

The Role of Mexican American Siblings in Adolescence and Young Adulthood

by

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ABSTRACT

Siblings are a salient part of family life; however, few studies have explored the role of siblings on youths' cultural development and educational expectations. In the current dissertation, two studies address this gap in the literature by using longitudinal data from 246 Mexican-origin sibling pairs and their mothers and fathers. The first study examined how older siblings' cultural orientations and values uniquely contribute to younger siblings' cultural orientations and values from late adolescence to young adulthood, after accounting for mothers' and fathers' cultural orientations and values; further, it was explored the role of sibling modeling and sibling characteristics as moderators of these associations. Findings revealed that older siblings' cultural orientations and values contribute to younger siblings' cultural orientations and values from late adolescence into young adulthood. Specifically, under conditions of high sibling modeling, younger siblings reported higher levels of Anglo orientation and familism values. Whereas, fathers' orientations were positively associated with younger siblings' Anglo and Mexican orientations and mothers' values were predictive of younger siblings' familism values. Together, the findings suggest that siblings and parents play different roles in youths' cultural development.

The second study explored the reciprocal associations between older and younger siblings' educational expectations from early/middle adolescence to middle/late adolescence and from middle/late adolescence to young adulthood. In this study it was tested the moderating role of family immigrant context and sibling characteristics in the association between older and younger siblings' educational expectations. Findings revealed that older siblings' educational expectations at T1 predicted younger siblings'

educational expectations at T2. Further, older siblings' educational expectations at T2 continued to influence younger siblings' educational expectations at T3, and younger siblings' educational expectations at T2 also predicted older siblings' educational expectations at T3. Family immigrant context moderated the association from older siblings' educational expectations at T2 to younger siblings' educational expectations at T3, such that the association was significant for immigrant-born families, but not for U.S.-born/Mixed-status families. Our study highlights the value of siblings' roles, particularly in immigrant families, as youth make important decisions about their educational pursuits.

Para mi mamá, mi abuelita, mis hermanas, y Joseph:

Con ustedes a mi lado, sé que nada es imposible.

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Introduction

Sisters and brothers are a universally salient part of family life in cultures around the world (Weisner, 1993; Whiting & Edwards, 1988; Updegraff, McHale, Killoren, & Rodríguez, 2010; Zukow, 1989), but the nature and influence of these relationships varies substantially across cultures (Cicirelli, 1995; Kolenda, 1993; Seymour, 1993; Updegraff et al., 2010). In South Asian culture, for example, sibling relationships are highly interdependent into adulthood because these cultural contexts embrace a marriage system that has clearly defined sibling roles (Kolenda, 1993). In fact, siblings continue to be involved throughout the lifespan in one another's decisions regarding marriage, residence, and wealth. These patterns highlight the highly structured nature of South Asian cultures based on kinship, and particularly sibling relationships (Kolenda, 1993).

In contrast, in Western cultures, sibling relationships during adolescence and young adulthood are characterized as more voluntary and less interdependent than in South Asian cultures (Cicirelli, 1995; Kolenda, 1993). In American culture, for instance, siblings' roles are less clearly defined, particularly in adolescence and young adulthood, and typically siblings do not play a role in decisions about marriage or residence. A possible explanation for the lack of interdependence among young adult siblings in Western societies may be due to the fact that Western societies emphasize individualism to a greater extent than kinship ties (Markus & Kitayama, 1991); however, the degree to which different Western cultures emphasize individualism and kinship ties varies (Riedmann & White, 1996). As such, research that further explores how siblings may influence each other in different cultural contexts is needed.

In the U.S., across the major ethnic groups (i.e., European American, African American, Asian, Hispanic), 69% to 77% of youth grow up with at least one sibling (US Census Bureau, 2011). In fact, youth in the U.S. are more likely to grow up with a sibling than with a father (McHale et al., 2012). Further, time-use data on European American (McHale & Crouter, 1996) and Mexican American youth (Updegraff, McHale, Whiteman, Thayer, & Delgado, 2005) show that, during childhood and adolescence, youth spend the majority of their out-of-school time with their siblings. In addition to spending the majority of their leisure time interacting with their siblings in childhood and adolescence, siblings also share their family time, meaning siblings may spend time as a dyad in the company of their parents or other family members. Not surprisingly, siblings' experiences during childhood and adolescence provide the groundwork for one of the longest lasting relationships most individuals experience and siblings may be important sources of support and influence as youth adopt new roles and responsibilities across the lifespan (McHale et al., 2012). Research to date in the U.S. has largely focused on European American youth, however, and we know considerably less about sibling influence in ethnic minority families (McHale et al., 2012; Updegraff et al., 2010).

Siblings in Mexican American families are embedded in a larger family and cultural context which places a strong emphasis on family relationships (Cauce & Domenich-Rodríguez, 2002; Sabogal et al., 1987). Mexican American families are characterized by their emphasis on family support, obligations, and interdependence among family members (Sabogal et al., 1987; Knight et al., 2010). Prior work suggests an association between sibling relationship quality among Mexican-origin youth and endorsement of family-oriented cultural values, such that siblings with higher

endorsement of familism values reported closer and more supportive relationships with their siblings (Updegraff et al., 2005). Thereby, this cultural context provides a setting where sibling relationships are embraced and supported, and thus, siblings may have a stronger influence on each other as compared to other ethnic groups.

The U.S. consists of more than 40 million immigrants, with the largest proportion (29%) coming from Mexico (Krogstad & Keegan, 2014), making Mexican Americans the largest immigrant group in the U.S. Family dynamics among predominantly immigrant families may provide a unique and important context to understand sibling relationships as siblings may share more similar experiences (e.g., school, peers) as compared to their parents as they navigate the mainstream culture. For instance, siblings are likely to share similar experiences in the U.S. school system, peer groups, and extracurricular activities; however, in immigrant families parents may be less knowledgeable of these experiences and how to navigate these different settings. Thus, it is possible that siblings in immigrant families may serve a unique role in Latino/Mexican culture. In addition to the potentially unique features of this cultural and immigrant context, the neglect of research on ethnic minority, and particularly Latino/Mexican-origin, siblings is significant given demographic shifts in the U.S. in recent decades. Latinos are the largest, fastest growing and youngest group in the U.S., and the majority of these youth are of Mexican heritage (70%; Child Trends Hispanic Institute, 2014). Importantly, this is a group for whom we know little about *normative* developmental and family processes (McLoyd, 1998; Umaña-Taylor, 2009). In Mexican American families, where family is a key source of support and guidance (Knight et al., 2010) and the majority of youth are growing up with at least one sibling (79%; U.S. Census, 2011), siblings are a prominent part of youths'

daily lives (Updegraff et al., 2010), and may uniquely contribute to youths' socialization and development.

Social learning theory (Bandura, 1977) has been influential in the study of siblings and their role in youth development (McHale et al., 2012). A social learning perspective directs our attention to observational learning and role modeling as key socialization processes through which youth acquire attitudes, skills, and behaviors (Bandura, 1977). Because siblings are central figures in the daily lives of children and adolescents (McHale et al., 2012; Updegraff et al., 2010; Weisner, 1989), siblings are potentially important role models and socialization agents (Conger & Little, 2010; Whiteman et al., 2011). Given that family relationships are salient and siblings may be particularly important due to their shared experiences and involvement in the U.S. educational system, peer groups, and activities, the goal of this dissertation is to examine the role of siblings in two aspects of Mexican-origin adolescents' and young adults' lives: cultural orientations and education.

The first study aims to explore the role of siblings in the development of youths' cultural orientations, with particular attention to how older siblings may influence younger siblings' cultural orientations, above and beyond the role of parents. In particular, we focus on older siblings' influence on younger siblings' Mexican and Anglo cultural orientations and familism values. Prior work has highlighted the family as the primary context for cultural socialization (Parke & Buriel, 2006; Umaña-Taylor & Yazedjian, 2006); however, the majority of this work focuses on *parents'* socialization of their children about their ethnic culture (Parke & Buriel, 2006; Umaña-Taylor & Yazedjian, 2006), and little is known about the possible role siblings may have in the

development of cultural orientations and values. This study addresses two goals: (a) to examine how older siblings' cultural orientations and values uniquely and prospectively contribute to younger siblings' cultural orientations and values across the transition from late adolescence to young adulthood, after accounting for mothers' and fathers' cultural orientations and values, and (b) to explore sibling modeling and sibling characteristics as moderators of these associations.

The second study addresses sibling influences on the development of educational expectations from early/middle adolescence to young adulthood by examining the reciprocal associations between older and younger siblings' educational expectations among Mexican American youth over an eight-year period spanning early adolescence to early adulthood. Previous research has noted the importance of examining changes in youths' educational expectations during adolescence and young adulthood (Mello et al., 2008; 2009; 2012). This study takes an important step in exploring these reciprocal processes over time in a particular sociocultural context: predominantly immigrant Mexican American families. This study also addresses characteristics of the family and sociocultural context that may contribute to within-group variability in these associations (Bronfenbrenner, 1986; Eccles, 2007; Eccles & Wigfield, 2002; Garcia Call et al., 1996). During adolescence and young adulthood, siblings may be important role models and sources of information when youth are constructing their educational expectations and career goals (Ali, Hawley McWhirter, Chronister, 2005; Ceja, 2006; Conger & Little, 2010). This may be particularly true among predominantly immigrant families as parents may be less familiar with the U.S. educational system. The specific aims of this second study are to (a) examine the associations between older and younger siblings' educational

expectations from early adolescence to young adulthood among a sample of Mexican American siblings, and (b) test sibling, family, and cultural moderators of these associations.

The two studies complement each other given their focus on the ways siblings may impact youths' development in different domains. First, each paper demonstrates the ways in which siblings may serve as role models, including older siblings' role in younger siblings' cultural orientations and values in the first paper, and the simultaneous impact siblings may have on each other's educational expectations in the second paper. Second, each paper captures different cultural characteristics and processes in which siblings' relationships are embedded. Third, each paper uses a longitudinal design to explore how siblings uniquely contribute to youths' cultural socialization and educational expectations. Lastly, these studies contribute to the sibling literature by examining the role of siblings in ethnic minority youths' positive development (Cabrera and The SRCD Ethnic and Racial Issues Committee, 2013). More broadly, these studies offer the potential to enhance our understanding of the nature and influence of sibling relationships in a cultural context that is prominent in the U.S. and has a strong emphasis on family relationships.

Study 1: The Role of Siblings in Mexican American Youths' Cultural Socialization from Adolescence to Young Adulthood

The family is a key context for cultural socialization (Parke & Buriel, 2006; Umaña-Taylor & Yazedjian, 2006) and there are a number of potential mechanisms through which cultural socialization occurs. Research on ethnic/racial socialization directs our attention to parents' efforts to socialize their children about their ethnic culture as one pathway of influence. In particular, parents intentionally expose their children to behaviors, traditions, and values that characterize the family's ethnic culture with the goal of imparting knowledge about their culture (Parke & Buriel, 2006; Umaña-Taylor & Yazedjian, 2006). Extant research on family cultural socialization has highlighted behaviors and activities that *parents* engage in as a way to transmit cultural heritage, customs, and traditions from one generation to the next (Hughes et al., 2003; 2006; 2009).

A second mechanism through which youth may learn about culture is by observing and modeling family members as they engage in culturally relevant activities, such as preparing and eating ethnic foods, celebrating cultural holidays, and using the family's native language (e.g., Bandura, 1977; Hughes et al., 2006). Social learning perspectives provide the conceptual underpinnings of this second pathway through which cultural development may occur, suggesting that children learn about culture by *observing* and *modeling* their parents' (and other family members') behaviors and values (Bandura, 1977). Similarities in parents' and children's behaviors, values, and attitudes are commonly viewed as evidence in support of social learning processes, with the idea that similarities result from children's efforts to model parents (Whiteman et al., 2007a;

2011). The role of parents as models for their children in the area of ethnicity and race has received some attention (Hughes et al., 2003; 2006; 2009), but we know little about the role of other family members, such as *siblings*.

Despite evidence of the importance of sibling relationships across the lifespan, most extant research has examined sibling relationship dynamics in childhood and adolescence (McHale, Updegraff & Whiteman, 2012). Considerably less is known about how the sibling relationship changes as youth move into young adulthood and begin to negotiate new roles (Conger & Little, 2010). The transition to young adulthood is an important period to study family relationships, including those with siblings, as the acquisition of new adult roles is likely to be associated with transformations in youths' relationships (Tanner, 2006). Siblings may be particularly important to consider as sources of influence in Mexican American families for several reasons. First, siblings are a prominent part of family life, as the majority of Latino families (77%) include at least two children (U.S. Census Bureau, 2011). In fact, regardless of ethnic group, youth in the U.S. are more likely to grow up with a sibling than with a father (McHale et al., 2012). Time-use data with Mexican American siblings also suggest that opportunities for sibling socialization are substantial: across a seven-day period, youth reported spending *more than 20 hours* in shared activities with siblings (Updegraff et al., 2005); comparatively, these same youth spent an average of 7 hours with parents and 16 hours with peers (Updegraff, McHale, Whiteman, Thayer, & Crouter 2006). The salience of siblings in Mexican American adolescents' daily lives, in combination with the culture's strong emphasis on family support, interdependence, and cohesion (Cauce & Domenich-

Rodríguez, 2002; Sabogal et al., 1987), suggest the need to consider siblings' roles in the development of youth's cultural orientations and values.

Prior cross-cultural research emphasizes the role of *older siblings* as caregivers (Dunn, 2007; Maynard, 2002; Nuckolls, 1993). It is within this context that older siblings may serve as teachers to their younger siblings (Azmitia & Hesser, 1993; Maynard, 2002). For example, work by Maynard (2002) on Mayan children (ages 3-11) revealed that older siblings taught their younger siblings how to do everyday tasks (i.e., washing, cooking), which over time resulted in an increase in younger siblings' participation in culturally important tasks. Thus, there is some evidence that siblings may uniquely contribute to youths' cultural development. From a social learning perspective, older siblings may be important socializers of younger siblings' cultural development because individuals are likely to pay attention to and imitate models who are perceived as more powerful and higher in status (Bandura, 1977). Within the hierarchical structure that characterizes Mexican American families (Knight et al., 2010), older siblings are likely to be perceived as having greater power and status relative to younger siblings. Although we know little about how older siblings may contribute to younger siblings' cultural orientations and values in adolescence and early adulthood, findings from investigations of sibling influences on delinquent (e.g., Slomkowski, Rende, Conger, Simons, & Conger, 2001; Whiteman et al., 2007b) and risky sexual behaviors (East & Khoo, 2005; McHale, Bissell, & Kim, 2009), including data from the present study (Whiteman, Zeiders, Killoren, Rodríguez, & Updegraff, 2014), are consistent with these social learning tenets. The present study aims to contribute to this area of research by (a) examining how older siblings' cultural orientations and values uniquely and

prospectively contribute to younger siblings' cultural orientations and values from late adolescence to young adulthood, after accounting for mothers' and fathers' cultural orientations and values, and (b) exploring sibling modeling and sibling characteristics as moderators of these associations.

The Role of the Family in the Cultural Adaptation Process

Cultural adaptation refers to the process an individual goes through over time as he/she adjusts to life in a new culture or context (Berry, 2007). Cultural adaptation is multidimensional and multifaceted (Berry, 2003; Cabassa, 2003), and includes adaptation in reference to the host (mainstream) and ethnic cultures in multiple domains (e.g., values, behaviors, identity). *Acculturation* refers to the process of cultural and psychological changes among individuals when they interact with the host culture (Berry, Phinney, Sam, & Vedder, 2006; Gonzales, Fabrett, & Knight, 2009). As individuals become more acculturated, they may adopt cultural beliefs, values, behaviors, and language from the host culture (Gonzales et al., 2002; Gonzales et al., 2009); however, the incorporation of new cultural values and perspectives does not suggest that individuals fail to maintain and develop their native cultural beliefs, values, and language, referred to as *enculturation* (Gonzales et al., 2002; Gonzales et al., 2009). Prior work has highlighted the role of parents in the transmission of culture to their offspring (e.g., Berry, 2007; Glass, Bengston, & Dunham, 1986; Hitlin, 2006; Vollebergh, Iedema, & Raaijmakers, 2001). It is possible that parents play a prominent role in enculturation, whereas siblings may be salient in the acculturation process, as siblings are more likely to share experiences in settings outside the home, such as in school and peer contexts, where exposure to the mainstream culture typically occurs. In assessing the role of siblings in

youths' cultural orientations and values, we moved beyond "proxy" measures of culture, such as language or nativity (Berry, 2003; Gonzales et al. 2002; Gonzales et al., 2009; Zane & Mak, 2003), to measure cultural adaptation as a multi-dimensional process including cultural orientations in reference to the mainstream and ethnic culture and familism values (Schwartz, Unger, Zamboanga, & Szapocznik, 2010).

