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## Family Environment, Heritage Language Profiles, and Socioemotional Well-being of Mexican-origin Adolescents with First Generation Immigrant Parents

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### Abstract

Although Mexican-origin youth with first-generation immigrant parents are relatively good at retaining their heritage language of Spanish, limited research has been conducted on their Spanish language development during adolescence. From three-wave longitudinal data across six years ( $N_{\text{wave1}} = 604$ ,  $M_{\text{age.wave1}} = 12.91$ , 54% female), distinct groups of adolescents with consistently high, improved, declined, and consistently low Spanish proficiencies were identified. Family relationship quality was more predictive of adolescents' Spanish proficiency than family language environment. The benefits of Spanish proficiency were consistent across adolescents' ethnic

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Authors' Contributions

JW conceived of the study, drafted the manuscript, and provided critical review and editing of the manuscript; WW conducted the data analyses, draft portions of the manuscript, and provided critical review and editing of the manuscript; LS drafted portions of the manuscript and provided critical review and editing of the manuscript; LX drafted portions of the manuscript and provided critical review and editing of the manuscript; JY drafted portions of the manuscript and provided critical review and editing of the manuscript; SYK created the design of the larger project and was responsible for data collection and curation, project management, and supervision of the current research. She also participated in the conceptualization of the current study and interpretation of the results, and provided critical reviews of the manuscript. All authors read and approved the final manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

identity, resilience, and life meaning. More research and practical attention to parent-adolescent relationships is needed to capitalize on the continued plasticity of adolescents' Spanish language development and to promote consequent positive outcomes.

### Keywords

Mexican-origin youth; heritage language; ethnic identity; resilience; life meaning

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### Introduction

The retention of heritage language is critical for the positive development of linguistic minority youth and for the cultural diversity of the larger society (Portes & Hao, 2002). Yet research has documented universal preference for and mastery of English across linguistic minority populations (August et al., 2006), as well as rapid loss of heritage language across immigrant generations (Portes & Hao, 2002). Even bilingual children were generally stronger in English than in their heritage language (August et al., 2006). As such, it is the heritage language, rather than English, that is at risk of inadequate development for diverse youth in the US. However, despite the assimilation pressure and life challenges in the host country of US, Mexican-origin youth with first-generation immigrant parents are exceptionally good at retaining their heritage language of Spanish (Tran, 2010). But whether and how within-group variations exist in their heritage language development are not well understood. Such research is particularly lacking beyond childhood when heritage language development continues but research attention disappears. To address these gaps, this study examines the profiles and transitions of Spanish proficiency across six years during adolescence among Mexican-origin youth with first-generation immigrant parents. Further, this study examines whether and how family language environment and family relationship quality matter for adolescents' heritage language development. In addition, a strength-based focus was adopted to examine whether and how Spanish language development is associated with positive outcomes that are particularly consequential for these Mexican-origin youth, including ethnic identity, resilience, and life meaning.

### Culturally Relevant Ecological Perspective of Minority Adolescents' Development

Youth-focused strength-based approaches have been applied primarily to White youth from relatively high socioeconomic backgrounds (Lerner et al., 2017). The contextual challenges and assets, positive developmental indicators, and developmental processes unique to minority youth are largely excluded or underexamined in the literature. Family and developmental researchers have been increasingly advocating for culturally relevant ecological perspectives in understanding minority children's development (Lerner et al., 2017; Stern et al., 2021). When Bronfenbrenner's bioecological systems model was adapted for racial/ethnic minority youth (Kuperminc et al., 2009; Stern et al., 2021), distinct culturally specific factors were highlighted, including racial/ethnic socialization, heritage language, ethnic identity, and resilience, within the backdrop of systemic oppression facing youth.

Specifically, language defines and sustains social stratification, and language prejudice associated with US's historical monolingual English ideology uniquely challenges the development of linguistic minority youth, including those of Mexican origin (Medvedeva, 2011). Prevalent misunderstandings, hesitations, and reserved support among socialization agents and institutions (e.g., parents, teachers, schools, and out-of-school programs, etc.) prevented heritage language to be commonly or consistently embraced as a cultural asset for linguistic minority youth (Sawyer et al., 2017). Even Mexican-origin youth with first-generation immigrant parents, whose heritage language retention exceeds that of any other linguistic minority group (Tran, 2010), received limited recognition and research attention on the development of their heritage language of Spanish<sup>1</sup>.

The development of heritage language is particularly understudied beyond childhood. Insofar as childhood is considered as a cognitively critical period for language development by mainstream linguistic theories (Montrul, 2010), adolescence may be construed as a socially critical period for heritage language development, considering the profound amount of rapid and dramatic socioemotional changes during this period (Pułaczewska, 2021). For linguistic minority adolescents, in particular, the accelerated development of racial/ethnic identity, the heightened pressure to succeed in the English-dominant mainstream educational system, and adjustment in parent-child and peer dynamics are some potential social factors that can impact adolescents' ongoing heritage language development. Yet change-sensitive longitudinal investigation and person-centered examination relating to adolescents' heritage language are lacking in research on minority youth (Lerner et al., 2017). For instance, do Mexican-origin youth follow different timelines and trajectories to develop their Spanish? What increase, decrease, fluctuating, or stable patterns exist for Mexican-origin adolescents' Spanish? How are these patterns associated with socialization predictors and developmental outcomes? This study strives to shed light on the answers to these questions.

### Heritage Language Development during Adolescence

Previous studies on heritage language development generally focused on the deceleration, loss, or attrition of heritage language across generations (e.g., Oh & Fuligni, 2010) and at school entry when the mainstream language starts to dominate their education (e.g., Hiebert, 2020). Only one study to our knowledge has specifically examined the development of heritage language development of Mexican-origin youth during adolescence. Linear increase in Spanish proficiency from adolescence to young adulthood were found when growth curve models were fitted for self-reported Spanish proficiency from 2<sup>nd</sup> generation Latina/x/o youth across three waves spanning ten years (Tran, 2010). The finding was robust when Spanish proficiency across understanding, speaking, reading, and writing domains were examined separately and collectively. While all groups (i.e., youth with Mexican, Cuban, Colombian, Dominican, Nicaraguan, and Central/South American origins) on average reported good Spanish proficiency at the beginning of the study, the proficiency level of Mexican-origin youth was the highest. This study underscored Latina/x/o adolescents' ability to retain and continuously develop heritage language, particularly for youth of

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<sup>1</sup>This study focuses on Spanish language, as it is the most common of various heritage languages shared in Mexican-origin individuals.

