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Mexican-Origin Youth's Risk Behavior from Adolescence to Young Adulthood: The Role of Familism Values

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Abstract

Engagement in risk behavior has implications for individuals' academic achievement, health, and well-being, yet there is a paucity of developmental research on the role of culturally-relevant strengths in individual and family differences in risk behavior involvement among ethnic minority youth. In this study, we used a longitudinal cohort-sequential design to chart intraindividual trajectories of risk behavior and test variation by gender and familism values in 492 youth from 12 to 22 years of age. Participants were older and younger siblings from 246 Mexican-origin families who reported on their risk behaviors in interviews spaced over eight years. Multilevel cohort-sequential growth models revealed that youth reported an increase in risk behavior from 12 to 18 years of age, and then a decline to age 22. Male youth reported greater overall levels and a steeper increase in risk behavior from ages 12 to 18, compared to female youth. For familism values, on occasions when youth reported higher levels, they also reported lower levels of risk behavior (i.e., within-person effect). For sibling *dyads* characterized by higher average levels of familism values, youth reported lower average levels of risk behavior (i.e., between-family effect). Findings provide unique insights into risk behavior from adolescence to young adulthood among Mexican-origin youth.

Keywords

adolescents and young adults; familism values; multilevel growth modeling; Mexican-origin families; risk behavior

Adolescence is a period of both opportunity and risk. Adolescents have opportunities for positive contributions to their own lives, families, and communities, but as compared to adults, are more likely to engage in behaviors that can place them at risk for negative outcomes (Phelps et al., 2007). These behaviors have been variably labeled as delinquent

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(Dishion & Patterson, 2006), problem (Jessor, 1993), or externalizing behaviors (Achenbach & Edelbrock, 1978); we refer to them here as risk behavior. During adolescence, the incidence of risk behavior, including disobedience to authority (e.g., missing curfew), status offenses (e.g., alcohol use), or explicit illegal offenses (e.g., shoplifting), tends to increase. This is worrisome because risk behavior has both concurrent and long-term consequences that may result in low academic achievement and attainment and poor health and well-being (Hair, Park, Ling, & Moore, 2009), ultimately interfering with healthy adult transitions (e.g., marriage, gainful employment, parenting; King, Meehan, Trim, & Chassin, 2006).

National data reveal that Latino adolescents' rates of alcohol use (national average 66.2%; Latino 72.4%, White 65.9%, and Black 63.4%, youth), drug use (e.g., combined marijuana and cocaine use; national average 46.2%; Latino 58.3%, Black 48.9%, and White 41.5%, youth), and engaging in physical fights (national average 24.7%; Black 34.7%, Latino 28.4%, and White 20.9%, youth) are equal to or higher than the national average and compared to adolescents from other ethnic/racial groups (Centers for Disease Control and Prevention, 2014). Particularly for Mexican-origin youth, Delva and colleagues (2005) found higher rates of substance use compared to Puerto Rican, Cuban, and other Latin-origin youth. To date, though, most studies on adolescent risk behavior have aggregated data across Latino subgroups or used ethnic comparative designs (e.g., Lynne-Landsman, Graber, Nichols, & Botvin, 2011), thus failing to capture the potential heterogeneity that exists within the Latino population. Given that adolescents of Mexican descent make up the majority of Latino youth (70%; Brown & Patten, 2014) and are the youngest and largest growing segment of the U.S. population (López & Rohal, 2015), these high rates of risk engagement have significant public health implications and highlight the need for understanding the developmental course of risk behavior for this group. To address this gap and consistent with calls for ethnic-homogenous research designs (Fuller & García Coll, 2010), our *first goal* was to document age-graded intraindividual change in risk behavior from early adolescence to young adulthood among Mexican-origin youth. We also examined gender differences in trajectories, based on evidence that male adolescents report higher levels of risk behavior as compared to females (e.g., Broidy et al., 2003).

Scholars have called for a careful consideration of strengths and positive adaptation, in addition to risk processes, for ethnic minority populations (Cabrera & The SRCD Ethnic and Racial Issues Committee, 2013; Fuller & García Coll, 2010). There is a growing literature examining psychosocial resilience (i.e., positive adaptation in the context of risk; Masten, 2001; Rutter, 1987) and protective mechanisms (i.e., factors that positively modify response to risk; Rutter, 1987) that may help Mexican-origin youth overcome adversity and promote positive health (Gonzales, Germán, & Fabrett, 2012; Neblett, Rivas-Drake, & Umaña-Taylor, 2012). For Mexican-origin youth, scholars have proposed youth's adherence to familism values (i.e., a set of normative beliefs about the importance of family as a source of support, guidance, and obligations; Marín & Marín, 1991) as a key protective resource or risk reducer for a variety of adjustment outcomes, including engagement in high risk or deviant behavior (Gonzales et al., 2012; Neblett et al., 2012). There is empirical research to support this proposition (Stein et al., 2014), but rarely has the role of familism values been examined from a developmental and longitudinal perspective. Thus, as guided by developmental frameworks that broadly emphasize the importance of culturally-relevant

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strengths that are unique to minority youth's developmental outcomes (Fuller & García Coll, 2010; García Coll et al., 1996), and calls to move beyond investigations including status measures of culture (e.g., English or Spanish language use) to understand cultural mechanisms of resilience or protection (Schwartz, Unger, Zamboanga, & Szapocznik, 2010), our *second goal* was to examine fluctuations in familism values as linked to risk behavior trajectories, after accounting for behavioral acculturation (i.e., Anglo cultural orientation) as a covariate related to variation in risk behavior (e.g., Ebin et al., 2001). This approach allowed us to consider the unique contribution of a core Mexican cultural value to changes in risk behavior from adolescence to young adulthood.