Cultural orientations capture youths' behaviors, attitudes, peer affiliations, and identification toward their ethnic culture and U.S. culture (Cuéllar, Arnold, & Maldonado, 1995). For instance, Mexican orientations capture youths' language use, ethnic affiliations, and activities that may demonstrate youths' engagement in their ethnic culture, including speaking Spanish, celebrating Mexican cultural traditions, and affiliating with other Mexican/Mexican American peers and adults (Cuéllar et al., 1995). Similarly, Anglo (mainstream, U.S.) orientations refer to youths' English language use, celebration of typically U.S. holidays and traditions, and involvement with individuals who identified as Anglo/Anglo American. These two cultural orientations largely reflect youths' cultural *involvement*. Our third indicator of culture is youths' *familism values*. In Latino cultures, particularly in Mexican American culture, familism values, which emphasize the importance of family support, obligations, and interdependence among family members (Sabogal et al., 1987; Knight et al., 2010), are salient. Research shows that Mexican Americans endorse familism values to a greater extent than European Americans individuals, and within this group, immigrants report greater familism values than U.S.-born individuals (Fuligni, Tseng, & Lam, 1999). Familism values are viewed as a core cultural value that offers protective benefits to youth (Germán, Gonzales, &

Dumka, 2009). Thus, we examined both Mexican and Anglo cultural orientations and familism values as indices of youths' cultural development.

The current study was designed to examine the unique contributions of siblings on youths' cultural orientations and values. Guided by the social learning tenets (Bandura, 1977), which highlight the importance of role models in youths' development, we anticipated that older siblings' cultural orientations and values would contribute above and beyond parents' cultural orientations and values. It was expected that the contributions of siblings may be most pronounced in the case of mainstream cultural orientations as older siblings may be particularly relevant role models for their younger siblings, as compared to parents, because of their greater exposure to mainstream culture (e.g., via school, peers, and extracurricular/community activities).

The Role of Sibling Modeling and Sibling Dyad Characteristics

Our second goal was to test potential moderators of the associations between younger and older siblings' cultural orientations, including younger siblings' *modeling* and *sibling dyad characteristics*. Social learning theory has been a predominant framework used by researchers to study sibling influences, as it suggests that youth acquire attitudes, skills, and behaviors by observing others and through social reinforcement (Bandura, 1977). Also, social learning theorists suggest that youth are more likely to model individuals who have a higher status than oneself (Bandura, 1997). Given the hierarchical structure of the sibling relationship (Dunn, 1983; Furman & Buhrmester, 1985), where older siblings are developmentally ahead of their younger siblings, they may be particularly likely to serve as role models as younger siblings develop their attitudes, values, and behaviors during adolescence and young adulthood.

Prior work demonstrates older siblings' influences on younger siblings' attitudes and behaviors (East & Khoo 2005; McHale et al., 2009); however, the vast majority of studies examining these associations do not directly measure younger siblings' modeling of their older siblings (for exceptions, see Whiteman et al., 2010; Whiteman et al., 2007b; Whiteman et al., 2014). In fact, researchers examining older siblings' influences on younger siblings have typically inferred modeling processes as post-hoc explanations for correlational findings. In the current study, we directly measure sibling modeling and test it as a moderator of the associations between older and younger siblings' cultural orientations and values. We expected that when younger siblings report high levels of sibling modeling, older and younger siblings' cultural orientations and values would be more strongly associated than when younger siblings report lower levels of sibling modeling.

Sibling influences also may vary as function of sibling dyads' structural characteristics (e.g., sibling dyad gender constellation, sibling age spacing; Buhrmester & Furman, 1990; McHale, et. al., 2009; 2012; Whiteman et al., 2011). As suggested by social learning theorists, youth are more likely to model others that are similar to them (Bandura, 1977), such as siblings who are closer in age, as they may be closer developmentally, than siblings with a wider age spacing (Whiteman et al., 2011). Further, siblings also may be more likely to model a same-sex sibling, given that they may be able to identify more with them because of their shared characteristics (East & Khoo 2005; McHale et al., 2009; Whiteman et al., 2011). For example, in a longitudinal study examining the association between parenting teens and their younger siblings' risk for early pregnancy in an ethnically diverse sample (i.e., Hispanics and African Americans),

younger sisters of parenting teens were at a higher risk for pregnancy compared to younger sisters of nonparenting teens, possibly because they identified with same-sex older sisters as role models (East & Jacobson, 2001). Based on theory and prior research, we examined whether the associations between older and younger siblings' cultural orientations and values were moderated by sibling age spacing and sibling gender dyad constellation. We expected that the associations between older and younger siblings' cultural orientations and familism values would be stronger for siblings who are closer in age and in same-sex sibling dyads.

Covariates

Family socioeconomic status (SES), mothers' nativity, time spent with extended family, and younger siblings' gender were included as covariates in this study. Beginning with family SES, extent research has documented the association between socioeconomic status and culture (Murry, Smith, & Hill, 2001); thus, by including SES as a covariate we were able to account for variation in the dependent variable (i.e., cultural orientations and values) attributed to SES and explore the role of cultural orientations and values above and beyond the role of SES. Given the potentially important role of extended family in cultural adaptation in ethnic minority families (Larson, Richards, Sims, & Dworkin, 2001), we also accounted for time spent with extended family as a covariate. Moreover, an important family characteristic to consider in youths' cultural orientations and values is *mothers' nativity*. Work by Gonzales and colleagues (2008), shows that youths' Mexican orientations were higher and Anglo orientations were lower when mothers were born in Mexico as compared to the U.S. By accounting for mothers' nativity in our models, we are able to examine the role of older siblings' and parents' cultural

orientations and values taking into account mothers' nativity. Lastly, we consider youths' *gender* as an important individual characteristic that may be associated with their cultural orientations and values. Gender may be particularly salient for Mexican-origin youth, given evidence of the role of gender in youth ethnic socialization processes (e.g., Umaña-Taylor, Alfaro, Bámaca, & Guimond, 2009) and family dynamics in this cultural group (e.g., Azmitia & Brown, 2002; Raffaelli & Ontai, 2004; Valenzuela, 1999). Further, cultural expectations may differ for girls and boys, given that females are generally considered as "carriers" of culture (Phinney, 1990). Thus, we included younger siblings' gender as a covariate to examine the unique contribution older siblings' and parents' cultural orientation after accounting for gender.

Present Study

In this study, we examined the role of older siblings in younger siblings' cultural orientations and values among Mexican American youth over a two-year period. Drawing broadly from a cultural socialization perspective (Hughes et al., 2006; Parke & Buriel, 2006; Umaña-Taylor & Yazedjian, 2006) and specifically on social learning theory (Bandura, 1977), we examined the contributions of older siblings' cultural orientations and values to younger siblings', after accounting for mothers' and fathers' cultural orientations and values. The examination of mothers, fathers, older and younger siblings in the same model provides an opportunity to capture the unique contributions that *each* family member has in youths' cultural orientations and values from adolescence to young adulthood. We anticipated that older siblings' orientations and values would contribute above and beyond parents' cultural orientations and values, particularly in terms of Anglo cultural orientations. Moreover, we expected that in cases where younger siblings report

high levels of sibling modeling, older and younger siblings' cultural orientations and values would be more strongly associated than when younger siblings reported low levels of sibling modeling. Moreover, given that role models are expected to have a stronger influence when they are more similar to oneself, we expected that the associations between older and younger siblings' Mexican orientations, Anglo orientations, and familism values would be stronger for siblings who are closer in age and in same-sex dyads. We included family socioeconomic status, mothers' nativity, time with extended family, and younger siblings' gender as covariates in all the models.

Method

Participants

Data were drawn from a larger longitudinal study of adolescent development and family socialization including 246 Mexican American adolescent sibling pairs and their parents (Updegraff, McHale, Whiteman, Thayer, & Delgado, 2005). Participants were recruited through schools in and around a southwest metropolitan area. Based on the larger study goals, criteria for participation were as follows: (1) 7th graders and an older sibling were living at home and not learning disabled, (2) biological mothers and biological or long-term adoptive fathers (i.e., 10 or more years) were living at home, (3) mothers were of Mexican-origin and (4) fathers worked at least 20 hours per week. Although not required for participation, 65% of mothers were employed at time of recruitment and 93% of fathers also were of Mexican descent. We focused on two-parent families, who represent the predominant arrangement in Mexican American families in the U.S. (65 %; U.S. Census Bureau, 2014) and in the county from which the sample was drawn (U.S. Census Bureau, 2000).

To recruit participants, letters and brochures describing the study goals (in English and Spanish) were sent to 1,856 families with Latino 7th graders in five public schools districts and five parochial schools. Follow-up telephone calls were conducted by trained bilingual staff to determine each family's eligibility and interest in participating in the project. The contact information of 396 families (21%) was incorrect and attempts to find updated information were unsuccessful and 146 families (10%) refused to be screened for eligibility. Eligible participants included 421 adolescents and their families (i.e., 32 % of those who were contacted and screened). Of those who were eligible, 284 families (67 %) agreed to participate, 95 (23 %) refused, and 42 families (10 %) moved before the recruitment process was completed. Interviews were completed with 246 adolescents and their families. Those who agreed but did not participate in the final sample ($n = 38$) were families that we were unable to locate or with whom we were unable to complete a home interview after repeated attempts.

At Time 1(T1), mothers and fathers averaged 39 years ($SD = 4.63$) and 42 years of age ($SD = 5.80$), respectively. Most parents were born in Mexico (71% of mothers; 69% of fathers); this subset of parents had lived in the U.S. an average of 12.38 ($SD = 8.86$) and 15.18 ($SD = 8.78$) years, for mothers and fathers respectively, and preferred to complete the interview in Spanish (66% of mothers; 67% of fathers). Parents reported an average of 10 years of education ($M = 10.34$; $SD = 3.74$ for mothers, and $M = 9.88$, $SD = 4.37$ for fathers). Parents came from a range of socioeconomic levels, with the percentage of families meeting federal poverty guidelines (18.3%) being similar to two-parent Mexican American families in poverty in the county where the sample was drawn (i.e., 18.6%; U.S. Census Bureau, 2000). Median family income was \$40,000 (range from

\$3,000 to over \$250,000). Younger siblings were 12.51 ($SD = 0.58$) and older siblings were 15.48 ($SD = 1.58$) years of age. Over 51% of younger siblings ($n = 125$) and 50% of older siblings ($n = 123$) were female. Younger siblings were most likely to be born in the US (62%), whereas older siblings were more likely to be born in Mexico (54%). The majority of youth preferred to complete the interview in English (83%).

Given the focus of the current study on the role of sibling modeling on youths' cultural development in late adolescence and young adulthood, and because some measures of interest (i.e., sibling modeling) was only collected at latter times points, we focused on data from older and younger siblings, mothers, and fathers at Time 2 (T2) and Time 3 (T3), which occurred approximately five and seven years after T1 (the initial wave of data collection; 2002-2003). It is important to note that the data used in the current study was collected in 2007-2008 during the economic downturn in the U.S. (T2) and right after the economic downturn in 2009-2010 (T3). At T2, over 75% of the families participated ($n = 185$). The majority of participating parents reported to be employed (i.e., 70% and 93% for mothers and fathers respectively). Younger siblings were 17.72 ($SD = .57$) and older siblings were 20.65 ($SD = 1.57$) years of age. The majority of participating youth lived with their parents (88% and 60% for younger and older siblings respectively). Those who did not participate could not be located ($n = 43$), had moved to Mexico ($n = 2$), could not presently participate or were difficult to contact ($n = 8$), or refused to participate ($n = 8$). When compared to the participant families ($n = 185$), non-participant families at T2 ($n = 61$) reported significantly lower income at Time 1 ($M = \$37,632$; $SD = \$28,606$ for non-participant families and $M = \$59,517$; $SD = \$48,395$ for participant families) and lower maternal education ($M = 9.48$; $SD = 3.45$ for

non-participant families and $M = 10.62$; $SD = 3.79$ for participant families) and paternal education ($M = 9.06$; $SD = 4.13$ for non-participant families and $M = 10.16$; $SD = 4.43$).

At T3, two years after T2, over 70% of the families participated ($n = 173$). The majority of participating mothers and fathers reported to be employed (i.e., 68% and 86% for mothers and fathers respectively). Younger siblings were 19.60 ($SD = .66$) and older siblings were 22.57 ($SD = 1.57$) years of age. The majority of participating youth lived with their parents (69% and 56% for younger and older siblings respectively). Those who did not participate could not be located ($n = 45$), had moved to Mexico ($n = 4$), could not presently participate or were difficult to contact ($n = 4$), or refused to participate ($n = 8$). The 12 remaining non-participant families were classified as mixed-status as family members within these families did not participate for different reasons (e.g., in one family the father refused to participate and we were unable to locate the mother, younger sibling, and older sibling). When compared to the participant families ($n = 173$), non-participant families at T3 ($n = 73$) reported significantly lower income at T1 ($M = \$41,636$; $SD = \$39,095$ for non-participant families and $M = \$59,137$; $SD = \$46,674$ for participant families), lower maternal education ($M = 9.35$; $SD = 3.53$ for non-participant families and $M = 10.75$; $SD = 3.75$ for participant families), and lower paternal education ($M = 8.49$; $SD = 4.08$ for non-participant families and $M = 10.46$; $SD = 4.37$ for participant families).

Procedures

Data were collected via two methods. First, home interviews lasting 2-3 hours were conducted separately with adolescent siblings and their mothers and fathers. At the beginning of the home interview at T1 (for T1) and T2 (for T2 and T3), informed consent forms were read to parents and youth (age 18 or older) in their preferred language (either

English or Spanish). After parents signed consent forms (for themselves and any minor children), assent forms were read aloud to youth under the age of 18 and their assent was obtained. Interviews were then conducted separately with each family member in his/her preferred language by bilingual interviewers. Due to variability in reading abilities, interviewers read questions aloud and entered responses into a laptop computer.

At the conclusion of the home interviews, the seven nightly phone calls were scheduled with family members as follows: three weekday calls and one weekend day call with adolescents and mothers; three weekday calls and one weekend day call with adolescents and fathers; and one weekday call with mothers, fathers, and adolescents. Thus, adolescents participated in all seven phone calls (five weekday and two weekend day evenings), and each parent participated in four phone calls (three weekday evenings and one weekend day evening). Phone calls were scheduled to capture the full range of weekdays (Monday–Thursday) and weekend calls included both a Saturday and a Sunday, to the extent possible, depending on each family’s schedule. Then, during the three to four weeks following the home interviews, family members were contacted for their telephone interviews, which used a cued-recall approach to collect daily diary data (McHale, Crouter, & Bartko, 1992). Specifically, each family had an activity list (left with the family at the home interview) that included 86 different activities grouped into categories. Adolescents were guided through the activity list, and for each activity they participated in, they were asked to report the duration of the activity (in minutes) and who else participated (e.g., parents, siblings, extended family adults, cousins, aunts, uncles). Phone calls lasted an average of 10–15 min per family member each night. At T1, families were given a \$100 honorarium for their participation in the home interview and

an additional \$100 for participating in the phone interviews. At T2, families received \$125 for participating in the home interviews and an additional \$125 for participating in the phone interviews. At T3, each family member was paid separately \$75 for his/her participation in the home interview and \$75 for his/her participation in the phone interviews. The same procedures were used at each wave of data collection. The University's Institutional Review Board approved all procedures.

Measures

All measures were forward and back-translated into Spanish for local Mexican dialect (Foster & Martinez, 1995). All final translations were reviewed by a third native Mexican American translator and discrepancies were resolved by the research team. Focus groups and pilot work were conducted to ensure the cross-ethnic and language equivalence of existing measures. Cronbach's alphas for all measures were acceptable for English- and Spanish-speaking participants; thus for efficiency, all alphas are reported for the overall sample rather than separately by language.

Background characteristics (T1). Mothers and fathers reported on their country of birth (0 = U.S.-born; 1= Mexico-born), as well as, on their education in years and their annual household income. Older and younger siblings reported on their own gender (0 = females; 1 = males) and sibling dyad gender constellation was calculated based on youths' responses (opposite-sex dyads= 0; same-sex dyads= 1). Sibling age spacing was calculated by subtracting younger siblings' age in years from older siblings' age in years.

Family socioeconomic status (T1). A log transformation was applied to household income to correct for skewness, and then a composite score was created for

family socioeconomic status (SES) at T2 by standardizing and averaging mothers' and fathers' educational levels and household income ($\alpha = .77$).

Time spent with extended family (T2). The time youth spent with extended family was measured during the series of seven nightly phone interviews conducted following the home visit at T2. Specifically, during each of the seven phone calls, youth reported on the durations of and their companions in (e.g., grandparents, uncles/aunts, cousins) their daily activities during nonschool hours. Aggregating across the seven phone interviews, we calculated *youths' time spent with extended family members*. We also calculated the *total amount of time youth spent across all activities and contexts*. We created a proportion score by dividing the time youth spent with extended family by youths' total time. A log transformation was applied to the proportion of time spent with extended family to correct for the skewness of the data.

Familism values (T2 and T3). Mothers, fathers, older and younger siblings completed a 16-item familism subscale of the Mexican American Cultural Values Scale (Knight et al., 2010). This measure consisted of three conceptual domains: (1) support/closeness (e.g., "It is always important to be united as a family"), (2) family obligations (e.g., "Children should be taught that it is their duty to care for their parents when their parents get old"), and (3) family as referent (e.g., "Children should always do things to make their parents happy"). Six of the 16 items were taken from Sabogal et al., (1987) and the other items were constructed through focus groups with Mexican American parents and adolescents. Participants used a 5-point scale, ranging from (1) *strongly disagree* to (5) *strongly agree*. Items were averaged to create an overall familism score with higher scores indicating higher levels of familism. Cronbach's alphas were .77

for mothers, .83 for fathers, .88 for older siblings, and .86 for younger siblings at T2, and .84 for younger siblings' familism at T3.

