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ORIGINAL PAPER

Self-Compassion Around the World: Measurement Invariance of the Short Form of the Self-Compassion Scale (SCS-SF) Across 65 Nations, 40 Languages, Gender Identities, and Age Groups

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Abstract

Objectives The 12-item Self-Compassion Scale–Short Form (SCS–SF) is a widely used instrument for the assessment of self-compassion. To date, there have been few examinations of this instrument's psychometric properties, particularly across nations and languages. Therefore, we used data from the Body Image in Nature Survey (BINS) to assess measurement invariance of the SCS–SF across nations, languages, gender identities, and age groups.

Methods Participants ($N = 56{,}968$) from 65 nations completed the SCS–SF in 40 languages. Using these data, we tested various hypothesised models of the SCS–SF in the total sample and, using multi-group confirmatory factor analysis, tested for invariance of the optimal model across national groups, languages, gender identities, and age groups.

Results In the total dataset, we found that an 11-item, 2-factor model (i.e., SCS-11) provided best fit to the data, with the two factors tapping distinct constructs of compassionate and uncompassionate self-responding. The SCS-11 was found to be partially scalar invariant across national groups and languages, and fully scalar invariant across gender identities and age groups. There was wide variation in latent means for the two factors, particularly across national groups and languages. Further analyses showed negligible associations between the two factors and sociodemographic variables, including marital status, financial security, and urbanicity.

Conclusions Our results suggest that it may be possible to derive a stable 2-factor model of the SCS–SF for use in cross-cultural research, but also highlight the likelihood of cross-national and cross-linguistic variations in the way that self-compassion is understood.

Keywords Self-Compassion Scale · Short Form · Measurement invariance · Cross-cultural · Multi-group confirmatory factor analysis (MG-CFA)

Research on *self-compassion* – broadly defined as "the ability to be kind and helpful to one's self at times of error or despair" (Ferrari et al., 2019, p. 1455) – has grown dramatically over the past two decades (Bluth & Neff, 2018; Swami et al., 2021a, 2021b). Although different conceptual models of self-compassion have been proposed (e.g., Gilbert, 2009, 2014; Gu et al., 2020), the most widely relied upon is that of Neff (2003a, 2003b), who viewed self-compassion as a balance between compassionate and uncompassionate self-responding in the face of personal struggle. More specifically, Neff's (2003a) model entails six components, each of which is viewed as essential for self-compassion: *self-kindness* (being supportive, caring, and understanding towards oneself in times of pain), *mindfulness* (awareness of the present moment experience of suffering with perspective and balance), *common humanity* (recognising that one's fallibilities as part of the larger human condition), *self-judgement* (harshly criticising oneself for failings and inadequacies), *overidentification* (becoming carried away with one's painful thoughts and feelings), and *isolation* (feeling alone and cut off from others in the experience of suffering).

Neff (2003a, 2003b, 2016) also theorised that the components of self-compassion can be organised into three broad domains of self-responding in the face of suffering, namely affective, cognitive, and attentional. From this perspective, the three domains are viewed as tapping into more compassionate or less uncompassionate ways that individuals respond emotionally to difficult experiences (with more self-kindness and less self-judgement), cognitively understand their difficult experiences (as part of a common human

experience rather than isolating), and pay attention to their difficult experiences (in a more mindful and less overidentified way). Although the six components are viewed as distinct, Neff (2016) also theorised that they are mutually engendering and change in tandem, such that they form an integrated and interacting system. To the extent that the components are balanced within individuals (Phillips, 2021), the system-level balance of the six elements represents a self-compassionate state of mind (Neff, 2016).

To measure the construct of self-compassion from this perspective, Neff (2003b) developed the Self-Compassion Scale (SCS). In its original form, the SCS contains 26 items that assess how often individuals engage in affective, cognitive, and attentional behaviours that are associated with more compassionate and fewer uncompassionate responses to personal suffering and general life difficulties. Based on confirmatory factor analysis (CFA) with college students from the United States, Neff (2003b) initially advanced a 6-factor model of SCS scores with a higher-order (hierarchical) self-compassion factor. Although some subsequent studies supported this model of the SCS (e.g., Abdulaziz et al., 2020; Chistopolskaya et al., 2020; Cunha et al., 2016), most have found this model to have less-than-adequate CFA-based fit (e.g., Costa et al., 2016; Williams et al., 2014). Neff (2016; see also Neff et al., 2017) has since acknowledged the statistical limitations and lack of empirical support for the model, which has led to a protracted and ongoing debate as to the appropriate factor structure of the SCS (for discussions and opposing viewpoints, see Muris & Otgaar, 2020, 2022; Muris & Petrocchi, 2017; Neff, 2019, 2020).

On the one hand, some scholars have argued in favour of a 2-factor model that consists of positively and negatively worded items, suggestive of a method effect and/or distinct latent factors (e.g., Chen & Chen, 2019; Kumlander et al., 2018; Montero-Marin et al., 2018; Muris & Petrocchi, 2017). Studies using exploratory factor analysis (EFA; López et al., 2015) and CFA (Brenner et al., 2017; Kumlander et al., 2018) have generally supported this 2-factor model within national groups, with scholars thus advocating for the use of separate scores representing compassionate self-responding (assessed by the positively valenced factors) and self-coldness, self-criticism, or uncompassionate self-responding (assessed by the negatively valenced factors; Muris et al., 2021). A variant of this model has six first-order factors placed hierarchically with two higher-order factors assessing compassionate and uncompassionate responding, respectively (e.g., Halamová et al., 2021; Strickland et al., 2022).

On the other hand, based on the results of bifactor exploratory structural equation modelling (bifactor-ESEM), Neff (2016, 2019; see also Neff et al., 2018; Neff & Tóth-Király, 2023) has favoured a model consisting of six uncorrelated specific or S-factors and one global (G-) factor of self-compassion. This modelling is consistent with Neff's (2016) view that the elements of self-compassion can be interpreted individually or within a unitary self-compassion score and that self-compassion is conceptualised as a bipolar continuum ranging from uncompassionate self-responding to compassionate self-responding. In a study with archival data from 20 international samples, Neff et al. (2019) reported good fit for models with six first-order factors and both a single G-factor and two G-factors. However, based on the finding that S-factors weakly defined the two G-factors, Neff et al. (2019) argued in favour of a model with a single G-factor. This model has subsequently received empirical support in some national groups (e.g., Cababie & Etchezahar, 2023; Kocur et al., 2022; Rakhimov et al., 2023; Tóth-Király et al., 2017).

However, there remains concern that this model (i.e., with six S-factors and a single G-factor) includes low target loadings that negatively affect interpretability of the factor solution and construct replicability (Buz et al., 2022). Moreover, in a recent contribution to this debate, Marsh et al. (2023) argued that the use of bifactor-ESEM would not have allowed for a true test of a bifactor model with six first-order factors and two G-factors. Instead, using Bayesian structural equation modelling, these authors reported that a model with six first-order factors and two G-factors had good fit to their data. Based on these results, Marsh et al. (2023) endorsed using SCS scores that represent the six first-order factors, a total SCS score, and the two latent components, rather than one G-factor. Other researchers have likewise suggested that a model with two G-factors has superior interpretability and replicability (Buz et al., 2022; see also Gillett et al., 2025).

These debates *vis-à-vis* the factor structure of the SCS are mirrored in modelling of the Short Form of the SCS (SCS–SF; Raes et al., 2011). The SCS–SF consists of 12 of the best-loading items from the SCS, two to represent each of the six self-compassion factors from the long form of the SCS. In the study reporting on the development of the SCS–SF, Raes et al. (2011) initially supported a model with six first-order factors and a higher-order factor based on CFAs with college students from the Netherlands and the United States. However, composite reliabilities for the first-order factors were generally less-than-adequate, leading to a preference for the use of overall SCS–SF scores in analyses (Neff, 2016). Subsequent studies have since supported the presence of six first-order factors in other national contexts (e.g., Alfonsson et al., 2023; Castilho et al., 2015; Garcia-Campayo et al., 2014; Le Barbenchon & Genin, 2024), but evidence of a self-compassion higher-order factor or G-factor is equivocal. Thus, while some studies support the presence of a higher-order factor (Yildirim et al., 2023) or G-factor (Rocha et al., 2022; Yılmaz-Koğar & Koğar, 2023), other work has failed to find evidence of either (Uršič et al., 2019).

Importantly, there is also evidence that a model with six first-order SCS–SF factors may not be universally supported (Fuochi et al., 2025). Thus, some studies have instead suggested that the SCS–SF should be conceptualised as a unidimensional instrument (Poli & Miccoli, 2023) or as consisting of two factors reflecting compassionate or uncompassionate self-responding (Babenko & Guo, 2019; Fuochi et al., 2025; Hayes et al., 2016; Kotera & Sheffield, 2020; Sutton et al., 2018), although composite reliabilities of the latter factor are sometimes less-than-adequate (Bratt & Fagerström, 2020). Moreover, at least one study has suggested that the SCS–SF should be conceptualised as consisting of more than two factors. Specifically, in a study of Chinese nursing students and medical workers, Meng et al. (2019) found evidence for a 3-factor model consisting of one positive and two negative factors (see also Zhao et al., 2023). Where studies have compared fit of the various proposed models, it is typically the 2-factor model that has best fit (e.g., Lluch-Sanz et al., 2022; Rahman et al., 2023).

There are several concerns with how the debates around the factorial validity of the SCS and SCS–SF have unfolded. The first is that, as scholars use increasingly varied and sophisticated methods of analysis to model scores on these instruments, it can be difficult for researchers and practitioners to know how to use these instruments most effectively (Strohmaier et al., 2023). Indeed, as Buz et al. (2022) have noted, despite years of debate over these issues, it is difficult to know what real progress has been made on this front. Second, as these debates have become increasingly passionate, scholars have sometimes made grand claims of widespread applicability or universality of their preferred model(s). At issue here is whether measures of self-compassion demonstrate adequate *measurement invariance* (i.e., the extent to which scores on these instruments measure the same latent construct of self-compassion across distinct groups; Guenole & Brown, 2014; Vandenberg & Lance, 2000). This is important because many scholars consider the establishment of scalar or partial scalar invariance to be a prerequisite of any meaningful comparison of latent scores, as well as examination of differential relations between constructs, across groups (Boer et al., 2018; Chen, 2007, 2008; Swami & Barron, 2019; Wells, 2021).

