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Validating a Japanese short form of the Sociocultural Adaptation Scale (SCAS) for undergraduate participants in outbound mobility programs in Malaysia and Thailand

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Abstract

Limited evidence is available on Japanese participants' changes in intercultural competence through outbound mobility programs. A part of this existing limitation of empirical evidence emerges from a need for an instrument that is publicly available, statistically valid and reliable, with a previous use for Japanese participants. This study selected the Sociocultural Adaptation Scale (SCAS). The samples were from two cohorts of Japanese participants of the School of Global Studies and Collaboration (GSC), Aoyama Gakuin University. These participants participated in its outbound student mobility programs in Malaysia and Thailand. The study conducted a team-based translation, and exploratory and confirmatory factor analyses, to ensure the validity and reliability of SCAS. The results showed a unidimensional structure of SCAS with acceptable reliability scores for the two cohorts across different timelines. The study filled the instrumental gap to measure intercultural competence as learning outcomes through SCAS for stakeholders of student mobility programs in Japan.

Keywords

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Factor analysis, Instrumental Design and Validation, Intercultural competence, Japanese universities

1. Introduction

The role of evidence is critical in today's postsecondary sector in Japan. Japanese postsecondary policies, programs, projects or initiatives benefit from sound evidence-based approaches, including generation, mobilization and dissemination. The Japanese postsecondary sector also could benefit from evidence to ensure its quality, accountability and learning of policies, programs, projects and initiatives. For example, one of the signature efforts by Japanese postsecondary stakeholders for outbound mobility initiatives is トビタテ! 留学 JAPAN (Leap Forward, Japan) (Hamano, 2024). The initiative is funded by the public-private partnership between the Japanese government and private companies to encourage Japanese candidates to participate in outbound mobility programs by funding some of their expenses. The number of Japanese students participating in outbound mobility programs within university agreements and related arrangements grew from 36,302 in the 2009 academic year to 107,346 participants before COVID-19 in 2019 (Hamano, 2024; Ministry of Education, Culture, Sports, Science and Technology [MEXT], 2023). The figure fell to 89,179 by 2023 (MEXT, 2026). Public funding for willing Japanese candidates appears to be a generous policy for participants, their families and guardians. Public funding like Leap Forward, Japan, appears to rest on the assumption that outbound student mobility programs develop participants' intercultural competence. However, such an assumption has rarely been tested empirically. The accountability of public funding, including Leap Forward, Japan, requires evidence through a robust methodological design, including a theory-driven, valid and reliable instrument.

However, the lack of a publicly accessible, free, theoretically sound, and psychometrically valid and reliable instrument is a major challenge in the field of intercultural relations (Landis & Wasilewski, 1999) and especially in the Japanese postsecondary sector (Hanada, 2018; Matsuo & Morino, 2017; Matsuo et al., 2018). The purpose of this study is to test the validity and reliability of an instrument for measuring the learning outcomes of Japanese undergraduate participants in outbound mobility programs. Specifically, the study examines the applicability of an instrument that has previously been used with Japanese

participants: the Sociocultural Adaptation Scale (SCAS; Ward & Kennedy, 1999). SCAS is a theory-driven and psychometrically valid and reliable instrument based on a theoretical framework of cultural learning and intercultural competence. After this introduction section, this study presents a conceptual foundation and related publications in a theoretical framework and the literature review sections to contextualize this study within the academic discourse. The method section explains the validation and reliability testing design, procedures, data collection and analysis approaches. The results section illustrates the results from the statistical analyses. The discussion section describes the instrumental applicability by comparing participant demographics with existing studies with similar student samples from Japan. The discussion section also compares the results from the analysis with the original research on the reliability consideration. Several limitations with future study recommendations conclude the study.

2. Theoretical Framework

2.1. Intercultural Competence

This section first defines intercultural competence and situates the theoretical framework among the conceptual traditions within outbound student mobility practices in the higher education context. One major consideration of theoretical frameworks of outbound student mobility programs in Japan is the ability to bridge cultural differences with someone from a culture other than one's own (e.g., Hanada, 2019; MEXT, 2017; Yokota et al., 2018). Such a concept is defined as intercultural competence (e.g., Deardorff, 2006; Fantini, 2000, 2002; Ward, 2004, 2022) or 異文化能力 (e.g., Kurachi, 1991; Matsuo et al., 2018; Matsuo & Morino, 2017; Nakao, 2023). Theoretical frameworks of intercultural competence reflect dominant assumptions of academic orientations, such as communication theories (e.g., Deardorff, 2006, 2015; Fantini, 2000, 2002; Bennett, 1986; Hammer, 2012), econometric theories (OECD, 2018) and psychological theories (e.g., Ward, 2004, 2022; Ward et al., 2001; Stewart et al., 1969).

2.2. The ABC Model of Culture Contact

Social psychology became a useful academic foundation to address issues related to behavioral aspects of participants in outbound student mobility programs. Social psychological theories are organized around understanding

individuals' cognitive, affective, and behavioral dimensions. Among these theoretical traditions, this study adopts a social psychological perspective, specifically Ward's ABC Model (Affective, Behavioral and Cognitive Model) (Ward, 2004, 2022; Ward et al., 2001). The model integrates three different theoretical approaches as one holistic model: an affect approach (stress and coping theories), a behavioral approach (culture learning theories) and a cognitive approach (social identification theories) (e.g., Ward, 2004, 2022; Ward et al., 2001; Ward et al., 1998).

