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Language Measurement Equivalence of the Ethnic Identity Scale With Mexican American Early Adolescents

Rebecca M. B. White[1], **Adriana J. Umaña-Taylor**, **George P. Knight**, and **Katharine H. Zeiders**
Arizona State University

Abstract

The current study considers methodological challenges in developmental research with linguistically diverse samples of young adolescents. By empirically examining the cross-language measurement equivalence of a measure assessing three components of ethnic identity development (i.e., exploration, resolution, and affirmation) among Mexican American adolescents, the study both assesses the cross-language measurement equivalence of a common measure of ethnic identity and provides an appropriate conceptual and analytical model for researchers needing to evaluate measurement scales translated into multiple languages. Participants are 678 Mexican-origin early adolescents and their mothers. Measures of exploration and resolution achieve the highest levels of equivalence across language versions. The measure of affirmation achieves high levels of equivalence. Results highlight potential ways to correct for any problems of nonequivalence across language versions of the affirmation measure. Suggestions are made for how researchers working with linguistically diverse samples can use the highlighted techniques to evaluate their own translated measures.

Keywords

ethnic identity; Hispanic/Latino/Latina; measurement/validation; cross-cultural

Latinos, of which Mexican Americans comprise two thirds, are the largest and fastest growing ethnic minority group in the United States. (Ramirez & de la Cruz, 2003). By 2025, 24.4% of the total U.S. population will be Latino, with Latinos of Mexican origin being substantially overrepresented among the young adolescents living in the United States (U.S. Census Bureau, 2004). In addition, nearly 80% of Mexican Americans speak a language other than English in the home and less than half of them speak English very well (U.S. Census Bureau, 2004). Given the migration pattern of Mexican American families to the United States, it is likely that representative samples of young adolescents will include substantial numbers of Latinos who either need or prefer to participate in developmental research in Spanish.

There are a substantial number of research issues regarding the transmission of Latino cultural orientation that are focused on young adolescents. Unfortunately, the research on

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Corresponding Author: Rebecca M. B. White, School of Social and Family Dynamics, Arizona State University, Tempe, AZ 85287-3701, rebecca.white@asu.edu.

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the key developmental issues during adolescence that are associated with the transmission of cultural orientation is very limited (McLoyd, 1998; Supple, Ghazarian, Frabutt, Plunkett, & Sands, 2006), in part by an overreliance on English-speaking samples. Knight, Roosa, and Umaña-Taylor (2009) have described the threats to internal and external validity of scientific inferences that result from either excluding non–English-speaking adolescents or requiring adolescents with limited English abilities to complete measures in English. Even when researchers take the time to carefully translate and back-translate measures, the multiple-language versions produced do not necessarily result in empirically equivalent measures of a construct (Herrera, DelCampo, & Ames, 1993; Kim, Nair, Knight, Roosa, & Updegraff, 2008; Nair, White, Knight, & Roosa, 2009). Efforts to further our understanding of these processes among young adolescents must be supported by appropriate conceptual and analytical models for researchers who are likely to encounter non–English-speaking participants.

One promising area of emerging developmental research with ethnic minority adolescents, including Mexican Americans, focuses on ethnic identity development. Ethnic identity is a salient construct for minority youth and has been positively linked to academic achievement (Supple et al., 2006), self-esteem (see Umaña-Taylor, Diversi, & Fine, 2002 for a review), proactive coping (Umaña-Taylor, Vargas-Chanes, Garcia, & Gonzales-Backen, 2008), and mental health (Roberts et al., 1999) among Latino youth. Furthermore, scholars argue that ethnic identity may serve an important protective function for ethnic minority youth by minimizing the negative effects of common stressors (Gonzales & Kim, 1997; Kiang, Yip, Gonzales-Backen, Witkow, & Fuligni, 2006; Phinney, 2003). However, much of the research on Latino ethnic identity development has focused on English-speaking samples, perhaps because the extension to multilingual samples necessitates measures of the construct that produce similarly valid and reliable scores across English- and Spanish-speaking groups. In light of (a) the potentially protective role of ethnic identity, (b) the many adjustment problems that have been found to occur at high rates among Mexican Americans (e.g., school dropout, mental health problems; Joiner, Perez, Wagner, Berenson, & Marquina, 2001; Roberts, Roberts, & Chen, 1997; U.S. Department of Education, 2000), and (c) the high prevalence of Spanish-speaking households (U.S. Census Bureau, 2004, 2007), an examination of the psychometric properties of ethnic identity measures within a multilingual Mexican American population is especially warranted. The purpose of this study was to (a) empirically test the measurement equivalence of Spanish and English language versions of a measure of ethnic identity in a diverse sample of Mexican-origin early adolescents, and (b) provide an appropriate conceptual and analytical model for empirically evaluating different language versions of a measure for researchers who need to translate their own measurement scales from English into other languages.

Ethnic Identity

Identity formation is a critical developmental task during the period of adolescence (Erikson, 1968). For many Latino adolescents living in the United States, developing an *ethnic* identity is particularly salient, given the focus on race and ethnicity in the United States (Umaña-Taylor & Alfaro, 2006). Based largely on theories of ego identity development (Erikson) and social identity (Tajfel, 1981; Tajfel & Turner, 1986), ethnic identity has been conceptualized as a developmental process that involves exploration of one's ethnicity, resolution regarding one's ethnic identity, and affirmation of one's ethnic group membership (Phinney, 1992; Umaña-Taylor, Yazedjian, & Bámaca-Gómez, 2004). Recent theoretical (Quintana et al., 2006; Umaña-Taylor et al., 2004) and empirical (Pahl & Way, 2006; Supple et al., 2006) work has emphasized the need to use a more fine-grained approach to assess ethnic identity that acknowledges its multifaceted nature. Consistent with this need, the

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Ethnic Identity Scale (EIS, Umaña-Taylor et al., 2004) was developed to allow each component of ethnic identity to be assessed independent of the other components.

The EIS is comprised of three subscales: exploration, resolution, and affirmation. Consistent with Erikson's (1968) theoretical notions of identity formation and Marcia's (1994) operationalization of Erikson's work, as well as Phinney's (1992) application of this work to ethnic identity, the exploration and resolution subscales of the EIS assess the degree to which individuals have explored their ethnic identity and resolved what their ethnicity means to them, respectively. The exploration subscale focuses on the degree to which individuals have explored their ethnic identity by doing things such as reading books or other materials that have taught them about their ethnicity, and the resolution subscale focuses on the degree to which individuals have resolved the meaningfulness of their ethnicity to their sense of self (i.e., clarity regarding the role that ethnic identity plays in one's life). The affirmation subscale is based largely on social identity theory (Tajfel, 1981) and assesses the degree to which individuals feel positively about their ethnic group membership. The subscales can be utilized to classify individuals into ethnic identity statuses. The additional benefit of the EIS, however, is that it allows researchers to uniquely examine the association between each component of ethnic identity and outcomes (Umaña-Taylor et al., 2004). This is especially useful, given that recent research has demonstrated the unique components of ethnic identity follow distinct developmental trajectories (Pahl & Way, 2006; Umaña-Taylor, Gonzales-Backen, & Guimond, 2009) and are differentially associated with adolescent outcomes (Supple et al., 2006; Umaña-Taylor et al., 2008).

The ability to independently assess each component of ethnic identity has critical practical implications as well. Existing work has demonstrated that, when examined with a composite score that combines all ethnic identity components, relationships between variables can be obscured. For example, using a composite score of ethnic identity, researchers concluded that ethnic identity was positively associated with familial ethnic socialization (Umaña-Taylor, Bhanot, & Shin, 2006); however, when the components of ethnic identity were uniquely examined in relation to familial ethnic socialization in two distinct studies, findings indicated that exploration and resolution were both positively associated with familial ethnic socialization, but affirmation was not associated with familial ethnic socialization (Supple et al., 2006; Umaña-Taylor et al., 2004). Given that ethnic identity has been identified as a protective resource for ethnic minority youth (Branscombe, Schmitt, & Harvey, 1999; Kiang et al., 2006; Ong, Phinney, & Dennis, 2006; Phinney, 2003), and as a result it may be a significant variable to target for intervention, it is important to be able to uniquely capture which aspect of ethnic identity may be most effective to target for intervention.

