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Acculturation Profiles and Psychological Adjustment in Chinese American Adolescents from
Immigrant Families

By

Stephanie Haft

A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy

in

Psychology

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University of California, Berkeley

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Abstract

Acculturation Profiles and Psychological Adjustment in Chinese American Adolescents from
Immigrant Families

by

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Doctor of Philosophy in Psychology

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Acculturation is the process of change and adaptation that occurs as individuals are in contact with a new host culture. As the population of U.S. immigrant youth continues to grow, research on acculturation has become critical in ensuring their health and social integration. Acculturation and developmental processes are inherently intertwined, yet longitudinal research on acculturation is lacking. Studying acculturation longitudinally can contribute to science on the dynamic nature of acculturation, and inform policy, programs, and interventions aimed at supporting immigrant youth's cultural adjustment. Unfortunately, few studies investigate acculturative changes within the same children over time, making it difficult to distinguish between individual variations in acculturation timing (e.g. different points in the same acculturation trajectory) and acculturation approach (e.g. individuals on different pathways of acculturation). In Chinese American youth – one of the largest and fastest growing immigrant subgroups – the study of acculturation is additionally obscured by the “model minority” stereotype (suggesting high integration into U.S. culture) and the “forever foreigner” stereotype (suggesting low integration into U.S. culture). Although connections between acculturation and psychological adjustment in youth have been found, such links are inconsistent in studies of Chinese American immigrant youth, warranting further investigation. Understanding the nature of associations between acculturation and psychological adjustment can help identify risk factors for mental health issues and inform interventions to support positive adjustment in immigrant youth.

To address the methodological and sample limitations of prior acculturation research, this dissertation longitudinally characterizes acculturation using person-centered approaches in Chinese American youth, as well as associations with their concurrent and subsequent psychological adjustment. I investigate both snapshots of cross-sectional acculturation *profiles* at each timepoint (using latent profile analyses), as well as longitudinal *transition* trajectories of how youth move between or stay in different acculturation profiles from one timepoint to another (using latent transition analyses). The study leverages a longitudinal dataset of Chinese American (CA) immigrant youth ($N=258$) collected at three waves when youth were 6-9 years old (early elementary school), 9-11 years old (late elementary school), and 15-18 years old (high school). Youth and parents reported on youth's behavioral acculturation (Chinese and English

language proficiency, Chinese and American friendships) and psychological adjustment (externalizing and internalizing symptoms).

Cross-sectional snapshots of acculturation profiles identified by latent profile analyses at each data wave identified three profiles during early elementary school and late elementary school, and two profiles during high school. The largest and most consistent acculturation profile was a bicultural or *Moderately Integrated* group, which showed relatively moderate and average levels across all acculturation variables (English language, Chinese language, American friends, Chinese friends). Among the cross-sectional profiles, the main sources of variation in acculturation were the levels of American friends during early elementary school and English language during late elementary school and high school. Longitudinal analyses of changes in acculturation profiles (acculturation transition trajectories captured by latent transition analyses) revealed that CA youth, on average, either moved to more integrated (bicultural) profiles or remained in integrated profiles across time. Both cross-sectional acculturation profiles and longitudinal transition trajectories were largely not associated with youth's psychological adjustment with one exception - youth in the *Moderately Integrated* group reported significantly lower concurrent externalizing problems during late elementary school, but significantly greater concurrent externalizing problems during high school compared to youth showing less bicultural profiles.

These results provide several key takeaways for the science of acculturation and efforts to support immigrant youth's cultural adjustment. First, in terms of language and social affiliations, youth were largely bicultural and remained bicultural over time – the largest variation was in their self-perceptions of English language proficiency. This result suggests that interventions targeting immigrant youth may need to be flexible and tailored to the youth's comfort with the English language. Second, there was no evidence for a profile in which youth disengaged from both cultures (often referred to as a marginalized group). There were also few associations between acculturation and adjustment. This lack of findings could be due to the time period examined, the geographic context with a relatively high density of Chinese Americans, or could suggest that acculturation in Chinese Americans varies from that of other groups which are more represented in the acculturation literature. Overall, our results still showed variation in acculturation profiles and acculturation transition trajectories over time, providing support for the conceptualization of acculturation as a dynamic and multidimensional process.

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Introduction

The United States is home to the largest number of immigrants in the world. Although migration is not a new phenomenon, the increasing rates of immigration in the 21st century are historically unprecedented (Motti-Stefanidi et al., 2018). Immigrants and their children will continue to become principal forces in the economy and the social fabric of the U.S. Within this context, ensuring the smooth adaptation of immigrants to their new host country is of considerable importance to clinicians, educators, and policymakers. Upon arrival to the U.S., a key task of all immigrants is balancing the adoption of elements from their new country with retaining aspects of their heritage culture – a process known as *acculturation*. Efforts to understand how immigrants acculturate have primarily been grounded in Berry's model, which suggests four distinct acculturation approaches: *integration* (maintaining heritage culture while adopting the host culture), *assimilation* (disengaging from heritage culture while adopting the host culture), *separation* (maintaining heritage culture while disengaging from the host culture), and *marginalization* (disengaging from both heritage and host cultures; Berry et al., 2006). Berry's model inspired a sizeable increase in research on acculturation over the past few decades (Juang & Syed, 2019), yet empirical support for the four profiles has been inconsistent. Given meaningful differences in immigration histories, language proficiencies, and availability of cultural resources, different cultural groups may adopt unique acculturation approaches in adjusting to the U.S., motivating the need for within-group studies.

Chinese Americans are one of the most rapidly growing racial/ethnic minority groups in the U.S (Budiman et al., 2019). There is a long history of Chinese immigration to the U.S., leading to significant within-group socioeconomic and generational diversity. Acculturation is a relevant process not only for first-generation Chinese Americans but also for their U.S.-born children (second-generation) and grandchildren (third-generation), who are exposed to Chinese culture through their family and community. To date, research on the process of acculturation in Chinese American immigrants has been obscured by two contradictory stereotypes. First, the “forever foreigner” stereotype suggests that Chinese Americans reject American culture; second, the “model minority” image paints a picture whereby Chinese Americans seamlessly integrate into American society (Sue et al., 2009). These stereotypes may lead researchers to oversimplify the acculturation experiences of Chinese Americans and overlook the diversity of acculturation within the community. Characterizing the acculturation of Chinese Americans has also been hampered by general limitations in acculturation research, including a lack of longitudinal studies, an overreliance on proxy measures such as country of birth, and failure to acknowledge the multidimensional nature of acculturation (Kunst, 2021). Overall, it is unclear whether acculturation approaches for Chinese Americans are consistent with those proposed by Berry's original model. Moreover, the absence of longitudinal studies on acculturation in Chinese Americans leaves unanswered questions about whether and how acculturation patterns evolve over different stages of life. Capturing the dynamic nature of acculturation is crucial to inform research efforts on acculturation as well as policies and programs that aim to address the evolving needs of diverse communities over time.

According to the integrative risk and resilience model of immigrant youth, completing acculturative tasks in language and social domains is critical for youths' positive adaptations (Suárez-Orozco et al., 2018). Although some studies suggest the presence of an “immigrant paradox” whereby youth's outcomes worsen with increases in their U.S. cultural orientations (Marks et al., 2014), this literature is mixed and limited by methodological challenges. In extant

meta-analyses on the immigrant paradox in youth, Asian American subgroups have shown patterns opposite of findings based on other racial and ethnic groups (Belhadj Kouider et al., 2015; Sirin et al., 2021; Tilley et al., 2021). These discrepancies highlight that the relation between acculturation and adjustment is not well-understood in Chinese American youth. However, this link is crucial to understand for the success of scholastic and community programs aimed at their successful integration into U.S. society.

The present dissertation addresses the need for a longitudinal, within-group study of acculturation in a sample of Chinese American immigrant youth. Specifically, I examine linguistic and social acculturation across the span of 11 years and three timepoints, featuring both (a) cross-sectional acculturation profiles and (b) longitudinal acculturation transition patterns. In addition, I investigate whether cross-sectional profiles and longitudinal transition patterns of acculturation are associated with adolescents' psychological adjustment.

The Construct of Acculturation

Acculturation as Bilinear and Multidimensional

Acculturation is the process of change and adaptation that occurs as individuals are in contact with a new host culture (Schwartz et al., 2010). Historically, acculturation was conceptualized as a unilinear construct, whereby immigrants shed aspects of their heritage culture as they adopt aspects of the host culture. This “straight line assimilation” model was primarily based on European immigration into the U.S. in the early 20th century (Schwartz et al., 2013). However, this conceptualization shifted with changing immigration patterns and the introduction of Berry's acculturation model in the late 20th century. According to Berry's model, (a) adaptation to the host culture and (b) retention of the heritage culture represent two independent aspects of acculturation (Berry et al., 2006). Crossing these two categories results in four possible profiles of acculturation: (i) integration (adopt host culture and retain heritage culture), (ii) assimilation (adopt host culture and relinquish heritage culture), (iii) separation (reject host culture and retain heritage culture), and (iv) marginalization (nonalignment with either host or heritage culture; Berry et al., 2006). This conceptualization of acculturation is now widely accepted, although empirical support for Berry's proposed four profiles remains equivocal. Several studies using immigrant samples have found fewer or more than four acculturation profiles, and the presence of a “marginalization” group is often small or nonexistent (e.g. Jang et al., 2017; Schwartz et al., 2010, 2020; Yan et al., 2021).

In the past decade, scholars have expanded upon Berry's original model in proposing that acculturation is also multidimensional—that is, it spans several processes (Schwartz et al., 2010). *Behavioral acculturation* includes the adoption or retention of visible cultural practices, such as language and media use, social affiliations, and cultural holidays, customs, and traditions. *Values acculturation* (sometimes called cognitive acculturation) involves changing one's belief system about concepts such as the importance of family, prioritization of the self, or appropriate emotional expression. *Identity-based acculturation* entails one's sense of belonging or attachment to cultural groups. A recent meta-analysis of 255 studies of acculturation found that trajectories of acculturation varied by dimension, such that changes in the behavioral domain proceeded faster than changes in the values and identity domains (Yoon et al., 2020). Furthermore, although greater adoption of the host culture was more advantageous for mental health outcomes in the behavioral domain, retaining heritage culture was more favorably related

to mental health outcomes in the values and identity domains. Taken together, the study of acculturation requires specificity in terms of both the orientation (host or heritage culture) and the domain (behavioral, values, identity).

