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Measurement Equivalence of Ethnic Identity across Four Ethnic Groups

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Doctoral Dissertation

### **Abstract**

Ethnic identity concerns one's identification with a group having similar cultural values, language, and traditions. The conceptualization and measurement of ethnic identity has varied greatly since 1970, when it first gained attention in research. In response to psychometric issues and limited generalizability of existing ethnic identity measures, the Multigroup Ethnic Identity Measure was developed (Phinney, 1992) and then revised as the Multigroup Ethnic Identity Measure – Revised (MEIM-R; Phinney & Ong, 2007). Despite the common use of this multigroup measure to assess ethnic identity in diverse samples, there have been few efforts to assess the measurement equivalence. To date, studies of measurement invariance of the MEIM-R have been limited by small and/or narrow samples. The present study evaluated factor structure, measurement invariance, convergent validity, and criterion validity of the MEIM-R. With a sample of 1074 emerging adults, there was evidence for measurement invariance at the configural level. When considering measurement invariance at the level of factor loadings and intercepts, there was inconsistent evidence for invariance between pairs of ethnic groups. There was evidence for construct validity, though correlations were moderate. Overall, we recommend continued caution when making conclusions regarding differences between groups when using the MEIM-R.

### Measurement Equivalence of Ethnic Identity across Four Ethnic Groups

As part of a multistage psychosocial identity theory, Erik Erikson theorized identity formation as a developmental process that occurs in stages and gains prominence in adolescence and early adulthood. Adolescents and emerging adults are challenged with integrating their schemas, sociocultural contexts, and personal experiences into a stable identity. Multiple domains of identity have subsequently been examined by researchers, including occupational, political, and religious identities (see review by Kroger & Marcia, 2011). More recently, ethnic identity has been added to this list and explored as an important component of identity development (Phinney, 1992).

Ethnic identity is conceptualized as one segment of an individual's overall identity. Its definition has evolved from a simple ethnic group label (e.g., African American) to a complex process of reconciling one's identification with an ethnic group with other aspects of the individual's identity. It is typically defined as one's identification with a group, which shares similar cultural values, language, and traditions (Helms, 2007).

From a developmental perspective, it is theorized that there are three stages of ethnic identity: *exploration*, *resolution*, and *affirmation* (Umaña-Taylor, 2011). The first two components are based on Erikson (1968) and Marcia's (1966) developmental theories of identity development. *Exploration* involves learning about the ethnic group. *Resolution* refers to integrating knowledge about that group with the individual's own values and beliefs. The third stage, *affirmation*, is derived from social identity theory (Tajfel, 1981) and concerns the positive or negative feelings about one's ethnic group. A person's experience with these components can vary in salience; individuals within the same ethnic group may have different degrees of immersion or conscientious engagement in each stage (Umaña-Taylor, 2011). Though not

necessarily with these specific labels (i.e., *exploration, resolution, affirmation*), measures of ethnic identity typically include items assessing exposure to information about an ethnic group and the degree of internalization of those messages.

Before discussing ethnic identity further, it is important to distinguish ethnic identity from racial identity. The terms “ethnic identity” and “racial identity” are often conflated. Multicultural psychology researchers regard these two terms as indicative of unique aspects of identity (e.g., Cokley, 2007; Helms, 2007). Ethnic identity refers to a sense of membership to an ethnic group, which involves self-labeling and identification with that group. On the other hand, racial identity refers to the collective identity of a group that has been socialized to identify itself as a single group. For example, “Afro-Latino” and “African-American” are ethnic identities, whereas “Black” is a racial identity. In other words, ethnic identity is self-imposed and self-identified, whereas racial identity is externally imposed by social and political ideology (Cokley, 2007).

As a social-developmental process, ethnic identity develops, in part, as a result of socialization. Ethnic socialization is the transmission of cultural messages, which inform one’s experience and beliefs as a member of an ethnic group (Huguley, Wang, Vasquez, & Guo, 2019). Ethnic socialization is typically thought of as largely occurring within the parent-child dyad and involves multiple practices, including explicitly teaching children about their ethnic culture/identity or preparing them for ethnic discrimination (Hughes et al., 2006). One of the reasons parents engage in ethnic socialization is in an effort to strengthen the child’s ethnic identity, which is thought to enhance their resiliency (Hughes et al., 2006).

Having a strong ethnic identity serves a protective function for psychosocial functioning. Numerous studies have reported a positive relation between strong ethnic identity and self-

esteem, self-efficacy, and general quality of life (e.g., Bracey, Bamaca-Gomez, & Umaña-Taylor, 2004; French & Chavez, 2010; Rivas-Drake et al., 2011; Schwartz, Zamboanga, & Jarvis, 2007; Smith & Silva, 2011). It is also associated with academic achievement and adjustment (e.g., Altschul, Oyserman & Bybee, 2006).

A strong ethnic identity is also associated with fewer adjustment difficulties, including depressive symptoms and externalizing behavior problems. Ethnic identity is related to fewer depressive symptoms in at least seven studies (e.g., Gaylord-Harden, Ragsdale, Mandara, Richards & Peterson, 2007; Juang, Nguyen & Lin, 2006; McHale, Whiteman, Kim & Crouter, 2007; Yasui, Dorham, & Dishion, 2004). Additionally, a strong ethnic identity is predictive of lower levels of delinquency (French, Kim, & Pillado, 2006), aggression (Austin, 2004; McMahon & Watts, 2002), and drug use (Marsiglia, Kulis, & Hecht, 2001; Marsiglia, Kulis, Hecht & Sills, 2004).

As described above, ethnic identity has frequently been associated with positive psychosocial adjustment. Many of these studies have examined ethnic identity by combining multiple ethnic minority groups into a single subsample. However, when researchers have examined individual ethnic groups more specifically, inconsistencies in the results emerge (Umaña-Taylor, 2011). For example, three studies indicated that strong ethnic identity predicts *increased* maladjustment in Asian American samples (Go & Le, 2005; Hishinuma et al., 2005; Yuen, Nahulu, Hishinuma, & Miyamoto, 2000) and in at least one Hispanic American sample (e.g., McCoy & Major, 2003). In two studies, ethnic identity was positively related to alcohol and substance use in adolescents and college students (Zamboanga, Raffaelli, & Horton, 2006; Zamboanga, Schwartz, Jarvis, & Van Tyne, 2009). These results provide some evidence that ethnic identity may function differently in specific ethnic groups or sub-groups; however, prior

to drawing such a conclusion, it is imperative to critically examine current measurement practices.