Mexican and Anglo cultural orientations (T2 and T3). Mothers, fathers, older and younger siblings reported on their endorsement of Mexican and Anglo cultural orientations using the Acculturation Rating Scale for Mexican Americans II (ARSMA-II; Cuéllar, Arnold, & Maldonado, 1995). Sample items include: "I associate with Mexicans and/or Mexican Americans" (Mexican orientation); and "I enjoy listening to music in English" (Anglo orientation). Participants responded using a Likert-type scale, ranging from (1) *not at all* to (5) *extremely often or almost always*. The subscale score was created by averaging the 17 items for the Mexican orientation scale and the 13 items for the Anglo orientation scale. Higher scores indicated stronger adherence to Mexican and Anglo orientations, respectively. For Mexican orientations, Cronbach's alphas were .88 for mothers', .90 for fathers', and .91 for older and younger siblings' Mexican orientations at T2. Cronbach's alphas were .95, .92, .87, and .79 for mothers', fathers', older and younger siblings' Anglo orientations, respectively, for T2. At T3, Cronbach's alphas for younger siblings' Mexican and Anglo orientations were .89 and .74, respectively.

Younger sibling modeling (T2). Younger siblings reported how often they tried to be like their sibling, the degree to which their sibling set a positive example for them, and the extent to which their sibling encouraged them to participate in particular activities by completing an 8-item scale measuring sibling modeling developed by Whiteman, McHale, and Crouter (2007a). A sample item was "(Sibling's name) sets an example for how I should behave." Younger siblings responded using a Likert-type scale, ranging

from (1) *never* to (5) *very often*. Items were averaged such that higher scores indicated greater modeling. Cronbach's alpha was .87 for T2.

Results

The goals of the present study were twofold: (a) to investigate how older siblings' cultural orientations and values uniquely contributed to younger siblings' cultural orientations and values across a two-year period from late adolescence into young adulthood, after accounting for mothers' and fathers' cultural orientations and values; and (b) to examine the moderating role of younger siblings' reports of modeling of their older siblings' behaviors on cultural orientations and values in young adulthood. As part of our second goal, we tested whether the moderating effects of younger sibling modeling differed as a function of sibling dyad gender constellation (i.e., same-sex versus opposite-sex dyads) and sibling age spacing.

To address these goals, a series of residualized change regression models were conducted in Mplus 7 (Muthén & Muthén, 2012). Addressing the first goal, the first step in each model included younger siblings' cultural orientations or values at T3 (i.e., familism, Mexican and Anglo orientations) regressed onto mothers', fathers', and older siblings' cultural orientations and values (i.e., Anglo and Mexican orientations, and familism values, respectively) at T2, while controlling for younger siblings' prior cultural orientations and values (T2), family SES, time with extended family, mothers' nativity (0 = U.S.-born, 1 = Mexico-born), younger siblings' gender (0 = female, 1 = male), sibling dyad gender constellation (0 = mixed gender, 1 = same gender), and sibling age spacing (Figure 1). Sibling dyad gender constellation and sibling age spacing were included in the first step as covariates, but also examined as moderators in the analyses addressing the

second goal. Models were conducted separately for each of the three cultural indicators (i.e., Anglo and Mexican orientations, and familism values).

The second step in each of the three models examined the role of younger siblings' reports of modeling as a moderator between older siblings' cultural orientations and values at T2 and younger siblings' cultural orientations and values two years later at T3. Specifically, an interaction term was computed (i.e., older siblings' cultural orientations/values X younger siblings' modeling). In cases where the interaction term is significant, follow up analyses were conducted using procedures described by Aiken and West (1991), which states that significant interactions should be probed by examining simple slopes at *high* (1 standard deviation above the mean) and *low* (1 standard deviation below the mean) levels of the moderating variable (i.e., sibling modeling). All independent (i.e., exogenous) variables were grand mean centered prior to conducting the analyses, and all interaction terms (i.e., older siblings' cultural orientations and values X younger siblings' modeling) were created by multiplying centered variables.

To further test whether the moderating effects of modeling differed as a function of sibling gender constellation and sibling age spacing, we conducted two additional steps. Specifically, in one model we added the two-way interaction (older siblings' cultural orientation X sibling dyad gender constellation) then the three-way interaction (older siblings' cultural orientation X sibling dyad gender constellation X younger sibling modeling). We repeated these steps for sibling age spacing, adding the two-way interaction (older siblings' cultural orientation X sibling age spacing) then the three-way interaction (older siblings' cultural orientation X sibling age spacing X younger sibling modeling).

To adjust for missing data, all the analyses used full information maximum likelihood (FIML; Enders 2010) estimation given that data is assumed to be missing at random (MAR). Table 1a, 1b, and 1c present the correlations, means, and standard deviations for study variables.

Younger Siblings' Anglo Orientations

The model predicting young siblings' Anglo orientations in young adulthood (T3) are shown in Table 2. The results revealed that fathers' Anglo orientations were positively associated with younger siblings' Anglo orientations two years later (T3), controlling for prior levels of younger siblings' Anglo orientations. Further, older siblings' Anglo orientations and the interaction between older siblings' Anglo orientations and younger siblings' modeling was significant. Probing of the interaction revealed that at high levels of modeling (1 *SD* above the mean), older siblings' Anglo orientations were positively associated with younger siblings' Anglo orientations, $b = .32$, $SE = .10$, $p < .01$. At low levels of sibling modeling (1 *SD* below the mean), however, there was no relation between older and younger siblings' Anglo orientation, $b = .06$, $SE = .08$, *ns* (see Figure 2). Additional analyses examining a two-way interaction between older siblings' Anglo orientations X sibling dyad gender constellation and a three-way interaction between older siblings' Anglo orientations X sibling dyad gender constellation X younger sibling modeling indicated no significant interactions. Further analyses examining a two-way interaction between older siblings' Anglo orientation X sibling age spacing, and a three-way interaction between older siblings' Anglo orientation X sibling age spacing X younger sibling modeling revealed no significant findings.

Younger Siblings' Mexican Orientations

Findings revealed that younger sibling gender and fathers' Mexican orientations were significant predictors, such that girls reported higher Mexican orientations than did boys, and fathers' Mexican orientations positively predicted younger siblings' Mexican orientations two years later (see Table 2). Furthermore, the interaction between older siblings' Mexican orientation and younger siblings' modeling was not significant. In addition, no significant interactions emerged involving the two- and three-way interactions testing whether younger sibling modeling differed as a function of sibling age spacing and sibling dyad gender constellation (not presented in tables).

Younger Siblings' Familism Values

Turning to younger siblings' familism values, mothers' familism values at T2 positively predicted younger siblings' familism values at T3, accounting for their prior familism values. In addition, the interaction between older siblings' T2 familism values and younger siblings' T2 modeling emerged as significant. Probing of the interaction revealed that at high levels of modeling (1 *SD* above the mean), older siblings' familism values were positively associated with younger siblings' familism values, $b = .25$, $SE = .09$, $p < .01$. At low levels of sibling modeling (1 *SD* below the mean), however, there was no relation between older and younger sibling' familism values, $b = -.01$, $SE = .10$, *ns* (see Figure 3). Analyses examining differences by sibling dyad gender constellation revealed a significant two-way interaction between older siblings' familism values and sibling gender constellation $b = -.38$, $SE = .13$, $p < .01$, but no significant three-way interaction. Probing of this two-way interaction suggested that among same-sex dyads, no association emerged between older siblings' and younger siblings' familism values, $b = -$

.08, $SE = .10$, $p = .40$; however, among opposite-sex sibling dyads, a positive association emerged, $b = .30$, $SE = .10$, $p < .001$. Because opposite-sex dyads include both older sister-younger brother dyads and older brother-younger sister dyads, we did an additional follow-up analysis with opposite-sex dyads to see whether the associations emerged for both subgroups (i.e., older sister-younger brother dyads versus older brother-younger sister dyads). Results revealed that the positive association emerged within both subgroups, ($b = .25$, $SE = .12$, $p < .05$ for older sister-younger brother dyads and $b = .29$, $SE = .14$, $p < .05$ for older brother-younger sister dyads). There were no additional interactions with age spacing.

Post-Hoc Analyses

Our analyses revealed higher levels of stability in younger siblings' Mexican orientations ($r = .84$ between T2 and T3) compared to their Anglo orientations ($r = .62$ between T2 and T3) and familism values ($r = .41$ between T2 and T3), leaving less variance to be explained in Mexican orientations relative to Anglo orientations and familism values. Thus, we further examined whether older siblings' Mexican orientations at T2 predicted younger siblings' Mexican orientations at T3, without controlling for T2 younger siblings' Mexican orientations. Findings revealed that younger sibling gender and fathers' Mexican orientations (discussed above) and older siblings' Mexican orientations were significant predictors; as expected older siblings' Mexican orientations positively predicted younger siblings' Mexican orientations two years later (see Table 3). No additional two-way or three-way interactions emerged when testing the role of sibling modeling and moderation by sibling dyad characteristics. This follow-up analysis suggests that older siblings' Mexican orientation is a predictor of younger siblings'

Mexican orientation prospectively, when prior (fairly stable) levels of younger siblings' Mexican orientations are not included in the model.

Summary

Our findings suggest that older siblings' cultural orientations and values uniquely contribute to younger siblings' cultural orientations and values from late adolescence into young adulthood. Specifically, under conditions of high sibling modeling, younger siblings reported higher levels of Anglo orientations and familism values when their older siblings reported higher Anglo orientations and familism values two years earlier, accounting for younger siblings' earlier values/orientations, parents' values/orientations, time spent with extended family, mothers' nativity, and family SES. Whereas, fathers' orientations were positively associated with younger siblings' Anglo and Mexican orientations and mothers' values were predictive of younger siblings' familism values. Contrary to our predictions, there were no significant interactions with sibling age spacing, but there was one interaction for sibling dyad gender constellation and familism values, such that in opposite-sex dyads (but not same-sex dyads) older siblings' familism predicted younger siblings' familism two years later.

Discussion

The present study advances our understanding of the role of family in the development of youths' cultural orientations and values across the transition from adolescence to young adulthood by documenting the importance of *older sisters and brothers* in the lives of their younger siblings. There are several notable contributions of this study. First, these findings illustrate the contributions of older siblings to increases in Mexican-origin younger siblings' cultural orientations and values over a two-year period,

while also accounting for mothers' and fathers' cultural orientations and values and time spent with extended family. By considering multiple family members and three different dimensions of culture (i.e., Mexican orientations, Anglo orientations, familism values), a differentiated picture of family influences on youths' cultural development emerges. An additional strength of this study is the examination of how sibling dynamics and characteristics, particularly the degree to which younger siblings strive to model (i.e., be similar to) their older siblings, and characteristics of the sibling dyad, have the potential to introduce variability into these associations. In this sample of predominantly immigrant two-parent Mexican-origin families, our findings highlight the unique roles of siblings as well as mothers and fathers, and document specific conditions under which sibling influences may be enhanced.

The Role of Older Siblings, Mothers, and Fathers in Youths' Cultural Orientations and Values

Our first goal was to examine the contributions of older siblings' cultural orientations and values to younger siblings' across the transition from adolescent to young adulthood, accounting for mothers' and fathers' cultural orientations and values and time with extended family. The examination of older siblings, mothers, and fathers in the *same* model provides an opportunity to capture the unique contributions that each family member has in youths' cultural orientations and values from adolescence to young adulthood.

Looking at the patterns of findings across the three dimensions of culture examined here offers important insights into the role of siblings, mothers and fathers in youths' cultural orientations and values. Beginning with *Anglo orientations*, a dimension

of culture where siblings were expected to play a salient role, older siblings' Anglo orientations predicted increases in younger siblings' Anglo orientation two years later (accounting for stability in younger siblings' Anglo orientations), but only when younger siblings reported high levels of sibling modeling. That is, when younger siblings have a desire to follow their older siblings' example, look up to them, and strive to be similar, older siblings' Anglo orientations is predictive of increases in younger siblings' Anglo orientations. The role of older siblings in Anglo orientations may be attributed, in part, to the likelihood that siblings share experiences in settings outside the home, such as in school and peer contexts, where exposure to the mainstream culture typically occurs.

A similar pattern emerged for *familism values*, such that older siblings' familism values predicted increases in younger siblings' familism values, but again only under conditions of high levels of younger sibling modeling. These findings suggest that, when younger siblings want to be similar to their older siblings, they may look to them as they develop their own family-oriented values. As siblings spend substantial time within the family context in Mexican culture (Updegraff et al., 2010), older siblings may serve as an important example of an "age-mate" that endorses a sense of family unity, support, and interdependence, values that are typically held with high regard in this cultural context. As this is one of the first studies to examine siblings' roles in the development of *cultural values*, these findings are promising and suggest the need to consider the role of siblings in the development of other culturally linked values in adolescence and young adulthood.

Evidence of the role of older siblings in the development of younger siblings' *Mexican cultural orientations* did not emerge in this study. It is possible that the null findings are partly a result of the high stability of youths' Mexican orientations over the

two-year period, leaving limited variability to be explained. Consistent with this explanation, when younger siblings' prior Mexican orientations were not included in the model, older siblings' Mexican orientations predicted younger siblings' Mexican orientations two years later. In contrast to the findings for Anglo orientations and familism values, however, younger siblings' modeling did not moderate this association. It is possible that siblings are not particularly salient models for youths' Mexican cultural orientations, which assessed behaviors such as speaking Spanish, celebrating Mexican cultural traditions, and associating with Mexican/Mexican American peers and adults (Cuéllar et al., 1995). Given that our sample was comprised of predominantly immigrant parents (70% were born in Mexico) and the majority of older siblings were born in the U.S. (54%), it may be that other family members (e.g., parents, grandparents) serve as role models for younger siblings in terms of their Mexican cultural orientations, as they may possess greater knowledge of their family ethnic culture and more proficient and frequent use of their native language (relative to older siblings). Consistent with this idea, our findings revealed that fathers' Mexican orientations predicted younger siblings' Mexican orientations, despite the stability in younger siblings' Mexican orientations over this two-year period.

Looking to the pattern of associations for mothers and fathers also yields insights about family influences on youths' cultural orientations and values in this sample of two-parent families. Specifically, fathers' Mexican and Anglo cultural orientations accounted for increases in younger siblings' cultural orientations across the transition to young adulthood, whereas mothers' familism values (but not fathers') were associated with younger siblings' familism values in young adulthood. One possible interpretation of this

pattern is that mothers and fathers may assume *unique* roles in their offsprings' cultural development in Mexican American families (Cauce & Domenech-Rodríguez, 2002; Umaña-Taylor & Updegraff, 2012). To the extent that fathers are viewed as authority figures in the family (Adams, Coltrane, & Parke, 2007), their cultural orientations may shape the opportunities, activities, and daily experiences that youth are exposed to with reference to their ethnic culture and the host culture.

It is also worth noting that fathers in our sample were required to be employed at the time of study recruitment (when younger siblings were in early adolescence), and were more likely to be employed at all three time points than mothers (i.e., 99%, 93%, and 86% for fathers, respectively, and 65%, 70%, and 68% for mothers, respectively). Fathers in this sample also lived in the U.S. slightly longer than mothers (15 years versus 12 years, respectively). Together, fathers' employment opportunities and more extended time in the U.S. may provide experiences in navigating the two cultural contexts and in employment (e.g., exposure to discrimination; opportunities to develop networks) that shape the experiences of their children with regard to exposure to and contact with U.S. and Mexican culture.

Although it might be expected that the transition to adulthood is a period characterized by moving away from the home and becoming financially independent (Arnett, 2000), the transition to adulthood in this study also was characterized by the economic downturn in the U.S. Likely attributable, in part, to these difficult economic times, a reasonable large number of younger siblings continued to live with their parents into young adulthood (69% at T3). Thus, this might have provided continued

opportunities for fathers' (and mothers') socialization in youths' cultural orientations/values across the transition to young adulthood.

In Latino families, women are typically viewed as the *carriers* of culture (Padilla, 2006; Phinney, 1990) and as the primary caregivers in the family (Azmitia & Brown, 2002); thus, mothers may be important models for the transmission of *values* that emphasize family solidarity, support, and interdependence (Perez-Brena, Updegraff, & Umaña-Taylor, 2015). As youth construct their value system during this developmental period (Arnett, 2000), they may refer to their mothers (relative to fathers) for guidance and support, particularly when the focus is on family-oriented values. Further, our findings are consistent with prior work using earlier time points of the current study: Perez-Brena et al. (2015) showed that from early to middle adolescence mothers' familism values were associated with increases in youths' familism values in late adolescence (only for younger siblings); however, this association did not emerge for fathers (Perez-Brena et al., 2015). Nevertheless, we need to consider that the findings for the current study are embedded within the context of the economic downturn. It is possible that due to the challenging economic times mothers' influences on youths' familism values became more noticeable, as families reported a sense of unity which enabled them to work together as a family through the economic and employment challenges that characterized a substantial portion of families.

Taken together, looking at the unique contributions of older siblings, mothers, and fathers across three different dimensions of culture yielded important insights about the differentiated roles of family members in the lives of young adults' cultural orientations and values within this sample of predominantly immigrant two-parent families.

