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Transactional Associations Between Supportive Family Climate and Young Children's
Heritage Language Proficiency in Immigrant Families

Abstract

Heritage language (HL) proficiency confers developmental benefits, however the onset of HL loss is observed among many young children from immigrant families. In this longitudinal study, transactional associations between children's HL proficiency and supportive family climate were examined in Chinese immigrant families with preschool aged children. Parental warmth, cultural maintenance values, and use of HL support were investigated as aspects of family climate. Measures included observable parent-child interactions and performance-based language proficiency assessments. While parental cultural maintenance values appeared influential, parental behavioral support of HL showed more robust prospective associations with children's HL development. Concurrently, children's earlier HL proficiency predicted subsequent parental behavior; parents whose children had limited HL proficiency decreased their use of HL support one year later. Implications of findings are discussed for immigrant parents with young children.

Keywords: heritage language development, family climate, parent child interaction, parenting, linguistic support, Chinese immigrants, longitudinal study

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Linguistic acculturation in immigrant households occurs at different rates for children and parents. Among adult immigrants in the U.S. who arrive with limited English proficiency, only a small number consider themselves fluent in English once settled (Portes & Rumbaut, 1996). Children of immigrants, on the other hand, acquire English as their primary language more readily than their parents (Oh & Fuligni, 2010; Portes & Rumbaut, 1996; Tseng & Fuligni, 2000). Unfortunately, some of these children may concomitantly lose or fail to develop proficiency in their heritage language (HL) in the course of the swift transition to English fluency (Oh & Fuligni, 2010; Portes & Hao, 1998; Rumbaut, 1994, 1997; Tseng & Fuligni, 2000; Veltman, 1988).

It is troubling that children with HL-proficient immigrant parents lose or fail to develop fluency in their HL, because young children are equipped to process multiple language inputs and develop bilingual proficiency with appropriate support (Bosch & Sebastián-Gallés, 2001; Kuhl, 2004; Newport, 1990). In the American context, however, broader conditions largely favor linguistic assimilation to English (Portes & Rumbaut, 1996). It may be challenging for immigrant families to provide sufficient support for HL development in young children, as there is often strong motivation to attend to English learning. For example, immigrant parents may feel compelled to discourage their children's use of HL in the home because of fears that their children will be at a scholastic or economic disadvantage if they are not fluent in English (Vongs, 2006). In fact, there is a higher risk of HL attrition among children from low-income, immigrant backgrounds compared to their middle-class counterparts (Lambert & Taylor, 1996). Moreover,

immigrant parents have been observed to reduce their use of HL as their children begin to speak English at home (Oh & Fuligni, 2010).

Nevertheless, retaining or developing HL proficiency is important given its numerous associations with positive developmental outcomes such as ethnic identity (Bankston & Zhou, 1995; Imbens-Bailey, 1996; Phinney, Romero, Nava, & Huang, 2001), which in turn has benefits for emotional adjustment (Lee, 2003; Phinney et al., 2001). Additionally, HL proficiency and the ability of immigrant parents and their children to communicate in a common language have been associated with a higher family relationship quality (Oh & Fuligni, 2010; Tseng & Fuligni, 2000). Moreover, children who are fluent in HL as well as in English are able to perform as a family resource by acting as language brokers, which can confer bicultural competence and a sense of familial role fulfillment (Buriel, Perez, De Ment, Chavez, & Moran, 1998; Orellana, 2009). Bilingual youth have also been shown to have higher academic achievement than their co-ethnic monolingual peers (Bankston & Zhou, 1995; Kim & Chao, 2009). Furthermore, the value of HL proficiency is increasingly recognized in multicultural societies and the globalized marketplace where bilingualism is an important asset.

Given the prevalence and potential consequences of HL loss, it is crucial to examine patterns of HL loss and maintenance among young children. Language experiences during early childhood can provide a strong foundation and perhaps a unique advantage for attaining and maintaining HL proficiency. Recent retrospective studies with young adult samples suggest that those who had childhood exposure to their HL demonstrate more native-like accent (Au, Knightly, Jun, & Oh, 2002; Knightly, Jun, Oh, & Au, 2003), superior speech production (Oh, Jun, Knightly, & Au, 2003), and better ability to perceive and distinguish HL sounds from other language sounds (Oh et al., 2003) compared to novice learners. While these studies provide

some evidence that early childhood experience are fundamental to HL learning, prospective research beginning in early childhood is needed as adult recollection of childhood linguistic environment may be biased by current language competencies. Prospective study of HL development is particularly important as children in immigrant families enter English dominant environments as they matriculate into preschool and elementary school.

Thus, in the current study we examined components of early supportive family climate as antecedents of young children's HL development. Specifically, we examined distal (i.e., parental cultural maintenance values, observed parental warmth) and proximal (i.e., observed parental support of HL) components of family climate that may support HL development. Furthermore, we investigated whether the relations between family processes and children's language competencies are transactional. While parental behaviors may support and scaffold children's development of language proficiency, children's early language development may elicit distinctive parental responses. Therefore, we also examined the prospective association between children's earlier HL proficiency and subsequent family interactions.

