# Chinese University Students' Intercultural Competence: Reconceptualization and Assessment

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## ABSTRACT

*Intercultural competence (IC) is considered as an essential soft skill for successful functioning in the globalized society in the 21st century. However, there is still a lack of culturally appropriate framework and instrument to understand and assess Chinese university students' IC development. The purpose of this study was to design a valid and reliable scale for assessing Chinese students' IC. Based on the AAA (Approach-Analyze-Act)-Chinese framework, a 30-item Intercultural Competence Scale-Chinese Version (ICS-CHN) was developed and validated with confirmatory factor analysis. Subsequent multigroup confirmatory factor analysis model further proved the measurement invariance of ICS-CHN in different gender groups. Together with its adequate reliability, convergent and discriminant validity, it is reasonable to conclude that ICS-CHN is a reliable and valid scale, corroborating that IC is a combination of affective/attitudinal, cognitive and behavioral skills and characteristics applied in intercultural encounters.*

**Keywords:** intercultural competence, reconceptualization, measurement validation, Chinese university students, 21st century skill

Intercultural competence (IC) is considered as an essential soft skill for successful functioning in the globalized society (Succi & Canovi, 2020). It refers to a person's ability to function effectively and appropriately in intercultural situations based on a set of affective, cognitive, and behavioral skills (Deardorff, 2006). Developing young people's intercultural competence that may help them thrive in the pluralistic world has become an urgent task. Opportunities for Chinese university students to get involved in intercultural interaction is increasing due to the shifting demographics inside China as well as the growth of students studying

internationally (Lin, 2020; Wen & Hu, 2019). However, there is still a lack of culturally appropriate framework and instrument for scholars and educators to understand and assess Chinese university students' IC development (Wu et al., 2013; Chao, 2014), given this concept originated in the West. Further, as argued by Griffith et al. (2016), few existing assessments of IC meet the standards of psychometric properties, despite the wide attention to this concept. The objectives of this study are to identify current conceptualizations of IC, review existing assessments and shed light upon our current understanding of IC in Chinese university students by revisiting, revising and developing more comprehensive views of this competence both at the theoretical and operational level.

## LITERATURE REVIEW

### Conceptualizing Chinese University Students' Intercultural Competence

Drawing on Grossman et al.'s (2015) process model of social thinking, Griffith et al.'s (2016) AAA framework divides intercultural interactions into three stages: Approach, Analyze, and Act, representing the attitudinal, cognitive, and behavioral aspects, respectively. The *Approach* dimension contains characteristics that drive an individual to voluntarily initiate and maintain intercultural contact, as well as traits that reflect a person's positive attitudes towards intercultural situations, including three subdimensions: Tolerance for Ambiguity, Cross-Cultural Self-efficacy, and Positive Cultural Orientation. Tolerance for ambiguity helps individuals properly cope with stress and remain engaged in intercultural interactions (Caligiuri & Tarique, 2012). Individuals with high self-efficacy will be more motivated to initiate and engage in intercultural interactions (Peterson et al., 2011). Positive cultural orientation is concerned with individuals' positive attitudes towards different cultures, including open-mindedness (Terrell & Rosenbusch, 2013), inquisitiveness (Deardorff, 2006), curiosity and respect for other cultures (Beechler & Javidan, 2007).

The *Analyze* dimension depicts an individual's ability to process received information in a preconception- and stereotype-free manner in four subdimensions: *Self-Awareness*, *Social Monitoring*, *Perspective Taking or Suspending Judgment*, and *Cultural Knowledge Application*. Individuals with high self-awareness are able to analyze how their own cultures shape their perspectives which further influence the ways they behave (Reid et al., 2012). Social monitoring reflects an individual's ability to evaluate the progress of the intercultural interaction based on other's behaviors and cues, as well as reactions to one's own performance (Lodder et al., 2016). The abilities of suspending judgment and perspective taking enable individuals to reduce their reliance on the preconceived judgement and stereotypes when understanding others' behaviors and perspectives (Griffith et al., 2016). Cultural knowledge application requires an individual to properly integrate culture-general, culture-specific, historical, and geopolitical information in intercultural situations (ibid).

The *Act* dimension incorporates *Behavioral Regulation* and *Emotional Regulation*. Behavior regulation requires an individual to suppress behaviors that

might be appropriate in one's own culture but inappropriate in other cultures, and change into appropriate behaviors (Ang et al., 2007). Individuals with strong emotion regulation abilities are capable of controlling which emotions they experience, how and when they experience them, and how and when they are expressed (Gross, 1998). This allows them to act more effectively in intercultural situations than those with no emotion regulation abilities (Haslberger et al., 2013).

The present study sought to conceptualize Chinese university students' IC by building on Griffith et al. (2016)'s framework for several reasons. First, while many existing models may put particular emphasis on cognitive (e.g., IC of EFL learners, Chao, 2014) or noncognitive (e.g., intercultural sensitivity, Chen & Starosta, 2000) aspects of IC, Griffith et al. (2016)'s AAA framework highlights the attitudinal, cognitive, and behavioral aspects of IC, lending good support to comprehensive conceptualization of IC. Second, AAA provides sufficient explanations of the interplay among dimensions, yet some existing frameworks fail to clarify such relationships despite their comprehensiveness and strong validity (e.g., CQS, Earley & Ang, 2003). Third, many existing IC frameworks rarely elaborate on how to translate the theoretical definitions into actual assessments. AAA provides specific definitions of the overall construct and its subdimensions, as well as example assessment topics of each dimension. This improves the conceptual clarity of IC and guides the development of an operational assessment more effectively.

