Measurement Invariance of the Self-Concept Clarity Scale across Race and Sex

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Abstract

Self-concept clarity refers to the extent to which one holds a coherent, consistent, and stable view of one's attributes and conceptualization of the self. Self-concept clarity is related to a number of constructs including psychopathology, adaptive development, cultural identity, coping style, and leadership. The most commonly used measure is the Self-Concept Clarity Scale (SCCS; Campbell et al. 1996). The SCCS has been used in diverse groups and provides evidence that self-concept clarity varies among ethnicities and between sexes. This study tested the measurement invariance of SCCS scores across large samples of White ($n = 696$), East Asian ($n = 794$), Southeast Asian ($n = 489$), Pacific Islander ($n = 238$), and Multiracial ($n = 490$) participants, and between sexes. Findings indicate that the SCCS has configural, metric, scalar, and strict invariance among races and between sexes. The latent factor variance and means were also equal across groups. These results suggest that the SCCS measures the same construct among groups and that scores represent the same level of self-concept clarity among groups. The current study found small but statistically significant differences among races in SCCS scores, which likely represent actual differences in self-concept clarity rather than different psychometric properties among groups.

Keywords Asian · Southeast Asian · Multiracial · Pacific islander · Configural · Metric · Scalar

Self-concept clarity refers to extent to which one holds a coherent, consistent, and stable view of one's attributes and conceptualization of the self (Campbell 1990). People with high SCC report being confident in understanding their own attributes, and describe these attributes consistently across situations. In contrast, people with low SCC tend to be unsure of themselves and to be tentative in their interpretations of their own qualities. SCC has implications for many subfields of psychology including clinical (Cicero 2018; Vartanian and Hayward 2018; Roepke et al. 2011), developmental (Lodi-Smith and Crocetti 2018), social (Landau et al. 2009), personality (Campbell et al. 1996), and cognitive psychology (Lodi-Smith and DeMarree 2017). For example, previous work has linked low self-concept clarity to schizophrenia (Cicero et al. 2015; Cicero et al. 2016), depression (Bigler et al. 2001), generalized anxiety (Kusec et al. 2016), social anxiety disorder (Stopa et al. 2010), and eating pathology (Vartanian and Hayward 2018). On the other hand, high self-concept clarity is

associated with adaptive development across the lifespan (Diehl and Hay 2011; Lodi-Smith and Roberts 2010; Lodi-Smith and Crocetti 2018), effective coping styles (Stopa et al. 2010), clear cultural identity (Usborne and Taylor 2010), and high quality leadership (Spain and Kim 2018). Thus, self-concept clarity is an important construct for many areas of psychology.

SCC has been measured in several different ways, but the most common measure of SCC is far and away the Self-Concept Clarity Scale (SCCS; see Campbell et al. 1996 for the items included in the scale). The SCCS is a 12-item self-report scale on which participants rate how much they agree with a series of statements on a scale of 1 *(Strongly Disagree)* to 5 *(Strongly Agree)*. The SCCS is a face valid scale, with evidence for the reliability and validity of its scores in many different populations including general population samples (e.g., Diehl and Hay 2011; Lodi-Smith and Roberts 2010), undergraduates (e.g., Butzer and Kuiper 2006; Cicero et al. 2013; Smith et al. 1996), and clinical samples of people with psychopathology (e.g., Bigler et al. 2001; Cicero et al. 2017; Evans et al. 2015). Previous research has found that the SCCS is a unidimensional construct (Campbell et al. 1996).

The SCCS has also been shown to be highly correlated with other measures and conceptualizations of self-concept

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clarity. For example, it is correlated with task-based measures of self-concept clarity, such as the Me-Not-Me Decision task in which participants rate a series of adjectives, including antonym pairs, as to whether or not the adjectives describe themselves. SCCS scores were associated with higher consistency in these ratings (e.g., rating introverted as "me" and extroverted as "not me"), higher confidence in these ratings, and shorter reaction times (Campbell et al. 1996; Cicero et al. 2017). Thus, the SCCS has considerable evidence for the reliability and validity of its scores across a wide variety of participants.