The Course of Risk Behavior Development from Adolescence to Young Adulthood

A developmental perspective on risk behavior purports expectations of change in frequency across age, particularly through adolescence and into young adulthood (Steinberg, 2010). There is some evidence that the prevalence of risk behavior increases during early adolescence, with declines beginning in middle to late adolescence and continuing into young adulthood (Gutman & Eccles, 2007; Measelle, Stice, & Hogansen, 2006; Pepler, Jiang, Craig, & Connolly, 2010). This pattern may typify a group of youth termed “late starters” (Moffitt, 1993) or those who occasionally experiment. This contrasts a second group of youth who exhibit the most problematic patterns of behavior; conduct problems in early childhood and aggressive and antisocial behavior persisting through adolescence into young adulthood (i.e., “early starters”; Moffitt, 1993). Evidence suggests rates of occasional experimentation during adolescence exceed rates of enduring problems (Johnston, O'Malley, Miech, Bachman, & Schulenberg, 2016). Because the current study used a community (non-clinical) sample of Mexican-origin youth, we focused on examining trajectories of risk behavior from adolescence to young adulthood that may be more typical of late starters.

Much of the research on changes in risk behavior from adolescence to young adulthood included samples comprised predominantly or exclusively of White adolescents (Gutman & Eccles, 2007; Measelle et al., 2006; Pepler et al., 2010; Powell, Perreira, & Harris, 2010). Because of ethnic differences in cultural backgrounds and values, as well as differences in the social opportunities and constraints that Mexican-origin youth face, we cannot assume that developmental change will be similar across groups (Fuller & García Coll, 2010). To our knowledge, only one study has examined Mexican-origin youth's trajectories of risk behaviors from middle adolescence to young adulthood, but with a sample of pregnant female adolescents followed through the first five years of parenting (Toomey, Umaña-Taylor, Updegraff, & Jahromi, 2015). This study found that risk behavior was highest prior to child birth (*M* age = 15 years old), with decreases to age 20, suggesting that pregnancy may have an impact on longitudinal engagement in risk behavior. Our study extends this work by focusing on risk behavior over time within a community sample of Mexican-origin youth who were recruited through schools and not selected based on risk.

Gender differences in risk behavior during adolescence are consistent, with boys generally reporting higher *levels* than girls (e.g., Broidy et al., 2003). Findings documenting gender

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differences in *rates of change*, however, are mixed (Bongers, Koot, Van der Ende, & Verhulst, 2003; Leve, Kim, & Pears, 2005; Pepler et al., 2010; Phelps et al., 2007; Powell et al., 2010). Some findings point to boys peaking earlier than girls, and other work finds no evidence of gender differences. To our knowledge, no research has examined gender differences among Mexican-origin youth. Theoretical explanations often focus on gender as a social position imposed on adolescents through differential socialization of boys and girls. Mexican culture traditionally is viewed as promoting gender typicality through parents' socialization of the traditional gender-typed traits of *machismo* (e.g., traditionalism, toughness, honor, responsibility for family; Mirandé, 1997) and *marianismo* (e.g., collectivism, nurturance, passiveness, purity, virginal; Gil, & Vazquez, 1996). Boys' engagement in higher levels of risk behavior (e.g., aggression and alcohol use), as compared to girls', might be manifested through extreme expressions of machismo (e.g., restricted emotionality, emphasis of celebratory drinking, aggressive risk taking; Kulis, Marsiglia, & Nagoshi, 2010). Furthermore, gender differentiated socialization may result in boys being granted more autonomy and freedom to spend time outside of the home, thus resulting in more opportunities (including time spent with peers) to engage in risk behavior relative to girls (Azmitia & Brown, 2002; Raffaelli & Ontai, 2004). Therefore, these divergent gendered expectations and experiences may lead to gender differences in Mexican-origin youth's trajectories of risk behavior.

Familism Values and the Development of Risk Behavior

Scholars have purported that familism values may relate to lower levels of externalizing and risk behaviors. This has been theorized, in part, because familism values are thought to cement strong bonds of attachment to the family (Brooks, Stuewig, & LeCroy, 1998), relate to perceptions of parents providing guidance and authority (Bush, Supple, & Lash, 2004), and provide a dependable source of social and emotional support (Rodriguez, Mira, Paez, & Myers, 2007), all of which are conceptualized to foster ties that discourage engagement in risk behavior. Moreover, family obligations and placing the family's needs above one's personal needs is related to delaying gratification (Gardner, Dishion, & Connell, 2008), a component of impulse control associated with lower levels of risk behavior (Steinberg, 2008).

Most empirical work supports youth's familism values as a culturally relevant protective factor that is a source of resilience for Mexican-origin youth (Stein et al., 2014). Indeed, cross-sectional and retrospective studies found that higher familism values were associated with lower levels of youth risk behavior, including externalizing behavior (Perez-Brena, Updegraff, & Umaña-Taylor, 2015; Germán, Gonzales, & Dumka, 2009), aggressive and rule-breaking behavior (Marsiglia, Parsai, & Kulis, 2009), and substance use (Ramirez et al., 2004; Tezler, Gonzales, & Fuligni; 2014) among Mexican-origin adolescent samples. Prospective longitudinal studies have found familism values to be associated with decreases in externalizing behaviors two years later for Mexican-origin youth (Berkel et al., 2010; Gonzales et al., 2011). Yet, to our knowledge, no research has examined both familism values and risk behavior over time using a developmental perspective. We extend this literature by examining individual fluctuations in familism values (*within-person* effects) related to changes in risk behavior.

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To gain a more nuanced understanding of youth development, it is important to examine not only individual variation, but also sources of variation within families. Because most families in the U.S., including those of Mexican origin, have multiple offspring (Mexican-origin $M = 2.5$, U.S. $M = 1.9$; Pew Hispanic Center, 2011), the examination of within-family similarities and differences in siblings' experiences may be particularly important (Plomin & Daniels, 1987). Considering the experiences of siblings using within- and between-family comparisons is one way to separate out shared (i.e., similarities between siblings) and nonshared (i.e., differences between siblings) influences on development (Plomin & Daniels, 1987). Yet, to our knowledge, no studies have examined the link between familism values at the level of the sibling dyad (e.g., considering two siblings' levels of familism values) and youth's trajectories of risk behavior. By taking advantage of a longitudinal within-family research design, this study extends prior research to examine how siblings' *between-family* (shared) and *within-family* (nonshared) levels of familism values relate to trajectories of risk behavior, thus making an important contribution to the developmental literature for ethnic minority youth.