As indicated above, one problem in the field has been the conflation of ethnic and racial identity. The conflation of these terms leads to troublesome interpretation and measurement practices. Measures of racial and ethnic identity have been used interchangeably; a measure of racial identity may be used to draw conclusions about ethnic identity and/or applied to other groups without validation. For example, the Multidimensional Inventory of Black Identity (Sellers, 1997), a measure of racial identity, has been used as an indicator of ethnic identity and adapted for use with other ethnic groups (e.g., French & Chavez, 2010). Whether the racial identity measure adequately assesses ethnic identity remains unclear, though using these measures interchangeably is inconsistent with theoretical frameworks.

Another challenge with current measurement practices is the use of single-group measures. Single-group measures of ethnic identity are limited in generalizability, and undermine theoretical frameworks that suggest ethnic identity is a universal component of identity development. For example, there are single-group measures of Asian (Asian Values Scale; Kim et al., 1999) and Latino identities (Multidimensional Measure of Cultural Identity Scales for Latinos; Felix-Ortiz, Newcomb, & Myers, 1994). These measures are based on identifying key components within a particular group, such as language or specific customs. These instruments aim to identify and evaluate culture-specific values and attributes for particular groups; however, they are often used as indicators of universal ethnic identity. To remedy the limitations of single-group measures, multigroup measures have been created to allow for better comparison across groups and across studies (e.g., Scale of Ethnic Experiences,

Malcarne, Chavira, Fernandez, & Liu, 2010; Multigroup Ethnic Identity Measure, Phinney, 1992; Ethnic Identity Scale, Umaña-Taylor et al., 2004).

Perhaps the most commonly used measure of ethnic identity is the Multigroup Ethnic Identity Measure (MEIM; Phinney, 1992). The popularity of the MEIM can be documented by a search in the PsycINFO database. A total of 730 peer-reviewed journal articles including the MEIM appeared between 1992 and 2017. In contrast, a similar search for peer-reviewed articles using the Ethnic Identity Scale (Umaña-Taylor et al., 2004) came up with only 166 articles.

The MEIM is one of the first measures to assess identity constructs across ethnic groups (Helms, 2007; Phinney, 1992). Its multigroup structure is based on Erikson's (1968) developmental theory and posits that all human beings have an ethnic identity. As such, the same items should be utilized to assess ethnic identity across multiple ethnic groups. Phinney (1992) acknowledged that group-specific historical, linguistic, and cultural factors are important to consider, but distinct from ethnic identity and should be captured in measures of culture/acculturation.

The original MEIM is composed of 14 items assessing three aspects of ethnic identity: *ethnic identity achievement*; *affirmation and belonging*; and *ethnic behaviors*. *Ethnic identity achievement* is based on Erikson's identity achievement model and assesses the extent to which someone has explored, understood, and committed to their ethnic identity. *Affirmation and belonging* is the extent to which someone feels positively about their ethnic group identification. *Ethnic behaviors* assesses the extent of interaction with group-members and participation in activities or traditions. In the original publication, overall reliability ranged from Cronbach's alphas .81 to .90 among samples. Subscale reliability ranged from .69 to .86. Phinney (1992)



described the scale as “consisting of three interrelated components” (p. 167); however, exploratory factor analyses indicated a single factor structure.

Since the original publication of the MEIM, there have been several psychometric evaluations and adaptations of the measures. One of those evaluations recommended removing the *ethnic behavior* component, made up of only 2 items (Roberts et al., 1999), on the basis of exploratory factor analysis. The reduced 12-item MEIM was subsequently validated with multiple age ranges and nationalities (Dandy, Durkin, McEvoy, Barber, & Houghton, 2008; Kazarian & Boyadjian 2008). It was also validated for mono-racial and bi-racial samples (Lee & Yoo, 2004; Spencer, Icard, Harachi, Catalano, & Oxford, 2000; Worrell, 2000; Yasui, Dorham, & Dishion, 2004). Internal consistency and reliability were evidently strong for the reduced MEIM (e.g., Lee & Yoo, 2004; Roberts et al., 1999; Worrell, 2000; Yasui, Dorham, & Dishion, 2004).

Despite the psychometric evidence for the reliability of the shortened MEIM (Roberts et al., 1999), subsequent studies conducting exploratory factor analyses have revealed an unstable factor structure (Cokley, 2007; Helms, 2007). In the original publication, factor analysis of the reduced measure suggested two factors and a global composite (*identity achievement & affirmation and belonging*; Roberts et al., 1999). Subsequent studies have yielded mixed support for this structure. Some studies have supported the two-factor structure (Worrell, 2000; Yasui, Dorham, & Dishion, 2004; Yip & Fuligni, 2002), whereas others have found evidence for three factors (*cognitive clarity, affective pride, & behavioral engagement*; Lee & Yoo, 2004). Researchers have also created two new factors using different item groupings than the original (*behavioral exploration & identification/belonging*; Spencer et al., 2000).

As a consequence of the unstable factor structure of the MEIM across studies, researchers have modified the measure for their individual samples (e.g., Spencer et al., 2000). These modifications lead to a nonstandard scale with varying number of items, scales, and items per scale. Adaptations have varied to such an extent that studies using the MEIM have a range of 10 to 24 items with 1 to 5 scales (Helms, 2007). This situation has resulted in a measure that only loosely resembles the original MEIM or the reduced MEIM and prevents generalizing conclusions across studies. Essentially, the measure became unstandardized and replicated the problem that inspired its initial creation: the difficulty of interpreting ethnic identity studies due to the multiple conceptualizations and adaptations of measures.

In response to the psychometric issues of the MEIM, a revision was published in 2007; the Multigroup Ethnic Identity Measure – Revised (Phinney & Ong, 2007). Eight items from the original MEIM were removed and the remaining items were reworded as a result of interviews and focus groups. Based on a sample of 192 university students (70% Latino, 20% Asian American, 5% European American, 3% African American), a two-factor solution was supported. The first factor, *exploration*, indicates effort to learn about and participate in an individual's ethnic heritage. The second factor, *commitment*, indicates positively valenced attitudes and attachment to one's ethnic group. These terms are consistent with the components of identity formation originally described by Erikson (Erikson, 1994).