The SCCS has also been used with a wide variety of participants from diverse racial, ethnic, and cultural groups. Early work using the SCCS suggested that differences in culture may affect latent levels of self-concept clarity, leading to ethnic differences in SCCS scores (Campbell et al. 1996). For example, there are several reasons that people from Eastern and Western cultures may have differences in self-concept clarity scores. First, Eastern cultures stress dialecticism (Peng and Nisbett 1999; Spencer-Rodgers et al. 2009), as opposed to more analytic thought in Western cultures. Dialecticism can be described as a holistic thought pattern that assumes contradiction and change are part of the human experience. Thus, East Asians may develop self-concepts that are more flexible than the central global self-concepts of Westerners. Second, people in Eastern and Western cultures differ in self-construal, the framework people use to define themselves. Western cultures tend to have more independent self-construals, such that the self is defined by personal attributes such as values, traits, or personalities. On the other hand, Eastern cultures tend to have more interdependent self-construals, such that the self is defined by relationships with others (Markus and Kitayama 1991). Thus, people of Western heritage (e.g., White or European Participants) may have higher self-concept clarity because they define themselves based on these attributes more than people of Eastern heritage (e.g., East Asian and Southeast Asian) who define themselves more based on group identity (Nisbett et al. 2001).

Third, Eastern cultures stress that context is important in understanding most constructs, including the self, and that as contexts change, inconsistencies in self-definitions follow (English and Chen 2011; Chen et al. 2006). Thus, these global judgments of clarity might either not be as important or arguably not even meaningful in Eastern cultures (Hardin et al. 2014). This theory is supported by the finding that SCCS scores are less strongly correlated with global self-esteem scores in Japanese participants than in Canadian participants. However, it is unclear if these score differences represent actual differences in latent self-concept clarity, or are related to differences in what the scale is measuring between groups. For example, if self-concept clarity, and the SCCS by extension, has fundamentally different meanings in these groups, it would be expected that the SCCS would lack measurement invariance among groups.

In addition to differences between people from Eastern cultures, people who identify as multiracial may have lower self-concept clarity than White participants. Ethnic identity has been found to be strongly associated with self-identity, and is a powerful part of one's overall self-concept (Tajfel 1981). Previous research has found that collective cultural identity clarity (i.e., the extent to which individuals hold clear conceptualizations of the cultural groups to which they belong) is strongly associated with self-concept clarity (Gardner and Garr-Schultz 2018). Multiracial individuals may have less clear cultural identity clarity because they identify with more than one group, which makes identity more complicated and potentially less clear (Renn 2008). However, like with other differences, measurement invariance needs to be established to determine whether any observed differences represent real differences in latent self-concept clarity or are related to differences in the psychometric properties among groups.

Another demographic characteristic that might be related to self-concept clarity is sex. Some theorists have argued that women may have lower self-concept clarity than men because women tend to define themselves more based on relationships than do men (Chen et al. 2006). Thus, women tend to have more interdependent self-construals, and men tend to have more independent self-construals, which is consistent with empirical work (Cross and Madson 1997; Cross et al. 2000). Research comparing men and women on SCCS scores has produced mixed results with some studies finding small differences (Light and Visser 2013; Campbell et al. 1996) and others finding no significant differences (Csank and Conway 2004). Thus a goal of the current research was to examine whether the SCCS is invariant between sexes and if men had higher SCCS scores than women.

One way to test whether the SCCS has the same psychometric properties among groups is to test measurement invariance (Chen 2008). The current study examines three types of measurement invariance. First, it examines configural invariance. To test configural invariance, a model is fit in which the factor loadings and item intercepts are free to vary among all the groups. If this model fits well, it would suggest that the SCCS is measuring the same construct among groups. This is the important for the SCCS because there is evidence that SCC may manifest in different ways among cultural and ethnic groups.

A second type of measurement invariance is metric invariance. To test metric invariance, the factor loadings of the items are constrained to be the same among all the groups. If this model fits as well as the configural model, it suggests that the SCCS is measuring SCC in the same way across groups. This is important for the SCCS because many studies using the SCCS have included diverse samples. The validity of SCCS scores in these groups depends on the assumption that the scale has metric invariance. If the SCCS does not have metric

invariance, then the interpretation of its scores in diverse groups, and the studies that have used it, may not be valid.

The third type of measurement invariance is scalar invariance. In a test of scalar invariance, both the factor loadings and item intercepts are constrained to be equal across groups. If the scalar invariance model fits as well as the configural invariance model, then one can assume that the scale scores represent the same latent level of SCC across groups (e.g. , a scores of 32 in White participants is equal to a score of 32 in East Asian participants). If the SCCS lacks scalar invariance, then mean comparisons among groups would be inappropriate because one would not be able to determine whether the differences were related to actual differences in SCC or differences in the psychometric properties of the scales.