Current Study

Using a longitudinal cohort-sequential (accelerated) design (Duncan, Duncan, & Hops, 1996) and data collected over eight years from sibling pairs, our *first goal* was to examine intraindividual change in the frequency of risk behavior from ages 12 to 22 among Mexican-origin siblings. We used a single index of risk behavior (e.g., substance use, disobedience to authority, fighting) to examine developmental change. This was informed by literature that suggests (a) a single higher order growth factor related to developmental changes in risk behavior (e.g., antisocial and substance use behaviors; Measelle et al., 2006) that calls into question the tendency of research to examine risk behaviors in isolation, and (b) trajectories of individual risk behaviors are highly interwoven because of a shared underlying cause (Jessor, 1993; Patterson, Dishion, & Yoerger, 2000; Measelle et al., 2006). This approach allows for the identification of general protective factors to be targeted in preventing risk behavior. We expected an increase in engagement in risk behavior from early to middle adolescence and a decrease from middle to late adolescence into young adulthood. Based on evidence of gender differences in risk behavior (e.g., Broidy et al., 2003) and parents' socialization (Azmitia & Brown, 2002; Raffaelli, & Ontai, 2004) we expected to find higher initial levels and steeper increases in risk behavior for male, relative to female, adolescents.

In addressing our *second goal*, as guided by cultural strengths (Cabrera & SRCD Ethnic and Racial Issues Committee, 2013) and cultural-ecological (Fuller & García Coll, 2010; García Coll et al., 1996) perspectives, we hypothesized that higher levels of familism values would be associated with lower levels of risk behavior during adolescence and young adulthood. To provide a rigorous test of this association, we used multilevel modeling (MLM) to distinguish within-person, within-sibling dyad, and between-sibling dyad effects, while accounting for acculturation (i.e., orientation toward Anglo culture within-person, within-sibling dyads, and between-sibling dyads; Ebin et al., 2001) and family characteristics (i.e., sibling birth order, family socioeconomic status; e.g., Bradley & Corwyn, 2002). This approach allowed us to treat each individual as his or her own control (i.e., ruling out the effects of stable individual differences, such as personality characteristics and nativity

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status), isolate within-person changes in familism values, and test the association with changes in risk behavior. Similarly, a within-family approach allows us to rule out (or control for) for sibling and family characteristics to isolate changes within sibling dyads that may also influence the association.

Method

Participants

Data came from a larger longitudinal study designed to examine gender, culture, and family socialization processes in Mexican-origin families from a range of socioeconomic backgrounds (Updegraff, McHale, Whiteman, Thayer, & Delgado, 2005; $N = 246$). Given the goals of the larger study, the eligibility criteria for participation were as follows: (a) mothers of Mexican origin, (b) a 7th grader and an older sibling (in all but two cases it was the next older sibling) living with their biological mother and biological or long-term adoptive father (i.e., a minimum of 10 years), and (c) fathers working at least 20 hours/week. Although not a criterion for eligibility, 93% of fathers also were of Mexican descent. We recruited the participating families through five school districts and five parochial schools that served ethnically and linguistically diverse communities in a southwestern metropolitan area. To recruit families, we sent letters and brochures describing the study in English and Spanish. Bilingual staff made follow-up telephone calls to determine eligibility and interest in participation. Of the 421 eligible families (23% of initial rosters; 32% of those contacted and screened for eligibility), 67% agreed to participate, 23% refused, and 10% were unreachable, with 246 families completing interviews and included in the present study.

At Time 1 (T1), families represented a range of socioeconomic (SES) levels. The percentage that met federal poverty guidelines was 18.3%, with an annual median family income of $40,000. Families, on average, included 3.79 offspring ($SD = 1.60$), and had an average household size of 5.94 ($SD = 1.63$). Parents had completed an average of 10 years of education ($M = 10.34$; $SD = 3.74$ for mothers, and $M = 9.88$; $SD = 4.37$ for fathers); the majority of parents' education was completed in Mexico (66% of fathers; 62% of mothers). Seventy percent of parents had been born outside the US; this subset of parents had lived in the U.S. an average of 12.37 ($SD = 8.86$) and 15.17 ($SD = 8.77$) years for mothers and fathers, respectively. Almost 70% of the interviews with parents were conducted in Spanish. Younger siblings (51% female) and older siblings (50% female) were 12.77 ($SD = .58$) and 15.70 ($SD = 1.60$) years of age at T1, respectively. Siblings were 2.94 ($SD = 1.55$) years apart in age, on average. The majority of younger siblings (62%) and older siblings (53%) were born in the U.S. and interviewed in English at T1 (83%). In most families (88%), sibling dyads were born in the same country (36% Mexico; 52% U.S.).

Two years later, Time 2 (T2) interviews were conducted with only younger siblings when they were in the 9th grade and averaged 14.64 years of age ($SD = .59$). Time 3 (T3) interviews were completed with all family members about three years after T2, when younger siblings averaged 17.72 years of age ($SD = .57$) and older siblings averaged 20.65 years of age ($SD = 1.57$). Time 4 (T4) interviews were conducted with all family members two years after T3, when younger and older siblings averaged 19.60 ($SD = .66$) and 22.57 years of age ($SD = 1.57$), respectively. Retention rates by family were 91%, 75%, and 70%

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for T2 through T4, respectively. Those who did not participate: could not be located (n = 10 at T2; n = 43 at T3; n = 45 at T4), had moved to Mexico (n = 2 at T3; n = 4 at T4), could not presently participate or were difficult to contact (n = 8 at T3), or refused to participate (n = 13 at T2; n = 8 at T3; n = 12 at T4). At T4, 12 families did not participate because of special circumstances (e.g., deceased or very ill family member) or had a combination of reasons for nonparticipation (e.g., some family members refused and others could not be located). Because participating families reported higher maternal education and family income at T1 as compared to non-participating families at T3 (maternal education M = 10.62, SD = 3.80 versus M = 9.48, SD = 3.45; family income M = $59,517; SD = $48,395 versus M = $37,632; SD = $28,606, respectively) and T4 (maternal education M = 10.75, SD = 3.75 versus M = 9.35, SD = 3.53; family income M = $59,136; SD = $46,674 versus M = $41,635; SD = $39,095, respectively), we controlled for T1 family SES, a composite score of mothers' and fathers' education and family income.

