Synopsis of Validity Studies in the context of the Intercultural Development Inventory

Aparajita Jaiswal
Post-Doctoral Research Associate, CILMAR
Purdue University

This white paper presents a synopsis of several decades of evidence for the validity of the Intercultural Development Inventory (IDI). The sources of this evidence include peer-reviewed scholarly articles and statistical analyses published by external parties. The original validation of the IDI instrument was published by Hammer and colleagues [1] in the *International Journal of Intercultural Relations*, a high-status peer-reviewed journal in the intercultural field. This study described and discussed both the content and construct validity of the IDI.

Content Validity

Content validity refers to the extent to which a given assessment or survey instrument measures the constructs or topics it is supposed to measure. Content validity is a qualitative approach that heavily relies on expert opinion in deciding if the survey actually measures the constructs it is designed to measure. The content validity of the IDI instrument was addressed through a rigorous scientific survey item creation and testing process. First, the authors conducted qualitative interviews with 40 men and women of varied ages, cultural backgrounds, and diverse international experiences. Interviews were transcribed, and then those transcripts were coded by four members of the research team. In practice, what this means is that each researcher separately labeled the interview line by line with six categories based on the Developmental Model of Intercultural Sensitivity: Denial, Defense/Reversal, Minimization, Acceptance, Adaptation, and Integration [1]. The next step is calculating the agreement between the raters. Generally, a Kappa value of at least 0.6 is considered

good and a Kappa value exceeding 0.75 demonstrates excellent inter-rater reliability. In this case, the inter-rater reliability coefficient was determined to range between 0.66 to 0.86 (at least good and often excellent).

More than 200 statements were identified in this qualitative analysis process. The researchers reviewed each coded interview statement for clarity, and 239 survey items were created based on the statements. In the next step, a panel review was conducted where the new survey items were sent to a panel of 5 to 7 experts for categorization. If the inter-rater reliability for any item was below a Kappa value of 0.60, or if more than 2 of these experts felt that an item was difficult to categorize, it was discarded from the list. The panel review process helped to bring down the list of items from 239 to 145. Then, to further ensure the validity of the instrument, the research team moved on to test the construct validity of the IDI.

Construct Validity

Construct validity measures to what degree the survey instrument is grounded in theory. For example, the IDI instrument was originally grounded in the Developmental Model of Intercultural Sensitivity (DMIS). Construct validity is a statistically driven methodology to establish the accuracy of an instrument in measuring its intended constructs. Generally, it is conducted after content validity. Factor analysis is one of the methods to establish the construct validity of the instrument – in practice, this means statistical tests are run to make sure that items group together into factors, or clusters, that reflect its foundational theory or model. To establish the construct validity for the IDI instrument, the 145 items questionnaire was distributed to a sample of 226 participants. Out of 226 participants 97 identified themselves as male and 127 as women. Respondents were a variety of age: 10% were

below 21 years, 45% were between 22-45, 18% were between 31 - 40, 16% between 41-50, 5% between 51 –50, and 0.5% above 60. Also, out of 226 participants 177 were from the United States and 49 participants came from 28 different countries.

The authors used more stringent than usual criteria for selecting survey items in the exploratory factor analysis (EFA). Factor loading is the correlation coefficient for a survey item, or how closely it is related to other items in its cluster. It is a rule of thumb to use a minimum factor loading of 0.4, but in the case of the IDI, the authors required a primary factor loading value greater than 0.5 and the secondary loading value greater than 0.2. Another criterion for survey item selection is Eigenvalues, which represent the total variability of the data points. Generally, survey creators select items with at least an Eigenvalue of 1. With the IDI, only items with at least an Eigenvalue of 2.0 were retained. This process helped to reduce the number of items from 145 to 122.

In the next steps, confirmatory factor analysis (CFA) was conducted for the 122 items. This statistical test provides additional evidence that the exploratory factor analysis correctly identified the construct clusters in the instrument. A sample of 591 respondents took the survey. The CFA helped to reduce the number of items from 122 to 52 items. Later on, the research team decided to drop two more items that lacked clarity, yielding a final scale consisting of 50 items. Participants respond to each item on a 5-point Likert Scale, from Disagree Strongly to Agree Strongly. The 50 items measure the five constructs of Denial/Defense (DD; 13 items), Reversal (R; 9 items), Minimization (M; 9 items), Acceptance/Adaptation (AA; 14 items) and Encapsulated Marginality (EM; 5 items). Figure 1 below delineates the steps taken to achieve the 50 question IDI.V2 instrument. The analysis revealed high reliability for

the instrument, with reliability coefficients for each construct greater than 0.8. The general rule of thumb for reliability coefficient indicates that coefficient values between 0.6 -0.7 indicates acceptable level of reliability and values 0.8 or greater indicates very good level of reliability [2]. The high reliability denotes that the survey instrument will produce consistent results when used to assess the similar constructs.