The primary goal of the current research was to examine the configural, metric, and scalar invariance of the SCCS across race and between sexes. The second goal of the current research was to examine whether there were differences in mean scores among races and between sexes if the SCCS was found to have scalar invariance. It was expected that East Asian, Southeast Asian, and Multiracial individuals would have lower SCCS scores than would White participants. It was also expected that women would have lower SCC scores than men based on previous research.

Method

Participants

Participants were 3030 undergraduates enrolled in psychology courses at a large public university in Hawaii who participated as partial completion of a course requirement. There were 794 East Asian (Chinese, Japanese, Korean, etc.), 489 Southeast Asian (Vietnamese, Cambodian, Filipino, etc.), 696 White, 238 Pacific Islander (Native Hawaiian, Guamanian, Fijian, etc.), and 490 Multiracial. There were also 106 Hispanic, 59 African American, 13 Middle Eastern, 12 South Asian (Indian, Pakistani, Sri Lankan, etc.), 8 Native American or Native Alaskan, 1 African, and 1 Maori were excluded from the analysis due to small sample sizes. An additional 123 participants were excluded listwise for missing data on one or more of the SCCS items, leaving a final sample of 2707. Participants ages ranged from 16 to 56 ($M = 20.13$, $SD = 3.48$). They were 68% female.

Materials

The Self-Concept Clarity Scale (SCCS) is a self-report questionnaire consisting of 12 items. Participants responded on a 5-point Likert scale from 1 = *strongly disagree* to 5 = *strongly agree* with how much they agreed with each statement. The SCCS has been positively correlated with consistency ($r =$

0.31) and temporal stability of self-views ($|rs| = 0.27$–0.38) (Campbell et al. 1996). In the current research, the SCCS had high internal reliability in the total sample ($\alpha = 0.864$) and high internal reliability in each racial group and sex ($\alpha s = 0.843$–0.895).

Procedure

Participants completed the SCCS online as part of a larger study that took approximately one hour to complete.

Data Analysis

All models were fit using MPlus Version 8.1 (Muthen and Muthen 1998-2018). Since the SCCS is a Likert-type scale with five response options, the data can be treated as either continuous or categorical (Rhemtulla et al. 2012). There are advantages and disadvantages to treating the data as continuous, and thus using a Pearson correlation matrix and Maximum Likelihood with robust standard errors (MLR), compared to treating the data as categorical, and using a polychoric correlation matrix and Weighted Least Squares, Mean and Variance Adjusted (WLSMV) estimator. In a monte carlo simulation study, Sass et al. (2014) reported that measurement invariance results tend to be similar with MLR and WLSMV but stopped short of declaring that the estimation method does not matter. Instead, they recommended testing a single group factor model with both MLR and WLSMV estimation first. If the fit statistics are similar, they recommend choosing either MLR or WLSMV based on a variety of other considerations. If the fit statistics are similar between estimation methods, MLR was used because: 1) model fit comparisons such as McDonald's non-centrality index and ΔCFI (discussed below) have been developed and validated in MLR, but not WLSMV. 2) Measurement invariance analyses in WLSMV require that each category (i.e., 1,2,3,4 & 5) are selected by at least one person in each group, which is not the case in these data. Although there are proposed solutions, these require recoding the data (e.g., coding "4" and "5" responses into "4") which eliminates data. 3) MLR allows to the calculation of metric invariance in addition to configural and scalar invariance while WLSMV only allows for the calculation of configural and scalar invariance.

As mentioned, the SCCS was designed as a unidimensional measure, and previous research has found that a unidimensional structure fits the data well (Campbell et al. 1996). Thus, the author first aimed to confirm the unidimensional structure of the scale in the full sample. The author fit a unidimensional model in the total sample with all 12 items loading on a single factor.

