Published in final edited form as:

Child Dev. 2016 September ; 87(5): 1601–1616. doi:10.1111/cdev.12545.

Intergenerational Transmission of Educational Attitudes in Chinese American Families: Interplay of Socioeconomic Status and Acculturation

Yishan Shen,

The University of Texas at Austin

Su Yeong Kim, and

The University of Texas at Austin

Yijie Wang

Fordham University

Abstract

This longitudinal study examined the influence of parents' educational attitudes on adolescents' educational attitudes and identified antecedents (i.e., parent education, family income, and parent acculturation), consequences (i.e., academic achievement and engagement), and a potential moderator (i.e., adolescent acculturation) of the transmission process. The sample was 444 Chinese American mothers, fathers, and adolescents (12–15 at W1). Using path analysis, this study found significant two-way interactions among parent education, income, and acculturation in predicting parents' concurrent positive educational attitudes, which, in turn, predicted adolescents' attitudes at W2. The latter link was further moderated by W1 and W2 adolescent acculturation for mother-adolescent and father-adolescent dyads. Adolescents' positive educational attitudes at W2, in turn, were positively associated with their concurrent academic achievement and engagement.

Keywords

educational attitudes; Chinese American; intergenerational transmission; SES; acculturation

Chinese American children often demonstrate high academic achievement, including high grades and educational attainment (Fuligni, 1997; U.S. Census Bureau, 2012). Scholars have argued that these extraordinary educational outcomes are the result of cultural attitudes: many Chinese American families perceive education as the only sure way for their children to move up the social ladder (Lee & Zhou, 2014; Sue & Okazaki, 1990). However, little empirical research has directly investigated Chinese American parents' and children's concrete attitudes toward education. That is, researchers have not studied how much Chinese American parents and children believe in the utility of education in terms of its expected economic return. More importantly, the mechanism of intergenerational transmission of educational attitudes remains unknown; that is, we do not yet understand how family

socioeconomic factors and parent acculturation may predict parental attitudes, how such attitudes are passed on to the children and consequently how they impact children's academic outcomes, and how children's formation of educational attitudes may vary depending on children's individual levels of acculturation. Thus, it is the goal of the current study to identify some antecedents, consequences, and a potential moderator of intergenerational transmission of educational attitudes among Chinese American families.

Intergenerational Transmission of Educational Attitudes

The expectancy-value model of achievement proposed by Eccles and colleagues (Eccles [Parsons] et al., 1983) suggests that children and adolescents' educational attitudes and values can guide their academic behaviors and impact their academic performance. This link has been supported by many empirical studies conducted with middle-class European American samples (e.g., Denissen, Zarrett, & Eccles, 2007; Durik, Vida, & Eccles, 2006), as well as specific racial/ethnic minority samples, such as African American youths (e.g., Darenbourg & Blake, 2013, 2014). The expectancy-value framework suggests that many individual differences and contextual factors can influence educational attitudes, and it particularly emphasizes the role of parents as important socializers, and points out a variety of pathways through which parents can influence their children's educational attitudes and, consequently, their academic outcomes (Eccles, 1993). A plethora of research has explored different pathways of parental influence on children's academic outcomes, such as through parental expectations or involvement (Hill & Tyson, 2009; Simpkins, Fredricks, & Eccles, 2015), and one important pathway is direct transmission of parental educational attitudes on children's attitudes (Gniewosz & Noack, 2012; Jodl, Michael, Malanchuk, Eccles, & Sameroff, 2001). To our knowledge, however, no study to date has directly investigated the transmission process for educational attitudes and resulting academic outcomes within Chinese American families.

Although there is a well-documented emphasis on the importance of education in Chinese-American families (Chao & Tseng, 2002; Tseng, Chao, & Padmawidjaja, 2007), this does not mean that Chinese American parents transmit only positive messages about education to their children. According to Mickelson (1990), it is actually what she calls "concrete" attitudes – in other words, attitudes about the rewards of education that are based on real-life experiences – that would have actual impact on achievement outcomes. Given the challenges associated with their immigrant/minority status, at least some Chinese American parents may realize that there are potential barriers to social mobility for themselves and their children, and beliefs like this may have negative implications for their children's attitudes toward education. For example, it was found that Chinese American parents' communication of their discriminatory experiences negatively affected children's socioemotional and academic outcomes (Benner & Kim, 2009). Therefore, in the current study, we examined the variability of educational attitudes among Chinese American families and investigated intergenerational transmission of educational attitudes using longitudinal data in children's early and middle adolescence. Early and middle adolescence are important developmental periods, because academic values formed during these periods have long-term implications for later educational careers (e.g., Barber & Olsen, 2004).

Interplay among Parental Education, Family Income, and Acculturation

Within the expectancy-value framework, Eccles' parental socialization model (Eccles, 1993) suggests that many neighborhood, family, parent and child characteristics and experiences could emerge as predictors of parental educational values and attitudes. For example, family income and parent education are two important contextual factors. This is also in line with the integrative model of child development (García Coll et al., 1996), which identifies family socioeconomic status as one of the common factors influencing child development in all populations. The integrative model (García Coll, et al., 1996) further emphasizes the role of unique factors that influence only certain racial/ethnic minority populations, and more importantly, the interplay between common factors and unique factors. In the case of Chinese American families, due to the large proportion of immigrant parents in this population, an important unique factor is parent acculturation. Thus, for Chinese American families, both common factors, such as socioeconomic status (e.g., family income and parent education), and unique factors (e.g., parent acculturation) come into play in forming the academics-related family context, which has developmental implications for the educational outcomes of children. Thus, we sought to examine the interplay among parental education, family income, and parental acculturation in predicting the educational attitudes of both mothers and fathers.

Family income and parental education level are two common SES factors that have been consistently linked to adolescents' academic adjustment, including that of Asian American adolescents generally, and that of Chinese American adolescents more specifically (Benner & Kim, 2010; Fuligni, 1997; Kiang, Andrews, Stein, Supple, & Gonzalez, 2013; Sirin, 2005). However, as previously mentioned, parents' attitudes toward education depend on their personal life experiences (Mickelson, 1990). When family income and parental education are considered together, Chinese American parents' attitudes toward education may vary depending on the interaction between the two factors. For example, some Chinese immigrant parents may have received "smaller economic rewards for their educations" (Min, 1995: 39), possibly due to their immigrant or racial/ethnic minority status, whereas others may have not have had this experience. It is likely that those who experience a mismatch between their education and their actual economic reward may question the worth of education. In other words, parents' education levels may relate to their educational attitudes differently depending on their income, and these varying attitudes may in turn impact their children's attitudes in various ways, which may ultimately be reflected in their varying academic outcomes.

Parental acculturation is also an important factor to consider when studying aspects of child academic development that are unique to immigrant families. Acculturation, or the extent to which individuals from immigrant families adopt the mainstream culture's values and practices, may influence parental attitudes toward education. Parents who are more acculturated to the mainstream culture may be more familiar with the American educational system, and may have more positive attitudes about the payoffs of education. Evidence shows that Chinese American adolescents whose fathers are more acculturated tend to get better grades and experience a slower academic decline than their peers across early and middle adolescence, above and beyond the influences of paternal education and family

income (Kim, Wang, Chen, Shen, & Hou, 2015). It is plausible that successful intergenerational transmission of positive attitudes may be one mechanism whereby parents are able to have a positive influence on their children's academic outcomes.