Procedures

At T1, when younger siblings were in 7th grade, families participated in structured in-home interviews lasting two to three hours. Bilingual interviewers conducted interviews separately with each family member using laptop computers and reading questions aloud to all participants. At T2, younger siblings were re-contacted and invited to participate in a one-hour phone interview using the same procedures for in-home interviews at T1. Interviewers read items over the phone and entered adolescents' responses into the computer. At T3 and T4, we used a similar procedure as was used in T1. Families received a $100 honorarium for participation at T1. Youth received $40 for participating in T2. Families received a $125 honorarium for T3 participation. At T4, each family member received a $75 honorarium for participation. The Institutional Review Board approved all procedures.

Measures

Separate individuals translated all measures into Spanish and back translated into English; a third, native Mexican-origin translator reviewed final translations and the research team resolved discrepancies (Knight, Roosa, & Umaña-Taylor, 2009). The familism values and acculturation measures had previously been translated for use in other studies including Spanish-speaking families and youth (detailed below).

Socioeconomic status (T1)—Both mothers and fathers reported on their educational attainment (i.e., highest level of education completed in number of years; e.g., 12 = high school graduate, 16 = college degree, BS/BA) and their annual incomes. Family SES was created by averaging three standardized variables: the log of household income (to correct for skew), mothers' report of educational attainment, and fathers' report of education attainment. Higher scores indicated higher SES (α = .78).

Risk behavior (T1-T4)—Youth's risk behavior was measured using a scale adapted from Eccles and Barber (1990), which was originally developed for an ethnically diverse sample. Seventeen of the 23 items were from the measure developed by Eccles and Barber. Minor wording adaptations were made for 6 of the 17 items (e.g., “Skipped a day of school” was changed to “Missed school without an excuse”). Two additional items were included based

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on our review of the literature and prior work with adolescents: “Got suspended from school” and “Used a weapon (e.g., rocks, bottles, knives).” Four items also were added from the Denver Youth Survey (Huizinga, Esbensen, & Weiher, 1991): “Used force (e.g., threats or fighting) to get things from people,” “Have been in gang fights,” Lied about your age to buy or do things,” and “Started rumors or lies.” Youth rated the frequency with which they engaged in 23 risk behaviors during the past year on a 4-point scale (1= *never*, 2 = *once*, 3 = *2 to 9 times*, 4 = *more than 10 times*). In the current study, adolescent youth (ages 12-19) most frequently endorsed (from 58% - 80% of youth) behaviors related to disobeying authority (i.e., disobeying parents, getting into trouble at school/work, missing school/work, doing something for the thrill of it, lying to parents). In young adulthood (ages 20-22), this changed to behaviors related to alcohol or drug use (i.e., gotten drunk or high; from 64% - 72% of youth). Items were averaged and Cronbach's alphas ranged from .87 – .91 for younger siblings across the four time points, and .86 - .90 for older siblings across T1, T3, and T4. Confirmatory factor analyses in the current sample with both siblings supported a one-factor solution, χ^2 (221) = 455.49, $p > .05$; RMSEA = .05 (90% CI: .04 | .05); CFI = .90, SRMR = .06. Standardized factor loadings (.29 - .69) were significant at the $p < .001$ level.

Familism values (T1-T4)—Familism values (16 items) were measured with youth reports on the familism subscales (i.e., support, obligations, and referent) of the Mexican American Cultural Values Scale (Knight et al., 2010). Knight and colleagues developed this measure particularly for use with Spanish- and English-speaking families of Mexican origin. They found evidence that the familism composite of the three subscales was reliable and valid for use with Mexican-origin youth. Items (e.g., “It is always important to be united as a family”) were rated on a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*) and averaged to create an overall score (younger sibling α = .84 - .92 across T1 – T4, and older sibling α = .86 - .90, for T1, T3 - T4). Higher scores reflect stronger familism values.

Acculturation level (T1-T4)—To measure acculturation, youth completed the Anglo cultural orientation subscale of the Acculturation Rating Scale for Mexican Americans-II (Cuéllar, Arnold, & Maldonado, 1995). Cuéllar and colleagues verified construct validity using a sample of five generations of Mexican-origin individuals. Thirteen items assessed individuals' orientation toward Anglo culture (e.g., “I think in English”). Youth rated items on a 5-point scale (1 = *not at all* to 5 = *extremely often or almost always*) with αs ranging from .74 - .82 for younger siblings T1 - T4, and for older siblings, from .86 - .88 T1, T3, and T4.

Results

Data Structure and Analytic Plan

Given our goal of examining developmental processes and age-related changes in risk behavior across adolescence, we used a longitudinal cohort-sequential (accelerated) design (Duncan et al., 1996). This design involves the examination of different age cohorts over the same period, and is advantageous because it combines a number of short-term longitudinal data points into a single longitudinal growth pattern (Enders, 2010). In the current study, we

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used data from younger siblings, who ranged from 12 to 15 years of age at T1 to 18 to 22 years of age at T4, and from older siblings, who ranged from 13 to 21 years of age at T1 to 20 to 28 years of age at T4. The current study examined risk behavior from 12 to 22 years of age (see Table 2 for sample size for each data point; 58% of data were from younger siblings and 42% of data were from older siblings) because of few data points from ages 23 to 28 *(n* ≤ 31 per age-point).

To examine age-related changes in risk behavior from 12 to 22 years of age, we used growth models in the multilevel modeling (MLM) framework (Raudenbush & Bryk, 2002) using PROC MIXED in SAS 9.2. This approach takes into account the nested nature of the data and is more flexible than other approaches (e.g., repeated measures ANOVA) because it allows for differences in assessment time across individuals and missing values within individuals. Growth modeling is also equipped to handle the patterns of missing data inherent in cohort-sequential designs with maximum likelihood (ML; Enders 2010). Time was nested within individuals, individuals were nested within sibling dyads, and sibling dyads were nested within families. Accordingly, our 3-level model partitioned variance into (a) within-person (over time; WP), (b) within-sibling dyad (differences between siblings within families – nonshared; WSD), and (c) between-sibling dyad (shared by both siblings; between families; BSD) components.