Mexican origin. It also documented coherent development across proficiency domains of understanding, speaking, reading, and writing.

However, growth curve models are limited by their assumption of homogeneity – assuming all individuals in the sample share the same developmental pattern. Important interindividual differences in Mexican-origin adolescents' development may be masked. Uncovering whether different adolescents have different increasing, declining, or fluctuating development of Spanish during adolescence, as well as the predictors and outcomes associated with such intragroup variations are important for research, parenting, education, and policy applications. That is, such research can inform what socialization strategies are effective for Spanish language development during adolescence, and how different language trajectories are associated with specific developmental outcomes. Then, targeted and evidence-based intervention, prevention, and promotion programs across adolescents' developmental contexts can be offered to support their heritage language and consequent positive development. Universal and group-specific policies can be purposefully developed and implemented to support sustainable linguistic diversity and social justice across linguistic groups.

### **Family Environment and Heritage Language Development**

Family is a critical context for youth to develop and sustain their heritage language (Cox et al., 2021), especially for linguistic minority children, whose heritage language is not usually taught in mainstream U.S. communities (Park et al., 2012). The family language environment benefits children's language development through material support, casual transmission of knowledge, and intentional teaching of skills (Mol & Bus, 2011). Children's frequent use of heritage language has been suggested to be the best venue to retain and develop it (Tran, 2010). First-generation Mexican-origin immigrant parents generally have limited English proficiency and commonly speak Spanish at home (Burriss, 2021), providing rich opportunities for children's Spanish language development. However, increased use of English relative to heritage language in the family was commonly observed for linguistic minority youth during adolescence (Kim et al., 2020). Still, the use of Spanish in the home context (Portes & Hao, 1998), no matter from adolescents to parents (Tran, 2010), or from parents to adolescents (Arriagada, 2005), all positively predicted Mexican-origin adolescents' Spanish proficiency. But most of these findings concern how home language use relates to Spanish proficiency at a point in time rather than with the development of Spanish proficiency over time, especially during adolescence when language proficiency was viewed as largely stabilized in mainstream linguistic research (Montrul, 2010). This study challenges this view by examining the extent to which heritage language development remains malleable during adolescence. Both language use and proficiency at a particular time can be transitional. Cross-sectional assessments greatly underestimate the amount of effort and support that is required for individuals' heritage language development. Only the above-noted longitudinal study (Tran, 2010) showed adolescents' use of Spanish with parents and others positively predicted the rate of increase in their Spanish proficiency. To enrich the understanding of how family language environment is associated with adolescents' heritage language development, this study examines the potential predictive

effects of parents' and adolescents' Spanish use on adolescents' profiles and transitions of Spanish proficiency overtime.

Meanwhile, beyond actual language use, family relationship quality is critical to offspring's language development. Sensitive, responsive, and supportive parenting helps ensure the effectiveness of family literacy practices on children's language development through positive parent-child interactions and children's engagement (Roberts et al., 2005); this process extends into adolescence, as positive family relationships continue to provide the foundation for parents to enforce and for children to endorse heritage values, norms, and language. Affective attachment among family members was considered central for heritage language retention in Hispanic origin youth, as youth considered home to be the most natural and comfortable place to speak Spanish (Guardado & Becker, 2014). Even if family relationships did not necessarily increase Mexican-origin adolescents' use of Spanish, it was consistently associated with higher Spanish proficiency of the adolescents (Oh & Fuligni, 2010). Thus, close family relationship might encourage adolescents' sophisticated mastery and use of heritage language, as they process and communicate complex personal, psychological, and social issues with family members. However, how family relationship quality influences stability and change of adolescents' heritage language development remains to be clarified.

In addition, as in other cultural groups, Mexican-origin fathers and mothers usually play different roles in families, with fathers being stricter and more authoritarian than mothers, while mothers are more nurturing and child-centered than fathers (Parra-Cardona et al., 2008). Some research has documented different effects between fathers and mothers on children's heritage language development. For example, mothers' bilingualism was found to be more beneficial than fathers' bilingualism on children's bilingualism based on longitudinal data on Asian and Latina/x/o Americans from U.S. census (Chen & Kang, 2019). Other demographic and socioeconomic factors (e.g., age of arrival, education) also frequently differed between fathers and mothers in their effects on children's heritage language skills. The parent-child relationship also gets realigned in adolescence, as exemplified by a recent study with Mexican-origin families, which noted decreases in maternal warmth, maternal hostility, and paternal warmth, as well as increase in paternal hostility (Chen et al., 2021). Thus father-child and mother-child relationships may further differentiate during adolescence. Yet little research to date has comprehensively examined how language use and relationship quality in father-adolescent and mother-adolescent interactions specifically predict adolescents' heritage language development.

### **Socioemotional Outcomes of Heritage Language Development**

Although heritage language development among linguistic minority youth is not adequately supported in general, its contribution to adolescents' positive development is undeniable. First, heritage language is a prominent contributor to adolescents' ethnic identity and cultural solidarity (Phinney et al., 2001). It is through heritage language that cultural assets are accumulated and passed on, ethnic membership and belongingness are generated, and representation of oneself within and beyond the ethnic group is constructed (Duff, 2007). A meta-analysis with 18 studies across childhood, adolescence, and young adulthood

revealed consistent positive correlations between heritage language proficiency and multiple dimensions of ethnic identity across different ethnic groups, including those of Mexican origin (Mu, 2015). As the exploration, affirmation, and formation of one's identity, including ethnic identity of minority youth, is particularly active during adolescence (Berry, 2006), the increase, decrease, and fluctuation of heritage language, may all have different implications for ethnic identity.

Secondly, as a unique cultural asset, heritage language development may help sustain and promote Mexican-origin adolescents' resilience when facing life challenges. Indicating adolescents' potential to achieve optimal development despite adversities (Masten, 2001), resilience is crucial for Mexican-origin youth, as they frequently encounter challenges associated with social inequalities in the US, including discrimination, prejudice, and community violence (Holleran & Jung, 2005). Protective factors from different levels of adolescents' developmental ecology can engender resilience in them (Cardoso & Thompson, 2010; Stein et al., 2013). Mastery of heritage language can lead to adolescents' competence and confidence, especially in contexts where their heritage language is used and valued. Mastery of heritage language also makes it easy for youth to receive support from their English-limited parents, grandparents, and mentors of their ethnic community. Studies have documented the positive associations between heritage language and protective factors across various domains, including school effort (Kim & Chao, 2009), academic achievement (Stevenson et al., 2019), and parental warmth (Chao & Kanatsu, 2008).