The affective approach concerns emotional reactions to unfamiliar cultural settings based on individuals' initial and ongoing stress and coping of intercultural relations. In this sense, Oberg's (1960) definition of culture shock appeared to be a component of this approach. Interventions in this approach aimed to reduce the distress of culture contact by providing personal and social resources and supports. A behavioral approach is related to culture learning theories as an extension of the social skills approach. This approach assumes interpersonal behaviors to be "mutually skilled performance" (Ward et al., 2001, p.268) or the ability to "...fit-in or negotiate interactive aspects of the host environment (e.g., social skills and learning in the target cultures) ..." (Ward & Kennedy, 1999, p. 661). Individual characteristics appear to fit within this domain described by Kealey (1989, 2001) and Vulpe et al. (2000). In this approach, sojourners need to acquire new culturally appropriate interpersonal skills when they face challenges establishing and maintaining cooperative relationships with members of host cultures. Otherwise, these sojourners' behaviors tend to be inappropriate, resulting in misunderstanding and conflicts with members of the host culture. Interventions for this approach focus on adjusting sojourners' social behavior or skills by providing training, mentoring, and learning opportunities about the host cultures. Then, the cognitive approach draws on social identity and social cognition theories that deal with issues such as cultural identity and intergroup perceptions: ethnocentrism, prejudice, and discrimination (Ward, 2004). This approach assumes that a culture consists of shared meaning by a group of people. When people interpret cultural symbolism differently from society to society, differences in cultural interpretation in one's own culture and the host culture could become a source of conflict. Conversely, this conflict could influence changes in individuals' views about the world (Ward, 2004; Ward et al., 2001). The Developmental Model of Intercultural Sensitivity (DMIS; Bennett, 1986) seems to be related to

this cognitive domain. Within this model, psychological adjustment corresponds to the affective component and sociocultural adaptation, which the SCAS measures, to the behavioral component.

The ABC model represents the two major components of individual adaptation in a new environment in the affective and behavioral approaches: psychological and sociocultural adaptations (Ward, 2004, 2022; Ward et al., 2001; Ward et al., 1998). The authors measured these constructs by the depression scores (or self-reported depression) of the Zung Self-Reported Depression Scale (Zung, 1965; Ward et al., 1998) and Sociocultural Adaptation Scale (SCAS) based on evidence from various samples (Ward & Kennedy, 1999), including the Japanese sample (Ward et al., 1998). For example, Ward et al. (1998) established empirical evidence for this distinction. In a longitudinal design, 35 Japanese students in New Zealand participated in a study to measure psychological adjustment through depression scores and sociocultural adaptation through SCAS scores at four different time points: within 24 hours of arrival, and 4, 6, and 12 months. Both types of adjustment problems were greatest on entry and decreased over time, contrary to the U-curve hypothesis (Lysgaard, 1955). These scores followed different trajectories. Ward et al. (1998) suggested that these two concepts were interrelated but distinct from each other when their findings concluded that individuals' psychological adjustment changed differently from their sociocultural adjustment over time. Their study also established evidence to pose questions about classic concepts such as culture shock (Oberg, 1960) and U-curve (Lysgaard, 1955) that have been dominant in the Intercultural Communication field. Distinguishing sociocultural adjustment from psychological adjustment in cultural learning terms brings clarity to this study of Japanese students' gains in intercultural competence in the behavioral domains under the ABC model.

2.3 Limitations of the sociocultural adaptation construct

Although the sociocultural adaptation construct has been widely accepted within the field of intercultural relations, some limitations have been recognized by Ward and others (e.g., Ward, 2004; Ward et al., 2001; Ward & Kennedy, 1999). First, cultural self-awareness (e.g., Stewart et al., 1969; Stewart, 1972, 1995), one of the commonly recognized existing ICC theories, has been discussed very little. Second, Wilson and colleagues (2017) revised the construct and instrument, recognizing the importance of theoretically expanding the

concept of intercultural competence due to societal changes by globalization, global mobility and cultural diversity. These researchers found at least three reasons for their proposed revision to the original construct and instrument: additional behavioral competencies, examining the potential bifactor structure, and adjusting the scale from the difficulty level to the competence level. Moreover, Wilson (2013) identified possible improvements, including language proficiency, communication skills, co-national contacts, and perceived discrimination in the existing constructs and instruments. Language proficiency was identified as one of the limitations of SCAS in a sociocultural adjustment study of international students in Japan (Simic-Yamashita & Tanaka, 2010). These limitations have shaped the design of this study.

2.4 Perceived intercultural competence

This study defines its main construct of intercultural competence as based on the cultural learning approach of the ABC model (e.g., Ward, 2004, 2022; Ward et al., 2001; Ward & Kennedy, 1999). This study defines "Intercultural Competence" by Japanese outbound students' cultural learning from participating in outbound mobility programs in Malaysia and Thailand, as captured by their self-reported survey responses rather than by experimental or other objective methods. In this sense, intercultural competence in this study reflects participants' self-reported success and difficulty in everyday social and academic situations. This definition and its measurement are appropriate for this study for three reasons. First, SCAS measures respondents' own understanding of changes in their intercultural competence based on their academic and social experience in Malaysia or Thailand. Second, as a self-report instrument, the SCAS can be administered to whole cohorts at low cost. Third, research on Japanese outbound mobility has relied largely on descriptive surveys and case reports, and no freely available, validated Japanese-language measure of this construct exists. Establishing such an instrument addresses this methodological gap.