Importantly, after accounting for the role of mothers and fathers, we found that siblings matter, but under specific conditions: older siblings are salient models for their younger siblings as they construct their Anglo orientations and familism values. Our findings also revealed the role of fathers in youths' cultural orientations (Mexican and Anglo) and the role of mothers in their value development during the transition to young adulthood.

The Moderating Role of Sibling Modeling and Sibling Dyad Characteristics

Guided by the social learning tenants that youth acquire attitudes, values, skills, and behaviors by observing others and through social reinforcement (Bandura, 1977), our second goal was to examine the moderating role of sibling modeling and sibling dyad characteristics in the association between older and younger siblings' cultural orientations and values. As noted, siblings' reports of modeling moderated the associations in two of the three domains examined in this study. Our findings revealed that older siblings' Anglo orientations and familism values predicted younger siblings two years later, but *only* when younger siblings reported high levels of sibling modeling. This is a particularly important finding given that in the current study we used a measure that captured siblings' perspectives on the degree to which they model their older siblings (Whiteman et al., 2007a). In other words, we were able to assess youths' perceived efforts to be similar to their siblings. Typically, sibling researchers use proxy variables (e.g., age spacing, sibling dyad gender constellation) to explore the role of sibling modeling (e.g., risky behaviors; East & Khoo 2005; McHale et al., 2009). A limited number of scholars have *directly* assessed youths' efforts to model their siblings. In fact, this may be one of the first studies to incorporate a direct assessment of sibling modeling as a way to understand youths' cultural development. By using this approach, it was

possible to gain a better understanding of the role of siblings' desire to be like their older siblings and to identify *specific conditions* (i.e., high levels of sibling modeling) under which older siblings predict younger siblings' cultural orientations and values.

Based on social learning theory, it was also hypothesized that sibling influences would be enhanced by certain dyad characteristics that may increase the likelihood of an older sibling serving as a model for younger siblings' orientations and values. That is, social learning principals suggests that youth are more likely to model others that are similar to them (Bandura, 1977), such as siblings who are closer in age (Whiteman et al., 2011) or a sibling of the same sex (East & Khoo 2005; McHale et al., 2009). The only case where sibling dyad characteristics mattered was in the association between older and younger siblings' familism values. Contrary to our hypothesis that sibling influences would be more pronounced in same-sex dyads, the association between older and younger siblings' familism values was positive and significant in *opposite-sex* sibling dyads, but not significant in same-sex dyads. This finding may be explained, in part, by research highlighting the potentially different socialization of girls and boys in Mexican American culture, with greater emphasis on family involvement and roles for girls and more autonomy and freedom for boys in Mexican American/Latino families (Cauce & Domenech-Rodríguez, 2002; Raffaelli & Ontai, 2004). Such findings are largely based on *between-family* comparisons (i.e., girls and boys in different families) and it is rare to study sisters and brothers growing up in the *same* families (McHale, Updegraff, Shanahan, Crouter, & Killoren, 2005). It is possible that such socialization differences set the stage for siblings to influence one another given their different socialization experiences.

Overall, the findings of this study provided little evidence of the moderating role of sibling dyad gender constellation and sibling age spacing. There are several possible reasons. One may have to do with the developmental period of focus in this study. It is possible that sibling age spacing, for example, is more influential as a moderator in early and middle childhood, but less relevant in late adolescence and early adulthood given that the structure of the sibling relationship becomes more egalitarian (Buhrmester & Furman, 1990). This shift in the sibling structure may enable siblings to share more equally in power and influence and have a more balanced relationship. It is also possible that the focus on cultural development played a role and that sibling dyad characteristics are less likely to emerge as moderators in this domain relative to other domains (e.g., sibling relationship quality). Similarities between siblings based on sibling dyad gender constellation and sibling age spacing have been mainly present when examining outcome variables such as risky behaviors (East & Khoo 2005; McHale et al., 2009), and sibling relationship quality (Buhrmester & Furman, 1990; Whiteman, Bernard, & McHale, 2010). Furthermore, given that Mexican culture is characterized by an emphasis on gender dynamics that are closely tied to cultural socialization (Cauce & Domenech-Rodríguez, 2002), it may not have been possible to adequately separate these influences to capture sibling socialization differences based on sibling dyad characteristics. Relevant to these null findings, Whiteman and colleagues (2014) argued for the need to move beyond the use of proxy measures of sibling similarity, such as sibling age spacing and sibling dyad gender constellation, to more directly assess the processes under which sibling similarities emerge, including siblings' modeling.

Limitations and Future Directions

The limitations of this study provide potential avenues for future research. First, this study focused on sibling influences on three dimensions of cultural development: Anglo and Mexican orientations and familism values. Future work should examine siblings' roles in other aspects of cultural development, such as ethnic identity and preparation/experiences of discrimination from adolescence to young adulthood (Umaña-Taylor & Updegraff, 2007; Umaña-Taylor, Yazedjian, & Bámaca-Gómez, 2004; Whitbeck et al., 2001) to provide additional insights on siblings' roles in different dimensions of cultural development. Second, this study was guided by social learning theory (Bandura, 1977) and focused on sibling *modeling*. Future work should consider other potential processes. From an ecological perspective, (Bronfenbrenner, 1986), which highlights the role of daily activities and experiences, siblings' *shared participation* in daily cultural activities might provide opportunities for siblings to influence on one another's cultural development (Tucker, McHale, & Crouter, 2008; Whiteman, Bernard, & McHale, 2010). Third, the focus of this study was on older siblings' influence on younger siblings' cultural development, yet it is possible that *reciprocal* influences may occur. As noted, the structure of the sibling relationship is expected to become increasingly egalitarian in late adolescence and early adulthood (Buhrmester & Furman, 1990); as such, future work should examine how younger siblings may influence older siblings' cultural development. Finally, our findings pertain to a specific sample of Mexican American families (i.e., predominantly immigrant, residing in the southwest, two-parent families), and therefore, our results may not generalize to all Mexican-origin families. For instance, given that our sample resided in the southwest, it may be that

living in close proximity to Mexico and living in a geographic region with an established Latino population may provide more opportunities for youth to engage in Mexican culture and embrace their cultural values, while also participating in U.S. culture. Future work should extend this research to families from different sociocultural contexts (e.g., new immigrant destinations, non-border locations) to increase our understanding of sibling influences on cultural development as embedded in the larger sociocultural context.

Conclusion

The current study is among the first to document the unique contributions of siblings and mothers and fathers in cultural orientations and values among a sample of adolescents growing up in predominantly immigrant families. Prior research has highlighted the role of parents in youths' cultural development (Hughes et al., 2003; 2006); however, a particularly novel aspect of our study was the inclusion of *siblings*, which have been largely neglected in the study of youths' cultural development. Sibling influences on youths' cultural orientations and values were evident under conditions of high levels of sibling modeling, such that older siblings' Anglo orientations and familism values positive predicted younger siblings'. Researchers interested in understanding the role of family in youths' cultural development should aim to incorporate siblings into their work given that majority of Latino youth in the U.S. (77% ; U.S. Census, 2011) grow up with at least one sibling, and our findings demonstrate that siblings play a role in youths' cultural orientations and values across the transition from adolescence to young adulthood. By further examining the unique contributions siblings and parents in youths' cultural adaptation process we can move the field forward in understanding the complex

ways that families may play a role in youths' cultural development and develop family-based programs that promote youths' cultural development.

Study 2: The Role of Siblings in Mexican American Youths' Educational Expectations from Adolescence to Young Adulthood

In the U.S., attending college has become a normative developmental transition for the majority of young adults (Lefkowitz, 2005). In fact, 33% of young adults (ages 25 to 29) in the U.S. earned a bachelor's degree or higher degree in 2012 (National Center for Education Statistics, 2013). Ethnic differences persist, however: 51% of Asian Americans, 33% of European Americans, and 19% of African Americans as compared to 11% of foreign-born Hispanics and 18% of U.S.-born Hispanics hold a college degree (Brown & Patten, 2012). These ethnic group differences underscore the need to understand factors that may promote educational attainment among Hispanic young adults (Umaña-Taylor, 2009). From a developmental perspective, educational attainment in young adulthood is influenced by the expectations, goals, and plans that are developed during adolescence (Eccles & Wigfield, 2002; Mello, 2009; 2012), as this is an important period for exploring one's identity and formulating realistic plans for the future (Markus & Wurf, 1987; Steinberg et al., 2009). Research on Hispanic and African American youth demonstrates that adolescents' educational expectations predict actual educational attainment and college attendance in young adulthood (Mello et al., 2012).

Adolescents' educational expectations are impacted by a range of individual and contextual factors, with the family being a particularly influential context for the development of youths' educational expectations (Eccles, 2007; Eccles & Wigfield, 2002). Within the family, the role of parents has received substantial attention in the study of adolescents' educational outcomes (Teachman & Paasch, 1998; Trusty, 2000), but we know much less about *siblings'* contributions. Siblings are potentially important

models and sources of information and support with regard to youths' educational and career decisions (Ali et al., 2005; Ceja, 2006; Conger & Little, 2010), particularly in families where parents are born outside the U.S. and generally have more limited exposure to and direct experience with the U.S. educational system. This study examines siblings' contributions to adolescents' educational expectations among predominantly immigrant Mexican American families in the U.S., where the largest proportion of immigrants come from Mexico (Krogstad & Keegan, 2014).

The vast majority of Mexican American youth (77%) growing up in the U.S. have at least one sibling (U.S. Census Bureau, 2011), and they spend considerably more time in shared activities with their siblings (> 20 hours per seven days) than with their parents or peers (Updegraff et al., 2010). In Mexican culture, siblings are a particularly important part of family life because of the cultural emphasis on family support, loyalty, and interdependence (Sabogal et al., 1987). Yet, we know very little about siblings' influences on adolescents' and young adults' educational expectations. The present study aims to contribute to this area of research by (a) examining the associations between older and younger siblings' educational expectations from early adolescence to young adulthood among a sample of Mexican American sibling pairs, and (b) by testing sibling, family, and cultural moderators of these associations. The conceptual underpinnings of our study are collectively informed by developmental theory (Erikson, 1968), an expectancy-value model of family influences on achievement (Eccles, 2007; Eccles & Wigfield, 2002), social learning theory (Bandura, 1977), and more broadly, by an ecological systems perspective (Bronfenbrenner, 1986).

Educational Expectations in Adolescence: Developmental and Family Factors

Adolescence is a key period to study the development of youths' educational expectations as this is a time when identity exploration is a salient developmental task (Erikson, 1968; Steinberg & Silk, 2002). The process of identity formation requires adolescents to assess their strengths and weaknesses and discover who they are as individuals (Erikson, 1968; Muuss, 1996); an integral part of identity development in adolescence is youths' conceptualization of their interests, abilities, and goals (Erikson, 1968; Holland, Gottfredson, & Power, 1980) in multiple domains, including education (Eccles, 2007; Eccles & Wigfield, 2002). Extant evidence is consistent with developmental theory in documenting adolescence and young adulthood as a time of development and change in youths' educational expectations (Mello et al., 2008; 2009; 2012). Importantly, though, change over time in educational expectations may vary by characteristics and processes in family and sociocultural contexts in which youths' lives are embedded (Bronfenbrenner, 1986; Eccles, 2007; Eccles & Wigfield, 2002).

An ecological systems perspective and an expectancy-value model of achievement emphasize the importance of *interactions* between the person and contexts of daily life (Bronfenbrenner, 1986; Eccles, 2007; Eccles & Wigfield, 2002); however, the expectancy-value model of achievement further suggests that youths' educational expectations may be influenced by other peoples' expectations given that youth may use this information to form schemas of their abilities and expectations, which in turn, youth may use to construct their educational expectations (Eccles, 2007; Eccles & Wigfield, 2002). Research shows that parents play a role in the development of youths' educational goals (e.g., Jodl, Michael, Malanchuk, Eccles, & Sameroff, 2001; Teachman & Paasch,

1998). Jodl et al. (2001), for example, documented that adolescents' educational expectations were positively associated with parents' expectations in European and African American families. Furthermore, when adolescents strongly identified with their mothers, they reported higher educational expectations after taking into account their mothers' educational expectations for them (Jodl et al., 2001). Together, these findings highlight the potential ways that parents can have a positive impact on the development of youths' educational expectations. We extend these ideas in a new direction, focusing on *siblings* as models for the development of Mexican-origin youths' expectations from adolescence to young adulthood.

Examining Siblings' Roles in Youths' Educational Expectations from Early Adolescence to Young Adulthood

Sisters and brothers are central figures in children's and adolescents' daily lives across many cultures as companions, caregivers, and sources of support (Updegraff et al., 2010; Weisner, 1993). Research on European American (McHale & Crouter, 1996) and Mexican American youth (Updegraff et al., 2005) shows that, during childhood and adolescence, youth spend the majority of their out-of-school time with their siblings. Thus, siblings' experiences during childhood and adolescence provide the groundwork for one of the longest lasting relationships most individuals experience, and siblings can serve as significant sources of emotional and instrumental support as youth adopt new roles and responsibilities across the lifespan (McHale et al., 2012).

During early and middle adolescence, older siblings may be particularly important sources of support and guidance for their younger siblings. A social learning perspective directs our attention to observational learning and role modeling as socialization

processes, and in particular, suggests that individuals who have higher status and share similar characteristics may be more likely to serve as models (Bandura, 1977; Whiteman et al., 2011). As older siblings are more developmentally advanced and likely to experience key transitions before their younger siblings (e.g., transition to high school or postsecondary education), they may serve as important role models for their younger siblings' educational expectations and plans (Bandura, 1977; Whiteman et al., 2011). For instance, older siblings may be able to provide essential information to their younger siblings regarding the steps they should follow to enter college (e.g., entrance exams, application process, financial aid; Buriel & De Ment, 1997; Ceja, 2006; Hurtado-Ortiz & Gauvain, 2007). In immigrant families, older siblings may be a *primary* source of information within the family for younger siblings given that their parents may not have attended school in the U.S. or had the opportunity to attend college themselves and may have limited experience navigating U.S. educational systems (Ceja, 2006; Sanchez, Reyes, & Singh, 2006). Thus, older siblings have the potential to inspire their younger siblings (Ceja, 2006; Sanchez et al., 2006) and serve as positive role models through their educational expectations and attainments. These predictions are in line with a social learning perspective, which emphasizes the significance of individuals of higher status as role models (Whiteman et al., 2011), such as older siblings for their younger siblings.

The period from adolescence to young adulthood is hypothesized to be a time of developmental change in the structure of the sibling relationship (Buhrmester & Furman, 1990; Conger & Little, 2010). In adolescence, sibling relationships are characterized as more hierarchical in that hypothesized influences are stronger from older to younger siblings than from younger to older siblings. Accordingly, extant data documents the role

of older siblings as models for younger siblings' behaviors and attitudes (e.g., East & Khoo 2005; Slomkowski et al., 2001; Whiteman, McHale, & Crouter, 2007b). As youth transition through adolescence and into adulthood, sibling relationships are expected to become more egalitarian (Buhrmester & Furman, 1990). These shifting dynamics from a hierarchical to a more egalitarian relationship structure may mean that sibling influences will become more reciprocal as the structure of the relationship becomes more balanced. Although the influence of younger siblings on older siblings is tested much less often than the influence of older siblings on younger siblings (East & Khoo 2005; Slomkowski et al., 2001; Whiteman et al., 2007b), this may be an important oversight as siblings transition from adolescence to adulthood when more reciprocal sibling influences may emerge.

The current study was designed to examine the role of older and younger siblings in one another's educational expectations across adolescence and into young adulthood. Guided by prior work on sibling relationships (East & Khoo 2005; Whiteman et al., 2007b), we expected that older-to-younger sibling influences on educational expectations would characterize early to middle adolescence and that reciprocal associations (older-to-younger and younger-to-older sibling influences simultaneously) would characterize middle/late adolescence to young adulthood. We expected this pattern to emerge as a result of shifts in the sibling structure (from hierarchical to more egalitarian) that may set the stage for reciprocal sibling influences.

Testing Sibling, Cultural, and Family Context Characteristics as Moderators

The second goal of this study was to explore the moderating effects of cultural-ecological characteristics on the associations between siblings' educational expectations

from adolescence to young adulthood. Sibling influences are likely to be altered by the characteristics of the contexts (e.g., family, cultural) in which these relationship influences are embedded (Updegraff et al., 2010). Ecological and cultural-ecological frameworks posit that *proximal processes*, such as adolescents' daily activities and interpersonal experiences, are embedded within the larger family and sociocultural context (Bronfenbrenner, 1986; García Coll et al., 1996). A key premise of these perspectives is that interactions among individual (e.g., gender, age), family (e.g., parents' educational level), and sociocultural (e.g., cultural beliefs) characteristics play a role in shaping these proximal processes and their implications for youth development and functioning. In this study, we examined sibling dyad characteristics and siblings' cultural backgrounds as contextual characteristics that may moderate the associations between older and younger siblings' educational expectations from early adolescence to young adulthood.