Aside from its predictive value, parental acculturation is also important to consider as a potential moderating factor, as the benefits of parental education and income may depend on the parents' levels of acculturation. For example, even well-educated parents may still experience difficulties in their careers if they are less acculturated to American society (Saad, Sue, Zane, & Cho, 2012; Zane & Song, 2007). These parents may be less likely to believe in the economic rewards of education. In other words, more education may be beneficial for positive parental educational attitudes only when coupled with high parental acculturation levels. Likewise, a higher income may be more beneficial when it is accompanied by higher acculturation levels. For example, in a study of Mexican American families, it was found that paternal income was protective for the psychological well-being of family members only in highly acculturated families, and not in less acculturated families (Crouter, Davis, Updegraff, Delgado, & Fortner, 2006). Similar patterns of associations may be present in the case of immigrant children's academic outcomes as well. Thus, we hypothesized that parents' acculturation levels may moderate the influence of parental education level and family income on parents' educational attitudes.

Does Intergenerational Transmission Vary as a Function of Adolescent Acculturation?

The process of intergenerational transmission of educational attitudes is one in which adolescents internalize the attitudes expressed by their parents, incorporating them into their own value system. This is not a passive and uniform process, but rather one that depends on adolescents' own constructions and life experiences (Gniewosz & Noack, 2012; Knafo & Schwartz, 2003). That is, adolescents can actively and selectively accept, interpret or reject the attitudes and values expressed by their parents.

As acculturation is an important, unique factor that contributes to the establishment of value systems for adolescents from immigrant families, Chinese American adolescents' own acculturation levels need to be taken into consideration, above and beyond parental influence. Previous studies on Chinese/Taiwanese students residing in the U.S. or Canada, who were at various developmental periods from middle childhood to emerging adulthood, have consistently uncovered a positive effect of acculturation on the students' psychological adjustment (e.g., S. H. Chen et al., 2014; Wang & Mallinckrodt, 2006). Thus, it is plausible that adolescents who are more oriented toward the American culture are better adapted to the mainstream society, and are thus more likely to identify with the American educational system and to believe in the value of education.

Moreover, adolescent acculturation can be a potential positive moderator affecting the transmission process of educational attitudes. Studies that investigated parent-child acculturation in Chinese families residing in North America have found that the influence of parent acculturation on parental beliefs or behaviors, such as parenting practices, is moderated by child acculturation (S. H. Chen, et al., 2014; Weaver & Kim, 2008), and the

same is true of the direct influence of parent acculturation on children's socioemotional and academic adjustment (Costigan & Dokis, 2006; Liu, Benner, Lau, & Kim, 2009). That is, above and beyond the effect of parent acculturation, child acculturation matters – both for parental beliefs/behaviors and for child outcomes. However, in the extant literature, child acculturation was almost always hypothesized to interact directly with parent acculturation, and whether child acculturation also moderates the link between subsequent parental beliefs/behaviors and child outcomes was not investigated. In other words, no previous study, to our knowledge, has conceptualized child acculturation as a factor that affects how children respond to specific parental beliefs or behaviors.

In this study, we examine the potential moderating effect of adolescent acculturation in the specific process of parent-child intergenerational transmission of educational attitudes; that is, we investigate whether adolescent acculturation moderates the link between parent educational attitudes and adolescent educational attitudes. Perhaps adolescents with high levels of acculturation may be more receptive to the transmission of positive educational attitudes. To test whether and how adolescent acculturation level moderates the transmission of parents' educational attitudes during children's early adolescence, ultimately affecting children's own attitudes during middle adolescence, we investigated adolescents' acculturation as a potential moderator, at both early and middle adolescence and for both mother-adolescent and father-adolescent dyads.

Parent Gender

In modern Chinese American culture, both mothers and fathers are greatly involved in childrearing (Chao & Tseng, 2002; Chuang & Su, 2008), and links among parental educational attitudes, and adolescent educational attitudes and outcomes may be similar for mothers and fathers. There is also some research on the different roles fathers and mothers assume in Chinese or Chinese American families, but findings have been mixed. For example, mothers assume greater responsibility in adolescents' schoolwork than do fathers (X. Chen & He, 2005), which suggests that they may be more influential to adolescents' formation of educational attitudes. On the other hand, given the role of fathers as disciplinarian and head of household, their value endorsement has been found to be more strongly associated with adolescents' adjustment (Costigan & Dokis, 2006). Given the limited literature on intergenerational transmission of educational attitudes, and the contradictory findings on parent gender in Chinese American families, the current study examines father-adolescent and mother-adolescent models separately, in order to explore similarities and differences in fathers' and mothers' influences.

Current Study

Building on previous literature, the current study aimed to examine antecedents, consequences, and a potential moderator of the intergenerational transmission process of educational attitudes in Chinese American families. Specifically, we sought to investigate 1) the interplay among parent education, family income, and parent acculturation in predicting Chinese American parents' concurrent attitudes toward education at children's early adolescence, 2) how parents' educational attitudes subsequently translate into children's

educational attitudes in middle adolescence, considering potential moderation by adolescent acculturation, and 3) how, in turn, adolescents' educational attitudes influence their academic outcomes, as measured by engagement and achievement. It was hypothesized that there should be two-way interactions between parent education and family income, between parent education and parent acculturation level, and between parent income and parent acculturation level in predicting parent attitudes toward education. It was also hypothesized that adolescent acculturation measured at early and middle adolescence would moderate the effect of parents' educational attitudes on adolescents' educational attitudes. All models were tested separately for mother-adolescent and father-adolescent dyads. As the comparison by parent gender is exploratory, we do not pose specific hypotheses regarding the extent to which models would be similar or different.

Although the construction of our analytic models was guided by theory and the extant literature, we recognize the possibility of bidirectional relations between parental educational attitudes and adolescent educational attitudes, as well as between adolescent educational attitudes and outcomes. Developmental theories now widely acknowledge the bidirectional nature of parent-child influences (Bronfenbrenner & Morris, 2006; Sameroff, 2000). Moreover, although social cognitive theories of behavior assume that individuals' beliefs influence their behaviors (Eccles [Parsons], et al., 1983), theories of social psychology also acknowledge that individuals' behaviors may influence their attitudes as well (Bem, 1970). For this reason, although we chose to focus on parent-driven intergenerational transmission of educational attitudes and the effect of adolescents' educational attitudes on their behaviors and performance, we also investigated alternative directions of bivariate relations among these variables in our analyses.

Method

Participants

Participants were Chinese American families with adolescents (age range: 12–15 years; $M_{\text{age}} = 13.04$ years; $SD = 0.73$; 54% female) from Northern California taking part in a larger longitudinal study. There were 444 families participating in Wave 1 and 350 families participating in Wave 2, which occurred four years later. The mean age was 44.41 for mothers ($SD = 4.77$) and 48.40 for fathers ($SD = 6.37$) at Wave 1. Seventy-four percent of adolescents were born in the U.S., whereas 90% of mothers and 87% of fathers were foreign-born, primarily from Hong Kong or southern provinces of China. The majority of families spoke Cantonese at home, and less than 10% spoke Mandarin.