Relative to the MEIM, there is substantially less evidence regarding the psychometric properties of the MEIM-R. Herrington and colleagues examined the reliability of the MEIM-R (Herrington, Smith, Feinauer, & Griner, 2016). They found that across 37 samples, the MEIM-R had an average Cronbach's alpha of .84, which was a statistically significant increase compared to the MEIM (Cronbach's alpha = .81; Herrington et al., 2016). Additional studies have also

reported support for internal consistency (e.g., Chakawa, Butler, & Shapiro, 2015; Grindal & Nieri, 2015; Homma, Zumbo, Saewyc, & Wong, 2014; Yoon, 2011). In regards to the factor structure, at least four studies have supported a two-factor structure after completing confirmatory factor analyses (Brown et al., 2014; Chakawa, Butler, & Shapiro, 2015; Homma, Zumbo, Saewyc, & Wong, 2014; Yoon, 2011).

A key psychometric question is measurement invariance of the MEIM-R. Measurement invariance assesses the psychometric equivalence of a construct across groups. The presence of measurement invariance indicates that a construct, such as ethnic identity, has the same meaning across ethnic groups (Glanville & Wildhagen, 2007). Measurement invariance has important implications for the interpretation of group differences. If there is evidence of measurement invariance, observed differences can be attributed to a true difference in the underlying construct. On the other hand, measurement non-invariance indicates that group differences may instead be attributable to different relations between the latent construct, its scales, and/or individual items.

To date, there are two publications assessing measurement invariance across ethnic groups in the MEIM-R. Yoon (2011) found differences in factor loadings and interfactor correlations between European Americans and ethnic minorities, indicating, measurement non-invariance. The study included a relatively small sample size ( $N = 289$ ) and combined all ethnic minorities into a single group (Yoon, 2011). In contrast, the second study demonstrated preliminary evidence of measurement invariance across five ethnic groups (Brown et al., 2014). The sample was large ( $N = 1643$ ), but only included pregnant women with a current diagnosis of gestational diabetes. Given this limited and discrepant evidence for measurement invariance of the MEIM-R, it remains unclear whether the instrument is appropriate for use in diverse samples.

The present study aims to generate more psychometric evidence for the MEIM-R in a diverse sample of emerging adults. Emerging adults are selected, because ethnic identity is thought to be a developmental task primarily emerging in adolescence and emerging adulthood (Phinney, 2006; Syed & Azmitia, 2008). The first part of the study evaluates the factor structure of the measure, and then measurement equivalence across ethnic groups. Phinney and Ong's (2007) proposed two-factor model is tested using confirmatory factor analysis. As recommended in the literature, measurement invariance is evaluated in order to test whether the MEIM-R fulfills its aim in measuring ethnic identity equivalently across diverse groups (Byrne & Campbell, 1999; Cokley, 2007; Helms, 2007).

The second part of the study concerns convergent and criterion validity of the MEIM-R. To assess convergent validity of the MEIM-R, its correlation with another ethnic identity scale (Scale of Ethnic Experiences; Malcarne, Chavira, Fernandez, & Liu, 2006) is assessed. Given the two instruments are intended to measure the same construct, the measures should be highly correlated. Self-esteem and ethnic socialization are included as indicators of criterion validity. As described above, ethnic identity is related to higher self-esteem (e.g., Fisher, Zapolski, Sheehan, & Barnes-Najor, 2017; Phinney, 1991; Phinney & Chavira, 1992; Smokowski, Evans, Cotter, & Webber, 2013; Xu, Farver, & Pauker, 2014). In line with this evidence, it is predicted that ethnic identity (i.e., MEIM-R) will be positively associated with self-esteem. In addition, ethnic socialization is evidenced as a positive predictor of ethnic identity (e.g., Dawson & Quiros; Harrell, 2000; Hughes et al., 2006). Thus, it is predicted that socialization practices will be positively related to ethnic identity.

## Method

### Participants

In total, 1617 emerging adults consented to participate in the study. Respondents were excluded if they were not enrolled at one of the six north Texas universities targeted in recruitment ( $n = 3$ ), were not between 18 to 25 years old ( $n = 10$ ), only completed the demographic questionnaire ( $n = 401$ ), or provided invalid data (e.g., gender = “toaster”;  $n = 2$ ). The reduced sample included 1243 students. Based on the original MEIM-R design, only students that identified as African American, Latino American, Asian American, and European American were included in the analyses ( $N = 1074$ ).

Demographic information for the sample is provided in Table 1. Regarding ethnic group identity, 20.1% students identified as Asian American, 21.8% as African American, 32.3% as Latino American, and 25.9% as European American. Most students were female (72.4%), with 27.1% male and .5% transgender or other gender. The average age was 20.04 years ( $SD = 1.74$ ). Most students were in their first four years of undergraduate education (93.8%), 3.8% in their fifth year or higher, and 2.3% graduate students. Family income was evenly distributed (Table 1).

**Sites.** Participants were recruited from five university/college campuses in the Dallas-Fort Worth metroplex. The majority of participants attended Southern Methodist University ( $n = 401$ ) and University of North Texas ( $n = 638$ ). In addition, participants were recruited from Paul Quinn College ( $n = 27$ ), University of Texas at Dallas ( $n = 4$ ), and University of Texas at Arlington ( $n = 4$ ). Attempts were made to recruit participants from Texas Women’s University, but the respondents did not meet inclusionary criteria.

## Measures

The present study included five measures. The first part of the study included a demographic questionnaire and the Multigroup Ethnic Identity Measure Revised (Phinney & Ong, 2007). The second part of the study utilized a second measure of ethnic identity and two measures intended to test criterion validity (i.e., socialization & self-esteem).

**Demographic Questionnaire.** Participants completed a 15-item demographic survey that assessed age, gender, sexual orientation, current year in school, income, ethnicity, nationality, immigration history, and family income.

**Multigroup Ethnic Identity Measure – Revised.** The Multigroup Ethnic Identity Measure Revised (MEIM-R; Phinney & Ong, 2007) is a revision of the Multigroup Ethnic Identity Measure (MEIM; Phinney 1992). It is a six-item measure of ethnic identity with two subscales: *exploration* and *commitment*. *Exploration* includes items describing an effort to learn about and participate in ethnic-cultural practices. An example of an *exploration* item is “I have often talked to other people in order to learn more about my ethnic group.” *Commitment* refers to items indicating positive affirmation of and attachment to one’s group. A representative item from the *commitment* subscale is “I feel a strong attachment towards my own ethnic group.” Items are rated on a four point Likert-type scale with 1 indicating *strongly disagree*, and 4 indicating *strongly disagree*. Psychometric evidence for the MEIM-R is summarized above.