To date, however, studies have only infrequently examined the measurement invariance of the SCS and/or the SCS–SF. Thus, in a study using archival data, Tóth-Király and Neff (2021) reported that the SCS model with six first-order factors and a single G-factor achieved scalar invariance across 15 nations, 12 languages, population type (student, community, clinical, mixed), and age groups (young adulthood, middle adulthood, late adulthood). On the other hand, Kanovský et al. (2021) reported that a 2-factor model of SCS scores (i.e., compassionate and uncompassionate self-responding) was not invariant across primary data from 10 nations. In terms of the SCS– SF specifically, Adu et al. (2024) found optimal fit for a unidimensional model, but only after accounting for high shared variability across item testlets, with this model being invariant across four nations (Germany, Ghana, India, and New Zealand).

Meanwhile, studies examining invariance of the SCS across gender have variously supported scalar invariance of the single bifactor model (Miyagawa et al., 2022; Neff et al., 2019; Tóth-Király & Neff, 2021; Tóth-Király et al., 2017), the 6-factor model with a higher-order factor (Cunha et al., 2016), and a 2-factor model (de Zoysa et al., 2022; Halamová et al., 2018). In terms of the SCS–SF, Adu et al. (2024) supported invariance of a unidimensional model across gender, age groups, and educational qualifications. Conversely, in a sample from Bangladesh, Rahman et al. (2023) reported that a 2-factor model consisting of compassionate and uncompassionate self-responding achieved scalar invariance across gender, age groups, and marital status. To date, however, far fewer studies have assessed measurement invariance of the SCS–SF compared to the SCS.

There are additional reasons to think that claims of universal application of any model may, at this stage, be premature. First, existing studies have not always ensured operational equivalence (i.e., characteristics of using an instrument in different populations) across samples. This is important because operational equivalence can affect how items on an instrument are understood and completed (He & van de Vijver, 2012), which in turn may shape response characteristics of items (Swami & Barron, 2019). Ensuring commonality of operational practices, insofar as possible in multinational studies, is therefore an important prerequisite for assessments of measurement invariance. Second, existing studies have relied on only a relatively limited set of samples: in terms of national groups, for example, the largest study utilised a maximum of 15 different national groups (Tóth-Király & Neff, 2021) and all studies have demonstrated sampling biases toward national groups in Europe (Halamová et al., 2021; Kanovský et al., 2021). As such, there is an urgent need to reconsider issues of measurement invariance in a much wider set of national and linguistic groups, which would provide a fuller account of potential universality of modelling.

Large, multinational studies offer unique opportunities to deal with many of the issues noted above, most pertinently dealing with the equivocal findings *vis-à-vis* the dimensionality of self-compassion scores and broader issues around measurement invariance. Such studies also offer a more powerful means of avoiding overgeneralised claims based on a limited set of cultural experiences and to give voice to national or linguistic groups that have not historically featured in the research literature. Thus, in the present study, we utilised data from the Body Image in Nature Survey (BINS; Swami et al., 2022), a collaborative, researcher-crowdsourced project that gathered

SCS–SF data between 2020 and 2022 from participants in 65 nations. The BINS dataset presents unprecedented opportunities to advance knowledge in several ways, primarily in terms of understanding SCS–SF item functioning across national and linguistic groups, as well as a much fuller consideration of measurement invariance. Additionally, it also offers a unique opportunity to examine the extent to which self-compassion is associated with other sociodemographic characteristics included in the BINS.

Thus, the first aim of the present study was to determine how best to model SCS–SF scores across the samples represented in the BINS. Here, we tested the following models, which all have been supported in the available literature on the SCS and/or SCS-SF: (a) a unidimensional model with all 12 items (Poli & Miccoli, 2023); (b) a 2-factor model reflecting compassionate and uncompassionate responding (Lluch-Sanz et al., 2022); (c) a 6-factor model reflecting the six lower-order SCS factors (Neff, 2003b); (d) a 6-factor model with six lower-order factors and two higher-order factors (Strickland et al., 2022); (e) a bifactor-ESEM model with six uncorrelated specific factors and one global bifactor (Neff, 2016, 2019; Neff & Tóth-Király, 2023; Neff et al., 2018); and (f) a Bayesian model with six first-order factors and two global bifactors (Marsh et al., 2023). Given the equivocal and volatile nature of previous findings, our overall objective was to identify an SCS–SF structure that would balance interpretability with the best opportunity to obtain scalar or partial scalar invariance, which in turn would allow us to examine between-group differences in latent scores.

Having established an optimal model for our total dataset, we aimed to assess measurement invariance of the SCS-SF across the 65 nations and 40 languages represented in the BINS, as well as across gender identities and age groups (i.e., emerging adults: 18–24 years; young adults 25–44 years; middle-age and older adults: ≥ 45 years; Arnett, 2000; Erikson, 1968). As before, we strove to balance the desire to establish invariance across as many groups as possible with interpretability. Finally, and in an attempt to contribute to the extant literature on self-compassion, we also used this opportunity to assess the extent to which sociodemographic variables included in the BINS (i.e., racialised status, residential context, educational qualifications, marital status, and financial security) are associated with self-compassion. We acknowledge that this final set of analyses are somewhat exploratory, but posit that this is a reflection of the current unsettled state of the literature.

Method

Portions of this section – specifically, Overview of the Body Image in Nature Survey, Participants, Demographics, and Procedures, Ethics, and Data Sharing are reproduced from an earlier paper that utilised the same dataset (Swami et al., 2023a, 2023b).

Overview of the Body Image in Nature Survey

The Body Image in Nature Survey (BINS) is a researcher-crowdsourced project involving 253 scientists working collaboratively across 65 nations (for a detailed, published study protocol, see Swami et al., 2022). All data were collected between November 2020 and February 2022 with community sampling, with the majority of recruitment taking place online. Unless exempt by national laws, all collaborating teams additionally obtained ethics approval from local institutional ethics committees or review boards. A list of nations, associated sample sizes, data collection methods, ethics approvals, and survey languages is presented in Supplementary Table S1.

Participants

The BINS dataset consists of 56,968 respondents from 65 nations, of whom 58.9% ($n = 33,539$) were women, 40.5% ($n = 23,083$) were men, and 0.6% ($n = 346$) were of another gender identity. In terms of race, the majority (74.2%, $n = 42,269$) self-identified as being part of a racialised majority, whereas 11.3% ($n = 6,448$) identified as part of a racialised/ethnic minority group, and 13.5% ($n = 7,689$) were uncertain about their status (race data were not collected in France [$n = 562$; 1.0%] due to legal restrictions prohibiting the collection and storage of race-based data). In terms of self-reported residence, 27.1% ($n = 15,408$) of participants lived in a capital city, 13.7% ($n = 7,811$) lived in a suburb of a capital city, 25.1% ($n = 14,319$) lived in a provincial city (more than 100,000 residents), 18.7% ($n = 10,680$) lived in a provincial town (more than 10,000 residents), and 15.4% ($n = 8,750$) lived in a rural area.

In terms of educational attainment, 0.5% ($n = 255$) reported that they had no formal education, 2.1% ($n = 1,171$) had completed primary education, 17.5% ($n = 9,954$) had completed secondary education, 33.5% ($n = 19,105$) had completed lower tertiary education, 21.5% ($n = 12,274$) had completed higher tertiary education, 21.5% ($n = 12,262$) were in full-time education, and 3.4% ($n = 1,947$) had some other qualification. Most participants were single (42.0%, $n = 23,955$), whereas 19.5% ($n = 11,083$) were in a committed relationship but not married, 33.5% ($n = 19,056$) were married, and 5.0% ($n = 2,874$) had another status. With regard to their financial security, 24.9% ($n = 14,157$) of participants reported that they felt less secure relative to others of their own age in their nation of residence, 49.6% ($n = 28,266$) equally secure, and 25.5% ($n = 14,545$) more secure. Participants ranged in age from 18 to 99 years ($M = 33.10$, $SD = 13.79$). Table 1 presents detailed sample

description data for all individual nations (differentiating between survey presentations in different languages in individual nations).

Measures

Self-Compassion

As part of the BINS package, participants completed the 12-item Self-Compassion Scale–Short Form (SCS–SF; Raes et al., 2011), which included two items for each of the six elements of self-compassion in Neff's (2003a) model (i.e., self-kindness, mindfulness, common humanity, self-judgement, overidentification, and isolation). Unless stated otherwise below, all items were rated on a 5-point scale, ranging from 1 (*almost never*) to 5 (*almost always*). Unless presented in English, or where a previously-validated translation was not available, the SCS–SF was translated for use in the BINS using the parallel back-translation procedure (Brislin, 1986). This involved a bilingual individual first translating the SCS-SF from English into the target language. A second bilingual individual then translated this version back into English. Next, the two versions of the measure were assessed – and any discrepancies settled – by a committee consisting minimally of the two translators and a researcher involved in the project). A list of the 40 languages in which the BINS survey package was presented is reported in Supplementary Table S1 and all translations are available from the first author.

Financial Security

Participants were asked to self-report how financially secure they felt relative to others of their own age in their country of residence (1 = *less secure*, 2 = *same*, 3 = *more secure*). This single-item measure of financial security has been used in previous cross-national work (Swami et al., 2012, 2020).

Urbanicity

Participants were asked about their current place of residence, with response options adapted from Pedersen and Mortensen (2001) as follows: *capital city*, *capital city suburbs*, *provincial city (more than 100,000 residents)*, *provincial town (more than 10,000 residents)*, and *rural areas*. We assigned response options values of 1 to 5 (in the above order) for statistical analysis and collapsed these into *urban* versus *rural* for descriptive purposes (i.e., value 1 vs. values 2 to 5). This measure of urbanicity has been used in previous cross-national work (Swami et al., 2020).

