = 0.026. The final model demonstrated similar model fit statistics as the baseline but RMSEA dropped (0.003), and BIC decreased by 446.48. The result suggested that the final model was better fitted than the baseline (Fig. 1). The complete figure with the error variances shown can be found in Fig. S1 of the Supplementary Materials.

Table 7 lists the standardized regression coefficients for the structural effects of gender and country on the six latent factors and two DIF items (self-understanding after messing up and not carried away by upsetting events) in the original and DIF-corrected models. The results indicated that self-compassion factors in men are significantly higher. In terms of country, Chinese participants reported significantly

Table 5 A comparison of Fit indices among CFA models

Models	CFI	TLI	RMSEA (90% CI)	SRMR	BIC	χ^2/df
Single factor	0.477	0.402	0.179 (0.176–0.182)	0.207	143,177.761	21,174.880/136***
2-factor model	0.932	0.921	0.065 (0.062–0.068)	0.049	133,612.731	1558.675/118***
6-factor model	0.980	0.974	0.038 (0.035–0.041)	0.029	132,695.139	529.561/104***

Table 6 A comparison of fit indices among MIMIC models

Models	CFI	TLI	RMSEA (90% CI)	SRMR	BIC	χ^2/(df, $n = 2881$)
Baseline-6 factor	0.980	0.974	0.038 (0.035–0.041)	0.029	132,695.139	529.561/104***
Gender	0.980	0.973	0.036 (0.033–0.039)	0.028	132,652.884	540.738/115***
Gender and country	0.978	0.974	0.038 (0.035–0.041)	0.029	132,695.139	529.561/104***
Country > E15	0.979	0.971	0.036 (0.033–0.038)	0.026	132,259.461	579.662/125***
Country > E17	0.980	0.972	0.035 (0.032–0.038)	0.026	132,248.659	560.894/124***

BIC Bayesian information criterion; *CFI* comparative fit index; *TLI* Tucker Lewis index; *RMSEA* root-mean-square error of approximation; *CI* confidence interval; *SRMR* standardized root-mean-square residual

*** $p < 0.001$

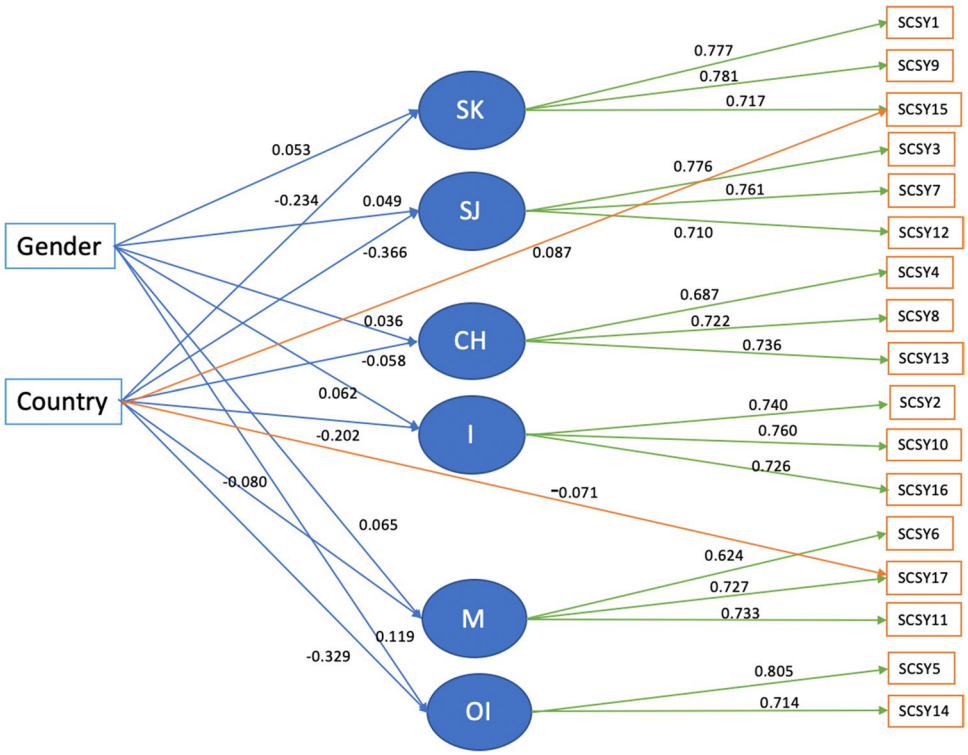

Fig. 1 MIMIC model of SCS-Y with gender and country as covariates. SK: Self-kindness, SJ: Self-judgement, CH: Common Humanity, I: Isolation, M: Mindfulness, OI: Over-identification