In turn, heritage language may also help youth find meaning in life, which signifies the extent to which youth see their life as significant, meaningful, and purposeful (Steger, 2009). Mastery of heritage language can make youth more resourceful by facilitating their access to knowledge, information, technologies, tools, products, and relationships from people and settings sharing the same heritage language, beyond the mainstream English-speaking U.S. context. Youth can have multiple reference frameworks to define themselves and their relationship with the world. Mastery of heritage language also expands one's life meaning through a stronger connection with the heritage culture's past and future. Mastery of heritage language enables individuals to have embodied feelings and experiences of the language, especially for meaning and phenomena not translatable to other languages, which can fuel personal sense of responsibility and hope for cultural continuance (McCarty et al., 2018).

Therefore, despite the scarcity of research directly linking heritage language with resilience and life meaning, evidence did exist that, Mexican-origin adolescents providing English-Spanish translation assistance to parents can yield positive developmental outcomes, including linguistic benefits, socioemotional benefits, self-efficacy, positive parent-child relationships, and parental dependence (Kim et al., 2017). All these heritage language relevant benefits were positively associated with their resilience and life meaning. However, again, these important but rare observations are based on cross-sectional studies at one point in time. If heritage language development unfolds and fluctuates over the life span, what implication do language change patterns have for adolescents' ethnic identity, resilience, and life meaning? Do the effects vary across adolescents with different language change patterns? The lack of longitudinal and person-centered studies limited our ability to answer

these questions. Thus, this study also examines how Mexican-origin adolescents' Spanish language change patterns are associated with these important socioemotional outcomes.

## Current Study

To enrich the understanding of heritage language development and within-group variations of Mexican-origin adolescents with first-generation immigrant parents, this study aims to answer three questions. First, profiles and transition patterns of Spanish language proficiency were explored across three different time points during adolescence. Next, whether and how language use and relationship quality in father-adolescent and mother-adolescent interactions predict adolescents' Spanish language transition patterns were examined. Finally, how Spanish language transition patterns are associated with the socioemotional outcomes of ethnic identity, resilience, and life meaning were investigated. Different transition patterns of adolescents' Spanish language proficiency were expected across the time points, including stable, improved, and declined proficiency. Frequent use of Spanish language and positive parent-child relationships, especially between mothers and adolescents, were hypothesized to be associated with more favorable Spanish language transition patterns. In turn, more favorable Spanish language transition patterns were expected to be associated with more positive ethnic identity, greater resilience, and greater life meaning.

## Methods

### Participants

The current data came from a three-wave longitudinal dataset on a project focusing on Mexican immigrant families (Wave 1: 2012 – 2015; Wave 2: 2013 – 2016; Wave 3: 2017 – 2020). At Wave 1, 604 Mexican American families were recruited in central Texas. Participating adolescents were in 6<sup>th</sup>-8<sup>th</sup> grades at Wave 1, and their ages ranged from 11.00 to 15.00 ( $M_{age} = 12.91$ ,  $SD = .97$ ). Slightly more than half of the adolescent sample was female (54%,  $N = 328$ ). Approximately 76% of adolescent participants ( $N = 455$ ) are US-born, while most of their parents were born outside the U.S. (99.3 % of mothers and 98.6 % of fathers). The median and mean household income was between \$20,001 and \$30,000 at Wave 1, and the average of the highest parent education level was some middle/junior high school. At Wave 2, 483 (80%) Mexican-origin families remained in participation, while 334 (55%) families continued participating at Wave 3.

Attrition analyses were conducted to examine if there were any differences in demographic variables and core study variables between retained families and families that quit. No significant differences were found between Wave 1 and Wave 2, except that parents from families with a higher education level are more likely to continue participating at Wave 2 ( $t_{mother} (591) = 2.41$ ,  $p < .05$ ;  $t_{father} (291) = 3.13$ ,  $p < .01$ ). Significant differences were found between Wave 2 and Wave 3. Specifically, adolescents are more likely to remain in the third wave if they reported a younger age ( $t_{age} (481) = .99$ ,  $p < .01$ ) in the second wave.

## Procedure

Target families were initially recruited via school presentations, public records, and community recruitment between 2012 and 2015. Families were eligible to participate if parents were of Mexican-origin and had a child in middle school who translated for at least one parent. A family visit was scheduled once families decided to participate. Before completing questionnaires, parents were required to provide informed consent, and adolescents were required to provide informed assent. Bilingual interviewers administered the questionnaires by reading questions aloud to participants and recording participants' responses on a laptop computer. Both Spanish and English versions of the questionnaire were prepared. The English questionnaires were first translated to Spanish and then back-translated to English. The discrepancies in this translation process were addressed by discussion among bilingual translators. The three waves of data were collected following the same procedures as in Wave 1. Families participating in the data collection were compensated \$60 at Wave 1, \$90 at Wave 2, and \$90 at Wave 3.

## Measures

**Profiles of heritage language proficiency.**—Adolescent heritage language proficiency profiles were identified using latent profile analysis across three waves. The indicators of adolescent heritage language proficiency profiles were measured on three aspects of adolescents' Spanish proficiency: reading (1 item; how well do you read in Spanish?), writing (1 item; how well do you write in Spanish?), and speaking and understanding (1 item; how well do you speak and understand Spanish?) at Waves 1, 2 and 3. The scale of each indicator is ranged from 1 (not well) to 5 (extremely well).

### Family language environment.

**Parent language use.:** Parent language use at Wave 1 was measured by one item adapted from a previous study (Tseng & Fuligni, 2000): "When you speak to your child, what language(s) do you use?". Both mothers and fathers responded to the item on a four-point scale (1 = *Spanish*, 2 = *Spanish and English, but mostly Spanish*, 3 = *English and Spanish, but mostly English*, and 4 = *English*).

**Adolescent language use.:** Adolescent language use at Wave 1 was assessed by one item adapted from the same study as before (Tseng & Fuligni, 2000): "When your child speaks to you, what language(s) does he/she use?". Both mothers and fathers responded to the item on the same four-point scale.