Regardless of whether researchers have examined a composite ethnic identity score, or the unique components of ethnic identity, ethnic identity has consistently been positively associated with indices of psychosocial functioning such as self-esteem among Latino adolescents (see Umaña-Taylor et al., 2002, for a review) and has been demonstrated to minimize the negative effects of discrimination for multiple ethnic minority group members (Branscombe et al., 1999; Kiang et al., 2006; Noh, Beiser, Kaspar, Hou, & Rummens, 1999). Thus, *ethnic identity* is an important developmental construct to examine among Latino adolescents generally and Mexican American adolescents specifically. Furthermore, it is critical to examine ethnic identity among *early* adolescents, given that identity development is theorized to become increasingly salient as individuals enter and progress through adolescence (Erikson, 1968). In addition, given the large numbers of Latino youth who speak Spanish (U.S. Census Bureau, 2004), it is important to understand ethnic identity development regardless of whether Mexican American early adolescents prefer English or Spanish. However, a majority of research on Latino ethnic identity development employs samples of older Latino adolescents that are diverse with regard to national origin and

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homogenous with regard to language (i.e., English-speaking). For example, studying older adolescents from diverse Latin American cultures, Umaña-Taylor et al. (2004) and Supple et al. (2006) employed only an English version of the EIS, and less than 5% of the sample in the Umaña-Taylor et al. (2008) study completed batteries in Spanish.

The need to study ethnic identity development among Latino groups diverse with regard to language abilities necessitates a measure of ethnic identity that offers valid, reliable, and psychometrically sound scores when administered to Spanish-dominant Latino youth as well as English-fluent Latino youth. Existing work has provided support for the validity and reliability of EIS scores when used with English-speaking Latino adolescents (Umaña-Taylor, 2005), but we have yet to establish whether scores from a Spanish version of the measure are similarly valid and reliable with Spanish-speaking Latino youth. Scholars have urged that future research focus more closely on immigrant youth, given that findings vary considerably by immigrant status (Quintana et al., 2006). Thus, an equivalent Spanish version of the EIS is necessary to be able to assess the ethnic identity experiences of immigrants who may not yet be fluent in English. Without such a measure, the ethnic identity experiences of those who are not fluent in English remain unclear.

Measurement Equivalence

Ethnic identity researchers, like researchers focusing on any and all cultural-developmental issues during adolescence, need frameworks that can be used to determine whether scores from measures of important constructs are similarly valid and reliable across language versions. For example, unless ethnic identity components are measured equivalently across research participants who prefer to participate in Spanish and those who prefer to participate in English, findings from (a) data pooled across languages, and (b) language-group comparisons may be misleading (Hui & Triandis, 1985; Knight & Hill, 1998). There are several types of measurement equivalence, including item, functional, and scalar equivalence (Hui & Triandis, 1985). Item equivalence is demonstrated when individual scale items have the same meaning across language versions. Functional equivalence exists when the behaviors being measured have similar correlates in both language versions. Scalar equivalence exists when a scale score refers to the same degree, intensity, and magnitude of the construct in both languages.

Item equivalence can be evaluated via tests of factorial invariance that assess whether the item functioning and factor structure are similar across language versions of a measure. There are four hierarchically nested levels of factorial invariance: configural, weak, strong, and strict (Widaman & Reise, 1997). Under the general case, configural invariance exists if scale items form a similar factor structure across language versions; weak factorial invariance exists if the factor loadings are similar; strong factorial invariance exists if the factor loadings and intercepts are similar; and strict factorial invariance exists if the factor loadings, intercepts, and unique errors are similar across language versions. Functional and scalar equivalence can be evaluated by conducting construct validity equivalence tests examining the similarity of the relationships between the EIS subscales and constructs theoretically related to ethnic identity (Knight, Tein, Prost, & Gonzales, 2000). Generally, functional equivalence exists when the slopes of the associations are similar across language versions and scalar equivalence exists when the slopes and intercepts of the associations are similar. In some cases, however, researchers may hypothesize that various constructs are expected to operate differently across language groups. In these cases, measurement equivalence is evidenced when the measures perform as one would expect based on theory (Knight et al., 2002). Indeed, if the culturally informed theory indicates that the construct is differentially related to some other construct across the language groups, or if the theory suggests some subtle differences in the item functioning and factor structure across language

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groups, then measurement equivalence would be indicated by somewhat different but theoretically consistent interrelationships with other constructs or among the items.

The analysis plan dictates the level of measurement equivalence necessary to answer any given research question. Specifically, violations of item equivalence at any level of factorial invariance (up to and including strict factorial invariance) will produce some degree of bias in any statistic based upon the covariance between, for example, EIS subscale scores and scores on other measures (e.g., correlations and regression coefficients). Violations of functional equivalence will influence analyses involving covariance structures. Violations of scalar equivalence will influence mean-level comparisons between groups.

In the current study, we examined the cross-language item, functional, and scalar equivalence of the EIS by conducting factorial invariance and construct validity testing of the Spanish and English versions of each subscale. Viewing ethnic identity as a normative developmental process for ethnic minority youth (Phinney, 1992; Umaña-Taylor et al., 2009a), we examined the former under the general case, whereby factorial invariance was evidenced by similarities among the language groups. That is, there was no culturally informed theory suggesting that items should function differently across language versions. The latter relied on several construct validity variables expected to be positively (i.e., ethnic pride, ethnic socialization, enculturation, social support, and active coping) or negatively (i.e., depression) related to most of the components of ethnic identity based on extant theoretical and empirical literature (Bernal & Knight, 1993; Mossakowski, 2003; Phinney, 1991; Phinney & Chavira, 1995; Simons et al., 2002; Umaña-Taylor & Bámaca, 2004).

The construct validity variables were selected because the associations between each of these variables and the ethnic identity constructs under examination (i.e., exploration, resolution, affirmation) are established in the theoretical and/or empirical literature. For example, existing theoretical work guided by ecological theory (Bronfenbrenner, 1989) has suggested that individuals' exploration and resolution of their ethnicity should be informed by their families' ethnic socialization practices and support from family members (Knight, Cota, & Bernal, 1993b; Umaña-Taylor & Fine, 2004). Empirical work has provided support for some of these associations by demonstrating a positive association between familial ethnic socialization and Latino adolescents' and childrens' ethnic identity (Knight, Bernal, Cota, Garza, & Ocampo, 1993a; Supple et al., 2006; Umaña-Taylor, Alfaro, Bámaca, & Guimond, 2009). Existing cultural theory suggests that ethnic identity is a central aspect of the enculturation process (Gonzales, Fabrett, & Knight, 2009). We hypothesized that enculturative values would be related to measures of ethnic identity. Researchers have consistently found ethnic identity exploration, resolution, and affirmation to be associated with indices of positive psychosocial functioning among Latinos (Phinney, 1992; Umaña-Taylor et al., 2002) and theoretical work suggests that cultural strengths, such as a strong orientation and attachment toward one's ethnic group, can promote positive psychological functioning among individuals from ethnic minority groups (Phinney, 2003). Thus, a negative association was expected between each ethnic identity construct and depressive symptoms. Phinney and Chavira (1995) found that adolescents engaged in more active forms of coping had higher levels of general ethnic identity (separate constructs were not examined). Therefore, we hypothesized a positive association between active coping and the three components of ethnic identity examined in the current study. On the basis of the work of Lee (2005) and Lee and Yoo (2004), we also hypothesized a positive association between ethnic pride and exploration, resolution, and affirmation. Finally, the associations between EIS subscales and the construct validity variables were expected to be constant across diverse levels of socioeconomic status, language use, and cultural orientations. Consequently, we examined construct validity under the general case, whereby functional

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and scalar equivalence were evidenced by similarities in slopes and intercepts among the language groups.

Method

Data for this study come from the second wave of an ongoing longitudinal study investigating the role of culture and context in the lives of Mexican American families in a large metropolitan area in a Southwestern state (Roosa, Liu, & Torres, 2008). Participants were recruited when they were students in 5th grade, selected from school rosters that served ethnically and linguistically diverse communities. The sample included a total of 750 families of Mexican or Mexican American descent. Eligible families met the following criteria at Wave 1: (a) They had a target fifth grader attending a sampled school; (b) the participating mother was the child's biological mother, lived with the child, and self-identified as Mexican or Mexican American; (c) the child's biological father was of Mexican origin; (d) the target child was not severely learning disabled; and (e) no stepfather or mother's boyfriend was living with the child (unless the boyfriend was the biological father of the target child).