Acculturation through a Developmental Lens

Acculturation and developmental processes are inherently intertwined. Emerging scholarship views acculturation through a developmental lens based on several principles (Bornstein, 2017; Juang & Syed, 2019; Schwartz et al., 2020). First, acculturation encompasses multiple dimensions of development, including cognitive, psychological, and cultural identity development, which evolve in response to changing cultural contexts. Second, acculturation is influenced by individual characteristics, social contexts, and broader societal factors, with interactions among these factors shaping both acculturation and developmental processes. At times, these processes overlap – for example, the integrative risk and resilience (IRR) model of immigrant youth development proposes that the completion of developmental tasks such as language proficiency often depends on acculturative tasks as a resource, and vice versa (Suárez-Orozco et al., 2018). Finally, a key takeaway of the overlap between acculturation and development is that acculturation is a process of change that occurs over time. Just like a developmental process, acculturation unfolds over the lifespan and can operate differently depending on the timescale (e.g. weeks, months, years) and developmental stage (childhood, adolescence, adulthood; Schwartz et al., 2020). Cross-sectional research on acculturation is therefore limited in disentangling individual differences in timing (e.g. individuals at different stages in the same acculturative trajectory) and approach (e.g. individuals with different acculturative strategies; Schwartz et al., 2020). Therefore, longitudinal studies are necessary to account for the full complexity of acculturation.

Measurement of Acculturation

Measures of acculturation have become more sophisticated over time, reflecting advances in theoretical models of immigrant adjustment. Early epidemiological studies of acculturation often employed proxy measures such as years spent in the U.S. and birth country (e.g. Marmot & Syme, 1976; Ortega et al., 2000). Over the past two decades, the use of these metrics has become less common, since they cannot capture the meaningful within-group heterogeneity that is of interest to acculturation researchers (Juang & Syed, 2019). Instead, the use of psychometrically validated self-report questionnaires to provide multidimensional and continuous scores of acculturation has grown in popularity (Yoon et al., 2013). After the introduction of Berry's four categories of acculturation, many studies began to employ median splits to create 2 x 2 classifications from these acculturation scales (Schwartz & Zamboanga, 2008). However, this approach has been criticized, as it presupposes the existence of Berry's four acculturation profiles for all immigrant groups, and uses arbitrary cut points that are likely to differ across studies (Schwartz et al., 2010). Moreover, most of this research was cross-sectional, which provides an incomplete picture of the dynamic process of acculturation. More recently, the field has recognized longitudinal, person-centered approaches as optimal for studying acculturation (Schwartz et al., 2010). These approaches (e.g., latent profile analysis and latent transition analyses) have allowed researchers to investigate sample-specific patterns of acculturation across multiple domains.

Acculturation in Chinese American Immigrants

Behavioral Acculturation of Chinese American Immigrant Families

There are several characteristics of Chinese American immigrants that may translate into unique acculturation profiles, particularly in the behavioral domain. First, Chinese American immigrants tend to settle in urban, ethnic enclaves (“Chinatowns”; Wu, 2015). This pattern has roots in the passing of the Chinese Exclusion Act of 1882, in which the formation of Chinatowns were necessary for Chinese immigrants to find housing and work. Today, research shows that even Chinese American immigrants without socioeconomic need tend to choose to reside among other Chinese Americans (Walton, 2015). These strong communities may increase the availability of social affiliations with other Chinese immigrants, while reducing the pressure to form relationships with American individuals (Zhou & Kim, 2006).

As well, the Chinese language is notably complex (Hu et al., 2014). When comparing immigrant groups, the attrition of language proficiency is steeper in Chinese American youth than in youth from other language groups (Alba & Org, 2004; G. Jia, 2008b; Zhang & Slaughter-Defoe, 2009). In addition, studies show that Chinese immigrant parents believe that bilingualism will confer future employment advantages and opportunities (Leung & Uchikoshi, 2012b; Smith & Li, 2020); thus, they often encourage English proficiency in their children. Because youth from linguistic minority families typically learn English faster than adults, they may feel more pressured to acquire English proficiency in order to translate for their parents (e.g. language brokering; Shen et al., 2019). Therefore, Chinese American immigrants (and especially youth) may show greater American orientation and lower Chinese orientation over time when language is the metric of acculturation.

Chinese American immigrants are simultaneously (and paradoxically) cast as “forever foreigners” with a low desire to integrate, as well as “model minorities” who represent successful assimilation into America. These stereotypes contribute to significant discrimination directed at Chinese Americans from the mainstream society (Kim et al., 2011). Some research suggests that Chinese American immigrants may adopt elements of American culture as a way to disprove these stereotypes (e.g. English language and media; Pyke & Dang, 2003; Wang et al., 2019). However, other research has suggested that increased perceptions of discrimination are related to greater retention of same-culture relationships as a protective mechanism (Berry et al., 2006). Overall, the unique stereotypes experienced by Chinese American immigrants may fuel the adoption of certain acculturation strategies that vary by behavioral domain (e.g., increasing English language and American media use while retaining Chinese social relationships).

Developmental and Generation Differences in Acculturation

Individuals within the same immigrant family may vary in their orientation to host and heritage cultures. Indeed, the discrepancy between parent and child acculturation (“acculturation gaps”) has been the subject of accumulating research, especially in Chinese American immigrant families (see Kim et al., 2020). In general, findings in Chinese American immigrant samples and other cultural groups show that immigrant youth are more likely than their parents to belong to bicultural (“integrated”) acculturation profiles (Schwartz et al., 2020). Second- or third-generation immigrant youth have experience in navigating between two cultures from a young

age and have more exposure to the host culture through school and peer networks (Schwartz et al., 2010).

Still, trajectories of acculturation may be influenced by developmental period at immigration as well as the length of host-culture exposure. In transitioning from childhood to adolescence, youth are increasingly more biologically and socially sensitive to their environment (Blakemore & Mills, 2014). This results in a variety of behavioral and identity changes in adolescents generally, and could therefore result in faster changes in cultural orientations for immigrant youth. There is indeed evidence for a “sensitive period” of acculturation, whereby duration of host culture exposure was related to identification with the host culture only for individuals who immigrated before age 16 in one study (Cheung et al., 2011). In a separate study of Chinese American college students, those who immigrated before age 12 perceived themselves to be more strongly American compared to those who immigrated after age 12 (Tsai et al., 2000). These patterns may be partially associated with the maturational constraints imposed by the ability to acquire a second language, which weakens with age (Cheung et al., 2011). Younger youth who are more easily able to acquire the host country language have more capacity to participate in the host country culture, accelerating their acculturation trajectories.

Cross-sectional Profiles of Acculturation in Chinese American Immigrants

Immigrant Adolescents and Young Adults. Several studies have used person-centered approaches to test for the presence of Berry’s four acculturation profiles in Asian American and Chinese immigrant samples (Table 1). Of these, one focused on an adolescent sample and two focused on college student samples. Three profiles of acculturation (bicultural, more American, and more Chinese) were identified in a sample of Chinese American adolescents using behavioral and values indicators of acculturation (Weaver & Kim, 2008). The largest class in this sample was “more American,” which comprised mostly English monolingual adolescents, followed by “bicultural” and then “more Chinese,” which represented bilingual adolescents. A study of Asian American college students (30.4% Chinese) examined Asian and American cultural values, and found three distinct acculturation profiles: integrated, separated, and assimilated (Suh et al., 2020). A separate study of Chinese Canadian college students used multiple indicators of acculturation. Cluster analyses identified five acculturation groups, three of which (integrated, separated, assimilated) aligned with Berry’s four-fold model (Chia & Costigan, 2006). However, the other two groups showed differentiation depending on domain. The fourth group had strong Chinese identity and values, but not behavioral practices – this group’s language profile was English dominant. The fifth group had low Chinese identity and values but strong Chinese behavioral practices, and were primarily Chinese dominant. Overall, these studies of Chinese immigrant adolescents and young adults supported the presence of three of Berry’s proposed four profiles (except for marginalization). The integrated or moderately integrated subgroup acculturation profiles were the most predominant across studies, reflecting that Chinese immigrant youth are largely bicultural.

Immigrant Adults. Of the five studies using person-centered approaches in Asian American or Chinese immigrant adult samples, three studies involved parent samples, who are in unique positions as agents of cultural socialization for their children. Three profiles of acculturation were identified in a sample of Chinese American mothers and fathers (bicultural, more American, and more Chinese) using behavioral and values indicators of acculturation

(Weaver & Kim, 2008). A study of Asian American (24.5% Chinese) adults using a composite of seven acculturation indicators also found two profiles that aligned with Berry's conceptualization: fully bicultural (integration), and alienated from host culture (separation; Jang et al., 2017). However, this study identified two additional profiles – a moderately bicultural (a subgroup of integration) profile, and a profile characterized as being alienated from heritage culture. A study of Chinese American immigrant mothers also found a subgroup of the integration profile (“psychologically-behaviorally undifferentiated”), which was composed of individuals with relatively modest endorsement of both Chinese and American behaviors and values (Tahseen & Cheah, 2012). The other three acculturation profiles aligned with Berry's integrated, assimilated, and separated profiles. Consistent is the presence of a bicultural (integrated) profile. Across all four studies, none found support for Berry's marginalization profile of acculturation, suggesting that rejection of both American and Chinese culture is not common for Chinese American immigrant adults.

A separate study of first-generation Chinese American mothers also examined both behavioral and psychological acculturation, demonstrating the independence of these domains (Ren et al., 2021). The results from latent profile analysis revealed four acculturation profiles: Behaviorally-Undifferentiated/Psychologically-Assimilated, Behaviorally-Marginalized/Psychologically-Separated, Behaviorally-Psychologically Assimilated, and Behaviorally-Integrated, Psychologically-Undifferentiated. Taken together, these studies suggest that Chinese American immigrant adults can display independent patterns of acculturation in behavioral and psychological (values, identity) domains.

In further breaking down the behavioral domain, an epidemiologic survey of Asian American adults (23% Chinese) constructed acculturation profiles specifically using language ability and preference, as well as social engagement and cultural identification (Salas-Wright et al., 2015). Latent profile analysis identified five acculturation classes, three of which were consistent with Berry's conceptualization (integrated, separated, assimilated), and one of which was a subgroup of the integrated profile (“partial bilingual/bicultural”). The fifth class (“English dominant/Asian oriented”) was categorically distinct in containing individuals with strong Asian identities and social affiliations yet greater preference and use of the English language. This study demonstrated that even within the behavioral domain, adults may adopt some behaviors from the host culture (e.g., language) while more strongly retaining others from their heritage culture (e.g., social relationships).

Overall, person-centered approaches to study acculturation in Asian American and Chinese immigrant samples have varied in terms of the constructs used to indicate acculturation as well as the number of acculturation profiles identified. However, consistent across almost all studies was the absence of a marginalization profile. Furthermore, several studies found a subgroup of the integration profile with individuals who only moderately endorsed elements from both cultures (Jang et al., 2017; Ren et al., 2021; Salas-Wright et al., 2015; Tahseen & Cheah, 2012).

