Research Article

Validating the Suinn-Lew Asian Self-Identity Acculturation Scale Among Middle Eastern Migrants: Linear Versus Orthogonal Approaches

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Abstract

The current study aimed at validating the 26-item Suinn-Lew Asian Self-Identity Acculturation scale (SL-ASIA) using confirmatory factor analysis (CFA) in first-generation young adult Middle Eastern (ME) migrants, and also exploring the agreement between the outcomes of linear and orthogonal approaches of acculturation using SL-ASIA. The CFA and convergent and discriminant validity measures were employed to validate the original linear SL-ASIA and the subsequently designed orthogonal SL-ASIA for first-generation young adult ME migrants in Australia (n = 382). Cohen's Kappa coefficient was used to measure the agreement between classifications obtained by the linear and orthogonal methods of measuring acculturation. The CFAs of the initial six-factor 21-item linear scale and the two-factor five-item orthogonal scale indicated poor fits. However, after model specification and validation, satisfactory fit and validity indices were achieved for the modified scales. The validated linear SL-ASIA comprised five factors and 15 items, and the validated orthogonal SL-ASIA comprised two factors and four items. The Kappa coefficient showed a high level of consistency between the linear and orthogonal models of acculturation, confirming that the use of either scale can lead to similar research outcomes. The study also supports the use of the validated linear and/or orthogonal scales to measure acculturation. This finding responds to the existing gap in the literature that until now, no acculturation scale is validated for ME migrants, and also no study is conducted to validate the orthogonal SL-ASIA.

Keywords: Acculturation, Psychometrics, Weights and Measures, Factor Analysis, Statistical, Transients and Migrants, Young Adult, Australia

1. Background

Significant population movement in the 21st century has led to an expanded interest in acculturation research and the demand for culturally and psychometrically sound measures (1). Acculturation happens when people from diverse cultural backgrounds come into continuous first-hand contact, and is defined as the process by which individuals adopt the attitudes, values, customs, beliefs, and behaviors of another culture (1, 2). The concept of acculturation was originally proposed by Redfield, Linton, and Herskovits, and through the years, a variety of approaches are suggested to conceptualize and measure acculturation (3, 4).

The linear and orthogonal approaches are two leading conceptualizations of acculturation. The linear framework treats the acculturation process as a linear shift from the state of being fully un-acculturated to fully acculturated to the host country culture (5, 6). In other words, it posits that individuals can only adhere to one culture at a time, and as they adopt the host culture characteristics simultaneously, they lose or give up the characteristics of their traditional culture (6, 7). In contrast, in an orthogonal framework, adherence to the traditional culture and adoption of the host culture characteristics are independent processes moving along two separate continuums. It postulates that immigrants have the ability to balance both their culture of origin and the new culture (6, 8). Berry, who espoused an orthogonal approach (9), proposed acculturation as a two-dimensional construct with one dimension relating to the level of maintenance of the culture of origin and the second to the level of identification with the new culture. According to the two independent components, individuals

could be categorized as separated (i.e., high in the culture of origin, low in the host culture), integrated (i.e., high in both cultures), assimilated (i.e., high in the host culture, low in the culture of origin), or marginalized (i.e., low in both cultures).

A wide range of measures and instruments are adopted to address the dimensionality and variation of acculturation in different cultural domains (10). In 1987, the Suinn-Lew Asian self-identity scale (SL-ASIA) was devised by Suinn et al. (11), in response to significant interest in the research literature of the Asian-American population, and due to the lack of objective measures of acculturation. The SL-ASIA is now the most commonly used scale to measure acculturation among Asians (2, 11). The SL-ASIA is originally a 21-item self-report scale devised based on the initial conceptualization of acculturation as a unidimensional or linear process (12). In the most recent version, five extra items are added to the scale to provide an additional method to bidirectionally classify responses. These items are included as the items 22 to 26, adjacent to the original 21-item SL-ASIA, and measure various aspects of acculturation comprising values, sense of behavioral competencies, and self-identity. Scores fall into one of four acculturation categories, including assimilation, integration, separation, and marginalization (10, 13). The inclusion of the five extra items to the original SL-ASIA allows for examining both the linear and orthogonal acculturation models in the same inventory, and thus a more precise and comprehensive assessment of acculturation. Although many studies apply the 26-item SL-ASIA to address both the linear and orthogonal approaches, there is a paucity of studies examining the consistency between the two approaches (6, 14, 15). In order to achieve the quality assessment outcomes from SL-ASIA, evaluating the potential convergence or non-convergence between the linear and orthogonal approaches is of great value, and further studies in this area are strongly advocated (6).

Psychometric properties of the original SL-ASIA are addressed in a wide range of literature. The legibility and writing quality, satisfactory test-retest reliability over a short time, and adequate internal consistency of the scale are confirmed in numerous studies (2, 13, 16). A meta-analysis review of published studies from 1987 to 2013 reporting the application of any version of the SL-ASIA showed that all reliability scores of this instrument range acceptable to excellent (2). Another review of 22 studies found that the 21-item SL-ASIA had good legibility and writing quality (13). The face and concurrent validities of the scale are also supported in many studies. A study on the validation of the SL-ASIA among Asian-American migrants showed a significant correlation between the 21-item SL-ASIA scores and demographic variables reflecting levels of Asian-American identity, and thus demonstrated a satisfactory concurrent validity of the scale (12). Another study measuring the validity of SL-ASIA among a sample of Chinese and Filipino-Americans also supported the concurrent validity of the scale by showing a significant correlation between the 21-item SL-ASIA scores and six demographic variables assumed to reflect the level of acculturation, such as age on arrival, years of residence, and years of school attendance in the host country (17).