Family immigrant context. It has been argued that educational values and educational expectations are salient among Hispanic youth and their families (Fuligni, 2001a; 2010), and particularly among those from immigrant backgrounds (Fuligni, 1997; Ogbu, 1990; Suárez-Orozco, Gaytán, & Kim, 2010), as they embrace the idea that obtaining a good education may lead to a better financial future for themselves and their family. Work by Fuligni (1997) demonstrated differences in educational aspirations among foreign-born and U.S.-born adolescents from ethnically diverse backgrounds (i.e., Latino, East Asian, Filipino, and European), with foreign-born youth holding higher educational aspirations than U.S.-born youth (Fuligni, 1997); however, prior work focuses on youths' nativity and does not take into consideration the role of nativity at the

family level. By only focusing on youths' nativity we are unable to capture variability that exists *within* the family context in place of birth, and exposure to ethnic and mainstream culture (Lau et al., 2005; Updegraff & Umaña-Taylor, 2010). Therefore, it could be argued that families characterized by parents and siblings who were foreign-born may be a unique context, as immigrant parents' strong values regarding education (Fuligni, 2010; Suárez-Orozco et al., 2010) are coupled with their limited experience with U.S. educational system. This combination of parents' emphasis on educational values but limited experience within the U.S. education system may lead youth to look to other family members, such as siblings, as role models and sources of advice and support in the realm of education and career opportunities (e.g., Bandura, 1977; Glass et al., 1986). From this work comes the prediction that family immigrant context would moderate the association between older and younger siblings' educational expectations, such that the associations would be stronger for immigrant-born families relative to mixed-status/U.S.-born families. We expected this association to emerge given *shared immigrant status* between family members may increase the relevance of family members, particularly siblings, as role models as they may share similar experiences within the family context and milieu (Bandura, 1977).

Sibling characteristics. Sibling relationships vary as function of their structural characteristics (e.g., sibling dyad gender constellation, sibling age spacing; Buhrmester & Furman, 1990; McHale et al., 2009; 2012; Whiteman et al., 2011). Prior work on sibling relationships demonstrates that sibling characteristics merit attention as they have implications for siblings' influences on one another (Buhrmester & Furman, 1990; McHale et al., 2009; 2012; Slomkowski et al., 2001). As suggested by social learning

theory (Bandura, 1977), individuals are more likely to model others who have a higher status, and are similar to them. These tenets suggest that modeling processes within the sibling relationship may be more likely to occur for dyads with similar characteristics (Whiteman et al., 2011). For instance, same-sex sibling dyads may be more likely to model each other as they may be able to identify more with someone that is of the same gender as them. Further, siblings that are closer in age may be more similar (e.g., less different in developmental/chronological age), and therefore likely to model each other (Whiteman et al., 2011); however, sibling dyads with wider age spacing may provide the older sibling with a higher status, and thereby encourage modeling in younger siblings (Whiteman et al., 2011). Based on prior work (Buhrmester & Furman, 1990; McHale, et al., 2009; 2012; Whiteman et al., 2011), stronger associations are expected between siblings' educational expectations for same-sex as compared to mixed-sex dyads, given that individuals are more likely to identify themselves with others that are similar to them (Whiteman et al., 2011). Age spacing was also tested as a moderator, but a specific hypothesis was not advanced given the conflicting predictions.

Covariates. Household income, parents' educational level, and youths' familism values were included as covariates in this study. Prior work on youths' educational expectations has emphasized the role of family resources, such that higher income is associated with higher levels of educational expectations (Bohon, Johnson, & Gorman, 2002; Melby, et al., 2008). Further, parents' educational level has been associated with youths' educational expectations and outcomes (Wigfield et al., 2006). Thus, for the current study, we included household income and parents' educational level as covariates

to explore the role of siblings' educational expectations after taking into account the contributions of parents' economic and educational resources.

Familism refers to individuals' endorsement of the belief that family serves as a source of support and guidance, and embraces the idea that family needs come before ones' individual needs (Knight et al., 2010). These values are highly embraced among Mexican American families (Hurtado 1995; Knight et al., 2010). Work by Fuligni and colleagues (2001b; 2004; 2010) emphasize that youths' sense of obligation to the family is reflected by their educational aspirations and motivation. It has been argued that academic motivation among minority youth may be rooted in their desire to bring pride to the family and to provide financially to their family in the future (Fuligni, 2001b; Fuligni & Hardway, 2004). Thus, youths' familism obligation values were included as a covariate to examine the associations between siblings' educational expectations after taking into account the role of siblings' values.

Present Study

In this study, we examined reciprocal associations between older and younger siblings' educational expectations among Mexican American youth over an eight-year period. Drawing broadly on developmental theory, we expected associations from older siblings' to younger siblings' educational expectations to be more likely to emerge from *early/middle adolescence* to *middle/late adolescence*. Further, we expected that reciprocal influences (i.e., older to younger siblings and younger to older siblings) would be more likely to emerge from *middle/late adolescence* to *young adulthood*, given that by this developmental period changes in the sibling structure should have occurred (i.e., more egalitarian and mutually influential relationship). Our longitudinal cross-lag model

allows for the exploration of whether sibling influences shift across this developmental period from a hierarchical sibling relationship (older siblings influence younger siblings only) to a more egalitarian relationship (older siblings influence younger siblings and younger siblings influence older siblings). To address our second goal, we explored several potential moderators of these associations: (a) family immigrant context; and (b) sibling dyad characteristics (i.e., sibling dyad gender constellation, age spacing). We expected stronger associations for immigrant-born families (as compared to mixed-status/U.S.-born families), and same-sex dyads (versus mixed-sex dyads). We did not advance specific hypotheses regarding age spacing. Based on prior work (Bohon et al., 2002; Fuligni, 2001a; 2001b; 2010; Melby, et al., 2008), household income, parents' educational level, and youths' familism values were included as covariates.

Method

Participants

Data were drawn from a larger longitudinal study of adolescent development and family socialization including 246 Mexican American adolescents and their families (Updegraff, McHale, Whiteman, Thayer, & Delgado, 2005). Participants were recruited through schools in and around a southwest metropolitan area. Based on the larger study goals, criteria for participation were as follows: (1) 7th graders and an older sibling were living at home and not learning disabled, (2) biological mothers and biological or long-term adoptive fathers (i.e., 10 or more years) were living at home, (3) mothers were of Mexican-origin and (4) fathers worked at least 20 h per week. Although not required for participation, 93% of fathers also were of Mexican descent. We focused on two-parent families, who represent the predominant arrangement in Mexican American families in

the U.S. (65 %; U.S. Census Bureau, 2014) and in the county from which the sample was drawn (U.S. Census Bureau, 2000).

To recruit participants, letters and brochures describing the study goals (in English and Spanish) were sent to 1,856 families with Latino 7th graders in five public schools districts and five parochial schools. Follow-up telephone calls were conducted by trained bilingual staff to determine each family's eligibility and interest in participating in the project. The contact information of 396 families (21%) was incorrect and attempts to find updated information were unsuccessful and 146 families (10%) refused to be screened for eligibility. Eligible participants included 421 adolescents and their families (i.e., 32 % of those who were contacted and screened). Of those who were eligible, 284 families (67 %) agreed to participate, 95 (23 %) refused, and 42 families (10 %) moved before the recruitment process was completed. Interviews were completed with 246 adolescents and their families. Those who agreed but did not participate in the final sample ($n = 38$) were families that we were unable to locate or with whom we were unable to complete a home interview after repeated attempts.

At Time 1(T1), mothers and fathers averaged 39 years ($SD = 4.63$) and 42 years of age ($SD = 5.80$), respectively. Most parents were born in Mexico (71% of mothers and 69% of fathers) and preferred to complete the interview in Spanish (66% of mothers, and 67% of fathers). Parents reported an average of 10 years of education ($M = 10.34$; $SD = 3.74$ for mothers, and $M = 9.88$, $SD = 4.37$ for fathers). The majority of foreign-born parents completed their education outside the U.S. (88% of mothers and 93% of fathers, respectively). Parents came from a range of socioeconomic levels, with the percentage of families meeting federal poverty guidelines (18.3%) being similar to two-parent Mexican

American families in poverty in the county where the sample was drawn (i.e., 18.6%; U.S. Census Bureau, 2000). Median family income was \$40,000 (range from \$3,000 to over \$250,000). Younger siblings were 12.51 ($SD = 0.58$) and older siblings were 15.48 ($SD = 1.58$) years of age. Over 51% of younger siblings ($n = 125$) and 50% of older siblings ($n = 123$) were female. Younger siblings were most likely to be born in the US (62%; $n = 153$), whereas older siblings were more likely to be born in Mexico (54%; $n = 132$). The majority of youth preferred to complete the interview in English (83%).

At Time 2 (T2), five years after the initial wave of data collection, over 75% of the families participated ($n = 185$). Younger siblings were 17.72 ($SD = .57$) and older siblings were 20.65 ($SD = 1.57$) years of age at T2. Those who did not participate could not be located ($n = 43$), had moved to Mexico ($n = 2$), could not presently participate or were difficult to contact ($n = 8$), or refused to participate ($n = 8$). When compared to the participant families ($n = 185$), non-participant families at T2 ($n = 61$) reported significantly lower income at Time 1 ($M = \$37,632$; $SD = \$28,606$ for non-participant families and $M = \$59,517$; $SD = \$48,395$ for participant families) and lower maternal education ($M = 9.48$; $SD = 3.45$ for non-participant families and $M = 10.62$; $SD = 3.79$ for participant families) and paternal education ($M = 9.06$; $SD = 4.13$ for non-participant families and $M = 10.16$; $SD = 4.43$).

At Time 3 (T3), seven years after the initial wave of data collection and two years after T2, over 70% of the families participated ($n = 173$). Younger siblings were 19.60 ($SD = .66$) and older siblings were 22.57 ($SD = 1.57$) years of age. Those who did not participate could not be located ($n = 45$), had moved to Mexico ($n = 4$), could not presently participate or were difficult to contact ($n = 4$), or refused to participate ($n = 8$).

The 12 remaining non-participant families were classified as mixed-status as family members within these families did not participate for different reasons (e.g., in one family the father refused to participate and we were unable to locate the mother, younger sibling, and older sibling). When compared to the participant families ($n = 173$), non-participant families at T3 ($n = 73$) reported significantly lower income at T1 ($M = \$41,636$; $SD = \$39,095$ for non-participant families and $M = \$59,137$; $SD = \$46,674$ for participant families), lower maternal education ($M = 9.35$; $SD = 3.53$ for non-participant families and $M = 10.75$; $SD = 3.75$ for participant families), and lower paternal education ($M = 8.49$; $SD = 4.08$ for non-participant families and $M = 10.46$; $SD = 4.37$ for participant families).

Procedures

The same procedures were used at each wave of data collection. Trained bilingual interviewers collected data in separate home interviews in family members' preferred language (either English or Spanish). At the beginning of the interview, interviewers obtained informed consent at T1 and at T2 (for T2 and T3). Due to variability in reading abilities, interviewers read questions aloud and entered responses into a laptop computer. Home interviews averaged between 2 to 3 hours in duration. Families were given a \$100 honorarium for the interviews at T1, \$125 at T2, and each family member was paid separately \$75 at T3. The Institutional review board approved all procedures.

Measures

All measures were forward and back-translated into Spanish for local Mexican dialect (Foster & Martinez, 1995). All final translations were reviewed by a third native Mexican American translator and discrepancies were resolved by the research team. Cronbach's alphas for all measures were acceptable for English- and Spanish-speaking

participants; thus for efficiency, all alphas are reported for the overall sample rather than separately by language.

Parents' educational level and household income (T1). Mothers and fathers reported on their education in years (e.g., 12 = *high school diploma*, 21 = *MD, JD, DO, DDS, OR Ph.D.*). Parents also reported on their annual household income. A log transformation was applied to household income to correct for skewness and kurtosis.

Familism values (T1). Older and younger siblings completed the 5-item subscale of the Mexican American Cultural Values Scale (Knight et al. 2010) assessing family obligations. Older and younger siblings rated items (e.g., “Older kids should take care of and be role models for their younger brothers and sisters”) using a 5-point scale, ranging from (1) *strongly disagree* to (5) *strongly agree*. Items were averaged to create the familism scores with higher scores indicating higher levels of familism. Cronbach's alpha was .72 and .66 for older and younger siblings respectively.

Youths' characteristics and family immigrant context (T1). Older and younger siblings reported on their own gender (0 = females; 1 = males) and sibling dyad gender constellation was calculated based on youths' responses (opposite-sex dyads= 0; same-sex dyads= 1). Mothers and fathers reported on their country of birth. Further, mothers reported on the country of birth for each sibling (0 = U.S.-born; 1= Mexico-born). Using mothers' and fathers' responses, a *family immigrant context* dummy code variable was created to distinguish between families where mothers, fathers, older and younger siblings were born outside the U.S., compared to families where not everyone was immigrant born (0 = Family Immigrant Context; 1 = Family non-Immigrant Context). Sibling age spacing was calculated by subtracting younger siblings' age in

years (as reported at the home interview) from older siblings' age in years (0 = less or equal to 3 years of apart in age; 1 = more than 3 years of apart in age).

Youths' educational expectations (T1, T2, T3). Older and younger siblings reported on their *educational expectations* by responding to the following item: "How far do you really think you will go in school?" Response choices for both questions were on a continuous scale representing the total number of years of education (e.g., 12 = *high school diploma*, 21 = *MD, JD, DO, DDS, OR Ph.D.*).

Results

The goals of the present study were twofold: (a) to examine the reciprocal associations between older and younger siblings' educational expectations from early/middle adolescence to middle/late adolescence, and from middle/late adolescence to young adulthood; and (b) to test the moderating role of family immigrant context, sibling age spacing, and sibling dyad gender constellation in the association between older and younger siblings' educational expectations. Covariates included parents' educational level, household income, family immigrant context, sibling age spacing, sibling dyad gender constellation, and youths' familism values (see Figure 4). To address these goals, we conducted a series of autoregressive cross-lag panel models (Cole & Maxwell, 2003) in Mplus 7 (Muthen & Muthen, 2012) to estimate reciprocal relations between older and younger siblings' educational expectations across three time points, after taking into account the effects of stability in each sibling's educational expectations. Multiple group models were tested to examine the moderating roles of family immigrant context, sibling age spacing, and sibling dyad gender constellation. Missing data were accounted for by

using the Full Information Maximum Likelihood estimator (FIML; Enders, 2010). Table 4 presents the correlations, means, and standard deviations for study variables.

Goal 1: Autoregressive Model

To address Goal 1, the autoregressive model was built in four steps: (1) stability estimates for older and younger siblings' educational expectations (e.g., older sibling educational expectation at T1 predicting older siblings' educational expectations at T2 and older siblings' educational expectations at T2 predicting older siblings' educational expectations at T3, and the same estimates for younger siblings); (2) all estimates from step 1 and cross-lag effects predicting younger siblings' educational expectations at one time point from older siblings' educational expectations from an earlier time point (e.g., older siblings' educational expectations at T1 predicting younger siblings' educational expectations at T2); (3) all estimates in step 1 and additionally the cross-lag effects predicting older siblings' educational expectations from an earlier estimate of younger siblings' educational expectations (e.g., younger siblings' educational expectations at T1 predicting older siblings' educational expectations at T2); and finally, (4) all the estimates in step 1 plus the cross-lag effects from steps 2 and 3 were included. For all of these steps, the following covariates were included: parents' education level, household income, older and younger siblings' reports of familism values, family immigrant context, sibling dyad gender constellation, and sibling age spacing. Nested model tests at each step were conducted to ensure our models fit the data well.

The model for Goal 1 was a good fit, $\chi^2(4) = 9.57$, $p = .05$, RMSEA = 0.08, CFI = 0.98 and SRMR = 0.02 and significant variance in older and younger siblings' educational expectations at T1, T2, and T3 was explained (see Figure 5). After

accounting for stability paths for older and younger siblings' educational expectations, cross-lag effects emerged such that higher levels of older siblings' educational expectations at T1 were associated with higher levels of younger siblings' educational expectations at T2 and higher levels of older siblings' educational expectations at T2 were associated with higher levels of younger siblings' educational expectations at T3. In addition, higher levels of younger siblings' educational expectations at T2 were associated with higher levels of older siblings' educational expectations at T3.

Goal 2: Testing the Moderators

To test the moderating effect of family immigrant context, sibling age spacing, and sibling dyad gender constellation, a series of multiple group auto-regressive panel models were estimated, first assessing differences as a function of family immigrant context (i.e., 0 = Immigrant-born families; 1 = U.S.-born/Mixed-status families), next assessing differences as a function of sibling age spacing (i.e., 0 = less or equal to 3 years apart in age; 1 = more than 3 years apart), and finally, assessing differences as a function of sibling dyad gender constellation (i.e., opposite-sex dyads= 0; same-sex dyads= 1). These models included the same stability and cross-lag effects and covariates as described above for Goal 1, with the exception that the moderators were removed one at a time (i.e., family immigrant context, sibling age spacing, sibling dyad gender constellation) and used as the multiple group variable to test whether they moderated the cross-lag associations between older and younger siblings' educational expectations. We tested for moderation by the grouping variable of interest when a path coefficient is significant for one group and not for the other group or when path coefficient signs differ across groups. Path coefficients were tested one at a time by comparing the fit of the

model in which the path coefficient of interest was unconstrained compared to a model in which all paths were constrained to be equal across groups. Evidence of moderation was reflected when the constrained model resulted in a significant change in $\Delta\chi^2$, $p < .05$, indicating the unconstrained model fit significantly better than the constrained model (Kline, 1998).

Family immigrant context moderated the association from older siblings' educational expectations at T2 to younger siblings' educational expectations at T3, $\Delta\chi^2(1) = 9.48$, $p < .01$, such that the association was significant for immigrant-born families but not for U.S.-born/Mixed-status families (see Figure 6). In contrast, no significant moderation effects emerged for sibling age spacing or for sibling gender constellation.