### Family relationship quality.

**Parental warmth.:** Paternal and maternal warmth at Wave 1 was each assessed by a 7-item scale adapted from the Iowa Youth and Families Project (Conger et al., 1995). Using responses ranging from 1 (*never*) to 7 (*always*), mothers and fathers reported on items, such as: "[Do you] listen carefully to your child's point-of-view (what he/she thinks)?" Higher mean scores reflecting higher levels of parental warmth and better family relationship quality ( $\alpha_{mothers} = .79$ ;  $\alpha_{fathers} = .93$ ).



**Parental hostility.:** Paternal and maternal hostility at Wave 1 was also assessed by a 7-item scale adapted from the Iowa Youth and Families Project (Conger et al., 1995). Using the same rating scale, mothers and fathers self reported on items, such as: “[Do you] Shout or yell at your child because you were mad at him/her?” Higher mean scores reflecting higher levels of parental hostility and worse family relationship quality ( $\alpha_{mothers} = .83$ ;  $\alpha_{fathers} = .79$ ).

### **Socioemotional outcomes.**

**Ethnic identity.:** Adolescent ethnic identity at Wave 3 was measured based on three measures of ethnic identity (i.e., centrality, exploration, and resolution). Adolescents self-reported these three measures using a five-point scale (1=*strongly disagree* to 5=*strongly agree*). The 3-item measure of ethnic identity centrality was adapted from the centrality subscale in the Multidimensional Inventory of Black Identity Scale (MIBIS; Sellers et al., 1997), while the 3-item exploration and 3-item resolution measures were adapted from corresponding subscales in the Ethnic Identity Scale (EIS; Umaña-Taylor et al., 2004). A sample item for centrality is “Being Mexican is an important part of who I am”; a sample item for exploration is, “I have often done things that will help me understand my Mexican background better”; and a sample item for resolution is, “I know what being Mexican means to me.” Higher mean scores show stronger ethnic identity ( $\alpha_{centrality} = 0.66$ ; exploration:  $\alpha_{w3} = .85$ ; resolution:  $\alpha_{w3} = 0.87$ ).

**Resilience.:** Adolescent sense of resilience at Wave 3 was assessed using 3 items adopted from the Connor-Davidson Resilience Scale (Connor & Davidson, 2003): “I am not easily discouraged by failure.”, “I can deal with whatever comes,” and “I tend to recover easily after an illness or hardship”. Adolescents reported their resilience on a 5-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*, with higher mean scores reflecting a greater sense of resilience ( $\alpha = .77$ ).

**Life meaning.:** Adolescent sense of life meaning at Wave 3 was measured using 3 items adopted from the meaning in life questionnaire (Steger et al., 2006): “My life has a clear sense of purpose,” “I understand my life’s meaning,” and “I have a good sense of what makes my life meaningful.” Adolescents rated on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). Higher mean scores indicate a greater sense of life meaning among Mexican-origin adolescents ( $\alpha = .88$ ).

**Covariates.**—A set of demographic variables were measured as covariates, including adolescent gender (i.e., female and male), nativity (i.e., whether born in the US or not), age, the parental highest level of education, and the average annual household income. Using an 11-point scale, each parent reported family income in \$10,000 increments (from 0 = less than \$10,000 to 11 = more than \$110,000).

### **Analysis plan**

Mplus 8.3 were utilized to conduct the analysis in four steps (Muthén & Muthén, 2017). First, latent profile analysis (LPA) was conducted at each wave based on Spanish speaking/ understanding, reading, and writing skills to identify different heritage language proficiency

profiles at each wave. The optimal number of profiles at each wave was chosen based on the recommendations about model indices (e.g., AIC, BIC, ABIC, LMR test) from Nylund et al. (2007) and the conceptual meaning of each profile. Second, latent transition profile analysis was conducted to identify different change/stability patterns of heritage language proficiency profiles from Wave 1 to Wave 3. Similar patterns were grouped together to form meaningful heritage language proficiency transition profiles. Third, one multinomial regression model was conducted to assess the association between family environment at Wave 1 (i.e., family language environment and family relationships environment) and heritage language proficiency transition profiles. Demographic information, including parental education, income, adolescent nativity, gender, and age, was included in the model as covariates. Fourth, multiple group comparison analysis was conducted to examine whether adolescent developmental competencies (i.e., ethnic identity, resilience, and life meaning) at Wave 3 vary across different heritage language proficiency transition profiles. Developmental competencies were modeled separately with demographic information and Wave 1 developmental competencies as covariates. Full information maximum likelihood (FIML) approach was applied in Mplus to handle missing data.

## Results

### Heritage Language Proficiency Profiles

The descriptive information and correlation of study variables are shown in Supplemental Table S1. Latent profile analyses discovered the same two profiles of youth with high versus low Spanish proficiency at each wave based on model fit indices and the conceptual meaning of profiles (Figure 1). Specifically, 43% of youth were grouped in the Low Proficiency profile characterized by lower levels of Spanish speaking/understanding, reading, and writing skills compared to youth in the High Proficiency group at Wave 1. At Wave 2, 23% of youth were identified as Low Proficiency, and the percentage increased to 41% at Wave 3.

Across three waves, latent transition analyses discovered four heritage language (i.e., Spanish) proficiency transition profiles, including youth with consistently high (Stable High group; 49%), improved (Improved group; 15%), declined (Declined group; 9%), and consistently low (Stable Low group; 25%) proficiency in Spanish (Table 1). The other nine youth were excluded from future analyses given the lack of consistent transition patterns (e.g., being in the High Proficiency group at Wave 1 and 3 and the Low Proficiency group at Wave 2) and the small sample size (i.e., nine).