The evidence regarding the validity of the SL-ASIA is still unclear due to the gaps in previous research. First, there is still a shortage of studies evaluating the construct validity of SL-ASIA, since the earlier studies are mostly deficient in using powerful statistical procedures (i.e., factor analyses) to firmly establish the structural validity of the scale (16). For example, in two previous studies on validating the 21-item SL-AISA, the factorial validity of the scale was measured using principal components analysis (PCA), which had some disadvantages compared with factor analysis as a more recent method of measuring construct validity (17-19). In addition, while the SL-ASIA is the most commonly cited instrument to evaluate acculturation among Asian immigrants, all validity studies are conducted among East, South-East, and South Asian population groups (including Chinese, Korean, Vietnamese, Indian, Hmong, Filipino, Cambodian, and Japanese), and to date, no study is established on the validity of the SL-ASIA among other Asian populations such as the ones from the Middle East (12, 17, 18, 20, 21). Moreover, the SL-ASIA is mostly validated among US immigrants and rarely among immigrants to other parts of the world (2, 13). Furthermore, there is a lack of research on the validity of the 26-item SL-ASIA, as to the best of authors' knowledge, no attempt is made to validate the extra five items of the scale (direct contact with Dr. Suinn-Lew) (14, 15).

On this basis, the current study aimed at validating the 26-item SL-ASIA using confirmatory factor analysis (CFA), and also exploring the agreement between the outcomes of the linear and orthogonal approaches of acculturation using SL-ASIA. The population under study was the first-generation young adult Middle Eastern (ME) migrants in Australia. Australia is considered one of the countries with the largest immigration population and characterized by a relatively high level of ethnic diversity. Over 28% of Australians are from diverse cultural and linguistic backgrounds and are migrants from other parts of the world (22). The Middle East is an important source of migrants to Australia since it is one of the most crisis- and conflict-

prone regions in the world (23-25). ME migrants constitute a large population group in Australia, and thus it is crucial to investigate information concerning their acculturation from both research and practice perspectives (23, 26). The current study focused on first-generation young adult migrants that compared to other age groups have a higher migration rate for Australia and the world (27, 28). Since they typically seek work or study, the process of settling in the host country can be complex and protracted for them. They are involved in a wide range of demanding and often stressful tasks due to negotiating education and employment pathways, along with learning a new language and understanding and navigating a completely unfamiliar culture and society (29-31). If they are from refugee backgrounds, these challenges are compounded by limited or low English language skills, the traumatic nature of the refugee experience, less access to social and cultural capital, and more vulnerability to racism and discrimination (29). This applies to many young adult ME migrants since about 60% of recent refugees to Australia are from Middle East (26); given that, and considering the dearth of appropriate measures of acculturation in young adult migrants, it seems essential to establish a suitable scale addressing the acculturation of young adult ME migrants in Australia (32).

2. Methods

2.1. Participants

The target population of the current study was male and female first-generation ME migrants in Australia aged 20 - 39 years. A first-generation migrant is defined as a foreign-born individual of foreign parents (33). A young adult, according to psychosocial development stages, is generally a person aged 20 - 39 years, which is also consistent with the recommended standard age categories of the Australian Bureau of Statistics (34).

2.2. Procedure

Participants were recruited from January 2017 to October 2017 in Queensland State, a significant destination for migrants in Australia. The sample size of 382 was calculated using the Cochran formula (35). This sample size was also adequate for CFA; as the minimum sample size required for conducting CFA is ten participants for each free parameter (36), with the estimation of 250 participants for the current study. To achieve the estimated sample size, out of 134,270 young adult ME migrants in Australia (28),

the study sample was selected from important community places (e.g., universities and other educational institutions, religious places, workplaces, shopping centers, ME festivals, ceremonies and exhibitions, and ME clubs and associations) using a convenience sampling method.

A face-to-face approach was utilized to recruit study participants. To collect data, the researcher attended the selected community locations. At each site, the researcher approached potential respondents, made an introduction, explained the objectives and advantages of the study, and asked whether they are interested in participating in the research. If a potential respondent indicated a willingness to participate, filter questions were asked to ascertain whether they qualified as a first-generation young adult ME migrant. The eligible subjects were provided with the information sheet, and informed consent was obtained from them. Respondents filled out the questionnaire at the data collection site, and the researcher provided advice if required. The average time taken to perform the survey was 20 - 30 minutes. The survey was administered in English, but for the participants with insufficient English proficiency, a session was scheduled at their convenience, in which Persian/English, Arabic/English, or Turkish/English speaking experts helped the subjects to understand the text and complete the questionnaire. Before conducting the survey, an expert panel reviewed the study questionnaire for clarity and conciseness, and a pilot-test was conducted on a sample of 20 subjects to check the clarity of the questionnaire items, and the feasibility and functionality of the research procedure. The study protocol was approved by the Ethics Committee of Griffith University.

2.3. Measure

To measure acculturation in the current study, the 26-item SL-ASIA was applied. The original SL-ASIA is a self-administered questionnaire consisting of 21 multiple-choice items scored based on a five-point Likert scale from 1 (high ethnic identity) to 5 (high Western identity). The overall mean score of the 21-item SL-ASIA is calculated using a linear approach since the higher total mean score obtained from the instrument denotes the higher level of acculturation (i.e., greater adherence to Western values) (11). Recently, five more items were incorporated into the scale, as items 22 - 26, to assess various aspects of acculturation comprising values, behavioral competency, and self-identity; the new items were scored similarly based on a five-point Likert scale. Using an orthogonal approach, scores obtained from the items fall into one of the four acculturation categories, including assimilation, integration, separation, and marginalization (10). As all study par-

ticipants were first-generation migrants, the item "What generation are you?" was removed from the scale, resulting in a 25-item SL-ASIA scale.