Longitudinal Profiles of Acculturation

The lack of studies that capture longitudinal changes in cultural orientations has been noted as one of the “greatest methodological concerns” in the acculturation literature (Meca & Schwartz, 2020, p. 9). Acculturative changes may be especially rapid during the transition from childhood to adolescence. Adolescence is a time of hormonal changes, acquisition of formal-

abstract reasoning, and sensitivity to social context due to changes in brain networks involved in social cognition (Blakemore & Mills, 2014). A key developmental task of adolescence is identity formation, which for immigrant youth involves reconciling perceived contradictions between host and heritage culture identification to achieve a coherent sense of self (Guerrero & Tinkler, 2010). This identity formation and reconciliation process may co-occur or intersect with immigrant youths' acculturation. Moreover, identity formation is theorized to involve "separation-individuation" from parents, in which adolescents differentiate themselves from their parents and parent-child relationships become more egalitarian (Koepke & Denissen, 2012). Because parents are primary sources of heritage culture socialization for immigrant youth, this process may result in a distancing from heritage culture.

Adolescence is also a key developmental period for friendship formation as well as heightened sensitivity to peer evaluation (Blakemore & Mills, 2014). More salient interactions with peers increases exposure to the host culture for immigrant adolescents. Stronger peer influence may lead some immigrant youth to incorporate more elements of the host culture into their lives with the goal of relating to peers. Overall, these key developmental tasks of adolescence – identity formation, parent separation-individuation, and friendship formation – can be related to or intersect with changes in behavioral acculturation, with youth becoming more bicultural or more oriented to the host culture.

There are several studies that investigate transition patterns in acculturation profiles over time in Mexican-heritage and Hispanic adolescents (Lee et al., 2020; Matsunaga et al., 2010; Yan et al., 2021). These studies have used person-centered approaches both to classify acculturation profiles at different timepoints (e.g., latent profile analyses), and to understand longitudinal stability and change in these profiles (e.g., latent transition analyses). The identification of specific acculturation transition profiles categorizes youth's possible movements from one acculturation profile to another over time (e.g. from a separated profile to a bicultural profile), or a pattern of remaining in the same acculturation profile over time (e.g. integrated profile across all timepoints).

First, a study of first- and second-generation Mexican American adolescents from fifth to seventh grade showed that most acculturation profiles remained stable over the study period. However, an increase in ethnic (heritage culture) identity exploration was observed over time, reflecting the developmental process of identity formation (Matsunaga et al., 2010). Second, a five year study of Mexican American adolescents also found that most youths stayed in the same acculturation profile or became more bicultural over time (Yan et al., 2021). Third, over the span of three years in a separate study of recent-immigrant Hispanic adolescents, mostly stable acculturation transition patterns were similarly observed (Lee et al., 2020). For youth who did change acculturation profiles, most became more bicultural in cultural practices, but less bicultural in their cultural identities and values. The authors speculated that these youth had more concrete guidance from parents, peers, and schools in terms of host and heritage cultural practices but received less support in navigating internal identities and beliefs. Overall, across the three studies, findings showed that although some immigrant youth changed acculturation profiles over time ("mover" transition profile), most often to a more bicultural profile, adolescents more commonly displayed stable acculturation profiles across timepoints ("stayer" transition profile).

To date, no longitudinal studies examine longitudinal acculturation *transition* profiles in Chinese American immigrants. Extant findings from the three studies on acculturation transition patterns in Mexican-heritage and Hispanic adolescents may not generalize to Chinese American

samples. Differences in language, history in the U.S., cultural community prevalence, skin tone, and global events can result in variability in immigration experiences and subsequent differences in longitudinal acculturation trajectories (Meca & Schwartz, 2020). Moreover, the length of time examined in the three studies cited above was relatively narrow, spanning 18 months (Matsunaga et al., 2010), 3 years (Lee et al., 2020), and 5 years (Yan et al., 2021). Examining a longer time span of acculturation profiles may reveal more movement in acculturation profiles as individuals age. Investigating longitudinal profiles of acculturation in Chinese American immigrant youth is crucial in more accurately revealing the dynamic process of acculturation, as well as rendering the study of acculturation more consistent with principles of developmental science.

Acculturation and Adjustment Outcomes

The developmental period of adolescence is hallmarked by hormonal and social changes that can confer vulnerability to the onset of mental health problems (Blakemore & Mills, 2014). Immigrant youth must additionally navigate the changes associated with acculturation. The acculturative process may result in stressful circumstances that can exacerbate mental health challenges, or could confer protection against maladjustment. Efforts to understand mental health and psychological adjustment outcomes in immigrant youth have therefore focused on acculturation as a key predictor (Suárez-Orozco et al., 2018).

The Immigrant Paradox in Children and Adolescents

Studies examining links between acculturation and adjustment outcomes are often framed as testing the *immigrant paradox*, the idea that as immigrant youth become more oriented to U.S. culture, their socioemotional adjustment worsens (Marks et al., 2014). The prevailing explanation is that stressors associated with the acculturative process (e.g., discrimination, language barriers) function as key mediators between acculturation and outcomes. Empirical support for the immigrant paradox in children and adolescents is mixed, and depends on methodological factors (Belhadj Kouider et al., 2015; Marks et al., 2014; Tilley et al., 2021).

First, patterns vary by the specific adjustment outcome examined. For example, a recent meta-analysis of studies testing the immigrant paradox in youth in the U.S. showed that foreign-born youth showed significantly *fewer* externalizing problems compared to U.S.-born youth ($g = -.06$), but foreign-born youth reported significantly *greater* internalizing problems ($g = .06$). The authors of the meta-analysis proposed that although internalizing problems may be greater in newcomer immigrant youth given experiences of social marginalization, externalizing problems may emerge as youth acculturate and come into greater contact with “deviant native-born peers” (Tilley et al., 2021, p. 503).

Second, even across the same construct and within the same sample, findings testing the immigrant paradox vary by reporter. Differences in the directionality of findings have been observed depending on whether adjustment is measured by teacher or parent in a sample of immigrant kindergarteners (Turney & Kao, 2012), or by self-report of symptoms compared to clinical interview in a sample of Asian American adults (John et al., 2012). These findings reflect that adjustment measurement tools may be culturally biased, and that behavior can depend on cultural context.

Third, the presence of a link between greater acculturation and worse developmental outcomes depends on how acculturation is measured. Evidence supporting the immigrant paradox in children and adolescents is stronger when using cross-generation comparisons (e.g. foreign-born vs. U.S.-born; Marks et al., 2014). This approach is commonly used in meta-analytic reviews of the immigrant paradox in youth (Belhadj Kouider et al., 2015; Dimitrova et al., 2016; Sirin et al., 2021; Tilley et al., 2021). Yet by equating generation status with acculturation, and assuming “acculturated” means “more American,” this method misrepresents the acculturative process. Instead, longitudinal studies that examine bilinear acculturative changes *within the same children* over time and investigate links to adjustment outcomes would be a more accurate portrayal of acculturation.

Acculturation and Adjustment in Chinese American Immigrant Youth

Broader findings on the immigrant paradox in youth have not generalized to Asian American or Chinese American samples. For example, in the meta-analysis reporting significantly greater externalizing problems in U.S.-born compared to foreign-born youth ($g=.06$), subgroup analyses of only Asian American immigrant youth found the opposite pattern ($g=-.06$; Tilley et al., 2021). A separate meta-analysis found an overall significant detrimental effect of acculturation on alcohol use in 43 studies of immigrant youth, but this association was nonsignificant when examining only studies on Asian origin youth (Sirin et al., 2021). Finally, a meta-analytic review of emotional and behavioral problems in North American immigrant youth found no overall differences between foreign-born and native children, with one exception: “almost all studies comparing different ethnic groups showed a higher prevalence rate in mental disorders in Asian migrant children” (Belhadj Kouider et al., 2015, p. 1254). Thus, these reviews motivate the need for more within-group studies on Chinese American immigrant youth.

The integrative risk and resilience (IRR) model outlines several acculturative tasks for positive immigrant youth development, including acquiring the host country language, maintaining the home culture, developing social belonging, and bridging the two cultures (Suárez-Orozco et al., 2018). Successful completion of these tasks enables immigrant youth to develop positive identities, affords more access to social resources, and reduces psychological stress associated with assimilation and heritage culture suppression. To date, research on Chinese American immigrant youth generally supports the IRR model by showing that greater Chinese and American orientations are often associated with better adjustment. Greater Chinese cultural orientations (measured by composite self-report scale) were associated with fewer depressive symptoms in a study of Chinese American adolescents (Juang & Cookston, 2009). Specific domains of acculturation, including Chinese media use (S. H. Chen et al., 2013) and Chinese language proficiency (Liu et al., 2009), have also been associated with better socioemotional adjustment in Chinese American youth. Greater American cultural orientations have shown associations with increased social competence (S. H. Chen et al., 2013) and decreased delinquent behaviors (Deng et al., 2010) in Chinese American children. Greater English language proficiency in particular has been linked to more prosocial behaviors and fewer externalizing symptoms in Chinese American preschoolers (Chung et al., 2019). Studies that used person-centered approaches to examine adjustment and acculturation profiles have shown that Asian Americans belonging to bicultural profiles report the best mental health (Jang et al., 2017), whereas Chinese Americans belonging to separated profiles have the worst psychological outcomes (Ren et al., 2021; Tahseen & Cheah, 2012). Yet these studies were all conducted with

adult samples. Using person-centered approaches that simultaneously consider both American and Chinese cultural orientations is important in obtaining a more holistic picture of Chinese American immigrant youth adjustment.

Although no studies have used longitudinal, person-centered approaches to examine acculturation in Chinese American youth, a study with Mexican American adolescents found associations between acculturation transition profiles and academic and socioemotional adjustment (Yan et al., 2021). Specifically, adolescents in the “stable integrated” profile (remained highly bicultural over 5 years) showed the highest levels of academic competence and socioemotional well-being. Adolescents in the “progressive” profile (characterized by moving to an integrated profile) showed the second most positive adjustment, while those in the “regressive” profile (either becoming “less American” or “less Mexican”) had the lowest levels of adjustment. Although caution should be used when generalizing these results to Chinese American youth, the findings suggest a general pattern whereby greater behavioral participation in both cultures maintained over time promotes the most adaptive outcomes.