Table 7 MIMIC model statistics of DIF items and SCS-Y factors

Item	Uncorrected model	Final DIF-corrected model
	ß(*SE*), df = 126	ß(*SE*), df = 126
Factor 1(self-kindness)		
Gender	0.054(0.021)* ($p = 0.01$)	0.053(0.021)*($p = 0.01$)
Country	-0.207(0.020)***	-0.234(0.021)***
Factor 2 (self- judgment)		
Gender	0.049(0.020)* ($p = 0.015$)	0.049(0.020)*($p = 0.015$)
Country	-0.366(0.019)***	-0.366(0.019)***
Factor 3 (common humanity)		
Gender	0.036(0.022) ($p = 0.095$)	0.036(0.022)($p = 0.095$)
Country	-0.058(0.022)**	-0.058(0.022)**
Factor 4 (isolation)		
Gender	0.062(0.021)**	0.062(0.021)**
Country	-0.202(0.021)***	-0.202(0.021)***
Factor 5 (mindfulness)		
Gender	0.065(0.022)**	0.065(0.022)**
Country	-0.119(0.022)***	-0.080(0.023)**
Factor 6 (overidentification)		
Gender	0.119 (0.021)***	0.119(0.021)***
Country	-0.329 (0.020)***	-0.329(0.020)***
Item 15		0.087(0.016)***
Item 17		-0.071(0.016)***

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

greater self-compassion factors, whereas UK participants tended to score higher on Item 15: Chinese participants tended to score higher on Item 17.

Discussion

This study aimed to validate the SCS-Y in UK and Chinese samples from the perspective of gender and country differences in the six-factor model fit. Self-compassion has been observed to vary across sex and cultures but is understudied among adolescents despite its importance. SCS-Y exhibited acceptable internal consistency; very good discriminant validity for all items; and impressive concurrent validity, as evidenced by a high Spearman correlation with SCS. The moderate internal consistency could be attributed to the polarity of self-compassion items because both positive and negative items are included in SCSY. Furthermore, that only 3 items are present per factor undoubtedly compromises the reliability and validity of any scale, and the responses of people with a history of mental disorders or those currently taking medication to the scale may differ. In this regard, analyzing the invariance in the scale by taking this variable as a covariate and/or to examine how the psychometric properties of the scale change when these individuals are excluded from the sample could be an interesting line of future research.

The hypothetical 6-factor model of correlated factors (self-kindness vs. self-judgment; common humanity vs. isolation; mindfulness vs. overidentification) yielded a good model fit. This result corroborated those in the literature (Bento et al., 2016; Mantzios et al., 2013; Neff et al., 2008) on a 6-factor model in various populations. In the Chinese population in particular, Huang et al. (2022) also reported a 6-factor model of SCS-Y as the best-fit model. However, this is the first study to consider gender and cultural invariance in SCS-Y.

Although the 6-factor model was reported to have the best model fit, a first-order-2-factor model representing positive and negative self-compassion was not without support in the literature (Costa et al., 2016; Lopez Angarita et al., 2015). In the current study, the 2-factor model also yielded an acceptable model fit (CFI > 0.90, RMSEA < 0.70). Specifically, the variability in the factor structure of SCS-Y could be explained by method variance via the use of positive and negative items, which could create unintended factors (Williams et al., 2002). The use of positive and negative items has often been criticized for reducing internal reliability and creating problems in factor structure and criterion-related validity (Lewis & Sauro, 2009). In particular, the uncompassionate items have also been criticized for being unrelated to the protective nature of self-compassion, being instead related to psychopathology (Muris et al., 2018).