**Rosenberg Self-Esteem Scale.** The Rosenberg Self-Esteem Scale (SES; Rosenberg, 1956) is a 10-item measure of an individual’s global self-worth and sense of value toward oneself. Item responses are on a four point Likert-type scale, ranging from *strongly disagree* (1) to *strongly agree* (4). Higher total scores reflect more positive evaluations of the self. An example of the items is “I feel that I have a number of good qualities.” The scale is one of the

most commonly used measures of self-esteem in adults. Reported reliabilities range from Cronbach's alpha of .77 to .88 for college samples and there is support for strong test-retest reliability (e.g., Butler & Gasson, 2005).

**Racism and Life Experience Scales.** The Racism and Life Experiences Scale (RaLES; Harrell, 1997, 2007) is a battery of 12 scales that assess racism-related stress. It was designed to be applicable to multiple racial/ethnic groups and is demonstrated to have good reliability (Bond et al., 2008; Kressin, Raymond, & Manze, 2008; Utsey, 1998).

*Racism-related Socialization Influences.* The Racism-related Socialization Influences scale is a supplemental scale of the RaLES. It assesses racial/ethnic socialization messages received from family members and other adults as well as the racial/ethnic composition of the responder's current and past social environments. There are nine items asking to what extent certain topics were discussed (e.g., "talk to you about how to cope with racism"). Items are rated on a five point Likert-type scale, ranging from *not at all* (0) to *extremely* (5). The last item concerns the ethnic/racial composition of various contexts (e.g., neighborhood, job).

**Scale of Ethnic Experiences.** The Scale of Ethnic Experiences (SEE; Malcarne, Chavira, Fernandez, & Liu, 2006) is a 32-item measure, which includes an *Ethnic Identity* scale. Items are rated on a five-point Likert-type scale from *strongly disagree* to *strongly agree*. The *Ethnic Identity* scale includes 12 items; such as, "my parents gave me a strong sense of cultural values." The measure was developed using a college sample, and studies indicate good internal consistency, adequate test-retest reliability, and a valid factor structure (Bastos, Celeste, Faerstein, & Barros, 2010; Cooper, Ziegler, Nelesen, & Dimsdale, 2009; Malcarne et al., 2006).

## **Procedure**

Participants were recruited from six universities in the Dallas-Fort Worth metroplex: Southern Methodist University; University of North Texas; Texas Women's University; University of Texas at Dallas; University of Texas at Arlington, and; Paul Quinn College. At Southern Methodist University and the University of North Texas, students were recruited through Sona Systems, which grants students credits for course assignments. At all of the universities, students were recruited via emails to student leaders of extracurricular organizations. Students recruited via organizations were entered into a drawing for a \$25 Amazon.com gift card, with 1 out of every 25 participants winning a gift card.

## **Analytic Approach**

Structural equation modeling was used to evaluate factor structure and measurement invariance across the four ethnic groups. A latent variable analysis package developed for R, "lavaan," was utilized for analyses (Rosseel, 2012). The two-factor (*exploration* and *commitment*) model proposed by Phinney and Ong (2007) was tested and compared to a single-factor model. Confirmatory factor analyses for the full sample and then for the individual ethnic groups were conducted. Then, measurement invariance was evaluated across all four ethnic groups using a sequence of nested models, starting with an unconstrained model and progressively adding constraints. Specifically, configural, metric, and scalar invariances were assessed. Model fit was tested using the Satorra-Bentler scaled mean-adjusted chi-square test (Satorra & Bentler, 2001). Given the chi-square test's sensitivity to sample size, additional fit indices were also reported. The Bentler Comparative Fit Index (CFI), in which a model fit is tested against a nested model, was examined (Bentler, 1990). In addition, the Root-Mean-Square Error of Approximation (RMSEA), a parsimony-adjusted index that, was assessed (Steiger &



Lind, 1980). Lastly, an absolute fit index, the Standardized Root-Mean-Square Residual (SRMR), was computed. Given well-documented (e.g., Fan & Sivo, 2005; Kline, 2011; Putnick & Bornstein, 2016) limitations of using standard cutoffs as indicators of fit, these fit indices were reported as qualitative information and thresholds of fit were not utilized (e.g., CFI > .9; Hu & Bentler, 1999). Given evidence of invariance at the scalar or metric levels across all four groups, partial invariance was then assessed by examining each pairwise combination of ethnic groups.

To assess convergent validity, a bivariate correlation was utilized to test the association between the MEIM-R (Phinney & Ong, 2007) and the ethnic identity scale of the Scale of Ethnic Experiences (Malcarne, Chavira, Fernandez, & Liu, 2006). Lastly, to test criterion validity of the MEIM-R, its relation with self-esteem and socialization was examined. A bivariate correlation was utilized to test the prediction that ethnic identity was positively associated with self-esteem. Similarly, the correlation socialization practices and ethnic identity was tested.

## **Results**

The aims of the present study were to generate psychometric evidence for the MEIM-R by examining its factor structure, measurement invariance, and convergent and criterion validity. First, preliminary analyses regarding the demographics of the multi-site sample are included below. Second, results of confirmatory factor analyses and measurement invariance models are described. Then, evidence for convergent and criterion validity is reported.

### **Preliminary Analyses**

One of the goals of the multi-site method was to increase demographic diversity in the study sample. Site-specific demographics for Southern Methodist University (SMU) and University of North Texas (UNT) are listed in Table 1. As anticipated, there were demographic differences between the SMU and UNT samples. Participants in the UNT ( $M = 20.16$  years,  $SD$

= 1.78) sample were significantly older than SMU students ( $M = 19.76$  years,  $SD = 1.59$ );  $t(1034) = 3.75, p < .001$ . Chi-square tests of independence were completed to compare gender, ethnicity, college year, and income at the two sites. There was not a significant gender difference between participants at the two universities,  $\chi^2(3) = 7.79, p = .05$ . However, there was a significant association between site and ethnic group, such that the SMU sample had a higher proportion of Asian-American (33.7%) and European-American (34.9%) students than UNT (12.4% and 21.3%, respectively),  $\chi^2(3) = 128.04, p < .001$ . Regarding income, the SMU sample had a higher proportion of students with high family income (i.e., \$120,000 or above) than UNT,  $\chi^2(7) = 257.11, p < .001$ . The SMU sample also had a higher proportion of first and second-year undergraduate students than UNT,  $\chi^2(5) = 37.83, p < .001$ .