The Present Study and Hypotheses

Although the U.S. continues to become a more multicultural society, research on acculturation in immigrant families has been limited by the use of proxy measures such as country of birth and the lack of longitudinal studies. Research on acculturation in Chinese American immigrant families, whose linguistic and historical circumstances are different from other immigrant groups, is particularly needed. The proposed study seeks to examine acculturation across 11 years in a sample of Chinese immigrant youth when they were 6-9 years old (Wave 1, early to middle childhood), 9-11 years old (Wave 2, middle childhood/preadolescence), and 15-18 years old (Wave 3, late adolescence). Specifically, the first aim is to identify cross-sectional latent profiles of acculturation in the behavioral domain (social relationships and language) in Chinese American immigrant parents and youth. I focus on the behavioral domain given evidence that acculturative changes proceed faster in this domain, rendering it more suitable to study longitudinal change (Yoon et al., 2020). In addition, social relationships and language are common key targets for interventions designed for immigrant youth, making it pertinent to understand changes in these areas over time (Gast et al., 2017; Motti-Stefanidi & Salmela-Aro, 2018). The second aim is to use latent transition analysis to classify longitudinal transition patterns of acculturation. The third aim is to investigate associations between cross-sectional and longitudinal acculturation profiles and adjustment outcomes (externalizing symptoms and internalizing symptoms). Overall, the proposed dissertation seeks to advance the acculturation literature with a more developmental perspective on acculturation, as well as inform programs, schools, and counselors that focus on promoting positive adjustment in immigrant youth.

Hypothesis 1: Cross-sectional Acculturation Profiles

In the sample Chinese American immigrant youth, I expect that latent profile analysis will identify five acculturation profiles: 1. Integrated, 2. Moderately integrated, 3. Integrated without Chinese language, 4. Separated, 5. Assimilated. This hypothesis is based on the acculturation profiles identified in prior literature as well as patterns of bilingual language proficiency in studies with Asian American or Chinese immigrant samples (Chia & Costigan,

2006; Jang et al., 2017; Ren et al., 2021; Salas-Wright et al., 2015; Suh et al., 2020; Tahseen & Cheah, 2012; Weaver & Kim, 2008).

Hypothesis 2: Longitudinal Acculturation Transition Profiles

Informed by prior studies of acculturation transition profiles in Mexican-heritage and Hispanic adolescents (Lee et al., 2020; Matsunaga et al., 2010; Yan et al., 2021), I hypothesize that four acculturation transition profiles will be identified: 1. Stable integrated, 2. Stable moderately integrated, 3. Increasing integration (trending towards more integrated), and 4. Decreasing integration (trending towards less integrated).

Hypothesis 3: Acculturation Profiles and Youth Psychological Adjustment

I hypothesize that youth belonging to more bicultural (or integrated) acculturation profiles as well as those with stable integrated transition profiles will have the fewest externalizing and internalizing symptoms in comparison to other profiles. These associations are supported by theoretical models of immigrant youth development (Suárez-Orozco et al., 2018) as well as empirical studies linking biculturalism to psychological benefits (Nguyen & Benet-Martínez, 2013).

Method

Participants

This analysis uses a three-wave, longitudinal archival dataset from a larger project on the socioemotional and academic adjustment of children from Chinese American immigrant families, collected from December 2007-December 2018. Participants are from a community-based sample of Chinese American immigrant parents and their children residing in the San Francisco Bay Area. The sample was recruited from recruitment fairs and flyers distributed in Asian American communities, from community organizations, and elementary schools. To be eligible for the study, families had to: (a) have a child of the target age (6-9 years) who was first- or second-generation Chinese American, (b) have both parents identify as Chinese American, (c) have the mother of the participating child be a biological parent, and (d) have one parent with reading literacy in either Chinese or English. The first wave included 258 children aged 6 to 9 years (48% girls; 24% foreign-born and immigrated to the U.S. as a child, 76% U.S.-born with at least one foreign-born parent) and their parents. The sample was socioeconomically diverse (57% of children eligible for free or reduced lunch, annual per capita income ranged from \$625 to \$50,000). The second wave included 239 of these children now aged 9 to 11 years ($M=9.20$, $SD=0.73$, 48.1% female), and the third wave included 164 of the original sample—now adolescents 15-18 years ($M=16.69$, $SD=0.61$, 52.5% female). Table 2 displays the demographic characteristics of the sample at Wave 1.

Procedure

Study procedures included an in-home or laboratory visit with a child interview (including questionnaires and neuropsychological assessments), parent interview, parent-child interaction tasks, and teacher questionnaires sent by mail. The proposed dissertation uses only questionnaire data. At the first and second waves, questionnaire data were obtained from laboratory interviews with parents conducted by trained bilingual research assistants in the participant's language of choice (English, Cantonese, Mandarin). Parents who could not complete the interview in the lab received a mailed packet of questionnaires, which they could complete on their own and mail back. At the third wave, after confirming eligibility and interest, families received a mailed parent letter, questionnaire packet, and return envelope. At Wave 3, youth received a separate assent and questionnaire to mail back. Parents and youth had the option to complete questionnaires electronically (by Qualtrics) if they preferred. Families were compensated for questionnaire completion with monetary incentives (cash and gift cards). All study procedures were approved by the UC Berkeley Committee for the Protection of Human Subjects (CPHS # 2010-11-2570).

Measures

Demographics (Waves 1, 2, and 3)

An adapted version of the Family Demographics and Migration History Questionnaire (Roosa et al., 2008) included questions on demographic variables such as immigration history and family socioeconomic characteristics. Because this questionnaire was originally used in a study of Mexican American families, questions were modified to be appropriate for the Chinese ethnicity, and were translated into Chinese following recommended procedures (Kim et al., 2009).

Cultural Orientations (Waves 1, 2, and 3)

Parents reported their child's (31 items) orientations towards American and Chinese culture using the Cultural and Social Acculturation Scale (CSAS; X Chen & Lee, 1996; X. Chen & Tse, 2010) at the first wave. At the second and third waves, children reported on their own cultural orientations. The CSAS measures cultural orientations using items asking about three behavioral domains: (a) language proficiency (8 items; "How well do you/does your child speak Cantonese/Mandarin/English?"), (b) media use (10 items; "How often do you/does your child watch Chinese/English TV?"), and (c) social relationships (6 items; "How many Chinese/American friends do you have?"). These three domains are assessed in both Chinese and English, resulting in six total subscales.

Before computing cultural orientation subscale scores, the six-factor model of cultural orientations (Chinese language, English language, Chinese media, English media, Chinese friends, American friends) was tested. Although at Wave 1 this six-factor model of cultural orientations was confirmed, at Waves 2 and Waves 3 exploratory factor analyses suggested a four-factor solution. Items evaluating media use showed low loadings (< 0.4) and so were dropped from subsequent analyses. Confirmatory factor analyses (CFA) showed that at all waves, a four-factor model (Chinese language, English language, Chinese friends, American friends) fit the data well according to Hu and Bentler's (1999) criteria (CFI > .95, SRMR < .08,

RMSEA < .06). Therefore, at each wave, items on the CSAS were standardized and four subscales were computed evaluating Chinese language, English language, Chinese friends, and American friends.

After imputing missing data for Waves 2 and 3, the omega reliabilities for Chinese language (4 items) were adequate at Wave 1 (0.95), Wave 2 (0.90), and Wave 3 (0.94). The omega reliabilities for English language (4 items) were adequate at Wave 1 (0.94), Wave 2 (0.78), and Wave 3 (0.85). The omega reliabilities for Chinese friends (3 items) were adequate at Wave 1 (0.74), Wave 2 (0.63), and Wave 3 (0.61). The omega reliabilities for American friends (3 items) were adequate at Wave 1 (0.80), Wave 2 (0.67), and Wave 3 (0.67).

Externalizing and Internalizing Symptoms (Waves 2 and 3)

Both parents and youth reported on youth's externalizing and internalizing symptoms. Based on past confirmatory factor analyses of data from the first and second waves (Gys et al., 2024), the data are best represented by examining parent and child reports separately. Given that acculturation relates to internalizing and externalizing differently across several studies (Tilley et al., 2021), I examine these constructs separately. Therefore, youth adjustment is measured by four separate subscales: parent-reported externalizing symptoms, parent-reported internalizing symptoms, youth-reported externalizing symptoms, and youth-reported internalizing symptoms. At Wave 2, parent and youth reports on youth adjustment were not significantly correlated ($r_{\text{internalizing}}=0.08$, $p_{\text{internalizing}}=0.22$; $r_{\text{externalizing}}=0.10$, $p_{\text{externalizing}}=0.11$). At Wave 3, parent and youth reports on youth adjustment were significantly correlated ($r_{\text{internalizing}}=0.28$, $p_{\text{internalizing}}<0.001$; $r_{\text{externalizing}}=0.29$, $p_{\text{externalizing}}<0.001$).

Parent Report. Parents rated their child's externalizing (33 items) and internalizing symptoms (31 items) using items from the Child Behavior checklist (CBCL; Achenbach & Rescorla, 2001). Both subscales ask parents to rate whether the proposed item is not true (0), somewhat or sometimes true (1), or very true or often true (2) of their child. Items are summed to create a composite raw score for each subscale. The parent-reported externalizing and internalizing demonstrated adequate internal consistency according to omega reliabilities at Wave 2 (0.90 and 0.83, respectively) and Wave 3 (0.86 and 0.90, respectively).

Youth Report. Youth reported on their own externalizing and internalizing symptoms using the Youth Self-Report scale (YSR; Achenbach & Rescorla, 2001), which contains items that are comparable to the CBCL. The youth-reported externalizing and internalizing demonstrated adequate internal consistency according to omega reliabilities at Wave 2 (0.77 and 0.67, respectively) and Wave 3 (0.83 and 0.89, respectively).

Data Analytic Plan

Analyses for Aim 1: Cross-sectional Acculturation Profiles

Latent profile analyses (LPA) in MPlus 8.0 software using the full information maximum likelihood (FIML) estimation method of handling missing data were used to construct profiles of acculturation. The four youth cultural orientation variables (English language, Chinese language, American social relationships, Chinese social relationships) were submitted as indicator

variables. I sequentially fit LPA models from 1 class to 6 classes, or until models fail to converge. I use five statistical metrics to determine the optimal number of classes (Nylund et al., 2007): (1) the Bayesian Information Criterion (BIC), (2) the Adjusted Bayesian Information Criterion (ABIC), (3) the Vuong-Lo-Mendell-Rubin likelihood ratio test (VLMR), (4) the bootstrap likelihood ratio test (BLRT), and (5) entropy. Better model fit is indicated by lower values of AIC and BIC, significant VLMR and BLRT tests ($p < .05$), and larger entropy values. In addition, I consider principles of parsimony (more than 5% of the sample in each class) and interpretability (theoretical meaning of each profile) when selecting the optimal number of classes (Weller et al., 2020).