Demographics

Participants were asked to provide their demographic data consisting of gender identity (1 = *woman*, 2 = *man*, 3 = *describe gender in another way*), age (open-ended), highest educational qualification (1 = *no formal education*, 2 = *primary education*, 3 = *secondary education*, 4 = *still in full-time education*, 5 = *undergraduate degree*, 6 = *postgraduate degree*, 7 = *other*), marital status (1 = *single*, 2 = *single but in a committed relationship*, 3 = *married*, 4 = *other*), and ethnicity/race (1 = *ethnic/racial majority*, 2 = *ethnic/racial minority*, 3 = *not sure*). For descriptive purposes at the national level and for analyses, response options for highest educational qualification were collapsed into *secondary/tertiary* (secondary education, undergraduate degree, postgraduate degree) versus *other* (all remaining categories) and response options of marital status were collapsed into *committed/married* (single but in a committed relationship, married) versus *other* (all remaining categories). Response options of ethnicity/race were collapsed into *racialised minority* (racial minority) versus *other* (all remaining categories).

Procedure, Ethics, and Data Sharing

Full procedural information about the BINS is provided in Swami et al. (2022). The BINS project was conducted in accordance with the principles of the Declaration of Helsinki (World Medical Association, 2013) and following local institutional guidelines. In brief, once local ethics approval had been obtained or collaborators confirmed that approval was not required as per national laws, researchers recruited participants from the community in their respective nations between November 2020 and February 2021. Inclusion criteria included being ≥ 18 years of age, a resident and citizen of the particular nation in which recruitment took place, and being able to complete a survey in the language in which it was presented. In all but nine locales (Supplementary Table S1), data collection was conducted online. All participants were presented with a standardised information sheet and provided (digital or written) informed consent before completing an anonymous version of the BINS survey package. Upon completion of the survey, participants received debriefing information, which included contact information for the first author as well as a local collaborator. The BINS data and our analytic codes are available on the Open Science Framework at https://osf.io/zpbc7/.

Data Analyses

The BINS study protocol (Swami et al., 2022) contains the general analytic plan for the structural and measurement invariance analyses of the key variables of the BINS,

Table 1 Sample Descriptions of Data from the Body Image in Nature Survey (BINS)

Nation	Sample size	Mean age (*SD*)	%Women	Mean financial security (*SD*)	%Urban residence	%Secondary/tertiary education	%In committed relationship or married	%Racialised minority
Argentina	670	35.36 (13.6)	57	2.13 (0.7)	98	81	50	9
Australia	1,038	35.23 (13.1)	71	1.90 (0.8)	93	77	55	18
Austria	1,279	41.99 (16.5)	54	2.08 (0.7)	67	62	63	9
Bahrain	441	30.47 (9.8)	74	1.98 (0.6)	98	87	51	8
Bangladesh	460	29.30 (8.6)	42	1.78 (0.8)	88	80	51	13
Bosnia & Herzegovina	406	43.93 (10.9)	64	2.15 (0.7)	87	90	70	16
Brazil	1,462	36.77 (12.0)	58	2.21 (0.7)	99	86	66	12
Bulgaria	248	33.52 (14.1)	62	2.16 (0.6)	92	54	52	4
Canada (English)	336	24.61 (10.0)	83	2.10 (0.7)	82	36	48	14
Canada (French)	806	38.22 (12.8)	88	2.29 (0.7)	78	95	72	7
Chile	422	36.14 (13.6)	79	2.28 (0.8)	94	73	41	8
China (Cantonese)	409	20.50 (5.9)	58	2.18 (0.7)	100	96	2	2
China (English)	349	21.93 (5.3)	65	1.79 (0.7)	97	62	26	6
China (Mandarin)	1,231	35.00 (7.3)	69	1.82 (0.6)	95	92	86	4
Colombia	793	27.15 (11.5)	60	2.01 (0.8)	96	57	22	7
Croatia	898	39.10 (12.1)	59	2.08 (0.7)	71	91	69	2
Cyprus	363	34.31 (9.6)	65	2.09 (0.7)	87	69	64	4
Czechia	700	38.10 (17.0)	66	2.29 (0.6)	82	75	62	2
Ecuador	863	30.97 (12.3)	53	1.81 (0.8)	86	65	33	11
Egypt	1,627	23.62 (8.7)	72	2.06 (0.6)	98	86	27	6
Estonia	449	38.93 (14.1)	63	2.10 (0.7)	80	64	58	2
France	562	36.01 (14.2)	76	2.08 (0.7)	64	67	47	NA
Germany	620	31.01 (11.9)	62	2.18 (0.8)	83	64	58	12
Ghana	434	21.97 (4.5)	41	2.08 (0.8)	84	72	32	26
Greece	556	31.49 (11.8)	65	2.03 (0.7)	91	63	55	5
Hungary	654	32.80 (13.4)	69	2.07 (0.6)	72	69	63	2
Iceland (English)	1,149	38.50 (17.5)	50	2.27 (0.7)	92	61	65	11
Iceland (Icelandic)	432	54.91 (15.5)	54	2.05 (0.6)	75	81	78	3
India (Hindi)	1,664	32.07 (11.8)	45	2.14 (0.8)	73	78	45	13
India (Tamil)	376	36.78 (12.1)	52	1.71 (0.6)	57	65	70	37
Indonesia	292	19.79 (3.2)	72	1.76 (0.5)	87	43	14	3
Iran	1,318	33.46 (11.3)	60	1.99 (0.6)	95	82	61	29
Iraq	405	34.13 (12.1)	33	1.49 (0.5)	100	97	45	53
Ireland	351	33.73 (12.4)	50	2.11 (0.8)	76	80	62	5
Israel	493	30.77 (11.6)	62	2.13 (0.7)	87	67	32	7
Italy	2,307	33.17 (14.0)	62	1.95 (0.6)	81	67	61	6
Japan	360	49.44 (16.6)	100	1.79 (0.6)	90	81	61	8
Kazakhstan	380	30.07 (11.3)	53	2.04 (0.6)	94	76	48	11
Latvia	827	41.04 (12.8)	66	2.02 (0.7)	74	82	69	4
Lebanon	1,295	25.74 (12.3)	67	1.93 (0.7)	70	63	33	16
Lithuania	491	40.34 (12.8)	51	2.05 (0.6)	72	84	74	3
Malaysia	1,193	27.81 (8.7)	69	1.74 (0.6)	76	84	29	30
Malta	347	35.52 (15.4)	72	2.10 (0.7)	78	71	60	7
Nepal	353	25.78 (6.0)	50	1.77 (0.7)	82	98	28	5
Netherlands	1,004	46.81 (16.3)	53	2.05 (0.6)	61	98	69	9
Nigeria	1,274	31.64 (9.2)	34	1.85 (0.8)	93	64	63	14
Norway	360	41.24 (11.6)	77	2.17 (0.7)	78	92	77	4
Pakistan	267	20.59 (2.7)	28	2.16 (0.9)	100	47	83	49

Table 1 (continued)

Nation	Sample size	Mean age (*SD*)	%Women	Mean financial security (*SD*)	%Urban residence	%Secondary/tertiary education	%In committed relationship or married	%Racialised minority
Palestine	401	27.64 (9.5)	25	2.01 (0.6)	81	90	42	7
Philippines (English)	350	24.87 (11.2)	0	2.03 (0.7)	97	56	24	13
Philippines (Tagalog)	504	37.43 (11.9)	73	1.83 (0.7)	97	89	65	16
Poland	1,954	30.51 (11.9)	62	1.99 (0.7)	74	63	56	3
Portugal	363	36.53 (17.9)	68	2.05 (0.7)	85	81	37	5
Romania	1,819	26.94 (10.8)	53	2.05 (0.7)	80	49	60	5
Russia	206	39.94 (11.8)	71	1.84 (0.5)	97	84	67	8
Saudi Arabia	380	28.02 (9.7)	55	2.03 (0.7)	94	83	33	20
Serbia	650	30.72 (11.3)	56	2.20 (0.7)	95	65	65	10
Slovakia	814	37.79 (14.7)	54	1.92 (0.6)	65	75	67	4
Slovenia	452	36.84 (14.9)	59	2.16 (0.7)	49	87	66	2
South Africa	318	35.15 (16.1)	53	1.74 (0.8)	78	73	45	31
South Korea	381	27.60 (9.7)	48	1.89 (0.6)	98	54	43	52
Spain	1,266	34.54 (16.3)	52	2.17 (0.8)	88	82	43	5
Switzerland	377	46.48 (15.2)	52	1.98 (0.7)	62	51	66	5
Taiwan	529	41.36 (13.6)	60	2.48 (0.7)	90	92	67	7
Thailand	3,275	25.85 (10.8)	62	1.76 (0.6)	87	45	23	6
Tunisia	374	41.62 (15.2)	55	2.10 (0.6)	96	90	63	0
Türkiye	2,518	31.63 (11.5)	57	1.98 (0.8)	97	61	57	14
Ukraine	141	39.00 (11.7)	59	1.74 (0.6)	95	87	71	9
United Arab Emirates (Arabic)	204	26.37 (6.7)	73	2.07 (0.4)	99	35	39	10
United Arab Emirates (English)	904	27.50 (11.8)	36	2.13 (0.8)	98	73	43	31
United Kingdom	1,243	37.99 (13.9)	54	2.03 (0.7)	84	87	68	23
United States of America	2,531	35.35 (12.7)	62	1.93 (0.7)	85	82	61	20

Note. *SD* = standard deviation

including the SCS–SF. Analyses not covered in this study protocol were not preregistered separately. We first explored the structure of the SCS–SF in the total sample, fitting: (a) a unidimensional model with all 12 items (Poli & Miccoli, 2023); (b) a 2-factor model reflecting compassionate and uncompassionate responding (Lluch-Sanz et al., 2022); (c) a 6-factor model (Neff, 2003b); (d) a 6-factor model with six lower-order factors and two higher-order factors (Strickland et al., 2022); (e) a bifactor-ESEM model with six uncorrelated specific factors and one G-factor (Neff, 2016, 2019; Neff & Tóth-Király, 2023; Neff et al., 2018); and (f) a Bayesian model with six first-order factors and two G-factors (Marsh et al., 2023). Based on the fit of these models, we selected an optimal model for use in the ensuing measurement invariance analyses.