Post-Hoc Analyses

To further examine the role of family immigrant context on older and younger siblings' educational expectations from early/middle adolescence to young adulthood, we conducted an additional set of analyses to compare immigrant-born families to U.S.-born families i.e., mothers, fathers, older and younger siblings were born in the U.S.), removing the mixed-status families from the comparison group. No significant moderation effects emerged for family immigrant context. In addition, we examined whether differences emerged between Immigrant-born (i.e., mothers, fathers, older and younger siblings were immigrant-born), U.S.-born (i.e., mothers, fathers, older and younger siblings were born in the U.S.), and Mixed-status families (i.e., families that included at least one immigrant parent or sibling). Findings revealed no significant moderation effects between the groups.

Summary

The overarching goal of the current study was to explore the bidirectional associations between older and younger siblings' educational expectations from early/middle adolescence to young adulthood. Findings revealed that older siblings' educational expectations at T1 and T2 were associated with higher levels of younger siblings' educational expectations at T2 and T3, respectively. Further, the association from T2 to T3 was moderated by family immigrant context, such that younger siblings' educational expectations were associated with older siblings' prior expectations among immigrant-born families only. In addition, from middle adolescence to young adulthood, younger siblings' educational expectations (T2) were associated with higher levels of educational expectations for older siblings (T3). No additional moderations emerged for sibling dyad gender constellation and sibling age spacing.

Discussion

The family is an influential context as youth develop their educational expectations, and the role of parents, in particular, has captured scholars' attention (Eccles, 2007; Eccles & Wigfield, 2002; Teachman & Paasch, 1998; Trusty, 2000). The role of siblings, in contrast, has largely been neglected. Siblings may serve as role models and sources of information and support as youth construct their educational paths (Ali et al., 2005; Ceja, 2006; Conger & Little, 2010). This study is among the first to explore the *reciprocal* associations between older and younger siblings' educational expectations among Mexican American youth from early adolescence to young adulthood. Using a cross-lagged model, this study documented siblings' contributions to one another's educational expectations, above and beyond parents' educational level and family

income. Further, these findings showed that the associations between siblings' expectations across the transition to young adulthood depend on the family immigrant context, such that different patterns of sibling influence emerged in immigrant families as compared to non-immigrant families. Together, these findings underscore the value of considering siblings' role in youths' educational expectation and document that the larger family context also plays a role in these associations.

Siblings' Influences on Educational Expectations from Early Adolescence to Young Adulthood

Our primary goal was to examine the *bidirectional* associations between older and younger siblings' educational expectations among Mexican American youth from early adolescence to young adulthood capturing a period of eight years in the lives of these youth. In early to middle adolescence, our findings underscored the role of older siblings for younger siblings' educational expectations. Specifically, older siblings' educational expectations in early/middle adolescence predicted higher levels of younger siblings' educational expectations five years later, after accounting for stability in youths' educational expectations and for parents' educational and economic resources and siblings' familism values. The specific influence of older to younger siblings is consistent with the perspective that, during early and middle adolescence, the sibling structure is typically characterized as hierarchical, meaning that influences are stronger from older to younger siblings, as older siblings have a higher status because of their more advanced developmental stage and birth position (Bandura, 1977; Whiteman et al., 2011). Further, older siblings may be a primary source of support and guidance for their younger siblings as youth conceptualize their future goals, interests, and abilities (Eccles, 2007; Eccles &

Wigfield, 2002; Updegraff et al., 2010). Grounded on the ecological systems perspective (Bronfenbrenner, 1986) and the expectancy-value model of achievement (Eccles, 2007; Eccles & Wigfield, 2002) that highlights the importance of interactions youth experience in their daily lives, our study provides evidence that older siblings may serve as role models and socialization agents for younger siblings as they construct their educational goals during early to middle adolescence.

Moreover, as youth transition from middle/late adolescence to young adulthood the sibling structure is expected to shift from a hierarchical relationship to a more egalitarian dynamic (Buhrmester & Furman, 1990; Conger & Little, 2010). These changes in the sibling dynamic may facilitate more reciprocal patterns of influence within the sibling relationship. The current study is rare in its examination of younger siblings' influence on older siblings, and simultaneously, of older siblings' influence on younger siblings, recognizing the dynamic dyadic nature of the sibling relationship. By examining *both* directions of influence across time and accounting for stability, we are able to better understand the unique contributions each sibling has on their educational expectations.

Our findings revealed in the two-year period from late adolescence to young adulthood that older and younger siblings influenced each other's educational expectations. As we elaborate below, these reciprocal associations only characterized immigrant-born families. Such findings underscore the value of considering both directions of sibling influence and testing whether there are specific conditions under which sibling influences are unidirectional or reciprocal.

The Moderating Role of Family Context and Sibling Characteristics

Our second goal addressed whether there were family context and sibling dyad characteristics which altered the associations between older and younger siblings' educational expectations across time, providing insights about whether there are specific conditions under which the directions of sibling influences and the strengths of the associations differed. In considering the role of the family context, this study addressed whether *family-level immigrant status*, defined by all four target family members' nativity (i.e., mothers, fathers, older and younger siblings), moderated the associations between older and younger siblings' educational expectations. Drawing from social learning theory (Bandura, 1977) and prior work documenting differences in educational aspirations among foreign-born and U.S.-born adolescents from ethnically diverse backgrounds (i.e., Latino, East Asian, Filipino, and European; Fuligni, 1997), it was anticipated that foreign-born family immigrant status (i.e., all four target family members were born in Mexico) may provide a distinct context for the associations among older and younger siblings' educational expectations, relative to families with one or more members born in the U.S. As noted, within immigrant-born families, the path from older siblings' expectations in late adolescence to younger siblings' expectations in young adulthood, highlighting a contextual condition that may foster *reciprocity* in sibling influences on educational expectations in the transition to young adulthood. These findings suggest that when families share a foreign-born status, youth may look to their siblings as they construct their educational expectations. Siblings may be particularly influential in this immigrant family context for a number of reasons. First, siblings are sharing the experience of negotiating the U.S. educational system, a system that their

parents may have limited experience in as they likely completed their educations in Mexico. In addition, immigrant parents in this sample primarily spoke Spanish, which may have limited their ability to negotiate the educational context and particularly the transition from secondary to post-secondary education, making siblings important resources during this developmental period of educational transition. This finding is particularly important as future work aiming to reduce the educational gap that exists across ethnic groups and between foreign-born and native-born Hispanics in the U.S. may benefit from targeting siblings' roles.

In families where one or more members were born in the U.S., younger siblings' educational expectations contributed to increases in older siblings' educational expectations when older siblings were in young adulthood. As noted, social learning theory (Bandura, 1977) emphasizes that youth are likely to model other individuals that are more similar to them and that they can identify with. During this developmental period, sibling relationships become more egalitarian and balanced in power/status (Buhrmester & Furman, 1990; Conger & Little, 2010), and this shift in the sibling structure may provide younger siblings with an opportunity to serve as role models to their older siblings. It may be that, as younger siblings navigate the transition out of secondary education and construct their future educational goals, they may influence their older siblings to pursue further education. Furthermore, this is one of the few studies that have directly tested *younger* siblings' influences on older siblings; thus, it highlights the importance of examining this association in future research to gain a better understanding of the ways siblings may influence one another in the transition to and through young adulthood.

Sibling dyad gender constellation and sibling age spacing were expected to play a significant role in the association between older and younger siblings' educational expectations from early adolescence to young adulthood, but our findings did not reveal any significant moderations. As the majority of research highlighting the importance sibling gender constellation has focused on other outcomes (e.g., sibling relationship intimacy, risky sexual attitudes, gender-typed interests, skills, and relationship experiences), it may be the outcome of interest in the present study, namely educational expectations, that partly explains the lack of gender constellation moderation effects. Sibling gender moderation effects may be more likely to emerge when the outcomes of interest are "gender-typed"; that is, they are traditionally displayed more by females or males. In fact, a prominent feature in the sibling literature has been to examine sibling influences on youths' gender-typed qualities (e.g., attitudes, personality, and activities; McHale, Updegraff, Helms-Erikson, & Crouter, 2001). Work by McHale and colleagues (2001) found, for example, that the links between firstborn and secondborn siblings' traditional gender role attitudes varied by gender constellation of the dyad. Furthermore, work focusing on sibling relationship quality indicates differences based on sibling dyad gender constellation (e.g., same or opposite sex) in adolescence and young adulthood, such that same-sex dyads report emotionally close and supportive relationships (i.e., a typically feminine relationship quality) more so than opposite-sex dyads (Kim, McHale, Osgood, & Crouter, 2006; McHale et al., 2006; Tucker, Updegraff, McHale, & Crouter, 1999). Together, these findings suggest that sibling gender constellation effects may vary based on the outcomes under consideration, and in the case of siblings' educational

expectations, youth in this study were not more or less likely to model a sibling of the same gender.

Our consideration of age spacing as a moderator was more exploratory, given past research yields conflicting findings. Despite the substantial variability in age spacing among sibling dyads in this study (i.e., 1 to 9 years), there was no evidence that age spacing moderated associations between older and younger siblings' expectations. What may be more important is the pathways siblings are on and the decisions they are facing, and differences in age may be less important when siblings are negotiating similar educational decisions (e.g., whether or not to pursue post-secondary education) and experiences (e.g., how to apply for financial aid, submit college applications).

More generally, some scholars argue that sibling dyad gender constellation and sibling age spacing could be considered as proxy measures for conditions that may foster modeling (Whiteman et al., 2011). A better test of the role of sibling similarity is to identify the conditions under which siblings model one another and the processes that explain greater sibling similarity. Thereby, future work should aim to move beyond proxy variables and to more directly assess youths' efforts to be similar to and model their siblings.

Limitations and Future Directions

The limitations of our study offer directions for future research. First, this study focused on youths' educational expectations as one measure of their educational outcomes. Future work should examine a broader range of educational outcomes, such as youths' motivation to learn and the perceived value youth place on their education from adolescence to young adulthood (Eccles et al., 1989; Roeser, Eccles, & Sameroff, 1998).

In addition, with additional waves of data, it would be possible to examine how siblings' expectations ultimately predict their educational attainment in adulthood. Future work should aim to investigate the link between youths' educational expectations and actual attainment and explore siblings' role in youths' attainment. Further, the design of this study resulted in a larger gap between T1 and T2 (five years) than between T2 and T3 (two years), which meant that there was less stability in siblings' expectations between T1 and T2 as compared to T2 and T3. Nonetheless, significant associations emerged across both timepoints, providing assurances that this study captured meaningful developmental transitions. Future work should aim to collect data with shorter gaps between the waves to capture the changes in the sibling dynamics in more detail. Second, the sample included two-parent families with *biological* sibling pairs. It is important to examine these associations among diverse family structures (e.g., single-parent, stepfamilies), as siblings' roles may vary as a function of their family structure (McHale et al., 2012). For instance, it is possible that siblings may be particularly influential in single-parent families given that siblings may take a more active role as caregivers and teachers to their younger siblings in this family context (e.g., Brody & Murry, 2001). In today's society there are more than 25 different types of sibling dyads – full, step, half, adopted, etc. (Treffers, Goedhart, Waltz, & Koudijs, 1990); thus, the task of understanding “normative” sibling experiences has become increasingly complex. Currently, the vast majority of research on sibling relationships focuses on full-biological pairs, and less attention has been directed to other types of sibling dyads. As such, future work should aim to explore sibling relationships in diverse family structures. Finally, the sample for the current study focused on a target sibling dyad within the family even

though slightly more than half of the families (52%) had three or more children living in the household. Future work should focus on the role *multiple* siblings have on youths' educational goals and development, given that sibling influences may vary across these different dyadic relationships within the family context.

Conclusion

Hispanics are the largest, fastest growing, and youngest ethnic minority group in the U.S. today (U.S. Census Bureau, 2014), and the majority of Hispanic youth nationwide are of Mexican heritage (70%; Child Trends Hispanic Institute, 2014); however, only 11% of foreign-born Hispanics and 18% of U.S.-born Hispanics hold a college degree (Brown & Patten, 2012). Given that Hispanic youth will make up a significant portion of the U.S. workforce in upcoming decades, addressing these educational disparities is crucial for the future of the U.S. economy (Fuligni & Hardway, 2004). Researchers interested in reducing this educational gap should aim to include siblings in their work as it is estimated that 69% to 77% of U.S. youth grow up with at least one sibling (US Census Bureau, 2011). Therefore, siblings are important family members that have the potential to directly impact youths' educational goals and plans. By further exploring siblings' roles in youths' education we can move forward and develop prevention and intervention programs with the goals of reducing educational disparities and strengthening youths' future educational pathways.

Overall Conclusion

Relationships among sisters and brothers are among the few *lifelong* relationships most individuals experience (Cicirelli, 1995; McHale et al., 2012). Sisters and brothers are a significant part of children's and adolescents' daily lives as caregivers, companions, and sources of support in cultures around the world (Weisner, 1993; Whiting & Edwards, 1988; Updegraff et al., 2010; Zukow, 1989). In the U.S., youth are more likely to grow up with a sibling than with a father (McHale, Updegraff, & Whiteman, 2012), and the majority of *Latino* youth (77%; US Census Bureau, 2011) grow up with at least one sister or brother. Yet, relative to the study of other family relationships (i.e., parent-child, marriage), sibling relationships have been neglected (McHale et al., 2012). This is particularly the case in ethnic minority families, where we know very little about the role of siblings in child, adolescent, and young adult development and well-being (Updegraff et al., 2010). The neglect of research on ethnic minority, and particularly *Latino/Mexican-origin*, siblings is significant given demographic shifts in the U.S. population in the past and upcoming 50 years.

Latinos are the largest, fastest growing and youngest ethnic minority group in the U.S. today (U.S. Census Bureau, 2014), and the majority of Latino youth nationwide are of Mexican heritage (70%; Child Trends Hispanic Institute, 2014). In Arizona, the location of the present studies, 91% of Latinos are of Mexican origin. Importantly, this is a group for whom we know very little about *normative* developmental and family processes (McLoyd, 1998; Umaña-Taylor, 2009). In Mexican-origin families, where family is a key source of support and guidance (Knight et al., 2010), siblings are a prominent part of youths' daily lives (Updegraff et al., 2010), and may uniquely

contribute to youths' socialization and development. My dissertation addresses these important gaps in the research on family dynamics and youth development and well-being through two empirical studies.

Collective Contributions

The two studies were complementary given their focus on sibling influences on youths' development in different domains. The first study documents the specific conditions under which sibling influences on cultural development may be enhanced; particularly, our study showed that older siblings are salient models for their younger siblings as they construct their Anglo cultural orientations and familism values. In the second study, results showed that both older and younger siblings were influential in the development of youths' educational expectations. Taken together, these findings provide compelling evidence for significance of siblings in youths' cultural and educational development.

Second, each study highlights the family and sociocultural contexts in which siblings' relationships are embedded. The first paper demonstrates that *each* family member plays a unique role in youths' cultural development. The second study highlighted the role of the *shared* immigration status at the family-level as a setting where sibling relationships may be salient as youth construct (or co-construct) their educational expectations. Together, these studies showed that sibling influences must be understood within the broader contexts in which they are developing, including both family and culture.

In addition, each study demonstrated that sibling roles and dynamics continue to evolve into young adulthood. The first study showcased older siblings as potential

models for their younger siblings, such that younger siblings' desire to model their older siblings (i.e., be more similar) was associated with younger siblings' cultural orientations and values as they became young adults. The second study revealed changes in the sibling structure across adolescence and into adulthood of sibling influence on educational expectations, such that in early/middle adolescence the sibling dynamic appeared to be hierarchical, whereas in young adulthood the sibling structure had reached a more balanced and egalitarian structure in terms of sibling influences on one another. Thus, each study provides evidence that the sibling relationship is a dynamic dyadic relationship which continues to change through adolescence and young adulthood.

Future Directions

Research on youth and families lag behind even with our efforts to understand normative development among Latino/Mexican-origin youth (Umaña-Taylor, 2009). Currently, the vast majority of research among Latino/Mexican-origin youth focuses on youths' risks for poverty, educational and neighborhood disadvantage, poor mental health, and increasing involvement in risky behaviors (CDC, 2012; Macartney, Bishaw, & Fontenot, 2013; White, Roosa, Weaver, & Nair, 2009); however, less research on ethnic minority youth in general, and Mexican-origin/Latino youth in particular, has focused on describing and predicting *positive* development and well-being or on identifying factors that promote youths' resiliency (Cabrera and the SRCD Race/Ethnicity Committee, 2013; Child Trends Hispanic Institute, 2014). In Latino/Mexican culture, siblings are a particularly important part of family life because of the cultural emphasis on family support and interdependence (Updegraff et al., 2010). Siblings can serve as significant sources of emotional and instrumental support, and serve

as role models as youth adopt new roles and responsibilities across the lifespan (McHale et al., 2013). The findings of this dissertation highlight the salient role siblings have in the family, and underscore the value of studying siblings as a potential familial resource that should be capitalized on in efforts to promote youth development and success in multiple domains.