Analyses for Aim 2: Longitudinal Acculturation Transition Profiles

To examine transitions in acculturation profiles over time, I conduct latent transition analyses (LTA), an extension of LPA (Nylund et al., 2006). Before conducting the LTA, I examine acculturation profile measurement invariance across time. Specifically, I compare two models using likelihood ratio tests and the AIC statistic: (1) a restricted model that assumes equal profile structures across all timepoints, and (2) a nonconstrained model with no constraints on profile parameters across time. Validity of using the restriction assumption is confirmed if the restricted model fit the data better according to likelihood ratio tests and the AIC statistic. Next, I construct an LTA to examine patterns of transitions between the separate acculturation LPAs over the three timepoints. A higher order latent variable captures each individual's probability of moving from one profile to another between timepoints, and transition acculturation profiles are classified into increasing integration, decreasing integration, or stable integration profiles based on the LPAs.

Analyses for Aim 3: Acculturation Profiles and Youth Psychological Adjustment

Demographic variables that are at least marginally significantly associated with both adjustment outcomes and acculturation profiles are included in initial models as covariates. Analysis of variance (ANOVA) tests compare mean differences in externalizing and internalizing symptoms across cross-sectional and acculturation transition profiles identified in Aims 1 and 2.

Results

Attrition Analyses

Of the 258 children at Wave 1, 239 also provided data on Wave 2 assessments, and 148 on Wave 3 assessments for the main variables included in the present study. Attrition analyses comparing children who completed both Wave 1 and Wave 2 assessment ($n=239$) to those who only completed the Wave 1 assessment ($n=19$) showed no significant differences in demographic variables (child age, child sex, child generation, family income, parental education, parental age, parental years in the U.S.; all $ps > .05$). Participating children in Wave 1 and those who dropped out before Wave 2 also showed no significant differences in Wave 1 cultural orientation variables (Chinese language, Chinese friends, English language, English friends). Attrition analyses also showed no significant differences in demographic variables and cultural orientation

variables when comparing the children who participated in all three assessment waves ($n = 148$) to children who dropped out after Wave 1 or Wave 2 assessment (all $ps >.05$).

Multiple Imputations for Missing Data

Because of participant attrition, data on key cultural orientation and adjustment variables were missing for 7.4% of the sample at Wave 2, and 43.0% of the sample at Wave 3. Data were assumed to be missing completely at random (MCAR) given that attrition analyses showed no significant associations between missingness and demographic or study variables. Multiple imputation by chained equations (MICE) was used to impute missing data – this method is adequate for data that are up to 50% missing and assumed to be MCAR (Graham & Schafer, 1999). Imputations were conducted using the *mice* R package (Van Buuren & Groothuis-Oudshoorn, 2011), which iteratively imputes missing variables based on observed data. Based on recommended guidelines (Azur et al., 2011), the variables included in the imputation process were: (a) Auxiliary demographic variables (child age, child sex, child generation, family income, parental education, parental age, parental years in the U.S), and (b) Cultural orientation and adjustment variables at Wave 1. The continuous variables in the present study were imputed using predictive mean matching with 20 imputations. An examination of separate summary statistics for observed and imputed values suggested no values of concern – the absolute differences in means between observed and imputed values were all less than two standard deviations, and the ratio of variances were all between 0.5 and 2.0 (Stuart et al., 2008).

Cross-sectional Acculturation Profiles

Results from latent profile analyses are displayed in Table 3. Separate latent profiles were constructed for youth acculturation at the three separate waves. Comparisons of fit indices across models specifying 2-6 classes suggested that a three-class solution was optimal at Wave 1. Specifically, this model demonstrated adequate entropy (0.85), the lowest BIC value, and significant LMR ($p=0.023$) and LRT ($p=0.0199$) values. Although a five-class solution showed higher entropy and a lower AIC value, this model contained a class composed of an inadequate proportion (3.9%) of the sample. At Wave 2, a three-class solution also emerged as the optimal solution based on comparatively lower BIC and AIC values, significant LMR (0.041) and LRT (0.036) values, and adequate entropy (0.79). At Wave 3, a two-class solution appeared most suitable, with high entropy (0.96) and significant LMR ($p<.001$) and LRT ($p<.001$) values. Although the three-class solution had lower BIC and AIC values, this model contained a class comprised of an inadequate proportion (3.9%) of the sample.

Inspection of the profiles identified by the LPAs showed that at Wave 1 (three-class solution), the largest class contained individuals with the lowest values for English language, American friends, and Chinese friends, and the highest values for Chinese language – this class was deemed the *Marginalized with Chinese Language* group ($n=170$, 65.9%). The second largest class ($n=66$, 26.4%) had relatively average values for Chinese language and Chinese friends, and comparatively higher yet moderate values for English language and American friends – this class was termed the *Moderately Integrated* group. The third and smallest class had the lowest values for Chinese language, moderate values for Chinese friends, and high values for English language and American friends, and was called the *Assimilated* group ($n=22$, 7.8%).

At Wave 2 (three-class solution), the largest class showed relatively average values for Chinese language and Chinese friends, and comparatively higher yet moderate values for English language and American friends – this class was similar to the second profile that emerged at Wave 1 and was likewise called the *Moderately Integrated* group ($n=150$, 58.3%). The second largest class ($n=57$, 22.0%) showed moderate values for Chinese language, Chinese friends, and American friends, and comparatively lower English language – this class was deemed the *Moderately Integrated with Low English* group. The third and smallest class had low values for Chinese language, Chinese friends, and American friends, and moderately low English language – this class was characterized as *Moderately Marginalized* ($n=50$, 19.7%).

At Wave 3 (two-class solution), the largest class was deemed the *Moderately Integrated* group ($n=208$, 80.6%), which showed a similar profile to the Moderately Integrated groups at Waves 1 and 2 (relatively average Chinese language and Chinese friends, comparatively higher yet moderate values for English language and American friends). The second class ($n=50$, 19.4%) showed a profile deemed *Moderately Integrated with Low English* and was similar to the Wave 2 profile with the same name, with relatively moderate values for Chinese language, Chinese friends, and American friends, and low English language. Scores on cultural orientation variables for the final profiles are displayed in Figure 1.

Longitudinal Acculturation Transition Profiles

Given that the emergent latent profiles across the three timepoints differed in number and type, longitudinal measurement invariance was not assumed for LTA – although measurement invariance can aid in interpretation, it is not a requirement for LTA models (Nylund-Gibson et al., 2022). Table 4 displays the transition probabilities matrix for the latent profiles across the three timepoints. The largest class at Wave 1 – *Marginalized with Chinese Language* – had similar probabilities of transitioning to a *Moderately Marginalized* class (29.8%), a *Moderately Integrated with Low English* class (31.4%) or a *Moderately Integrated* class (38.7%) at Wave 2. Those in the *Assimilated* class at Wave 1 had a 100% probability of being in the *Moderately Integrated* class at Wave 2, and those in the *Moderately Integrated* class had a 95.2% probability of being in the same class at Wave 2. There was a small probability (4.8%) of transitioning from a *Moderately Integrated* to a *Moderately Integrated with Low English* class from Wave 1 to Wave 2.

From Wave 2 to Wave 3, individuals in the *Moderately Integrated* group had a high probability (90.7%) of remaining in the *Moderately Integrated* group. Individuals in the *Moderately Marginalized* group also had a high probability (83.5%) of transitioning to the *Moderately Integrated* group. Those in the *Moderately Integrated with Low English* group at Wave 2 had relatively similar probabilities of either remaining in the *Moderately Integrated with Low English* group at Wave 3 (50.7%) or transitioning to the *Moderately Integrated* group at Wave 3 (49.3%).

To further characterize transition profiles, transitions were classified as *increasing integration*, *decreasing integration*, *stable assimilated*, or *stable separated*, similar to another LTA study of youth acculturation (Yan et al., 2021). The *increasing integration* group included those who changed from a less integrated to a more integrated group – from the *Marginalized with Chinese Language* to the *Moderately Integrated* group, from the *Moderately Marginalized* to either *Moderately Integrated* group, from the *Assimilated* to the *Moderately Integrated* group, or from the *Moderately Integrated with Low English* to the *Moderately Integrated* group. The

decreasing integration group included those who changed from the *Moderately Integrated* to the *Moderately Integrated with Low English* group, or from the *Marginalized with Chinese Language* to the *Moderately Marginalized* group. The *stable integrated* included those who remained in the *Moderately Integrated* group or those who remained in the *Moderately Integrated group with Low Language* over time. As displayed in Table 5, from Wave 1 to Wave 2, the majority of transitions were classified as *increasing integration* (55.0%), followed by *stable integrated* (24.4%), and then *decreasing integration* (20.5%). From Wave 2 to Wave 3, the majority (66.3%) of individuals' transitions were categorized as *stable integrated*, about a quarter (28.3%) were categorized as *increasing integration*, with the rest classified as *decreasing integration* (5.4%).

Acculturation Profiles and Demographic Characteristics

Differences in demographic characteristics between acculturation latent profiles and acculturation latent transition profiles are displayed in Table 6. There were no significant differences in child age, parent age, or child sex between different acculturation profile and transition groups.

Immigration History

When examining variables related to immigration history (child generation, parent years in the U.S.), there were significant differences between groups in child generation according to Fisher's exact test at Wave 1 ($p=.015$). According to post-hoc tests, at Wave 1, the *Moderately Integrated* group was composed of a significantly higher proportion of 2nd generation children (87.7%) than the *Marginalized with Chinese Language* group (70.9%; $p_{adj}=.020$). In addition, at Wave 1, there were significant differences between acculturation profiles in parent years in the U.S. between at least two groups ($F(2,244)=4.543$, $p=.012$). Tukey's post-hoc test for multiple comparisons showed that parent years in the U.S. was significantly greater on average for the *Moderately Integrated* group ($M=13.96$, $SD=7.49$, $N=61$) as compared to the *Marginalized with Chinese Language* ($M=10.81$, $SD=7.26$, $N=166$, $p=.015$). At Wave 2, the *Moderately Integrated* group was composed of a significantly higher proportion of 2nd generation children (82.5%) than the *Moderately Marginalized* group (64.7%; $\chi^2(2)=8.28$, $pairwise p_{adj}=.048$). In transitions from Wave 1 to Wave 2, there were a greater proportion of 2nd generation children among the group that remained in integrated profiles (*stable integrated*; 87.3%) as compared to those whose transitions were categorized as *increasing integration* (70.9%; $pairwise p_{adj}=.042$).