Tests for configural, metric, and scalar invariance (in this sequence) were conducted with multi-group confirmatory factor analysis (MG-CFA; Chen, 2007). We thereby tested whether the SCS–SF items loaded on the same number and configuration of factors in all groups (configural invariance), whether item loadings were the same in all groups (metric invariance), and whether item intercepts were the same in all groups (scalar invariance). The following groups were investigated in separate analyses: (a) national groups; (b) languages; (c) gender identities (women vs. men vs. other gender identities); and (d) age (18–24 years vs. 25–44 years vs. ≥ 45 years). Invariance of the cross-language survey presentation (i.e., where surveys were presented in more than one language in a single nation) in Canada (French in addition to English), China (Cantonese, Mandarin, English), Iceland (Icelandic, English), India (Hindi, Tamil), the Philippines (Tagalog, English), and the United Arab Emirates (Arabic, English) was tested prior to testing measurement invariance across national groups. Because the independent datasets originating from these nations were entered in invariance tests across national groups multiple times, we refer to "national groups" instead of "nations" in this first set of analyses.

Model constraints were relaxed if scalar measurement invariance did not hold, thereby aiming to identify a partial scalar measurement invariance model (i.e., a model, wherein item parameters are equal across some groups and items, but not all). For this, the alignment method (Asparouhov & Muthén, 2023) was applied for guidance. This method is based on the notion of approximate measurement invariance and does not require exact measurement invariance. Starting with the configural invariance model, it seeks a solution that minimises the differences in loadings and intercepts across groups, while still retaining identical fit to the configural invariance model. Alignment provides quantitative information on the amount of deviation from scalar measurement invariance for the overall set of items and on the groups and items for which measurement invariance concerning either loadings and/or intercepts holds. We utilised the alignment method to identify items that could be used as anchor items (two items as a minimum for the estimation of latent means; Byrne et al., 1989; for a simulation study, see Pokropek et al., 2019) in partial scalar measurement invariance models. Once alignment is established, it can be used to compare latent means even when there is not support for complete invariance (for a discussion, see Marsh et al., 2018). We present information on latent mean differences between groups in (a) to (d) based on either the full or partial scalar MG-CFA models, where applicable. We also present reliability estimates (omega total; McDonald, 1999) for the SCS–SF, based on the configural invariance model in the national groups.

Multilevel models were then used to investigate sociodemographic correlates of SCS–SF factor scores across the national groups. For Level-1 predictors, the group-mean-centred variables of financial security, urbanicity, education, marital status, and racialised status were used; for Level-2 predictors, we used the cluster-level means of these variables. The model thereby distinguished Level-1 from Level-2 effects and investigated associations of the predictors with the outcome both at the individual level (Level 1) within national groups, but also at the cluster level (Level 2) between national groups. Bayesian estimation (using diffuse priors as specified in the Mplus default settings) was used to obtain parameter estimates on a standardised scale.

Mplus 8.8 (Muthén & Muthén, 1998–2017) was used for all analyses, using full-information maximum likelihood estimation to account for partially missing data. There were 527 missing values in total (0.08%) among the 12 items of the SCS–SF. Marsh et al. (2023) reported that maximum likelihood (ML) and mean and variance adjusted weighted least squares (WLSMV) estimators produced broadly comparable model fit in structural analyses of the SCS (with slightly higher CFI/TLI values for WLSMV estimation, but slightly lower RMSEA values for ML estimation; see below for model fit indices), which was also confirmed in preliminary analyses with the present data. WLSMV estimation requires the same number of response options per item across groups, whereas MLR does not. As four national groups (Nigeria, Russia, Saudi Arabia, Ukraine) presented the SCS–SF with 7-point (instead of 5-point) response anchors, we therefore opted to use robust ML estimation (MLR) instead of WLSMV (as was stated in the study protocol; Swami et al., 2022). However, prior to analysis, the 7-point scales were numerically equated to the 5-point response scales by applying a scale transformation (Aiken, 1987) that replaced the original scale values 1 through 7 with the equated scale values of 0.86, 1.57, 2.29, 3.00, 3.71, 4.43, and 5.14, respectively.

Model fit was assessed with the comparative fit index and the Tucker-Lewis index (CFI and TLI; values close to 0.95/0.90 indicative of good/acceptable fit), the RMSEA and its 90% confidence interval (root-mean square error of approximation; values close to 0.06 indicative of good fit; for MG-CFAs with more than 10 groups, we used a cut-off of 0.15; Jang et al., 2017), and the standardised root mean square residual (SRMR; values close to 0.08 indicative of good fit; Hu & Bentler, 1999). Fit of the configural, metric, and scalar invariance models were compared by use of ΔCFI and ΔRMSEA values, and $\Delta\chi^2$ tests, relying primarily on the former two, as they were not affected by the large sample size of the current study. We used cut-offs of ΔCFI $\lesssim$ 0.020/0.010 as an indication of good fit of metric vs. configural and scalar vs. metric invariance models, and ΔRMSEA $\lesssim$ 0.030/0.015, respectively (Rutkowski & Svetina, 2014).

Results

Preliminary Structural Analyses in the Total Sample

Table 2 presents model fit parameters for the SCS–SF in the total sample. The unidimensional CFA-based model did not fit the data well. Distinguishing between positively and negatively valenced items (i.e., compassionate and uncompassionate self-responding) in a 2-factor model improved model fit, but left room for improvement. Excluding Item #10, whose loading was < 0.50 on its designated factor, improved the model fit further. This item has been shown to be problematic in previous work utilising the SCS (e.g., Baggaley et al., 2025; Buz et al., 2022; Finaulahi et al., 2021). Further, allowing (as suggested by modification indices) for correlated errors between Items #11 and #12 resulted in good model fit (and fit that was also superior to a 2-factor CFA-based model with correlated errors that retained Item #10; Table 2). Standardised loadings for this model are presented in Table 3. Notably, the (expected) negative correlation between the Compassionate and Uncompassionate Self-Responding factors was relatively modest ($r = -0.20$,

Table 2 Structural Analyses of the SCS–SF in the Total Sample

Model	$\chi^2(df)$	CFI	TLI	RMSEA	90% *CI*	SRMR
1F	63922.17(54)	0.511	0.402	0.144	[0.143, 0.145]	0.148
2F	10407.15(53)	0.921	0.901	0.059	[0.058, 0.060]	0.044
2FCE	6834.72(52)	0.948	0.934	0.048	[0.047, 0.049]	0.041
2F, excl. Item #10	7887.93(43)	0.935	0.916	0.057	[0.056, 0.058]	0.035
2FCE, excl. Item #10	4331.09(42)	0.964	0.953	0.042	[0.041, 0.043]	0.030
6F[a]	3334.51(39)	0.975	0.957	0.039	[0.037, 0.040]	0.028
6F + 1HO[b]	52968.67(54)	0.593	0.502	0.132	[0.131, 0.133]	0.156
6F + 2HO[c]	7831.08(48)	0.940	0.918	0.054	[0.053, 0.055]	0.081
6F + 1GlbBF	No convergence					
6B-ESEM + 1GlbBF[d]	14.07(3)	1.000	0.998	0.008	[0.004, 0.012]	0.001
Bayesian 6B-ESEM + 2GlbBF[e]	No convergence					

Note. 1F = 1-factor CFA model; 2F = 2-factor CFA model; 2FCE = 2-factor CFA model with correlated errors between Items #11 and #12; 6F = 6-factor CFA model; 6F + 1HO = CFA model with six lower-order factors and one higher-order factor; 6F + 2HO = CFA model with six lower-order factors and two higher-order factors; 6F + 1GlbBF = CFA bifactor model with six specific factors and one global factor; 6B-ESEM + 1GblBF = exploratory structural equation bifactor model with six specific factors and one global factor; Bayesian 6B-ESEM + 2GblBF = Bayesian exploratory structural equation bifactor model with six specific factors and two global factors

[a]The latent-variable correlation matrix was not positive definite

[b]Constraining the residual variance of Item #1 to be > 0 to ensure a proper solution

[c]Constraining the residual variance of Item #1 to > 0, the latent-variable covariance matrix still was not positive definite (i.e., the residual variances of Over-Identification and Self-Kindness were negative). This problem could also not be solved by imposing further constraints

[d]The condition number of the rotated solution was $0.14 * 10^{-8}$, indicating a probably poorly identified optimal rotation. Also, the residual variance of Item #6 was < 0

[e]Running for nearly 25 h on an Intel Core i5-8500 CPU with 3 GHz and 16 GB RAM

$p < 0.001$), suggestive of distinct factors that also speaks against the use of a total score.

Retaining Item #10, but fitting six factors to the data also resulted in good model fit (Table 2). However, the factor intercorrelation matrix was not positive definite (caused by an intercorrelation of $r = 1.01$ between Isolation and Over-Identification) and intercorrelations were also excessively high between the positively valenced factors (ranging from $r = 0.73$ to 0.95; Table S3), as well as between the negatively valenced factors ($rs = 0.75$ and 0.81, in addition to the previously mentioned $r = 1.01$ between Isolation and Over-Identification). That is, the positively and negatively valenced factors were each nearly indistinguishable and thus appear insufficiently distinct from one another. The 6-factor CFA-based model with one higher-order factor clearly did not fit the data, the 6-factor CFA-based model with two higher-order factors fitted worse than the 2-factor CFA-based model and produced negative residual variances, and the bifactor-CFA model with six S-factors and one G-factor did not converge.

The bifactor-ESEM model had good fit and superior fit compared to the bifactor-CFA model. However, considering the item loading pattern (Table 3), (a) the G-factor appeared to be very similar to the Uncompassionate Self-Responding factor in the 2-factor CFA-based model; (b) S-factor loadings were mostly low and below recommended limits (Morin, 2023; Swami et al., 2023a); (c) only three of the six S-factors (Self-Judgement, Common Humanity, and Mindfulness) could be recovered, and; (d) Item #6 had such a high loading on Self-Kindness that it produced a negative residual variance for this indicator. Overall, and following best-practice recommendations for bifactor-ESEM (Morin, 2023; Swami et al., 2023a), we concluded that it was not possible to support the bifactor-ESEM model. Finally, the Bayesian bifactor-ESEM model with six S-factors and two G-factors did not converge.

The 2-factor CFA model without Item #10 and with correlated errors for the Self-Judgement items (i.e., Items #11 and #12) was therefore considered the most parsimonious and best-fitting model. We elected to use this model in all further analyses. Given the omission of one item, we henceforth refer to this scale as the SCS-11.

Invariance of the SCS-11 Cross-Language Survey Presentation in Six Countries

Detailed results are presented in Table S2. The SCS-11 achieved configural invariance in all countries, except China (and the UAE; see below), metric invariance in Iceland, and scalar invariance in Canada and the Philippines.