Supportive Family Climate and Children's HL Development

Parental warmth. Affective climate (e.g., warmth) and instrumental support (e.g., teaching of ethnic culture and language) at home may contribute to children's language development. Research has supported a link between features of the parent-child relationship and young children's English language and literacy development. For example, a positive affective climate marked by parental warmth predicts later cognitive and language scores among young children (Fuligni, Han, & Brooks-Gunn, 2004). Similarly, strong associations have been found between maternal responsiveness and children's language proficiency (Beckwith & Rodning, 1996; Steelman, Assel, Swank, Smith, & Landry, 2002). However, these studies

focused on children's English proficiency; less is known about the role of affective family climate on HL development within immigrant families.

In her recent survey study, Park (2007) found that family cohesion was associated with greater HL proficiency among Korean American youth and that this relationship was mediated by ethnic identity. Youngsters who reported high levels of family cohesion also reported strong ethnic identity, which in turn, predicted more advanced HL proficiency. Another study suggested that parents' values concerning HL maintenance were only related to youth's HL retention, when there was a close and cohesive parent-child relationship (Luo & Wiseman, 2000). A supportive and rewarding affective family climate in immigrant families may directly bolster linguistic enculturation or may be a pre-requisite condition for parents who wish to promote their children's HL development. However, these previous studies have focused on predictors of HL proficiency among adolescents, rather than young children, and relied on self-reported HL proficiency and family cohesion. In the current study, we used observations of parental warmth during parent-child interactions and standardized assessments of HL proficiency to investigate how family climate might predict HL development during early childhood.

Parental cultural maintenance values. To support cultural maintenance immigrant parents can engage in a variety of behaviors that facilitate the transmission of values to their children in ways that are active and explicit through teaching, or passive and implicit through daily routines and cultural scripts. Immigrant parents may view HL learning as integral to their ability to transmit and maintain ethnic culture. Indeed, research has demonstrated a link between parental cultural maintenance values and children's HL. In their study of adolescents and their parents from Armenian, Vietnamese, and Mexican immigrant backgrounds, Phinney et al. (2001) found that parental endorsement of cultural maintenance values was strongly associated with

adolescents' HL proficiency across ethnic groups. While parental cultural maintenance values appear to influence children's HL proficiency, surveys of this type have been limited to cross-sectional designs and adolescent self-reports of language proficiency. Adolescents' self-assessed proficiency may be as much a reflection of ethnic identity as it is an indicator of language skills given the robust association between ethnic identity and HL proficiency (Park, 2007). As such, the link between parental values and youths' reported HL proficiency may also simply reflect the shared variance of family attitudes toward enculturation. In the current study, we examined parental cultural maintenance values as an antecedent of young children's HL proficiency, using performance-based measures of HL proficiency.

Parental behavioral support of HL. In the U.S. where English is the only language actively supported by mainstream society, input and scaffolding of HL among immigrant populations must rely heavily on the familial network (Park, 2007). Given that language is considered the vehicle for transmitting the cultural heritage across generations (Pease-Alvarez & Vasquez, 1994), parents who value cultural maintenance may organize daily language routines to shape HL maintenance, particularly by electing to speak the HL at home. Yet, beyond expressed values of cultural maintenance, little developmental research has documented how specific parental behaviors or practices relate to children's language outcomes.

Nonetheless, there is variability in the extent to which immigrant parents purposefully facilitate children's development of the HL (Guardado, 2002). It appears that even when parents hold attitudes committed to cultural and linguistic maintenance, there are varying levels of success in raising bilingual children (Guardado, 2010). In addition, the observed link between parental cultural maintenance and children's HL proficiency may be explained by more specific behaviors that facilitates HL development. Therefore, we investigated how more proximal

linguistic support behaviors may prospectively predict children's HL development, over and above parents' stated goals of cultural maintenance.

Influence of Children's HL Proficiency on Family Climate

Familial processes are interactive in nature, and parents and children exert concurrent influences on each other (Sameroff, 1975). While supportive family climate may facilitate children's HL learning, parents may also adjust their behaviors according to children's trajectories of HL development. Therefore, it is important to consider how children's HL development and family climate may change reciprocally, such that children's earlier HL use and proficiency may potentially shape later parental behaviors.

Child HL loss has been implicated as a cause of deteriorations in immigrant family relationship quality. Yet, a critical review of this research cautions against this conclusion. For example, Fillmore (1991) reported that HL loss was prevalent among young children in immigrant families and led to profound disruptions in the parent-child relationship. However, the study has been criticized due to its reliance on retrospective parental reports of child language development in a convenience sample of acquaintances of interviewers oriented to the research hypotheses (Rodriguez, Diaz, Duran, & Espinosa, 1995; Winsler, Díaz, Espinosa, & Rodríguez, 1999). Causal inference from more recent studies linking HL loss to poor quality parent-child relations are similarly unwarranted given that the directionality of associations cannot be inferred from these cross-sectional designs (Oh & Fuligni, 2010; Tannenbaum & Howie, 2002).