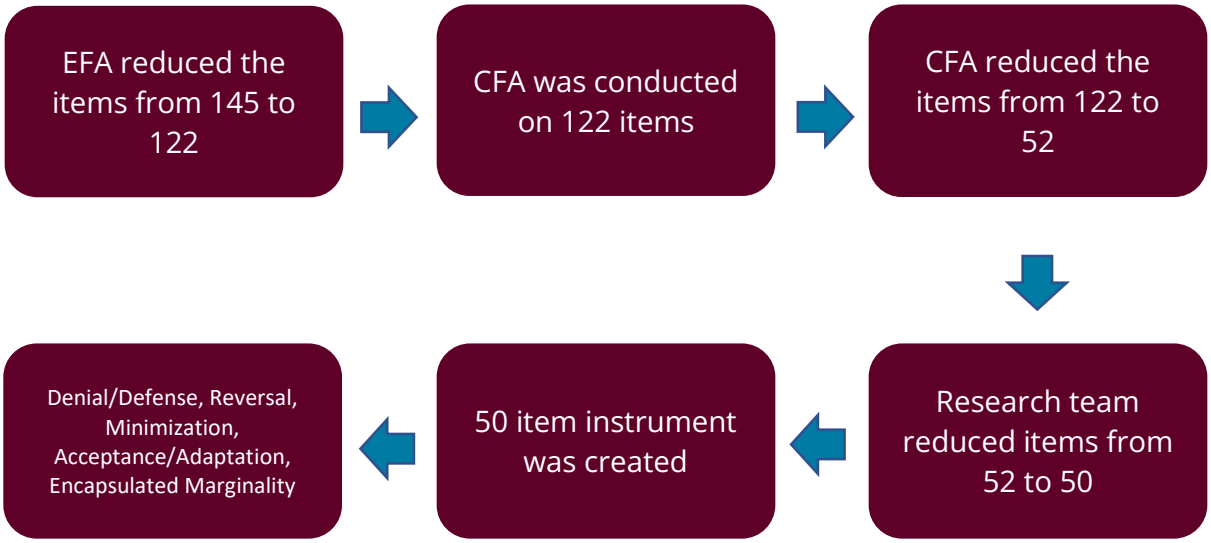

Figure 1: Instrument development process

Post-hoc Analysis

Content validity and construct validity are processes that help create an instrument. Then, after construction, the survey needs to be tested for effectiveness with post-hoc analysis. After the IDI v2 was created, a post-hoc test was performed where the final 50-question instrument was distributed to a sample of 766 respondents. The data for DD, R, M, and AA were used to calculate the "total IDI score" for the participants. To calculate the "total IDI score" the raw scores for DD, R, M, and AA were used and incorporated into a formula to produce a z-score with a mean of 100 and standard deviation of 15. The intent of calculating the "total IDI score" helped to

ground the IDI instrument into the Developmental Model of Intercultural Sensitivity (DMIS) theory, meaning a low total IDI score represented an ethnocentrism mindset and high total IDI score represented an ethnorelative mindset. Theoretically grounding an instrument into a theory proves the construct validity of the instrument and confirms that constructs that were proposed by the theory can be effectively measured through the survey instrument.

Validation of the IDI v3 with a Diverse Sample

A second round of construct validity was conducted by Hammer [3]. The intent of this construct validation was to validate the 50-item IDI. For the purpose of the study, the IDI was administered to a large, diverse sample of 4763 individuals. These individuals belonged to different cultural background categories, for example, managers at NGO, members from local church, US university students, and high school students consisting of international students from Italy, Costa Rica, Ecuador, Japan, Austria, Brazil, Germany, and Hongkong. Moreover, the gender-wise demographics for each group is as follows: NGO (46% male, 54% female), local church (31% male, 69% female), US university students (34% male, 65% female), high school (63% male, 37% female).