Table 3 Standardised Loadings in the 2-Factor CFA Model with Correlated Errors and Excluding Item #10 and the ESEM Bifactor Model in the Total Sample

	2-Factor CFA Model		Bifactor-ESEM Model with Six S-Factors and One G-Factor						
Item	CS	UCS	Global	SK	SJ	CH	IS	MI	OI
1		0.66***	0.65***	0.00	0.01	−0.05***	0.11***	−0.01	−0.04*
2	0.61***		−0.10	0.02	−0.09	0.10	0.58***	0.02	−0.003
3	0.67***		−0.20***	−0.02	0.06	−0.03	0.37***	0.41***	−0.002
4		0.63***	0.64***	0.01	−0.004	0.02*	0.05	0.00	−0.16***
5	0.59***		−0.13***	0.03	0.01	0.37***	0.31***	0.02	0.01
6	0.64***		−0.25***	1.59***	0.00	0.00	0.00	0.00	0.00
7	0.67***		−0.19***	0.03	−0.03	0.10***	0.02	0.62***	0.00
8		0.69***	0.69***	−0.01	−0.07*	−0.03	−0.05	0.19***	0.01
9		0.71***	0.71***	0.01	−0.003	0.08***	0.01	−0.02*	0.17***
10	NA		0.02	−0.01	0.01*	0.64***	0.02	0.02	−0.01
11		0.59***	0.59**	−0.004	0.41***	−0.03***	0.04***	0.03***	0.11***
12		0.57***	0.58*	0.01	0.52***	0.05***	−0.05***	−0.02*	−0.04**

Note. CS = compassionate self-responding; UCS = uncompassionate self-responding; Global = global factor; SK = self-kindness; SJ = self-judgement; CH = common humanity; IS = isolation; MI = mindfulness; OI = over-identification. Shaded cells indicate on which factors item pairs were expected to load in the bifactor model (when assigning items with highest loadings to factors by exclusion procedure). The high loading of Item #6 on SK was the cause of its negative residual variance. CS and UCS intercorrelated with $r = -0.20$ ($p < 0.001$) in the 2-factor CFA model, and the residuals of the SJ Items #11 and #12 intercorrelated with $r = 0.33$ ($p < 0.001$)

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

Scalar invariance was arguably also present in India, where overall model fit bordered on the limit of acceptability. The model of configural invariance did not converge for the data from the UAE. The overall fit of the metric invariance model appeared to be good, whence it was concluded that metric invariance was achieved. Based on these results, data of Canada and the Philippines were each pooled in the analysis of national groups. Thus, there were 70 data sets from 65 countries available for the analysis of national groups.

National Groups

Data from the UAE (Arabic) were excluded to achieve convergence of the configural invariance model. The configural invariance model fitted the data of the remaining 69 national groups from 65 countries adequately, as did the metric invariance model (Table 4). The scalar model did not fit the data. Composite reliabilities (ω total) ranged from 0.49 to 0.88 (*Mdn* = 0.78) for Compassionate Self-Responding, and 0.48 to 0.88 (*Mdn* = 0.80) for Uncompassionate Self-Responding.

Factor intercorrelations ranged from −0.75 to 0.995 (*Mdn* = −0.35), indicating that compassionate and uncompassionate self-responding were not clearly distinct in some of the national groups. This indicated that a unidimensional model might have attained adequate or even good fit in some national groups, with negatively or, in some cases, even *positively* scored Uncompassionate Self-Responding items (or, equivalently, *negatively* scored Compassionate Self-Responding items). Specifically, significantly positive factor intercorrelations (ranging from 0.12 to 0.82, *Mdn* = 0.42, excluding the outlier of 0.995) were observed for data from China (Mandarin), Ghana, India (Hindi), India (Tamil), Iraq (where an intercorrelation of 0.995 was obtained), Kazakhstan, Lebanon, Nepal, Nigeria, Pakistan, Saudi Arabia, South Africa, and the UAE (English). These positive intercorrelations suggested that conceptual distinctions between compassionate and uncompassionate self-responding appeared slightly or even greatly diminished in these national groups.

Excluding four national groups with reliabilities < 0.60 for either factor (i.e., India [Tamil], Israel, Spain, and Iraq, which also exhibited the outlying factor intercorrelation) meaningfully increased the fit of the invariance models in the remaining 65 national groups (Table 3). Hence, data of only these 65 national groups were used in subsequent analysis.

Alignment Analysis and Partial Scalar Measurement Invariance Model

Applying alignment analysis, we obtained information on the approximate invariance of the item parameters of the SCS-11 items across the 65 retained national groups. The alignment model achieved the same fit as the configural invariance model (Table 2) and suggested item pairs #2 and #3, and #4 and #8, to be the most invariant of the

Table 4 Invariance Analyses of the SCS-11 Concerning National Groups, Language, Gender Identities, and Age Groups

Grouping variable	$\chi^2(df)$	CFI	TLI	RMSEA	90% *CI*	SRMR	Model comparisons			
							ΔCFI	ΔRMSEA	Configural	Metric
National groups without UAE (Arabic)										
Configural invariance	12969.47(2898)	0.927	0.904	0.066	[0.065, 0.067]	0.057				
Metric invariance	16607.82(3510)	0.904	0.897	0.068	[0.067, 0.069]	0.079	0.023	0.002	3711.83(612)	
Scalar invariance	33319.29(4122)	0.787	0.804	0.094	[0.093, 0.095]	0.109	0.117	0.026	22040.40(1224)	19213.64(612)
National groups without UAE (Arabic), India (Tamil), Iraq, Israel, and Spain										
Configural invariance	10852.17(2730)	0.938	0.919	0.060	[0.059, 0.062]	0.052				
Metric invariance	13782.09(3306)	0.920	0.914	0.062	[0.061, 0.063]	0.073	0.018	0.002	2991.27(576)	
Scalar invariance	28440.13(3882)	0.813	0.827	0.088	[0.087, 0.089]	0.102	0.107	0.026	19174.72(1152)	16898.75(576)
Languages without Hebrew and Tamil										
Configural invariance	10520.94(1596)	0.935	0.915	0.062	[0.060, 0.063]	0.049				
Metric invariance	12771.51(1929)	0.921	0.914	0.062	[0.061, 0.063]	0.066	0.014	0.000	2254.72(333)	
Scalar invariance	25898.91(2262)	0.828	0.841	0.084	[0.083, 0.085]	0.092	0.093	0.024	16530.97(666)	14953.87(333)
Gender identities										
Configural invariance	4718.98(126)	0.963	0.951	0.044	[0.043, 0.045]	0.032				
Metric invariance	4892.59(144)	0.962	0.956	0.042	[0.041, 0.043]	0.032	0.001	−0.002	52.68(18)	
Scalar invariance	5787.03(162)	0.955	0.954	0.043	[0.042, 0.044]	0.035	0.007	0.001	1003.86(36)	964.31(18)
Age Groups										
Configural invariance	4693.18(126)	0.961	0.950	0.044	[0.043, 0.045]	0.032				
Metric invariance	4859.74(144)	0.960	0.954	0.042	[0.041, 0.043]	0.032	0.001	−0.002	73.85(18)	
Scalar invariance	5970.33(162)	0.951	0.950	0.043	[0.043, 0.044]	0.036	0.009	0.001	1264.26(36)	1238.16(18)

Note. All p-values of χ^2 and $\Delta\chi^2$ tests (comparisons of the multigroup models) were < 0.001. Gender identity compared groups of women, men, and other gender identity, age compared groups of participants with 18–24 years, 25–44 years, ≥ 45 years of age

Compassionate and Uncompassionate Self-Responding factors, respectively, based on the number of national groups their item parameters were invariant in and their overall R^2 values (assigning more weight to the former than the latter for the selection of anchor items; Table S4). These item pairs were used as anchors for the two subscale factors, constraining their intercept and loading parameters to be invariant across all 65 national groups and estimating the parameters of all remaining items freely.

This partial scalar measurement invariance model fitted adequately on the data, $\chi^2 = 12.991.31$, $df = 2.986$, CFI = 0.924, TLI = 0.909, RMSEA = 0.064 (90% $CI = 0.063, 0.065$), SRMR = 0.060. Figure 1 presents the rank ordering and Cohen *d*-values of all national groups, as compared to the United Kingdom, for the Compassionate Self-Responding and Uncompassionate Self-Responding factors. To enable direct comparisons between the factors, rank orderings in each factor are accompanied by the respective values in the other factor in this figure. Ranks correlated with $r = 0.32$ ($p = 0.011$). For Compassionate Self-Responding scores, the UK was in the lower third of all national groups (rank 50); for Uncompassionate Self-Responding scores, in the middle (rank 30). The three national groups with highest positive means in terms of Compassionate Self-Responding (as compared to the UK) were Nepal, Bangladesh, and Nigeria (with *d*-values ranging from 0.95 to 0.88). With the exception of Nepal, the other two national groups (and, in fact, the next three groups as well) had higher means than the UK on the Uncompassionate Self-Responding factor as well ($d = 0.24$ to 0.60 for ranks 2 to 6). The first group with higher Compassionate Self-Responding mean scores, but lower Uncompassionate Self-Responding mean scores than the UK was Croatia (ranking 7th). The three national groups with the highest negative means in Compassionate Self-Responding were Pakistan, Japan, and Lebanon ($d = -0.67$ to -0.23). All three groups also had lower Uncompassionate Self-Responding means than the UK ($d = -0.32$ to -0.54). The first national group in this rank ordering where this pattern was reversed (lower Compassionate and higher Uncompassionate Self-Responding means), was Italy (ranking 60th).

Ghana, the Philippines, and Bangladesh were the three national groups with the highest positive means on the Uncompassionate Self-Responding subscale ($d = 1.09$ to 0.60), all of which had higher Compassionate Self-Responding means than the UK as well ($d = 0.73$ to 0.92). The first national group to break this pattern (higher Uncompassionate, but lower Compassionate Self-Responding means) was France (ranking 8th). The three national groups with the highest negative means in Uncompassionate Self-Responding were Iceland (Icelandic), Norway, and Taiwan ($d = -1.17$ to -0.71). Iceland (Icelandic) and Norway also had higher Compassionate Self-Responding means than the UK ($d = 0.54$ and 0.47), but Taiwan had a lower Compassionate Self-Responding mean than the UK ($d = -0.22$).