3. Literature Review

In the literature in English, the availability of instruments for measuring learning outcomes of outbound mobility programs consists of diverse theoretical domains, methodological requirements, available languages and costs. Some studies have reviewed a variety of instruments to measure and

evaluate the effectiveness of intercultural education training approaches (Fantini, 2009a; Paige, 2003), while other researchers evaluated the existing instruments' applicability to outbound student mobility evaluation research (Paige & Stallman, 2007; Perry & Southwell, 2011). While diverse instruments are available to researchers and evaluators, identifying instruments that fit their evidence-generation objectives is a major methodological shortcoming in the studies of outbound student mobility programs.

A recent study (Goldstein, 2022) argued for the need to reduce cultural bias in existing measurements by developing new instruments that reflect diverse theoretical, methodological and cultural perspectives of instrument designers and teams. A need for psychometrically adequate instruments for measuring dimensions and outcomes of interventions was identified as a significant challenge (e.g., Landis & Wasilewski, 1999; Kealey, 2001, 2015). Kealey (2015) recognized self-assessment bias and socially desirable responses as significant challenges for claiming predictive power among the existing instruments and recommended that behavioral-based approaches offer the best promise for assessing an individual's potential for success in another culture. Some researchers (Kealey, 2001; Ruben & Kealey, 1979) found that local counterparts' evaluations of individuals were more accurate than self-report surveys. At the same time, such behavior-based assessment might pose feasibility challenges for a large group of participants across partner institutions; instruments that ask participants about specific behavioral situations offer a practical option. An analysis of methodologically valid and reliable instruments is necessary to implement an evaluation of learning outcomes of outbound student mobility programs.

Some efforts were made to synthesize the statistical and practical significance of the existing instruments mainly available in English. One systematic review (Goldstein, 2022) (n = 68) uncovered the five (5) most common instruments: Intercultural Development Inventory (IDI), Cross-Cultural Adaptability Inventory (CCAI), Cultural Intelligence Scale (CIS), Global Competence Aptitude Scale (GCAS) and Global Perspective Inventory (GPI). Another meta-analysis (Burrow, 2019) evaluated the existing instruments applied in intercultural competence studies in U.S. outbound student mobility literature. The author concluded that these instruments were all psychometrically valid and reliable, and emphasized the importance of selecting and applying appropriate instruments in intercultural competence

studies. Furthermore, Vande Berg et al. (2012) synthesized a series of studies that used the Intercultural Development Inventory (IDI; Hammer, 2012). Because these studies shared a common instrument, their results could be compared directly. The synthesis showed that students' gains in intercultural competence were often smaller than assumed, and that time abroad alone did not ensure development; gains depended largely on intentional interventions such as cultural mentoring (Vande Berg et al., 2012). These English-language studies thus built a cumulative body of evidence on the relationship between outbound mobility programs and intercultural competence.

A need for evidence through systematic approaches becomes clear when reviewing the existing literature in the Japanese language. For example, Hamano (2024) conducted a review of the literature to summarize the existing trends in outbound student mobility research publications, although it was neither a systematic review nor a rapid review. This analysis uncovered 12 publications on learning outcomes of outbound student mobility programs for Japanese participants between 2011 and 2020. The author concluded these studies often applied descriptive surveys and interviews. Another study (Nakao, 2023) published reflective case studies of individual experiences on intercultural competence. Yokota et al. (2018) conducted a large-scale data analysis to establish an evidence base for the impact of outbound student mobility programs among Japanese participants (n = 1298). However, this large-scale study (Yokota et al., 2018) utilized a survey that was not tested for its instrumental validity and reliability. Other existing studies were often theoretically oriented analyses by a literature review (e.g., Hamano, 2024; Ikeda, 2014; Kainuma, 2018), case practice descriptions (e.g., Cutting, 2015; Hashimoto, 2006; Wang, 2013), or program implementation reports (e.g., Matsumoto, 2008; Okamura & Nukaga, 2018; Takahara & Tanaka, 2011). The literature review of Japanese publications uncovered a lack of the use of instruments that are valid and reliable to generalize their results beyond the context of their studies.

When psychometric validity and reliability were applied as criteria to the review of the existing instruments, only seven (7) studies (Hanada, 2015, 2019; Nagai, 2018; Lee, 2019; Ujitani, 2015; Ward et al., 1998; Ward & Kennedy, 1999) applied psychometrically valid and reliable instruments in their studies. A meta-analysis by Ward and Kennedy (1999) concluded that SCAS was a psychometrically valid and reliable instrument across nationalities and geographic destinations, including Japanese students in New Zealand. This

study also included both cross-sectional studies and longitudinal designs to illustrate its flexibility, robustness and theoretical soundness. Hanada (2015, 2019) applied the Intercultural Development Inventory (IDI) to evaluate Japanese undergraduate students' intercultural competence gains and concluded that pre-departure orientations were statistically related to participants' learning outcomes. Nagai (2018) applied the Beliefs, Events, and Values Inventory (BEVI). Ujitani (2015) implemented the Cross-Cultural Adaptability Inventory (CCAI) in her study as CCAI is available in Japanese translation and found that her students' post-return CCAI results were statistically significant compared to their pre-departure CCAI results. Lee (2019) applied the OECD's Global Competence in PISA Assessment (2018) and the Intercultural Effectiveness Scale (IES) by Portalla and Chen (2010). Ward et al. (1998) used the Sociocultural Adaptation Scale (SCAS) to evaluate Japanese students' changes with statistically significant results. Unfortunately, these are the only studies based on psychometrically valid and reliable instruments.

Identifying an instrument in the Japanese language was a significant barrier. The existing English/Japanese instruments were fee-based instruments that were also copyrighted for their use. Without being able to find an appropriate instrument in Japanese, the existing studies had to opt to explore a non-Japanese instrument with translation. This study therefore attempted to contribute to evidence on whether the SCAS retains its instrumental validity and reliability when translated from English to Japanese, and administered to Japanese participants in Malaysia and Thailand, a population and region underrepresented in the literature. This study also attempted to make a validated Japanese version freely available to researchers and practitioners.