In total, 711 families were interviewed at Wave 2, approximately 2 years after Wave 1 data collection, when most target children were in the seventh grade. A total of 678 families had complete data on all the study variables and were included in analyses for this study. Consistent with recommendations for sampling and recruitment in studies of culturally and linguistically diverse populations (Roosa et al., 2008), participants were free to choose to complete the battery in Spanish or English. Among these, 596 young adolescents chose to complete the study battery in English, and 82 chose to complete the battery in Spanish. Families with complete data did not differ from those with incomplete data ($n = 33$) on parental education, parent generational status, child generational status, and maternal age. Families with complete data did, however, report higher family incomes, $t(703) = 2.46$, $p < .05$, and adolescents were slightly older, $t(709) = 4.288$, $p < .01$, when compared to their counterparts with incomplete data. Among the current study's sample, 70.4% of children and 26.3% of mothers were born in the United States. The average age of children at Wave 2 was 12.35 years ($SD = 0.53$), and the average age for mothers was 37.87 years ($SD = 5.77$). Approximately half in the youth sample were male (50.1%) and 78.7% of the families lived in two-parent households. The average annual income for the sample ranged from $30,000 to $35,000.

Procedures

Using a combination of random and purposive sampling, the research team identified communities served by 47 public, religious, and charter schools from throughout the metropolitan area chosen to represent the economic, cultural, and social diversity of the city. Recruitment materials were sent home with all children in the fifth grade in the selected schools. Recruitment materials included a letter and brochure (both in English and Spanish) that explained the research project, asked parents to indicate on a response form whether they were interested in participating in the study, and, if so, to provide contact information. Upon obtaining family contact information, families whose ethnicity was indicated as Hispanic or families with Hispanic/Latino surnames were selected for screening. More than 85% of those who returned the recruitment materials were eligible for screening (e.g., Hispanic), and 1,028 met the study eligibility criteria. Computer-assisted personal interviews were completed with 750 families, 73% of those eligible. At Wave 1, mothers (required), fathers (optional), and children (required) participated in in-home interviews.

Recruiters scheduled computer-assisted personal interviews according to family preference and interviewer availability. Interviews were designed to last about 2.5 hr. Cohabitating

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family members' interviews were conducted concurrently by professionally trained interviewers in different locations at the participants' homes. Each interviewer received at least 40 hr of training. Interviewers read each survey question and possible response aloud in participants' preferred language to reduce problems related to variations in literacy levels. Families were paid $50 per participating family member.

Measures

Participants were asked a series of demographic questions, including questions about annual family income, years of education, and generational status. In two-parent families in which fathers participated, means of mother and father reports on income, education, and generational status were used to calculate sample means. In single-parent families, mothers' reports on these variables were used in the calculation of sample means. Generational status was determined by asking parents where they, their child, and the child's maternal and paternal grandparents and great grand parents, were born. The generational status variable, which was calculated for both parents and children, was ordinal whereby 1 indicated that the individual was born in Mexico and 4 indicated that all ancestors (up to and including the target child's maternal/paternal great grandparents) were born in the United States. We used adolescents' scores on the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II; Cuellar, Arnold, & Maldonado, 1995) to describe the sample with regards to English and Spanish language use across diverse contexts (i.e., spoken language, music, television, and writing). Higher scores on the 8-item scale (ranging from 1 = *almost never* to 5 = *almost always*) indicated higher levels of use of the specific language. All materials were available in English and Spanish. Unless noted otherwise, in what follows, all measures were translated and back-translated by bicultural and bilingual adults, with at least a bachelor's degree, who were representative of the local Latino community and had a high degree of familiarity with the most common local Spanish dialect.

Ethnic identity—Ethnic identity was assessed with the 17-item EIS (Umaña-Taylor et al., 2004), which includes 3 subscales that measure exploration (7 items), resolution (4 items), and affirmation (6 items). Evidence of the reliability and validity for subscale scores is presented elsewhere for English-speaking samples (Umaña-Taylor et al., 2004) and mixed Spanish/English language samples (Umaña-Taylor et al., 2008). Items, in English, were originally presented in Umaña-Taylor et al. (2004). They have been slightly modified to reflect that the current study focused exclusively on Mexican-origin adolescents and are presented, in Spanish and English, in Appendix Table A.1. Adolescents were asked to indicate how true each item was for them and items were scored on a 5-point Likert-type scale, with end points of *not at all true* (1) to *very true* (5). In the current study, Cronbach's alphas were .73, .86, and .75 for the English versions of the exploration, resolution, and affirmation subscales, respectively, and Cronbach's alphas were .71, .85, and .80 for the Spanish versions, respectively.

The Spanish version of the EIS was developed by the second author for use in a longitudinal study focused on Latino adolescents' ethnic identity development (see Umaña-Taylor et al., 2009a). Items were initially translated by an English/Spanish bilingual native Spanish speaker. The Spanish version was reviewed by a second English/Spanish bilingual native Spanish speaker to check for clarity and any awkward or confusing wording. Items were then back-translated by a third English/Spanish bilingual native Spanish speaker. The original English version was compared to the back-translated version, inconsistencies were discussed among the team of translators, and a final Spanish version was adopted based on consensus.

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Ethnic pride—A 4-item scale, Mexican American Ethnic Pride, was used to measure participants' sense of pride in their Mexican origin. Thayer, Valiente, Hageman, Delgado, and Updegraff (2002) developed and pilot tested the measure with a sample of 162 Mexican American adolescents and found the items to represent a single latent construct. Subsequent work demonstrated evidence of construct validity and reliability in Spanish- and English-speaking samples of Mexican Americans (Berkel, Knight, Zeiders, & Tein, in press; Knight et al. 2009). Adolescents were asked to rate how much they agreed or disagreed with each item (e.g., "You feel proud to see Latino actors, musicians, and artists being successful"), with responses ranging from *not at all true* (1) to *very true* (5). In the current study Cronbach's alphas were .70 and .78 for the English and Spanish versions of adolescent reports, respectively.

Ethnic socialization—The 10-item ethnic socialization scale was adopted from the Ethnic Identity Questionnaire developed by Bernal and Knight (Bernal & Knight, 1993; Knight et al., 1993a, 1993b). The scale is meant to assess the extent to which mothers socialized children into Mexican culture. A sample item asked mothers how often they "tell [target child] that the color of a person's skin does not mean that person is better or worse than anyone else?" Berkel et al. (in press) demonstrated the construct validity of this 10-item version of the Ethnic Identity Questionnaire in a sample comprised of both English- and Spanish-speaking young adolescent Mexican Americans. Responses ranged from *almost never or never* (1) to *a lot of the time (frequently)*" (4). In the current study, Cronbach's alphas were .76 for English-speaking and .74 for Spanish-speaking mothers.

Mexican American cultural values—The Mexican American Cultural Values Scale (MCVS) was used to assess enculturative values. Tests demonstrating the reliability, validity, cross-developmental invariance, and some evidence of cross-language equivalence of MCVS scale and subscale scores are presented elsewhere (Knight et al., in press). A total enculturation score represented a mean score of the following subscales: *religion* (e.g., "Parents should teach their children to pray"), *familism support and emotional closeness* (e.g., "Parents should teach their children that the family always comes first"), *familism obligations* (e.g., "If a relative is having a hard time financially, one should help them out if possible"), *familism family as referent* (e.g., "A person should always think about their family when making important decisions"), *traditional gender roles* (e.g., "Mothers are the main people responsible for raising children"), and *respect* (e.g., "Children should always be polite when speaking to any adult"). Adolescents were asked to rate how much they agreed or disagreed with each item, with responses ranging from *not at all* (1) to *completely* (5). Cronbach's alphas in the current study were .89 and .86 for English-speaking and Spanish-speaking adolescents, respectively.

Social support—The Multidimensional Scale of Perceived Social Support was designed to assess perceived social support from family and friends (Zimet, Dahlem, Zimet, & Farley, 1988). Only the family subscale was used in the current analyses. Adolescents were asked to indicate to what degree each of four statements (e.g., "Your family really tries to help you") was true on a Likert-type scale ranging from *not true at all* (1) to *very true* (5). In the current study, Cronbach's alphas were .82 and .87 for English and Spanish versions, respectively.