Our examination of MLM growth models proceeded in the following order. First, we examined risk behavior trajectories for the entire sample. We then examined the interaction of gender on the growth trajectory's parameters. Next, we examined the role of familism values[1] on risk behavior, accounting for individuals' levels of acculturation (i.e., Anglo orientation)[2]. Table 1 presents the final 3-level growth model equation and descriptions of how variables were centered at each level. At Level 1, we included age polynomials (i.e., linear and quadratic terms) to describe the changes in risk behavior across development. We computed each individual's exact age by subtracting his/her birth date from his/her interview date. We centered age at the average age of all participants across time (grand $M = 17.57$ years). Level 1 also included time-varying familism values and acculturation level (WP; over time effect). At Level 2, time-invariant individual characteristics that varied across siblings (i.e., youth gender) were included, as well as cross-time mean differences for sibling pairs within families for familism values and acculturation level (WSD effect). Further, at Level 2 we controlled for the age of youth at T1 to separate longitudinal developmental changes from cross-sectional age differences. Level 3 included time-invariant family characteristics (i.e., T1 Family SES) and the sibling dyad-level (i.e., sibling pairs within families) cross-time means of familism values and acculturation (BSD; shared by both siblings). We present the Bayesian Information Criterion (BIC) and the Akaike Information Criterion (AIC) to represent model fit (lower values indicate improved fit).

[1]As an additional step, we examined gender differences in familism values. Gender was not a significant predictor of the intercept or the growth trajectories, suggesting male and female youth exhibited similar patterns of familism values within and between families over time.

[2]We examined youth's nativity, in addition to acculturation, and it was not a significant predictor of the risk behavior intercept or growth trajectories, indicating that at the average age of the sample, U.S.-born and Mexico-born youth reported similar levels of risk-taking behaviors and both groups exhibited similar patterns of growth in risk behavior over time.

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As specified in Table 1, familism values and acculturation level at Level 1 were group-mean centered, reflecting a WP effect. A significant negative WP effect for familism values would suggest that, on occasions when an individual reported greater familism values than usual (compared to his or her *own* cross-time average), he or she also reported lower levels of risk behavior than usual. At Level 2, familism values and acculturation were group-mean centered around the *sibling dyads*' cross-time mean, reflecting a WSD effect. A significant negative WSD familism effect would suggest that an individual who reported higher levels of familism values compared to his or her sibling, on average, reported less risk-taking behaviors compared to his or her sibling. At Level 3, familism values and acculturation were grand mean centered, reflecting a BSD effect. A significant negative BSD familism effect would suggest that sibling *dyads* characterized by higher average levels of familism values were characterized by lower average levels of risk behavior.

Risk Behavior Trajectories from Adolescence to Young Adulthood

Table 2 presents the means and standard deviations for study variables from ages 12 to 22. We estimated an initial growth model to examine the overall trajectory of risk behavior from age 12 to 22 years old in the entire sample. In this analysis, we examined each polynomial term (i.e., linear, quadratic, and cubic). Further, using a series of deviance tests, we examined the significance of the variance components to determine whether we should treat each coefficient as random or fixed (Raudenbush & Bryk, 2002). The overall growth model revealed that the risk behavior followed a quadratic growth trajectory (Table 3, Model 1). Based on deviance and significance tests, the linear term was random at Level 2 and Level 3. We fixed the quadratic term at Level 2 and Level 3. Note that we examined differences in the growth trajectory by sibling birth order (0 = older sibling, 1 = younger sibling) to confirm that siblings followed similar changes in risk-taking behaviors (Table 3, Model 2). No differences emerged, suggesting that siblings had similar linear and quadratic growth across time. We then examined variation by youth gender. Results revealed differences by gender in overall level of risk taking and quadratic growth (Table 3, Model 3). Figure 1 presents the trajectories graphed by youth gender, and shows that both boys and girls reported an increase in risk behavior from approximately 12 to 18 years of age, and then a decline to age 20. Boys showed greater levels and a steeper increase in risk behavior from age 12 to 18, compared to girls.[3]

Familism Values and Risk Behavior

Addressing our second goal, we examined the role of familism values on boys' and girls' risk behavior trajectories, accounting for their acculturation (Table 3, Model 4). Results revealed a significant WP effect suggesting that on occasions when an individual reported higher familism values (compared to his or her own cross-time average familism level), he or she reported lower levels of risk behavior. A BSD familism values effect also emerged suggesting that, in families characterized by higher average levels of familism values in the

[3]We examined whether gender differences in trajectories were further moderated by sibling status. This was done by including a sibling by gender interaction on the intercept, linear slope, and quadratic slope. No sibling by gender interactions emerged suggesting similar gender differences across younger and older siblings.

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sibling dyad, youth reported lower levels of risk behavior. No significant WSD effect emerged.

Discussion

This study represents one of the first examinations of developmental trajectories of intraindividual change in risk behavior and the role of familism values among Mexican-origin youth in a community-based sample. The cohort-sequential longitudinal design significantly improves the validity of conclusions about trajectories of risk behavior for Mexican-origin youth because it indicates that observed changes across age are due to intraindividual change and not cohort effects. Our finding of risk behavior peaking at age 18 varied from prior research with White or multi-ethnic samples of youth. In the context of the prior literature that has found mixed findings on gender differences in rates of change (e.g., Pepler et al., 2010), we found that male youth had steeper increases in risk behavior than female youth. In considering the role of youth's familism values, our findings provide support for familism values as a key aspect of Mexican-origin youth's culture that may reduce risk for engagement in risk behavior, enhancing our understanding of individual and sibling variability. This study supports the notions that we need to (a) identify developmental competencies that reduce risk specifically for ethnic minority youth, (b) culture (e.g., cultural values) is one possible developmental competency, and (c) ethnic-homogenous designs, like the one used in the current study, allow us to identify the developmental competencies that are relevant (and through what mechanisms they are relevant) to risk reduction for specific groups (Fuller & García Coll, 2010; García Coll et al., 1996).