2.4. Data Analysis

The SPSS version 24 and IBM AMOS 24 were utilized for data analysis. Data analysis was conducted in three stages. In the 1st stage, the original SL-ASIA (named here as the linear SL-ASIA) was validated. In the 2nd stage, the five-item scale adjacent to the original SL-ASIA (named here as the orthogonal SL-ASIA) was validated. In the 3rd stage, the agreement between the validated linear SL-ASIA and the validated orthogonal SL-ASIA was examined. Data cleaning was applied to the data set, and a few missing values were observed (with a missing rate of 0.6%), which were imputed with the median of nearby points.

2.4.1. Stage 1 (Validating the Linear SL-ASIA)

For the linear SL-ASIA (20-item scale excluding the item regarding participants' generation), CFA was used to measure the fit of the factor model. The original six-factor structure was developed based on the available literature [11, 12, 17]. It included language and cultural preferences with six items (e.g., spoken language), interaction with four items (e.g., childhood friends), an affinity for ethnic identity and pride with three items (e.g., participation in ethnic activities), generational identity with three items (e.g., maternal ethnic identity), generation and geographic history with three items (e.g., contact with the country of birth), and food preferences with two items (e.g., food preferences at home). In line with the literature, the adequacy of the model was assessed using incremental and absolute fit indices [37-40].

Fit indices were supplemented with the information on how well each item fits the CFA model. Both standardized residuals and modification indices were used to identify model misspecifications. Items with standardized residuals above the limits $\pm$ 2.5 and high modification indices were classified as mis specified. To improve model fit, modifications were made through the deletion of non-significant observed variables by modifying the path between the variables and adding various covariances between error terms [37].

To evaluate the consistency and quality of the SL-ASIA, its reliability and validity were assessed. Since an instrument cannot be valid unless it is reliable, the internal consistency reliability of the SL-ASIA was first measured using Cronbach's alpha [41, 42]. To assess the scale validity, the convergent and discriminant validity indices were used [43]. Convergent validity is the degree of confidence that a

construct is well measured by its indicators [44]. In the current study, convergent validity was assessed using factor loading, composite reliability (CR), and average variance extracted (AVE) [42]. Discriminant validity is the extent to which one construct is different from the other ones. Discriminant validity of the study constructs was measured by comparing AVE with maximum shared squared variance, and average shared squared variance [45, 46].

2.4.2. Stage 2 (Validating the Orthogonal SL-ASIA)

The CFA process was also applied to validate the orthogonal SL-ASIA. The original two-factor model was structured based on previous research [10]. It included value with two items (i.e., belief in the ethnic value and Australian value), behavioral competency with two items (i.e., fit with ethnic community and Australian community), and self-identity with one item (the way of describing self). Model fit, reliability, convergent validity, and discriminant validity of the orthogonal SL-ASIA were measured using the same indices used in the 1st stage.

2.4.3. Stage 3 (Examining the Agreement Between the Linear and Orthogonal Approaches to Measure Acculturation)

First, the total score of the validated linear SL-ASIA was calculated based on a five-point Likert scale from 1 (low acculturation) to 5 (high acculturation). Second, the validated orthogonal SL-ASIA was employed to classify the study participants into four acculturation categories, including assimilation, integration, separation, and marginalization. Third, Cohen's Kappa coefficient was used to measure the consistency of classifications based on linear and orthogonal approaches. To calculate Kappa, the method of assessing the estimated Kappa coefficients was used to identify the cutoff points at which the two approaches had the highest agreement [47].

3. Results

A total of 382 out of the 2570 participants approached completed the questionnaire with a response rate of 14.8%. The mean age of the participants was 30.4 $\pm$ 4.57 years; 91.1% of participants were Muslim, 3.7% Christian, Jewish, etc., and 5.2% had no religion. About 54% of participants had a university degree. Almost 60% of participants were single or divorced and 40.1% were married or cohabited.

3.1. Validating the Linear SL-ASIA

The initial 20-item, six-factor SL-ASIA model (Figure 1) was tested in the study. The model reached a poor goodness of fit (χ^2 = 765.798, P < 0.0001, root mean square er-

ror of approximation (RMSEA) = 0.102). Thus, specification searching was conducted to understand the sources of model misspecification. Based on modification indices, some items of SL-ASIA were found to have a large error covariance, and by considering the covariates between them, the goodness of the model fit indices improved. Six potentially problematic items were identified in the model using standardized residuals. The model fit improved by moving the item where raised from the generation and geographic history subscale to the interaction subscale. The five remaining items were identified as sources of misspecification and thus were removed from the analyses. They included preferred language, preferred music, current friends, preferred friends, and contact with the country of birth. As a result of these modifications, the model fit elevated to an acceptable level. The removal of some items from the model also resulted in the omission of the subscale generation and geographic history. Therefore, the final model comprised of five factors and 15 items was achieved (Figure 2). Table 1 shows the model fit indices before and after modification.