As people from different cultures have their own shared personality traits and communication style (de Vries et al., 2013; Gudykunst et al., 1996), which further influences individuals' ways of thinking and behaving in interpersonal interactions, it is necessary to consider personality traits and communication styles shared by Chinese people when conceptualizing their IC (Chao, 2014; Wu et al., 2013). Cheung et al. (1996) summarized three major personality traits in Chinese people in interpersonal relationships: *harmony*, *ren qing* (Relationship), and *face*. As a key characteristic of competent interpersonal communication in Chinese culture (Chang, 2001; Wei & Li, 2013), *harmony* is a virtue that Chinese people pursue when handling interpersonal matters, to avoid conflict and maintain equilibrium. *Ren qing* (Relationship) indicates an individual's emotional responses when facing different situations in daily life (Cheung et al, 1996). *Face* reflects a person's concern for maintaining or enhancing one's own face and that of others (Cheung et al, 1996; Zane & Yeh, 2002). Hence, smooth, comfortable communication and moderate face-saving behaviors allow a Chinese individual to be better prepared for and skilled in communication (Zane & Yeh, 2002).

Communication literature also suggests distinctive styles of Chinese interpersonal communication from their western counterparts, including implicit communication (*hanxu* 含蓄), listening-centered communication (*tinghua* 听话), polite communication (*limao* 礼貌), and insider-communication (*zijiren* 自己人) (Fang & Faure, 2011; Gao & Ting-Toomey, 1998). Using non-straightforward and even ambiguous words to communicate their message, hiding true feelings, and avoiding giving direct 'no' or negative responses are typically found in Chinese people's communication. In their perspective, listening and modesty are

encouraged to show deference and respect, and they tend to be highly engaged in conversation with people they are familiar with (Gao & Ting-Toomey, 1998). Therefore, we argue for the integration of personality traits and primary functions of Chinese interpersonal communication into the AAA framework and define IC as an individual's ability to harmonize with others with dignity through effectively gathering, interpreting, and acting upon different cues in cross-cultural or multicultural settings.

Within this integrated framework, the *Approach* dimension determines whether the students are attitudinally primed for intercultural situations. This dimension is assessed by students' tolerance for ambiguity and cross-cultural self-efficacy levels that drive them to voluntarily initiate and maintain an intercultural relationship; and by the extent to which they exhibit positive cross-cultural orientation and typical Chinese personality traits to view the process and outcomes of intercultural contacts as beneficial.

The *Analyze* dimension covers students' self-awareness, self-monitoring, perspective-taking/suspending judgment, and cultural knowledge application. These cognitive skills enable the students to accurately gather, interpret and relate information in intercultural situations. The *Act* dimension is embodied in students' effective regulation of behavior and emotion that incorporates Chinese communication styles. Behaviorally, the students evaluate the applicability of their familiar communication styles in different cultural settings. Emotionally, students' control over emotions experienced during intercultural interactions is reflected in their politeness and face-directed communication. The three dimensions are dependent in nature, while a loose sequential relationship is suggested in which the positive outcomes of an earlier stage contribute to the success in a later stage. The adapted framework is presented in Figure 1.
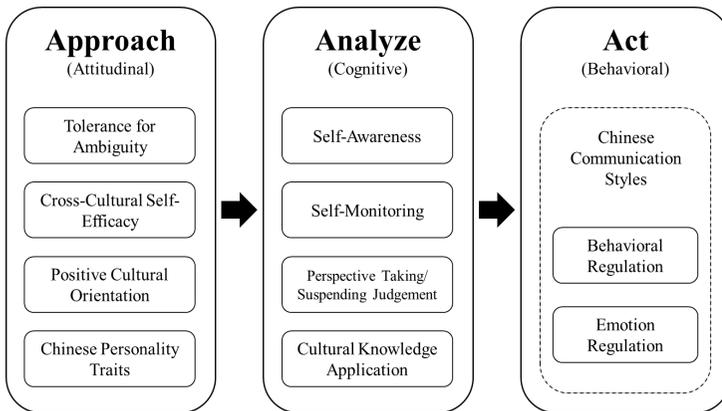


**Figure 1: The Approach-Analyze-Act-Chinese (AAA-CHN) Framework Assessing Chinese Students' Intercultural Competence**

One of the predominant approaches assessing IC is self-assessment instrument. A variety of IC measures have been developed in different disciplines (e.g.,

psychology, nursing, management). In educational contexts, widely used IC scales with good reliabilities include *Intercultural Development Inventory* (Hammer et al., 2003; Cronbach's α of the subscales ranged from .80 to .85), *Intercultural Sensitivity Scale* (Chen & Starosta, 2000; Cronbach's α for the whole scale was .86), and *Cultural Intelligence Scale* (Earley & Ang, 2003; Cronbach's α of the subscales ranged from .77 to .84). Considerable empirical studies have documented the usability of these scales among samples of varied cultural backgrounds and identities. However, criticism has been growing regarding the one-size-fits-all approach in measuring Easterners' IC using frameworks and instruments developed in Western contexts.

Indeed, most Eastern Asian cultures are predominantly collectivistic in nature wherein the importance of the group is stressed over the individual; whereas many North American and Western European countries are individualist cultures that stress the needs of the individual over the needs of the group as a whole (Triandis, 2001). Previous studies suggested that people from collectivist and individualist cultures are different in patterns of thoughts and behaviors. For example, Grimm et al. (1999)'s examination of cultural differences in self-described personality traits found that collectivist sample reported higher scores on attentiveness, respectfulness, humility, cooperativeness; whereas individualist samples reported higher scores on independence, pleasure seeking, assertiveness. In interpersonal communication, compared to those from individualist cultures, people from collectivist cultures favored more use of implicit and indirect messages (Gudykunst et al., 1996), compromising strategy when handling conflicts (Cai & Fink, 2002), and listening-centered communication style (Holmes, 2006). Although some universal attributes such as open-mindedness and flexibility might be shared by all, cultural variability as identified in personality and communication styles implies that relevant aspects of IC needed by individuals from collectivist and individualist cultures should not be the same. In this regard, some scholars took a non-Western perspective and posited that characteristics such as empathy (Chen & Starosta, 1996), tolerance (Kim, 2001), and face saving (Ting-Toomey & Kurogi, 1998) are important elements of Eastern Asian people's IC. Unfortunately, few attempts have been further made to develop tools assessing IC from these perspectives, except for two scales.