Developmental Course of Risk Behavior

Consistent with Jessor (1993) and Measelle and colleagues (2006), this study took a comprehensive approach to the measurement of risk behaviors, which included a range of problem behaviors such as shoplifting, disobeying authority figures, and using substances. Our sample was characterized by relatively low levels of risk engagement, which is consistent with other studies using community samples (Gutman & Eccles, 2007; Measelle et al., 2006). Across youth born in both the U.S. and Mexico, we found increasing levels of risk behavior that peaked in late adolescence (i.e., age 18) and then slightly decreased into young adulthood. These findings are in contrast to studies of predominantly White youth generally finding that risk behavior peaks in middle adolescence (Gutman & Eccles, 2007; Measelle et al., 2006; Pepler et al., 2010). This discrepancy may suggest that this change pattern is unique to the experiences of Mexican-origin youth. Providing support for this notion, there is evidence that Mexican-origin youths' engagement in other types of risk behavior (e.g., sexual behavior) also peaks later than youth from other ethnic groups (Kan, Cheng, Landale, & McHale, 2010).

One explanation for this delay might be Mexican-origin parents' tendency toward a more protective and controlling parenting style (see Halgunseth, Ispa, & Rudy, 2006 for review), thus delaying engagement and ultimately influencing when risk behavior peaks for these youth. Alternatively, the differences in findings may relate to methodological differences across studies. One difference pertains to how risk behavior has been measured across

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studies, such that different scales have been used and varying domains of risk behavior have been assessed (Gutman & Eccles, 2007; Measelle et al., 2006; Pepler et al., 2010). For example, in contrast to Gutman, Eccles, Pepler, and colleagues, the risk behavior scale used in the current study and the study by Measelle and colleagues included substance use in addition to delinquent and antisocial behavior. Yet, even when considering the use of varying risk behavior measures, the studies with predominantly White youth had similar findings (i.e., behavior peaking at age 15; Gutman & Eccles, 2007; Measelle et al., 2006; Pepler et al., 2010), suggesting overlap in the developmental timing of these behaviors. A second methodological consideration is that our study included sibling pairs from different age cohorts. Based on our research design (i.e., no T2 data from older siblings; approximate 3-year age gap between siblings), younger siblings contributed slightly more data than older siblings did, with younger siblings overrepresented in early to middle adolescence. However, we did not find any sibling birth-order effects on change in risk behavior over time that might imply age differences in the peak of risk behavior between younger and older siblings. The lack of sibling birth order effects is in contrast with prior research that suggests that younger siblings with older siblings who engage in risk behavior may have amplified risk for engagement (Defoe et al., 2013 with Dutch siblings) and that younger siblings have higher levels of risk behavior than their older siblings at the same age (Rodgers & Rowe, 1988 with White and Black families). It could be that family and cultural dynamics in Mexican-origin families, including the more protective and controlling parenting style (Halgunseth et al., 2006) and cultural emphasis on familism and respeto (e.g., deference, good behavior; Calzada, Fernandez, & Cortes, 2010), diminish sibling dynamics around modeling risk behavior. As we did not focus on the influence of older siblings (or parents) on younger siblings' behavior, this is an important avenue of future research.

Consistent with some prior research (Gutman & Eccles, 2007) and as hypothesized, our findings also revealed gender differences in *changes* in risk behavior. In particular, even though male and female adolescents had similar initial levels of risk behavior at age 12, males showed a steeper increase in risk behavior peaking at age 18, which then declined through age 22. Female youth showed slower growth in risk behavior, but as with male youth, also peaked at age 18, and then risk behaviors declined into young adulthood. These findings demonstrate that gender is an important consideration for Mexican-origin youth's developmental changes in risk behavior. In conjunction with prior research that has found Mexican-origin boys to be more likely engage in sexual risk behavior than girls (Guilamo-Ramos, Bouris, Jaccard, Lesesne, & Ballan, 2009), it is important for future research to move beyond the category of gender to examine gendered *mechanisms* (e.g., variation in time spent in the family compared to peer context, gender role attitudes, and parents' socialization goals for sons and daughters) to gain a nuanced understanding of the processes underlying trajectories of risk behavior across multiple domains for boys relative to girls.

Contribution of Familism Values to Developmental Course of Risk Behavior

Familism values emerged as a significant predictor of risk behavior after controlling for youth acculturation (i.e., Anglo cultural orientation) and family SES. This is notable because much of the prior research has examined acculturation (often focusing on proxy variables such as language, nativity) *to the exclusion of* cultural values. The current study accounted

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for acculturation with a multiple-item measure as a time-varying covariate, rather than with a proxy measure (e.g., nativity, primary language) at a single point in time (Schwartz et al., 2010). The relation of familism values and risk behavior included significant within-person (nonshared) and between-dyad (shared) sibling effects. In the context of increasing risk behavior (on average) over adolescence, individual variability in familism values related to individuals' own fluctuations in risk behavior (within-person effect), such that on occasions when youth reported greater familism values than usual (compared to his or her *own* cross-time average), youth also reported lower levels of risk behaviors. The between-sibling dyad effect suggests that differences *between* families in average levels of siblings' familism values linked to average levels of risk behavior. In particular, sibling dyads characterized by *higher* average levels of familism values had *lower* average levels of risk behavior. Thus, familism values for individuals and sibling dyads emerged as beneficial.

Consistent with prior work finding that collective levels of familism values are protective (e.g., Gonzales et al., 2011), this study suggests that individuals' and siblings' shared levels of familism values are an important cultural factor related to less engagement in risk behavior among Mexican-origin youth. Youth who value and emphasize the importance of family over the individual may learn to delay gratification and have relatively better impulse control and, thus, lower participation in risk behavior (Germán et al., 2009; Steinberg, 2008). Furthermore, shared sibling familism values may act to reinforce an emphasis on the importance of family, shared obligations, and the idea that one's behavior reflects on the family (Marín & Marín, 1991). For example, because older siblings serve as models to younger siblings, they may reinforce familism values as another socialization agent, thereby promoting similarity in the level of familism within the household. Shared values between siblings may provide an additional source of support for positive behavior and may help youth exert self-control, thus, decreasing opportunities for and engagement in risk behavior. Conversely, we did not find a within-sibling dyad effect, which would suggest that variability in familism values between siblings within families (e.g., an individual reporting higher familism values than the dyad average and less risk-taking behaviors) was not linked to individuals' risk behavior. This may suggest that average levels of familism values across sibling pairs matter, but the *discrepancy* in familism values among siblings within families was not related to individual risk behavior.