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Table 1a

Correlations, Means, and Standard Deviations for Anglo Orientation and Covariates (N = 246)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	
1 YS modeling T2	--												
2 YS Anglo orientation T2	.20*	--											
3 YS Anglo orientation T3	.08	.62*	--										
4 OS Anglo orientation T2	.18*	.54*	.55*	--									
5 M Anglo orientation T2	.11	.43*	.47*	.56*	--								
6 F Anglo orientation T2	-.06	.37*	.50*	.50*	.73*	--							
7 SES T2	.11	.22*	.34*	.38*	.63	.61*	--						
8 Mothers' nativity T1	-.05	-.41*	-.35*	-.41*	-.74*	-.60*	-.39*	--					
9 YS gender T1	-.22*	-.02	-.01	.05	-.02	.12	-.03	.06	--				
10 Sibling dyad gender constellation T1	.09	.08	.06	.11	.01	-.07	-.06	-.01	.00	--			
11 Sibling age spacing T1	.05	-.03	-.07	-.05	.11	.07	.07	-.16	.08	-.01	--		
12 Time with extended family T2	.15	-.04	-.18*	-.16*	-.12	-.15	-.14	-.01	.00	-.06	.06	--	
	<i>M</i>	2.86	4.03	3.99	3.93	2.84	3.02	-.06	.71	.49	.55	2.94	.23
	<i>SD</i>	.83	.50	.49	.64	1.04	.94	.85	.45	.50	.50	1.55	.35

Note. YS = younger sibling; OS = older sibling; M = mother; F = father; SES = Socioeconomic status, T2 = Time 2, T3 = Time 3. Mothers' nativity was coded 0 = *U.S.-born*, 1 = *Mexico-born*; YS gender was coded 0 = *females*, 1 = *males*; Sibling dyad gender constellation was coded 0 = *opposite-sex dyads*, 1 = *same-sex dyads*. * $p < .05$.

Table 1b

Correlations, Means, and Standard Deviations for Mexican Orientation and Covariates (N = 246)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	
1 YS modeling T2	--												
2 YS Mex orientation T2	.05	--											
3 YS Mex orientation T3	.04	.84*	--										
4 OS Mex orientation T2	.02	.71*	.69*	--									
5 M Mex orientation T2	-.06	.63*	.65*	.64*	--								
6 F Mex orientation T2	.02	.65*	.67*	.60*	.64*	--							
7 SES T2	.12	-.46*	-.48*	-.41*	-.41*	-.31*	--						
8 Mothers' nativity T1	-.06	.63*	.64*	.64*	.72*	.71*	-.38*	--					
9 YS gender T1	-.22*	-.01	-.10	.05	.09	.07	-.04	.06	--				
10 Sibling dyad gender constellation T1	.08	.10	.13	.09	.08	.13	-.05	-.01	.00	--			
11 Sibling age spacing T1	.05	-.07	-.07	-.05	-.07	-.04	.07	-.16*	.08	-.01	--		
12 Time with extended family T2	.13	.18*	.21*	.14	.14	.04	-.14	-.01	.01	-.08	.06	--	
	<i>M</i>	2.86	3.54	3.52	3.60	4.02	3.87	-.06	.71	.49	.55	2.94	.24
	<i>SD</i>	.83	.78	.74	.76	.72	.78	.85	.45	.50	.50	1.55	.35

Note. YS = younger sibling; OS = older sibling; M = mother; F = father; Mex = Mexican, SES = Socioeconomic status, T2 = Time 2, T3 = Time 3. Mothers' nativity was coded 0 = *U.S.-born*, 1 = *Mexico-born*; YS gender was coded 0 = *females*, 1 = *males*; Sibling dyad gender constellation was coded 0 = *opposite-sex dyads*, 1 = *same-sex dyads*. * $p < .05$.

Table 1c

Correlations, Means, and Standard Deviations for Familism Values and Covariates (N = 246)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	
1 YS modeling T2	--												
2 YS Familism values T2	.20*	--											
3 YS Familism values T3	.11	.41*	--										
4 OS Familism values T2	.15	.12	.21*	--									
5 M Familism values T2	.10	.22*	.27*	-.02	--								
6 F Familism values T2	-.08	.11	.15	.01	.21*	--							
7 SES T2	.12	.03	.01	.22*	-.16*	-.36*	--						
8 Mothers' nativity T1	-.06	-.07	.02	-.05	.06	.25*	-.39*	--					
9 YS gender T1	-.21*	-.07	.02	-.00	.10	-.00	-.03	.06	--				
10 Sibling dyad gender constellation T1	.09	-.04	-.05	.02	.14	.04	-.06	-.01	.00	--			
11 Sibling age spacing T1	.05	.10	-.02	-.16*	.06	.04	.07	-.16*	.08	-.01	--		
12 Time with extended family T2	.12	.15	-.06	.01	.00	-.07	-.14	-.01	.01	-.06	.07	--	
	<i>M</i>	2.87	4.14	4.34	4.11	4.40	4.48	-.06	.71	.49	.55	2.94	.24
	<i>SD</i>	.83	.47	.40	.50	.37	.38	.85	.45	.50	.50	1.55	.35

Note. YS = younger sibling; OS = older sibling; M = mother; F = father; SES = socioeconomic status, T2 = Time 2, T3 = Time 3. Mothers' nativity was coded 0 = *U.S.-born*, 1 = *Mexico-born*; YS gender was coded 0 = *females*, 1 = *males*; Sibling dyad gender constellation was coded 0 = *opposite-sex dyads*, 1 = *same-sex dyads*. * $p < .05$.

Table 2

Parents' and Older Siblings' Cultural Orientations and Younger Siblings' Modeling (T2) Predicting Younger Siblings' Cultural Orientations at T3 (N = 246)

	YS Anglo orientation (T3)		YS Mexican orientation (T3)		YS Familism (T3)	
Predictors (T2)	Model 1		Model 2		Model 3	
Intercept	3.94***	(.09)	3.47***	(.11)	4.39***	(.08)
YS cultural orientation\values	0.43***	(.07)	0.51***	(.06)	0.30***	(.07)
Family SES	0.00	(.07)	-0.07	(.06)	-0.01	(.06)
Mothers' nativity	0.09	(.10)	0.07	(.12)	-0.03	(.08)
YS gender	-0.01	(.06)	-0.19**	(.06)	0.05	(.06)
Sibling gender constellation	0.00	(.06)	0.05	(.06)	-0.05	(.06)
Time with extended family	-0.12	(.09)	0.16	(.10)	-0.15	(.09)
Sibling age spacing	-0.01	(.02)	0.00	(.02)	-0.01	(.02)
Mother cultural orientation\values	0.01	(.06)	0.09	(.07)	0.18*	(.09)
Father cultural orientation\values	0.12*	(.06)	0.14*	(.07)	0.06	(.10)
OS cultural orientation \values	0.19*	(.08)	0.10	(.07)	0.12 [†]	(.07)
YS modeling	0.00	(.04)	-0.02	(.04)	0.04	(.04)
OS Cultural orientation\values X YS modeling ¹	0.16**	(.06)	-0.05	(.06)	0.15*	(.07)
<i>R</i> ²	0.56***	(.06)	0.78***	(.03)	0.28***	(.07)

Note. All italicized variables are covariates. YS = younger sibling, OS = older sibling; T1 = Time 1; T2 = Time 2; T3=Time 3. Mothers' nativity was coded 0 = *U.S.-born*, 1 = *Mexico-born*; YS gender was coded 0 = *females*, 1 = *males*; Sibling dyad gender constellation was coded 0 = *opposite-sex dyads*, 1 = *same-sex dyads*.

¹ Following a hierarchical progression, we included an interaction term to examine the role of younger siblings' reports of modeling as a moderator between older siblings' cultural orientations and values at T2 and younger siblings' cultural orientations and values at T3. [†] $p < .10$ * $p < .05$, ** $p < .01$, *** $p < .001$

Table 3

Parents' and Older Siblings' Mexican Orientations and Younger Siblings' Modeling (T2) Predicting Younger Siblings' Mexican Orientations at T3 (N = 246)

	YS Mexican orientation (T3)	
Predictors (T2)		
Intercept	3.42***	(.14)
Family SES	-0.16*	(.07)
Mothers' nativity	0.16	(.15)
YS gender	-0.25**	(.08)
Sibling gender constellation	0.08	(.08)
Time with extended family	0.22	(.12)
Sibling age spacing	0.00	(.02)
Mother cultural orientation\values	0.14	(.09)
Father cultural orientation\values	0.27***	(.08)
OS cultural orientation \values	0.27***	(.08)
YS modeling	0.01	(.05)
OS Cultural orientation\values X YS modeling ¹	0.00	(.08)
<i>R</i> ²	0.67***	(.05)

Note. All italicized variables are covariates. YS = younger sibling, OS = older sibling; T1 = Time 1; T2 = Time 2; T3=Time 3. Mothers' nativity was coded 0 = *U.S.-born*, 1 = *Mexico-born*; YS gender was coded 0 = *females*, 1 = *males*; Sibling dyad gender constellation was coded 0 = *opposite-sex dyads*, 1 = *same-sex dyads*.

¹ Following a hierarchical progression, we included an interaction term to examine the role of younger siblings' reports of modeling as a moderator between older siblings' cultural orientations and values at T2 and younger siblings' cultural orientations and values at T3.

† $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 4

Correlations, Means, and Standard Deviations for Study Variables (N = 246)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1 OS Educational expectations T1	--														
2 OS Educational expectations T2	.40*	--													
3 OS Educational expectations T3	.36*	.65*	--												
4 YS Educational expectations T1	.11	.15*	.16*	--											
5 YS Educational expectations T2	.33*	.30*	.40*	.26*	--										
6 YS Educational expectations T3	.18*	.35*	.34*	.32*	.59*	--									
7 Household income T1 ¹	.26*	.42*	.44*	.20*	.29*	.22*	--								
8 Mothers' educational level T1 ²	.27*	.44*	.36*	.16*	.21*	.20*	.49*	--							
9 Fathers' educational level T1 ²	.27*	.35*	.35*	.22*	.20*	.31*	.48*	.65*	--						
10 Sibling dyad gender constellation T1	-.02	.03	-.08	.07	-.05	-.01	-.03	-.03	-.04	--					
11 Sibling age spacing T1	.05	-.08	-.10	.02	-.03	.01	.05	.08	.11	-.01	--				
12 Family immigrant context T1 ³	.17*	.27*	.26*	-.06	.29	.22*	.49*	.31*	.22*	.04	.03	--			
13 OS Familism values T1	.11	.13	.05	.06	.14*	.11	-.02	.17*	-.00	.02	-.02	.08	--		
14 YS Familism values T1	-.06	-.04	-.15	.14*	-.01	.09	.13*	.06	.09	.10	.05	-.04	.03	--	
	<i>M</i>	15.55	15.43	15.43	15.72	15.27	15.67	10.65	10.34	9.86	.55	.31	.66	4.22	4.25
	<i>SD</i>	2.50	2.45	2.62	2.19	2.24	2.26	.69	3.73	4.37	.50	.46	.47	.66	.59

Note. YS = younger sibling; OS = older sibling; T1 = Time 1, T2 = Time 2, T3 = Time 3. Sibling dyad gender constellation was coded 0 = *opposite-sex dyads*, 1 = *same-sex dyads*. Sibling age spacing was coded 0 = *less or equal to 3 years of age apart*, 1 = *more than 3 years of age apart*. * $p < .05$.

¹ Log transformation was used to correct for skewness in the Household income variable.

² Mothers' and fathers' educational level ranged from 12 = *high school diploma*, 21 = *MD, JD, DO, DDS, OR Ph.D.*

³ Family immigrant context was coded 0 = *Immigrant-born families (n = 83)*; 1 = *U.S.-born/Mixed-status families (n = 163)*.

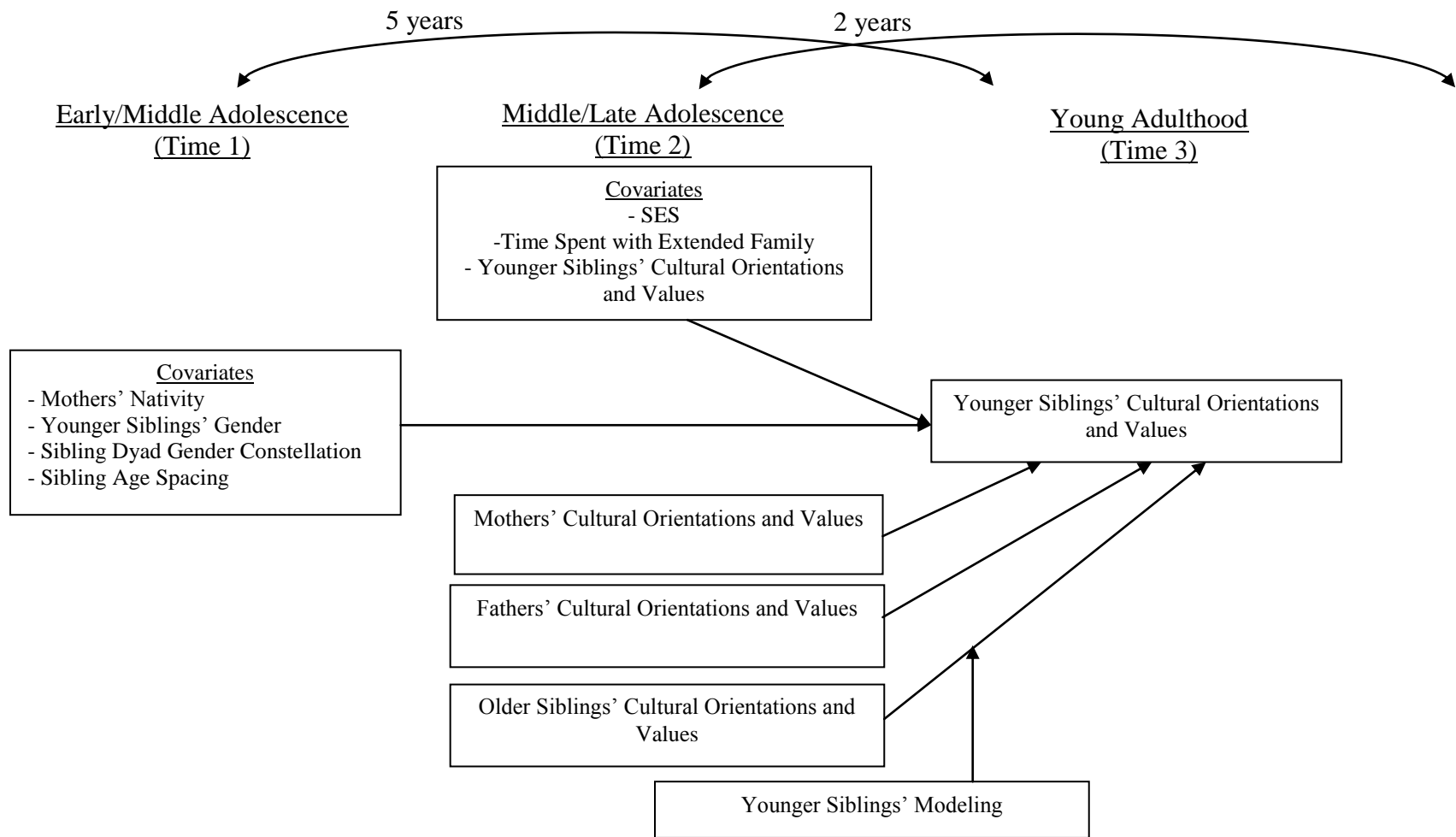


Figure 1. Regression model to predict younger siblings' cultural orientations and values from late adolescence to young adulthood.

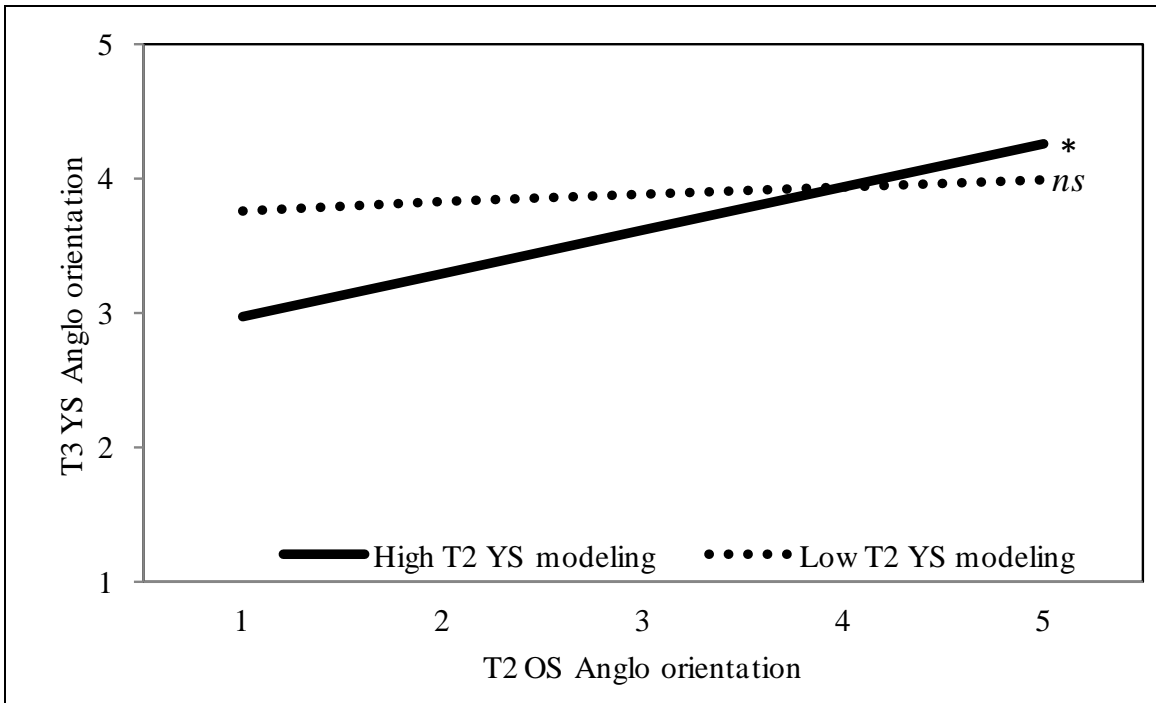


Figure 2. Interaction between T2 older siblings' (OS) Anglo orientation and T2 younger siblings' (YS) modeling on T3 younger siblings' Anglo orientation. ** slope significant $p < .01$; *ns* slope is non-significant.