To test the measurement invariance of the SCCS, a series of models was fit starting with the configural model (see Fig. 1). In this configural model, all the items loaded
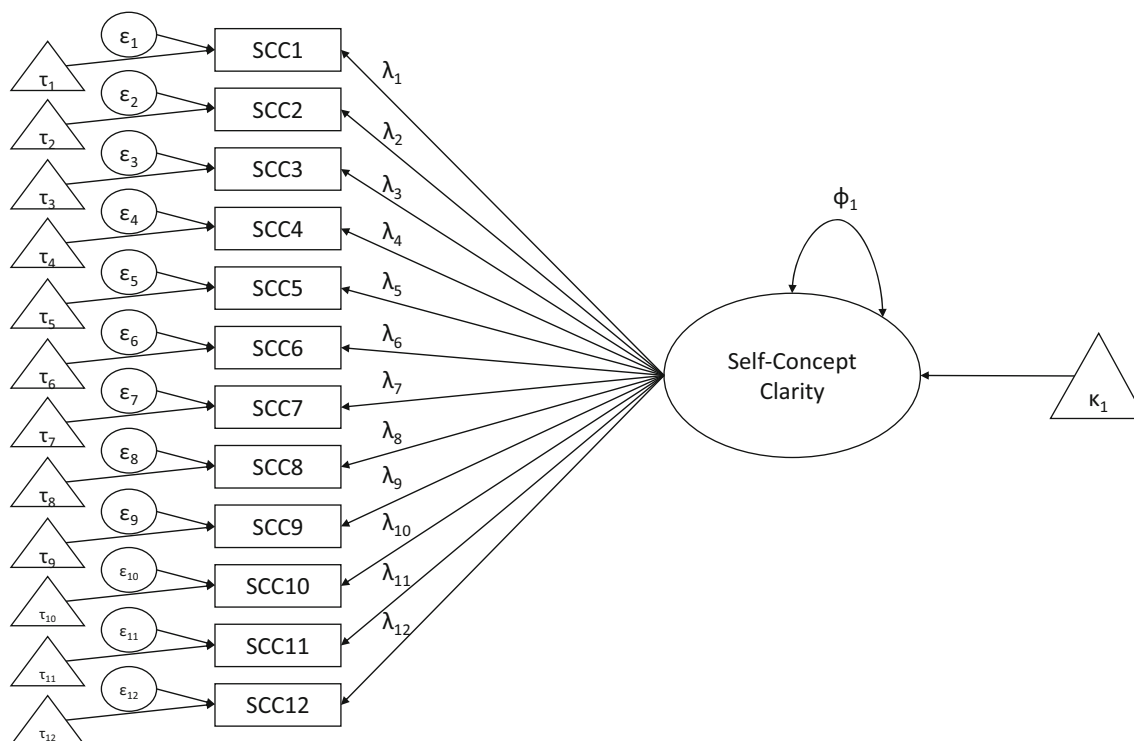
Fig. 1 Single group latent model of self-concept clarity Figure caption: SCC = Self-Concept Clarity, λ = factor loadings, τ = item intercepts, ε = item residuals, φ = latent factor variance, κ = latent factor mean

on a single factor, but the factor loadings and intercepts were free to vary among the groups. In the metric model, the factor loadings (λ in Fig. 1) are constrained to be the same across groups, but the intercepts are allowed to vary. Next, a scalar invariance model was tested in which the factor loadings (λ)and the intercepts (τ) are constrained to be equal among groups. A "strict" measurement invariance model was then specified in which the factor loadings, intercepts, and item residuals (ε) were constrained to be equal across groups. If this model fits just as well as the configural model, it suggests that the internal consistency is equivalent among groups (Cheung and Rensvold 2002). Next, structural invariance was examined. The equivalence of construct variance was tested by constraining the factor variance (φ) to be equal across groups. If this model fits as well as the configural model, it suggests that the range of responses is equivalent across groups. Finally, the equivalence of latent means was tested by constraining the latent means (κ) to be equivalent across groups. If this model fits just as well as the configural model, it suggests that the mean level of the construct is the same across groups.

To determine whether the single group and configural models fit the data well, the Root Mean Squared Error of Approximation (RMSEA), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI) were calculated. RMSEA values < .10 were considered to be acceptable and < .05 to be excellent. CFI and TLI values > .90 were considered acceptable and values over .95 were considered excellent (Hu and Bentler 1998; Hu and Bentler 1999; Marsh et al. 2004).

To test whether the metric and scalar models fit the data as well as the configural model, a Satorra-Bentler chi-square difference test (SBχ2; Satorra and Bentler 2001) was calculated. Given the well-known limitations of ratio tests based on chi-square (Cheung and Rensvold 2002), the SBχ^2 was supplemented with a change in McDonald's Noncentrality Index (Mc; Mcdonald 1989) and change in CFI (ΔCFI; Meade et al. 2008). Cutoffs of Mc < .02 and ΔCFI < .010 were used as evidence of measurement invariance, following common recommendations (Cheung and Rensvold 2002). These models were tested separately among races and between sexes.