Procedure

In 2002, seven middle schools in major metropolitan areas of Northern California with a substantive population of Asian American students (at least 20% of the student body) were selected for participation. With the help of school administrators, Chinese American students in seventh and eighth grades were identified, and their families were invited to participate in the study. Of those families, 47% agreed to participate (both parent consent and student assent were obtained), and 76% of the families agreeing to participate actually completed the survey. Four years later, families were re-contacted, and approximately 79%

of the Wave 1 participating families returned completed surveys for Wave 2. Surveys were available in both English and Chinese. Families who returned completed surveys received a small amount of monetary compensation.

Attrition analyses were conducted to compare families participating at Wave 2 versus those who had dropped out after Wave 1 on key demographic variables (i.e., adolescent gender and age, parent age, parent education, family income, and parent and adolescent nativity). Results revealed no significant differences on any of the variables, with the exception of adolescent gender: Girls were more likely to have participated in Wave 2 than boys, $\chi^2 = 15.83$, $p < .001$. Adolescent gender is thus included as a covariate for all analyses.

Measures

Parent and family characteristics—Parents' highest levels of education, acculturation, and family income were measured at Wave 1. For the measure of parent education, parents reported their highest level of education on a 9-point scale, with 1 = *no formal schooling*, 2 = *some elementary school*, and 9 = *finished graduate degree (medical, law, Master's degree, etc)*. For family income, parents reported on their annual gross family income using a scale ranging from 1 = *\$15,000 or under*, to 2 = *\$15,001-\$30,000*, to 12 = *\$165,001 or more*. In this study, we used mothers' reports for the model involving mother-child dyads and fathers' reports for the model involving father-child dyads.

Acculturation—Parent and adolescent acculturation processes were measured using the 10-item American cultural orientation scale of the Vancouver Index of Acculturation (Ryder, Alden, & Paulhus, 2000). This measure captures 10 different domains of the acculturation process, such as traditions and values, and it has been well validated with Asian American adolescents (see Weaver & Kim, 2008). Sample items include, "I often follow mainstream American cultural traditions (e.g., celebrate holidays)," and "I enjoy social activities with Americans." The response scale ranged from 1 = *strongly disagree* to 5 = *strongly agree*, with higher scores indicating greater levels of acculturation to American society. Cronbach's alpha coefficients were .83 and .84 for fathers and mothers at Wave 1. For adolescents, Cronbach's alpha coefficients were .81 and .79 at Wave 1 and Wave 2, respectively.

Attitudes toward education—Parent and adolescent attitudes toward education were assessed using four items adapted from Mickelson's (1990) Concrete Attitudes toward Education scale. Parent attitudes were measured at Wave 1, and adolescent attitudes were measured at Wave 2. Sample items include, "Studying in school rarely pays off later with good jobs," and "People in my family haven't been treated fairly at work no matter how much education they have." Ratings ranged from 1 = *strongly disagree* to 5 = *strongly agree*. Items were reverse coded so that higher ratings would indicate more positive attitudes toward education. Cronbach's alpha was consistently .67 for both mother and father reports at Wave 1 and for adolescent reports at Wave 2.

Adolescent academic outcomes—Two measures were used to assess adolescents' academic outcomes at Wave 2: grade point average (GPA) and academic engagement. GPAs were obtained from school records, and ranged on a scale of 0–4. Academic engagement

was measured via self-report, using five items adapted from the Iowa Youth and Families Project (Conger, Elder, Lorenz, Simons, & Whitbeck, 1994). Sample items include, “I try hard at school” and “I usually finish my homework.” Ratings ranged from 1 = *strongly disagree* to 5 = *strongly agree*, with higher scores indicating a greater degree of academic engagement. Reliability of the scale was good ($\alpha = .85$).

Analytic Strategy

Following a preliminary set of measurement invariance analyses across parent gender, path analyses were conducted in a structural equation modeling (SEM) framework, separately for mother-adolescent and father-adolescent dyads (see Figures 1 and 2 for examples). All analyses were conducted in Mplus 7.3 (Muthén & Muthén, 1998–2015) using maximum likelihood estimation with robust standard errors (MLR). As shown in Table 1, percentage of missing data ranged from 0.5% to 18% for Wave 1 variables across mother, father, and adolescent reports, and from 10% to 23% for Wave 2 variables. Missing data were handled through full-information maximum likelihood (FIML), which utilizes all available information from the covariance matrix instead of deleting cases with missing data or imputing missing data (Enders, 2001).

Mediation analyses were conducted in conjunction with moderation analyses within the same models. The three predictors (parent education, parent income, and parent acculturation measured at Wave 1) and the three interaction predictors (parent education X income, parent education X parent acculturation, and parent income X parent acculturation) were specified to have an effect on contemporaneous parent educational attitudes during the child’s early adolescence. Parent educational attitudes, in turn, were specified to predict the adolescent’s educational attitudes during middle adolescence – and, finally, adolescent attitudes were specified to subsequently relate to contemporaneous academic outcomes (GPA and academic engagement). In addition, adolescent acculturation was hypothesized to moderate the intergenerational transmission of educational attitudes (parent educational attitudes at Wave 1 predicting adolescent educational attitudes at Wave 2). We tested the moderation of adolescent acculturation twice, first with the measure at Wave 1 and again with the measure at Wave 2, in separate models, separately for each parent-adolescent dyad, resulting in four structural equation models. Although they are not presented in the figures, all predictors (parent education, family income, parent acculturation, adolescent acculturation, and all interaction terms) were specified to correlate with one another, and all models controlled for adolescent gender and age as covariates.

Results

Descriptive Statistics and Measurement Invariance

Table 1 displays descriptive statistics for study variables, as well as zero-order correlations among the variables. On average, parents’ highest level of education was close to high school graduation. Average family income reported by both parents was about \$45,001–\$60,000. Mothers’ and fathers’ levels of acculturation at Wave 1 were similar, and were at a moderate level. Paired-sample *t* tests showed that adolescents’ levels of acculturation at Wave 1 were significantly higher than those of both parents (compared to mothers: $t(405) =$

8.96, $p < .001$; compared to fathers: $t(377) = 8.42$, $p < .001$), and showed an increase from Wave 1 to Wave 2, $t(347) = 2.69$, $p = .008$. As expected, Chinese American parents' attitudes toward education at Wave 1 were only slightly above neutral. Adolescents' attitudes toward education at Wave 2 were more positive than those of their parents, with paired-sample $t(320) = 6.79$, $p < .001$ compared to mothers and $t(297) = 6.24$, $p < .001$ compared to fathers.

To ensure that the measurement of acculturation and educational attitudes at Wave 1 was comparable across mothers and fathers, we conducted measurement invariance analyses across parent gender using confirmatory factor analyses (CFA). Metric (factor loading) invariance allows for the comparison of associations, whereas strong (intercept) invariance permits the comparison of means (e.g., Little, 1997). For each measure, the latent factors for mothers and fathers were specified to correlate with one another, as were the error terms of the corresponding indicators. For parental acculturation, we further correlated the error terms of two indicators within reporters (i.e., pertaining to maintaining or developing and believing in mainstream American values) based on modification indices for better model fit. A series of nested models were compared with one another using Wald-test. Model parameters were first freely estimated, and then factor loadings and intercepts of the indicators were constrained in sequence in latter models. A significant difference in model fit would suggest measurement nonequivalence. The measure of parental acculturation reached full metric invariance: $\chi^2(9, N = 444) = 12.02$, $p = .21$ and partial strong invariance upon releasing the constraint on the intercept of one indicator: $\chi^2(8, N = 444) = 10.00$, $p = .27$. The measure of parental educational attitudes reached both metric and strong invariance $\chi^2(3, N = 443) = 1.89$, $p = .59$ and $\chi^2(3, N = 443) = 4.83$, $p = .19$. Thus, the measures were generally comparable across mothers and fathers.