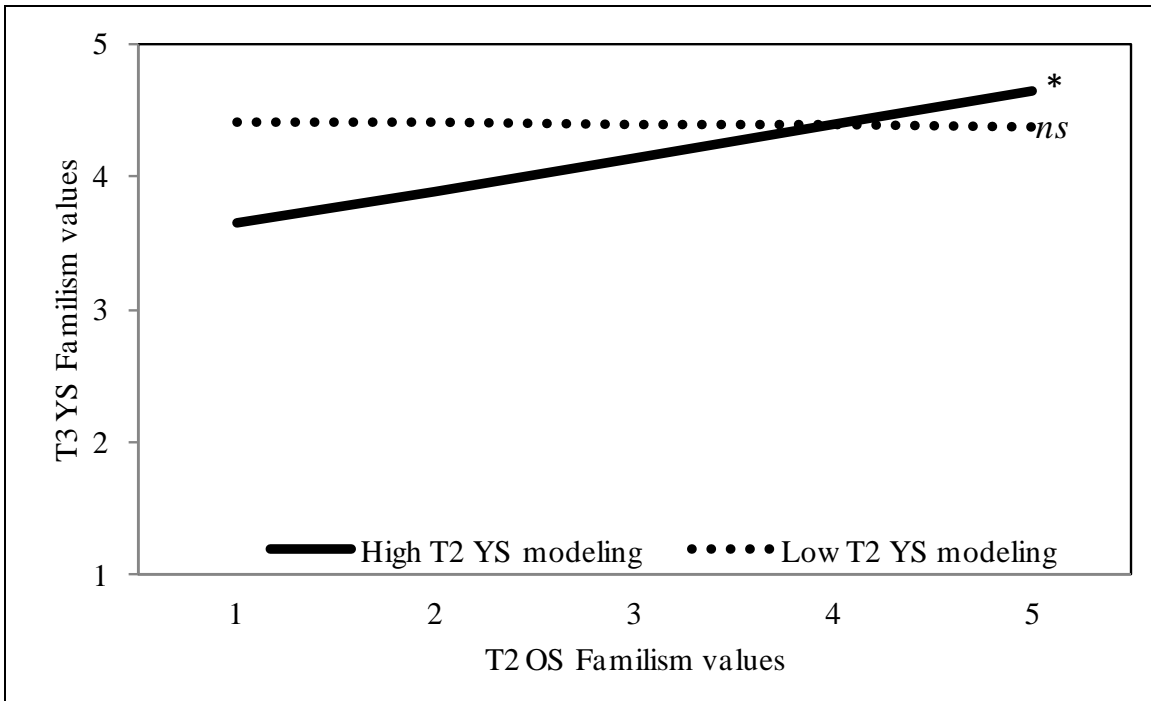


Figure 3. Interaction between T2 older siblings' (OS) familism values and T2 younger siblings' (YS) modeling on T3 younger siblings' familism values. ** slope significant $p < .01$; *ns* slope is non-significant.

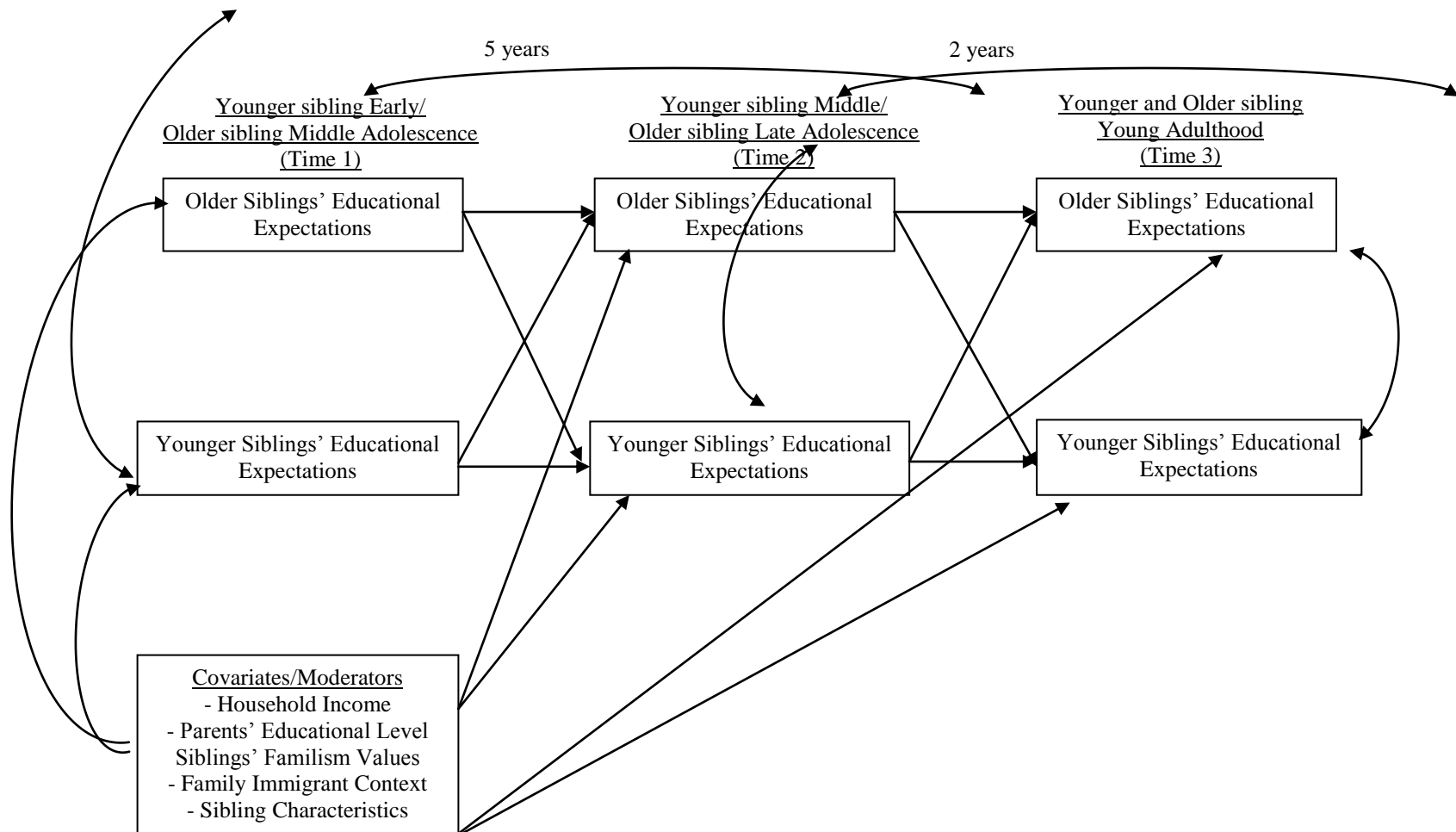


Figure 4. Overall model for three-wave autoregressive cross-lag model of the associations between older siblings' reports of educational expectations on younger siblings' educational expectations.

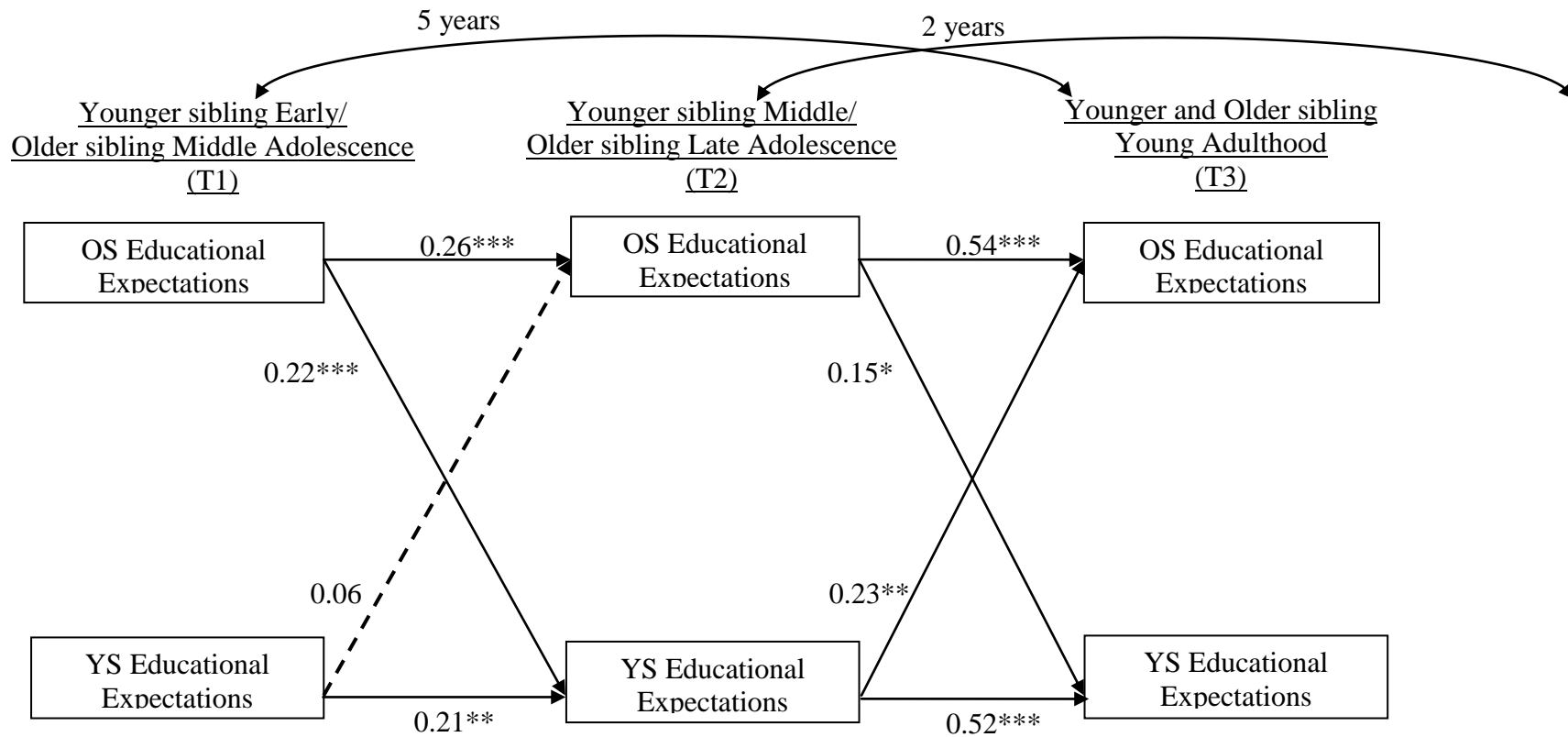


Figure 5. Unstandardized estimates for older siblings' and younger siblings' educational expectations cross-lag model. Analyses controlled for household income, parents' educational level, family immigrant context, sibling dyad gender constellation, sibling age spacing, and familism values. YS = younger sibling; OS = older sibling; T1 = Time 1, T2 = Time 2, T3 = Time 3. Dashed line indicates non-significant paths. A solid line indicates significant paths. [†] $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

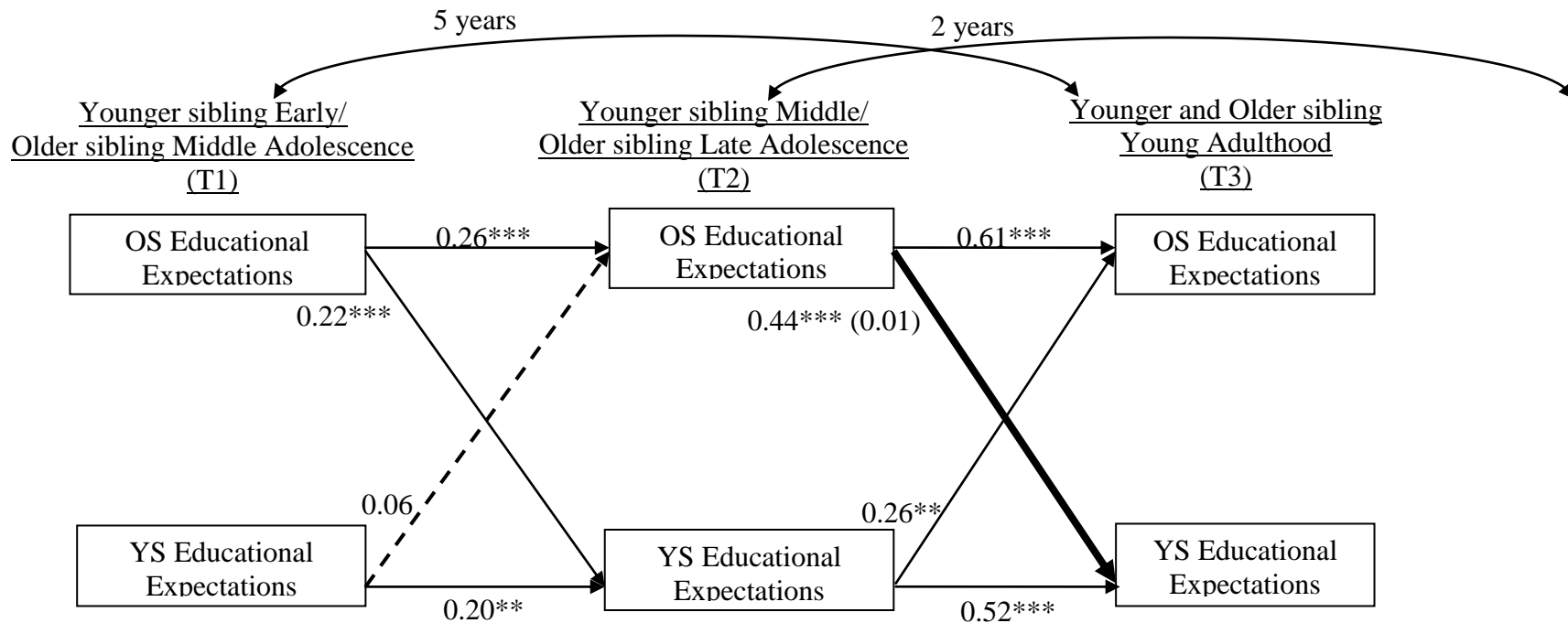


Figure 6. Unstandardized estimates for older siblings' and younger siblings' educational expectations cross-lag model testing for family immigrant context (i.e., 0 = Family Immigrant-born ($n = 83$); 1 = Family U.S.-born/Mixed-status ($n = 163$)). Significant (unstandardized) path estimates for the association between older siblings' and younger siblings' educational expectations as moderated by family immigrant context. Analyses controlled for household income, parents' educational level, sibling dyad gender constellation, sibling age spacing, and familism values. YS = younger sibling; OS = older sibling; T1 = Time 1, T2 = Time 2, T3 = Time 3. *Dashed line* indicates non-significant paths. A *bold line* indicates significant moderation. Estimates for Immigrant-born families appear outside the parentheses and estimates for U.S.-born/Mixed-status families appear inside the parentheses. $^{\dagger} p < .10$, $^* p < .05$, $^{**} p < .01$, $^{***} p < .001$.

APPENDIX A

STUDY 2 FAMILY IMMIGRANT CONTEXT DISTRIBUTION

	Mothers	Fathers ^a	Older Sibling	Younger Sibling
Immigrant-born families (<i>n</i> = 83)	Mexico	Immigrant	Mexico	Mexico
U.S.-born families (<i>n</i> = 60)	U.S.	U.S.	U.S.	U.S.
Mixed-status (<i>n</i> = 103)				
(<i>n</i> = 1)	U.S.	U.S.	U.S.	Mexico
(<i>n</i> = 8)	U.S.	Immigrant	U.S.	U.S.
(<i>n</i> = 2)	U.S.	Immigrant	Mexico	Mexico
(<i>n</i> = 7)	Mexico	U.S.	U.S.	U.S.
(<i>n</i> = 3)	Mexico	U.S.	Mexico	Mexico
(<i>n</i> = 26)	Mexico	Immigrant	Mexico	U.S.
(<i>n</i> = 51)	Mexico	Immigrant	U.S.	U.S.
(<i>n</i> = 4)	Mexico	Immigrant	U.S.	Mexico

^a The majority of fathers that were born outside the U.S., were born in Mexico with the exception of four fathers that were born elsewhere in Latin America. There was one case where father's nativity was missing.