Family Socioeconomic Status

Several group differences also emerged in family socioeconomic characteristics (family per capita income and parental education). Differences were tested using concurrent family per capita income for cross-sectional acculturation profiles, and using the prior wave of per capita income for acculturation transition profiles. Significant group differences emerged in family per capita income for Wave 1 acculturation profiles ($F(2,245)=11.91$, $p<.001$) and Wave 2 acculturation profiles ($F(2,224)=4.151$, $p=.017$). Tukey's post-hoc analyses showed that at Wave 1, the *Marginalized with Chinese Language* group had a significantly lower per capita income on average ($M=10,185$, $SD=7,435$) than both the *Moderately Integrated* group ($M=13,040$,

$SD=8,992$, $pairwise p_{adj}=.043$) and the *Assimilated* group ($M=18,846$, $SD=8,772$, $pairwise p_{adj}<.001$). Youth in the *Assimilated* group also had a significantly higher family per capita income than youth in the *Moderately Integrated* group ($pairwise p_{adj}=.014$). At Wave 2, the *Moderately Integrated* group reported significantly greater per capita income on average ($M=13,225$, $SD=8,522$) than the *Moderately Integrated with Low English* group ($M=9,642$, $SD=7,196$, $pairwise p_{adj}=.028$).

Significant group differences emerged in parental education levels for Wave 1 acculturation profiles ($F(2,250)=10.96$, $p<.001$) and Wave 2 acculturation profiles ($F(2,250)=3.621$, $p=.028$). Tukey's post-hoc analyses showed that at Wave 1, the *Assimilated* group had a significantly greater parental education on average ($M=15.38$, $SD=2.71$) than both the *Moderately Integrated* group ($M=13.64$, $SD=2.86$, $pairwise p_{adj}<.012$) and the *Marginalized with Chinese Language* group ($M=12.89$, $SD=2.17$, $pairwise p_{adj}<.001$). At Wave 2, the *Moderately Integrated* group had significantly greater parental education ($M=13.61$, $SD=2.67$) than the *Moderately Integrated with Low English* group ($M=12.62$, $SD=1.99$, $pairwise p_{adj}=.038$).

Acculturation Profiles and Adjustment

Relevant Covariates

Correlations between adjustment scores and demographic variables (child age, child sex, child generation, per capita income, parental education, parent age, and parent years in the U.S.) were computed to select covariates that were significantly associated with both adjustment variables and acculturation profiles. Among Wave 2 adjustment variables, there was a positive and marginally significant correlation between parent-reported internalizing symptoms and parent age ($r=.13$, $p=.055$), and youth-reported externalizing symptoms were significantly higher in males as compared to females ($p=.0002$). However, there were no acculturation profile differences in parent age and child sex at any wave, so these variables were not included as Wave 2 covariates. Among Wave 3 adjustment variables, youth-reported internalizing symptoms were significantly higher in females than in males ($p=.030$). Greater family per capita income was significantly correlated with greater youth-reported internalizing problems ($r=0.17$, $p=.013$) and externalizing problems ($r=0.13$, $p=.047$). Youth-reported externalizing problems were also significantly and positively correlated with greater parental education ($r=.15$, $p=.018$). However, because there were no differences in child sex, per capita income, or parental education at Wave 2 or in Wave 2 to Wave 3 transition profiles, these variables were not included as covariates.

Concurrent and Longitudinal Wave 2 Adjustment

Figure 2 displays average Wave 2 adjustment scores from parent and child reports by Wave 2 acculturation profiles (Figure 2A) and Wave 1 to 2 acculturation transition profiles (Figure 2B). There were no significant differences between profile or transition profile groups in parent-reported internalizing symptoms, parent-reported externalizing symptoms, or child-reported internalizing symptoms. There was a significant difference in Wave 2 child-reported externalizing symptoms between Wave 2 acculturation profiles ($F(2,235)=4.119$, $p=.018$). Tukey's post-hoc analyses showed that the *Moderately Integrated – Low English* group reported significantly greater concurrent externalizing problems on average ($M=5.04$, $SD=3.23$) as

compared to the *Moderately Integrated* group ($M=3.82$, $SD=2.77$, *pairwise* $p_{adj}=.028$). There was no significant difference in Wave 2 child-reported externalizing symptoms between Wave 1 to Wave 2 acculturation transition profiles.

Concurrent and Longitudinal Wave 3 Adjustment

Figure 2 displays average Wave 3 adjustment scores from parent and child reports by Wave 3 acculturation profiles (Figure 2C) and Wave 2 to 3 acculturation transition profiles (Figure 2D). There were no significant differences between profile or transition profile groups in parent-reported internalizing symptoms, parent-reported externalizing symptoms, or child-reported internalizing symptoms. There was a significant difference in Wave 3 child-reported externalizing symptoms between Wave 3 acculturation profiles ($F(1,245)=5.618$, $p=.019$), whereby youth in the *Moderately Integrated* profile reported greater externalizing problems on average ($M=9.99$, $SD=5.90$) than youth in the *Moderately Integrated – Low English* profile ($M=7.88$, $SD=4.42$). There was no significant difference in Wave 3 child-reported externalizing symptoms between Wave 2 to Wave 3 acculturation transition profiles.

Discussion

Cross-Sectional Acculturation Profiles and Demographic Characteristics

According to Berry's (2006) model, youth would be expected to fall into four profiles of acculturation: integrated, assimilated, separated, and marginalized. However, based on studies showing a lack of a marginalization profile and more nuanced acculturation profiles in Asian American immigrant samples (Chia & Costigan, 2006; Jang et al., 2017; Ren et al., 2021; Salas-Wright et al., 2015; Suh et al., 2020; Tahseen & Cheah, 2012; Weaver & Kim, 2008), I expected to identify five profiles: integrated, assimilated, separated, moderately integrated, and integrated without Chinese language. Results diverged from hypotheses in that only the moderately integrated profile was demonstrated consistently across the three waves. The data supported a three-class solution in early elementary school (6-9 years old; *Marginalized with Chinese Language, Moderately Integrated, and Assimilated*), a three-class solution in late elementary school (9-11 years old; *Moderately Integrated with Low English, Moderately Integrated, and Moderately Marginalized*), and a two-class solution in high school (15-18 years old; *Moderately Integrated and Moderately Integrated with Low English*).

Early Elementary School (6-9 years old)

Entering into formal schooling during early elementary school is a key developmental milestone – for immigrant children, this may represent one of the first significant contacts with American peers and teachers. In this sample when children were 6-9 years old, the level of American friends was the variable that differed the most (at least one standard deviation difference per class). These differences may parallel the significant profile differences in immigration history, as studies suggest that a longer length of residence in a host country is associated with a greater number of interethnic friendships due to greater opportunities for interethnic contact prior to entry into formal schooling (Titzmann, 2014; Titzmann et al., 2007). Differences in American friends may also reflect the significant socioeconomic differences

between profiles, whereby the lower socioeconomic status of children in the *Marginalized with Chinese Language* class translated into differences in interethnic contact. Greater immigrant socioeconomic status is associated with greater interethnic contact in communities and neighborhoods, and this contact can mediate the association between socioeconomic status and interethnic friendships (Damen et al., 2021).

Children in early elementary school must acquire basic language and literacy skills to lay the foundation for future academic achievement. Consequently, at this age, bilingual language acquisition is a key developmental task. Overall, results showed that Chinese language skills were relatively similar across the classes at this timepoint – significant differences had not yet emerged. This could be due to the challenges associated with learning Chinese and the time it takes to master the language, which may be similarly difficult for all children at this age (Hu et al., 2014). The largest proportion of the sample – the *Marginalized with Chinese Language* class – had, on average, the highest Chinese language yet the lowest English language. Children in this group had parents who had immigrated more recently, and therefore may have had limited exposure to English prior to school entry.

Late Elementary School (9-11 years old)

Although early elementary school focuses on acquiring basic language and literacy skills, in late elementary school there is a shift to using these skills to learn other topics. For immigrant children, acquiring academic proficiency in English is therefore a key developmental and acculturative task that is necessary for academic success. Potentially reflecting these demands, at this timepoint the largest class (*Moderately Integrated*) had the highest English scores, whereas in early elementary school the largest class had the lowest English scores on average. Scores on English language were the strongest differentiator of the different acculturation profiles at this timepoint. These differences in English language proficiency may stem from variability in home English exposure (Hammer et al., 2014; Leung & Uchikoshi, 2012a), whereby youth from the *Moderately Integrated with Low English* and *Moderately Marginalized* groups were likely to have received less exposure than the *Moderately Integrated* group. During late elementary school, children also begin to form hierarchical social structures and peer groups – forming peer relationships is therefore a necessary component of achieving social competence for immigrant youth. At this timepoint, the levels of American friends were relatively similar (all within half a standard deviation) across acculturation profiles. At this developmental stage, youth have experienced significant exposure to U.S. culture through formal schooling, including high interethnic contact – therefore, differences in American friendships may be minimal.

High School (15-18 years old)

When youth in our study were 15-18 years old and in high school, the majority (80.6%) were classified into a *Moderately Integrated* profile with the remaining (19.4%) in a *Moderately Integrated with Low English* profile. Unlike prior waves, these two groups did not differ significantly in immigration history or socioeconomic variables. Similar to the same acculturation profiles in late elementary school, the variable that distinguished these two classes was English language proficiency. The disparity in English language proficiency into adolescence may be surprising given research showing that Chinese dual language learners require 4-6 years of English exposure to “catch up” to English monolinguals (Paradis & Jia,

2017). However, other research has shown that whereas dual language learners may achieve full written and conversational English fluency by adolescence, more complex oral language skills such as lexical semantics and grammar can still lag behind that of their monolingual peers (Soto-Corominas et al., 2020). Research has shown that Chinese adolescents in particular may speak English with a nonstandard accent in adolescence (Qin et al., 2008), and are often acutely aware of this “difference” given the salience of social cognition during this developmental time period (Kim et al., 2011). In the present study, adolescents with accents may have rated their spoken English proficiency as lower despite adequacy in other English language areas. Still, in adolescence, youth from the two acculturation profiles did not report large differences in terms of Chinese language, Chinese friends, and American friends.