Path Analyses

The results for these path analyses are presented in Figures 1 and 2. Model fit is considered good if the fit index RMSEA is .06 or below, and CFI is .95 or above (Hu & Bentler, 1999). Although we observed both significant main effects and interactions, because these main effects are subsumed by the higher-order interactions, we only focus on the significant interactions below. Moving from left to right in Figures 1 and 2, the first set of links on the far left show that, for mother-adolescent models, the interactions between maternal education and family income, and between maternal education and acculturation, were significant in predicting maternal educational attitudes, whereas the interaction between family income and maternal acculturation was not. In contrast, for father-adolescent models, all three main effects (paternal education, family income, and paternal acculturation) were significant in predicting paternal educational attitudes, but only one interaction term, between family income and paternal acculturation, was significant in predicting paternal educational attitudes.

The significant interactions were then probed following the procedures outlined by Aiken and West (1991). As the relations were similar for the models involving Wave 1 adolescent acculturation and those involving Wave 2 adolescent acculturation, we present relations in only the former in Figure 3. Specifically, for mother-adolescent dyad models, two

interactions were significant in predicting maternal educational attitudes (see Figures 3a and 3b). First, maternal education level and maternal attitudes toward education were more closely related when family income was high (Figure 3a). That is, the positive influence of maternal education informing positive maternal attitudes toward education was magnified when coupled with high income. Second, the positive influence of maternal education on positive maternal educational attitudes was magnified when mothers showed high levels of acculturation (Figure 3b). For father-adolescent dyad models, one interaction was significant in predicting paternal educational attitudes (Figure 3c). Family income was positively associated with paternal educational attitudes only when fathers showed high levels of acculturation. When fathers showed low levels of acculturation, family income was not significantly associated with paternal educational attitudes.

Moving to the second set of links in Figures 1 and 2 – the intergenerational transmission links for educational attitudes and the moderation by adolescent acculturation at Wave 1 or Wave 2 – we see that the transmission effects of educational attitudes were consistently significant for both mother-adolescent dyads and father-adolescent dyads. More importantly, we found some evidence of interaction between adolescent acculturation and parental educational attitudes in predicting adolescent educational attitudes. Interestingly, the moderation by adolescent acculturation assessed at Wave 1 was significant only for mother-adolescent dyads and not for father-adolescent dyads, whereas the moderation by adolescent acculturation assessed at Wave 2 was significant only for father-adolescent dyads and not for mother-adolescent dyads.

We then probed the significant moderation by adolescent acculturation for the intergenerational transmission of educational attitudes (see Figures 4a and 4b). For mother-adolescent dyads, the transmission effect of attitudes toward education from mothers to adolescents was stronger when adolescents showed higher acculturation during early adolescence (Figure 4a). Similarly, for father-adolescent dyads, the transmission of educational attitudes from fathers to adolescents was again stronger when adolescents showed higher acculturation, but this was during middle adolescence rather than early adolescence (Figure 4b).

The last set of links in Figures 1 and 2, connecting adolescent educational attitudes to adolescent academic outcomes, including academic achievement (GPA) and engagement, were consistently significant across all four models. These sets of significant direct links constituted significant indirect effects as well (see Table 2). For mother-adolescent dyads, the interaction between maternal education and family income had an indirect effect on adolescent GPA and academic engagement at Wave 2 through maternal educational attitudes at Wave 1 and, in turn, adolescent educational attitudes at Wave 2. Moreover, the interaction between maternal education and acculturation had an indirect influence on adolescent academic engagement at Wave 2 through the same set of mediators, parents' and adolescents' educational attitudes. Similarly, for father-adolescent dyads, the interaction between family income and father acculturation indirectly influenced adolescents' later academic engagement at Wave 2 through paternal educational attitudes and subsequent adolescent educational attitudes at Wave 2.

Testing Alternative Models

In order to examine the possibility of bidirectional relations between parent educational attitudes and adolescent attitudes, and between adolescent attitudes and academic outcomes, we also tested two sets of alternative models. As the difference between these alternative models and the original models tested in the main analyses lies only in the temporal orderings among mediators and outcomes, we constructed simplified mediational path models for mother-adolescent and father-adolescent dyads; these were similar to the models presented in Figure 1, except that all of the interaction terms were omitted. The model fit indices were $CFI_{range} = .94-.97$; $RMSEA_{range} = .05-.06$.

In the first set of alternative models, the placements of parent and adolescent educational attitudes were altered, so that adolescent educational attitudes at Wave 1 would predict parent educational attitudes at Wave 2. The model fit was not as good: $CFI_{range} = .89-.90$; $RMSEA_{range} = .08-.09$, suggesting that parent-driven paths of intergenerational transmission of educational attitudes may better fit the current data than adolescent-driven paths. In the second set of alternative models, the placements of adolescent educational attitudes and outcomes were altered, so that adolescent academic outcomes at Wave 2 would predict adolescent educational attitudes at Wave 2. The model fit indices were similar to those for the simplified mediational models: $CFI_{range} = .94-.97$; $RMSEA_{range} = .05-.06$. However, the sizes of the outcomes $\rightarrow$ attitudes paths were numerically smaller ($\beta_{range} = .13-.17$; $p_{range} = .01-.05$) than the attitudes $\rightarrow$ outcomes paths in the simplified mediational models ($\beta_{range} = .20-.24$; $p < .001$), suggesting that, although bidirectional relations may exist, the influence of adolescent educational attitudes on their academic performance may be stronger than vice versa.

Discussion

Using longitudinal data across a 4-year span from early to middle adolescence, and reports from multiple informants, the current study investigated the process of intergenerational transmission of educational attitudes for Chinese American families, and found significant family antecedents (parent education, family income, and parent acculturation), outcomes (academic engagement and achievement), and a moderator (adolescent acculturation) of the transmission process.

As expected, we found that both indicators of SES (parental education and family income) were significantly associated with educational attitudes for both parents. The importance of including separate indicators of SES has been previously advocated (e.g., Duncan & Magnuson, 2003; Mistry, Biesanz, Chien, Howes, & Benner, 2008), as different aspects of SES could uniquely influence parental outcomes and children's development. Indeed, we observed a significant interaction between maternal education and family income in their association with maternal educational attitudes. Maternal education was more closely associated with maternal educational attitudes in the context of high family income; however, for mothers from low-income families, education was not as strongly associated with positive educational attitudes. Although assumptions have previously been made about the potential influence of perceived mismatch between individuals' income and education on their concrete attitudes toward the actual rewards of education (Mickelson, 1990), to our

knowledge, our study was the first to test these assumptions empirically, demonstrating the salience of such associations for Chinese American families.