Wu et al. (2013) developed and validated the *Assessment of Intercultural Competence of Chinese College Students* (AIC-CCS). Their EFA (Exploratory Factor Analysis) results identified six factors, which accounted for 63.02% of the total variance: knowledge of self, knowledge of others, attitudes, intercultural communicative skills, intercultural cognitive skills, and awareness. Cronbach's α of these dimensions ranged from .73 to .91. Chao (2014) developed the *Intercultural Competence Scale* to explore the levels of Taiwanese university EFL learners' IC, and extracted five factors from EFA, which accounted for 67.57% of the total variance: knowledge of intercultural interaction, affective orientation to intercultural interaction, self-efficacy in intercultural situations, behavioral performance in intercultural interaction, and display of intercultural consciousness. Cronbach's α of these dimensions ranged from .76 to .93.

Wu et al. (2013) and Chao (2014)'s frameworks have undoubtedly broadened our understandings of important components of IC necessary for Chinese university students to thrive in intercultural settings. However, a scrutinization of these two measures suggests several issues to be carefully addressed. First, a great deal of evidence shows that personality traits and communication styles vary across cultures which is especially true when comparing individualist and collectivist cultures (de Vries et al., 2013; Gudykunst et al., 1996; Triandis, 2001). Researchers have thus argued that both personality and communication style should be included in the key elements of IC when cultural variability is considered (Covert, 2014; Yu et al., 2002). Wu et al. (2013) and Chao (2014)'s characterizations of Chinese students' IC only partially reflected Chinese people's personality and communication style, such as politeness and face protection.

Second, many existing items that assess the cognitive aspect (knowledge) of IC tend to put an emphasis on the culture-specific content. The expressions of "foreign knowledge" or "other cultures" present ambiguity, which may confuse the respondents about which cultures these items refer to. As Griffith et al. (2016) argued, an individual can expect to encounter people from diverse cultures throughout their lifetime. Such exposure may result in greater familiarity with some cultures and comparatively less understanding of others. As such, instead of assessing culture-specific knowledge, Griffith et al. (2016) suggested that it may be more preferable to assess cultural knowledge at a general level.

Third, methodologically, Chao (2014) only reported the results of Cronbach's $\alpha$ and the construct validity of the measure remained unclear. Although Wu et al. (2013) provided evidence of both internal reliability and validity of their scale, insufficient evidence was available to understand whether their scale was universal across gender groups, given reported gender differences in previous IC studies (e.g., Solhaug & Kristensen, 2020). Therefore, based on an adapted IC framework, the major goal of this study was to develop an instrument to address the aforementioned issues by 1) incorporating personality and communication style shared by the targeted cultural group which have long been overlooked or insufficiently attended when IC is conceptualized in a specific cultural context, 2) taking "an individual's application of knowledge about other cultures to facilitate the intercultural interaction" as the indicator of intercultural knowledge instead of assessing cultural-specific knowledge; and 3) examining measurement invariance across gender which has been rarely reported by previous studies to provide more evidence of the psychometric properties of IC measure.

Two research questions were proposed to guide this study:

(1)     Was the new scale reliable and valid for assessing Chinese university students' IC?

(2)     Did the new scale measure Chinese university students' IC in the same way across gender groups?

# METHOD

## Generation of the Initial Item Set

We followed established scale development principles for developing the initial item set (Gamst et al., 2015) as well as validation procedures (Worthington & Whittaker, 2006). First, we did a thorough review by searching for articles that synthesized the conceptual models and assessment tools of IC in key databases (e.g., *PsycArticles, PsycInfo, Education Research Complete, Linguistics and Language Behavior Abstracts and Academic Search Complete*) and journals (e.g., *Intercultural Education, International Journal of Intercultural Relations, Journal of Cross-Cultural Psychology, Journal of International Education Research, Journal of Studies in International Education, Language and Intercultural Communication, and Journal of Research in International Education*) in this field, as well as papers that discussed the theory of Chinese social orientation (e.g., Yang, 1993). Second, a pool of items was developed for the initial prototype version of the scale. To leave sufficient room for psychometric refinement (Hinkin, 1998), a total of 56 items were initially generated with 5 to 6 items in each sub-dimension. The generation of each item relied on (1) the definition and assessment topics suggested by Griffith et al. (2016); (2) a review of existing IC items which followed Griffith et al.'s (2016) framework; and (3) a review of literature that discussed Chinese personality traits and communication styles (which were not included in Griffith et al.'s framework). A total of 56 items were developed in the initial form of the scale.

The *Approach* domain included four sub-dimensions: (i) *Tolerance for Ambiguity*, (ii) *Cross-Cultural Self-Efficacy*, (iii) *Positive Cultural Orientation*, and (iv) *Chinese Personality Traits.* Four items were generated by adapting from Herman et al. (2010)'s *Tolerance for Ambiguity Scale*, which manifested a person's ability to operate effectively and calmly in an uncertain environment (*Tolerance for Ambiguity*). Five items were generated by adapting Chao (2014)'s *Intercultural Competence Scale for Taiwanese EFL Learners*, and Briones et al. (2009)'s *Cultural Self-Efficacy Scale* to depict the degree to which an individual believes that he or she could achieve a goal in intercultural situations (*Cross-Cultural Self-Efficacy*). Five items were generated by adapting Chen and Starosta (2000)'s *Intercultural Sensitivity Scale*, Bird and Osland (2004)'s Global Competencies Inventory, and Chao (2014)'s *Intercultural Competence Scale for Taiwanese EFL Learners* to assess an individual's positive attitudes towards intercultural situations (*Positive Cultural Orientation*). Six items were generated by adapting Leung et al. (2011)'s *Harmony Scale*, Wang et al. (2008)'s *Ren Qing Scale*, Cheung et al. (2003)'s *Chinese Personality Assessment Inventory*, and Chou (1996)'s *Acquisitive Face Orientation Subscale* to describe the characteristic patterns of thought, feelings, and behavior that are perceived to be prototypical of members of Chinese culture (*Chinese Personality traits*). The traits of *Harmony*, *Ren Qing*, and *Face* were integrated into this dimension to reflect the most valued attributes of a competent communicator in the Chinese culture (Xiao & Chen, 2012).