Table 1. Goodness of Fit Indices for the Linear SL-ASIA Before and After Fitness[a]

Measure	Before Fitness	After Fitness
χ^2/df	4.941	3.514
RMSEA	0.102[b]	0.079
PCLOSE	0.000[b]	0.124
CFI	0.770[b]	0.946
TLI	0.717[b]	0.918
PCFI	0.628	0.619
IFI	0.773[b]	0.947
NFI	0.730[b]	0.927
SRMR	0.111[b]	0.054

[a]Chi-squared to degree of freedom ratio (χ^2/df) (values $\leq$ 3 indicate a good fit and $\leq$ 5 a permissible fit); root mean square error of approximation (RMSEA) (values $\leq$ 0.05 indicate a good fit and $\leq$ 0.08 an adequate fit); PCLOSE (values > 0.05 indicate a good fit); comparative fit index (CFI) (values $\geq$ 0.95 indicate a good fit and $\geq\geq$ 0.9 an acceptable fit); Tucker-Lewis index (TLI) (values $\geq$ 0.95 indicate a good fit and $\geq$ 0.9 an acceptable fit); parsimony adjustment to the CFI (PCFI) (values $\geq$ 0.5 indicate a good fit); incremental fit index (IFI) (values $\geq$ 0.95 indicate a good fit and $\geq$ 0.9 an acceptable fit); normal fit index (NFI) (values $\geq$ 0.95 indicate a good fit and $\geq$ 0.9 an acceptable fit); and standardized root mean square residual (SRMR) (values $\leq$ 0.05 indicate a good fit and $\leq$ 0.1 an acceptable fit).
[b]Values are below the acceptable level.

Through the model specification and validation process, more satisfactory reliability and validity indices were obtained. Table 2 represents the reliability, convergent, and discriminant validity coefficients of SL-ASIA before and after modification. As shown in Table 2, through modification, Cronbach's alpha improved to a good level of internal

consistency for all modified subscales with a value of 0.76 for the whole modified scale. Before modification, the convergent and discriminant validities of some subscales were not adequate (indicated values in Table 2). However, after modification, convergent and discriminant validities were confirmed for all the subscales, and thus, the validity of the modified SL-ASIA was confirmed.

3.2. Validating the Orthogonal SL-ASIA

The results of the CFA did not support the orthogonal SL-ASIA model (Figure 3), and the model showed a poor fit (χ^2 = 137.804, P < 0.0001, RMSEA = 0.343). Through model specification, the goodness of fit improved by replacing the item belief in ethnic value with fit with the Australian community and vice versa. Therefore, two subscales of value and behavioral competency were changed to two new ones as ethnic identification and non-ethnic identification. Following these modifications, model fit indices reached satisfactory levels; however, subsequent validity analyses indicated that the self-identity subscale was not valid, and thus this subscale was removed. This resulted in an improved model, comprised of two factors and four items (Figure 4) with a good fit. Table 3 shows the model fit indices before and after the model improvement.

As shown in Table 4, before modification, the reliability, and convergent and discriminant validities of the subscales were poor. However, following the model specification and scale validation, the orthogonal SL-ASIA presented satisfactory reliability and validity. Through modification, the reliability of the whole orthogonal scale increased from 0.44 to 0.67.

3.3. Examining the Agreement Between the Linear and Orthogonal Approaches to Measure Acculturation

In the first step, the validated scales were scored using both linear and orthogonal models. The responses to the items of the validated linear scale were summed and then divided by the number of items to form the overall acculturation score. The scores ranged from 1 (low acculturation) to 5 (high acculturation). Then, the validated orthogonal SL-ASIA was employed to classify the study participants into four acculturation categories as assimilation, integration, separation, and marginalization. For this purpose, first, the study subjects were classified based on the level of being ethnic-identified and Australian-identified. The mean scores of the items belief in ethnic value and fit with an ethnic community were used to categorize participants as low ethnic identified or high ethnic identified. Similarly, the mean scores of the items belief in Australian value and fit with the Australian community were
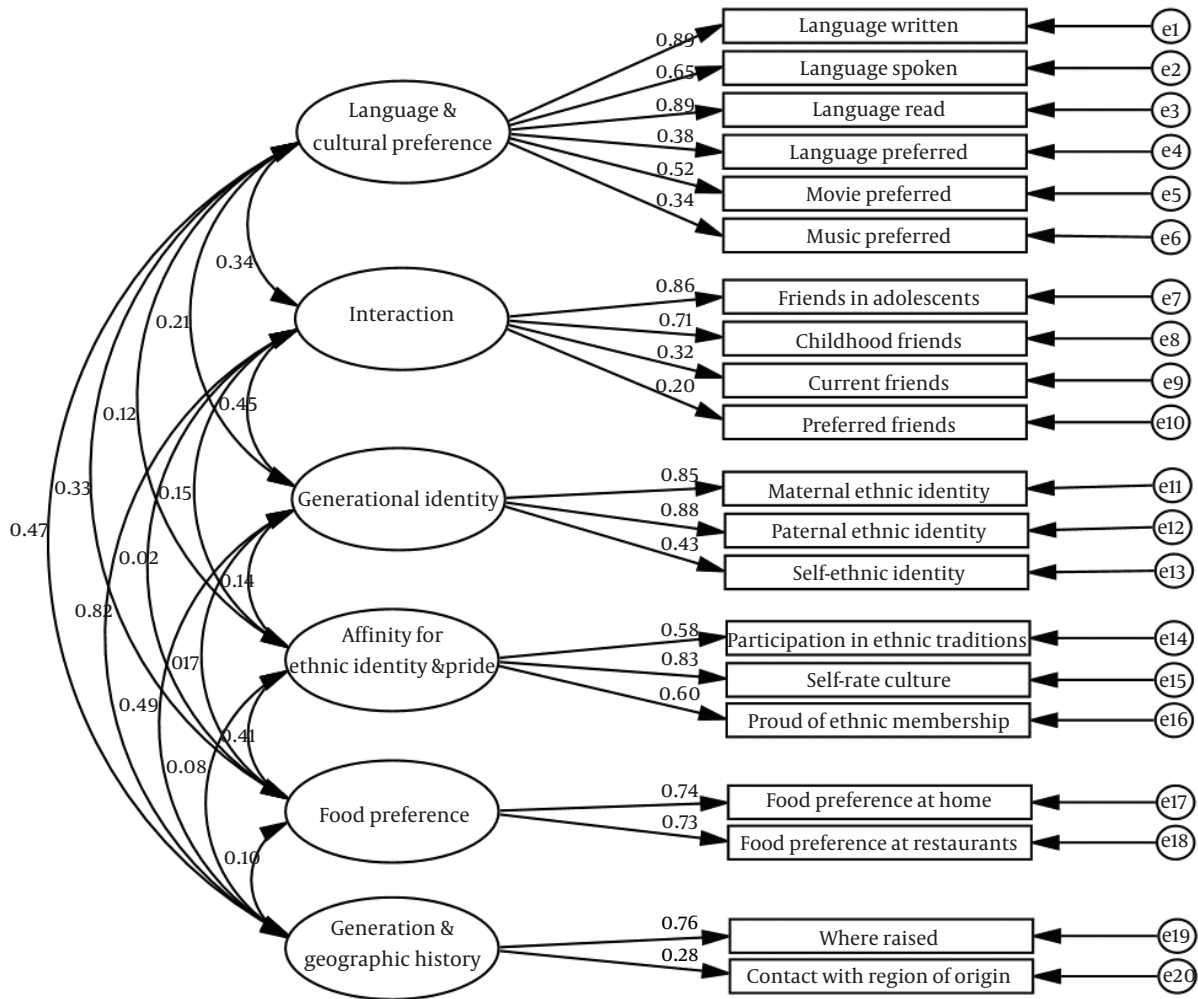
Figure 1. Factor structure of the original SL-ASIA