4. Method

4.1. Instrument description and selection

This study was based on the existing theoretical framework, cultural learning theory (e.g., Ward, 2004, 2022; Ward et al., 2001; Ward & Kennedy, 1999). Cultural learning theory is accompanied by an instrument, the Sociocultural Adaptation Scale (SCAS). The available instrument included 41 items (Ward & Kennedy, 1999, p.663). According to the authors, the SCAS is designed to require participants to respond to the level of difficulty on a five-point scale (no difficulty/slight difficulty/moderate difficulty/great

difficulty/extreme difficulty). The authors also explained that the SCAS scale is flexible and adaptable to fit participants' characteristics. Although most studies included 20 to 23 SCAS items, the authors claimed that most items are applicable to diverse groups. In order to support their claim, Ward and Kennedy (1999) analyzed SCAS's validity and reliability across 16 studies in their meta-analysis study. These authors concluded that the SCAS's construct validity in the metadata is evident in the consistent significant correlation (range 0.20-0.62, M = 0.38) between the SCAS scores and the Zung Self-rating Depression Scale scores (Zung, 1965; cited in Ward & Kennedy, 1999, p.667). Furthermore, these authors examined SCAS's reliability by reporting Cronbach's alpha in their metadata (Ward & Kennedy, 1999). Sixteen (16) studies in the meta-analysis study indicated reliability indices ranging from 0.75 to 0.91 (M = 0.85), including Cronbach's alpha of 20-item SCAS for the longitudinal design of Japanese students in New Zealand (n = 35) as 0.88. The available results indicated that the SCAS would be a valid and reliable instrument applicable to a diverse sample group, including the Japanese participants, as these designers claimed (Ward & Kennedy, 1999).

Moreover, Ward and Kennedy (1999) explored the SCAS structure by conducting factor analysis using one of their studies on Singaporean students abroad (n = 108). After deleting nine items (e.g., transport, climate, accommodations, and shopping) out of 29 items at the 0.70 criterion, these authors conducted a forced two-factor analysis by using oblique rotation; the study explained that the first factor (eigenvalue = 6.4) accounted for 32% of the variance and the second factor (eigenvalue = 1.7) accounted for 8.7% of the variance. These two factors were described as "moderately highly related" (Ward & Kennedy, 1999, p.669). These authors labelled the first factor "Cultural Empathy and Relatedness" and the second factor "Impersonal Endeavors and Perils" (p. 670). These factors could be interpreted as the sub-dimensions of sociocultural adaptation processes, emphasizing interpersonal aspects of the cultural learning theory. Comparing the existing factor analysis results with those of this study could confirm the SCAS instrumental validity and reliability for the participants in this study.

The scale is a publicly available instrument, flexible as described by the designers, tested for Japanese participants, and has a social behavioral focus to measure intercultural competence scales. These four criteria were important for choosing SCAS for this study, especially after reviewing a variety of English-

language instruments, some of which were available in Japanese for a fee (e.g., Fantini, 2009b; Hanada, 2015; Paige & Stallman, 2007). As Wilson (2013) noted, more than 100 studies had been conducted using SCAS by 2012, and this wide acceptance allowed the research team to determine SCAS as the most appropriate instrument for this study. Although the instrument is over 20 years old, SCAS was selected for this study to fulfill its instrumental needs. An ideal option would be a Japanese instrument, but no instrument was available for this project as reviewed in the literature. Unfortunately, Ward et al.'s (1998) original study included no Japanese translation. Other options were too expensive to purchase for over 200 licenses, and this study had no budget purchasing licenses. A revised version of the scale, SCAS-R (Wilson et al., 2017), became available only after this study had translated and piloted the original SCAS. Because this study had continued to collect data through 2025 annually, the original instrument was retained to keep scores comparable across cohorts. Under the resource limitations and methodological considerations, the study opted for SCAS with a rigorous translation procedure as a pragmatic solution to this study.

4.2. Context

The School of Global Studies and Collaboration (GSC), Aoyama Gakuin University, is a new department established in 2015. One of the goals of this department was to improve GSC students' ability to bridge cultural differences with someone from cultures other than their own. The central pedagogy of the GSC curriculum is a 15-week outbound student mobility requirement through one of its partner universities in Malaysia and Thailand. Equally important was measuring and illustrating GSC students' learning outcomes through empirical evidence. Since mobility participation is a requirement for all GSC students, a monitoring and evaluation mechanism was integral to the curriculum structure to generate evidence for institutional quality assurance, learning and accountability. The mechanism was designed to ensure students' process and learning outcomes throughout their participation in destination countries by the author as a member of GSC's steering committee from 2011 to 2015. To achieve this institutional quality assurance, learning and accountability, the GSC monitoring and evaluation mechanism needed to identify an instrument that could examine the changes in Japanese participants' intercultural competence in the behavioral domain due to their academic and social experience in the destination countries (e.g., Hiratsuka, 2026a, 2026b; Hiratsuka et al., 2022).

4.3. Sample Descriptions

The study participants were two cohorts of Japanese undergraduate students who were enrolled in the School of Global Studies and Collaboration (GSC), at Aoyama Gakuin University. These two cohorts were the first two student groups that entered GSC's undergraduate degree studies during the 2015 admission cohort (N = 225) (Gakkou Houjin Aoyama Gakuin, 2015) and the 2016 admission cohort (N = 214) (Gakkou Houjin Aoyama Gakuin, 2016). These students were required to participate in the 15-week semester-long outbound student mobility programs in Malaysia and Thailand as a part of the requirement to earn the Bachelor of Arts degree at AGU. The total sample size for the two cohorts is 439 (N = 439).