Active coping—The Children's Coping Strategies Checklist (CCSC) is a self-report inventory in which children describe their coping efforts (Ayers, Sandler, West, & Roosa, 1996). For the current study, only items from the subscale of active coping dimension were used. Adolescents were asked to indicate how often they did each of 12 things (e.g., "You told yourself that you could handle this problem") in order to solve problems or make themselves feel better. Response choices ranged from *almost never or never* (1) to *almost*

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always or always (5). Cronbach's alphas were .92 and .91 for English and Spanish versions, respectively.

Depression—The computerized version of the Diagnostic Interview Schedule for Children (DISC-IV), a structured diagnostic instrument designed for use by nonclinicians, was used to assess child mental health symptomatology (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). The DISC was originally developed in 1979 and has been successfully translated into Spanish according to psychometric work done in Puerto Rico (Bravo et al., 2001; Bravo, Woodbury-Farina, Canino, & Rubio-Stipec, 1993; Ribera, Canino, Rubio-Stipec, & Bravo, 1996). Adolescents' reports on symptoms were used to estimate symptoms counts for major depressive disorder in the current study.

Results

Analytic Strategy

The present study focused on the item, functional, and scalar equivalence (Hui & Triandis, 1985) of each EIS subscale. All equivalence analyses were conducted using Mplus statistical software (Muthén & Muthén, 2007). Item correlations and means and standard deviations for each group are presented in Appendix Tables A.2, and A.3, respectively. We initially ran descriptive statistics on each item from the EIS and determined that all of the items for the exploration and resolution subscales were normally distributed. However, all items from the affirmation subscale were negatively skewed and kurtotic. Consequently, for all analyses involving the latter scale, maximum likelihood restricted (MLR) estimation was used, which offered maximum likelihood (ML) parameter estimates with standard errors and a chi-square test statistic that are robust to nonnormality (Muthén & Muthén, 2007). For analyses on the former two scales, ML estimation was used.

Factorial invariance—Factorial invariance was assessed by using multigroup confirmatory factor analysis (CFA) to fit a series of hierarchically nested factor structures, moving from configural invariance up to strict factorial invariance (Knight et al., 2002; Millsap & Kwok, 2004; Widaman & Reise, 1997). At each level of factorial invariance testing, we applied additional constraints to the multigroup measurement model, using nested-model comparisons to determine whether the added constraint contributed to poor model fit. Subsequent invariance constraints were only tested if the previous level of invariance was met (criteria described below). Consistent with the general case, configural invariance was established if a CFA model that allowed the same set of items to form a factor in each group showed good model fit. The comparison of (a) configural invariance to weak factorial invariance, (b) weak to strong factorial invariance, and (c) strong to strict factorial invariance involved the addition of (i) loading constraints, (ii) latent intercept constraints, and (iii) unique factor variance constraints, respectively, across language groups.

Multiple indices were used to assess model fit because each individual fit index is subject to limitations. The chi-square test statistic and Yuan–Bentler T2* test statistic were used to assess perfect model fit under ML and MLR estimation, respectively, along with several practical fit indices. Generally, model fit was considered good (acceptable) according to practical fit indices if the comparative fit index (CFI) was greater than or equal to 0.95 (0.90), the root mean square error of approximation (RMSEA) was less than or equal to 0.05 (less than 0.08), and the standardized root mean square residual (SRMR) was below 0.05 (less than 0.08; Hu & Bentler, 1999; Kline, 2005). However, we also examined Hu and Bentler's combinational rules to asses model fit. Hu and Bentler found that a cutoff value of 0.96 for the CFA in combination with SRMR < 0.10 and an RMSEA < 0.06 resulted in the

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least sum of Type 1 and Type 2 error rates. Judgments regarding overall fit of the model were based on evaluating the evidence across both combinational rules, individual cutoffs, and the chi-square statistic. The chi-square difference test ($\Delta\chi^2$) and Sattora–Bentler chi-square difference test (S-B $\Delta\chi^2$; Sattora & Bentler, 2001) were used to make nested model comparisons under ML and MLR estimation, respectively. Because χ^2 criteria are sensitive to trivial modifications of fit (Cheung & Rensvold, 2002), significant $\Delta\chi^2$ and S-B $\Delta\chi^2$ statistics had to be accompanied by marked changes in practical fit for the constraint to be viewed as inappropriate.

The general approach to multigroup CFA model testing for each subscale proceeded as follows: All models were estimated from a baseline configural model in which the subscale items were treated as indicators of the latent construct. For identification purposes, we set the factor loading for one item equal to 1 (keeping this consistent across language groups). When model fit was deemed good/acceptable, we proceeded to testing a weak factorial invariance model. In the weak factorial invariance models we added loading constraints, requiring that the factor loadings for individual items be equal across groups. When model fit was good/acceptable, we proceeded to testing a strong factorial invariance model. In the strong factorial invariance models, we retained the loading constraints and added latent intercept constraints. When model fit was good/acceptable, we proceeded to testing the strict factorial invariance models. In the strict factorial invariance models, we retained the loading and latent intercept constraints and added unique factor variance constraints for each item. Any and all variations that were made to this standard approach are described within the specific scale subsection.

Construct validity equivalence—Construct validity equivalence tests were used to assess functional and scalar equivalence of the EIS. In a series of hierarchically nested model testing, we specified models in which each EIS subscale score was regressed on a construct validity variable: first allowing the slope and intercept to be freely estimated within group, next constraining the slope to be invariant across groups, and then (if slope invariance was established) constraining the intercept to be invariant across groups. Consistent with the general case, the similarity of slopes across language groups implied functional equivalence. The added similarity of intercepts across language groups implied scalar equivalence. We determined whether added model constraints resulted in significant misfit, by examining the $\Delta\chi^2$ test (exploration, resolution) or the S-B $\Delta\chi^2$ test (affirmation). Though we selected validity constructs that have been shown to be theoretically and empirically related to various dimensions of ethnic identity development (e.g., ethnic socialization, ethnic pride, depression), it is important to note that, due in part to a the dearth of research examining measurement equivalence (Millsap, 2007), there were no known Spanish–English equivalent scales measuring the relevant constructs. Therefore, rather than assume that the scales measuring the construct validity variables were equivalent across language versions, we focused on the *pattern* of construct validity results. Notably, we looked for evidence that a particular EIS subscale was equivalent by examining the similarity/dissimilarity of regression coefficients across the various construct validity analyses. Similarly, because the construct validity variables came from measures that themselves had not been established as cross-language equivalent, we looked for evidence that a construct validity variable measure may be nonequivalent by examining how it performed across the various dimensions of ethnic identity. This approach is consistent with prior work (Knight, Virden, & Roosa, 1994). Finally, we ran the same analyses, adding controls for family income and generational status. Those models resulted in the same equivalence findings and are not presented here.

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Preliminary Analyses

Among the 678 families included in the current analyses, 596 had English-speaking and 82 had Spanish-speaking early adolescents. Given the relatively small sample of the Spanish-speaking group and the imbalance between the two groups, we performed three sets of analyses approximating power to: (1) estimate the measurement model in our smallest group, (2) reject a close-fitting model, and (3) estimate model parameters in the multigroup design. First, we used the Mplus Monte Carlo function (Muthén & Muthén, 2007) to conduct simulation studies examining our power to estimate the measurement model in the smaller, Spanish-speaking group. Results of these simulations indicated that we were adequately powered (≥0.80) to estimate 7-item, 6-item, and 4-item factor models in this group when data were normally distributed. We drew on the work of MacCullum, Browne, and Sugawara (1996) to estimate our power to reject close fit. Because so many models were tested, we report power for our average *df* (*M* = 22). With a sample size of 678, under our average *df*, our power to reject close fit was > 0.95. Finally, reflecting the multigroup design employed in the current study, we used the Mplus Monte Carlo function to conduct simulation studies examining our power to estimate the measurement model among two groups, one with sample size of 596 participants and the other with sample size of 82 participants. The results indicate that we have power > 0.90.