Despite the popularity of the SCS and recognition of its validity, the measurement invariance of the newly developed SCS-Y has yet to be established in adolescents across countries and genders. On regressing the underlying factors of SCS-Y on gender and country, the result showed consistent findings with previous studies (e.g., Yarnell et al., 2018) that male adolescents demonstrated a higher level of underlying SCS-Y factors than females. Chinese adolescents also reported a significantly higher level across the underlying factors of SCS-Y, a pattern consistent with the findings that Chinese undergraduate students experienced more intensely the extremities of self-compassion (Birkett, 2013) despite the overall higher total score in SCS-Y in Chinese than in UK adolescents. A cultural factor such as dialecticism (Peng & Nisbett, 1999), which determines how one perceives conflicting concepts and settles for a final perspective, could also influence self-compassion. Although adults from dialectical and nondialectical cultures operate holistically through compassionate and uncompassionate self-responding (Miyagawa & Neff, 2023), Chinese adolescents could be more influenced by dialectical cultures and have more inconsistent self-views and behaviors across contexts (Spencer-Rodgers et al., 2009). This could lead to their contradictory self-statements and increase their ambivalence in the self-evaluation (Spencer-Rodgers et al., 2004). Thus, it increases the risk of self-compassion extremes. Future studies on their operation in adolescents should be conducted.

By inspecting the DIF items of the SCS-Y across gender and countries in adolescents, measurement invariance for further clinical and research use was established. There were no DIF items across gender, suggesting all items were invariant in measuring self-compassion in males and females. Of the 17 items, 2 differed across countries, as indicated by the modification indices. When the direct effects of the 2 items between countries were freely estimated, the improved model resulted in a lower BIC. The detection of DIF items hindered the country-level comparison across 2 of the self-compassion items. In the literature, Chinese adolescents reported a higher capability for controlling their emotions and not being overwhelmed in distress. This corroborates the findings of Zhao et al. (2021) on Chinese children, who found that mindfulness was perceived as a type of emotion repression. Further studies should explore the Chinese translation of this construct and the development of Chinese self-compassion measures in depth.

On the other hand, UK adolescents reported a higher ability to perceive the uniqueness of their setbacks and a greater tendency toward self-sympathy after mistakes. This pattern may be consistent with the core features of collectivism and individualism. The former emphasized expressive suppression, whereas the latter focused on emotional expression (Ramzan & Amjad, 2017). Emotional control is more valued in collectivistic cultures for maintaining social harmony. Likely, Chinese adolescents perceived their ability to contain distress to be greater than their actual abilities to conform due to deeply indoctrinated ideology during their upbringing and education. Further research is needed to look into their self-compassion pattern.

In addition, uniqueness has been commonly regarded as a defining feature of individualism (e.g., Markus and Kitayama, 1991). This is demonstrated in the pattern of self-compassion in the current study, where UK adolescents reported a higher tendency than Chinese adolescents to view their challenges as unique, potentially influencing their perceived loneliness, which could subsequently intensify mental disturbances, such as depression. Moreover, other factors, such as forgiveness, also differs between individualistic cultures, such as the US, and collectivistic cultures, such as Japan (Joo et al., 2019). Western culture focuses more on intrapersonal relations and self-enhancement while Eastern Asian culture places more emphasis on relationship harmony and emotional control to maintain stable interpersonal relationships. Consistent with the findings, UK teenagers rated higher than Chinese adolescents in being patient and understanding of themselves when they make mistakes.

Limitations and Future Research

The dialectical thinking and benign self-criticism and self-reflection that revise the Chinese conceptualization of self-compassion were postulated by Zhao et al. (2021). This is supported by Tsai (2015), who extracted a 4- rather than a 6-factor structure in Chinese gifted adolescents (self-kindness, self-criticism, common humanity, and mindfulness).

The similarity in factor structure across cultures could be due to the inclusion of participants from Hong Kong in the China pool. Hong Kong could be under greater individualistic influence, which is reflected in a more Westernized self-construal and identity (House & House, 2004). Future studies should increase the homogeneity of the sample in each cultural group. The study had some limitations, such as a binary gender option. As transgender and gender nonconforming individuals are social minority groups (Lin et al., 2021), a consistent binary gender option was offered to all participants. In future studies, nonbinary gender should be investigated to obtain a fuller picture of gender and self-compassion.

Conclusion

The current study translated the self-compassion scale for youth into Chinese and tested it on UK and Chinese samples. The study yielded good reliability and validity for SCS-Y.

In testing measurement invariance using the MIMIC model, a good model fit was obtained for a 6-factor model corresponding to three positive self-compassion spheres and three negative self-compassion spheres. Upon checking the modification index, 2 items were flagged for DIF across the country. The DIF items associated with country were Y15 ("I try to be understanding and patient with myself even when I mess up.") and Y17 ("When something upsets me, I try to notice my feelings and not get carried away by them."). In particular, UK participants tended to score higher on Y15, whereas Chinese participants tended to score higher on Y17.

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Author Contributions Dr. Ho Nam Cheung, lead author and corresponding author, designed the study, collected data, ran analysis, and drafted the first manuscript.