### Predictors of Heritage Language Proficiency Transition Profiles

Multinomial logistic regression analyses revealed the association between family environment and youth heritage language proficiency transition profiles after controlling for demographic information (i.e., youth age, gender, nativity, as well as parental income and education). Given that the Stable High group is the largest group, Table 2 displays the results of the association when the Stable High group is the reference group. Transition profiles were rotated to be the reference group to fully compare each set of profiles (See Table S2 for the results using the Stable Low group as the reference group). In terms of

family language environment, there was no significant relation between paternal or maternal Spanish use at home and youth heritage language proficiency transition profiles. Youth who used more English when speaking to mother were more likely to be in the Stable Low group than the Stable High group ( $b = 0.400$ ,  $SE = 0.170$ ,  $p = .019$ ,  $Odds Ratio = 1.492$ ; Table 1). In terms of family relationship quality, the results showed that youth who experienced higher maternal warmth at Wave 1 were less likely to be in the Stable Low group ( $b = -0.277$ ,  $SE = 0.121$ ,  $p = .022$ ,  $Odds Ratio = 0.758$ ) or the Improved group ( $b = -0.372$ ,  $SE = 0.136$ ,  $p = .006$ ,  $Odds Ratio = 0.689$ ) compared to the Stable High group (Table 2); youth who perceived higher father hostility at wave 1 were more likely to be in the Improved group than the Stable High group ( $b = 0.413$ ,  $SE = 0.169$ ,  $p = .015$ ,  $Odds Ratio = 1.511$ ; Table 2) or Stable Low group ( $b = 0.373$ ,  $SE = 0.181$ ,  $p = .039$ ,  $Odds Ratio = 1.452$ ; Table 2S).

As there are two subgroups within the Improved group (i.e., Low Proficiency at wave 1, High Proficiency at wave 2 and 3; and Low Proficiency at wave 1 and 2, High Proficiency at wave 3), analysis was conducted to check which subgroup may drive the results of the association between father hostility and heritage language proficiency transition profiles; that is, how father hostility at Wave 1 was related to the probability of being in the two subgroups within the Improved group. Results showed that youth who experienced higher father hostility at wave 1 were more likely to be in the subgroup with two waves of high Spanish proficiency than the subgroup with one wave of high Spanish proficiency, indicating that the results may be driven by the subgroup that has low Spanish proficiency at wave 1 and high Spanish proficiency at wave 2 and 3.

### Youth Outcomes of Heritage Language Proficiency Profiles

Youth with different developmental patterns of heritage language proficiency had significant differences in ethnic identity, resilience, and life meaning at Wave 3 after controlling for Wave 1 outcomes (Figure 2). Specifically, youth in the Stable Low group reported lower levels of ethnic identity centrality and exploration than the other three groups (i.e., Stable High group, Improved group, and Decline group). Youth in the Stable Low group perceived lower ethnic identity resolution than the Improved group. Youth in the Stable Low group reported lower levels of resilience than the Stable High or Declined group. Youth in the Stable Low group perceived lower levels of life meaning compared to the Stable High or Improved group; youth in the Declined group reported lower levels of life meaning than the Improved group. Overall, youth in the Stable Low group showed disadvantaged socioemotional outcomes across various domains.

### Discussion

Heritage language is often touted as one of the primary vehicles used in the intergenerational transmission of culture and the ability to preserve one's heritage language has important implications on adolescents' socioemotional development (Oh & Fuligni, 2010). However, among adolescents from immigrant households, there is a downward trend in heritage language maintenance and a growing preference for English. Further, there are few comprehensive studies that investigate the links amongst predictors, preservation, and the associated outcomes, of Spanish language development among Mexican-origin adolescents.

To address this gap, the present study examined family-level predictors (i.e., family language environment, parent-child relationship) of adolescent profiles of Spanish language proficiency, how these language profiles changed over time; and how adolescent Spanish language transition profiles were differentially linked to adolescents' ethnic identities as well as other positive developmental outcomes (i.e., resilience and life meaning) from early to later adolescence.

Findings of the current study revealed distinct typologies of Spanish language proficiency and demonstrated important within-group variations concerning how Spanish proficiency are developed and maintained across adolescence among Mexican-origin youth. There was a two-profile solution consistently across all three waves, marked by high, and low, levels of speaking/understanding, reading, and writing. Consistent with existing work demonstrating that Mexican-origin youth are better at retaining their heritage language (Oh & Fuligni, 2010; Tran, 2010), more Mexican-origin adolescents were found in the high, as compared to the low, proficiency profiles; further, approximately two-thirds of adolescents in the sample indicated high levels of Spanish proficiency in later adolescence – perhaps, these findings may be related to the fact that Mexican-origin adolescents recruited in the present study had to engage in frequent translation between Spanish and English for their families (i.e., eligibility criteria of the current study); thus, adolescents are more likely to be somewhat proficient in Spanish. Examinations of adolescents' Spanish language profiles overtime also revealed meaningful differences: there were almost double the number of adolescents in the Stable High, versus Stable Low, profiles of Spanish proficiency across adolescence. Despite continued low proficiency among some adolescents in the sample, results suggested that achieving high proficiency in Spanish language (and reaping their associated benefits; see below) is attainable before later adolescence. Critically, although prior research suggests people's language abilities are established relatively early, and loss of heritage language tend to occur at a young age (Anderson, 2012), these findings revealed non-linear trends that hint at some level of plasticity in continued Spanish language development over the time course of adolescence (i.e., improved profiles which showed high proficiency at Wave 2 or Wave 3; 14.2%). This plasticity comes at a cost as a smaller, but substantial, percentage of youth were found in the declined transition profile (i.e., 9.1%), highlighting the risk of heritage language attrition.

Given the heterogeneous patterns of adolescent Spanish language profiles, examinations of familial environment based on language use at home and parent-child relationships (i.e., parental warmth and hostility) were conducted to test whether they differentially predicted adolescents' ability to preserve their heritage language development across adolescence. Results suggested that family relationship quality, as compared to language environment, is more predictive of adolescents' heritage language proficiency. Specifically, adolescents who experienced greater warmth from their mothers were more likely to be in the stable high versus stable low or improved profiles – these findings are somewhat consistent with existing research that have demonstrated supportive familial environments to be conducive for heritage language development and maintenance (Guardado & Becker, 2014; Tseng & Fuligni, 2000); while adolescents who experienced greater hostility from their fathers were more likely to be in the improved profile versus stable high or low profiles. These results highlighted the distinct paths from mothers, versus fathers, to adolescents' Spanish