Comparisons on demographic variables by adolescent language were examined. Adolescents who completed the interview in Spanish differed from those who completed the interview in English on parental education from those who completed the interview in English on parental education [M_{Spanish} = 9.37, *MEnglish* = 10.74; *t* (676) = 3.51, *p* < .001], and family income [M_{Spanish} = 4.93, *MEnglish* = 8.04; *t* (673) = 6.00, *p* < .001]. Additionally, English-speaking adolescents were more likely than Spanish-speaking adolescents to report higher generational status [χ^2 (6, *N* = 678) = 32.13, *p* <.001] and have parents with higher generational statuses [χ^2 (3, *N* = 678) = 96.45, *p* < .001]. However, adolescents who completed the interview in Spanish did not differ from those completing the interview in English on (a) English language use [M_{Spanish} = 4.50, *MEnglish* = 4.49; *t* (642) = 0.16, *p* = .87] or (b) Spanish language use [M_{Spanish} = 3.17, *MEnglish* = 3.09; *t* (642) = 0.64, *p* = .52]. Perhaps those Mexican American adolescents who chose to complete the measures in Spanish are more comfortable, and maybe more fluent, in Spanish, even though they live in a context that requires substantial English use.

Factorial Invariance of Each Domain of Ethnic Identity

Exploration—Overall, this EIS subscale demonstrated strict factorial invariance across Spanish and English language groups (Table 1). The initial configural invariance model (7 items) demonstrated some misfit. In examining the modification indices, we decided to allow the unique item variances to correlate in both language groups between Items 6 and 11 because of similar wording in each item (see Appendix Table A.1). The adjusted model (see footnote “a.” for configural invariance, in Table 1) fit well according to multiple indices of fit. Working from the adjusted configural model, we found that the additional constraints applied to test weak, strong, and strict factorial invariance did not lead to significant misfit as measured by $\Delta\chi^2$.

Though the model achieved the highest level of invariance, 1 item failed to load on the common factor in both groups. Specifically, Item 2 (Table A.1) did not have a statistically significant loading on the exploration construct, though the value of the loading was invariant across language groups (λ = 0.02, *SE* = 0.06, *p* = *ns*). As a follow-up, we ran the same invariance analyses on a 6-item exploration subscale omitting Item 2, the only reverse-scored item. Once again, allowing the same two unique factor variances to correlate, the model achieved strict factorial invariance.

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Resolution—Overall, the EIS subscale measuring resolution demonstrated strict factorial invariance across Spanish and English versions (Table 1). The initial configural invariance model fit well according to multiple indices of fit. The additional constraints applied to test weak, strong, and strict factorial invariance did not lead to significant misfit as measured by $\Delta\chi^2$.

Affirmation—The affirmation subscale of the EIS demonstrated partial strict factorial invariance across Spanish and English language groups (Table 1). The initial configural invariance model demonstrated some misfit. In examining the modification indices, we decided to allow the unique item variances to correlate in both language groups between Items 1 and 7 because of similar wording in each item (see Table A.1). The adjusted model fit well according to multiple indices of fit. Working from the adjusted configural model, we next constrained the factor loadings to test weak factorial invariance, and this constraint did not lead to significant misfit as measured by the S-B $\Delta\chi^2$. Constraining the item means contributed to significant misfit according to the S-B $\Delta\chi^2$ statistic. However, even though the added constraint resulted in a significant S-B $\Delta\chi^2$, the strong factorial invariance model still fit acceptably well according to the CFI, RMSEA, and to both combinational rules. Consequently, we moved on to testing a strict factorial invariance model. This model did not fit well according to the S-B $\Delta\chi^2$ test, most individual indices of fit, and to both combinational rules. We examined modification indices and freed the unique factor variance constraint for Items 7 and 9, which resulted in the final partial strict factorial invariance model for the affirmation subscale of the EIS.

Construct Validity Equivalence Analyses of Each Domain of Ethnic Identity

Exploration—In following with the results from the factorial invariance analyses, we ran construct validity analyses with both the 7-item and 6-item exploration subscales. The 7-item and 6-item versions of the scale performed similarly (Table 2). Specifically, for both versions of the exploration measure, the slope constraint did not contribute to significant misfit, except in the case of ethnic socialization, $\Delta\chi^2(1)_{7\text{ item}} = 6.00$, $p = .01$, and $\Delta\chi^2(1)_{6\text{ item}} = 5.16$, $p < .05$. That is, slopes were invariant when exploration was regressed on ethnic pride, $\Delta\chi^2(1)_{7\text{ item}} = 0.12$, $p = .73$; $\Delta\chi^2(1)_{6\text{ item}} = 0.01$, $p = .93$; Mexican American cultural values, $\Delta\chi^2(1)_{7\text{ item}} = 1.40$, $p = .24$, and $\Delta\chi^2(1)_{6\text{ item}} = 2.20$, $p = .14$; family social support, $\Delta\chi^2(1)_{7\text{ item}} = 0.25$, $p = .62$, and $\Delta\chi^2(1)_{6\text{ item}} = 0.36$, $p = .55$; active coping, $\Delta\chi^2(1)_{7\text{ item}} = 0.50$, $p = .48$, and $\Delta\chi^2(1)_{6\text{ item}} = 0.72$, $p = .40$; and depression, $\Delta\chi^2(1)_{7\text{ item}} = 1.03$, $p = .31$, and $\Delta\chi^2(1)_{6\text{ item}} = 2.38$, $p = .12$. Similarly, when the intercept constraints were added to ethnic pride, they did not lead to significant misfit:$\Delta\chi^2(1)_{7\text{ item}} = 0.36$, $p = .55$, and $\Delta\chi^2(1)_{6\text{ item}} = 0.29$, $p = .59$; Mexican American cultural values, $\Delta\chi^2(1)_{7\text{ item}} = 0.51$, $p = .47$, and $\Delta\chi^2(1)_{6\text{ item}} = 0.29$, $p = .59$; family social support, $\Delta\chi^2(1)_{7\text{ item}} = 1.17$, $p = .28$, and $\Delta\chi^2(1)_{6\text{ item}} = 1.18$, $p = .28$; active coping, $\Delta\chi^2(1)_{7\text{ item}} = 3.12$, $p = .08$, and $\Delta\chi^2(1)_{6\text{ item}} = 3.40$, $p = .07$; and depression, $\Delta\chi^2(1)_{7\text{ item}} = 1.83$, $p = .18$; $\Delta\chi^2(1)_{6\text{ item}} = 1.91$, $p = .17$.

Resolution—The resolution subscale of the EIS demonstrated invariance in slopes across five of six outcomes. That is, slopes were invariant when resolution was regressed on ethnic pride, $\Delta\chi^2(1) = 0.49$, $p = .49$; Mexican American cultural values, $\Delta\chi^2(1) = 1.16$, $p = .28$; family social support, $\Delta\chi^2(1) = 3.04$, $p = .08$; active coping, $\Delta\chi^2(1) = 0.67$, $p = .41$; and depression, $\Delta\chi^2(1) = 0.42$, $p = .52$. Similarly, when the intercept constraints were added to ethnic pride, $\Delta\chi^2$ (1) = .34, $p = .56$; Mexican American cultural values, $\Delta\chi^2$ (1) = .09, $p = .76$; family social support, $\Delta\chi^2$ (1) = .88, $p = .35$; active coping, $\Delta\chi^2$ (1) = 3.43, $p = .06$; and depression, $\Delta\chi^2$ (1) = 1.20, $p = .27$, they did not lead to significant misfit. The slope constraint on the model involving ethnic socialization resulted in significant model misfit, $\Delta\chi^2(1) = 7.24$, $p = .01$. Consequently, it was not necessary to test the intercept constraint.

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Affirmation—The affirmation subscale of the EIS demonstrated invariance in slopes across all outcomes examined here. That is, slopes were invariant when affirmation was regressed on ethnic socialization, S-B $\Delta\chi^2(1) = 0.35$, $p = .55$; ethnic pride, S-B $\Delta\chi^2(1) = 3.15$, $p = .08$; Mexican American cultural values, S-B $\Delta\chi^2(1) = 0.08$, $p = .78$; family social support, S-B $\Delta\chi^2(1) = 1.31$, $p = .25$; active coping, S-B $\Delta\chi^2(1) = 0.01$, $p = .92$; and depression, S-B $\Delta\chi^2(1) = 0.17$, $p = .68$. When the intercept constraints were added to ethnic socialization, S-B $\Delta\chi^2$ (1) = 13.22, $p < .01$; ethnic pride, S-B $\Delta\chi^2$ (1) = 17.05, $p < .01$; Mexican American cultural values, S-B $\Delta\chi^2$ (1) = 7.32, $p < .05$' family social support, S-B $\Delta\chi^2$ (1) = 13.13, $p < .01$; active coping, S-B $\Delta\chi^2$ (1) = 12.69, $p < .01$; and depression, S-B $\Delta\chi^2$ (1) = 9.48, $p < .01$, they resulted in significant model misfit.