The *Analyze* domain included four sub-dimensions: (i) *Self-Awareness*, (ii) *Self-Monitoring*, (iii) *Perspective Taking/Suspending Judgement*, and (iv) *Cultural Knowledge Application*. Six items were generated by adapting Lu and Wan (2018)'s *Cultural Self-Awareness Scale* to denote the degree to which a person understands how his or her culture influence his or her cognitive, emotional, and behavioral responses (*Self-Awareness*). Five items were generated by adapting Chen and Starosta (2000)'s *Intercultural Sensitivity Scale*, and OECD's (2017) *Global Competence Scale* to gauge a person's attention to the other's behaviors and cues, as well as their responses to one's own actions during intercultural interactions (*Self-Monitoring*). Eight items were generated by adapting OECD's (2017) *Global Competence Scale* to assess a person's active consideration of others' potential viewpoints and active refrainment from preconceived cultural schema (*Perspective Taking/Suspending Judgement*). Five items were generated by adapting Wu et al. (2013)'s *Assessment Tool for Chinese College Students' ICC* to describe a person's utilization of cultural knowledge to facilitate intercultural interaction (*Cultural Knowledge Application*).

The *Act* domain includes two sub-dimensions: *Behavior Regulation*, and *Emotion Regulation*. Six items were generated to assess three out of five distinctive styles of Chinese interpersonal communication: *implicit communication*, *listening-centered communication*, and *insider-communication* in the domain of *Behavioral Regulation*. The rest two distinctive styles of Chinese interpersonal communication: *polite communication* and *face-directed communication* were mapped to the domain of *Emotion Regulation*, with another six items from Gross and John (2003)'s *Emotion Regulation Questionnaire*, Zane and Yeh (2002)'s *Loss of Face Scale*, and Fang and Faure (2011)'s definitions of these two communication styles.

## Data Collection and Participants

After the initial item set was generated, the English and Chinese version of the scale were prepared following a standardized backtranslation procedure (Brislin, 1970). According to the validity criteria suggested by Messick (1995) for educational and psychological measurement, the content and substantive aspects of construct validity need to demonstrate the items' content relevance, representativeness, technical quality, and consistency with theories. Thus, three university professors (two of them specialized in intercultural issues in education; one specialized in educational measurement), and ten university students with rich experiences of intercultural contacts were invited to evaluate the clarity, readability, face validity, and translation of the items. All items in the initial version of the survey were rated on a 7-point Likert scale (1 = "Strongly Disagree" to 7 = "Strongly Agree"). The initial version of the Intercultural Competence Scale-Chinese Version (ICS-CHN) was then administered to Chinese university students via a web-link. In order to avoid participants' misunderstanding about the survey items or obstacles in accurately answering questions or rating their level of agreement on each item due to their English proficiency limitations, the Chinese version was administered. Each student voluntarily completed the survey

individually, with no incentive provided. Ethical approval for this study was obtained from the Research Ethics Committee in the authors' host institution.

A total of 565 undergraduate students responded to the online survey. Thirty-six invalid cases (e.g., responses of regular pattern, outliers) were removed, leading to a final sample of 529 (40.1% male; mean age = 19.2 years old, SD = 1.70). The participants came from different universities in 27 different provinces of mainland China. They majored in different fields at different grade levels. Among the 529 students, 67.7% (n = 358) were freshmen, 9.5% (n = 50) were sophomores, 9.5% (n = 50) were juniors, and 13.4% (n = 71) were senior students; 43.1% (n = 228) majored in Engineering, 20.6% (n = 109) in Management, 11.7% (n = 62) in Science, 11% (n = 58) in Humanities, 5.5% (n = 29) in Art, 2.6% (n = 14) in Law, 2.1% (n = 11) in Economics, 1.7% (n = 9) in Medicine, 1.3% (n = 7) in Education, and 0.4% (n = 2) in Agriculture. Detailed demographics of the sample are presented in Figure 2.
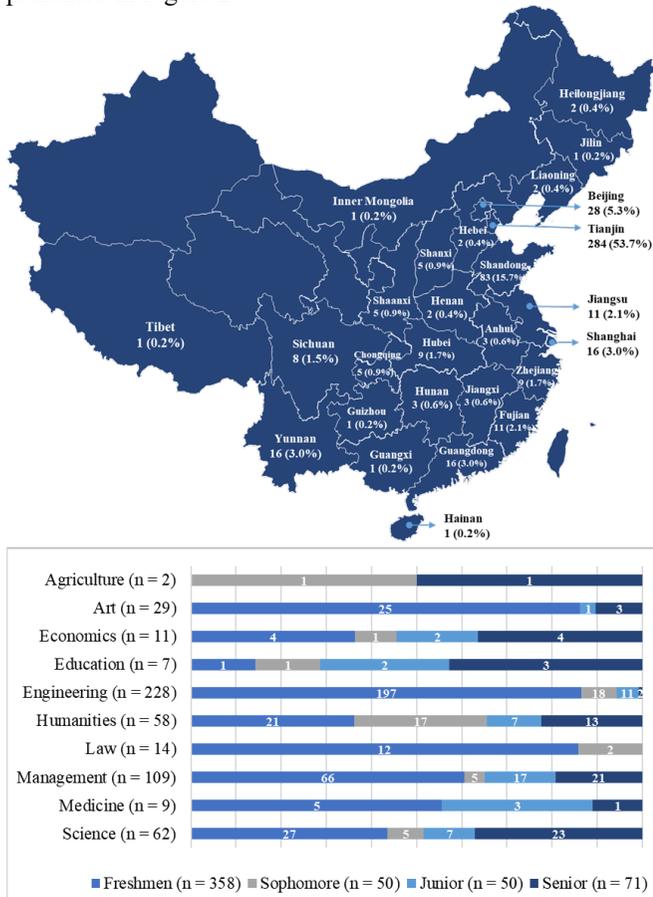