Summary of Cross-sectional Acculturation Profiles

Findings on cross-sectional acculturation profiles aligned with prior research on acculturation in Asian American samples in several ways. First, a “moderately integrated” profile was found consistently across all three waves. This pattern is similar to other studies demonstrating a less extreme version of Berry’s proposed “integrated” profile (Jang et al., 2017; Ren et al., 2021; Salas-Wright et al., 2015; Tahseen & Cheah, 2012), whereby individuals show relatively moderate and equivalent scores across all heritage and host culture domains. Second, I did not observe a clearcut “marginalized” profile with uniformly low scores across all domains as originally proposed by Berry. This was also the case in extant person-centered studies with Asian American samples (Chia & Costigan, 2006; Jang et al., 2017; Ren et al., 2021; Salas-Wright et al., 2015; Suh et al., 2020; Tahseen & Cheah, 2012; Weaver & Kim, 2008). Instead, I identified a profile that was lower on all domains except for Chinese language at Wave 1 (*Marginalized with Chinese Language*) as well as a profile that was only moderately low across domains at Wave 2 (*Moderately Marginalized*). Taken together with prior research, findings suggest that acculturation profiles are often not as extreme in terms of level or as uniform across domains as Berry’s original model suggests.

Findings extend prior work in examining the childhood developmental period and differentiating language from other acculturation domains. Although American friends were the strongest differentiator of acculturation profiles when youth were 6-9 years old, English language was the biggest discriminator at both 9-11 years and 15-18 years. Language variables did not always align with other acculturation domains, as was demonstrated most clearly in the *Marginalized with Chinese Language* group at Wave 1 and the *Moderately Integrated with Low English* groups at Waves 2 and 3. Although language is often used as a proxy for overall levels of acculturation (S. Lee et al., 2011), findings suggest that this may not accurately reflect acculturation levels in social domains. Compared to other foreign-born populations in the U.S., first-generation Chinese Americans are more likely to have lower English proficiency (Echeverria-Estrada & Batalova, 2020). Lower English proficiency in parents may have translated into lower English proficiency in their children in the *Moderately Integrated with Low English* groups through the home language environment (Hammer et al., 2014). In addition, researchers have found consistent age-related decreases in Chinese language proficiency in Chinese American youths, a language loss occurs at a faster rate compared to other language groups (G. Jia, 2008a; Zhang & Slaughter-Defoe, 2009). Consistent with these findings, across all three waves and acculturation profiles in our sample, Chinese language was relatively moderate or low and did not emerge as a strong differentiator of the acculturation classes.

Finally, there were significant socioeconomic differences between acculturation profiles at the first two timepoints, although these differences were not observed in adolescence. The acculturation profiles with higher orientations to American culture – *Assimilated* and *Moderately Integrated* – had higher per capita income and parental education than other groups. Chinese immigrants with socioeconomic constraints are more likely to live in ethnic enclaves with other Chinese immigrants (Tang et al., 2023; Zhou, 2014), which could reduce the exposure of their children to English language and American friends. Parental educational and financial resources may also influence their degree of engagement with their children’s schooling and therefore the level of interaction with American parents and friends. Using the same sample as the present study, an examination of school-based parent involvement found that lower income was associated with lower parent-reported school involvement (Curtis et al., 2021). A study of Chinese immigrants with young children also found that those with a lower socioeconomic status placed a higher emphasis on family cohesion, which could reflect an effort to construct a positive family environment to offset the stress of financial strain (Yamamoto et al., 2016). In the context of low socioeconomic status, Chinese immigrant youth may therefore have stronger relationships within the family unit rather than with individuals in the host culture.

Longitudinal Acculturation Transition Profiles and Demographic Characteristics

Chinese American youth in our sample followed three of our four hypothesized acculturation transition profiles – increasing integration (trending towards more integrated), decreasing integration (trending towards less integrated), and stable integrated. I did not observe two distinct “stable integrated” and “stable moderately integrated” transition profiles, as this distinction did not emerge at cross-sectional timepoints. The hypothesis that the most common transition profile would be stable integrated was partially supported: It emerged for transitions from late elementary school to high school, but from early elementary school to late elementary school the most common transition was increasing integration.

Early Elementary School to Late Elementary. School (6-9 years to 9-11 years)

From early to late elementary school, most (95.2%) children who belonged to the *Moderately Integrated* profile remained in that profile (*stable integrated*). In addition, all youth who belonged to the *Assimilated* profile transitioned to a *Moderately Integrated* profile by late elementary school. This suggests that once youth adopt an integrated or bicultural acculturation strategy, they are likely to maintain it, as these profiles are generally considered more adaptive for immigrants' adjustment (Nguyen & Benet-Martínez, 2013). Furthermore, youth whose transitions remained stable in the integrated acculturation profiles were more likely to be second-generation immigrants. These youth have more established social networks in the host culture schools and among peers, which could make it easier for them to maintain an integrated acculturation profile (Schwartz et al., 2010).

The majority (65.9%) of children in early elementary school were classified into the *Marginalized with Chinese Language* profile, which was characterized by high Chinese language yet low Chinese friends, English language, and American friends. Children belonging to this acculturation profile were almost equally as likely to transition to a *Moderately Marginalized* profile (29.8%; a *decreasing integration* transition), a *Moderately Integrated – Low English* profile (31.4%), or a *Moderately Integrated* profile (38.7%; both *increasing integration*

transitions). These three profiles differed mainly in their relative level of English language proficiency, suggesting that this is the main variable along which acculturation pathways diverged. Consistent with this pattern of heterogeneity, a recent study of German immigrant adolescents found meaningful individual differences in the speed of host language adoption – termed *acculturation pace* (Aumann et al., 2022). In the present study, differences in trajectories of youth English language proficiency may be related to variability in parent host language proficiency or the youth’s level of participation in American cultural activities (Carhill et al., 2008; F. Jia et al., 2014; Páez, 2009).

The diversity in acculturation pathways aligns with the integrative risk and resilience (IRR) model, which highlights the multifaceted nature of immigrant youth development (Suárez-Orozco et al., 2018). In the current study, as youth progress from early to late elementary school, they not only navigate acculturation processes but also grapple with the developmental task of transitioning to formal schooling. This school transition presents new challenges such as acquiring academic skills, building relationships with teachers and peers, and exercising self-regulation in a more structured environment (Savina, 2021). These unique developmental demands may influence the overall trend of acculturation profiles, with most youth either remaining integrated (24.4%) or becoming more integrated (55.0%). Moderate levels of language proficiency and friendships in both the host and heritage culture may facilitate a smoother transition to schooling.

Late Elementary School to High School (9-11 years to 15-18 years)

From late elementary school to high school, most (66.3%) youth remained stable in integrated profiles. This finding mirrors the results of prior acculturation studies of immigrant adolescents which found that “stayer” (stable) profiles were significantly more common than “mover” profiles (Lee et al., 2020; Matsunaga et al., 2010; Yan et al., 2021). These results also align with research showing that moderately integrated profiles are consistently present across timepoints in longitudinal studies of immigrant samples (Salas-Wright et al., 2015; Schwartz & Zamboanga, 2008; Yan et al., 2021).

Only a small proportion of youth (5.4%) in the study exhibited a *decreasing integration* transition from a *Moderately Integrated* profile to a *Moderately Integrated – Low English* profile. This finding contrasts with a study on Mexican-heritage adolescents, where almost a quarter of the sample showed decreasing integration (“regressive”) transitions (Yan et al., 2021). However, it’s important to note that the previous study assessed acculturation across multiple domains, including behavior, values, and identity, whereas the current study focused solely on behavioral acculturation. It is possible that youth may transition differently in different domains of acculturation due to developmental factors. English use and proficiency likely occurs earlier due to academic necessity, and this serves as a foundation for forming friendships with Americans (Smokowski & Bacallao, 2011). Exposure to heritage culture language and relationships may be more accessible before youth develop more independence from parents in adolescence. However, values and identity domains may fluctuate more into adolescence, when youth are more sensitive to social environments and navigating identity formation (Blakemore & Mills, 2014). In fact, a study of Hispanic adolescents found that profile transitions were mostly increasing integration (“progressive”) in behavioral domains, yet decreasing integration (“regressive”) in identity and values domains (Lee et al., 2020), highlighting the multidimensional nature of acculturation. Therefore, while the present study demonstrates

largely increasing integration and stable acculturation transitions in the sample of Chinese American immigrant youth, patterns may differ if identity or values domains were assessed.

Acculturation Profiles and Adolescent Psychological Adjustment

We hypothesized that youth belonging to more integrated or bicultural profiles, as well as those with stable integrated transition profiles, would exhibit lower levels of internalizing and externalizing problems. However, contrary to these expectations, there were few significant differences in psychological adjustment between the acculturation profiles, both concurrently and longitudinally. There was a significant difference in child-reported externalizing problems between the *Moderately Integrated* and *Moderately Integrated - Low English* profiles at Waves 2 and 3. Specifically, at Wave 2, youth in the *Moderately Integrated* profile reported significantly higher externalizing problems, while at Wave 3, they reported significantly lower externalizing problems compared to the *Moderately Integrated - Low English* group.

Acculturation and Concurrent Late Elementary School Adjustment

The finding that youth in the *Moderately Integrated* group reported fewer externalizing problems than those in the *Moderately Integrated – Low English* group during late elementary school was consistent with our expectations. While this result generally aligns with research on the psychological benefits of biculturalism (Nguyen & Benet-Martínez, 2013), there are two important nuances to note with the present study. First, the variable that distinguished these two profiles was proficiency in English language, suggesting that this factor drove the differences in externalizing problems. In studies of Chinese and Asian American immigrant youth, greater English proficiency is associated with increased interpersonal skills, better approaches to learning, and higher self-regulation (S. H. Chen et al., 2014; Kang et al., 2014) – all of which may serve to help youth manage behavior and reduce externalizing problems. Second, the group difference in externalizing problems did not emerge when externalizing problems were reported by parents. This discrepancy may reflect contextual differences in behavior between home and school. The group gap in English proficiency may have been more strongly related to differences in externalizing problems at school, where English proficiency is critical for immigrant youth to form relationships with teachers and peers as well as learn more efficiently (Kang et al., 2014). Parents may not observe greater externalizing problems at home in the context of lower youth English proficiency. Moderate Chinese proficiency may be sufficient for youth to form parent relationships and follow parental instructions, therefore limiting any low English proficiency-related externalizing problems.

There were no acculturation group differences in either parent-reported or child-reported internalizing problems. Perhaps this is because English language proficiency was the major difference between acculturation groups. As previously discussed, this variable may be related to youth's ability to manage external behavior through teacher and peer relationships as well as self-regulation (Kang et al., 2014). By contrast, differences in youth's ability to regulate internal feeling states through private speech may be more related to their native language or bilingual abilities, rather than differences in English proficiency alone (Jiménez Jiménez, 2015; Sawyer, 2016).