In addition, the separation of parental income and educational attainment into two distinct indicators of SES, as well as testing of relations separately for mothers and fathers, enabled us not only to observe a significant moderation of parental acculturation, but also to distinguish subtle differences in this moderation between mothers and fathers. In the maternal model, acculturation interacted significantly with education when predicting parental educational attitudes, whereas in the paternal model, acculturation was a significant moderator of income. Maternal education was more strongly related to maternal educational attitudes when mothers reported higher levels of American cultural orientation. In line with previous studies demonstrating that Asian Americans who are more familiar with the American cultural norms are more likely to benefit economically from their educational investment (Saad, et al., 2012; Zane & Song, 2007), our study shows that, given similar levels of education, those with higher acculturation levels are more likely to endorse the benefits of education. Likewise, family income mattered for paternal educational attitudes in the case of highly acculturated fathers, but not for less acculturated fathers. A previous study with Mexican American families (Crouter, et al., 2006) found that income mattered for fathers' and other family members' psychological well-being, especially for more acculturated families. Our study uncovered a similar interaction between family income and paternal acculturation for father-adolescent intergenerational educational attitudes and adolescents' academic well-being.

The subsequent link between parental educational attitudes and adolescents' own educational attitudes – or, in other words, the transmission of educational attitudes from parents to adolescents – was significant across mother-adolescent and father-adolescent dyads. This is consistent with findings from a previous study of both European American and African American families, which revealed significant transmission effects of educational attitudes (Jodl, et al., 2001). It is also consistent with findings regarding transmission of more general beliefs, in both academic and nonacademic domains, among European American families (e.g., Simpkins, et al., 2015) and other immigrant families, such as Mexican American families (e.g., Simpkins, Vest, & Price, 2011). To our knowledge, the current study is one of the first to have investigated the direct transmission process of educational attitudes within Chinese American families. As in the studies mentioned above, the effect of intergenerational transmission was only moderate, which suggests that adolescents' values and attitudes do not exactly reflect those of their parents. We found that the extent to which adolescents corroborated their parents' educational attitudes depended on adolescents' own levels of acculturation. In line with our hypothesis, the results suggest that adolescents' acculturation facilitates the transmission of positive educational attitudes held by their parents. Perhaps adolescents who are more acculturated are more inclined to accept the positive educational attitudes that their parents try to convey.

In addition to the general pattern of moderation by adolescent acculturation, we also found a nuanced difference between mother-adolescent and father-adolescent dyads. Specifically, adolescent acculturation functioned as a moderator for the mother-adolescent transmission of educational attitudes during early adolescence, and a similar moderation effect was

observed for the father-adolescent dyad during middle adolescence. In Asian American families, mothers are more responsible for the socialization of children during earlier developmental periods (Inman, Howard, Beaumont, & Walker, 2007), whereas fathers become more influential during later developmental periods, when children have more interactions outside the home (Costigan & Dokis, 2006; Kim, Wang, Orozco-Lapray, Shen, & Murtuza, 2013). This provides a potential explanation for the difference in moderation across mother-adolescent and father-adolescent dyads, but the actual mechanism awaits more rigorous future research.

Our findings regarding the impact of adolescent acculturation on academic adjustment are consistent with some of the recent studies revealing that acculturation is adaptive for Chinese American children's socioemotional well-being (e.g., S. H. Chen, et al., 2014). However, our results are in contrast with some other studies conducted with ethnically diverse samples of Asian American adolescents; these studies found negative associations between acculturation and adjustment, including poorer school performance and more substance use (Eng et al., 2008; Hahm, Lahiff, & Guterman, 2004). In these studies, acculturation was discussed in relation to associations with deviant peers and exposure to messages that undervalue education. However, our findings highlight the adaptive nature of acculturation in its association with positive attitudes toward education (i.e., belief in the rewards of education) and, subsequently, with better academic outcomes. We speculate that the differences between our findings and those of studies uncovering a negative effect of acculturation might be due to measurement differences (i.e., using proxy variables, such as language use, to measure acculturation in these previous studies; Eng, et al., 2008; Hahm, et al., 2004); it might also be the result of potential between-group heterogeneity and/or unassessed processes in their ethnically diverse Asian American samples.

Lastly, we replicated the previously documented effects of children's educational attitudes on their academic outcomes in studies with European American samples (e.g., Denissen, et al., 2007; Durik, et al., 2006) and other immigrant samples, such as Latino adolescents (e.g., Henry, Merten, Plunkett, & Sands, 2008; Suizzo et al., 2012). For Chinese American adolescents, as for adolescents from other racial/ethnic groups, positive educational attitudes were associated with better academic performance. Linking all of these interconnected processes together, our results present intergenerational transmission of educational attitudes as a specific pathway through which the complex interplay of parental education, family income, and parental acculturation consequently links to adolescents' academic outcomes in Chinese American families. By integrating both developmentally common (i.e., parental education and family income) and unique (i.e., acculturation) factors, and investigating their indirect influences on adolescent academic outcomes through the mediational process of intergenerational transmission of educational attitudes, this study well corroborates and combines the integrative model of child development (García Coll, et al., 1996) and the parental socialization model within the expectancy-value framework (Eccles, 1993).

Limitations and Future Directions

The current study has several limitations. First, our sample was recruited from an area with a dense Chinese American population. Thus, the generalizability of our findings is limited, as

Chinese American families residing in other parts of the United States may have different acculturation levels and educational attitudes. Second, we conceptualized intergenerational transmission of educational attitudes as a process that involves family academic socialization; however, we did not have an actual measure of academic socialization (e.g., school involvement; Hill & Tyson, 2009) available to test for such a mechanism. Future studies should investigate the specific processes of academic socialization within Chinese American families that contribute to intergenerational transmission of educational attitudes; they should also identify other potential moderating factors, in addition to acculturation, that may enhance the intergenerational transmission of positive educational attitudes. Third, although we used separate reports of SES by mothers and fathers, both parents reported family annual income, and reports of individual income were not available.

Implications for Interventions

Although Chinese American families are usually found to place a strong emphasis on education (e.g., Fuligni, 1997), our study finds that there is variability in Chinese American families' concrete attitudes about the economic rewards of education. Thus, interventions targeting both parents' and adolescents' educational attitudes may improve Chinese American adolescents' academic performance. In a study with Latino immigrant mothers and young children (Schaller, Rocha, & Barshinger, 2007), it was found that targeting the parents' daily pro-educational attitudes and behaviors helped overcome the negative effect of low maternal education levels, and academically motivated the children. Similar interventions would be efficacious for Chinese American families as well, but practitioners may need to pay extra attention to promoting positive educational attitudes that are specifically relevant to the economic payoffs of education. Alternatively, interventions may target the acculturative processes of parents and adolescents. Our findings suggest that both parents' and adolescents' acculturation can serve as protective catalysts for the intergenerational transmission process of positive educational attitudes.

Conclusion

In conclusion, this study demonstrates that there is variability in the concrete educational attitudes of Chinese American parents and adolescents, variability that can be easily overlooked given the strong emphasis on education in Chinese American culture. We also highlight the complex interplay among parental education, income, and acculturation in forming parental educational attitudes, as well as the role of adolescent acculturation in conditioning parent-adolescent transmission of educational attitudes.