**Figure 2: Demographics of the Sample** (i.e., Number of Participants by Locations of Universities, Majors, and Grade Levels)

# RESULTS

## Descriptive Statistics

The analysis procedures were carried out using SPSS and AMOS software. There was no missing data. Before the analyses, the normality of the dataset was examined. The descriptive statistics showed that the mean scores of the 56 items in the ICS-CHN were in the range from 3.27 to 6.06. The skewness and kurtosis indices ranged from -.78 to .40 and -.67 to .92, respectively, which was within Kline's (2005) recommendation. The data for this study were thus regarded as normal and suitable for further analyses.

## Factorial Structure of the ICS-CHN

A confirmatory factor analysis (CFA) on a congeneric model with uncorrelated errors was performed to analyze the factorial structure of the ICS-CHN. We followed the most widely used method by fixing the unstandardized factor loading of one observed measure per factor to a value of 1.0 (Brown, 2015). This approach serves the function of passing the metric of the marker indicator along to the latent variable (Brown & Moore, 2023). The measurement model was then tested using structural equation modeling (SEM) technique with maximum likelihood (ML) estimation method. In SEM, the measurement model relates the latent variable to its indicators and ascertain if the data fits the model well (Henseler & Sarstedt, 2013). In order to evaluate the goodness of fit of the specified model to the observed data, the present study utilized chi-square statistics divided by degree of freedom ($\chi^2/df < 3$), Standardized Root Mean Square Residual (SRMR < .08), Comparative Fit Index (CFI above .90), Incremental Fit Index (IFI above .90), and Root Mean Square Error of Approximation (RMSEA < .08) (Kline, 2005; McDonald & Ho, 2002). Moreover, when the assumption of univariate and multivariate normality is fulfilled and more than five categories are involved in the analysis, maximum likelihood (ML) is less likely to produce biased results (Mîndrilă, 2010). Hence, ML was selected as the estimation method in this study.

The dataset showed a poor model fit ($\chi^2/df = 3.00$; CFI = .80; IFI = .80; RMSEA [90% C.I.] = .062 [.059, .064], SRMR=.059). A scrutiny of the measure revealed problematic items with low factor loadings. In addition to removing the items with poor factor loadings, we were also aware that the conceptual framework we employed in this study dissected IC into a good deal of dimensions (i.e., ten dimensions). We thus sought to distill the ICS-CHN to not only ensure acceptable psychometric properties of the scale, but also to satisfy the practical concerns of researchers such that additional measures of other constructs could be included in the same survey package to widen their research scope (Schmitt, 1996). To this end, we selected the top three items with the highest loadings for each subscale. These results suggest that the subscales (1) *Positive Cultural Orientation* (4 items), (2) *Tolerance for Ambiguity* (3 items), (3) *Cross-Cultural Self-Efficacy* (3 items), (4) *Chinese Personality Traits* (3 items), (5) *Self-Awareness* (4 items), (6) *Self-Monitoring* (4 items), (7) *Perspective*

*Taking/Suspending Judgement* (4 items), (8) *Cultural Knowledge Application* (3 items), (9) *Behavior Regulation* (4 items), and (10) *Emotion Regulation* (4 items) are reasonable measures of Chinese university students' IC. This approach allowed us to identify the items that best tapped into the general IC construct, but also ensured a fair representation of all IC dimensions (Roets & Hiel, 2011). After selecting 30 items from 56 items, the CFA results showed an acceptable fit with the 10-factor model ($\chi^2$/df = 2.85; CFI = .91; IFI = .91; RMSEA [90% C.I.] = .059 [.055, .063], SRMR=.045). The factor loadings of all items ranged from .50 to .82.

## Reliability and Validity of the ICS-CHN

Messick (1995) further highlighted the need for evidence to support the structural aspect (domain structure) and external aspect (convergent and discriminant evidence) of construct validity. Thus, we adopted a quantitative approach to examine the internal consistency, factorial structure, as well as convergent and discriminant validity of the scale. However, Cronbach and Shavelson (2004) suggested that using alpha coefficient alone to determine reliability may not be sufficient. Hence, we also adopted composite construct reliability (CCR) in this study to detect the internal consistency of the indicators of each construct (Fornell & Larcker, 1981). The alpha coefficients of all subscales ranged from .67 to .78, and CCR values ranged from .63 to .77, which were all above the conventional cut-off point of .60 (Fornell & Larcker 1981), indicating the acceptable level of reliability for each subscale of the ICS-CHN (see Table 3).

Two alternative models, including a one-factor model (the overall construct of IC) and a three-factor model (the three broad dimensions of IC), were also tested to examine the best factorial structure for the ICS-CHN. Results showed poor model fits for the one-factor model ($\chi^2$/df = 4.29; CFI = .83; IFI = .82; RMSEA [90% C.I.] = .079 [.075, .083], SRMR=.057); as well as for the three-factor model ($\chi^2$/df = 3.97; CFI = .84; IFI = .85; RMSEA [90% C.I.] = .075 [.071, .079], SRMR=.056). This supported the 10-factor model as the final factor structure of the ICS-CHN. Parameter estimates of the final 30-item ICS-CHN are shown in Table 1.