If the SCCS was found to be scalar invariant, the second goal of the current research was to examine whether there were differences in SCCS scores among races and between sexes. SCCS scores were compared among races with a one-way ANOVA with planned Bonferroni-corrected t-tests among each combination of races. SCCS scores between sexes were compared with an independent samples t-test.

Results

Table 1 shows the means, standard deviations, and Pearson correlations among the items of the SCCS. First, the fit of a single group model with all of the items loading on a single factor was examined. Two models were specified, one using MLR and treating the variables as continuous and one using WLSMV and treating the variables as categorical. As can be

Table 1 Items Descriptives and Correlations for the Self-Concept Clarity Scale

Item	1	2	3	4	5	6	7	8	9	10	11	12
1	–											
2	0.58	–										
3	0.51	0.23	–									
4	0.50	0.22	0.62	–								
5	0.44	0.17	0.47	0.57	–							
6	0.09	0.04	0.17	0.15	0.19	–						
7	0.38	0.143	0.44	0.44	0.42	0.20	–					
8	0.54	0.21	0.52	0.55	0.49	0.17	0.54	–				
9	0.45	0.21	0.47	0.50	0.49	0.14	0.46	0.67	–			
10	0.42	0.15	0.44	0.48	0.45	0.14	0.43	0.53	0.56	–		
11	0.15	0.05	0.10	0.18	0.17	0.20	0.15	0.23	0.22	.26	–	
12	0.41	0.47	0.47	0.43	.42	0.11	0.40	.49	0.45	.46	.10	–
M (S-D)	3.04 (1.11)	2.60 (2.84)	2.71 (1.13)	3.06 (1.15)	3.20 (1.10)	3.07 (1.06)	3.15 (1.15)	3.19 (1.14)	3.19 (1.14)	3.16 (1.17)	2.54 (1.07)	2.77 (1.15)

seen in Table 2, the fit statistics were similar between the two approaches. The RMSEA, CFI, and TLI were acceptable with MLR estimation, while CFI and TLI were acceptable in WLSMV and RMSEA was close to acceptable. RMSEA was slightly higher in MLR and CFI and TLI were slightly higher in WLSMV. Following Sass et al. (2014), since the fit statistics were similar between approaches, it was decided to use MLR due to the advantages of MLR described above.

Measurement Invariance by Race

As can also be seen in Table 2, the configural model among races had acceptable fit statistics according to RMSEA, CFI, and TLI. This suggests that the unidimensional model is appropriate for the all racial groups. The factor loadings for the configural model

across races can be found in Table 3. The metric model, in which the factor loadings were constrained to be equal across groups, also had acceptable model fit. This model fit worse than the configural invariance model according to the $SB\chi^2$ difference test, but did not fit worse according to Mc and ΔCFI as these were well below the cutoffs of 0.02 and 0.01, respectively. Given the well-known limitations of the $SB\chi^2$ difference test, and that two of the three indices indicated metric invariance, this was taken as evidence that the SCCS has metric invariance across races. This suggests that the items measure the same construct of SCC across races. The scalar model also had acceptable fit and did not fit the model significantly worse than the configural model according to the Mc and ΔCFI, but did fit significantly worse according to the $SB\chi^2$. Like the metric model, this was taken as evidence that the SCCS has scalar invariance across

Table 2 Fit statistics for configural, metric, and scalar models by race

Model	χ^2	df	RMSEA	90% CI	TLI	CFI	BIC	AIC	χ^2_{diff} (df)	p value	McD	ΔCFI
1. Single Group (Total Sample)												
MLR	1140.078	53	0.082	0.078–0.086	0.909	0.927	97,200.323	97,422.927	–	–	–	–
2. Single Group (Total Sample)												
WLSMV	2325.205	53	0.119	0.115–0.123	0.929	0.943	–	–	–	–	–	–
Configural	1341.514	265	0.087	0.082–0.091	0.900	0.920	87,837.581	86,745.415	–	–	–	–
Metric	1402.366	309	0.081	0.077–0.085	0.913	0.919	87,550.675	86,718.268	63.493 (44)	0.0287	.003	.002
Scalar	1476.719	353	0.077	0.073–0.081	0.922	0.916	87,277.269	86,704.620	138.952 (88)	0.0001	.007	.004
Strict	1539.585	401	0.072	0.069–0.076	0.930	0.915	86,960.763	86,671.487	198.071 (136)	0.0004	.009	.005
Factor Variance	1545.112	405	0.072	0.068–0.076	0.931	0.915	86,934.675	86,669.014	203.598 (140)	0.0004	.010	.005
Factor Means	1562.444	409	0.072	0.068–0.076	0.931	0.914	86,920.393	86,678.346	220.93 (144)	<0.0001	.012	.006