Site differences in ethnic identity were also assessed. There was no significant difference between the SMU ( $M = 3.00, SD = .67$ ) and UNT ( $M = 2.97, SD = .71$ ) samples on the Multi-group Ethnic Identity Measure Revised (MEIM-R) overall scale;  $t(1037) = .67, p = .50$ , or the two subscales. Ratings on the *exploration* subscale did not differ significantly between sites ( $M_{SMU} = 2.92, SD = .77; M_{UNT} = 2.90, SD = .78$ ),  $t(1037) = .36, p = .72$ , nor did ratings on the *commitment* subscale ( $M_{SMU} = 3.09, SD = .71; M_{UNT} = 3.05, SD = .75$ ),  $t(1037) = .89, p = .38$ .

### **Confirmatory Factor Analysis**

Development of the MEIM-R, as well as subsequent studies, have posited that the instrument consists of two factors, *exploration* and *commitment*. To test this two-factor model, confirmatory factor analyses were completed for the overall sample, and then for each of the four individual ethnic groups.

**Two-Factor Model for the Overall Sample.** A two-factor model with three items loading on each factor was tested using confirmatory factor analysis (Figure 1). The two-factor

model provided good fit to the data, as indicated by good fit indices, CFI = .981, RMSEA = .1, SRMR = .03. Items loaded specifically onto their designated factors (Figure 1) and the two factors correlated significantly with each other, as expected. Reliability of the individual scales was good (*exploration*  $\alpha = .89$ , average inter-item correlation = .73; *commitment*  $\alpha = .88$ , average inter-item correlation = .71). The two-factor model fit the data significantly better than a single-factor model,  $\Delta\chi^2 = 583.94$ ,  $p < .001$ . Additional fit indices are listed in Table 2.

**Two-Factor Model for Individual Ethnic Groups.** Confirmatory factor analyses were completed to assess the fit of the two-factor model for each individual ethnic group. The ethnic groups were similar in their goodness of fit (Table 3). For the Asian American subgroup, CFI = .98, RMSEA = .11, SRMR = .03. For the African American subgroup, CFI = .99, RMSEA = .06, SRMR = .02. In the Latino American subgroup, CFI = .98, RMSEA = .11, SRMR = .03. Last, in the European American subgroup, CFI = .96, RMSEA = .13, SRMR = 0.05. Factor loadings for each ethnic group are listed in Table 4.

### Measurement Invariance

To analyze measurement invariance, a series of nested models with increasing constraints were tested and changes in model fit indices are evaluated. First, a configural invariance model, in which the factor structure was constrained to be similar across groups, was tested. Second, a weak invariance model, in which factor loadings are constrained to be equal across groups, was tested and compared to the configural invariance model. Due to evidence of metric non-invariance across all four groups, pairwise models for each combination of ethnic groups were tested for invariance. When metric invariance was established between two groups, the scalar invariance models were tested by constraining intercepts to be similar between groups.

**Configural Invariance.** Configural invariance indicates whether the basic organization of the *exploration* and *commitment* factors is supported across the four ethnic groups. Configural invariance is tested by specifying the same factor structure for all groups, while allowing loadings, intercepts, and residual variances to differ. The configural invariance model across ethnic groups is supported, as evidenced by good fit indices, CFI = .98, RMSEA = .11, SRMR = .03.

**Metric Invariance.** In the metric invariance model, factor loadings were constrained to be equivalent across the four ethnic groups. This model was then compared to the configural invariance model, indicating worsened fit,  $\Delta\chi^2 = 29.61, p = .04$  (Table 5). Given the lack of evidence for metric invariance across all four ethnic groups, pairwise metric invariance was tested for all six combinations of ethnic group pairs (Table 6).

There was evidence for metric invariance among the following ethnic group pairs: Asian American and African American ( $\Delta\chi^2 = 11.09, p = .09$ ); Asian American and Latino American ( $\Delta\chi^2 = 9.29, p = .16$ ); African American and Latino American ( $\Delta\chi^2 = 7.24, p = .23$ ), and; Latino American and European American ( $\Delta\chi^2 = 5.53, p = .48$ ). There was a lack of evidence for metric invariance between the Asian American and European American ( $\Delta\chi^2 = 14.60, p = .02$ ) and African American and European American ( $\Delta\chi^2 = 13.49, p = .04$ ) pairs.

**Partial Metric Invariance.** Partial metric invariance was assessed for the African American and European American pair. Based on modification indices, a partial invariance model was created, with all factors loadings constrained except for the loading of item #1 on the *exploration* factor. This model was then compared to the configural invariance model for the African American and European American pair. With the factor loading of item #1 invariant, the

model fit improved ( $\Delta\chi^2 = 7.50, p = .19$ ) indicating partial metric invariance between the African American and European American groups.

**Metric Non-invariance.** Partial metric invariance was also assessed for the Asian American and European American pair. Modification indices suggested allowing the loadings of items #2 and #3 on the *commitment* factor to freely vary. With the factor loading of item #2 allowed to vary freely, model fit did not improve,  $\Delta\chi^2 = 14.56, p = .01$ . Allowing the factor loading of item three to vary freely also did not improve model fit,  $\Delta\chi^2 = 13.49, p = .04$ . To further assess partial invariance, the remainder of the items were iteratively allowed to vary freely in their factor loadings; none of these models indicated improved model fit (Table 6). As such, there was evidence for metric non-invariance between the Asian American and European American groups.

**Scalar Invariance.** At the scalar invariance level, factor loadings and intercepts were constrained, and the models were compared to the respective metric invariance models. There was evidence for scalar invariance among the following ethnic group pairs: Asian American and African American ( $\Delta\chi^2 = .80, p = .93$ ); African American and Latino American ( $\Delta\chi^2 = 6.12, p = .19$ ). There was a lack of evidence for scalar invariance between the Asian American and Latino American pair ( $\Delta\chi^2 = 9.98, p = .04$ ) as well as the Latino American and European American pair ( $\Delta\chi^2 = 39.95, p < .0001$ ).