language proficiency and may reflect culturally specific or more traditional definitions of gendered parental roles (i.e., a nurturing mother versus a strict father; Gamble et al., 2007). For maternal warmth, perhaps, adolescents who experience greater maternal warmth likely come from families that have the emotional resources (Updegraff et al., 2009) to cultivate the retention of heritage language (i.e., patience, nurturance, etc.); this may explain why maternal warmth was predictive of adolescents' membership in the stable high profile. For paternal hostility, perhaps, adolescents who experience more hostility from fathers may be more afraid of interacting with their fathers and experience greater stress when engaging in translation for their fathers (a common parent-child interaction among immigrant families; Morales & Hanson, 2005), which may motivate adolescents to improve their Spanish skills. This impetus to improve their Spanish language ability may partially explain why fathers' hostility during early adolescence is predictive of adolescents' group membership in the improved transition profile (i.e., adolescents can communicate effectively with fathers when they have high Spanish proficiency and reduce father-child conflicts). Further, considering that Mexican-origin fathers hold more disciplinary power at home (Updegraff et al., 2009), adolescents may perceive greater paternal hostility with increased time spent with their fathers even though adolescents who spend more time with their fathers are also more likely to have additional opportunities to speak and practice the Spanish language. There was no measure for time spent between adolescents and their fathers in the current study, so it is difficult to test (or at least control for) whether increased time shared between adolescents and their fathers indirectly led to improvements in adolescents' Spanish language proficiency. Future studies may include measures of the length of time shared between parents and adolescents to provide a clearer account of why and how paternal hostility is linked to increased adolescent Spanish proficiency. Overall, these findings indicate that Mexican-origin adolescents are more motivated to sustain their high Spanish levels, or improve their Spanish skills, to maintain high-quality interactions with their mothers and to become effective communicators in their interaction with their fathers (e.g., to resist the father's influence, defend themselves, win an argument, etc.).

The literature is mixed concerning the positive links between parents' Spanish use and adolescents' own levels of Spanish proficiency: some studies find that parental Spanish use is associated with adolescents' Spanish proficiency (Arriagada, 2005), while other researchers have found heritage language use at home to possess only a small (but statistically significant) effect on children's heritage language acquisition (Tseng & Fuligni, 2000). Findings from the present study is supportive of the latter as parental Spanish proficiency use was not predictive of adolescents' Spanish language transition profiles. Perhaps parental heritage language use at home is insufficient in meeting the linguistic demands requisite for adolescent's heritage language development. It is important to note also that the present study used data from a unique sample of Spanish-speaking parents and their adolescent children who translated between Spanish and English. Thus, parents might possess high levels of Spanish proficiency and show little variability in Spanish language proficiency across families (i.e., a ceiling effect), which may explain why it was difficult to detect the potentially positive links between parental language use and adolescents' Spanish language development. More convincingly, it is possible that parents' Spanish use may be related to adolescents' Spanish proficiency, but this association is contingent on the

quality of the parent-child dynamic (as demonstrated by the significant associations between family relationship quality and adolescents' language development in the current work). For example, mother's Spanish use is promotive of adolescents' Spanish proficiency only when youth share a strong and supportive relationship with their mothers. More research might be needed to clarify the pathways through which family language environment may be indirectly linked to Mexican-youth's Spanish proficiency.

The benefits of Spanish proficiency were consistent across various socioemotional dimensions. In line with our predictions, adolescents in the stable high profile (and at times, the improved profile) showed the best adolescent outcomes, demonstrating highest levels of ethnic identity (i.e., centrality, exploration and resolution), resilience and life meaning; in contrast, adolescents in the stable low profile consistently showed the worst socioemotional outcomes. The links between Spanish proficiency and ethnic identity are not surprising considering the extensive body of work that have supported the notion that heritage language proficiency and ethnic identities are positively associated (Arredondo et al., 2016; Kim & Chao, 2009). Spanish proficiency is a gateway that facilitates the development of shared ethnic background, knowledge and culture; as Spanish language is highly valued within Mexican-origin ethnic enclaves, adolescents with strong command of the Spanish language are also better equipped with social capital to communicate and interact with other co-ethnics in their community, and show deeper connections with their ethnic roots (Morales et al., 2012).

An important contribution of the present study is the focus on positive adolescent developmental indicators such as adolescents' resilience and life meaning. This study is unique as it incorporates a strength-based approach and suggested that heritage language could be a type of cultural resource for facilitating personal growth (Stevenson et al., 2019). As mentioned, adolescents with high levels of Spanish proficiency, or those who demonstrate improvements in Spanish proficiency, are likely to enjoy greater support from other co-ethnics in their community (Morales et al., 2012), which can function as a resource for building up their adaptation skills and their coping abilities, in turn raising adolescents' resilience. It is important to note that adolescents in the stably low group showed lowest levels of resilience among the different transition profiles, and this finding may resonate with the uniqueness of the resilience construct. Previous work showed that resilience increases especially during positive adjustments to challenging moments or adversities (Cardoso & Thompson, 2010). Perhaps, adolescents with stably low Spanish proficiency have trouble developing close ties with other co-ethnics and feel greater isolation from their cultural communities (Oh & Fuligni, 2010); thus, they must learn how to overcome and manage these adverse experiences by building up their own sense of resilience. For life meaning, Spanish language has been associated with ethnic identity development, which is in turn linked to higher levels of life meaning (Phinney et al., 2001). It is likely that a large part of why adolescents with greater levels of Spanish proficiency also showed high levels of life meaning is related to their greater levels of ethnic identity (Kiang & Fuligni, 2010). Indeed, the pattern of findings for life meaning and the three domains of ethnic identity were highly similar. All in all, this study offers novel evidence that Spanish language proficiency is related to Mexican-origin adolescents' resilience and life meaning and greater research needs to be channeled to understand the links between adolescents'

Spanish language proficiency and (other) positive developmental outcomes. Simultaneously, there is a need for greater practical and policy attention in this area of work to encourage and facilitate adolescents' heritage language development and their socioemotional development.