Miss. Wing Shan Ho, second author, prepared demographic statistics and drafted part of the result section.

Dr. Habibi Asgarabad, M helped double-checked the data analysis and revised tables and results in the last resubmission.

Prof. Stella Chan, joint last author, reviewed the study and the manuscript.

Prof. Jo Williams, joint last author, reviewed the study and the manuscript.

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Data Availability Data is available upon emailing Dr. H. N. Cheung at amy.hn.cheung@hku.hk.

Declarations

Ethical Approval The study had been approved by the ethics committee of the Hong Kong Metropolitan University and has, therefore, been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. All participants provided informed consent prior to their participation in the study.

Conflict of Interest The authors declare that they have no conflicts of interest.

References

Alispahic, S., & Hasanbegovic-Anic, E. (2017). Mindfulness: Age and gender differences on a Bosnian sample. *Psychological Thought, 10*(1), 155–166. https://doi.org/10.5964/psyct.v10i1.224

Baker, F. B. (2001). The basics of item response theory (2nd ed.). *ERIC*.

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin, 107*(2), 238–246. https://doi.org/10.1037/0033-2909.107.2.238

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*(3), 588–606. https://doi.org/10.1037/0033-2909.88.3.588

Bento, E., Xavier, S., Azevedo, J., Marques, M., Freitas, V., Soares, M. J., Martins, M. J., Xavier, A., Castilho, P., Morais, S., Macedo, A., & Pereira, A. T. (2016). Validation of the Self-Compassion Scale in a community sample of Portuguese pregnant women. *European Psychiatry, 33*(S1), S238–S238. https://doi.org/10.1016/j.eurpsy.2016.01.598

Birkett, M. A. (2013). Self-compassion and empathy across cultures: Comparison of young adults in China and the United States. *International Journal of Research Studies in Psychology, 3*(1), 25–34. https://doi.org/10.5861/ijrsp.2013.551

Brenner, R. E., Heath, P. J., Vogel, D. L., & Credé, M. (2017). Two is more valid than one: Examining the factor structure of the Self-Compassion Scale (SCS). *Journal of Counseling Psychology, 64*(6), 696–707. https://doi.org/10.1037/cou0000211

Brenner, R. E., Vogel, D. L., Lannin, D. G., Engel, K. E., Seidman, A. J., & Heath, P. J. (2018). Do self-compassion and self-coldness distinctly relate to distress and well-being? A theoretical model of self-relating. *Journal of Counseling Psychology, 65*(3), 346–357. https://doi.org/10.1037/cou0000257

Brislin, R. W. (1986). The wording and translation of research instruments. In W. J. Lonner & J. Berry (Eds.), *Field methods in cross-cultural research* (pp. 137–164). Sage.

Chalmers, R. P. (2012). mirt : A multidimensional item response theory package for the R environment. *Journal of Statistical Software, 48*(6), 1–29. https://doi.org/10.18637/jss.v048.i06

Chen, J., Yan, L. S., & Zhou, L. H. (2011). Reliability and validity of Chinese version of Self-Compassion Scale. *Chinese Journal of Clinical Psychology*, *19*(06): 734–736. https://doi.org/10.1016/2Fj.jesf.2021.10.001

Cheng, H., & Furnham, A. (2004). Perceived parental rearing style, self-esteem and self-criticism as predictors of happiness. *Journal of Happiness Studies, 5*(1), 1–21. https://doi.org/10.1023/B:JOHS.0000021704.35267.05

Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment, 6*(4), 284–290. https://doi.org/10.1037/1040-3590.6.4.284

Cleare, S., Gumley, A., Cleare, C. J., & O'Connor, R. C. (2018). An investigation of the factor structure of the Self-Compassion Scale. *Mindfulness, 9*(2), 618–628. https://doi.org/10.1007/s12671-017-0803-1

Costa, J., Marôco, J., Pinto-Gouveia, J., Ferreira, C., & Castilho, P. (2016). Validation of the psychometric properties of the Self-Compassion Scale: Testing the factorial validity and factorial invariance of the measure among borderline personality disorder, anxiety disorder, eating disorder and general populations. *Clinical Psychology & Psychotherapy, 23*(5), 460–468. https://doi.org/10.1002/cpp.1974

Cunha, M., Xavier, A., & Castilho, P. (2016). Understanding self-compassion in adolescents: Validation study of the Self-Compassion Scale. *Personality and Individual Differences, 93*, 56–62. https://doi.org/10.1016/j.paid.2015.09.023