MLR Maximum Likelihood Estimation with Robust Standard Errors, *WLSMV* Weighted Least Squares Mean and Variance Adjusted, *df* Degrees of Freedom, *RMSEA* Root Mean Squared Error of Approximation, *TLI* Tucker-Lewis Index, *CFI* Comparative Fit Index, *BIC* Bayes Information Criterion, *AIC* Akaike Information Criterion, χ^2_{diff} Satorra-Bentler chi-square difference test, *McD* McDonald's Noncentrality Index

Table 3 Standardized Factor Loadings for the Configural Model

	White	East Asian	Multiracial	Pacific Islander	Southeast Asian
1	0.73	0.64	0.69	0.70	0.65
2	0.71	0.72	0.75	0.67	0.73
3	0.74	0.70	0.68	0.76	0.71
4	0.77	0.73	0.74	0.75	0.72
5	0.65	0.67	0.69	0.68	0.65
6	0.15	0.31	0.08	0.28	0.16
7	0.65	0.61	0.67	0.61	0.55
8	0.82	0.79	0.78	0.79	0.80
9	0.75	0.73	0.70	0.78	0.78
10	0.67	0.65	0.70	0.62	0.68
11	−0.25	−0.24	−0.35	−0.10	−0.27
12	0.63	0.60	0.63	0.65	0.60

Table 5 Standardized Factor Loadings by Sex

	Female	Male
1	0.68	0.66
2	0.72	0.72
3	0.74	0.67
4	0.75	0.70
5	0.68	0.64
6	0.19	0.28
7	0.62	0.61
8	0.80	0.78
9	0.76	0.71
10	0.67	0.66
11	−0.24	−0.25
12	0.62	0.64

groups. This suggests that the SCCS scores represent the same latent level of SCC across groups and that mean comparisons among groups are appropriate. The Strict invariance model had acceptable model fit and did not fit significantly worse than the configural model according to the Mc and ΔCFI, but did fit significantly worse according to the SBχ^2. This suggests the SCCS has strict measurement invariance.

For the tests of structural invariance, both the model in which the factor variance was constrained to be equal across groups and the model in which the latent mean was constrained to be equal across groups had acceptable model fit and did not fit significantly worse than the configural model according to the Mc and ΔCFI, but did fit significantly worse according to the SBχ^2. Thus, the SCCS was found to have structural invariance across race in addition to measurement invariance.

Measurement Invariance by Sex

Next, the same models were examined for sexes. As can be seen in Table 4, the configural model had acceptable fit statistics. The factor loadings for the configural model between sexes can be found in Table 5. The Metric model also fit the data well and did

not fit worse than the configural model according to the SBχ^2, Mc, or ΔCFI. The Scalar Model fit the data well and did not fit worse than the configural model according to Mc or ΔCFI but did fit significantly worse according to SBχ^2. Like the models among races, the SCCS has metric and scalar invariance between sexes. The Strict invariance model with respect to sex had acceptable model fit and did not fit significantly worse than the configural model according to the Mc and ΔCFI, but did fit significantly worse according to the SBχ^2. This suggests the SCCS has strict measurement invariance between sexes.

For the tests of structural invariance by sex, both the model in which the factor variance was constrained to be equal across groups and the model in which the latent means were constrained to be equal across groups had acceptable model fit and did not fit significantly worse than the configural model according to the Mc and ΔCFI, but did fit significantly worse according to the SBχ^2. Thus, the SCCS was found to have structural invariance between sexes.

Mean Comparisons

Since the SCCS has scalar invariance among races and between sexes, mean comparisons are appropriate. First, a 5X2