**Table 1: Parameter Estimates of ICS-CHN**

| | Statement | *SE* | *C.R.* |
|---|---|---|---|
| ***Tolerance for Ambiguity*** | | | |
| 1 | I can be comfortable with people whose values and lifestyles are very different from mine. 我与不同价值观和生活方式的人相处起来很融洽。 | .82 | -[a] |
| 2 | I am comfortable with people with all kinds of cultural backgrounds. 我与不同文化背景的人相处起来很自在。 | .74 | 17.53 |

| | | | |
|---|---|---|---|
| 3 | I enjoy communicating with people whose values are very different from mine.<br>我喜欢和拥有不同价值观的人交往。 | .56 | 12.73 |

**Cross-Cultural Self-Efficacy**

| | | | |
|---|---|---|---|
| 4 | I am confident that I can adjust to living in different cultural contexts.<br>我能够适应不同的文化环境。 | .77 | -[a] |
| 5 | If I lived in a different culture, I will be able to take part in social activities of the people of that culture.<br>如果我生活在其它国家，我能够融入当地的社交活动。 | .66 | 14.73 |
| 6 | If I lived in a different culture, I will be able to mix with classmates/colleagues from different cultures.<br>如果我生活在其它国家，我能够和来自不同文化的同学/同事都相处得很好。 | .74 | 16.85 |

**Positive Cultural Orientation**

| | | | |
|---|---|---|---|
| 7 | I am interested in learning about other cultures.<br>我很有兴趣去了解其他文化。 | .74 | -[a] |
| 8 | I am open-minded to people from different cultures.<br>我可以接纳来自不同文化的人。 | .73 | 16.28 |
| 9 | I am willing to interact with people from different cultures to broaden my horizon.<br>我愿意与来自不同文化的人交往，以拓宽自己的视野。 | .72 | 15.90 |

**Chinese Personality Traits**

| | | | |
|---|---|---|---|
| 10 | Making concessions during intercultural interactions demonstrates your maturity.<br>能够在跨文化交际中做出必要的妥协，表明了一个人的成熟程度。 | .61 | -[a] |
| 11 | Doing and repaying favor to each other will be a major reason for my strengthened relationship with foreign friends.<br>互相帮忙和回报人情是我加强与外国友人关系的主要方式。 | .65 | 11.67 |
| 12 | Building up close and mutually beneficial relationships is a success in intercultural interactions.<br>在跨文化交际中，我们需要建立亲密且互惠的关系。 | .68 | 12.49 |

**Self-Awareness**

| | | | |
|---|---|---|---|
| 13 | I know how my culture affects what I value.<br>我知道我的文化如何影响我的价值观。 | .82 | -[a] |

| 14 | I know how my culture affects my decisions.<br>我知道我的文化如何影响我做决定。 | .76 | 18.52 |
|---|---|---|---|
| 15 | I know how my culture influences the way I behave.<br>我知道我的文化如何影响我的行为方式。 | .82 | 20.16 |

**Social Monitoring**

| 16 | I am able to discern other people's emotional responses in intercultural situations.<br>在跨文化交际中，我能够辨别他人的情绪反应。 | .59 | -[a] |
|---|---|---|---|
| 17 | I am very observant of how others respond when interacting with people from different cultures.<br>和来自其他文化的人交往时，我非常善于观察对方的反应。 | .76 | 13.21 |
| 18 | I infer other's social norms through observing their behaviors during intercultural interactions.<br>我通过观察他人在跨文化交际中的行为来推断他们的社会规范。 | .62 | 11.51 |

**Perspective Taking/Suspending Judgement**

| 19 | I will not use behavioral norms of my culture to judge the behaviors of a foreigner.<br>我不会用我的文化中的行为规范来评判外国人的行为。 | .64 | -[a] |
|---|---|---|---|
| 20 | I will compare my own cultural perspective with another cultural perspective during intercultural interactions.<br>在跨文化交际中，我会将自己的文化视角和对方的文化视角作比较。 | .66 | 13.74 |
| 21 | When disagreement appears, I will try to imagine how I will feel if I were holding other's cultural perspective.<br>出现分歧时，我会试着想象如果我采用对方的文化视角，我会有什么样的感受。 | .69 | 14.18 |

**Cultural Knowledge Application**

| 22 | I am able to use my knowledge about a foreigner's culture to understand his/her values and beliefs.<br>我能够利用我对外国文化的了解来理解外国人的价值观和信仰。 | .56 | -[a] |
|---|---|---|---|
| 23 | I am able to apply my knowledge about a foreign culture during intercultural interactions.<br>在跨文化交际中，我能够运用我所知道的外国文化的知识。 | .71 | 12.30 |
| 24 | I know what makes a successful intercultural interaction. | .65 | 11.67 |

|  |  |  |  |
|---|---|---|---|
|  | 我知道什么是成功的跨文化交际。 |  |  |

**Behavioral Regulation**

| 25 | I will listen to him/her without interrupting if the foreigner's culture values the respect for seniority.<br>如果对方的文化重视辈分或资历，我会听他/她说话，不去插嘴。 | .58 | -ᵃ |
| 26 | I will make small talks before getting to the point if other's culture favors indirectness and implicitness.<br>如果对方的文化倾向于含蓄委婉的表达，我会在进入正题之前先寒暄一番。 | .70 | 12.35 |
| 27 | If I study in a Western culture, I will take initiative to make friends with local people.<br>如果我在一个不同的文化环境中学习/生活，我会主动和当地的人交朋友。 | .68 | 12.49 |

**Emotional Regulation**

| 28 | When I'm faced with a cultural shock, I make myself think about it in a way that helps me stay calm.<br>面对文化冲击时，我会以一种能让自己保持冷静的方式来面对它。 | .80 | -ᵃ |
| 29 | During intercultural interactions, I will not complain in front of others even when I have been offended.<br>在跨文化交际中，即便我被冒犯了，我也不会在别人面前抱怨。 | .50 | 11.30 |
| 30 | Even if I am misunderstood due to cultural differences, I will respond politely.<br>即便因为文化差异被误解，我也会礼貌地应对。 | .66 | 15.47 |

To assess convergent validity, Average Variance Extracted (AVE) values were calculated. As shown in Table 2, the AVE values of *Positive Cultural Orientation*, *Tolerance for Ambiguity*, *Cross-Cultural Self-Efficacy*, and *Self-Awareness* were all above .50, but that of other constructs were below this threshold. According to Fornell and Larcker (1981), if AVE is less than .50, but composite reliability is higher than .60, the convergent validity of the construct can be adequate. Moreover, the AVE for all subscales was greater than the squared correlation coefficients for the corresponding inter-constructs. For example, the AVE of *Tolerance for Ambiguity* (.52) was higher than the squared correlation coefficients (.42, .32, .20, .24, .34, .29, .38, .24, and .30) for its corresponding inter-constructs. Further, discriminant validity was warranted when the AVE values for each construct were greater than the squared correlation coefficients for the corresponding inter-constructs (Fornell & Larcker, 1981). Our results supported the convergent validity and discriminant validity of the ICS-CHN.