Eapen, V., & Crncec, R. (2012). Strategies and challenges in the management of adolescent depression. *Current Opinion in Psychiatry, 25*(1), 7–13. https://doi.org/10.1097/yco.0b013e32834de3bd

Elkind, D. (1967). Egocentrism in Adolescence. *Child Development, 38*(4), 1025–1034. https://doi.org/10.2307/1127100

Elkind, D. (1976). Child development in educational settings. *Educational Psychologist, 12*(1), 49–58. https://doi.org/10.1080/00461527609529155

Finlay-Jones, A. L. (2017). The relevance of self-compassion as an intervention target in mood and anxiety disorders: A narrative review based on an emotion regulation framework. *Clinical Psychologist, 21*(2), 90–103. https://doi.org/10.1111/cp.12131

Gadermann, A. M., Guhn, M., & Zumbo, B. D. (2012). Estimating ordinal reliability for Likert-type and ordinal item response data: A conceptual, empirical, and practical guide. *Practical*

Assessment, Research & Evaluation, 17(3), 1–13. https://doi.org/10.7275/n560-j767

Gilbert, P. (2014). The origins and nature of compassion focused therapy. *British Journal of Clinical Psychology, 53*(1), 6–41. https://doi.org/10.1111/bjc.12043

Han, H. (2014, January). *Analyze cultural affection on accounting research in UK and China by Hofstede's cultural study and supported by Gray's model*. [Undergraduate paper, Teesside University]. https://www.researchgate.net/publication/265192326_The_research_of_difference_between_UK_and_China_by_Hofstede_Model

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

House, R. J., & House, R. J. (2004). *Culture, leadership, and organizations: The GLOBE study of 62 societies*. Sage Publications, Thousand Oaks.

Huang, L., Chen, Z., Jiang, W., Qu, D., Wang, Y., Fang, X., Han, H., Huang, C., Li, Z., & Chi, X. (2022). Validation of the Chinese version of Self-Compassion Scale for Youth (SCS-Y). *Mindfulness, 13*(12), 3166–3178. https://doi.org/10.1007/s12671-022-02024-0

Jensen de López, K., Rosenberg, K. B., Hansen, T. G. B., & Knudsen, H. B. S. (2023). Short report: Self-compassion and satisfaction with life in Danish adolescents with Developmental Language Disorder (DLD): "We are all in the same boat." *Research in Developmental Disabilities, 134*, 104400–104406. https://doi.org/10.1016/j.ridd.2022.104400

Johnson, D. P., & Whisman, M. A. (2013). Gender differences in rumination: A meta-analysis. *Personality and Individual Differences, 55*(4), 367–374. https://doi.org/10.1016/j.paid.2013.03.019

Joo, M., Terzino, K. A., Cross, S. E., Yamaguchi, N., & Ohbuchi, K.-I. (2019). How does culture shape conceptions of forgiveness? Evidence from Japan and the United States. *Journal of Cross-Cultural Psychology, 50*(5), 676–702. https://doi.org/10.1177/0022022119845502

Kazdin, A. E. (1993). Adolescent mental health: Prevention and treatment programs. *American Psychologist, 48*(2), 127–141. https://doi.org/10.1037/0003-066X.48.2.127

Kitayama, S., & Uchida, Y. (2003). Explicit self-criticism and implicit self-regard: Evaluating self and friend in two cultures. *Journal of Experimental Social Psychology, 39*(5), 476–482. https://doi.org/10.1016/S0022-1031(03)00026-X

Kitayama, S., Markus, H. R., Matsumoto, H., & Norasakkunkit, V. (1997). Individual and collective processes in the construction of the self: Self-enhancement in the United States and self-criticism in Japan. *Journal of Personality and Social Psychology, 72*(6), 1245–1267. https://doi.org/10.1037/0022-3514.72.6.1245

Lewis, J. R., & Sauro, J. (2009, July 19-24). *The factor structure of the System Usability Scale.* [Conference paper]. Human Centered Design, First International Conference, HCD 2009, Held as Part of HCI International 2009, San Diego, CA, USA.

Lin, Y., Xie, H., Huang, Z., Zhang, Q., Wilson, A., Hou, J., Zhao, X., Wang, Y., Pan, B., Liu, Y., Han, M., & Chen, R. (2021). The mental health of transgender and gender non-conforming people in China: A systematic review. *The Lancet Public Health, 6*(12), e954–e969. https://doi.org/10.1016/S2468-2667(21)00236-X

Loehlin, J. C. (2004). *Latent variable models: An introduction to factor, path, and structural equation analysis*. Psychology Press.