Discussion

There are a substantial number of important research issues regarding the transmission of Latino cultural orientation that are focused on young adolescents; one such issue is ethnic identity development. Gaining an understanding of the ethnic identity experiences of Mexican Americans is critical, given the salience of ethnicity for ethnic minority group members in the United States as well as the potential implications of this construct for Mexican Americans' psychosocial adjustment. To date, research on important cultural developmental processes, including ethnic identity, has been hampered by the exclusion of Spanish-speaking participants and/or overreliance on English-speaking participants (Knight et al., 2009). Research efforts to further our understanding of Mexican American cultural orientation, by necessity, must expand to include Spanish-speaking young adolescents. Such an expansion requires (a) researchers to allow participants to participate in their language of choice (Roosa et al., 2008), and (b) measures available in multiple languages. To support these efforts, researchers need an appropriate conceptual and analytical model for examining translated measures. Given that substantial proportions of Latinos generally, and Mexican Americans specifically, prefer to speak Spanish or do not speak English very well (U.S. Census Bureau, 2004), the relative exclusion of Spanish-speaking Latinos from ethnic identity research poses major limitations. Specifically, the ethnic identity experiences of diverse groups of early adolescents cannot be assumed to be the same, especially when prior work has demonstrated considerable within-group variation in developmental findings (Quintana et al., 2006). To support the expansion of research on cultural orientation to more diverse groups, groups that include both English- and Spanish-speaking early adolescents, research must establish the equivalence of Spanish language and English language versions of measures of important cultural orientation constructs, such as *ethnic identity*.

Overall, given the available evidence, our choice to conduct both within-group and between-group analyses on the basis of correlation/covariance structure and using all three EIS subscales is defensible, and the choice to examine mean-level differences in exploration and resolution across the language groups is equally defensible. Both the exploration and resolution subscales of the EIS demonstrated item, functional, and scalar equivalence across language versions. The affirmation subscale demonstrated limited item equivalence (i.e., partial strict factorial invariance), as well as functional equivalence across language versions. These conclusions imply that item-level and scale-level analyses based on the covariance/correlation structure are justified for all three subscales. In addition, item-level and scale-level analyses focused on mean-level differences between English- and Spanish-speaking Mexican American early adolescents on exploration and resolution are justified. However, caution should be used when interpreting mean differences between Spanish- and English-speaking early adolescents on the affirmation subscale.

The mean-level differences represent differences between the two language groups with respect to the meaning of a particular score on the measure. Put differently, our findings

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suggest that a score of 3 on the affirmation subscale has a different meaning for Spanish and English responders. Thus, any analyses of mean differences using different language versions (i.e., comparing English speakers to Spanish speakers) are uninterpretable because the values are not equivalent across groups. This does not mean that one language group scores higher, on average, than the other language group on ethnic identity affirmation; it simply means that we are unable to interpret any potential mean differences (or lack thereof) that emerge due to the difference between groups in the implied magnitude of the values.

With respect to construct validity, two notable patterns arose from these analyses: (1) All construct validity relationships involving ethnic socialization demonstrated invariance, and (2) none of the EIS measures were related to depression. First, the exploration and resolution subscales demonstrated scalar and functional language equivalence across all construct validity analyses, except those analyses involving our measure of ethnic socialization. Given the pattern of findings suggesting functional and scalar equivalence across the other construct validity analyses, the lack of invariant slopes/intercepts in the ethnic socialization analyses only are viewed as most likely a function of nonequivalence, and language bias, in the Spanish and English versions of the ethnic socialization measure. Second, though prior work on ethnic identity has shown that it is negatively related to depression (Mossakowski, 2003; Roberts et al., 1999; St. Louis & Liem, 2005), these studies were conducted with older samples. Our focus on early adolescence may help to explain the lack of association found here. Still, the slopes/intercepts describing associations between depression and exploration/resolution were invariant across language forms, addressing (and providing support for) the empirical question of measurement equivalence, if not the theoretical/developmental questions regarding the relationship between ethnic identity and depression in early adolescence. The latter may be an important issue for future research.

Conceptually, ethnic identity development is considered a normative developmental process for Latino youth (Umaña-Taylor et al., 2009a) and, if measured similarly by both language versions, the *exploration, resolution*, and *affirmation* constructs are expected to be related to conceptually relevant constructs (e.g., ethnic pride) in the same way across language versions. Put simply, if the translated scale is accurately measuring the construct of interest, we expect it to relate to the validity indicators in the same way that the English version of the scale did. Indeed, the purpose of the current study was to assess whether the English and Spanish versions of the EIS subscales accurately measure the constructs in both languages, an endeavor that will permit ethnic identity researchers to test this normative developmental theory with both Spanish- and English-speaking populations. It is important to note that we are not arguing that the process of ethnic identity formation is similar for English-dominant and Spanish-dominant groups (who are likely differentiated by immigration status and recency of immigration to the United States); in fact, we believe that processes may differ across these groups, given the differences in salience of ethnicity for the groups based on their social context and historical experiences (Umaña-Taylor et al., 2009a). However, findings from the current study provide researchers with confidence in knowing that the EIS is similarly measuring ethnic identity concepts in both language versions, and, thus, any differences in processes that may emerge in future research between groups that complete different language versions of the measure (e.g., a recent immigrant group who completed the measure in Spanish and a U.S.-born group that completed the measure in English) are indeed a result of differences in the process of ethnic identity rather than differences resulting from measurement error. More important, however, any mean-level differences that emerge between groups can only be interpreted for the exploration and resolution subscales, as the affirmation subscale does not demonstrate strict factorial invariance or slope *and* intercept equivalence, as discussed in detail previously.

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In terms of a potential recommendation for change in the EIS, although all three subscales performed reasonably well in the series of invariance model testing, there was a notable pattern suggesting that the early adolescent Mexican Americans in our study appeared to have difficulty with reverse-worded items. The EIS contains 17 items, 7 of which are reverse scored: All 6 of the affirmation items and 1 of 7 items on the exploration subscale (Item 2). The affirmation subscale did not achieve the highest levels of factorial invariance. Furthermore, Item 2 from the exploration subscale failed to load on the exploration construct in both groups. Taken together, results suggest that the reverse wording of items in the EIS may be problematic among early adolescent Mexican Americans regardless of language version. The absence of invariance model-fitting problems among the resolution analyses and with all positively worded items in the exploration subscale suggests that positive wording may be preferable. Indeed, a simple rewording of the reverse-worded items may address any factorial invariance issues identified with the affirmation subscale and may correct for the failure of Item 2 to load on the exploration dimension among samples of early adolescent English- and Spanish-speaking Mexican Americans.

In addition, the failure of the affirmation subscale to achieve scalar equivalence across language versions may also reflect problems with reverse-wording. The use of negative wording may be less common in the Spanish language. Consequently, many Spanish-speaking respondents may have responded to the items as if they were positively worded. For example, a Spanish-speaking respondent who was high on affirmation may have responded to “Si pudiera escoger, preferiría tener otro origen étnico que no fuera Mexicano/Mexicano Americano” (“If you could choose, you would prefer to be of an ethnicity that was not Mexican/Mexican American”) with a *very true* (5) rather than a *not at all true* (1), as if the item were positively worded. The mathematical implication of such misinterpretation of the items would be lower mean scores and intercepts in the construct validity analyses among Spanish-speaking respondents on the affirmation dimension. Our results showed that across all validity analyses involving the affirmation scale, Spanish-speaking respondents had lower intercepts than English-speaking respondents, providing mathematical support for the reverse-wording hypothesis. Consequently, a simple rewording of the items has considerable potential to address any problems associated with the scalar equivalence for this subscale.