Acknowledgments

Support for this research was provided through awards to Su Yeong Kim from (1) Eunice Kennedy Shriver NICHD 5R03HD051629-02 (2) Office of the Vice President for Research Grant/Special Research Grant from the University of Texas at Austin (3) Jacobs Foundation Young Investigator Grant (4) American Psychological Association Office of Ethnic Minority Affairs, Promoting Psychological Research and Training on Health Disparities Issues at Ethnic Minority Serving Institutions Grant (5) American Psychological Foundation/Council of Graduate Departments of Psychology, Ruth G. and Joseph D. Matarazzo Grant (6) California Association of Family and Consumer Sciences, Extended Education Fund (7) American Association of Family and Consumer Sciences, Massachusetts Avenue Building Assets Fund, and (8) Eunice Kennedy Shriver NICHD 5R24HD042849-14 grant awarded to the Population Research Center at The University of Texas at Austin.

References

- Aiken, L.S.; West, S.G. *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA, US: Sage Publications, Inc; 1991.
- Barber BK, Olsen JA. Assessing the Transitions to Middle and High School. *Journal of Adolescent Research*. 2004; 19:3–30. DOI: 10.1177/0743558403258113
- Bem, DJ. *Beliefs, attitudes, and human affairs*. Oxford, England: Brooks/Cole; 1970.
- Benner AD, Kim SY. Intergenerational experiences of discrimination in Chinese American families: Influences of socialization and stress. *Journal of Marriage and Family*. 2009; 71:862–877. DOI: 10.1111/j.1741-3737.2009.00640.x [PubMed: 20161516]
- Benner AD, Kim SY. Understanding Chinese American adolescents' developmental outcomes: Insights from the family stress model. *Journal of Research on Adolescence*. 2010; 20:1–12. DOI: 10.1111/j.1532-7795.2009.00629.x [PubMed: 20454605]
- Bronfenbrenner, U.; Morris, PA. The Bioecological Model of Human Development. In: Lerner, R.M.; Damon, W., editors. *Handbook of child psychology (6th ed.): Vol 1, Theoretical models of human development*. Hoboken, NJ, US: John Wiley & Sons Inc; 2006. p. 793-828.
- Chao, R.; Tseng, V. Parenting of Asians. In: Bornstein, M.H., editor. *Handbook of parenting: Vol. 4: Social conditions and applied parenting*. 2. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers; 2002. p. 59-93.
- Chen SH, Hua M, Zhou Q, Tao A, Lee EH, Ly J, Main A. Parent–child cultural orientations and child adjustment in Chinese American immigrant families. *Developmental Psychology*. 2014; 50:189–201. DOI: 10.1037/a0032473 [PubMed: 23566081]
- Chen, X.; He, Y. The family in mainland China: Structure, organization, and significance for child development. In: Roopnarine, J.L.; Gielen, U.P., editors. *Families in Global Perspective*. Boston, MA: Allyn & Bacon; 2005. p. 51-62.
- Chuang SS, Su Y. Transcending Confucian teachings on fathering: A sign of the times or acculturation. *On new shores: Understanding immigrant fathers in North America*. 2008:129–150.
- Conger, R.D.; Elder, G.H., Jr; Lorenz, F.O.; Simons, R.L.; Whitbeck, L.B. *Families in troubled times: Adapting to change in rural America*. Hawthorne, NY, US: Aldine de Gruyter; 1994.
- Costigan CL, Dokis DP. Relations Between Parent-Child Acculturation Differences and Adjustment Within Immigrant Chinese Families. *Child Development*. 2006; 77:1252–1267. DOI: 10.1111/j.1467-8624.2006.00932.x [PubMed: 16999796]
- Crouter AC, Davis KD, Updegraff K, Delgado M, Fortner M. Mexican American Fathers' Occupational Conditions: Links to Family Members' Psychological Adjustment. *Journal of Marriage and Family*. 2006; 68:843–858. DOI: 10.1111/j.1741-3737.2006.00299.x [PubMed: 18414596]
- Darensbourg AM, Blake JJ. Predictors of achievement in African American students at risk for academic failure: The roles of achievement values and behavioral engagement. *Psychology in the Schools*. 2013; 50:1044–1059. DOI: 10.1002/pits.21730
- Darensbourg AM, Blake JJ. Examining the academic achievement of Black adolescents: Importance of peer and parental influences. *Journal of Black Psychology*. 2014; 40:191–212. DOI: 10.1177/0095798413481384
- Denissen JJA, Zaretzky NR, Eccles JS. I like to do it, I'm able, and I know I am: Longitudinal couplings between domain-specific achievement, self-concept, and interest. *Child Development*. 2007; 78:430–447. DOI: 10.1111/j.1467-8624.2007.01007.x [PubMed: 17381782]
- Duncan, G.J.; Magnuson, K.A. Off with Hollingshead: Socioeconomic resources, parenting, and child development. In: Bornstein, M.H.; Bradley, R.H., editors. *Socioeconomic status, parenting, and child development*. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers; 2003. p. 83-106.
- Durik AM, Vida M, Eccles JS. Task values and ability beliefs as predictors of high school literacy choices: A developmental analysis. *Journal of Educational Psychology*. 2006; 98:382–393. DOI: 10.1037/0022-0663.98.2.382
- Eccles [Parsons], J.S.; Adler, T.F.; Futterman, R.; Goff, S.B.; Kaczala, C.M.; Meece, J.L.; Midgley, C. Expectancies, values, and academic behaviors. In: Spence, J.T., editor. *Achievement and achievement motives*. San Francisco, CA: W. H. Freeman; 1983. p. 75-146.