Löffler, C. S., & Greitemeyer, T. (2021). Are women the more empathetic gender? The effects of gender role expectations. *Current Psychology, 42*, 220–231. https://doi.org/10.1007/s12144-020-01260-8

Lopez Angarita, A., Sanderman, R., Smink, A., Zhang, Y., van Sonderen, E., Ranchor, A., & Schroevers, M. J. (2015). A reconsideration of the Self-Compassion Scale's total score: Self-compassion versus self-criticism. *PLoS ONE, 10*(7), e0132940. https://doi.org/10.1371/journal.pone.0132940

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods, 1*(2), 130–149. https://doi.org/10.1037/1082-989X.1.2.130

Mantzios, M., Wilson, J. C., & Giannou, K. (2013). Psychometric properties of the Greek versions of the Self-Compassion and Mindful Attention and Awareness Scales. *Mindfulness, 6*(1), 123–132. https://doi.org/10.1007/s12671-013-0237-3

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review, 98*(2), 224–253. https://doi.org/10.1037/0033-295X.98.2.224

Marsh, H. W., Nagengast, B., & Morin, A. J. S. (2013). Measurement invariance of big-five factors over the life span: ESEM tests of gender, age, plasticity, maturity, and la dolce vita effects. *Developmental Psychology, 49*(6), 1194–1218. https://doi.org/10.1037/a0026913

Marsh, I. C., Chan, S. W. Y., & MacBeth, A. (2018). Self-compassion and psychological distress in adolescents—A meta-analysis. *Mindfulness, 9*(4), 1011–1027. https://doi.org/10.1007/s12671-017-0850-7

Masyn, K. E. (2017). Measurement invariance and differential item functioning in latent class analysis with stepwise multiple indicator multiple cause modeling. *Structural Equation Modeling, 24*(2), 180–197. https://doi.org/10.1080/10705511.2016.1254049

Meng, R., Yu, Y., Chai, S., Luo, X., Gong, B., Liu, B., Hu, Y., Luo, Y., & Yu, C. (2019). Examining psychometric properties and measurement invariance of a Chinese version of the Self-Compassion Scale-Short Form (SCS-SF) in nursing students and medical workers. *Psychology Research and Behavior Management, 12*, 793–809. https://doi.org/10.2147/PRBM.S216411

Miles, J., & Shevlin, M. (2007). A time and a place for incremental fit indices. *Personality and Individual Differences, 42*(5), 869–874. https://doi.org/10.1016/j.paid.2006.09.022

Miller, C. A., Guidry, J. P. D., Dahman, B., & Thomson, M. D. (2020). A tale of two diverse qualtrics samples: Information for online survey researchers. *Cancer Epidemiology, Biomarkers & Prevention, 29*(4), 731–735. https://doi.org/10.1158/1055-9965.Epi-19-0846

Miyagawa, Y., & Neff, K. D. (2023). How self-compassion operates within individuals: An examination of latent profiles of state self-compassion in the U.S. and Japan. *Mindfulness, 14*(6), 1371–1382.https://doi.org/10.1007/s12671-023-02143-2

Montero-Marin, J., Kuyken, W., Crane, C., Gu, J., Baer, R., Al-Awamleh, A. A., Akutsu, S., Araya-Véliz, C., Ghorbani, N., Chen, Z. J., Kim, M.-S., Mantzios, M., Rolim Dos Santos, D. N., Serramo López, L. C., Teleb, A. A., Watson, P. J., Yamaguchi, A., Yang, E., & García-Campayo, J. (2018). Self-compassion and cultural values: A cross-cultural study of self-compassion using a Multitrait-Multimethod (MTMM) analytical procedure. *Frontiers in Psychology, 9*, 2638–2638. https://doi.org/10.3389/fpsyg.2018.02638

Muris, P., & Otgaar, H. (2022). Deconstructing self-compassion: How the continued use of the total score of the Self-Compassion Scale hinders studying a protective construct within the context of psychopathology and stress. *Mindfulness, 13*(6), 1403–1409. https://doi.org/10.1007/s12671-022-01898-4