The initial data preparation and management required procedures to organize the data and ensure the quality. Out of the total enrollment in the two cohorts (N = 439), 363 cases were included in the sample (n = 363). The cases with missing values greater than 70% were subjected to elimination from the sample. Seventy-two (72) cases from the two cohorts were eliminated due to missing values based on the above elimination criteria. Four (4) additional cases were also eliminated as outliers after further examination; the pattern of responses to the selected response items and lack of response to the open-ended items suggested that these cases should be considered inattentive responses. The total percent of responses dropped from the dataset was 17%. The sample (n = 363) from the two cohorts in this study all participated in and completed their required outbound student mobility programs in one of two destination countries to meet the sample requirement.

4.4. Instrumentation and Translation

This study designed a short form of the original Sociocultural Adaptation Scale (SCAS) (Ward & Kennedy, 1999; Ward et al., 1998) to produce survey data about changes in the participants' intercultural competence. The research team reviewed the original SCAS list to select the most appropriate items that would fit the needs of the outbound mobility program based on their expertise in sociometrics, psychometrics and comparative education. The SCAS short form includes 25 items from the original 41 SCAS items. Based on the original item list (Ward & Kennedy, 1999), the short form included a Likert Scale from one (1) to five (5) in Japanese: 難しくない [no difficulty]/あまり難しくない[slight difficulty]/そこそこ難しい[moderate difficulty]/非常に難しい[great difficulty]/極めて難しい

[extreme difficulty]. The SCAS short form had to go through a systematic translation procedure from English to Japanese as a part of this instrumentation stage (Hiratsuka et al., 2022; Hiratsuka, 2021).

The study required a systematic translation from English to Japanese as the original studies had no Japanese translation available (Ward et al., 1998; Ward & Kennedy, 1999). The translation procedure for this study used the TRAPD model team-based translation (Translation, Review, Adjudication, Pretesting, and Documentation) (Mohler et al., 2016) to ensure instrumental quality and accuracy. The translation team included one Japanese speaker, two bilingual Japanese-English speakers, and one external Japanese speaker to proceed with the TRAPD translation model. Once the translation was completed, the instrument was piloted in 2016 before the full rollout. After the pilot study showed a normal distribution of student responses, the research team approved the full instrument rollout (Hiratsuka et al., 2022; Hiratsuka, 2021). Table 1 includes the original SCAS items and their corresponding Japanese translation.

TABLE (1)
SCAS ENGLISH-JAPANESE TRANSLATION CHART

English	Japanese
(1) Making friends	友達を作る
(3) Making yourself understood	自分の意思を理解してもらう
(8) Talking about yourself with others	自分を表現する
(9) Understanding jokes and humor	ジョークやユーモアを理解する
(10) Dealing with someone who is unpleasant/cross/aggressive	不快な行動をとるような人に対処する
(13) Dealing with people in authority	権威のある地位にいる人たちに対処する
(14) Dealing with the bureaucracy	お役所的な応対に対処する
(17) Communicating with people of a different ethnic group	異なった民族グループの人たちとコミュニケーションをとる
(18) Relating to members of the opposite sex	異性の人たちに共感する

English	Japanese
(19) Dealing with unsatisfactory services	大学・公共機関での満足のいかないサービスに対処する
(22) Dealing with people staring at you	物珍しげな視線に対処する
(24) Understanding the local accent/language	現地特有のアクセント・言語を理解する
(28) Relating to older people	年長の人たちに共感する
(29) Dealing with people of higher status	社会的な地位が高い人たちに対処する
(30) Understanding what is required of you at university	何が大学で要求されているか理解する
(31) Coping with academic work	学業をこなす
(32) Dealing with foreign staff at the university	現地の大学のスタッフと意思疎通をはかる
(33) Expressing your ideas in class	授業で意見を述べる
(35) Accepting/understanding the local political system	現地の政治システムを受け入れる・理解する
(36) Understanding the locals' world view	現地の人たちの世界観を理解する
(37) Taking a local perspective on the culture	現地の人たちと同じ文化的視点をもつ
(38) Understanding the local value system	現地の価値観を理解する
(39) Seeing things from the locals' point of view	現地の人たちの視点で物事をみる
(40) Understanding "Cultural Differences"	「文化の違い」を理解する
(41) Being able to see two sides of an intercultural issue	異文化問題を両側面からみる

Note. [( ) indicates the item number in the original SCAS list (Ward & Kennedy, 1999, p.663).]

4.5. Data Collection

This study collected survey data from undergraduate participants during their mandatory pre-departure and post-return orientations by the department. The department faculty and administrative staff members responsible for the outbound student mobility program management distributed the SCAS short form in a Scantron form to all participants when they attended to supervise these orientations. Once completed, the administrative staff collected the forms and brought these responses to the faculty member. The faculty member scanned the scantrons using the scantron reader to generate data in an Excel form. The demographic information was combined with the survey data to prepare for this study's analysis. Table 2 describes the data collection schedules during these orientations for the two cohorts.