There are important limitations to be highlighted. First, analyses in the current study relied on adolescents' self-reports of their Spanish language proficiency. Previous research showed that self-reports are strongly correlated with objective assessments of language proficiency (Marian et al. 2007); however, it is important to be mindful that the accuracy of adolescents' reports are subjective and can vary from person to person. Although this study utilized a multi-informant method (i.e., parents' language use at home, parents' reports of warmth and hostility), perhaps adopting more objective assessments of adolescents' linguistic abilities such as standardized language test scores may provide further corroboration of the observed results. Second, the present study sampled for Mexican-origin adolescents who actively engage in translation for their immigrant parents. The constant need for translation may encourage adolescents' Spanish language development and may explain why there were more adolescents observed in the high, versus low, proficiency profile. Further, participants were recruited from central Texas where there is a large population of Spanish-speaking immigrants. People living in Texas might be more open to Spanish language use (i.e., a larger number of co-ethnics living in the area), which can create more opportunities and greater ease for adolescents to practice their Spanish language and promote their language development (Morales et al., 2012). Thus, it is important for future work to assess the external validity of the current findings to non-immigrant populations, where translation is less common, and also to communities with fewer Mexican-origin co-ethnics, and other geographies outside of Texas. Third, it is important to understand the heterogeneity of different heritage language maintenance across different immigrant populations in the US. This study focused on Spanish language proficiency because (1) Mexican-origin families are the most prevalent in the US and (2) previous research revealed that unlike other languages, Spanish-speaking adolescents are more likely to retain their heritage language (Tran, 2010). It may be important to understand whether the present findings can be generalized to other non-Spanish speaking immigrant-origin adolescents to clarify whether the benefits of heritage language development (i.e., greater levels of ethnic identity, resilience and life meaning) are also applicable to non-Spanish speaking groups, or if there is something unique about Spanish language proficiency and/or Mexican-origin populations. Fourth, the current study distinguished the links between family language environment and relationship quality with adolescents' Spanish language development separately for fathers and mothers but did not examine for potentially divergent pathways for male and female adolescents as it was beyond the scope of the present study. As some studies revealed that girls demonstrate higher language proficiency than boys (Lutz, 2006), gender was included as a covariate in all analyses. However, it may be important for researchers interested in examining how adolescents' language development differ for male and female adolescents, for example, to fill this important gap in future work. Finally, contemporary research has neglected immigrants' heritage language proficiency and focused primarily on their English proficiency as English is commonly associated with economic opportunities as well as improved assimilation to US culture (Tran, 2010). The goal here was to examine Mexican-origin adolescents' Spanish proficiency, thus there were no assessments of adolescents'

English proficiency. Researchers with a different research question that include, for example, how bilingual Mexican-origin adolescents develop and maintain their bilingual skills, or whether bilingualism is associated with various developmental outcomes may benefit from including assessments of English language in future studies.

## Conclusion

Heritage language development is a critical developmental asset that is linked with adolescents' developmental and socioemotional outcomes – particularly for youth from immigrant households. However, few studies focus specifically on Spanish language development (as compared to the English language) in Mexican-origin youth and there is an absence of work that have demonstrated how the family environment can play a critical role in the continued development of Spanish language proficiency (beyond childhood and) across adolescence. The present study capitalizes on longitudinal multi-informant and multilevel data from Mexican-origin youth and their parents to clarify how familial environments (i.e., family relationship quality and not parental language use) contribute to adolescents' uniquely advantaged but still diversely developed heritage language proficiency, and their links to differential socioemotional outcomes, across early and late adolescence. Adolescents are more likely to show higher levels of Spanish language proficiency across adolescence, and those who consistently demonstrate high levels of proficiency report higher levels of ethnic identity; here, we also offer some of the first evidence about the positive links between Mexican-origin adolescents' Spanish language proficiency and greater levels of resilience and life meaning. Future research should continue to adopt multi-informant study designs but also incorporate objective measures beyond self-reports. We also highlight the importance of extending findings of the current study to other non-Spanish speaking adolescents to extend the generalizability of the present findings.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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## Data Sharing Declaration

Data for this manuscript's data will not be deposited.

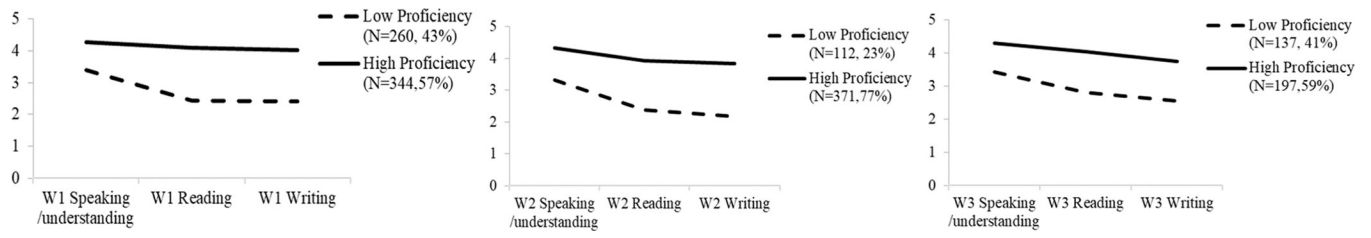
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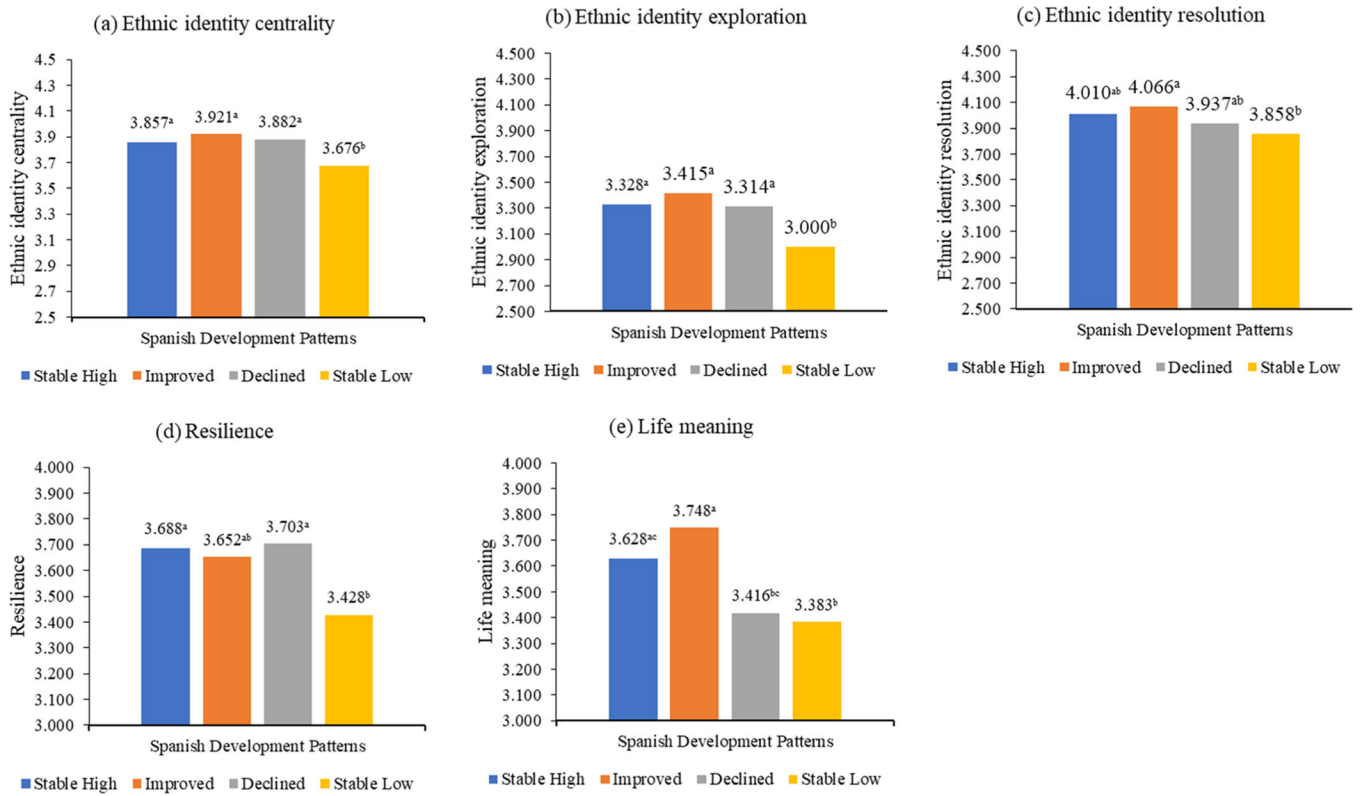
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**Figure 1. Profiles of Adolescents Heritage Language Proficiency across Three Waves**