Table 2. Reliability, Convergent, and Discriminant Validity Coefficients for SL-ASIA Before and After Modification[a]

Name of Subscales	Before Fitness					After Fitness				
	α	CR	AVE	MSV	ASV	α	CR	AVE	MSV	ASV
Language/cultural preference	0.785	0.795	0.422[b]	0.219	0.101	0.798	0.870	0.632	0.106	0.066
Interaction	0.612	0.625[b]	0.346[b]	0.676[b]	0.204	0.773	0.831	0.622	0.264	0.097
Generational identity	0.718	0.854	0.664	0.241	0.107	0.718	0.857	0.668	0.264	0.089
Ethnic identity and pride	0.701	0.811	0.590	0.167	0.045	0.701	0.820	0.605	0.170	0.054
Food preference	0.712	0.745	0.594	0.167	0.063	0.712	0.764	0.619	0.170	0.077
Generation/geographic history[c]	0.232	0.448	0.330	0.676	0.230	-	-	-	-	-

[a] α > 0.7 represents good reliability and > 0.5 acceptable reliability; convergent validity = average variance extracted (AVE) > 0.5 and composite reliability (CR) > 0.7; discriminant validity = average variance extracted (AVE) > maximum shared squared variance (MSV) and average variance extracted (AVE) > average variance extracted (ASV).
[b] Values are below the acceptable level.
[c] Removed subscales after model fit.

used to classify participants as low Australian identified or high Australian identified. Next, different combinations of

the participants' level of being ethnic-identified and Australian identified were used to classify them as assimilated,
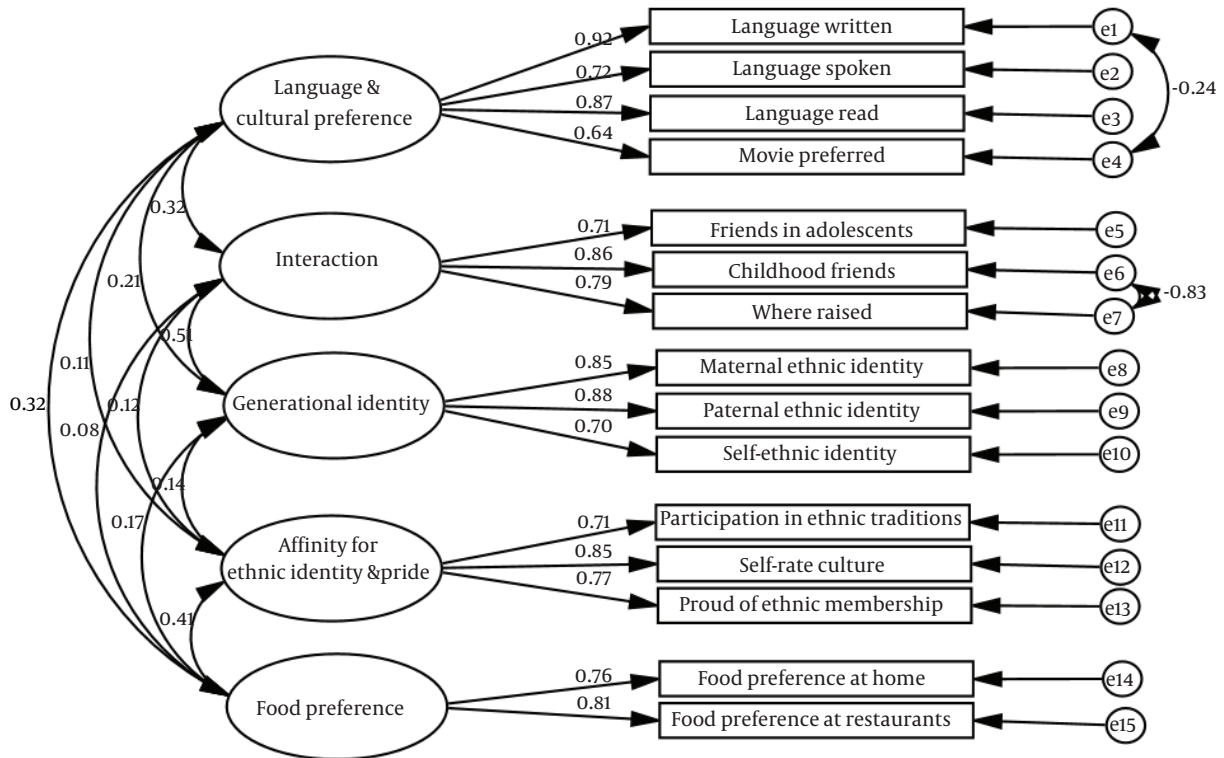
Figure 2. Standardized regression weights for the validated original SL-ASIA
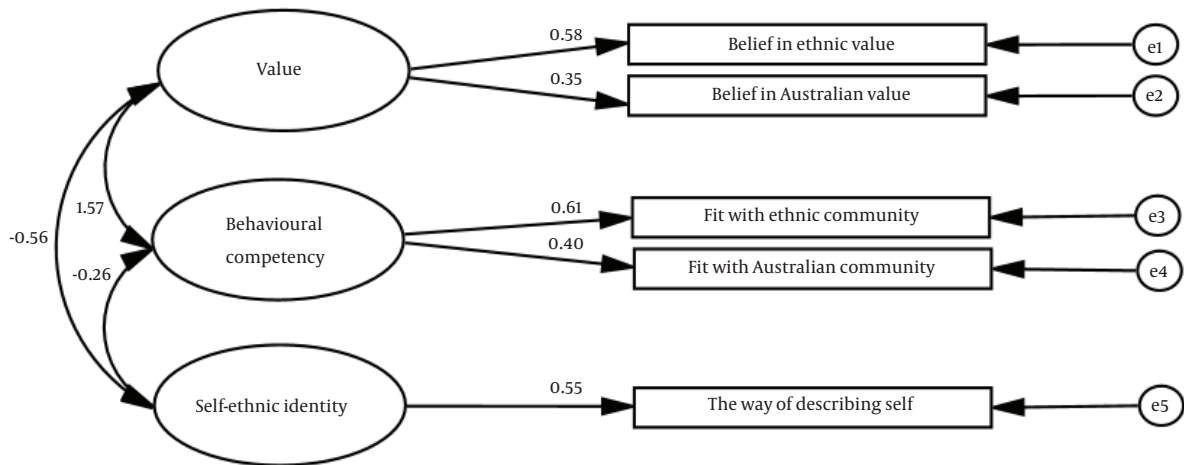