TABLE (2)
DATA COLLECTION SCHEDULE

Cohort	Pre-departure data	Post-return data
2015 Group 1	June 2016	January 2017
2015 Group 2	December 2017	September 2018
2016 Group 1	June 2017	January 2018
2016 Group 2	December 2018	September 2019

4.6. Data Analysis Strategy

This study performed three analytical strategies to explore the instrumental validity and reliability of the SCAS short form. The first analysis described the participants: Gender, Destination Countries, Cohort Years, English Proficiency and Academic Performance. Gender, cohort years and destination countries were categorical variables. English proficiency and academic performance were scale variables. For the English proficiency variable, IELTS scores of the samples were used as these students were required to take the IELTS tests. For the categorical variables, a chi-square test of independence was planned to evaluate whether there was a statistical difference in destination countries and gender between the cohort groups. For the scale variables, an independent samples t-test was planned to evaluate whether or not English proficiency and academic performance were statistically different between the cohort groups.

The second analytical strategy for this study was the investigation of the psychometric properties of the SCAS short form among the cohorts. The initial analytical step explored the ICC scale in terms of the stability of the psychometric properties within and across the two cohorts, 2015 and 2016. Exploratory factor analysis (EFA) and analysis of internal consistency (Cronbach's alpha) were planned to examine the stability of the SCAS short form instrument in this phase. For this analysis, Stata (ver. 16.1) (StataCorp, 2020) was used to perform EFA with polychoric correlation.

EFA was based on the matrix of polychoric correlations since the items in the Sociocultural Adaptation Scale (SCAS) were measured on an ordinal 5-point Likert scale. The principal axis extraction method and promax oblique rotation were planned as the EFA settings. EFA was selected to investigate whether the short form of SCAS measures a unidimensional construct or whether multiple subscales would be assumed. Separate analyses were planned for pre- and post- questionnaires for the 2015 and 2016 cohorts. This study planned to perform its data analysis through Stata 16.1 (StataCorp, 2020). Stata 16.1 was necessary to perform exploratory and confirmatory factor analyses with specific settings as a part of this validation and reliability test: Principal axis extraction method and promax oblique rotation as the EFA settings.

To explore whether the one-factor structure also holds for pre- and post-surveys in the 2015 cohort and pre- and post- surveys in the 2016 cohort, confirmatory factor analysis (CFA) was performed. For this analysis, Stata (ver. 16.1) was used to perform CFA with polychoric correlation.

In addition to testing the statistical significance of the result at the 5% level, this study planned to measure the practical significance through Cohen's d (Fidler. & Cumming, 2019). Defined as a measure of the magnitude, Cohen's d explains an effect size which illustrates the difference between two means in standard deviation (SD) units. The d values are classified as small (mean difference less than .2 SD), medium (mean differences around .5 SD), and large (mean difference greater than .8 SD) by computing a mean difference divided by a pooled standard deviation. However, these classifications are arbitrary and vary depending on the disciplines and fields according to the existing literature (e.g., Green & Salkind, 2011; Fidler & Cumming, 2019; Field, 2013).

4.7. Demographic characteristics of the samples

The selected descriptive statistics procedures were performed to report the distribution of the samples across the two cohorts and determine whether the analysis could be performed as one group. Among the categorical variables, the test for gender was found to be different between the cohort groups, Pearson χ^2 (1, n = 363) = 6.122, p = 0.013. The proportions of the two genders were 29.8% (male) and 70.2% (female) in 2015 and 42.3% (male) and 57.7% (female) in 2016, respectively. More female students were enrolled in the 2015 cohort than in the 2016 cohort. Destination countries showed no statistical or practical significance.

The test result for the IELTS scores was significant, t(361) = 2.035, p = 0.043. On average, the 2015 cohort (M = 5.45, SD = 0.48) scored higher than the 2016 cohort (M = 5.34, SD = 0.52). The 95% confidence interval for the difference in means was narrow, ranging from 0.036 to 0.21. The effect size (Cohen's d) was approximately 0.21, showing a small effect.

The test result for GPA was also significant, t(361) = 2.96, p = 0.004. On average, the 2015 cohort (M = 2.69, SD = 0.57) scored higher on GPA than the 2016 cohort (M = 2.5, SD = 0.63). The 95% confidence interval for the difference in means was narrow, ranging from 0.062 to 0.31. The effect size, Cohen's d, was 0.31, showing a small-to-medium effect.

Based on the test results from this analysis, this study required that the cohorts be analyzed separately due to statistically significant differences in gender, language proficiency, and academic performance. The results are shown in Table 3.

TABLE (3)
DESCRIPTIVE STATISTICS OF THE SAMPLE

		2015	2016	*p*
Country, %	Malaysia	44.2	37.4	.185a
	Thailand	55.8	62.6	
Gender, %	Male	29.8	42.3	.013a
	Female	70.2	57.7	
IELTS	*M*(*SD*)a	5.45 (.48)	5.34 (.52)	.043b
GPA	*M*(*SD*)b	2.69 (.57)	2.5 (.63)	.004b

Note. [a – significance testing conducted with χ^2 test of independence.
b – significance testing conducted with independent samples t-test.]

5. Results

5.1. Exploratory Factor Analysis (EFA) with Polychoric Correlation

The initial exploratory factor analysis (EFA) examined the dimensionality of the 25-item SCAS short form based on the pre-departure score in the 2015 cohort. The initial EFA solution extracted four factors with eigenvalues greater than 1 (12.92, 2.26, 1.47, and 1.07), which explained 73.7% of the variance in the data. Among these four factors, three factors were moderately to highly correlated in the correlation matrix; correlation coefficients ranged between .40 and .63. The correlation coefficients from these three factors suggested a potential one-factor structure of the instrument. Examining a potential one-factor structure of this instrument required this analysis to proceed to the next EFA by enforcing a one-factor solution in this EFA procedure.