Other researchers have in fact argued that HL loss may not inevitably weaken communication or diminish familial bonds. Usita and Blieszner (2002) contend that immigrant families are able to activate strategies for coping with communication barriers caused by HL loss.

In their qualitative study of Japanese American mother-daughter dyads, they found that immigrant families adapted to communication difficulties in ways that reduced tension and enhanced feelings of closeness, such as seeking clarification and using humor. It is conceivable that dissonant language acculturation poses difficulties but also presents opportunities for positive adaptation. Given the mixed findings and methodological limitations in the extant literature, data are needed on the cross-lagged associations between children's HL proficiency and parent-child interaction quality.

Indeed, children's levels of HL competence may influence parents' linguistic behaviors toward their children. In their study, Tseng and Fuligni (2000) found that adolescents who mutually spoke HL with their parents had more emotional closeness with their parents compared to those who mutually spoke English with parents. However, longitudinal analyses indicated that relationship quality predicted change in family language use, but family language use did not predict later relationship quality. Parents and adolescents who felt closer and who engaged in more discussion were more likely to switch to speaking the same language two years later, and this change in language use typically reflected parents switching from HL to English use. Thus, children's HL loss may shape linguistic behaviors of their parents. In the current study, both observed affective (i.e., parental warmth) and linguistic (i.e., parental HL support) components of supportive family climate were examined as potential antecedents and consequences of child HL development.

The Current Study

The guiding premise of the current study was that HL development and family climate are interconnected processes that unfold together beginning in early childhood in immigrant families. The study aim was to identify supportive family climate factors that influence child HL

development as well as examine the bidirectionality in this transaction. Specifically, we investigated three types of supportive family climate variables (i.e., observed parental warmth, reported parental cultural maintenance values, and observed parental support of HL) as prospective predictors of HL development during early childhood. Furthermore, we examined the influence of children's HL proficiency on later parental affective (i.e., observed parental warmth) and linguistic (i.e., observed parental support of HL) behaviors.

We hypothesized that family climates characterized by parental warmth, HL support behaviors, and parental commitment to cultural maintenance would be positively associated with children's HL development one year later. However, we expected that the more proximal factor of parental support of HL would account for more variance in HL development compared to the more distal family process variables of warmth and enculturation values. Furthermore, we posited that previously observed associations between children's HL proficiency and positive family relations may be at least partially accounted for by the closeness and mutual understanding afforded by children's HL abilities. Thus, we hypothesized that child HL proficiency at baseline might be related to more warm and positive interactions with parents one year later. However, no a priori hypotheses were made regarding the prospective links between children's HL proficiency and subsequent parental HL support.

Method

Participants

Families were eligible if at least one of the parents was a Mandarin or Cantonese Chinese speaker who immigrated to the U.S. after the age of 18 years. Participant recruitment began at community-based HL schools in the greater Los Angeles area. Previous research on similar samples suggests that there is considerable variability in HL outcomes among children who

attended HL classes (Cheng & Kuo, 2000). Nevertheless, we expanded our sample by recruiting participants who did not attend HL schools using network sampling. Families of children enrolled in HL school were asked to refer other eligible immigrant Chinese families to participate in the study.

The final sample of the study was 68 Chinese immigrant parents (86% mothers, T1 *Mage* = 39.76 years, *SD* = 4.06) and their children (38% female, T1 *Mage* = 5.11 years, *SD* = .81) who participated at T1 and T2 of the study (mean T1-T2 interval = 14.2 months). Of the final sample, 52% of the children were attending HL schools. There were more families who spoke Mandarin (78%) than families who spoke Cantonese; this proportion of Mandarin and Cantonese speaking families reflects the fact that Mandarin was the dominant Chinese language in the study recruitment area. The reported median annual household income range was more than \$100,000 (20%), but there was considerable variability in the income distribution (range = less than \$4,999 to more than \$100,000, mean income range = \$60,000 - \$69,999). Additionally, mother's education level was also distributed across a wide range (2 years - 20 years), with a mean education level of 14.34 years (*SD* = 5.40).

Procedure

Interviews were conducted by a pair of interviewers in the families' homes on two occasions approximately one year apart. One interviewer spoke the HL (i.e. Mandarin or Cantonese) and the other interviewer spoke English. The interviewer who spoke the language which the parents and child most often communicated to each other took the lead in providing general instructions to the family. The interviewers first obtained written consent from the parents to participate in the study. The families were then asked to engage in a series of parent-child dyadic interactions. Families were informed that they would be video-recorded during the

interactions, and to tell the interviewers if they did not want to engage in any parts of the interactions. In one interaction, they were asked to tell two stories together in two 5-minute story-telling sessions; the child was instructed to tell his or her parent a story about a time when something 1) scary and 2) fun had happened to the child. The parent was instructed to help their child tell the stories. Participants were instructed to speak whichever language they would usually use together. After completion of the story-telling interactions, the parent and child were separated and met individually with the interviewers to complete the language assessments and self-report questionnaires. All questionnaires were available in both English and Chinese (simplified and traditional characters) and parents completed assessments in the language of their choice.