Figure 3. Factor structure of the short-form SL-ASIA

integrated, separated, or marginalized. Subjects were classified as assimilated if they were low ethnic identified and high Australian identified, as integrated if they were high ethnic identified and high Australian identified, as separated if they were high ethnic identified and low Australian identified, and as marginalized if they were low ethnic
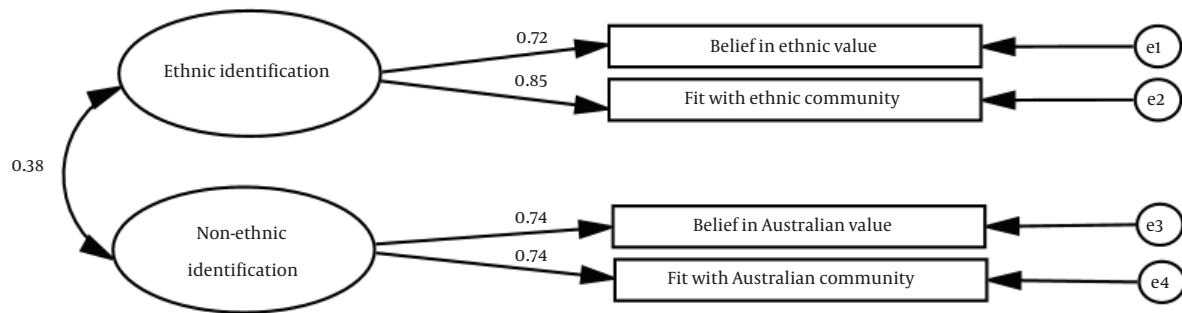
Figure 4. Standardized regression weights for the validated short-form SL-ASIA

Table 3. Goodness of Fit Indices for the Orthogonal SL-ASIA Before and After Fitness[a]

Measure	Before Fitness	After Fitness
χ^2/df	45.935[b]	0.147
RMSEA	0.343[b]	0
PCLOSE	0.037[b]	0.091
CFI	0.659[b]	1
TLI	-0.138[b]	1.015
PCFI	0.198[b]	0.167
IFI	0.665[b]	1.002
NFI	0.660[b]	1
SRMR	0.1344[b]	0.0027

[a]Chi-square to degree of freedom ratio (χ^2/df) (values $\leq$ 3 indicate a good fit and $\leq$ 5 indicate a permissible fit); root mean square error of approximation (RMSEA) (values $\leq$ 0.05 indicate a good fit and $\leq$ 0.08 indicate an adequate fit); PCLOSE (values > 0.05 indicate a good fit); comparative fit Index (CFI) (values $\geq$ 0.95 indicate a good fit and $\geq$ 0.9 indicate an acceptable fit); Tucker Lewis index (TLI) (values $\geq$ 0.95 indicate a good fit and $\geq$ 0.9 indicate an acceptable fit); parsimony adjustment to the CFI (PCFI) (values $\geq$ 0.5 indicate a good fit); incremental fit index (IFI) (values $\geq$ 0.95 indicate a good fit and $\geq$ 0.9 indicate an acceptable fit); normal fit index (NFI) (values $\geq$ 0.95 indicate a good fit and $\geq$ 0.9 indicate an acceptable fit); and standardized root mean square residual (SRMR) (values $\leq$ 0.05 indicate a good fit and $\leq$ 0.1 indicate an acceptable fit).
[b]Values are below the acceptable level.

identified and low Australian identified.