Muris, P., van den Broek, M., Otgaar, H., Oudenhoven, I., & Lennartz, J. (2018). Good and bad sides of self-compassion: A face validity check of the Self-Compassion Scale and an investigation of its relations to coping and emotional symptoms in non-clinical adolescents. *Journal of Child and Family Studies, 27*(8), 2411–2421. https://doi.org/10.1007/s10826-018-1099-z

Murphy, S., Elklit, A., Chen, Y. Y., Ghazali, S. R., & Shevlin, M. (2019). Sex differences in PTSD symptoms: A differential item functioning approach. *Psychological Trauma: Theory, Research, Practice, and Policy, 11*(3), 319–327. https://doi.org/10.1037/tra0000355

Neff, K. D. (2003). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity, 2*(2), 85–101. https://doi.org/10.1080/15298860309032

Neff, K. D. (2003). The development and validation of a scale to measure self-compassion. *Self and Identity, 2*(3), 223–250. https://doi.org/10.1080/15298860309027

Neff, K. D. (2016). The Self-Compassion Scale is a valid and theoretically coherent measure of self-compassion. *Mindfulness, 7*(1), 264–274. https://doi.org/10.1007/s12671-015-0479-3

Neff, K. D., & McGehee, P. (2010). Self-compassion and psychological resilience among adolescents and young adults. *Self and Identity, 9*(3), 225–240. https://doi.org/10.1080/15298860902979307

Neff, K. D., Pisitsungkagarn, K., & Hsieh, Y.-P. (2008). Self-compassion and self-construal in the United States, Thailand, and Taiwan. *Journal of Cross-Cultural Psychology, 39*(3), 267–285. https://doi.org/10.1177/0022022108314544

Neff, K. D., Tóth-Király, I., Yarnell, L. M., Arimitsu, K., Castilho, P., Ghorbani, N., Guo, H. X., Hirsch, J. K., Hupfeld, J., & Hutz, C. S. (2019). Examining the factor structure of the Self-Compassion Scale in 20 diverse samples: Support for use of a total score and six subscale scores. *Psychological Assessment, 31*(1), 27–45. https://doi.org/10.1037/pas0000629

Neff, K. D., Bluth, K., Tóth-Király, I., Davidson, O., Knox, M. C., Williamson, Z., & Costigan, A. (2020). Development and Validation of the Self-Compassion Scale for Youth. *Journal of Personality Assessment, 103*(1), 92–105. https://doi.org/10.1080/00223891.2020.1729774

Ng, C. S., & Hurry, J. (2011). Depression amongst Chinese adolescents in Hong Kong: An evaluation of a stress moderation model. *Social Indicators Research, 100*(3), 499–516. https://doi.org/10.1007/s11205-010-9626-3

Peng, K., & Nisbett, R. E. (1999). Culture, dialectics, and reasoning about contradiction. *The American Psychologist, 54*(9), 741–754. https://doi.org/10.1037/0003-066X.54.9.741

Piaget, J. (1950). *The psychology of intelligence*. Brace: Harcourt.

Pyszkowska, A., & Rönnlund, M. (2021). Psychological flexibility and self-compassion as predictors of well-being: Mediating role of a balanced time perspective. *Frontiers in Psychology, 12*, 671746. https://doi.org/10.3389/fpsyg.2021.671746

Ramzan, N., & Amjad, N. (2017). Cross cultural variation in emotion regulation: A systematic review. *Annals of King Edward Medical University, 23*(1), 77–90. https://doi.org/10.21649/akemu.v23i1.1512

Raykov, T., Marcoulides, G. A., Lee, C.-L., & Chang, C. (2013). Studying differential item functioning via latent variable modeling: A note on a multiple-testing procedure. *Educational and Psychological Measurement, 73*(5), 898–908. https://doi.org/10.1177/0013164413478165

Revelle, W. R. (Photographer) (2015). *psych: Procedures for Psychological, Psychometric, and Personality Research (Version 1.5.4).* Software.

Revelle, W. R. (Photographer) (2017). *psych: Procedures for personality and psychological research.* Software.