Measures

Parental cultural maintenance values. The 6-item Parental Cultural Maintenance scale (PCM, Phinney et al., 2001) measured the extent to which the parents were motivated to maintain their heritage culture. The items are designed to assess the amount of parental effort in instilling ethnic pride, discussing ethnic history and the meaning of ethnicity, and encouraging their children to learn and practice cultural traditions and values (Phinney et al., 2001). A sample item was “We teach our child about what it means to be Chinese” (1 = almost never; 5 = almost always). The reliability and validity of this scale has been demonstrated in a sample of diverse immigrant families including Vietnamese Americans (Phinney et al., 2001). In the present study, the items of the measure also demonstrated reliability ($\alpha = .87$). Unlike the other measures that were obtained at both T1 and T2 (warmth, HL support, and HL proficiency), PCM was assessed only at T1 due to expected stability of values over the one-year period.

Observed parental warmth. Using the coding scheme that was created based on Parent and Child Expressed Affect (Isley, O'Neil, Clatfelter, & Parke, 1999), coders rated their overall impressions of the parent-child storytelling interaction qualities on the dimension of warmth. Warmth was defined as parental affection, which may be expressed verbally or nonverbally. The rating was based on a 5-point Likert scale (1 = not at all or low; 5 = always or high). Coders were asked to consider the following verbal and nonverbal indicators of parental warmth in their global rating: (a) expressing approval of the child through praise or positive comments, (b) providing reassurance or comfort (e.g., when the child tells about a scary experience), (c) using terms of endearment to address the child, (d) using a pleasant tone of voice, (e) use of physical affection, such as patting, or putting an arm around the child, and (f) smiling at or laughing with the child. Since individuals may rely on only verbal or nonverbal expression, parents did not have to express warmth in both channels in order to receive a high rating of warmth. There was adequate inter-rater reliability among the coders in rating parental warmth (ICC = .68).

Observed parental HL support. Similarly, coders rated their impression of parental HL support in parent-child interactions, using the 5-point Likert scale (1 = not at all or low; 5 = always or high). HL support was defined by the parent's amount and quality of HL use and HL input, marked by degree to which the parent appeared to support the child's HL production in the interaction. Coders were asked to rate the extensiveness of HL support as indicated by: (a) high levels of parents' use of the HL during the interaction, (b) restating their children's English statements in the HL, (c) explicit verbal encouragement of the child to speak in the HL, (d) assisting the child in translating English words or phrases into the HL, (e) correcting HL production, and (e) praising the child's HL use or production. The inter-rater reliability was high among the coders (ICC = .89).

Children’s HL proficiency: Pre-LAS-O. Children’s HL expressive proficiency was assessed at T1 and T2 based on their performance on the modified Chinese version of Language Assessment Scales – Oral (LAS-O, De Avila & Duncan, 1981). This study used the Pre-LAS version, which was created for the assessment of oral language skills of kindergarten and first graders. The scales consist of vocabulary subtests and story retelling and have been used in previous research on children’s Spanish HL maintenance (Rodriguez et al., 1995; Winsler et al., 1999). In this study, the English version of the scales was translated into Chinese with necessary modifications (e.g., in the English version, an item required production of the plural noun “books” in the sentence. Since Chinese language does not make singular/plural distinctions but does use various classifiers (measure words) to define the quantity of a given object, “books” was replaced with the measure word for “car” (using the appropriate classifier, “liàng”). The modifications were piloted and refined in a pretesting phase.

The Pre-LAS yields a total composite score consisting of weighted subtest scores. In the vocabulary subtests, children were tested in their ability to verbally produce object labels and other words in context from what they heard or saw. For example, the experimenter pointed to different body parts in the cue picture book and had children name the parts. Scores were assigned based on the number of pictures children verbally identified in Chinese. In another subtest, children were instructed to listen to an audio-recording and to repeat exactly what they heard. This part was intended to measure children’s oral proficiency in language structures. For example, children were asked to repeat sentences such as “Where is Ming’s pencil?” (“XiǎoMíng de qiānbǐzài nǎlǐ?”) and “She dressed herself” (“Tāzìjǐ chuānyīfú”). The scoring was based on whether or not the child said the parts “Ming’s” (“XiǎoMíng de”) and “herself” (“tāzìjǐ”) correctly, in order to assess the child’s internalization of Chinese syntactic constructions.

In the Story Retelling subtest, children listened to an audio recording of a story while following along looking at a picture book. The child was then instructed to retell the story in his/her own words as much as possible. The interviewer prompted the child if they appeared to struggle with telling the story (e.g., “What happened in the beginning?” or “and then what happened?”). Children’s utterances were recorded and transcribed, and the language production was measured by the number of distinct words produced in the child’s narrative. Language complexity was calculated using the number of verbs and the average number of words per verb phrase that the child used in the narrative productions.