In the second step, the comparison of the classifications achieved by the linear and orthogonal methods showed a satisfactory Kappa value of 0.817, indicating a high level of consistency between the two scales (48). It was the highest agreement observed between the two approaches after assessing the estimated Kappa coefficients. Through this method, using a linear method scored based on a five-point Likert scale (from 1 as low acculturation to 5 as high acculturation) and an orthogonal method scored based on a four-point Likert scale (i.e., 1, marginalization;

2, assimilation; 3, separation; and 4, integration), 12 (4×3) possible (2×2) tables were constructed using all possible cutoff points, and thus 12 possible Kappa coefficients were calculated. Table 5 presents the final selected cutoff points at which the highest Kappa coefficient, indicating the highest agreement, was achieved, and the cross-tabulations were calculated by the linear and orthogonal methods of measuring acculturation using the cutoff points (47).

4. Discussion

The current study aimed at validating the linear and orthogonal SL-ASIA for the first-generation young adult ME migrants and also evaluating the agreement between the linear and orthogonal approaches to measure acculturation using the validated scales.

4.1. Structure of the (Sub) Scales
4.1.1. Validated Linear SL-ASIA

Through the validation process, two items preferred music and preferred language were deleted from the language and cultural preferences subscale. Based on the literature, musical preferences form in early adolescence and become entrenched and stable during later adolescence and young adulthood (49). Since all participants in the current study were young adults, their musical preferences were likely to be fully developed; therefore, the other four changeable items, including spoken language, written language, read language, and preferred movies, were more relevant to the language and cultural preferences subscale, compared to the item preferred musics. The deletion of the item preferred language to achieve the model fit showed that the language and cultural preferences subscale is better inferred from actual language skills rather

Table 4. Reliability, Convergent, and Discriminant Validity Coefficients for SL-ASIA Before and After Modification[a]

Name of Subscale	Before Fitness					Name of Subscale	After Fitness				
	α	CR	AVE	MSV	ASV		α	CR	AVE	MSV	ASV
Value	0.340[b]	0.36[b]	0.23[b]	2.46[b]	1.38[b]	Ethnic identity	0.754	0.76	0.62	0.14	0.14
Behavioral competency	0.389[b]	0.41[b]	0.26[b]	2.46[b]	1.26[b]	Non-ethnic identity	0.708	0.71	0.55	0.14	0.14
Self-identity[c]	.[d]	0.31[b]	0.31[b]	0.31[b]	0.19	-	-	-	-	-	-

[a] α > 0.7 represents good reliability and > 0.5 represents acceptable reliability; convergent validity = average variance extracted (AVE) > 0.5 and composite reliability (CR) > 0.7; discriminant validity = average variance extracted (AVE) > maximum shared squared variance (MSV) and average variance extracted (AVE) > average variance extracted (ASV).
[b] Values are below the acceptable level.
[c] Removed subscale after model fit.
[d] Cronbach's alpha is not applicable, as it measures the internal consistency between the items.

Table 5. Cross Tabulations Combining the Linear and Orthogonal Approaches to Measure Acculturation Using SL-ASIA

Linear Method[a]	Orthogonal Method[b]		Total	Kappa	P Value
	Low Acculturation	High Acculturation			
Low acculturation	255	13	268		
High acculturation	16	98	114	0.817	0.000
Total	271	111	382		

[a] Applying final linear scores, subjects were classified using cutoff point of 1 for low acculturation and cutoff points of 2 to 5 for high acculturation.
[b] Applying final orthogonal scores, subjects were classified using cutoff points of 1 and 2 for low acculturation and cutoff points of 3 and 4 for high acculturation (47).

than language preferences. Moreover, after modification, two items, ethnic origin of current friends and ethnic origin of preferred friends, were removed from the interaction subscale and two other items ethnic origin of childhood friends and ethnic origin of friends in adolescence were determined as being related to the interaction subscale of acculturation, and thus remained. Also, the item where raised was moved from the subscale generation to the subscale interaction. In fact, since all participants in the current study were first-generation migrants, the ethnic origin of their friends during childhood and adolescence could not correspond with those of the ones they currently associate with or those of the ones they prefer to associate with them in the community, but were more consistent with where they grew up. Through model specification, the item contact with the country of birth was removed from generation and geographic history subscale. It was in line with the results of two original principal component analyses by Suinn et al. (12) and Ownbey and Horridge (17), which revealed that removing this item contributed to a better model fit.

As a result, five factors, including language and cultural preferences, interaction, generational identity, food preferences, and affinity for ethnic identity and pride, remained in the final model. These results were consistent with those of the studies by Suinn et al. (12) and Ownbey and Horridge (17) on Asian-American participants, and those of the study by Suinn et al. (20), on Asians living in Singapore, which identified reading/writing/cultural pref-

erences, ethnic interaction, an affinity for ethnic identity and pride, generational identity, and food preferences as interpretable factors of SL-ASIA using PCA. They were also in line with the results of the CFA by Abe-Kim et al. (21), which revealed a factor structure similar to the one determined by Suinn et al. (12). In contrast, in the PCA conducted by Kodama and Canetto (18) on Japanese students in the US, written language and spoken language were identified as two separate factors along with four other factors ethnicity of friends up to the age of 18, ethnic identity, ethnic involvement and pride, and food preferences. However, the small sample size in their study (n = 62) cast doubt on any conclusion.