After the data were collected, confirmatory factor analysis was conducted to evaluate if the IDI data would align with the DMIS theoretical framework. The results of the confirmatory factor analysis revealed that a seven-dimension model (Denial, Defense, Reversal, Minimization, Acceptance, Adaptation, and Cultural Disengagement) was statistically more robust than the earlier five-dimension model (Denial/Defense, Reversal, Minimization, Acceptance/Adaptation (AA) and

Encapsulated Marginality) – that is, identifying seven constructs measured by the 50 items did a better job of explaining the patterns in the data than the original five.

Further correlation analysis was conducted for the seven-dimension scale to demonstrate the theoretical relationships between them. This analysis found positive correlations between Denial, Defense, and Reversal. Acceptance and Adaptation were positively correlated to each other and negatively correlated to Denial, Defense, and Reversal. These correlations show that Denial, Defense, and Reversal are grouped together as more monocultural orientations, and Acceptance and Adaptation are grouped together as more intercultural orientations. Minimization demonstrated a weak correlation with both groups, revealing Minimization as a transitional orientation between the two. These patterns of correlation confirm that the IDI was well grounded in the DMIS. However, Encapsulated Marginality (EM) correlated positively with reversal while not correlating to Acceptance or Adaptation. This result contradicted the DMIS theory, as the DMIS assumed that EM is a dimension of Integration and leads to Adaptation, therefore the lack of correlation between EM and Acceptance or Adaptation were a contradiction to the DMIS model. Since EM correlated with Reversal, it was determined that EM is a representation of Cultural Disengagement and not cultural identity formation or transformation. Based on these findings, EM was measured as a separate construct by the IDI but does not actually form part of the Intercultural Development Continuum. The results of analysis also revealed that the IDI data that was collected from 4763 individuals followed a normalized distribution, Denial (2.6%), Polarization (14%), Minimization (67%), Acceptance (14.9%), and Adaptation (1.6%). For these reasons, the validation of the IDI resulted in a theoretical revision, with the

five-orientation Intercultural Development Continuum replacing the six-stage DMIS as the theory underlying the IDI instrument.

External Validation

ACS Ventures Report 2016

In a 2016 report [4], ACS ventures – an independent agency – conducted an external validation study of the IDI instrument. ACS ventures confirmed that the IDI is a valid instrument and meets industry standards. Specifically, the report confirmed that the IDI meets *Response Content* or development standards, since the IDI was developed through a rigorous process and a panel of experts was involved in creating the instrument. Moreover, the IDI also meets *Test Content* or measurement standards, as it effectively reports the intercultural sensitivity of participants in objective (Developmental Orientation) and subjective (Perceived Orientation) scores. The report also emphasized the robust internal structure of the instrument. ACS ventures found the IDI, which has undergone multiple confirmatory factor analysis to confirm the structure and its application for participants from diverse background, ensures the validity of the instrument.

ACS Ventures Report 2017

A second report by ACS ventures [5] concluded that the IDI was psychometrically valid based on extensive statistical analysis. They conducted an analysis of a very large dataset of 218,111 respondents with varied national and international communities. Out of 218,111 respondents, 150,577 were from educational setting and 67,534 from industry. They found the five-factor model (Denial, Polarization [Reversal, Defense], Minimization, Acceptance, and Adaptation) reflective of the

Intercultural Development Continuum theory a good fit for both organizational and educational data. Importantly, ACS ventures also found the instrument cross-culturally valid. In other words, the *Item Analysis* and *Test Score* performance point to the instrument's capacity to accurately measure intercultural sensitivity for people of different genders, ethnicities, education levels, ages, and roles. These findings are supported by the application of the IDI in many peer-reviewed studies across a wide variety of disciplines, such as speech and language pathology [6], [7], nursing [8], pharmacy [9], STEM [10], and management [11]. The confirmatory factor analysis and report from ACS ventures confirm that the IDI is also a robust instrument to measure the intercultural competence of students from the BIPOC population [12]. Moreover, the IDI has been used by researchers from different countries such as Switzerland [13], Hungary [14], China [15], Japan [16], Iran [17], and Netherlands [18]. These studies have also found the instrument valid and robust in assessing the intercultural competence of the participants belonging to different nationalities and backgrounds.