In this study, children’s total oral language scores on the Chinese Pre-LAS-O demonstrated adequate internal consistency at T1 ($\alpha = 0.79$) and T2 ($\alpha = 0.88$). Since we produced a Chinese version of the LAS-O, we examined the concurrent validity of the measure by investigating its correlations with other established measures. Children’s Pre-LAS-O scores were correlated with receptive HL language scores on a Chinese version of the Peabody Picture Vocabulary Test – Third Edition (PPVT-III; Dunn & Dunn, 1997; Goetz, 2003) ($r = .37, p < .01$) and parent reports of children’s HL language use on the Language Use and Preference Questionnaire (LUPQ; Tannenbaum, 2003) ($r = .31, p < .01$) at T1.

Data Analysis Strategy

Transactional processes of supportive family climate and children’s HL proficiency among Chinese immigrant families were examined in three stages. First, the influence of T1 supportive family climate (i.e., observed parental warmth, reported parental cultural maintenance values, and observed parental HL support) on T2 children’ HL proficiency was prospectively examined. Second, the prospective association between T1 children’s HL proficiency and T2 supportive family climate (i.e., warmth and HL support) was also examined. Since we

anticipated that parental cultural maintenance values would remain relatively stable over the course of one year, it was assessed only at T1 and not included in the second analyses. These regression models were conducted in PASW Statistics v.18.

Finally, Mplus v.5.0 (Muthén & Muthén, 2007) was used to test transactional cross-lagged path model that concurrently examined whether T1 family climate variables predicted changes in children's HL proficiency and whether T1 children's HL proficiency predicted changes in family climate conditions at T2. The model fit was assessed by examining R^2 values, model chi-square, the Comparative Fit Indices (CFI), and Root Mean Squared Error Approximation (RMSEA), where CFI values of .90 or higher and RMSEA values of .05 or lower indicate good model fit (Kline, 2005).

All analyses included five control variables: child's gender, maternal education, family income, child HL attendance, and Chinese language type (i.e., Mandarin vs. Cantonese). These were potential third variables that could be correlated with both HL proficiency and family processes. Children enrolled in HL school may show higher HL proficiency compared to those who do not attend HL school; there may also be family climate differences between these two groups of children. Gender effects have been evident in the literature on young children's language development (e.g., Huttenlocher, Haight, Bryk, Seltzer & Lyons, 1991). Family income and maternal education level are two indicators of socioeconomic status that have been consistently correlated with children's language development and the family processes under study (e.g., Lambert & Taylor, 1996; Walker, Greenwood, Hart & Carta, 1994). Lastly, we explored whether Cantonese- and Mandarin-speaking families differ in HL trajectories.

For all descriptive analyses and regressions, missing data were imputed using multiple imputation (MI), which is recommended over ad hoc methods such as single imputation or

listwise deletion (Peng, Harwell, Liou, & Ehman, 2006; Schafer & Olson, 1998). MI is highly efficient even for small sample sizes in the range of the current study (Peng et al., 2006; Graham & Schafer, 1999). Missing data values were imputed 5 times (PASW Statistics v.18) using an iterative Markov chain Monte Carlo method. Since the missing rate for the data was less than 20%, $m = 5$ was considered sufficient (Graham & Schafer, 1999). Each of the five datasets was individually analyzed and then pooled to yield a single set of pooled estimates (Peng et al., 2006). For our path analytic models conducted in Mplus v.5.0, a full information, maximum likelihood estimation approach was used to handle the missing values (Acock, 2005).

Results

Attrition Analyses

Our participant retention rate from T1 to T2 was 86%. Attrition analyses using independent t-test indicated no significant differences in child age, maternal education, annual household income, child's HL school attendance, and Chinese language type for families who did not return at T2 versus those who participated at both times. Additionally, there were no significant differences in degree of observed parental warmth, observed parental support of HL, and children's HL proficiency at baseline. However, two variables were significantly associated with retention in the sample at T2. Families who returned to participate at T2 had a higher degree of self-reported cultural maintenance values than those who did not return ($t = 2.05, p = .044$), and they were more likely to have a boy as the index child in the study ($t = 2.49, p = .030$).

Correlations Among Study Variables

Bivariate correlations between all variables of interest are presented in Table 1. Robust stability over the follow-up period across T1 and T2 was observed in children's HL proficiency

($r = .46, p < .001$) and parental observed HL support ($r = .52, p < .001$). However, observed parental warmth at T1 and T2 were not significantly correlated ($r = -.07, n.s.$). Prospectively, cultural maintenance values ($r = .32, p = .017$) and parental HL support ($r = .34, p = .024$), but not parental warmth ($r = -.05, n.s.$), were associated with children's HL proficiency at T2. In terms of the association between T1 children's HL proficiency and T2 family climate, there was a significant positive correlation between T1 children's HL proficiency and T2 HL support ($r = .28, p = .035$). However, T1 children's HL proficiency was not correlated with T2 warmth ($r = .004, n.s.$).