As expected, families in which the early adolescents chose to complete the battery in Spanish reported lower levels of income and education than families in which the early adolescent chose to complete the battery in English. The former group was also more likely to have been born in Mexico (i.e., were first-generation Mexican American), compared to the latter group. The groups demonstrated similar language-use patterns, probably because the ARMSA assesses use in multiple contexts, including spoken/written language, music, and television. Prior research has shown that earlier generations of immigrants are more likely to have cultural orientations consistent with the culture of origin than with the host culture (Szapocznik, Santisteban, Kurtines, Perez-Vidal, & Hervis, 1984), suggesting that our Spanish-speaking early adolescents were more likely to have cultural orientations consistent with traditional Mexican culture than with mainstream U.S. culture. Therefore, the likely distribution of cultural orientations and observed distributions in socioeconomic statuses across language groups was in the expected direction, and any evidence of cross-language invariance (as seen for the resolution and exploration subscales) provides some indirect support for use of the measures across socioeconomic and cultural orientation groups as well. However, any evidence of noninvariance (as seen for the affirmation subscale) may be due to differences in socioeconomic status, cultural orientations, and/or language. However, because our construct validity results were replicated when family income and young adolescent generational status were controlled, we can be certain that the

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functional and scalar equivalence analyses were not influenced by group differences in these important sociodemographic variables.

The results of this study should be viewed in light of relevant study limitations. First, our findings may not generalize to other Spanish-speaking groups. Given the size and proportion of Mexican Americans in the United States (U.S. Census Bureau, 2004) and the amount of research conducted with this group (Umaña-Taylor et al., 2002), testing the measurement equivalence of the EIS within this population was important. However, our tests do not preclude the need to conduct similar tests with other Spanish-speaking groups. Second, the size of the Spanish-speaking group was small. Several sets of analyses indicated that we were adequately powered to reject a close-fitting model, and to estimate model parameters in the multigroup design for the exploration, resolution, and affirmation subscales. We also concluded that we were adequately powered to estimate the measurement model in our smaller, Spanish-speaking group for the exploration and resolution subscales. In light of the skewed nature of the data for the affirmation subscale, we may have been underpowered to estimate the measurement model in the Spanish-speaking group alone. However, we were able to identify important group differences in how the affirmation subscale performed in the Spanish- and English-speaking groups. Across all three subscales, we remain unable to answer one important question regarding power: What is the power to detect group differences in how the measures function? However, even with our relatively small number of Mexican American adolescents who preferred to complete the measures in Spanish, we were able to detect differences in factor loadings across language groups for the affirmation subscale. Overall, the issue of power in multigroup invariance testing deserves considerable attention. One important, as yet undetermined issue affecting the power of these kinds of studies is meaningfully defining the effect size of deviations from measurement invariance. Answers to the questions of how much and what kind of difference is meaningful for tests of invariance have yet to be determined (Cheung & Rensvold, 2002). Meanwhile, larger samples of Spanish-speakers are needed to examine the stability of the findings presented here. Third, we examined the cross-language item, functional, and scalar equivalence of the Spanish and English versions of each subscale separately, as three 1-factor models. A larger sample of Spanish speakers is needed to support similar assessments of the full 3-factor model of ethnic identity development.

In sum, this was the first study to examine the cross-language measurement equivalence of multiple dimensions of ethnic identity development (i.e., exploration, resolution, and affirmation), a notable gap in the ethnic identity literature. The results were favorable, demonstrating that the Spanish and English versions of the exploration and resolution EIS subscales achieved the highest levels of factorial invariance and equivalence and that the affirmation subscale demonstrated reasonably high levels of factorial invariance and equivalence, with some notable options for relatively small modifications that may facilitate scalar equivalence across language forms of this subscale. Specifically, future researchers using the EIS among samples of Spanish- and English-speaking Mexican Americans may consider modifying all reverse-scored items to make them positively worded, a change that may address issues with Item 2 (exploration) and all affirmation items. Future empirical evaluations of cross-language measurement equivalence also may benefit from diversifying the types of measures employed in the construct validity analyses by including construct validity indicators from sources other than mother and adolescent self-report. In addition, given the discrepancy in sample size for our Spanish-speaking versus English-speaking groups of adolescents, it will be important for future researchers to increase efforts to include more Spanish-speaking adolescent participants in their studies. More than 70% of parents in the current study preferred to complete their interviews in Spanish, and only 12% of adolescents preferred Spanish. Efforts to include more Spanish-speaking youth may involve oversampling for recent immigrants, interviewing adolescents from these families

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immediately upon their entry into the United States, interviewing adolescents with shorter-term exposure to the U.S. school system, and sampling from neighborhoods that are highly supportive of Latino culture and language (Roosa et al., 2008). More important, as researchers working with language-diverse populations increasingly offer multiple-language versions of their batteries, this study offers a framework for empirically evaluating the cross-language measurement equivalence of translated measures.

Appendix

Table A1

Ethnic Identity Subscale Items in English and Spanish

	Item in English ***Item in Spanish***
Item 2[a]	You have not participated in any activities that would teach you about your background. *No he participado en ninguna actividad que me enseñara sobre mi origen.*
Item 4	You have experienced things that reflect your background, such as eating food, listening to music, and watching movies. *He experimentado cosas que reflejan mi origen, como comer comida, escuchar música y ver películas.*
Item 5	You have attended events that have helped you learn more about your background. *He asistido a eventos que me han ayudado a aprender más acerca de mi origen.*
Item 6	You have read books/magazines/newspapers or other materials that have taught you about your background. *He leído libros/revistas/periódicos u otros materiales que me han enseñado acerca de mi origen.*
Item 8	You have participated in activities that have exposed you to your background. *He participado en actividades que me han expuesto a mi origen.*
Item 11	You have learned about your background by doing things such as reading (books, magazines, newspapers), searching the Internet, or keeping up with current events. *He aprendido acerca de mi origen al hacer cosas como leer (libros, revistas, periódicos), buscar en el internet o mantenerme al día con eventos actuales.*
Item 15	You have participated in activities that have taught you about your background. *He participado en actividades que me han enseñado acerca de mi origen.*
Resolution	
Item 3	You are clear about what your background means to you. *Tengo claro lo que significa para mi, mi origen.*
Item 12	You understand how you feel about your background. *Entiendo cómo me siento acerca de mi origen.*
Item 14	You know what your background means to you. *Sé lo que mi origen significa para mí.*
Item 17	You have a clear sense of what your background means to you. *Tengo un sentido claro de lo que mi origen significa para mí.*
Affirmation	
Item 1[a]	Your feelings about your background are mostly negative. *Mis sentimientos sobre mi origen son mayormente negativos.*
Item 7[a]	You feel negatively about your background. *Me siento negativo/a acerca de mi origen.*
Item 9[a]	You wish you were of a cultural background that was not [Mexican/Mexican American]. *Quisiera ser de un origen étnico que no fuera [Mexicano/Mexicano Americano].*

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	Item in English ***Item in Spanish***
Item 10[a]	You are not happy with your background. *No estoy contento/a con mi origen.*
Item 13[a]	If you could choose, you would prefer to be of an ethnicity that was not [Mexican/Mexican American]. *Si pudiera escoger, preferiría tener otro origen étnico que no fuera [Mexicano/Mexicano Americano].*
Item 16[a]	You dislike your background. *No me gusta mi origen.*

[a]. Reverse-scored item.

Source: English items reprinted with permission from Umaña-Taylor, A. J., Yazedjian, A., & Bámaca-Gómez, M. (2004). "Developing the Ethnic Identity Scale Using Eriksonian and Social Identity Perspectives." *Identity: The International Journal of Theory and Research, 4*, 9–38 (Taylor & Francis Group, UK).