Languages

Excluding Hebrew and Tamil (see above), the SCS-11 could be considered configural and metric invariant across languages, but not scalar invariant (Table 4). Using Items #2 and #3, and #4 and #8, as anchors, a partial scalar measurement model was fitted to the data. This model had adequate fit, $\chi^2 = 12.284.78$, $df = 1.744$, CFI = 0.923, TLI = 0.908, RMSEA = 0.064 (90% $CI = 0.063, 0.065$), SRMR = 0.056, similar to the fit of the partial scalar measurement model on the national group data.

Compared to English, Tagalog, Bangla, and Nepali had the three highest Compassionate Self-Responding means ($d = 0.55$ to 0.53; Fig. 2). These three languages broadly matched the three highest ranking national groups (see preceding section), only that the Philippines (where Tagalog is spoken) ranked fourth there. The three languages with highest negative means in Compassionate Self-Responding were Japanese, Italian, and Czech ($d = -0.78$ to -0.34). Japan was also the second-lowest ranking national group in the preceding analysis. Concerning Uncompassionate Self-Responding scores, the three languages with highest means (compared to English) were Bangla, Indonesian, and Polish ($d = 0.30$ to 0.10). Bangladesh was among the three highest-scoring national groups in the preceding analysis as well. The three languages with largest negative means were Icelandic, Norwegian, and Bosnian ($d = -0.95$ to -0.53). Iceland (Icelandic) and Norway were also among the three national groups with the largest negative means in the preceding analysis. Ranks in the two factors correlated with $r = 0.12$ ($p = 0.49$), i.e., somewhat lower than among the national groups.

Gender Identities and Age Groups

The SCS-11 achieved scalar invariance across both the gender identities and age groups (Table 4). Men had higher (latent) Compassionate Self-Responding scores (Cohen's $d = 0.12$, $p < 0.001$) and lower Uncompassionate Self-Responding scores ($d = -0.12$, $p < 0.001$) than women. Other gender identities had mean Compassionate Self-Responding scores that were similar to women's ($d = 0.07$, $p = 0.240$), but higher Uncompassionate Self-Responding scores than women ($d = 0.23$, $p < 0.001$); that is, Uncompassionate Self-Responding scores were highest among other gender identities overall. Age groups 25–44 years vs. 18–24 years differed by $d = 0.06$ (Compassionate Self-Responding) and $d = -0.26$ (Uncompassionate

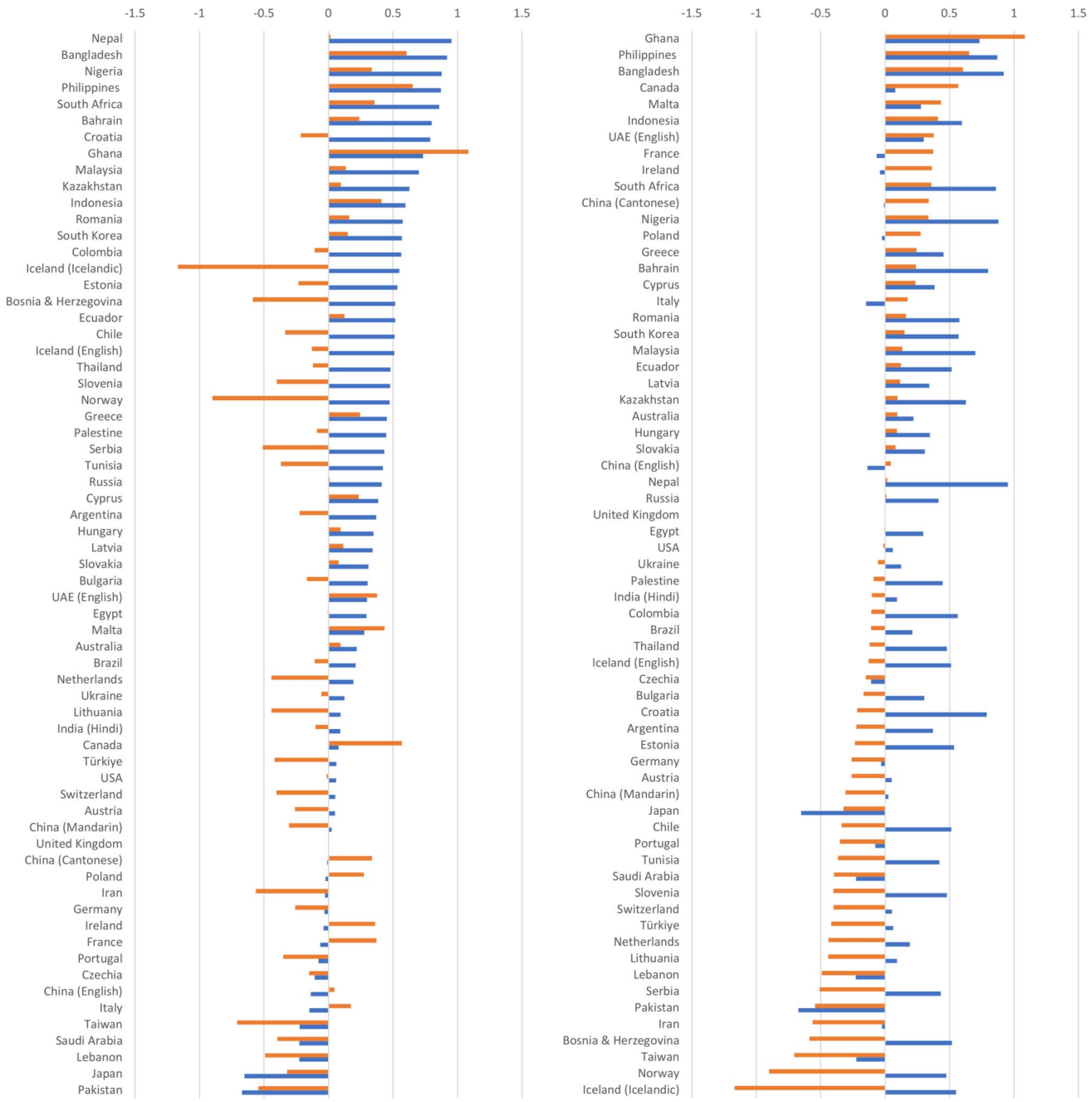

Fig. 1 Rank Ordering and Magnitude of Standardised Latent Mean Differences (Cohen's d) in the Two Factors of the SCS-11 (Left: Ranked by Compassionate Self-Responding [blue bars], Right: Uncompassionate Self-Responding [orange bars]; Values in the Other Factor are Each Provided for Comparison) Between National Groups (as Compared to the UK). *Note*. Data from UAE (Arabic), India (Tamil), Iraq, Israel, and Spain were excluded either due to poor model fit or poor scale reliability (see main text)

Self-Responding), whereas age groups ≥ 45 years vs. 18–24 years by $d = 0.21$ (Compassionate Self-Responding) and $d = -0.59$ (Uncompassionate Self-Responding; all p-values < 0.001). That is, compassionate self-responding scores increased with age, whereas uncompassionate self-responding scores decreased with age (the latter more strongly than the former).

Sociodemographic Correlates of the SCS-11

Table 5 presents the results in the final models of the multilevel regression analyses for the Compassionate and Uncompassionate Self-Responding subscales of the SCS-11. For Compassionate Self-Responding, there was a small positive association with financial security and very small

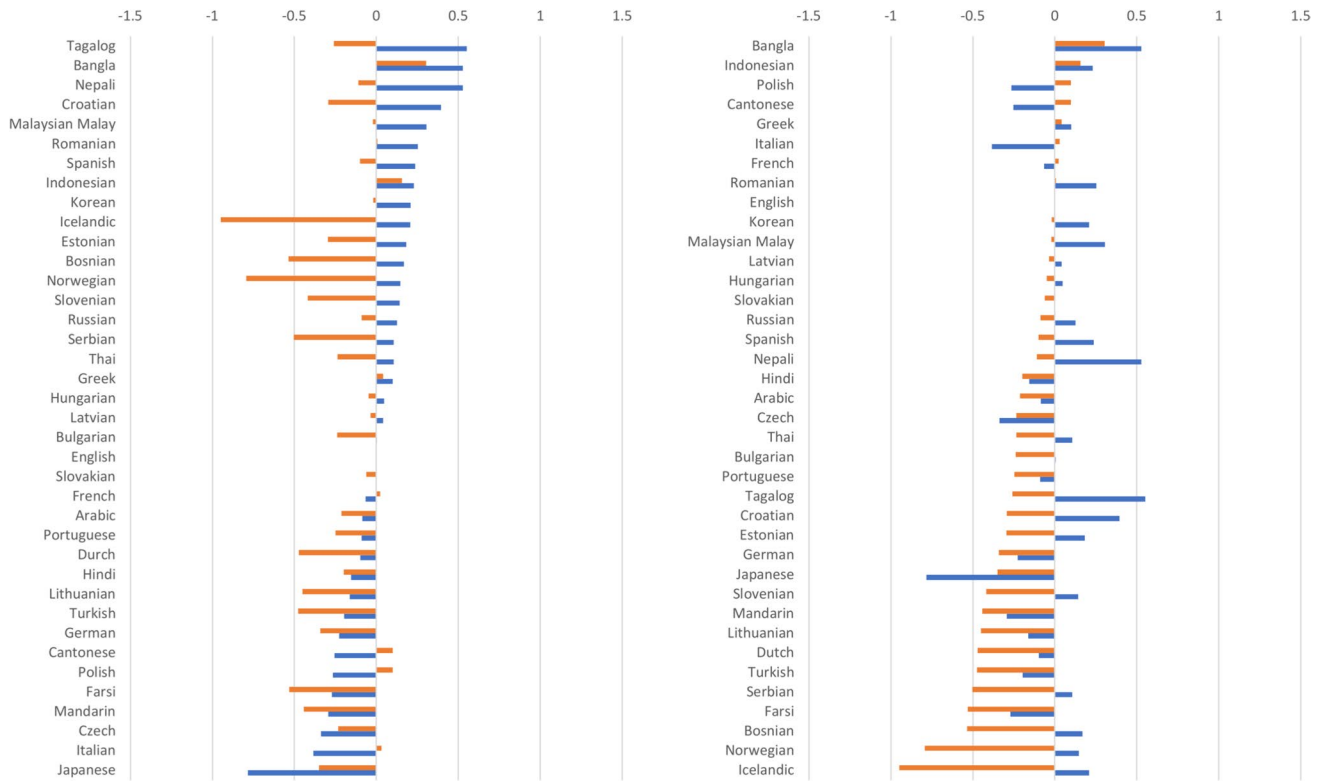

Fig. 2 Rank Ordering and Magnitude of Standardised Latent Mean Differences (Cohen's *d*) in the Two Factors of the SCS-11 (Left: Compassionate Self-Responding [blue bars], Right: Uncompassionate Self-Responding [orange bars]; Values in the Other Factor are Each Provided for Comparison) Between Languages (as Compared to English). *Note*. Hebrew and Tamil data were excluded due to poor scale reliability (see main text)