As shown in Table 1, demographic variables were generally not associated with children's HL proficiency or family climate measures. Child gender, maternal education, household income, and HL school attendance were not significantly correlated with cultural maintenance, warmth, HL support, or children's HL proficiency. However, families in which Cantonese was the HL reported lower parental cultural maintenance values ($t = -2.34, p = .023$) and had lower assessed HL proficiency at T1 ($t = -4.61, p < .001$) and T2 ($t = -2.36, p = .021$) compared to families in which Mandarin was the HL.

Family Climate as an Antecedent of Children's HL proficiency

A hierarchical multiple regression analysis was then conducted to predict HL proficiency scores at T2 (see Table 2). Family climate measures were specified as distal (i.e., warmth and cultural maintenance values) or proximal (i.e., HL support) in prospectively predicting children's HL proficiency. In the first step, all demographic control variables (i.e., child's gender, maternal education, household income, HL school attendance, and Chinese language type) were entered. In the next step, T1 distal family climate variables (i.e., warmth and cultural maintenance) were entered, controlling for the demographic variables from the first step. All variables were

included in the model in case of possible suppression effects. Finally in the third step, T1 proximal family climate variable (i.e., HL support) was entered.

In the first step, Chinese language type was the only significant predictor of T2 children's HL proficiency ($\beta = -.29, p = .029$). In the second step, cultural maintenance values at T1 prospectively predicted children's HL proficiency at T2 ($\beta = .32, p = .040$), but warmth did not ($\beta = -.07, n.s.$). In the third step, T1 HL support ($\beta = .35, p = .014$) predicted children's HL proficiency at T2, but the effect of cultural maintenance values and Chinese language type were rendered marginally significant ($\beta = .27, p = .067, \beta = -.24, p = .099$, respectively). The final model accounted for 30% of the variance in T2 children's HL proficiency, with HL support accounting for 10% of the variance.

Family Climate as an Outcome of Children's HL proficiency

Children's HL proficiency at T1 was also examined as a predictor of family climate at T2 including HL support and parental warmth (cultural maintenance values were not assessed at T2). Table 3 presents the regression analysis examining T1 children's HL proficiency as a predictor of T2 parental HL support only. In the first step, none of the demographic variables predicted T2 HL support. In the second step, children's HL proficiency at T1 positively predicted T2 HL support ($\beta = .35, p = .033$). The final model explained 14% of the variance in parental HL support one year later, with children's HL proficiency accounting for 8% of the variance. We found no significant association between children's HL proficiency at T1 and parental warmth at T2 in the next model that was tested.

Transactional Associations between Parental HL Support and Children's HL proficiency

Findings from the regression analyses indicated the significant and robust effect of HL support as both a predictor and outcome associated with children's HL proficiency. That is, HL

support is an important aspect of supportive family climate that plays a role in children's HL proficiency. No other family climate variables were independently and prospectively related to HL proficiency. We therefore tested the proposed bidirectional path model that examined the transactional processes between parental HL support and children's HL proficiency over time. The model included the stability paths for HL support and for children's HL proficiency from T1 to T2. The main paths of interest were the two cross-lagged paths from T1 HL support to T2 children's HL proficiency and from T1 children's HL proficiency to T2 HL support. Significance of both paths would suggest bidirectional transactions between HL support and children's HL proficiency over time.

In testing the models, we controlled for child's gender, HL school attendance, maternal education, household income, and Chinese language type by including their direct effects on the outcome variables (i.e., T2 HL support and T2 HL proficiency). Additionally, all predictors were allowed to covary and all parameters were estimated freely. However, nonsignificant paths ($p > .02$) and correlations involving demographic covariates were omitted from the full saturated model to obtain the final trimmed model (Figure 1). As such, the degrees of freedom were maximized and statistical power for model testing was enhanced (Kline, 2005). Examination of R^2 values revealed that the trimmed model explained as much variance in T2 HL support ($R^2 = .31, p = .006$) and T2 HL proficiency ($R^2 = .33, p = .002$) as the full model ($R^2 = .32, p = .005$ and $R^2 = .34, p = .001$, respectively). Additionally, the observed model fit indices for the final model were $\chi^2(14) = 15.33, p = .356$, CFI = .958, RMSEA = .037, which indicated good model fit.

As expected, the results indicated significant stability paths from T1 to T2. T1 HL support positively predicted T2 HL support ($\beta = .44, p < .001$), and T1 HL proficiency also

positively predicted T2 HL proficiency ($\beta = .35, p = .006$). More importantly, both transactional paths were significant. T1 HL support predicted T2 HL proficiency ($\beta = .32, p = .008$), and T1 HL proficiency predicted T2 HL support ($\beta = .25, p = .029$). Also importantly, while the transactional and stability paths were strong in the model, HL support and HL proficiency were not correlated at T1 ($\beta = .20, p = n.s.$) or at T2 ($\beta = -.17, n.s.$) in the path model.