**Partial Scalar Invariance.** Partial scalar invariance was assessed for the Asian American and Latino American pair. Based on modification indices, the intercept of item #3 was allowed to vary freely between groups with all other intercepts constrained to be equal. This model was compared to the metric invariance model for the Asian American and Latino pair. Partial scalar invariance for the Asian American and Latino American groups was supported,  $\Delta\chi^2 = 3.71, p =$

.30. Regarding the Latino American and European American pair, modification indices suggested allowing the intercept of item #6 to vary freely between groups. This model, with the intercept of item #6 varying freely between groups with other intercepts constrained, was compared to the metric invariance model for the Latino American and European American pair. There was evidence for partial scalar invariance among the Latino American and European American groups,  $\Delta\chi^2 = 2.78, p = .43$ .

### **Convergent and Criterion Validity**

In order to assess convergent validity of the MEIM-R, its correlation with the *Ethnic Identity* subscale of the Scale of Ethnic Experiences is assessed. There was a significant correlation between the MEIM-R overall ethnic identity scale and the SEE *Ethnic Identity* scale,  $r = .58, p < .001$ . The SEE ethnic identity scale was also significantly correlated with the *exploration* ( $r = .48, p < .001$ ) and *commitment* ( $r = .60, p < .001$ ) factors of the MEIM-R.

To assess criterion validity of the MEIM-R, its relation with self-esteem was assessed. Ethnic identity was positively correlated with self-esteem ( $r = .16, p < .001$ ). Results were similar when looking at the correlations between MEIM-R factors, *exploration* and *commitment*, and self-esteem. There was a significant positive correlation between *exploration* and self-esteem ( $r = .09, p < .01$ ). There was also a significant positive correlation between *commitment* and self-esteem ( $r = .20, p < .001$ ).

The relation between ethnic/racial socialization and ethnic identity was also assessed. There was a significant correlation between socialization and ethnic identity ( $r = .42, p < .001$ ). Socialization was positively associated *exploration* ( $r = .42, p < .001$ ) and *commitment* factors ( $r = .35, p < .001$ ).

### Discussion

The present study is a novel evaluation of the measurement equivalence of the MEIM-R in a large diverse sample of emerging adults. The study aimed to generate psychometric evidence for the MEIM-R, and to evaluate whether its intent to measure ethnic identity equivalently across ethnic groups holds true. In a multi-site sample of 1074 university students, the factor structure of the MEIM-R and measurement invariance across four ethnic groups (i.e., Asian Americans, African Americans, Latino Americans, and European Americans) was evaluated. In addition, indicators of convergent and criterion validity were examined. Results indicated preliminary evidence for measurement invariance across ethnic groups when considering the two-factor structure of the MEIM-R. When looking at factor loadings and item intercepts across the ethnic groups, there was mixed evidence for measurement invariance. There was evidence for convergent and criterion validity, though correlations were moderate. These findings extend the limited prior research, and suggest that the MEIM-R could be used to measure ethnic identity across ethnic groups, though several limitations should be kept in mind.

In the present sample, the two-factor structure posited by Phinney and Ong (2007) was supported. Specifically, a correlated-two factor model with two distinct factors (*exploration* and *commitment*) fit the data well. The two-factor model fit the data better than a single-factor model with one overall *ethnic identity* scale. This finding corroborates the results of existing studies, and provides support for developmental theories of ethnic identity development (Brown et al., 2014; Phinney & Ong, 2007; Yoon, 2011).

There was evidence for configural invariance in the study sample, indicating the same factor structure across all of the ethnic groups. This finding provides further support for the two-factor structure of the MEIM-R. Next, equal factor loadings across ethnic groups were tested

(i.e., metric invariance). Overall, there was a lack of evidence for metric invariance across all four of the groups. In other words, the relations between items and the *exploration* and *commitment* factors were not equivalent across groups. To assess this non-invariance further, group differences at the pairwise level were tested and indicated support for equivalent factor loadings between the following pairs: Asian American and African American; Asian American and Latino American; African American and Latino American; Latino American and European American. There was evidence for partial metric invariance between the African American and European American groups, when one item's factor loading was allowed to vary freely. In contrast, metric non-invariance was found between the Asian American and European American groups. Even with allowing the factor loading for each of the items to vary iteratively, there was evidence that the pattern of loadings on the *exploration* and *commitment* factors was different between Asian American and European American students. Metric invariance is required in order to meaningfully compare the relations between factors across different groups; as such, comparisons of the *exploration* and *commitment* factors between the Asian American and European American groups should be interpreted with caution.

Furthermore, the scalar invariance model (i.e., equal item intercepts across groups) was tested at the pairwise group level. There was evidence for scalar invariance, or partial scalar invariance, between the following pairs: Asian American and African American; African American and Latino American; Asian American and Latino American; Latino American and European American. This finding implies that there are no systematic response biases between these groups, and that *exploration* and *commitment* means can be meaningfully compared between the specified ethnic groups.



Overall, it seems that measurement invariance holds for the MEIM-R when comparing ethnic minority groups to each other. In contrast, when comparing an ethnic minority group to the European American group, evidence for measurement invariance at the factor loading and intercept levels weakens. This suggests that the measurement of ethnic identity is functioning differently in the European American group, relative to the ethnic minority groups. As noted by Millsap and Kwok (2004), conclusions about partial measurement invariance should be made in consideration of the purpose of the measure and the planned analyses. In the present study, partial measurement invariance implies that between particular ethnic groups, there is evidence for invariance for some items and not for others. In other words, certain ethnic groups are responding to particular items in different ways, leading to differential factor loadings and item intercepts between groups. In the case of metric non-invariance between the Asian American and European American groups, researchers should use caution when comparing associations between the *exploration* and *commitment* factors and other external variables between these groups, particularly when conducting analyses that rely on the assumption of metric invariance (i.e., multiple regression, path analysis).

To assess convergent validity of the MEIM-R, its relation with the ethnic identity scale of the Scale of Ethnic Experiences was assessed. The correlation was significant ( $r = .58, p < .001$ ), though weaker than expected. The moderate correlation between the two ethnic identity measures indicates that there is more of a difference in the measures that can be explained by measurement error, and suggests that the two measures may not be tapping the same construct. Qualitatively, these measures also appear to be assessing similar, but distinct, constructs. When looking at the Scale of Ethnic Experiences, individual items seem to assess socialization (e.g., “My parents gave me a strong sense of cultural values”) and beliefs about the importance of

ethnic identity (e.g., “Ethnic pride is not very important to a child’s upbringing”), whereas the MEIM-R asks more specifically about the individual’s personal engagement in their own ethnic identity (e.g., “I have a strong sense of belonging to my own ethnic group”). This finding further illustrates the distinct and varying operationalization of ethnic identity found among existing measures in the literature.