Table 4 Fit statistics for configural, metric, and scalar models by sex

Model	χ^2	df	RMSEA	90% CI	TLI	CFI	BIC	AIC	χ^2_{diff} (df)	p value	McD	ΔCFI
1. Configural	1221.406	106	0.083	0.079–0.088	0.906	0.925	97,308.187	97,308.187				
2. Metric	1238.882	117	0.080	0.076–0.084	0.915	0.924	97,308.187	96,929.326	17.416 (11)	0.0961	.001	.001
3. Scalar	1292.658	128	0.078	0.074–0.081	0.919	0.921	97,273.873	96,961.162	71.252 (22)	0.0001	.007	.004
4. Strict	1318.369	140	0.075	0.071–0.078	0.925	0.921	97,203.420	96,962.873	96.963 (34)	<.0001	.009	.004
5. Factor Variance	1326.774	141	0.075	0.071–0.078	0.925	0.920	97,203.811	96,969.278	105.368 (35)	<.0001	.011	.005
6. Factor Means	1328.792	142	0.074	0.071–0.078	0.926	0.920	97,197.816	96,969.296	107.386 (36)	<.0001	.011	.005

MLR Maximum Likelihood Estimation with Robust Standard Errors, *WLSMV* Weighted Least Squares Mean and Variance Adjusted, *df* Degrees of Freedom, *RMSEA* Root Mean Squared Error of Approximation, *TLI* Tucker-Lewis Index, *CFI* Comparative Fit Index, *BIC* Bayes Information Criterion, *AIC* Akaike Information Criterion, χ^2_{diff} Satorra-Bentler chi-square difference test, *McD* McDonald's Noncentrality Index

race by sex ANOVA was run, and there was not a significant interaction between race and sex ($F (4, 2612) = 1.737$, $p = 0.139$). However, as can be seen in Table 6, there was a significant difference in SCCS scores among races ($F (4, 2620) = 4.913$, $p = .001$). Planned independent samples t-tests for all possible combinations, using a Bonferroni correction for multiple comparisons revealed that the White group had higher SCCS scores than the East Asian ($t (1,446) = 2.977$, $d = 0.156$, $p = .032$) and Southeast Asian groups ($t (1147) = 3.455$, $d = 0.208$, $p = .004$). The Pacific Islander group had higher SCCS scores than the Southeast Asian group ($t (697) = 3.138$, d $= 0.253$, $p = .018$) and marginally higher scores than the East Asian group ($t (996) = 2.712$, d $= 0.201$, $p = .093$). Males had significantly higher SCCS scores than females (t $(2,620) = 2.268$, $p = 0.023$, d $= 0.097$).

Discussion

The results of the current research suggest that the SCCS has configural, metric, and scalar invariance among White, East Asian, Southeast Asian, Pacific Islander, and Multiracial participants and between men and women. This suggests that the SCCS consistently measures the same construct among these groups and that mean scores represent the same latent level of self-concept clarity among groups. This provides evidence that studies including the SCCS in these groups have reached conclusions that are not biased by different psychometric properties among groups and that mean comparisons in scores among these groups represent actual differences in latent levels of self-concept clarity as opposed to merely differences in observed scores. These results suggest that researchers can continue to use the SCCS in diverse samples. Although studies using the SCCS have made the assumption that it is invariant among these groups, to my knowledge this is the first study to test this assumption empirically.

A second major finding of the current research is that Asian and Southeast Asian participants had lower SCCS scores than White participants. Pacific Islander and Multiracial participants did not differ from White participants, but Pacific Islanders had higher scores than Southeast Asian and tended to have higher scores than East Asian participants. However, it should be noted that most of these effects were small (Cohen's d < 0.20). At the same time, the model in which the latent

means were constrained to be equal across groups fit just as well as the models in which the latent means were allowed to vary. Thus, the significant results in the manifest means may be more due to the large sample size than the large differences among groups. This finding is consistent with previous work showing that Japanese participants have lower SCCS scores than Canadian participants (Campbell et al. 1996).

There may be several different reasons that East Asian and Southeast Asian had lower SCCS scores than did White participants. As mentioned, there are well documented differences in self-construal between those of Eastern and Western Heritage, with those with eastern heritage having more interdependent self-construal and those with western heritage having more independent self-construal (Markus and Kitayama 1991). This may be associated with higher self-concept clarity because people from Western cultures tend to define themselves more based on their personal attributes than do people from Eastern cultures (Nisbett et al. 2001). Critically, the results of the current research suggest that these differences are related to actual group differences in self-concept clarity, as opposed to differences in psychometric properties of the scale in different groups. Future research could include measures of self-construal to see if individual differences in self-construal could account for differences in self-concept clarity.