The second EFA analysis was performed with an enforced unidimensional solution. The single-factor solution explained 53.2% of the variance in the data. The factor loadings for the items ranged between .58 and .82. The internal consistency of the unidimensional solution was confirmed by a high internal consistency index (Cronbach's alpha = .94). The results are shown in Table 4.

TABLE (4)
SUMMARY OF ITEMS AND FACTOR LOADINGS FOR PRINCIPAL AXIS EXTRACTION METHOD WITH PROMAX OBLIQUE ROTATION

Item	Factor Loading	Communality
(1) Making friends	.62	.38
(2) Making yourself understood	.69	.48
(8) Talking about yourself with others	.68	.47
(9) Understanding jokes and humor	.61	.38
(10) Dealing with someone who is unpleasant/cross/aggressive	.60	.35
(13) Dealing with people in authority	.59	.35
(14) Dealing with the bureaucracy	.60	.36
(17) Communicating with people of a different ethnic group	.68	.46
(18) Relating to members of the opposite sex	.66	.44
(19) Dealing with unsatisfactory services	.67	.45

Item	Factor Loading	Communality
(22) Dealing with people staring at you	.50	.25
(24) Understanding the local accent/language	.60	.36
(28) Relating to older people	.64	.40
(29) Dealing with people of higher status	.66	.44
(30) Understanding what is required of you at university	.67	.45
(31) Coping with academic work	.61	.38
(32) Dealing with foreign staff at the university	.71	.50
(33) Expressing your ideas in class	.63	.40
(35) Accepting/understanding the local political system	.71	.52
(36) Understanding the locals' world view	.81	.66
(37) Taking a local perspective on the culture	.81	.67
(38) Understanding the local value system	.81	.67
(39) Seeing things from the locals' point of view	.72	.52
(40) Understanding "Cultural Differences"	.69	.49
(41) Being able to see two sides of an intercultural issue	.70	.49
Eigenvalue	11.32	
% of variance	70.53	

Note. [( ) indicates the item number in the original SCAS list (Ward & Kennedy, 1999, p.663).]

5.2. Confirmatory factor analysis for the SCAS short form stability across time and cohorts.

Although the first run of CFA showed less than satisfactory model fit as measured by RMSEA, CFI, and TLI indices, the exploration of suggested modification indices in CFA output showed that introducing error covariances between the items would improve model fit. Once these indices were implemented, the CFA model showed a sufficient model fit in each of the datasets (RMSEA<.05, CFI>.95, and TLI>.95). The internal consistency indices were high in the post-survey 2015, pre-survey and post-survey 2016 datasets (.92, .94, and .92, respectively).

6. Discussion

The purpose of this study was to fill a gap in the availability of Japanese language instruments for an evaluation of intercultural competence as learning outcomes of outbound student mobility programs for Japanese undergraduate students. The School of Global Studies and Collaboration (GSC), Aoyama Gakuin University, needed an instrument in the Japanese language to assess the changes in students as a result of their participation in the outbound mobility programs. Although their monitoring and evaluation mechanism has been integral to GSC's efforts toward learning, accountability and academic contributions to the scholarly research and policy analysis and administrative practices of higher education in Japan, the author faced significant challenges in finding appropriate instruments that were theory-driven, psychometrically valid and reliable, methodologically sound, applicable to Japanese samples and financially accessible. The difficulties of instrument availability for this project became evident through reviewing the existing literature in English and Japanese. Based on the review, the study shifted its goal to use the existing instrument in English with precedence to the Japanese samples by implementing a systematic translation approach and performing a series of analytical procedures. The study conducted instrumental validation, reliability testing, and descriptive statistics on the samples. From these analyses, the results validated the instrument, showed satisfactory reliability, and established the applicability to the Japanese participants. At the same time, the results brought several implications for the project team analysts.

As intercultural competence is a significant measurement concept of outbound student mobility program research, this study was able to make the SCAS short form available with its tested validity and reliability for the Japanese samples. The evidence of this instrumental validity and reliability of the SCAS short form filled a gap in the instrument availability of intercultural competence in the literature that is theory-driven, methodologically sound and financially accessible. This study established the validity and reliability of the Sociocultural Adaptation Scale (SCAS) through the TRAPD translation approach and expert review for the Japanese sample. This contribution to the literature is a critical step toward further development of empirical data and evidence for outbound student mobility initiatives in higher education policy in Japan, as the Japanese postsecondary policy requires diverse evidence through evidence-based approaches. The availability of the SCAS short form could encourage other

researchers and administrative staff in Japan to perform their assessments and evaluations of diverse outbound student mobility programs. Such attempts could establish more evidence, databases and analytical procedures than their current status. This instrumental availability also could encourage Japanese policymakers to consider future evidence use in their policy formations of outbound student mobility programs, including Leap Forward, Japan.

6.1. The SCAS short form validity and reliability to ensure the applicability to the Japanese sample.

The instrumental validity and reliability of the SCAS short form could be further confirmed through the representation and comparison with the Japanese general population. This study compared the results of the descriptive statistics from the cohorts to the existing studies in the Japanese literature to evaluate their representation in the Japanese undergraduate population. When compared, the samples could be considered reflective of the undergraduate population in Japan. Based on the comparison in the following tables, the sample was determined to be representative of Japanese undergraduate students in terms of age, gender, and English proficiency. The sample comparison is listed in Tables 5 and 6.