In the current study, five items were omitted from the initial SL-ASIA model. It was inconsistent with some previous research proposing these items as indicators of acculturation (12, 17, 18, 20, 21). Three possible explanations are offered for this discrepancy. First, most of the previous works, including the studies by Suinn et al. (12, 20), Ownbey and Horridge (17), and Kodama and Canetto (18), used PCA as the data analysis method. PCA has some drawbacks compared to the CFA applied in the current study. The main purpose of PCA is data reduction, which summarizes many variables into a smaller number of components. In the PCA, the existence of hypothetical underlying factors is not essential, and a component is simply a combination of correlated variables. However, CFA aims at explaining the correlation between variables and finding a factor model that reproduces the observed correla-

tion in the best way. Thus, CFA provides a more accurate result compared to PCA (19). Second, while the construct validity of the SL-ASIA is established in the literature using PCA (12, 17, 18, 20) or factor analysis (21), in the current study, it was further investigated using convergent and discriminant validities. Therefore, the deletion of some items in the current study was to achieve convergent and discriminant validities, although prior to removing these items, an acceptable level of some model fit indices had been achieved. Third, the current study was the 1st among first-generation young adult ME migrants. This could explain some differences observed between the findings of the current research and similar studies focusing on different Asian populations, generations, and age groups (12, 17, 18, 20, 21).

The psychometric properties of the validated 20-item linear SL-ASIA and its four subscales were assessed. Overall, it was observed that the modified linear SL-ASIA had satisfactory validity and reliability measures. The reliability coefficient of the whole scale was 0.76. It was consistent with the results of a review on the reliability of the linear SL-ASIA, reporting coefficient alphas in the satisfactory to good range, and variations from 0.62 to 0.97 (2).

4.1.2. Validated Orthogonal SL-ASIA

Following the validation of the orthogonal SL-ASIA, two subscales value and behavioral competency needed to be modified by substituting two new subscales named ethnic identification and non-ethnic identification. This happened as a result of replacing the item belief in ethnic value with the item fit with the Australian community and vice versa. These replacements indicated that participants' beliefs in the values of a single culture (ethnic or Australian) and their fit with the community related to that culture had high intercorrelations with each other. In contrast, the relationship between belief in the values of ethnic culture and belief in the values of Australian culture was low. Also, the association between fitting with ethnic communities and fitting with Australian communities was low. The item the way of describing self was removed from the model since it was not a valid measurement for the self-ethnic identity subscale.

The modified orthogonal SL-ASIA and its two subscales had high reliability and validity coefficients. To the best of authors' knowledge, the current study was the first to examine the reliability and validity of the orthogonal SL-ASIA (15).

4.2. The Agreement Between the Linear and Orthogonal Approaches to Measure Acculturation

The current study results showed a high level of Kappa agreement (Kappa = 0.817; $P \leq 0.0001$) between the linear and orthogonal models of acculturation using SL-ASIA, which was inconsistent with a study conducted by Dao et al. (6), on Asian-American men measuring the consistency of the SL-ASIA in characterizing the level of acculturation using the orthogonal versus the linear approaches. In that study, the classification obtained from the total scores of the original 21-item linear SL-ASIA was compared with the categorization derived from each value and behavioral competency subscales of the original five-item orthogonal SL-ASIA. The obtained results showed, low Kappa agreement coefficients for different ethnic Asian groups, ranging from 0.069 to 0.213 and from 0.137 to 0.320, for the value and the behavioral competency items, respectively. Based on the observed discrepancies of classification, Dao et al. (6), concluded that the employment of a linear method of acculturation may lead to identifying subjects that are characteristically different from the ones selected using an orthogonal method of acculturation. However, in the current study, the strong level of agreement between the validated linear and orthogonal SL-ASIA confirmed that the employment of either scale can lead to similar research outcomes. Thus, since the conceptualization of acculturation developed considerably in the past few decades, this research could fill the gap found in previous studies regarding the use of SL-ASIA as a valid scale to assess acculturation using both linear and orthogonal approaches.

4.3. Strength and Limitations

To the best of authors' knowledge, it was the first study to validate both the linear 21-item and the orthogonal five-item SL-ASIA using the CFA technique and examine their convergent and discriminant validities. It was also the initial study examining the psychometric properties of the SL-ASIA in Australia, and the first one to validate the acculturation scale for ME migrants worldwide. The research had several limitations. First, the employment of the non-probability convenience sampling method could result in some selection bias and the study may thus not be regarded as representative for young adult ME migrants (50). Second, the measures used in the study were self-reported, which may cause a response bias in the results. Third, although the sample size was large enough to support the analyses and ensure adequate statistical power, the low response rate was a limitation to the study, which resulted in a difficult and time-consuming data collection procedure.

4.4. Conclusions

The current study aimed at validating the 26-item SL-ASIA and also exploring the agreement between the outcomes of the linear and orthogonal approaches of acculturation using SL-ASIA. The study findings suggested that both the modified linear and orthogonal SL-ASIA were valid instruments to evaluate acculturation. It was further supported by the strong level of agreement between the linear and orthogonal approaches of acculturation. The high level of consistency between the validated linear and orthogonal SL-ASIA showed that the use of either scale can lead to similar research outcomes. Future research is recommended to investigate the validity of the linear and orthogonal SL-ASIA in other countries and among other Asian migrants with different age groups and generations.

Footnotes

Authors' Contribution: Study concept and design: Neda Hashemi and Neil Harris. Analysis and interpretation of data: Neda Hashemi, Maryam Marzban, and Bernadette Sebar. Drafting of the manuscript: Neda Hashemi. Critical revision of the manuscript for important intellectual content: Neda Hashemi, Maryam Marzban, Bernadette Sebar, and Neil Harris. Statistical analysis: Neda Hashemi and Maryam Marzban.

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