Criterion validity was assessed by examining the relation between ethnic identity and self-esteem, as well as the relation between socialization and ethnic identity. Both of these relations were significant, though again weaker than expected. The correlation between ethnic identity and self-esteem was weak ( $r = .16$ ), consistent with existing studies, which also find a small to moderate effect (Umaña-Taylor, 2004). Similarly, the relation between socialization and ethnic identity was moderate ( $r = .42$ ). This may be because a measure of racial socialization was used, which is likely different in some ways than ethnic socialization.

Another methodological issue is the inconsistency in which response scale to use when administering the MEIM-R. The instrument has been administered as both a 4-point and 5-point Likert scale (e.g., Torres & Ong, 2010; Yoon, 2011). The MEIM (Phinney, 1992) uses a 4-point scale, and the authors of the MEIM-R suggest a 5-point scale with a neutral mid-point, but no clear recommendation or justification is provided (Phinney & Ong, 2007). Some researchers argue that including a neutral option complicates interpretations of a participant’s responses – it is impossible to know whether a respondent is choosing the neutral option due to misunderstanding of the item, lack of attention, or social desirability (see Simms et al., 2019 for review). The present study used a 4-point scale. In comparison of 4-point and 5-point scales of personality questionnaires, there is little difference in psychometric precision (Simms et al., 2019). Without adequate item response theory analyses, it remains unclear whether a 4-point or

5-point Likert scale is the most appropriate for measuring ethnic identity constructs. It is possible that certain groups, such as the European American group, rely more heavily on the neutral option. If this is true, the lack of a neutral option in the present study may in part explain the inconsistent measurement invariance when comparing the European American groups to other ethnic groups.

The present study is limited by its cross-sectional design, majority women sample, and regional constraint. Data was collected at only one time point, which prohibits causal inferences or assessment of the developmental process of ethnic identity development. The sample is mostly women (72.4%) and limited to universities in the Dallas-Fort Worth metroplex, which limits the generalizability of conclusions. Furthermore, this is an American sample, which suggests a different ethnic identity experience given the exposure to multiple differing ethnic groups.

At the crux of ethnic identity measurement is the use of ethnic group labels. In the present study, participants self-identified into one of the ethnic group categories listed in Phinney and Ong's measure (2007). It is important to consider that these ethnic groups are heterogeneous, and encompass multiple nationalities and specific cultures. For example, a person who identifies as Indian-American likely has a different cultural experience than someone who identifies as Vietnamese-American; however, both are grouped as "Asian American." The ethnic group labels also disregard immigration history, and attach "-American" to each group, regardless of the individual's understanding of their own acculturation process. The demographic questionnaire in this study included items assessing nationality and place of birth. Future studies should assess measurement invariance between immigrant and non-immigrant groups, or among specific national origin groups rather than collapse participants into an assumed homogenous pan-ethnic category (Lai et al., 2017).

In conclusion, the present study provides new psychometric evidence for the MEIM-R, with a particular focus on measurement invariance across ethnic groups. The two-factor structure of the MEIM-R was supported in the present study sample. There was mixed evidence for measurement invariance; researchers should continue assessing invariance in their individual study samples and take caution when making conclusions regarding differences between groups when using the MEIM-R. There was evidence for convergent and criterion validity, though the relations were weak to moderate. Importantly, these findings about the psychometric evidence for the MEIM-R are indicative of the continued lack of clarity of the definition of ethnic identity and how best to measure it. Much work remains to be done in this domain.