*Note.* W=Wave



**Figure 2. Different Levels of Adolescent Outcomes at Wave 3 of Each Heritage Language Proficiency Transition Profiles**

*Note.* Superscripts indicate whether the level of outcomes at Wave 3 differ across different heritage language proficiency transition profiles after controlling for Wave 1 outcomes. Transition profiles with different superscripts are significantly different in outcomes.

**Table 1**

Stability and Change of Adolescents' Spanish Skill development from Wave 1 to Wave 3

<i>Wave 1 profiles</i>	<i>Wave 2 profiles</i>	<i>Wave 3 profiles</i>	
		<b>Low proficiency</b>	<b>High proficiency</b>
Low proficiency	Low proficiency	152 (25.2%) <sup>b</sup>	18 (3.0%) <sup>c</sup>
	High proficiency	8 (1.3%) <sup>e</sup>	72 (11.2%) <sup>c</sup>
High proficiency	Low proficiency	6 (1.0%) <sup>d</sup>	1 (0.2%) <sup>e</sup>
	High proficiency	49 (8.1%) <sup>d</sup>	298 (49.3%) <sup>a</sup>
<b><i>Transition profiles</i></b>	<b>Change or stable</b>	<b>Profile names</b>	<b><i>N</i> (%)</b>
	Stable profiles	Stable high	298 (49.3%)
		Stable Low	152 (25.2%)
	Change profiles	Improved	90 (14.2%)
		Declined	55 (9.1%)
		Others	9 (1.5%)

Note.

<sup>a</sup> stable high group;

<sup>b</sup> stable low group;

<sup>c</sup> improved group;

<sup>d</sup> declined group;

<sup>e</sup> others.

*N* = 604.

**Table 2**

Multinomial Logistic Regression of the Influence of Wave 1 Family Environment on Adolescent Heritage Language Proficiency Transition Profiles

Variables	Coefficient	s.e.	<i>p</i>	Odds Ratio
<i>Stable Low Group</i>				
Parental education	-0.014	0.052	.796	0.986
Family income	-0.052	0.075	.489	0.949
Nativity (0 = Mexico, 1 = U.S.)	0.268	0.247	.278	1.307
Youth age	-0.014	0.123	.912	0.986
Gender (0 = girl, 1 = boy)	0.047	0.215	.827	1.048
Maternal Warmth	-0.277	0.121	.022	0.758
Paternal Warmth	-0.034	0.106	.747	0.967
Maternal Hostility	-0.022	0.133	.868	0.978
Paternal Hostility	0.040	0.141	.774	1.041
Language mother used when speaking to the child	0.071	0.282	.800	1.074
Language father used when speaking to the child	-0.044	0.369	.905	0.957
Language the child used when speaking to mother	0.400	0.170	.019	1.492
Language the child used when speaking to father	0.493	0.259	.057	1.637
<i>Declined Group</i>				
Parental education	0.043	0.081	.596	1.044
Family income	0.025	0.097	.799	1.025
Nativity	0.320	0.382	.403	1.377
Youth age	-0.333	0.187	.076	0.717
Gender	0.245	0.287	.393	1.278
Maternal Warmth	-0.126	0.143	.379	0.882
Paternal Warmth	0.084	0.125	.501	1.088
Maternal Hostility	0.067	0.181	.712	1.069
Paternal Hostility	-0.032	0.220	.883	0.969
Language mother used when speaking to the child	-0.541	0.537	.314	0.582
Language father used when speaking to the child	0.187	0.642	.771	1.206
Language the child used when speaking to mother	0.148	0.250	.554	1.160
Language the child used when speaking to father	-0.075	0.614	.903	0.928
<i>Improved Group</i>				
Parental education	-0.050	0.066	.446	0.951
Family income	-0.102	0.091	.260	0.903
Nativity	0.062	0.298	.836	1.064
Youth age	0.141	0.134	.293	1.151
Gender	-0.439	0.264	.096	0.645
Maternal Warmth	-0.372	0.136	.006	0.689
Paternal Warmth	0.028	0.118	.812	1.028
Maternal Hostility	-0.168	0.169	.321	0.845
Paternal Hostility	0.413	0.169	.015	1.511



Variables	Coefficient	s.e.	<i>p</i>	Odds Ratio
Language mother used when speaking to the child	0.352	0.355	.321	1.422
Language father used when speaking to the child	-0.132	0.439	.763	0.876
Language the child used when speaking to mother	0.032	0.227	.887	1.033
Language the child used when speaking to father	0.460	0.323	.154	1.584

*Note.* *Stable high group* is the reference group.

*N* = 595 adolescents.

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