TABLE (5)
COMPARISON OF DESCRIPTIVE STATISTICS AMONG THE EXISTING STUDIES IN JAPAN

Study Names (n)	Age (at the time of departure/ arrival in the destination countries)	Gender (%)	
		Male students	Female students
The 2015 Cohort (*n* = 181)	19.2	29.8	70.2
The 2016 Cohort (*n* = 182)	19.3	42.3	57.7
Hanada (2015, 2019) (*n* = 303)	Traditional student age between 18 and 21*	37.5	62.5
Ward et al. (1998) (*n* = 35)	18.6	51	49
JASSO (2018)		37	62
Kawai Juku (2018) (*n* = 801)		41	58

Note. [**The author confirmed this age description (Hanada, Personal communication, 2020*).]

TABLE (6)
IELTS SCORES (ACADEMIC BAND) COMPARISON

Group	Score
The 2015 Cohort	5.45
The 2016 Cohort	5.34
IELTS (2018)(Nationality: Japanese)	5.83
IELTS (2018)(The first language: Japanese)	5.79

Note. [*The data were extracted from the official IELTS website (https://www.ielts.org/teaching-andresearch/test-taker-performance).*]

According to this comparison, the age of this study's participants was comparable to other existing studies. Participants' average age at departure was 19.26 years old. Yokota et al. (2018) sampled Japanese outbound mobility students in different age groups. Within the age groups, the sample of outbound Japanese undergraduate students' age at the time of departure between 18 and 23 years old was approximately 90%. In Yokota et al.'s study (2018), their outbound undergraduate sample was defined as participants who participated in the programs at their partner universities as a part of their home university degree programs in Japan. Another study on age comparison was conducted by Hanada (2015, 2019). Although Hanada (2015) did not indicate a specific age group, he described his sample as equivalent to the traditional Japanese undergraduate students in their outbound mobility programs. This was also confirmed by the author when the author spoke with the researcher on the phone (Hanada, Personal Communication, 2020).

Gender distribution was also similar across all existing studies in Japan. Overall, female students made up a larger proportion than male students in all samples. The 2015 cohort included more female students than the 2016 cohort and the other existing studies. The gender imbalance in the 2015 cohort was an important consideration when further analysis was conducted as this result was a major consideration for the separate analyses between the two cohorts. One exception was Ward et al. (1998), which included only a slightly higher proportion of male students than female students.

Furthermore, the participants' English language proficiency in IELTS score (academic) averaged 5.39. The score came from participants' best results from one of the two IELTS scores. These participants took two official IELTS exams before applying to their required outbound mobility programs through

its partner universities in Malaysia and Thailand. The average scores in these cohorts were slightly lower than the two official categories given in IELTS data, which included nationality (Japanese) and first language (Japanese).

6.2. A comparison with the existing SCAS studies with the Japanese samples.

A comparison between this study and the original SCAS study could further contribute to building evidence of the applicability of this instrument to the Japanese samples. This study examined the internal consistency of SCAS by Cronbach's alpha when the Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were performed to examine whether the instrument could be applied as the unidimensional solution. Cronbach's alpha for all four analyses included .94 (EFA), .92, .94 and .92 (CFA). The two studies (Ward et al., 1998; Ward & Kennedy, 1999) included Cronbach's alpha of .85 for the Japanese sample. As a reliability score above .70 is considered acceptable, all studies achieved an acceptable rate of this reliability score for the Japanese samples. This result comparison further established the SCAS as one of the reliable instruments available to evaluate Japanese undergraduate participants' intercultural competence as learning outcomes of outbound mobility programs, including destination countries in Malaysia and Thailand for this study and New Zealand for the original study. More studies are encouraged to apply the SCAS short form to Japanese samples in diverse destination countries as preparation for establishing evidence of intercultural competence.

7. Limitations

Several limitations were challenging for this research. First, a common limitation for cross-cultural studies involving translations, using a translated instrument (Van de Vliert, 2011) was a shortcoming in this study. For example, some students in the pilot study expressed their difficulty understanding some questions in the SCAS short form of the Sociocultural Adaptation Scale (SCAS). Overcoming this limitation required a team translation strategy available from Mohler et al. (2016). This translation strategy contributed to overcoming the instrument translation, criterion validity and content validity limitations.

Second, the sample representation could be a limitation for future studies if researchers wish to use the SCAS short form in their samples other than the traditional undergraduate population in Japan. The instrument will

require another validation and reliability testing procedure for high school students younger than 19 years old, and less proficient in English or destination countries other than Malaysia and Thailand. The instrument also requires the procedure for Japanese samples older than 19 years old among the general working population in Japan who are expats or retirees in countries outside of these two destinations. Researchers are encouraged to conduct validation and reliability testing before applying the SCAS short form to their samples.

Third, using instrumental validation and reliability testing methods could be a limitation for future studies. The method could be complex, require particular software, and necessitate some understanding of psychometric theories. Overcoming this challenge, the author had to train himself to be knowledgeable about the theories and methods in addition to being proficient in the software. The study also consulted with an external statistician to ensure the process and the quality by consulting with external experts and confirming the method design, translation, analysis strategies and procedures. Future studies are encouraged to include team members with knowledge of psychometric theories, proficiency in appropriate software and methodological skills in instrumental validation and reliability testing.

Fourth, the data collection schedule is a limitation of this study. Although the ideal data collection schedule would have been at the time of participants' entries into their destination countries as modeled in Ward et al. (1998), the research team was unable to establish this schedule since the senior administration of the department only approved the described data collection schedule in this study. The research team encourages future studies to attempt their data collection schedule to align with the academic standards.

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Ethical Approval

The original study received the ethics approval of the University of Toronto, where the author was conducting this study.

Declaration of Competing Interest

No competing interest was involved in this study.

Data Availability Statement

The survey data analyzed in this study are publicly unavailable due to privacy restrictions and the conditions of institutional approval for their use.

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