Reference:

[1] M. R. Hammer, M. J. Bennett, and R. Wiseman, “Measuring intercultural sensitivity: The intercultural development inventory,” *Int. J. Intercult. Relat.*, vol. 27, no. 4, pp. 421–443, 2003.

[2] Ursachi, G., Horodnic, I. A., & Zait, A. (2015). How reliable are measurement scales? External factors with indirect influence on reliability estimators. *Procedia Economics and Finance*, *20*, 679-686.

[3] M. R. Hammer, “Additional cross-cultural validity testing of the Intercultural Development Inventory,” *Int. J. Intercult. Relat.*, vol. 35, no. 4, pp. 474–487, 2011.

[4] A. Wiley, “Intercultural development inventory (IDI): Independent review,” *ACS Ventur. LLC Las Vegas NV USA*, 2016.

[5] A. Wiley, “Validation analysis of the intercultural development inventory (IDI),” *Las Vegas NV ACE Ventur.*, 2017.

[6] L. Krishnan, C. Masters, H. Holgate, and …, “Structured study abroad enhances intercultural competence,” *… Learn. …*, no. Query date: 2022-06-02 08:39:17, 2017, [Online]. Available: https://ir.library.illinoisstate.edu/cgi/viewcontent.cgi?article=1010&context=tlcsd

[7] L. A. Krishnan and L. Jin, “Long-Term Impact of Study Abroad on Intercultural Development,” *Perspect. ASHA Spec. Interest Groups*, vol. 7, no. 2, pp. 560–573, 2022.

[8] E. A. Fitzgerald, P. R. Marzalik, and J. Kue, “Assessing intercultural development pre-and post education abroad,” *J. Nurs. Educ.*, vol. 57, no. 12, pp. 747–750, 2018.

[9] I. Hasan, S. Hendricks, M. Todd, G. Yun, and …, “From There to Here: Evaluating the Transition of an International Advanced Pharmacy Practice Experience in London,” *Purdue J. …*, no. Query date: 2022-06-01 18:56:09, 2021, [Online]. Available: https://docs.lib.purdue.edu/pjsl/vol8/iss1/16/

[10] L. Starr, K. Yngve, and L. Jin, “Intercultural competence outcomes of a STEM living–learning community,” *Int. …*, no. Query date: 2022-06-01 18:56:09, 2022, doi: 10.1186/s40594-022-00347-x.

[11] P. Eigenmann and J. Bürki, “Diverse Intercultural Competence Assessments at a Swiss University of Applied Sciences,” *CCBC 2022*, p. 257, 2022.

[12] J. A. Kruse, J. Didion, and K. Perzynski, “Utilizing the Intercultural Development Inventory® to develop intercultural competence,” *Springerplus*, vol. 3, no. 1, pp. 1–8, 2014.

[13] E. Zazzi, “Contributors to the development of intercultural competence in nursing students,” *Nurse Educ. Today*, no. Query date: 2022-06-01 18:56:09, 2020, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S026069171931202X
[14] I. POLYÁK, D. KÉRY, and K. TARDOS, “Measuring and Developing Intercultural Competence of University Faculty,” no. Query date: 2022-06-02 08:39:17, 2012, [Online]. Available: https://kgk.sze.hu/images/dokumentumok/kautzkiadvany2013/kultura/polyak_kery_tardos.pdf
[15] J. Jackson, “Globalization, internationalization, and short-term stays abroad,” *Int. J. Intercult. Relat.*, vol. 32, no. 4, pp. 349–358, 2008.
[16] M. Cutting, Y. Goda, and K. Suzuki, “Evaluating Impact of Pre-Departure Training on Study Abroad Outcomes by Adapting Kirkpatrick’s Evaluation Framework,” in *ICOME 2021 International Conference for Media in Education*, 2021, pp. 287–294.
[17] M. Jalali, “Developing and Assessing Intercultural Competence through Ethnographic Interviews in the Domestic Context of Teacher Education in Iran,” *Issues Lang. Teach.*, no. Query date: 2022-06-01 18:56:09, 2021, [Online]. Available: https://ilt.atu.ac.ir/article_13333.html
[18] J. van Melle and M. Ferreira, “Developing Students’ Intercultural Sensitivity at the Home Campus: An Innovative Approach Using the Theory of the Creative Action Methodology Pedagogy,” *Teach. Learn. Inq.*, vol. 10, 2022.