Table 5 Sociodemographic Correlates of the SCS-11 and Associations with Compassionate and Uncompassionate Self-Responding

Predictor	Compassionate Self-Responding			Uncompassionate Self-Responding		
	Estimate (posterior *SD*)	95% credibility interval	*p* (one-tailed)	Estimate (posterior *SD*)	95% credibility interval	*p* (one-tailed)
Level 1: Individual level						
Financial security	**0.10 (0.005)**	**[0.09, 0.10]**	**< 0.001**	**−0.13 (0.004)**	**[−0.13, −0.12]**	**< 0.001**
Urbanicity	**−0.02 (0.004)**	**[−0.03, −0.01]**	**< 0.001**	0.00 (0.005)	[−0.01, 0.01]	0.46
Education	**0.03 (0.004)**	**[0.02, 0.04]**	**< 0.001**	**−0.06 (0.004)**	**[−0.07, −0.05]**	**< 0.001**
Marital status	**0.02 (0.004)**	**[0.01, 0.03]**	**< 0.001**	**−0.05 (0.004)**	**[−0.06, −0.04]**	**< 0.001**
Racialised status	−0.002 (0.004)	[−0.01, 0.01]	0.36	−0.003 (0.004)	[−0.01, 0.01]	0.21
Level 2: Cluster-level means						
Marital status				**−0.41 (0.102)**	**[−0.58, −0.16]**	**< 0.001**
Random Effects						
Intercept residual variance	1.00 (0.00)	[1.00, 1.00]	< 0.001	0.83 (0.08)	[0.67, 0.97]	< 0.001
Variance explained (Level 1/Level 2)	1% / 0%			3% / 17%		

Note. Estimates are on a standardised scale. *SD* = standard deviation. Significant (one-sided $p < .025$) estimates are highlighted in boldface

positive associations with having either secondary or tertiary education and being in a committed relationship or married. In turn, there was a very small negative association with residing in a capital city (urbanicity). Cast into the metric of Cohen *d*, mean differences due to urbanicity, education, and marital status (all of which were dichotomous predictors) amounted to $d = -0.03$, 0.05, and 0.03 (in the above order). There were no associations at the cluster level (between national groups). Concerning Uncompassionate Self-Responding, there were small negative associations with financial security, education, and marital status (Cohen *d*-values of the latter two: −0.12, −0.10). On the cluster level, the means of marital status were negatively associated with UCS means across national groups.

Discussion

In the present study, we used the BINS dataset – with data from 56,968 respondents across 65 nations and 40 languages – to conduct the most comprehensive assessment to date of the factorial validity and measurement invariance of the SCS–SF. Our results suggested that an 11-item, 2-factor model reflecting compassionate and uncompassionate self-responding (i.e., the positively and negatively valenced items) most optimally balanced parsimony, item retention, conceptual clarity, and statistical robustness compared to other models that were tested. Additionally, this 2-factor model evidenced partial scalar invariance across national groups and languages, as well as full scalar invariance across gender identities and age groups. Associations between compassionate and uncompassionate self-responding varied widely across national groups, and there were weak individual-level associations between both factors and sociodemographic variables. Below, we discuss each of these results in greater detail, beginning with modelling of SCS-SF scores.

As we noted above, there have been protracted and sometimes vociferous debates about how best to model scores on both the SCS and its short form (e.g., Muris et al., 2021; Neff, 2016, 2019; Strickland et al., 2022). Indeed, as increasingly sophisticated analytic methods have been deployed, it can sometimes be difficult for researchers to know what progress has been made and for practitioners to know how best to use these instruments (Buz et al., 2022; Strohmaier et al., 2023). We do not pretend that our data and results will necessarily resolve these debates, and we also acknowledge that our data can only speak to the SCS–SF and not the SCS. Nevertheless, we suggest that our results offer an informative contribution to ongoing debates, insofar as we have relied on possibly the largest dataset containing SCS–SF scores to date and certainly the most diverse in terms of nations and languages.

In the present work, we tested the most common data-driven and hypothesised models that have been deployed in the literature using our total dataset. Our results showed that a unidimensional model of the SCS–SF (Poli & Miccoli, 2023), a 6-factor model with a higher-order factor (Neff, 2003b), and a 6-factor model with two higher-order factors (Strickland et al., 2022) all had poor fit to the data. Additionally, in our dataset, a bifactor-CFA model with six S-factors and one G-factor, as well as a Bayesian bifactor-ESEM model with six S-factors and two G-factors (Marsh et al., 2023), failed to converge. On the other hand, the bifactor-ESEM model favoured by Neff (2016, 2019) had adequate fit to our data. However, this model failed to meet recognised criteria for retention (Morin, 2023; Swami et al., 2023a), with S-factor loadings generally very low (i.e., below recommended limits) and difficulties interpreting the solution. As such, we concluded that our data do not conclusively favour retention of this model.

Conversely, a 2-factor model that distinguished between positively and negatively valenced items (i.e., compassionate and uncompassionate self-responding), with one item omitted (Item #10, "When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people") and allowed for correlated errors between one pair of items (#Items 11 and #12), evidenced good model fit. The same model with Item #10 retained caused difficulties with factor interpretation, so we elected to eliminate this item and retain an 11-item version of the SCS–SF. Of course, eliminating Item #10 may have had unintended consequences. In fact, test adaptation scholars generally recommend avoiding item exclusion where possible, because doing so may result in construct under-representation (i.e., where content that makes up a construct is not fully represented in the instrument) and may affect validity of scores on an instrument (Swami et al., 2021a, 2021b).

Nevertheless, we suggest that there are good reasons to consider elimination of Item #10 from the SCS–SF. Thus, some scholars have suggested that this item can be difficult to understand or interpret in some national or linguistic groups (Buz et al., 2022). Additionally, there is evidence that Item #10 taps a state-like condition of self-compassion, in contrast to the other items, which tap more trait-like conditions (Medvedev et al., 2021; Truong et al., 2022). Finally, Item #10 may also share a high degree of conceptual similarity with other SCS-SF items (Finaulahi et al., 2021) and have low discriminatory power (Maya et al., 2024). Indeed, evidence suggests that omission of this item improves model fit and/or composite reliability of the SCS–SF (e.g., Maya et al., 2024; Meng et al., 2019). In view of these issues, we suggest that elimination of Item #10 is both supported by our results and test adaptation theory.

As such, we suggest that it is an 11-item, 2-factor model of the SCS–SF that had optimal and best fit to our data. This

is consistent with the results of other studies utilising samples from singular nations, where distinct compassionate and uncompassionate self-responding factors have been observed (e.g.,Babenko & Guo, 2019; Fuochi et al., 2025; Hayes et al., 2016; Kotera & Sheffield, 2020; Sutton et al., 2018). This has sometimes been said to reflect method effects (i.e., an emergent model that distinguishes positively and negatively worded items; Muris & Petrocchi, 2017). However, a more likely explanation is that the compassionate and uncompassionate dimensions represent distinct latent variables, rather than just being reflective of reverse-coding (Adu et al., 2024; Büchner et al., 2025). This is supported by the finding that scores on each dimension are differentially related to other constructs, such as resilience, shame, and well-being (Fucohi et al., 2025; Kotera & Sheffield, 2020; López et al., 2015).

Importantly, our results with the total sample also suggested that the Compassionate and Uncompassionate Self-Responding factors were nomologically distinct. That is, to the extent that these factors were only weakly correlated, it suggests that each taps a relatively distinct conceptual construct. In turn, this finding suggests that – in our dataset at least – computation of an overall SCS–SF score would not be advisable. Rather, our results suggest that there are two distinct latent dimensions tapping relatively discrete constructs. This is consistent with recent work with Italian adult showing that compassionate and uncompassionate self-responding can sometimes show different correlation patterns (e.g., only compassionate self-responding being associated with higher perspective-taking; Fuochi et al., 2025). In fairness, the degree of discreteness did vary across national groups in our study – a point we return to below. Based on the total sample, however, our results support conceptualisation of the SCS–SF as tapping two distinct constructs that assess compassionate and uncompassionate self-responding, respectively.

We are not aware of any previous study that has examined cross-national or cross-language invariance of the SCS–SF, but work with the SCS has supported invariance of a bifactor-ESEM model (Tóth-Király & Neff, 2021) and a hierarchical 2-factor model (Halamová et al., 2021) across nations and languages. However, previous studies have been limited to a relatively small number of national groups (a maximum of 15 nations in the former study) and our sample size and representation of both national groups and languages far surpasses that of previous work. Here, our results showed that the 11-item, 2-factor model of SCS–SF scores achieved configural and metric invariance across national groups and languages. The lack of cross-national and cross-linguistic scalar invariance – although not unprecedented (Kanovský et al., 2021) – requires some explanation.

One possibility is that the construct of self-compassion being measured by the SCS–SF – and more specifically the distinction between compassionate and uncompassionate self-responding that is inherent in Neff's (2003a, 2003b, 2016) model of self-compassion – lacks universal applicability. For instance, recent qualitative work has highlighted cultural differences in how respondents interpret SCS items. Specifically, among Chinese young adults, Zhao et al. (2021) found cultural variations in how the positively valenced factors were interpreted (e.g., self-kindness as a form of self-pity, mindfulness as a form of emotion suppression) and a lack of distinction in understandings of the negatively valenced factors. In a similar vein, it is possible that how the various components of self-compassion converge differs as a function of cultural and religious values (Neff et al., 2008; Zeng et al., 2016), linguistic variation, and learning histories; that is, to the extent that self-compassion is context-dependent (Montero-Marin et al., 2018), we should expect cultural variation in understandings of the latent construct, which in turn impact measurement invariance.