Table 2: Correlations (Squared Correlations), Reliability, CCR, AVE, and Mean of Subscales of the ICS-CHN

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Tolerance for Ambiguity | - | | | | | | | | | |
| 2. Cross-Cultural Self-Efficacy | .65 (.42) | - | | | | | | | | |
| 3. Positive Cultural Orientation | .57 (.32) | .62 (.38) | - | | | | | | | |
| 4. Chinese Personality Traits | .45 (.20) | .50 (.25) | .62 (.38) | - | | | | | | |
| 5. Self-Awareness | .49 (.24) | .45 (.20) | .56 (.31) | .52 (.27) | - | | | | | |
| 6. Social Monitoring | .58 (.34) | .58 (.34) | .60 (.36) | .52 (.27) | .55 (.30) | - | | | | |
| 7. Perspective Taking /Suspending Judgement | .54 (.29) | .55 (.30) | .67 (.45) | .64 (.41) | .66 (.43) | .65 (.42) | - | | | |
| 8. Cultural Knowledge Application | .62 (.38) | .62 (.38) | .59 (.35) | .56 (.31) | .63 (.40) | .62 (.38) | .66 (.43) | - | | |
| 9. Behavioral Regulation | .49 (.24) | .52 (.27) | .67 (.50) | .64 (.41) | .54 (.29) | .60 (.36) | .66 (.43) | .56 (.31) | - | |
| 10. Emotional Regulation | .55 (.30) | .56 (.31) | .63 (.40) | .59 (.35) | .52 (.27) | .65 (.42) | .65 (.42) | .58 (.34) | .64 (.41) | - |
| Cronbach's Alpha | .74 | .78 | .78 | .67 | .84 | .69 | .70 | .67 | .68 | .67 |
| CCR | .76 | .77 | .77 | .68 | .84 | .70 | .70 | .68 | .68 | .70 |
| AVE | .52 | .53 | .53 | .42 | .64 | .44 | .44 | .41 | .42 | .44 |
| Mean | 4.50 | 4.73 | 5.32 | 5.07 | 5.06 | 4.88 | 5.03 | 4.80 | 5.07 | 4.95 |
| SD | 0.93 | 0.87 | 0.86 | 0.85 | 0.93 | 0.81 | 0.84 | 0.87 | 0.85 | 0.81 |

*Note.* All Cronbach's alpha values were significant at 0.01; CCR = Composite Construct Reliability; AVE = Average Variance Extracted; Mean values were based on 7-point scales.

**Measurement Invariance Test**

Measurement invariance was tested using the multigroup confirmatory factor analysis (MCFA) model. The sample was split by gender because empirical evidence has reported gender differences in IC (e.g., Solhaug & Kristensen, 2020). Following the sequence of analyses suggested by Vandenberg and Lance (2000), four phases of analyses were performed. In a preliminary phase, the factor models were tested for men and women separately to test the configural invariance model. The test was conducted by fitting a MCFA model where the structure of the factor models was the same for both gender groups. The results suggested an adequate fit for this model for males ($\chi^2/df$ = 1.95, CFI = .90, IFI = .90, RMSEA [90% C.I.] = .067 [.060, .075], SRMR = .052) with four correlated errors, as well as for females ($\chi^2/df$ = 2.33, CFI = .90, IFI = .90, RMSEA [90% C.I.] = .065 [.059, .071], SRMR = .051) with four correlated errors, indicating the tests on measurement invariance can be proceeded (Byrne et al., 1989). In the second phase, the weak invariance model or metric invariance model was tested, wherein the factor loadings were restricted to be equal across gender. Results showed that the chi-square difference between Models 1 and 0 was not statistically significant ($\Delta\chi^2$ (20) = 28.03, $p$ > .05, $\Delta$CFI = -.002), indicating that items within each factor were interpreted in the same way by both male and female students.

In the third phase, the scalar invariance model was tested to ensure the underlying factors can be compared across gender by imposing invariance on factor loadings and item intercepts across gender. The chi-square difference between Models 2 and 1 was not statistically significant ($\Delta\chi^2$ (20) = 30.94, $p$ > .05, $\Delta$CFI = -.001), suggesting that the imposition of equality constraints did not result in a substantially worse fit than the previous model (without those constraints). This confirmed that factor loadings and item intercepts of ICS-CHN were invariant across gender (De Gieter et al., 2009). In the fourth phase, the strict invariance model was tested to examine whether the variances of the regression equations for each item were invariant across gender, wherein the factor loadings, intercepts, and residual variances were restricted to be equal across gender. The chi-square difference between Models 3 and 2 was statistically significant ($\Delta\chi^2$ (30) = 66.47, $p$ = .002, $\Delta$CFI = -.006). The chi-square difference test indicated that Model 3 with invariance of residuals represented a significant decrease in goodness of fit relative to the scalar invariance model (Model 2). Nevertheless, the $\Delta$CFI value was small (< .01), suggesting that the decrease in fit was not substantial (Cheung & Rensvold, 2002). Therefore, the tests of Model 0 to Model 3 established the measurement invariance of ICS-CHN, indicating that this scale measured the same construct in the same way across gender groups. Results of the measurement invariance test are presented in Table 3.