Alternatively, this finding could be due to limited variability in familism values at this level (siblings' familism values were very similar to one another). This similarity may make it difficult to detect within-family differences. The current study took an important first step in linking one aspect of Mexican culture, individuals' and siblings' average levels of familism values, to the development of risk behavior. In future research, it will be important to study the mechanisms that underlie these associations. For example, examining sibling influence explicitly to understand what aspects of the sibling relationship (e.g., intimacy, conflict, modeling) in combination with which dimensions of youth's cultural values *and* orientations (e.g., bicultural orientation – Mexican in combination with Anglo cultural values) might exacerbate or reduce the incidence of risk behavior among Mexican-origin youth.

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Limitations and Future Directions

Despite our contributions, the current study has several limitations. First, the eligibility criteria of the study, namely two-parent families with at least two offspring and fathers employed at least part-time, limit the generalizability of our findings. Although the majority of households of Mexican origin with children in the U.S. are two-parent families (67%) with working fathers (95%; U.S. Census Bureau, 2010), it is important to extend this work to examine the development of risk behavior within different family contexts (e.g., single-parent, divorced, unemployed fathers). For example, peer influence and role models, which research has related to risk behavior across adolescence (e.g., Patterson et al., 2000; Low, Snyder, & Shortt, 2012), may differ across family contexts. Furthermore, participants were of Mexican descent; thus, results may not apply to youth from other Latino subgroups. However, given that Mexican-origin adolescents compromise 70% of Latino youth in the U.S. (Brown & Patten, 2014), understanding the heterogeneity within this particular group has substantial public health implications.

Second, although the current design provided a strong test of the association between familism values and risk behavior, we did not address issues of reciprocal causation, nor did we rule out the influence of other time-varying experiences (e.g., acculturative stress, discrimination). Studies are warranted that examine prior within-person fluctuations in values (and other sociocultural factors) as predictors of subsequent risk behavior (e.g., lagging the data). Furthermore, because we only have a measure of risk behavior from younger siblings at our second assessment and a three-year age gap between siblings, younger siblings contributed more data to the analysis overall. Thus, we were unable to disentangle cohort and age effects, though we did not find any sibling effects on risk behavior. Third, our results are based on self-reports from youth in sibling pairs at multiple time points. Self-report data may capture youth's positive portrayals of themselves; thus, risk behavior may be under-reported and familism values may be over-reported. Thus, because of common method variance, our estimate of the relation between familism and risk behavior may be inflated. Furthermore, because we are relying on youth reports alone (lacking parent reports) and youth's familism values are a reflection of the larger family context, we cannot rule out the influence of the larger family context on youth's risk behavior to conclude that youth's familism values alone are leading to changes. Replication of these findings is necessary.

Conclusions

This study extended research on developmental change in risk behavior from adolescence to young adulthood among Mexican-origin youth using an ethnic-homogenous design to underscore the value of a *cultural strengths* perspective. Our findings support interpretations of familism values as an important cultural protective factor for risk behavior from adolescence to young adulthood and have significant applied implications. Programs that support Mexican-origin youth's strong family-oriented values may be beneficial in contributing to the reduction of risk behavior. Indeed, there is evidence that preventive-interventions that empower Mexican-origin families to identify and use cultural strengths and provide opportunities for families to apply coping and parenting skills to their specific needs demonstrate reductions in adolescents' problem behaviors (Gonzales et al, 2012).

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Given the growing population of Mexican-origin families in the U.S. and the heightened risk of youth from these families developing adjustment problems, it is critical for researchers to identify effective strategies based on the cultural strengths literature to reduce problematic developmental outcomes.

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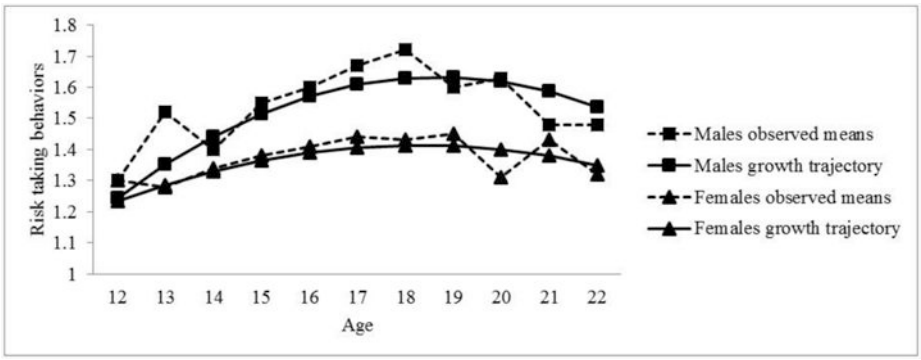

Figure 1.

Girls' and Boys' Observed Risk Behavior Means from Age 12 to 22 Years Old.

Note. Means were based on discrete age; individuals ranging from 12 – 12.99 were considered 12 years old, 13 – 13.99 were considered 13 years old, etc.

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Table 1

Final 3-Level Growth Model Equation and Explanation of Centering or Coding for Each Predictor

Final 3-level growth model equation

$$\text{Risk behavior}_{tij} = \beta_{000} + \beta_{100}(\text{Age}_{tij}) + \beta_{200}(\text{Age}^2_{tij}) + \beta_{300}(\text{WP familism}) + \beta_{400}(\text{WP acculturation}_{tij}) + \beta_{010}(\text{Gender}_{ij}) + \beta_{020}(\text{T1Age}_{ij}) + \beta_{030}(\text{WSD familism}_{ij}) + \beta_{040}(\text{WSD acculturation}_{ij}) + \beta_{110}(\text{Age}_{tij})(\text{Gender}_{ij}) + \beta_{210}(\text{Age}^2_{tij})(\text{Gender}_{ij}) + \beta_{001}(\text{BSD familism}_j) + \beta_{002}(\text{BSD acculturation}_j) + \beta_{003}(\text{BSD T1 SES}_j) + e_{tij} + \zeta_{0i} + r_{00j}$$

Predictors	Centered or Coded
Level 1 (time level)	
Age (linear)	Grand mean centered (Age – sample grand mean)
Age^2 (quadratic)	Grand mean centered (Age – sample grand mean)
WP familism values	Group mean centered (Time-varying familism – person cross-time familism mean)
WP acculturation level	Group mean centered (Time-varying acculturation – person cross-time acculturation mean)
Level 2 (person level)	
Age at T1	Centered at overall mean age at T1 (T1Age – sample mean at T1)
Youth gender	Female = 0; Male = 1
Sibling status	Older sibling = 0; Younger sibling = 1
WSD familism values	Group mean centered (Person cross-time familism value mean – sibling dyad cross-time familism mean)
WSD acculturation level	Group mean centered (Person cross-time acculturation level – sibling dyad cross-time acculturation mean)
Level 3 (family level)	
SES at T1	Grand mean centered (SES at T1 – sample grand mean)
BSD familism values	Grand mean centered (Sibling dyad cross-time familism mean – sample grand mean)
BSD acculturation level	Grand mean centered (Sibling dyad cross-time acculturation mean – sample grand mean)

Note. WP = within person, WSD = differences between siblings (within families), BSD = between sibling dyads (across families). SES = Family socioeconomic status.