Discussion

The goal of this longitudinal study was to examine whether there are transactional associations between supportive family climate (i.e., parental warmth, cultural maintenance values, and parent use of HL support strategies) and child HL proficiency in Chinese immigrant families. We investigated whether distal (i.e., warmth and cultural maintenance values) and proximal (i.e., HL support) supportive family climate factors could facilitate children's HL proficiency one year later. Likewise, we examined how children's HL proficiency might shape these aspects of family climate one year later. We identified HL support as the only dimension of family climate that was independently associated with children's HL proficiency in both directions. That is, parental HL support prospectively predicted children's HL proficiency, and children's HL proficiency prospectively predicted HL support.

Results indicated the specificity of family climate in influencing children's HL development. Unlike parents' provision of positive affective climate or a general commitment to maintaining the heritage culture, their actual linguistic support appears to promote child HL development. Stated otherwise, a lack of HL support early on was associated with child HL loss. The critical importance of HL support is not surprising, given that a linguistic environment is required facilitate children's cognitive capacity to process language and develop proficiency (Kuhl, 2004; Newport, Bavelier, & Neville, 2001). Yet, it is crucial to recognize that HL input is

not typically provided in mainstream North American communities; therefore, HL learning and maintenance hinge on HL input at home. Our finding about the importance of parental HL support is bolstered by the fact that we controlled for children's enrollment in HL schools in the community. Thus, this finding highlights the potency of immigrant parents' role in HL development in the home. In addition, contrary to the concern that parent's promotion of HL in the home may harm children's development of English proficiency, a recent cross-sectional study (Tsai, Park, Liu, & Lau, in review) found parent's use of HL to be associated with children's HL proficiency but with no observed cost to English proficiency.

It is interesting that HL support, but not parental warmth, facilitated Chinese children's HL proficiency. In their study of family climate and English development, Fuligni et al. (2004) found both parental warmth and linguistic support to be associated with children's English language scores in their sample of European, African, and Latin American families. Our findings may indicate that this previously suggested influence of parental warmth on children's language development may not apply to the learning of HL within immigrant families. Unlike the learning of mainstream culture, enculturation, including HL learning, relies solely on the kinship network (Park, 2007). Given the unique challenge in acquiring HL proficiency (i.e., limited access to rich linguistic HL environment in the mainstream society), only parental HL support but not warmth may exert influence on Chinese children's HL development. It is also possible that the role of affective climate differs for monolingual and bilingual families. Since Fuligni et al. (2004) did not discuss whether children in their study were raised in monolingual or bilingual homes, this possibility demands future empirical research. Nevertheless, literature supports the notion that cultural context may moderate the link between parenting and child

outcomes as the context shapes the meaning and implications of parental behavior (Fung & Lau, 2009).

The Fuligni et al (2004) findings may have also been due to the younger age of children in their study (i.e., 2-3 years old). It is possible that the role of affective family climate (e.g., warmth) in children's general language development diminishes with children's increased overall verbal skills. Younger children with limited verbal skills may rely more heavily on non-verbal cues, while older children with higher verbal skills pay more attention to linguistic cues. Furthermore, the relationship between parental warmth and children's HL proficiency may unfold differently during adolescence when children's own perceptions of family climate gain increased importance in predicting youth outcomes (Wu & Chao, 2005). Apart from developmental considerations, our negative findings may be due to cultural differences in the conventional expression of parental warmth. Our coding focused on verbal and physical affection, and these expressions may be more salient or typical features of positive relationship climate in European American families compared to immigrant Chinese families (Lin & Fu, 1990).

It is important to note that parents' more global efforts to maintain the heritage culture did not independently predict HL proficiency after accounting for observed HL support. Although previous studies indicated that cultural maintenance values were associated with adolescent HL proficiency (Phinney et al., 2001), specifically scaffolding HL expression is a more proximal predictor of children's HL development than parental attitudes toward cultural maintenance. This suggests that the active ingredient of a parental orientation toward enculturation is behavioral scaffolding of language output. Other potential mechanisms that

underlie the benefits of parental cultural orientation might include providing visits to homeland or supporting social networks with HL-speaking peers.

Not only did parental HL support predict children's HL proficiency at T2, but HL support was also predicted *by* children's HL proficiency at T1 in cross-lagged models. That is, parents with more proficient children at T1 continued to provide HL support, while parents whose children were less proficient at T1 diminished their support of the HL at T2. Thus, it appears that children who may benefit the most from HL support have parents who are more likely to later withdraw rather than bolster their efforts in supporting their child's HL development. Rather than persisting in their level of HL support with their children, Chinese immigrant parents may feel discouraged by their children's early weakness in HL development thus desist their use of HL. This transactional pattern may speed HL attrition in the second generation.