- Eccles, JS. School and family effects on the ontogeny of children's interests, self-perceptions, and activity choices. In: Jacobs, JE., editor. Nebraska symposium on motivation. Vol. 40. Lincoln, NE: U. Nebraska Press; 1993. p. 145-208.
- Enders CK. The performance of the full information maximum likelihood estimator in multiple regression models with missing data. *Educational and Psychological Measurement*. 2001; 61:713-740. DOI: 10.1177/0013164401615001
- Eng S, Kanitkar K, Cleveland HH, Herbert R, Fischer J, Wiersma JD. School achievement differences among Chinese and Filipino American students: Acculturation and the family. *Educational Psychology*. 2008; 28:535-550. DOI: 10.1080/01443410701861308
- Fulgini AJ. The academic achievement of adolescents from immigrant families: The roles of family background, attitudes, and behavior. *Child Development*. 1997; 68:351-363. [PubMed: 9180006]
- García Coll C, Lamberty G, Jenkins R, McAdoo HP, Crnic K, Wasik BH, Garcia HV. An integrative model for the study of developmental competencies in minority children. *Child Development*. 1996; 67:1891-1914. DOI: 10.2307/1131600 [PubMed: 9022222]
- Gniewosz B, Noack P. What you see is what you get: The role of early adolescents' perceptions in the intergenerational transmission of academic values. *Contemporary Educational Psychology*. 2012; 37:70-79. DOI: 10.1016/j.cedpsych.2011.10.002
- Hahn HC, Lahiff M, Guterman NB. Asian American Adolescents' Acculturation, Binge Drinking, and Alcohol- and Tobacco-Using Peers. *Journal of Community Psychology*. 2004; 32:295-308. DOI: 10.1002/jcop.20002
- Henry CS, Merten MJ, Plunkett SW, Sands T. Neighborhood, parenting, and adolescent factors and academic achievement in Latino adolescents from immigrant families. *Family Relations: An Interdisciplinary Journal of Applied Family Studies*. 2008; 57:579-590. DOI: 10.1111/j.1741-3729.2008.00524.x
- Hill NE, Tyson DF. Parental involvement in middle school: A meta-analytic assessment of the strategies that promote achievement. *Developmental Psychology*. 2009; 45:740-763. DOI: 10.1037/a0015362 [PubMed: 19413429]
- Hu, L-t; Bentler, PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*. 1999; 6:1-55. DOI: 10.1080/10705519909540118
- Inman AG, Howard EE, Beaumont RL, Walker JA. Cultural transmission: Influence of contextual factors in asian indian immigrant parents' experiences. *Journal of Counseling Psychology*. 2007; 54:93-100. DOI: 10.1037/0022-0167.54.1.93
- Jodl KM, Michael A, Malanchuk O, Eccles JS, Sameroff A. Parents' roles in shaping early adolescents' occupational aspirations. *Child Development*. 2001; 72:1247-1265. DOI: 10.1111/1467-8624.00345 [PubMed: 11480945]
- Kiang L, Andrews K, Stein GL, Supple AJ, Gonzalez LM. Socioeconomic stress and academic adjustment among Asian American adolescents: The protective role of family obligation. *Journal of Youth and Adolescence*. 2013; 42:837-847. DOI: 10.1007/s10964-013-9916-6 [PubMed: 23371003]
- Kim SY, Wang Y, Chen Q, Shen Y, Hou Y. Parent-child acculturation profiles as predictors of Chinese American adolescents' academic trajectories. *Journal of Youth and Adolescence*. 2015; 44:1263-1274. DOI: 10.1007/s10964-014-0131-x [PubMed: 24820295]
- Kim SY, Wang Y, Orozco-Lapray D, Shen Y, Murtuza M. Does 'tiger parenting' exist? Parenting profiles of Chinese Americans and adolescent developmental outcomes. *Asian American Journal of Psychology*. 2013; 4:7-18. DOI: 10.1037/a0030612 [PubMed: 23646228]
- Knafo A, Schwartz SH. Parenting and adolescents' accuracy in perceiving parental values. *Child Development*. 2003; 74:595-611. DOI: 10.1111/1467-8624.7402018 [PubMed: 12705575]
- Lee J, Zhou M. The success frame and achievement paradox: The costs and consequences for Asian Americans. *Race and Social Problems*. 2014; 6:38-55. DOI: 10.1007/s12552-014-9112-7
- Little TD. Mean and covariance structures (MACS) analyses of cross-cultural data: Practical and theoretical issues. *Multivariate Behavioral Research*. 1997; 32:53-76. DOI: 10.1207/s15327906mbr3201_3 [PubMed: 26751106]

- Liu LL, Benner AD, Lau AS, Kim SY. Mother-adolescent language proficiency and adolescent academic and emotional adjustment among Chinese American families. *Journal of Youth and Adolescence*. 2009; 38:572–586. DOI: 10.1007/s10964-008-9358-8 [PubMed: 19636729]
- Mickelson RA. The attitude-achievement paradox among Black adolescents. *Sociology of Education*. 1990; 63:44–61. DOI: 10.2307/2112896
- Min, PG. Major issues relating to Asian American experiences. In: Min, PG., editor. *Asian Americans: Contemporary trends and issues*. Thousand Oaks, CA, US: Sage Publications, Inc; 1995. p. 38-57.
- Mistry RS, Biesanz JC, Chien N, Howes C, Benner AD. Socioeconomic status, parental investments, and the cognitive and behavioral outcomes of low-income children from immigrant and native households. *Early Childhood Research Quarterly*. 2008; 23:193–212. DOI: 10.1016/j.ecresq.2008.01.002
- Muthén, LK.; Muthén, BO. *Mplus user's guide*. 7.3. Los Angeles, CA: Muthén & Muthén; 1998–2015.
- Ryder AG, Alden LE, Paulhus DL. Is acculturation unidimensional or bidimensional? A head-to-head comparison in the prediction of personality, self-identity, and adjustment. *Journal of Personality and Social Psychology*. 2000; 79:49–65. DOI: 10.1037/0022-3514.79.1.49 [PubMed: 10909877]
- Saad CS, Sue S, Zane N, Cho YI. The relationship between education and ethnic minority factors in income among Asian Americans. *Asian American Journal of Psychology*. 2012; 3:66–78. DOI: 10.1037/a0026867
- Sameroff AJ. Developmental systems and psychopathology. *Development and Psychopathology*. 2000; 12:297–312. DOI: 10.1017/s0954579400003035 [PubMed: 11014740]
- Schaller A, Rocha LO, Barshinger D. Maternal attitudes and parent education: How immigrant mothers support their child's education despite their own low levels of education. *Early Childhood Education Journal*. 2007; 34:351–356. DOI: 10.1007/s10643-006-0143-6
- Simpkins SD, Fredricks JA, Eccles JS. The role of parents in the ontogeny of achievement-related motivation and behavioral choices: VI. Parent behavior and child belief models. *Monographs of the Society for Research in Child Development*. 2015; 80:98–107. DOI: 10.1111/mono.12162 [PubMed: 26325499]
- Simpkins SD, Vest AE, Price CD. Intergenerational continuity and discontinuity in Mexican-origin youths' participation in organized activities: Insights from mixed-methods. *Journal of Family Psychology*. 2011; 25:814–824. DOI: 10.1037/a0025853 [PubMed: 21988079]
- Sirin SR. Socioeconomic status and academic achievement: A meta-analytic review of research. *Review of Educational Research*. 2005; 75:417–453. DOI: 10.3102/00346543075003417
- Sue S, Okazaki S. Asian-American educational achievements: A phenomenon in search of an explanation. *American Psychologist*. 1990; 45:913–920. DOI: 10.1037/0003-066x.45.8.913 [PubMed: 2221563]
- Suizzo MA, Jackson KM, Pahlke E, Marroquin Y, Blondeau L, Martinez A. Pathways to achievement: How low-income Mexican-origin parents promote their adolescents through school. *Family Relations: An Interdisciplinary Journal of Applied Family Studies*. 2012; 61:533–547. DOI: 10.1111/j.1741-3729.2012.00727.x
- Tseng, V.; Chao, RK.; Padmawidjaja, IA. Asian Americans' Educational Experiences. In: Leong, FTL.; Ebreo, A.; Kinoshita, L.; Inman, AG.; Yang, LH.; Fu, M., editors. *Handbook of Asian American psychology*. 2. Thousand Oaks, CA, US: Sage Publications, Inc; 2007. p. 105-123.
- U.S. Census Bureau. Educational Attainment in the United States: 2009. 2012. Retrieved from <http://www.census.gov/prod/2012pubs/p20-566.pdf>
- Wang CCDC, Mallinckrodt B. Acculturation, attachment, and psychosocial adjustment of Chinese/Taiwanese international students. *Journal of Counseling Psychology*. 2006; 53:422–433. DOI: 10.1037/0022-0167.53.4.422
- Weaver SR, Kim SY. A person-centered approach to studying the linkages among parent-child differences in cultural orientation, supportive parenting, and adolescent depressive symptoms in Chinese American families. *Journal of Youth and Adolescence*. 2008; 37:36–49. DOI: 10.1007/s10964-007-9221-3 [PubMed: 20725611]
- Zane, N.; Song, A. Interpersonal Effectiveness Among Asian Americans: Issues of Leadership, Career Advancement, and Social Competence. In: Leong, FTL.; Ebreo, A.; Kinoshita, L.; Inman, AG.;

Yang, L.H.; Fu, M., editors. Handbook of Asian American psychology. 2. Thousand Oaks, CA, US: Sage Publications, Inc; 2007. p. 283-301.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Figure 1.