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Table 2

Means (Standard Deviations) and Observed Frequencies of Risk Behavior and Familism Values by Youth Age and Gender

	Risk Behavior				Familism Values				*N*
	Boys		Girls		Boys		Girls		Full Sample
Age 12	1.30 (.25)	1.00 – 2.17	1.30 (.38)	1.00 – 3.26	4.34 (.39)	3.31 – 5.00	4.34 (.37)	3.19 – 5.00	119
Age 13	1.52 (.45)	1.00 – 3.17	1.28 (.27)	1.00 – 2.13	4.19 (.65)	1.06 – 5.00	4.19 (.55)	2.44 – 5.00	131
Age 14	1.40 (.41)	1.00 – 3.30	1.34 (.36)	1.00 – 3.09	4.35 (.50)	1.69 – 5.00	4.29 (.57)	1.25 – 5.00	162
Age 15	1.55 (.41)	1.00 – 2.87	1.38 (.36)	1.00 – 2.57	4.27 (.72)	1.19 – 5.00	4.22 (.60)	1.19 – 5.00	184
Age 16	1.60 (.57)	1.00 – 3.35	1.41 (.30)	1.04 – 2.30	4.07 (.72)	2.44 – 5.00	4.28 (.58)	1.88 – 4.94	57
Age 17	1.67 (.44)	1.00 – 2.91	1.44 (.34)	1.00 – 2.43	4.16 (.56)	2.56 – 5.00	4.27 (.46)	3.19 – 5.00	88
Age 18	1.72 (.49)	1.04 – 3.48	1.43 (.32)	1.00 – 2.70	4.17 (.42)	3.19 – 4.94	4.11 (.51)	2.75 – 5.00	122
Age 19	1.60 (.43)	1.04 – 3.20	1.45 (.36)	1.00 – 2.39	4.37 (.38)	3.50 – 5.00	4.28 (.48)	2.81 – 5.00	123
Age 20	1.63 (.48)	1.00 – 3.43	1.31 (.28)	1.00 – 2.52	4.17 (.48)	2.94 – 4.94	4.32 (.43)	3.13 – 5.00	101
Age 21	1.48 (.42)	1.00 – 2.96	1.43 (.40)	1.00 – 2.70	4.25 (.41)	3.07 – 4.81	4.33 (.45)	3.06 – 5.00	71
Age 22	1.48 (.39)	1.00 – 2.74	1.32 (.28)	1.00 – 1.96	4.21 (.47)	3.25 – 5.00	4.15 (.55)	2.80 – 4.94	51

Note. Discrete age was used to describe the sample, such that individuals ranging from 12 – 12.99 were considered 12 years old, 13 – 13.99 were considered 13 years old, etc. Sample size (*N*) was based on all available data of risk behavior.

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Table 3

Multilevel Growth Models of Mexican-origin Youth's Risk Behavior with Familism Values, Controlling for Acculturation Level (N = 492 Youth in 246 Families)

Predictors	Model 1	Model 2	Model 3	Model 4
Intercept (approximately age 18)	1.52 (.02)***	1.52 (.04)**	1.63 (.03)***	1.63 (.04)***
Age at Time 1	0.01 (.01)	0.02 (.02)	0.01 (.01)	0.01 (.01)
SES at Time 1	0.01 (.02)	0.01 (.02)	0.01 (.02)	0.03 (.02)
Gender			-0.22 (.04)***	-0.22 (.03)***
Sibling		0.01 (.06)		
Linear	0.01 (.00)	0.02 (.01)*	0.01 (.01)*	0.01 (.01)*
Quadratic	-0.01 (.00)***	-0.01 (.00)***	-0.01 (.01)***	-0.01 (.00)***
Linear X Gender			-0.01 (.01)	-0.01 (.01)
Quadratic X Gender			0.00 (.00)*	0.00 (.00)*
Linear X Sibling		-0.02 (.01)		
Quadratic X Sibling		0.00 (.00)		
Acculturation (WP)				-0.03 (.03)
Acculturation (WSD)				-0.06 (.05)
Acculturation (BSD)				-0.03 (.04)
Familism (WP)				-0.04 (.02)*
Familism (WSD)				-0.05 (.05)
Familism (BSD)				-0.19 (.05)***
Random effects				
L1 residual	0.05 (.00)***	0.05 (.00)***	0.05 (.00)***	0.05 (.01)***
L2 intercept variance	0.07 (.01)***	0.07 (.01)***	0.06 (.01)***	0.06 (.01)***
L2 linear slope variance	0.00 (.00)**	0.00 (.00)**	0.00 (.00)*	0.00 (.00)**
L3 intercept variance	0.03 (.01)***	0.03 (.01)***	0.03 (.01)***	0.03 (.01)***
L3 linear slope variance	0.00 (.00)	0.00 (.00)	0.00 (.00)	0.00 (.00)
Fit indices				
AIC	877.2	877.3	846.2	829.7
BIC	919.2	929.8	898.8	903.3

Note. WP = within person, WSD = within sibling dyads, BSD = between sibling dyads family.. AIC = Akaike Information Criterion. BIC = Bayesian Information Criterion. SES = Family socioeconomic status. L1 = Level 1, L2 = Level 2, L3 = Level 3. Gender is coded as 0 = boys and 1 = girls. Sibling is coded as 0 = older sibling and 1 = younger sibling.

*$p \leq .05$,

**$p < .01$,

***$p < .001$.