Samejima, F. (1968). Estimation of latent ability using a response pattern of graded scores 1. *ETS Research Bulletin Series, 1968*(1), i–169. https://doi.org/10.1002/j.2333-8504.1968.tb00153.x

Spencer-Rodgers, J., Peng, K., Wang, L., & Hou, Y. (2004). Dialectical self-esteem and east-west differences in psychological well-being. *Personality & Social Psychology Bulletin, 30*(11), 1416–1432. https://doi.org/10.1177/0146167204264243

Spencer-Rodgers, J., Boucher, H. C., Peng, K., & Wang, L. (2009). Cultural differences in self-verification: The role of naïve dialecticism. *Journal of Experimental Social Psychology, 45*(4), 860–866. https://doi.org/10.1016/j.jesp.2009.03.004

Stewart, S. M., Kennard, B. D., Lee, P. W., Hughes, C. W., Mayes, T. L., Emslie, G. J., & Lewinsohn, P. M. (2004). A cross-cultural investigation of cognitions and depressive symptoms in adolescents. *Journal of Abnormal Psychology, 113*(2), 248–257. https://doi.org/10.1037/0021-843X.113.2.248

Sun, X., Chan, D. W., & Chan, L. (2016). Self-compassion and psychological well-being among adolescents in Hong Kong: Exploring gender differences. *Personality and Individual Differences*, *101*, 288–292. https://doi.org/10.1016/j.paid.2016.06.011

Tanaka, J. S. (1987). "How big is big enough?": Sample size and goodness of fit in structural equation models with latent variables. *Child Development, 58*(1), 134–146. https://doi.org/10.2307/1130296

Tang, X., Tang, S., Ren, Z., & Wong, D. F. K. (2019). Prevalence of depressive symptoms among adolescents in secondary school in mainland China: A systematic review and meta-analysis. *Journal of Affective Disorders, 245*, 498–507. https://doi.org/10.1016/j.jad.2018.11.043

Tóth-Király, I., & Neff, K. D. (2021). Is self-compassion universal? Support for the measurement invariance of the Self-Compassion Scale across populations. *Assessment, 28*(1), 169–185. https://doi.org/10.1177/1073191120926232

Tóth-Király, I., Bőthe, B., & Orosz, G. (2017). Exploratory structural equation modeling analysis of the Self-Compassion Scale. *Mindfulness, 8*(4), 881–892. https://doi.org/10.1007/s12671-016-0662-1

Tsai, M. Y. (2015). Construction and factorial validation of the Chinese version of the Self-Compassion Scale for gifted students. *Psychology Research, 5*(11), 634–644. https://doi.org/10.17265/2159-5542/2015.11.003

Williams, L. J., Ford, L. R., & Nguyen, N. (2002). Basic and advanced measurement models for confirmatory factor analysis. In E. S. Rogelberg (Ed.), *Research methods in industrial and organizational psychology* (pp. 366–389). Blackwell Publishers.

Yarnell, L. M., Stafford, R. E., Neff, K. D., Reilly, E. D., Knox, M. C., & Mullarkey, M. (2015). Meta-analysis of gender differences in self-compassion. *Self and Identity, 14*(5), 499–520. https://doi.org/10.1080/15298868.2015.1029966

Yarnell, L. M., Neff, K. D., Davidson, O. A., & Mullarkey, M. (2018). Gender differences in self-compassion: Examining the role of gender role orientation. *Mindfulness, 10*(6), 1136–1152. https://doi.org/10.1007/s12671-018-1066-1

Zessin, U., Dickhäuser, O., & Garbade, S. (2015). The relationship between self-compassion and well-being: A meta-analysis. *Applied Psychology: Health and Well-Being, 7*(3), 340–364. https://doi.org/10.1111/aphw.12051

Zhang, Y.-L., Liang, W., Chen, Z.-M., Zhang, H.-M., Zhang, J.-H., Weng, X.-Q., Yang, S.-C., Zhang, L., Shen, L.-J., & Zhang, Y.-L. (2013). Validity and reliability of Patient Health Questionnaire-9 and Patient Health Questionnaire-2 to screen for depression among college students in China. *Asia-Pacific Psychiatry, 5*(4), 268–275. https://doi.org/10.1111/appy.12103

Zhang, H., Watson-Singleton, N. N., Pollard, S. E., Pittman, D. M., Lamis, D. A., Fischer, N. L., Patterson, B., & Kaslow, N. J. (2019). Self-criticism and depressive symptoms Mediating role of self-compassion. *Omega: Journal of Death and Dying, 80*(2), 202–223. https://doi.org/10.1177/0030222817729609

Zhao, M., Smithson, J., Ford, T., Wang, P., Wong, N. Y. B., & Karl, A. (2021). Self-compassion in Chinese young adults: Specific features of the construct from a cultural perspective. *Mindfulness, 12*(11), 2718–2728. https://doi.org/10.1007/s12671-021-01734-1

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