Structural equation model involving Wave 1 adolescent acculturation. P = parent; Edu = Education; Incom = Income; Acc = Acculturation; A = Adolescent; Att = Educational Attitude. For mother-adolescent dyad (top coefficients): $\chi^2 (23, N=443) = 42.01, p = .01$; CFI = .97; RMSEA = .04; 90% CI = [.02, .06]; SRMR = .04. For father-adolescent dyad (bottom coefficients): $\chi^2 (23, N=443) = 49.98, p = .001$; CFI = .95; RMSEA = .05; 90% CI = [.03, .07]; SRMR = .05. Coefficients are all standardized. The circle represents the residual variance of parent educational attitude. The two-headed curved arrows that connect the circle and other variables represent correlations specified between the endogenous variable (parent educational attitudes) and other exogenous variables (i.e., adolescent acculturation; P Att X A Acc). * $p < .05$; ** $p < .01$; *** $p < .001$.

Figure 2.

Structural equation model involving Wave 2 adolescent acculturation. P = parent; Edu = Education; Incom = Income; Acc = Acculturation; A = Adolescent; Att = Educational Attitude. W1 P Att X W2 A Acc = Wave 1 parent educational attitude X Wave 2 adolescent acculturation. For mother-adolescent dyad (top coefficients): $\chi^2 (23, N=438) = 36.21, p = .04$; CFI = .98; RMSEA = .04; 90% CI = [.01, .06]; SRMR = .04. For father-adolescent dyad (bottom coefficients): $\chi^2 (23, N=441) = 44.99, p = .004$, CFI = .96, RMSEA = .05; 90% CI = [.03, .07]; SRMR = .05. The circle represents the residual variance of parent educational attitude. The two-headed curved arrows that connect the circle and other variables represent correlations specified between the endogenous variable (parent educational attitudes) and other exogenous variables (i.e., adolescent acculturation; W1 P Att X W2 A Acc). * $p < .05$; ** $p < .01$; *** $p < .001$.

Figure 3.

Probed interactions predicting parental educational attitude. Because parental educational attitudes were centered on their means in the actual structural equation models, we increased the intercepts by the mean values of parental educational attitudes in these figures for easier interpretation. * $p < .05$; *** $p < .001$.

(a)

(b)

Figure 4.

Intergenerational transmission of educational attitudes moderated by adolescent acculturation. W1 = Wave 1; W2 = Wave 2. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 1

Zero-Order Correlations and Descriptive Statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Maternal acculturation W1 (M)	---												
2. Maternal education W1 (M)	.34**	---											
3. Family income W1 (M)	.28**	.51**	---										
4. Maternal educ attitudes W1 (M)	.24**	.42**	.47**	---									
5. Adolescent acculturation W1 (A)	.19**	.15**	.14**	.09	---								
6. Paternal acculturation W1 (F)	.44**	.28**	.18**	.27**	.19**	---							
7. Paternal education W1 (F)	.25**	.62**	.52**	.39**	.07	.29**	---						
8. Family income W1 (F)	.33**	.53**	.91**	.46**	.12*	.18**	.51**	---					
9. Paternal educ attitudes W1 (F)	.24**	.37**	.34**	.58**	.07	.26**	.36**	.36**	---				
10. Adolescent acculturation W2 (A)	.19**	.14*	.09	.07	.31**	.12*	.07	.13*	.10	---			
11. Adolescent educ attitudes W2 (A)	.17**	.27**	.31**	.27**	.10	.15*	.31**	.31**	.29**	.16**	---		
12. Grade Point Average W2 (S)	.10*	.13*	.10	.14**	.06	.00	.14*	.06	.09	.11	.21**	---	
13. Adolescent acad engagement W2 (A)	.07	.12*	.16**	.14**	.16**	.07	.18**	.16**	.05	.15**	.24**	.49**	---
<i>N</i>	408	397	384	407	442	380	368	363	381	349	343	400	344
<i>M</i>	3.46	5.86	3.82	3.13	3.73	3.48	5.93	4.00	3.13	3.80	3.46	3.15	3.89
<i>SD</i>	0.47	1.72	2.49	0.78	0.49	0.44	1.82	2.54	0.77	0.44	0.76	0.60	0.73

Note: W1 = Wave 1; W2 = Wave 2. M=mother report; F = father report; A = adolescent report; S = school report. educ =educational, acad = academic.

*
 $p < .05$.

**
 $p < .01$.

Table 2

Indirect Effects of Predictors on Adolescent Academic Outcomes

Path	Model 1 Indirect effects		Model 2 Indirect effects	
	β	SE	β	SE
Mother-Adolescent Dyad				
Education → M Attitude → A Attitude → GPA	.014 *	.006	.014 *	.006
Income → M Attitude → A Attitude → GPA	.009 [†]	.005	.009 [†]	.005
Acculturation → M Attitude → A Attitude → GPA	.002	.002	.002	.002
Edu_inc → M Attitude → A Attitude → GPA	.008 *	.004	.009 *	.004
Edu_Acc → M Attitude → A Attitude → GPA	.009 *	.004	.008 *	.004
Inc_Acc → M Attitude → A Attitude → GPA	.000	.003	-.001	.003
Education → M Attitude → A Attitude → Engagement	.014 *	.005	.014 *	.005
Income → M Attitude → A Attitude → Engagement	.009 *	.005	.009 *	.005
Acculturation → M Attitude → A Attitude → Engagement	.002	.002	.002	.002
Edu_inc → M Attitude → A Attitude → Engagement	.008 *	.004	.009 *	.004
Edu_Acc → M Attitude → A Attitude → Engagement	.009 *	.004	.008 *	.004
Inc_Acc → M Attitude → A Attitude → Engagement	.000	.003	-.001	.003
Father-Adolescent Dyad				
Education → F Attitude → A Attitude → GPA	.013 *	.006	.013 *	.006
Income → F Attitude → A Attitude → GPA	.009 [†]	.005	.010 [†]	.005
Acculturation → F Attitude → A Attitude → GPA	.009 *	.004	.009 *	.004
Edu_inc → F Attitude → A Attitude → GPA	.006	.004	.006	.004
Edu_Acc → F Attitude → A Attitude → GPA	.004	.003	.004	.003
Inc_Acc → F Attitude → A Attitude → GPA	.008 *	.004	.008 *	.004
Education → F Attitude → A Attitude → Engagement	.014 *	.006	.014 *	.006
Income → F Attitude → A Attitude → Engagement	.010 *	.005	.010 *	.005
Acculturation → F Attitude → A Attitude → Engagement	.010 *	.004	.010 *	.004
Edu_inc → F Attitude → A Attitude → Engagement	.007 [†]	.004	.007 [†]	.004
Edu_Acc → F Attitude → A Attitude → Engagement	.004	.004	.004	.004
Inc_Acc → F Attitude → A Attitude → Engagement	.009 *	.004	.009 *	.004

Note. Model 1: model involving Wave 1 adolescent acculturation; Model 2: model involving Wave 2 adolescent acculturation. M = Mother; F = Father; Edu = Education; Inc = Income; Acc = Acculturation. Bold paths denote significant indirect effects.

* $p < .05$.