Table 1

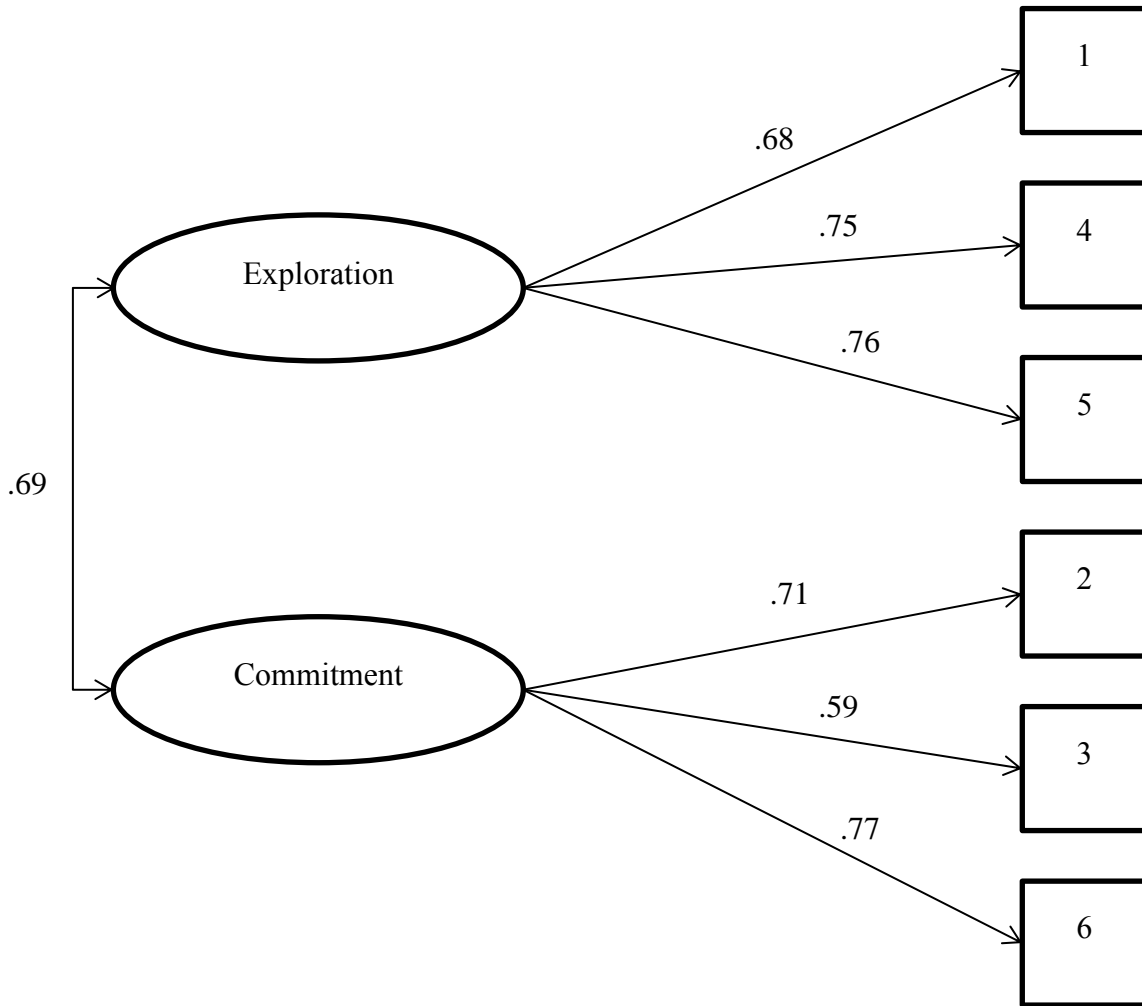
*Demographics of Study Sample*

	Total	SMU	UNT
<i>n</i>	1074	401	638
Age M( <i>SD</i> ) (years)	20.04(1.74)	19.76(1.59)	20.16(1.78)
Ethnic Group (%)			
Asian American	20.1	33.7	12.4
African American	21.8	12	26.2
Latino American	32.2	19.5	40.1
European American	25.9	34.9	21.3
Gender (%)			
Male	27.1	31.9	24.3
Female	72.4	67.8	75.2
Other	.5	.2	.5
Year in college (%)			
First-year, undergraduate	28.8	32.3	27.7
Second-year, undergraduate	26.5	30.3	24.2
Third-year, undergraduate	22	16.8	25.2
Fourth-year, undergraduate	16.5	14.8	16.9
≥ Fifth-year, undergraduate	3.8	1.5	5.2
Graduate	2.3	4.5	.8
Family Income (%)			
Below \$39,999	27.2	10.1	35
\$40,000 - \$79,999	25.2	14	32.4
\$80,000 - \$119,999	22.2	23.3	22.3
\$120,000 or above	25.4	52.5	10.4

*Note.* Not included in the table are students from: PQC  $n = 27$ ; UTD  $n = 4$ ; UTA  $n = 4$ .

Figure 1

*MEIM-R Factor Structure*



*Note:* Factor loadings are for the full sample. Factor loadings for individual ethnic groups are provided in Table 4.

Table 2

Model Fit Indices for MEIM-R Two-Factor and Single-Factor Models

	DF	$\chi^2$	$\Delta\chi^2$	<i>p</i>	CFI	$\Delta$ CFI	RMSEA	$\Delta$ RMSEA	SRMR	$\Delta$ SRMR
Two Factor Model	8	93.04			.98		.10		.03	
Single Factor Model	9	677.35	583.94	<.001	.85	.13	.26	.16	.07	.05

Table 3

Model Fit Indices of Two-Factor Model for Individual Ethnic Groups

	CFI	RMSEA	SRMR
Asian American	.98	.11	.03
African American	.99	.06	.02
Latino American	.98	.11	.03
European American	.96	.13	.05



Table 4

Factor Loadings for Individual Ethnic Groups

	Asian American	African American	Latino American	European American
Exploration - Item #1	.53	.51	.63	.71
Exploration - Item #4	.61	.67	.68	.77
Exploration - Item #5	.63	.67	.70	.77
Commitment - Item #2	.67	.63	.71	.71
Commitment - Item #3	.48	.60	.60	.57
Commitment - Item #6	.72	.69	.73	.71

Table 1

*Model Fit Indices for Overall Sample*

	df	$\chi^2$	$\Delta\chi^2$	p	CFI	RMSEA	SRMR
Overall model	8				.98	.10	.03
Configural invariance	32	130.20			.98	.11	.03
Weak (metric) invariance	50	159.81	29.609	.04*	.97	.09	.08
Strong (scalar) invariance	62	204.79	44.982	<.001***	.97	.09	.09

Table 6

*Pairwise Group Measurement Invariance Models*

Configural Invariance						
	df	$\chi^2$	CFI			
Asian American & African American	16	43.48	.98			
Asian American & Latino American	16	69.28	.98			
Asian American & European American	16	73.33	.97			
African American & Latino American	16	56.87	.98			
African American & European American	16	60.92	.98			
Latino American & European American	16	86.72	.97			
Metric Invariance						
	df	$\chi^2$	$\Delta \chi^2$	p	$\Delta CFI$	
Asian American & African American	22	54.56	11.09	.086	.98	
Asian American & Latino American	22	78.58	9.29	0.16	.98	
Asian American & European American	22	87.93	14.60	.024*	.97	
African American & Latino American	22	64.11	7.24	.230	.98	
African American & European American	22	74.40	13.49	.036*	.97	
Latino American & European American	22	92.25	5.53	.478	.97	
Partial Metric Invariance						
	df	$\chi^2$	$\Delta \chi^2$	p	CFI	$\Delta CFI$
Asian American & European American						
Item #3 (commitment)	21	86.51	13.18	.022*	.97	.004
Item #2 (commitment)	21	87.89	14.56	.012*	.96	.005
Item #1 (exploration)	21	85.16	11.83	.037*	.97	.004
Item #4 (exploration)	21	85.80	12.47	.029*	.97	.004
Item #5 (exploration)	21	87.68	14.35	.014*	.96	.005
Item #6 (commitment)	21	85.53	12.20	.032*	.97	.004
African American & European American						
Item 1 (exploration)	21	68.42	7.50	.186	.98	.001

Table 6 (continued)

*Pairwise Group Measurement Invariance Models*

Scalar Invariance	df	$\chi^2$	$\Delta \chi^2$	<i>p</i>	CFI	$\Delta$ CFI
Asian American & African American	26	55.37	0.80	.938	.98	.001
Asian American & Latino American	26	88.54	9.97	.041*	.97	.003
Asian American & European American	26	101.93	14.00	.007**	.96	.006
African American & Latino American	26	70.22	6.12	.191	.98	.001
African American & European American	26	92.21	17.80	.001***	.97	.007
Latino American & European American	26	132.21	39.95	<.0001***	.96	.015

Partial Scalar Invariance	df	$\chi^2$	$\Delta \chi^2$	<i>p</i>	CFI	$\Delta$ CFI
Asian American & Latino American <i>Item #3 intercept</i>	25	82.29	3.71	.295	.97	.001
Latino American & European American <i>Item #6 intercept</i>	25	95.04	2.78	.426	.97	.000

Note. \**p* < .05, \*\**p* < .01, \*\*\**p* < .001

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