Another reason the East and Southeast Asian participants could have had lower scores are differences in reliance on dialecticism vs. analytic thinking (Peng and Nisbett 1999; Spencer-Rodgers et al. 2009). East and Southeast Asian participants may be fundamentally more comfortable with contradictions in their self-concepts that are related to changes in context, circumstances, or relationships with others (English and Chen 2011; Chen et al. 2006). Some theorists have gone as far as to say that these types of global judgments about the self might not represent a meaningful construct in some samples (Hardin et al. 2014). The results of the current research suggest that the SCCS is measuring the same construct in these diverse groups and that participants are answering the questions in the same way. Like self-construal, future research could include measures of dialecticism to determine whether individual differences in dialecticism can account for group differences in SCCS scores. Future research could further examine the equivalence of the SCCS by examining its correlations with other constructs among groups. In addition to self-construal and dialecticism, future research could include other

Table 6 Descriptive statistics of the Self-Concept Clarity Scale across race and sex

	Total M (SD)	White M (SD)	East Asian M (SD)	Multiracial M (SD)	Pacific Islander M (SD)	Southeast Asian M (SD)
Total	36.48 (8.50)	37.28 (8.84)	35.97 (8.02)	36.59 (8.71)	37.63 (8.51)	35.49 (8.43)
Male	37.04 (7.91)	38.04 (8.16)	36.38 (7.10)	38.36 (8.20)	37.53 (8.37)	35.18 (8.21)
Female	36.23 (8.75)	36.98 (9.08)	35.71 (8.48)	35.85 (8.81)	37.68 (8.61)	35.61 (8.52)

measures in self-concept clarity's nomological network, such as self-esteem, which has been found to be less strongly correlated with self-concept clarity in Japanese compared to Canadian participants (Campbell et al. 1996). If the SCCS is truly equivalent among groups, it would be expected to find that it would have similar validity coefficients with a variety of other measures.

In contrast to our hypotheses and the findings for East and Southeast Asians, multiracial participants did not have lower self-concept clarity than did other monoracial participants. However, this is consistent with previous research that suggests multiracial participants have similar levels of ethnic identity clarity to monoracial participants (Spencer et al. 2000).

In addition to differences in SCCS scores by race, men had higher SCCS score than women. However, this effect size was very small (Cohen's $d = 0.097$). This is consistent with previous research suggesting that women have marginally smaller or no difference in SCCS scores as compared to men (Light and Visser 2013; Campbell et al. 1996; Csank and Conway 2004). These small difference may be related to previous work showing that women have more interdependent self-construals than do men (Cross and Madson 1997; Cross et al. 2000), and tend to define themselves more based on relations than do men (Chen et al. 2006).

One limitation of the current research is that the participants were college students. Thus, the results of the current study may not generalize to other samples including general population, international, or clinical samples of people with psychological disorders. College students may have higher IQ, SES, and education levels compared to the general population, and may also be psychologically healthier, which has been shown to be associated with higher self-concept clarity (see Cicero 2018, for a review). At the same time, the majority of young adults in the United States attend college (Bureau of Labor Statistics 2016; National Center for Education Statistics 2016), and thus these results may generalize to the broader population. Moreover, college students experience similar levels of psychopathology to their non-college-attending peers (Blanco et al. 2008), and students who are ethnic minorities experience similar levels of racial discrimination and other risk factors for psychopathology (Hwang and Goto 2009; Solorzano et al. 2000; Swim et al. 2003).

Future research could extend this work into other racial groups such as African-American or Hispanic participants. The participants in the current research were all living in the United States. Thus, it is unclear if these results will generalize to East Asian participants living in Asia such as Japanese, Korean, or Filipino nationalists. The current research also included a mix of first-generation, second-generation, and third+ generation immigrants. Measurement invariance by generation status was not examined due to low numbers of first-generation immigrants. Future research could include

appropriate samples sizes and examine invariance among these groups.

Another potential limitation of the current research is that the study was conducted online, rather than in person. Careless or invalid responding could not be guarded against. At the same time, careless or invalid responding would contribute to error variance and would likely make the models fit worse and result in rejecting models that should otherwise be retained. Thus, it is unlikely that this type of responding would cause us to conclude the scale is invariant when it fact it is not.

Overall, the results of the current research suggest that SCCS scores have promising psychometric properties in East Asian, Southeast Asian, Pacific Islander, Multiracial, and White participants. The SCCS appears to measure the same construct in these groups, and mean scores represent the same latent level of self-concept clarity among these groups. Researches using the SCCS can be confident that the scale produces valid scores across these groups and that mean comparisons represent actual differences in levels of self-concept clarity as opposed to the result of differences in psychometric properties of the scale.

Compliance with Ethical Standards

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