**Table 3: Measurement Invariance Test Between Male and Female Students**

*Note.* M0 = baseline model (no invariance imposed); M1 = invariant factor loadings; M2 = invariant factor loadings and invariant intercepts; M3

| Models | $\chi^2$ | df | $\Delta\chi^2$ | $\Delta df$ | CFI | $\Delta$CFI | RMSEA | 90% C.I. | SRMR |
|---|---|---|---|---|---|---|---|---|---|
| Sample baselines | | | | | | | | | |
| Men | 690.554 | 355 | | | .897 | | .067 | [.059, .074] | .052 |
| Women | 826.304 | 355 | | | .899 | | .065 | [.059, .071] | .051 |
| Measurement | | | | | | | | | |
| M0 (configural) | 1552.909 | 712 | - | - | .896 | - | .047 | [.044, .051] | .052 |
| M1 (metric) | 1580.936 | 732 | M1-M0  28.03 (p > .05) | 20 | .894 | -.002 | .047 | [.044, .050] | .056 |
| M2 (scalar) | 1611.880 | 752 | M2-M1  30.94 (p > .05) | 20 | .893 | -.001 | .047 | [.043, .050] | .056 |
| M3 (structural) | 1678.351 | 782 | M3-M2  66.47 (p < .01) | 30 | .887 | -.006 | .047 | [.044, .050] | .060 |

= invariant factor variances and covariances.

## DISCUSSION

The ten-factor model confirmed the fundamental definition of IC in this study, which suggested that Chinese university students' IC reflected their ability to maintain harmonious relationships with culturally different others through effectively gathering, interpreting, and acting upon radically different cues in cross-cultural or multicultural settings (Griffith et al., 2016; Xiao & Chen, 2012). Consistent with many existing IC frameworks, results of this study corroborated IC as a combination of affective/attitudinal, cognitive and behavioral skills and characteristics applied in intercultural encounters (e.g., Arasaratnam & Doerfel, 2005; Byram, 1997; Deardorff, 2006). More specifically, a number of attributes that were claimed as universal in promoting successful intercultural interactions also held true with our Chinese sample.

As revealed by ICS-CHN, affectively/attitudinally, a Chinese university student with strong IC would score high in tolerance for ambiguity caused by cultural differences (Deardorff, 2006; Gudykunst, 2002); in cross-cultural self-efficacy that promotes cultural adaptation and formation of intercultural friendships (Peterson et al., 2011); and in curiosity, respect, and open-mindedness about different cultures (Bird & Osland, 2004; King & Magolda, 2005). Differing from previous IC frameworks and measures, ICS-CHN confirmed that the common personality traits of a culture (i.e., *Harmony*, *Ren Qing* and *Face* in the current Chinese context), or the characteristic patterns of thought, feelings, and behavior that were perceived to be prototypical of members of a culture were also important elements of the affective/attitudinal aspect of IC (Covert, 2014; Yu et al., 2002). Cognitively, a high level of IC indicated strong self-awareness of the ways one's own culture influenced how one perceived and behaved (DeJaeghere & Zhang, 2008); being interpersonally sensitive (Gudykunst, 2002); being able to take the cultural perspective of others and withhold judgement when cultural differences occurred (Byram, 1997); and being able to utilize cultural knowledge to facilitate intercultural interaction (Griffith et al., 2016). Behaviorally, similar to previous studies (Ang et al., 2007; Bird & Osland, 2004), strong IC allowed an individual to monitor and revise one's behaviors and emotions to function appropriately in intercultural situations.

Findings of this study offered important implications both in theory and practice. From a theoretical perspective, the development of ICS-CHN attended to two major issues that have often been overlooked. First, the adapted conceptual framework of IC provided specific definitions of the overall construct and its subdimensions, considered included both cognitive and noncognitive components, and clarified the relationship between IC subdimensions. This greatly improved the conceptual clarity of IC while ensuring the comprehensiveness for evaluating the construct. Second, most of the existing IC models were developed from the Western perspective. This perspective has been critiqued for "its limitation to sufficiently bringing forth cultural particularities" in IC research (Dalib et al., 2014, p.131). This study responded to the call for conceptualizing IC based on a culture-specific approach that minimized the

Western bias (Chen, 2009; Spitzberg & Changnon, 2009) by incorporating Chinese personality traits and communication styles into the conceptual framework. The validation of this adapted framework contributed to a more comprehensive understanding of this concept. From a practical perspective, the ICS-CHN armed researchers and educators who are interested in IC with a valid and reliable tool to evaluate Chinese university students' level of IC, and ideally in other cultural contexts with necessary adaptations of cultural characteristics-related subscales.

There were several limitations in this study. First, the initial 56-item ICS-CHN was modified by selecting three items with the highest factor loadings for each subscale. Although we recognized that this modification served to simplify the model (MacCallum et al., 1992) both for theoretical conformity and practical concerns, the characteristics of findings may be specific to the CFA sample. Evaluation with other samples is needed to further validate the ICS-CHN. Second, although this measurement scale was repeatedly refined and tested through scrupulous multiple stages, the sample was collected from a single region of China (i.e., mainland China) and only included undergraduate students. Hence, future research is suggested to examine the generalizability of ICS-CHN with samples of different age groups or grade levels from other Greater China regions (e.g., Chinese Taipei, Hong Kong, Macau.)

## CONCLUSION

This study intended to develop and validate a new scale to assess Chinese university students' intercultural competence. Relying on an adapted conceptual framework of IC that incorporated Chinese personality traits and communication styles, this study confirmed the key domains of Chinese university students' IC. Through a series of scale development procedures, the prototype of the scale was created. The final 30-item 10-subdimensional ICS-CHN showed adequate reliability, construct, convergent and discriminant validity. Results of the multigroup confirmatory factor analysis (MCFA) model further proved the measurement invariance of ICS-CHN across gender groups. Therefore, it is reasonable to conclude that ICS-CHN was a reliable and valid scale with good psychometric properties.

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