In this regard, it is interesting to note that the association between the compassionate and uncompassionate responding factors varied widely across national groups. In fact, across about a dozen national groups, we observed strong, positive intercorrelations between these factors, which suggests that the conceptual distinction between compassionate and uncompassionate self-responding was diminished in these groups. In fact, wide variations in the association between the positive and negative components of the SCS have also been reported elsewhere (e.g., Neff et al., 2018), which suggests that the extent to which these components can be considered unitary may vary across national and linguistic contexts. Our study was not set up to effectively assess why these cross-national variations may have existed, but some relevant work has raised the possibility that cultural values (e.g., dialecticism, a cultural variable that promotes seeing the world as full of change and contradiction; Peng & Nisbett, 1999) affect the degree of unitary understandings of self-compassion (for a review, see Chio et al., 2021). More generally, it seems likely that compassionate and uncompassionate self-responding are context-dependent characteristics that are, at least partially, shaped by cultural norms, values, and practices (Gilbert et al., 2011; Neff et al., 2008). For instance, in cultural communities where negative feelings toward the self are used to regulate behaviours (e.g., where feeling shame is normative when experiencing failure), uncompassionate self-responding may be more easily triggered and compassionate responding may be relatively absent (Neff et al., 2008), thus leading to a clearer demarcation between these facets of self-compassion.

An alternative possibility is that full scalar invariance may have been an unrealistic goal, particularly for a study with as large a number of groups as ours (Marsh et al., 2018). Importantly, our results also suggested that it was possible to achieve partial scalar invariance of the 2-factor SCS-11 across all but five national groups and across

all but two languages represented in the BINS (where the two SCS-11 subscales had low composite reliabilities). While we suggest exercising caution when making claims about the universality of the self-compassion construct, these results are important from a practical point-of-view because they suggest that it may be possible to conduct cross-national and cross-language comparisons of SCS–SF scores. Indeed, our own comparisons of latent means indicated very large differences in both compassionate and uncompassionate responding across national groups and languages. Understanding why such differences exist is, however, more difficult and will require more focused attempts at understanding how culture and languages shape the experience of self-compassion.

Our results also showed that the SCS-11 achieved full scalar invariance across gender identities and age groups. In terms of the former, our findings are broadly consistent with previous work showing that a 2-factor model of the SCS is invariant across women and men (e.g., de Zoysa et al., 2022; Fucohi et al., 2025; Halamová et al., 2018). We also found that men had higher latent compassionate self-responding scores and lower uncompassionate self-responding scores compared to women and respondents who identified as being of another gender identity. This is broadly consistent with the finding that men report greater self-compassion than women (Yarnell et al., 2015), which may in turn reflect gendered pressure on women to attend to the needs of others before their own and to engage in self-sacrifice that diminishes opportunities for self-compassion. We also found that respondents of another gender identity reported the highest levels of latent uncompassionate self-responding, which may reflect the impact that minority stress has on this construct (Helminen et al., 2023). While extending the extant research beyond the binary of women and men was important, it should be noted that our sample of respondents of another gender identity was very small.

We also found that the SCS-11 was fully scalar invariant across emerging adults (18–24 years), young adults (25–44 years), and middle-age and older adults (≥45 years). Additionally, our analyses showed that compassionate self-responding increased with age, whereas uncompassionate self-responding decreased with age. These findings are broadly consistent with previous work showing that there is a positive association between age and self-compassion (e.g., Neff & Pommier, 2013; Neff & Vonk, 2009). In explanation, Tóth-Király and Neff (2021) suggested that improvements in self-acceptance with age may help to explain why self-compassion increases with age. Our findings may be particularly important because they suggest that, consistent with research among older adults in Australia (Phillips & Ferguson, 2013), self-compassion is best described in terms of compassionate and uncompassionate self-responding, both of which are associated with well-being outcomes in different directions.

Our further analyses showed that greater compassionate self-responding and lower uncompassionate self-responding, respectively, were associated with greater financial security, higher educational attainments, and being in a committed relationship or married. The associations with financial security and education – two proxies of socioeconomic status – may reflect the fact that perceived or actual socioeconomic disadvantage may leave individuals with fewer opportunities, tools, and spaces to develop and maintain self-compassion. Socioeconomic disadvantage is a risk factor for poorer physical and mental health, which in turn may reduce tendencies toward compassionate self-responding and increase uncompassionate self-responding. Additionally, the relationships with marital status may reflect the impact that positive social interactions have on compassionate and uncompassionate self-responding. Overall, however, associations between the SCS-11 factors and sociodemographic variables – including an association between compassionate self-responding and urbanicity – were very weak. In practical terms, these sociodemographic variables do not appear to meaningfully impact experiences of compassionate and uncompassionate self-responding.

Limitations and Future Research

Although the present work provides one of the largest cross-national and cross-language databases on self-compassion, our findings should be considered in light of a number of constraints on their generalisability (Simons et al., 2017). First, because the BINS only included the SCS–SF, we are only able to draw conclusions about this particular scale and any attempt to generalise to the SCS should be treated with extreme caution. For instance, we generally found in our analyses that bifactor models did not converge, whereas other studies with the SCS have shown that both convergence and adequate model fit is possible (e.g., Tóth-Király & Neff, 2021). This may reflect the different degrees of stability that the SCS and SCS–SF, respectively, demonstrate both at the level of indicators and latent factors. As such, while we suggest that our results may provide indicative conclusions about the conceptual nature of self-compassion, direct applications to the SCS should be avoided.

In a similar vein, we utilised a data-driven approach to arrive at an optimal model (i.e., the SCS-11) for use in our analyses. One critique of this approach is that we were overly focused on model fit to the detriment of previously hypothesised models and theoretical definitions of self-compassion. In reality, we tested competing models in our work and found that it was the SCS-11 that presented optimal fit, whereas all alternative models presented less-than-optimal fit to the data. Nevertheless, we acknowledge that retention

of the 2-factor SCS-11 runs the risk of over-simplifying measurement of what is a complex construct. This, in turn, may limit the ability of the SCS-11 to detect convergent constructs, such as depression, anxiety, or positive well-being (Rakhimov et al., 2023). Even so, we see these as ongoing discussions that can be informed by the present data and results.

In terms of sampling, we recognise that our recruitment strategy was opportunistic in most cases and, as such, the individual samples should not be considered representative of a particular nation. This, in turn, may impact the generalisability of our findings, particularly when making cross-study comparisons. Relatedly, although one of the strengths of the BINS dataset is the focus on operational equivalence across research sites (Swami et al., 2022), we cannot entirely rule out small differences in recruitment and survey completion (e.g., in terms of online versus offline completion, participant remuneration, specific recruitment methods). Also related to recruitment, because the BINS dataset was researcher-crowdsourced, our data was underrepresented in several world regions (e.g., Africa, Central Asia, the Caribbean, Central America), though this is a common limitation of many large-scale, cross-national studies (Krys et al., 2024).

A further constraint on generalisability was that specific conditions during the period of data collection – which extended over 15 months and took place in the shadow of the COVID-19 pandemic – may have varied substantially across nations. This is particularly important because it is difficult to know how the pandemic itself, along with pandemic-related policies and outcomes (e.g., detriments to mental health) impacted levels and experiences of self-compassion. Moreover, these varying conditions make it difficult to know to what extent our data are temporally reliable and whether specific pandemic-related experiences (e.g., being in lockdown, severity of the pandemic, national and international responses to the pandemic, none of which were measured in our survey) may have affected our findings. Still, given the consistency of the factor structure of the SCS-11 across groups, any biases in results are likely to be reflected in latent group differences.

Our findings also raise several important questions that could be more fully answered in future research. For instance, it is unclear at present why instrument composite reliabilities were less-than-adequate in some national groups and why data from some linguistic groups detrimentally affected convergence. Likewise, although our results provide useful representations of latent differences in compassionate and uncompassionate self-responding across national groups and languages, much more can be done to understand why these latent differences exist. More generally, we suggest that there is a need to more thoroughly explore meanings and understandings of self-compassion across different cultural, national and linguistic contexts. Qualitative research (e.g., Zhao et al., 2021) that focuses on respondent understandings of specific SCS–SF items may be particularly useful in this regard.

These constraints on generalisability notwithstanding, the present work suggests that the SCS–SF, when used in an international context, is best conceptualised as an instrument that assesses distinct facets of compassionate and uncompassionate self-responding. This, in turn, may have important implications for how self-compassion – at least when assessed using the SCS–SF should be operationalised and conceptualised in practice across diverse national and linguistic contexts. Failure to fully appreciate these issues of measurement, particularly in cross-cultural contexts, may seriously hamper efforts to identify both putative contributors and outcomes of self-compassion, as well as creating confusion in practical scenarios where simple measures of self-compassion are required. Of course, we recognise that these debates about measurement are ongoing (Buz et al., 2022; Strohmaier et al., 2023), but we hope the availability of our results and dataset will offer scholars and practitioners a view of a route forward.

Supplementary Information The online version contains supplementary material available at https://doi.org/10.1007/s12671-025-02560-5.

Author Contributions **Viren Swami**: Conceptualisation, Methodology, Validation, Resources, Writing – original draft, Project administration; **Ulrich S. Tran**: Conceptualisation, Methodology, Formal analysis, Data curation, Writing – original draft; **Martin Voracek:** Conceptualisation, Methodology, Validation, Writing – review & editing; **Stefan Stieger**: Conceptualisation; Methodology; Validation; Writing – review & editing;**All Remaining Authors:** Data curation; Investigation; Writing – review & editing.

Data Availability The BINS data and our analytic codes are available on the Open Science Framework at https://osf.io/zpbc7/.

Declarations

Conflicts of Interest The authors have no conflicts of interest to declare.

Ethics Approval The overall project received ethics approval from the School Research Ethics Panel at the first author's institution (approval code: PSY-S19-015) and, unless exempt by national laws, all collaborating teams additionally obtained ethics approval from local institutional ethics committees or review boards. A list of local ethics approvals is presented in Supplementary Table S1.

Informed Consent All participants provided either digital or written informed consent.

Use of Artificial Intelligence No AI tools were used in the preparation of this manuscript.

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