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Table A2

Correlations Among Ethnic Identity Scale Items for English-Speaking (n = 596) and Spanish-Speaking Participants (n = 82)

	Exploration							Resolution				Affirmation					
Items	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
Exploration																	
Item 1[a]	—	.07	.11	.06	.18	.02	−.04	−.04	.19	.03	.22*	.24*	.15	.18	.12	.45***	.23*
Item 2	−.03	—	.32**	.25*	.03	.31**	.16	.36**	.45***	.43***	.37***	.05	.01	.18	−.08	.01	.22*
Item 3	−.06	.39***	—	.43***	.36**	.35**	.62***	.38***	.31**	.48***	.35**	.15	.07	.14	.08	−.01	.23*
Item 4	.01	.27***	.40***	—	.27*	.59***	.44***	.33**	.22*	.32**	.43***	−.05	−.03	−.14	−.11	−.15	.06
Item 5	−.01	.28***	.39***	.36***	—	.32**	.47***	.32**	.10	.26*	.18	−.02	−.14	−.07	.01	−.08	−.05
Item 6	−.01	.28***	.45***	.56***	.38***	—	.45***	.47***	.34**	.44***	.43***	−.12	−.05	−.07	−.02	−.14	.10
Item 7	.04	.32***	.57***	.49***	.56***	.50***	—	.52***	.25*	.45***	.28*	−.03	−.15	.03	−.06	−.23*	.13
Resolution																	
Item 8	−.09**	.35***	.38***	.32***	.25***	.33***	.31***	—	.53***	.70***	.53***	.01	−.05	.15	.05	−.01	.17
Item 9	−.03	.37***	.37***	.37***	.29***	.39***	.38***	.56***	—	.62***	.59***	.21	−.01	.32**	.11	.14	.36***
Item 10	−.03	.36***	.37***	.31***	.26***	.37***	.37***	.59***	.66***	—	.59***	.01	−.13	.08	−.05	−.08	.08
Item 11	−.01	.38***	.39***	.33***	.27***	.39***	.37***	.60***	.58***	.67***	—	.10	.01	.22*	.12	.15	.18
Affirmation																	
Item 12[a]	.26***	.12*	.02	−.01	−.02	.01	.06	.04	.06	.08*	.10*	—	.68***	.43***	.36**	.41***	.30**
Item 13[a]	.25***	.09*	−.04	−.04	−.13	−.09*	−.07	.01	.02	.03	.04	.57***	—	.30**	.36**	.38***	.34**
Item 14[a]	.15**	.18***	.03	−.01	−.11**	−.03	.01	.09*	.09*	.09*	.12**	.38***	.44***	—	.35**	.35**	.49***
Item 15[a]	.07	.07	.01	.05	.04	.03	.01	.07	.06	.11**	.10*	.22***	.15**	.26***	—	.33**	.50***
Item 16[a]	.19***	.14**	.01	−.01	−.06	.03	−.03	.11**	.09*	.08	.17***	.44***	.29***	.42***	.20***	—	.42***
Item 17[a]	.16***	.09*	−.01	−.04	−.10	−.01	−.07	.12**	.07	.16***	.08*	.34***	.39***	.35***	.23***	.29***	—

Note: English-speaking participants' correlations below the diagonal, and Spanish-speaking participants' correlations above the diagonal.

[a] Indicates a reverse-coded item.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

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Table A3

Means and Standard Deviations of Subscale Items

	English-speaking (*n* = 596)	Spanish-speaking (*n* = 82)
Subscale	**M (*SD*)**	**M (*SD*)**
Exploration		
Item 2[a]	3.68 (1.31)	3.73 (1.32)
Item 4	4.49 (0.79)	4.52 (0.86)
Item 5	3.86 (1.06)	4.05 (1.06)
Item 6	3.49 (1.25)	3.70 (1.19)
Item 5	3.36 (1.29)	3.24 (1.42)
Item 8	3.58 (1.18)	3.85 (1.09)
Item 11	3.61 (1.21)	3.88 (1.10)
Resolution		
Item 3	4.28 (0.88)	4.41 (0.87)
Item 12	4.39 (0.83)	4.48 (0.74)
Item 14	4.37 (0.87)	4.46 (0.76)
Item 17	4.17 (0.88)	4.32 (0.84)
Affirmation		
Item 1[a]	4.29 (1.03)	3.90 (1.28)
Item 7[a]	4.61 (0.91)	4.20 (1.37)
Item 9[a]	4.73 (0.69)	4.41 (1.09)
Item 10[a]	4.78 (0.79)	4.70 (1.01)
Item 13[a]	4.52 (0.88)	4.56 (0.95)
Item 16[a]	4.83 (0.70)	4.70 (0.96)

[a]. Indicates a reverse-coded item.

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Biographies

Rebecca M. B. White is an assistant professor at Arizona State University (ASU), Tempe, in the School of Social and Family Dynamics. She received her PhD in family and human development from ASU and her MPH from the University of Arizona, Tucson. Her research interests include measurement/methodological issues in research with ethnic minority families, and cultural and contextual influences on psychosocial adjustment.

Adriana J. Umaña-Taylor is an associate professor of family and human development at ASU in the School of Social and Family Dynamics. She received her PhD in human development and family studies from the University of Missouri-Columbia. Her research interests include adolescents' ethnic identity formation, familial socialization processes, and psychosocial well-being (e.g., psychological adjustment, academic achievement).

George P. Knight, PhD, is professor and social/developmental psychologist in the Department of Psychology at ASU. He received his doctorate from University of California, Riverside. His research interests include cultural adaptation in immigrant and minority youth and adults as well as methodological issues associated with research on ethnic minority families.

Katharine H. Zeiders, MS, is a family and human development doctoral student in the School of Social and Family Dynamics at ASU, Tempe. Her interests include cultural stressors, social support and risk and resiliency processes among Mexican American youth.

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Table 1

Cross-Language Factorial Invariance Model Testing for the Ethnic Identity Scale Administered to English- and Spanish-Speaking Mexican American Adolescents

Subscale	df	χ^2 Value	Comparative fit index	Root mean square error of approximation	Standardized root mean square residual	Akaike information criterion	$\Delta\chi^2(df)$ S-B χ^2 2Δ $(df)^b$
Exploration							
Configural invariance	28	111.38	0.93	0.09	0.04	13,671.30	—
Configural invariance[a]	26	54.31	0.98	0.06	0.03	13,618.22	—
Weak invariance	32	56.98	0.98	0.05	0.03	13,608.90	2.68(6)
Strong invariance	38	63.16	0.98	0.04	0.04	13,603.08	6.18(6)
Strict invariance	45	72.23	0.98	0.04	0.04	13,598.14	9.07(7)
Resolution							
Configural invariance	4	12.62	0.99	0.08	0.02	5,670.55	—
Weak invariance	7	15.04	0.99	0.06	0.02	5,666.98	2.43(3)
Strong invariance	10	15.95	1.00	0.05	0.02	5,661.89	0.91(3)
Strict invariance	14	19.44	1.00	0.03	0.03	5,657.37	3.49(4)
Affirmation							
Configural invariance	18	53.01	0.91	0.08	0.04	9,498.46	—
Configural invariance[a]	16	25.56	0.97	0.04	0.03	9,455.84	—
Weak invariance	21	32.12	0.97	0.04	0.05	9,454.82	5.26(5)
Strong invariance	26	42.12	0.96	0.04	0.07	9,456.42	11.72(5)*
Strict invariance	32	71.10	0.90	0.06	0.15	9,518.91	20.84(6)**
Partial strict invariance	30	44.81	0.96	0.04	0.10	9,463.48	4.35(4)[c]

[a] Represents an adjusted configural model in which unique factor variances were permitted to correlate in both language groups to improve model fit.

[b] For exploration and resolution, under maximum likelihood estimation, the chi-square difference test is employed. For affirmation, under maximum likelihood restricted estimation, the Sattora–Bentler chi-square difference test is employed.

[c] Compares the partial strict model to the strong invariance model.

* $p < .05$.

** $p < .01$.

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Table 2

Unstandardized Path Coefficients for Slope and Intercept When Adolescent Report on Exploration, Resolution, and Affirmation Were Regressed on Each Construct Validity Measure.

	Exploration		Explorationa		Resolution		Affirmation	
	Slope	**Intercept**	**Slope**	**Intercept**	**Slope**	**Intercept**	**Slope**	**Intercept**
Ethnic socialization	0.19* (.61*)	3.11 (1.85)	0.23* (.66*)	3.01 (1.73)	0.15* (.59*)	3.84 (2.50)	0.01	4.59 (4.38)
Ethnic pride	0.53**	1.37	0.63**	0.93	0.39**	2.47	0.18*	3.84 (3.60)
Mexican American cultural values	0.52**	1.58	0.71**	0.80	0.73**	1.28	−0.32*	5.94 (5.76)
Family and social support	0.29**	2.48	0.33**	2.31	0.32*	2.91	0.03	4.50 (4.28)
Active coping	0.37**	2.35	0.44**	2.10	0.45**	2.65	0.07*	4.36 (4.15)
Depression	−0.01	3.77	−0.01	3.79	−0.02	4.38	0.01	4.59 (4.39)

Note: Mothers reported on ethnic socialization. Adolescents reported on all other construct validity measures. When coefficients were identical across language groups only the constrained value is presented. When coefficients were significantly different across language groups, both groups' coefficients are presented: English (Spanish).

[a] Path coefficients omitting Item 2 from the exploration latent construct.

* $p < .05$.

** $p < .01$.