This finding that parental behavior follows in suit with children's earlier HL use is in line with a previous longitudinal study. Tseng and Fuligni (2000) found that immigrant parents tended to shift from HL to English use when their adolescent children preferred to speak English at home (Tseng & Fuligni, 2000). Our results support this tendency of immigrant parents to accommodate their own language behavior to their children's trajectories of language use and proficiency. Furthermore, our results suggest that some parents discontinue their use and support of HL when their children are still quite young, hampering the prospect of children receiving developmental benefits associated with HL proficiency and bilingualism. These evocative effects of child language behaviors should be given more attention in both basic and applied research and the design of strategies to promote HL vitality.

In the current longitudinal study, we found no evidence that parents whose children had limited HL proficiency decreased their expression of warmth towards their children during the

early childhood period. Thus, results from the current study do not support the concern raised from some previous studies that suggest child HL loss negatively impacts parent-child relationships in immigrant families (Fillmore, 1991; Oh & Fuligni, 2010; Tannenbaum & Howie, 2002). Inferring causality from cross-sectional associations or relying on self-report measurements to assess HL proficiency and family climate may have limited these studies. It is also possible that the relationship between HL proficiency and family climate differs in early childhood and adolescence. Our results support the notion that differential language acculturation need not result in poor parent-child relations (Usita & Blieszner, 2002). It appears that immigrant families with young children may be resilient to disruption of parent-child relationship quality during the course of dissonant language acculturation. Language dissonant parent-child dyads may adapt by sharing intimacy in ways that are less dependent on shared language fluency. For example, children and parents may develop feelings of closeness through non-verbal displays of support and caring as parents continue to show the same degree of warmth regardless of children's HL loss.

In interpreting our results, it is important to keep in mind that immigrant families should not be considered deficient when children show attrition in HL. Rather, bilingualism may be construed as an enrichment opportunity not readily available in most non-immigrant or monolingual homes. Accordingly, immigrant parents who do not provide sustained HL support may be making a rationale choice for their family based on relational or educational goals.

There are limitations of this study that need to be addressed to inform future research. First, expanded measures of positive family climate are warranted as this study largely examined verbal and physical affection in observed interactions which may not encompass the features of warm interactions in Chinese immigrant families. These cultural issues may have contributed to

the relatively low inter-rater reliability on observed warmth within our team of bilingual coders who had varying levels of Chinese cultural orientation. Furthermore, future studies should examine how negative family climate may be transactionally related to children's HL development. Second, our measure of HL proficiency was a Chinese translation of a measure developed to assess English expressive language. Although we adapted it to address expressive language abilities in Chinese (e.g., Chinese grammatical constructions) and showed convergence with other measures of language ability and use, representative normative data are not available. Third, since the study used more time-consuming objective measurements to assess HL proficiency and family climate, the sample size obtained was relatively small compared to previous survey studies. Fourth, our focus on Chinese immigrant families residing in relatively ethnically dense communities may limit the generalizability of our findings.

Future studies should investigate the role of immigrant communities and neighborhood factors that may support and enrich children's HL learning. Interestingly in the current study, families speaking Cantonese as the HL had lower child HL proficiency and lower parent reported cultural maintenance values compared to families speaking Mandarin. It is possible that this may be related to the Cantonese language being a minority language within the Chinese American community under study. Immigrant families who speak minority dialects or variants of HL may be more prone to discontinue HL practices thus yielding higher risk of HL attrition compared to those who speak majority dialects.

This study contributes to the current literature by providing insight about the important factors related to HL development among immigrant families with young children. Despite HL loss that emerges early in life (Oh, Jun, Knightly, & Au, 2003), previous studies have typically focused on adolescent-parent dyads. Findings from the current study provide important guidance

for early parenting, which may have lasting impact on children's HL development. The study also featured some strengths in addressing methodological limitations in previous literature (e.g., cross-sectional design, self-report measures). Family climate was assessed in observed parent-child interactions and children's HL proficiency was measured with performance-based measures. Furthermore, the longitudinal design allowed us to conduct all analyses prospectively and to examine bidirectional processes where results indicated transactional influences of children and parents on each other.

The results demonstrate that immigrant parents can directly support children's HL proficiency and that these parent behaviors are, in part, shaped by children's early language patterns. These transactions suggest that early slippage in children's HL proficiency discourages their parents from providing HL support over time, yet children appear to need this support in order to maintain or develop HL proficiency. This pattern may explain the rapidity of HL loss whereby children of HL dominant immigrant parents may be monolingual English speakers by middle childhood. Early HL loss sets in motion a trajectory of HL loss as parental linguistic supports for language maintenance are shed. As such, immigrant parents who wish to promote children's HL development should provide direct linguistic support in their interaction, beginning in early childhood and re-doubling such efforts when children show declines in HL use, preference, or proficiency. Given the known value and benefits of HL proficiency in the contemporary society (Bankston & Zhou, 1995; Imbens-Bailey, 1996; Kim & Chao, 2009), immigrant parents should be encouraged to persist in scaffolding their children's expressive HL in everyday interactions.

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