Acculturation and Concurrent High School Adjustment

During high school, youth in the *Moderately Integrated* group reported greater externalizing problems on average than youth in the *Moderately Integrated – Low English* group. This pattern was opposite of both our hypothesis and of the late elementary school results. We had expected the more bicultural profile – in this case the *Moderately Integrated* group – to have better adjustment given the demonstrated psychological benefits of biculturalism (Nguyen & Benet-Martínez, 2013). However, in labeling the *Moderately Integrated* group as the more “acculturated” or “American” of the two profiles, this finding is consistent with the immigrant paradox whereby greater acculturation is associated with worse adjustment (Marks et al., 2014). Evidence for the immigrant paradox is stronger during adolescence as compared to childhood (Coll et al., 2012; Dimitrova et al., 2016). Mirroring the present results, a meta-analysis of immigrant youth in Europe found that during preadolescence, immigrant youth had worse adjustment outcomes in comparison to their native-born peers, but this pattern reversed in adolescence (Dimitrova et al., 2016).

The comparatively higher English proficiency in the *Moderately Integrated* group may be associated with greater externalizing problems in adolescence due to several reasons. First, immigrant youth who are more proficient in English may be more likely to develop deeper connections with American peers. During this developmental period characterized by experimentation with substances, these peer affiliations may increase immigrant youth’s exposure to externalizing behaviors involving alcohol and drug use (Kane et al., 2019). Second, a higher proficiency in English may create acculturation gaps between adolescents and parents – this may be especially salient in our sample since Chinese American immigrants have comparatively lower English proficiency compared to other immigrant groups (Pew Research Center, 2021). Numerous studies with Chinese American immigrant families have shown that parent-adolescent acculturation gaps are associated with worse adolescent adjustment (Ho, 2014; Telzer, 2010). Consistent with our finding, a study of Asian American immigrant youth in 5th grade found that non-English-dominant bilingual children had fewer externalizing behaviors compared to English-dominant bilingual children (Han & Huang, 2010). The authors hypothesized that this was because the non-English-dominant bilingual children were more likely to preserve their parent’s heritage language, facilitating more positive parent-child relationships. Language proficiency differences may obscure effective communication between parents and immigrant youth, which could escalate conflict and lead to greater youth externalizing (Costigan & Dokis, 2006).

Still, acculturation group differences were not observed when externalizing problems were reported by parents. This could reflect that youth may report on externalizing behaviors that are present at school and with peers (e.g., substance use) that are not captured on parent reports.

Acculturation Transition Profiles and Adjustment

There were no differences in parent-reported or child-reported adjustment measures between different acculturation transition profiles. Very few studies have investigated adjustment differences between longitudinal acculturation pathways using person-centered approaches. A study of Mexican American adolescents did find that maintaining an integrated acculturation profile at the beginning and end of 5 years (*stable integrated*) was associated with greater academic competence and socioemotional well-being (Yan et al., 2021). However, this study measured cultural attitudes, behaviors, and beliefs – perhaps pathways of behavioral

acculturation measured in our study are less relevant to adolescent adjustment than pathways of identity or values acculturation.

A recent perspective on temporal concepts of acculturation suggested that quick shifts in *acculturation pace* may destabilize family systems in immigrant youth, with potential implications for youth adjustment (Titzmann & Lee, 2022). These authors suggested that measuring acculturation pace in the domain of language may need to be assessed over shorter time intervals. For example, a study of German immigrant adolescents from the Soviet Union found that acculturation pace in language use assessed three times over three years predicted family acculturation conflict (Aumann et al., 2022). Perhaps in the present study, measuring acculturation three times over nearly a decade was not sufficient to capture the more fine-grained changes in acculturation that would be associated with youth adjustment. Alternatively, acculturation may have not been associated with adjustment in the context of the time period of our study. The data were collected from 2007 to 2018, and so may not fully capture the current geopolitical climate that could impact acculturation patterns and their relation with youth adjustment. Chinese American immigrants have faced heightened discrimination in recent years due to the origins of the COVID-19 pandemic in China (Cheah et al., 2020; Haft & Zhou, 2021). Research has shown that the level of acculturation of Chinese American immigrant youth is influenced by conditions of discrimination (Juang & Cookston, 2009). Therefore, youth's acculturation profiles may show stronger associations with adjustment in the context of increased discrimination. Future studies could consider incorporating measures of discrimination and other environmental predictors at each timepoint of a longitudinal study to better understand contextual factors that shape acculturation processes.

Another explanation for the weak associations between acculturation and adjustment in the present study could be the geographic context of the study. Our sample resided in a region with a relatively high concentration of Chinese Americans. According to the specificity principle in acculturation science, variations in the density of co-ethnic communities in the host country can shape acculturation trajectories (Bornstein, 2017). On the one hand, co-ethnic communities may facilitate access to the host culture through informational resources – on the other hand, ethnic enclaves may provide sufficient social connections so that immigrants do not feel the need to engage with the host culture. Therefore, it is unclear in the present study how the relatively high concentration of Chinese Americans in the region contributed to acculturation patterns and links with adjustment. To further comprehend the link between ethnic density and acculturation patterns, future research can replicate these analyses in geographic regions with relatively fewer Chinese American immigrants.

Limitations

The study results should be considered in the context of several limitations. First, the measures of cultural orientations and adjustment were limited to questionnaires and youth and parent report. Because a key acculturation variable was Chinese and English language use, future research would benefit from including objective language proficiency measures. A study of Chinese American adults found that participants used reference frames (the language proficiencies of those around them) in evaluating their language proficiency (Tomoschuk et al., 2019). Applying this to the present study, perhaps youth in the *Moderately Integrated – Low English* group were comparing themselves to English monolingual peers, thereby

underestimating their true English proficiency and overestimating acculturation differences with the *Moderately Integrated* group. Although validation studies have demonstrated the cross-cultural applicability of the adjustment measures used (Guttmannova et al., 2008), it is possible that acculturation levels still shaped reporting biases. Because Chinese parents tend to socialize children to minimize negative emotional expression (Yu et al., 2015), greater orientation to Chinese culture may have been linked to fewer externalizing problems in youth because of youth's social desirability reporting bias. Indeed, during high school the *Moderately Integrated – Low English* group did report fewer externalizing problems than the *Moderately Integrated* group. However, this pattern was reversed during late elementary school, making it unlikely that cultural reporting biases fully accounted for the discrepancy. To minimize concern of reporting biases, future studies of acculturation and adjustment could obtain measures from additional reporters (e.g., peers, teachers) as well as objective assessments (e.g., language proficiency, clinical interview).

Second, measurement of acculturation was limited to the behavioral domain – specifically language proficiency and social affiliation. A previous longitudinal study of Hispanic adolescents found that acculturation in behavioral, identity, and values domains did not always align and progressed at different rates (Lee et al., 2020). Because adolescence is a crucial developmental period for identity formation (Blakemore & Mills, 2014), understanding how cultural identities and values shift into adolescence is informative for integrative models of acculturation and development.

Third, although attrition analyses revealed no significant demographic differences between those who dropped out and those who remained in the study, the notable reduction in sample size between the second and third waves of the study (69% retention rate) remains a notable limitation. Unmeasured variables or changes in circumstances not captured in the analysis may have influenced the decision to discontinue participation. For example, individuals experiencing higher levels of stress or those undergoing significant life transitions may have been more likely to withdraw from the study, potentially skewing the observed patterns of acculturation. In addition, even with using methods to handle missing data, the reduction in sample size could limit the ability to detect smaller effects regarding changes in acculturation over time. Consequently, the findings derived from the reduced sample may be less robust compared to those based on a larger, more representative cohort.

Implications

Findings have several implications for acculturation research and for efforts to promote positive psychological adjustment in immigrant youth. In terms of methodological implications, the research aligns with perspectives that acculturation is not a static variable (Schwartz et al., 2020). The composition and size of various acculturation profiles changed across childhood and adolescence, strengthening the rationale to investigate acculturation and developmental changes in tandem (Juang & Syed, 2019). Second, findings add to growing research that calls into question the validity of Berry's seminal four categories of acculturation (Schwartz et al., 2010). Acculturation researchers would benefit from using person-centered approaches to classify sample specific acculturation profiles. Third, although acculturation profiles were related to child generation and parent time in the U.S. at the first timepoint, these associations declined and were nonexistent by the third timepoint. These findings suggest that the use of child generation (or

nativity status) and parent time in the U.S. may not be accurate proxies for behavioral acculturation, particularly for adolescent immigrant youth.

The current results also have relevance for programs and practitioners that serve immigrant youth. The longitudinal design revealed that scores on the language and social acculturation variables were more heterogeneous when youth were 6-9 years old, and converged to be more similar when youth by adolescence. This finding is relevant to the study of *acculturation tempo*, the time it takes to achieve a particular acculturative task or stage (Titzmann & Lee, 2022). Acculturation tempo can vary by cultural group; it is relevant to understanding the optimal timing of support services for immigrant youth. The findings suggest that for Chinese American immigrant youth, promoting language competence and peer connections is a relevant acculturative task in early and middle childhood. During adolescence, although some scaffolding for English proficiency may still be required, focusing on other acculturation targets (e.g. identity factors) may be more salient.

Finally, results did not strongly align with the immigrant paradox, whereby greater acculturation (or orientation to American culture) is deemed to be associated with worse psychological adjustment. Instead, only child-reported externalizing problems were concurrently related to acculturation profiles – and the direction of this association depended on the timepoint. When conceptualizing the role of acculturation level on the psychological adjustment of Chinese American immigrant youth, it is essential for clinicians and teachers to adopt an idiographic approach. Doing so entails recognizing that the same acculturation profile may have different associations with adjustment outcomes at different developmental stages—perhaps beneficial during middle childhood but associated with detrimental outcomes during adolescence. To identify targets for intervention, it is important to assess the factors that mediate the relation between acculturation and adjustment. Current findings suggest that Chinese American immigrant youth’s self-report of their English proficiency may be a source of heterogeneity that could ultimately contribute to differences in adjustment. Prior research suggests that other relevant factors to assess in interventions for immigrant youth mental health could include acculturative stress, ethnic identity, family acculturation gaps, peer relations, and perceived discrimination (d’Abreu et al., 2019).

Conclusion

The aim of the present study was to use a longitudinal, person-centered approach to better understand behavioral acculturation in a sample of Chinese American immigrant youth. Findings revealed that the number and composition of profiles of linguistic and social acculturation varied over the course of three measured timepoints over an 11-year span. Youth transitioned between different acculturation profiles over the course of the study, mainly showing increasing or stable changes towards more integrated or bicultural profiles. These transitions were not significantly associated with differences in internalizing or externalizing symptoms, although acculturation profiles were associated with concurrent youth-reported externalizing symptoms at two timepoints. Overall, the study strengthens recent calls to use person-centered, longitudinal approaches in the study of immigrant youth acculturation, and bolsters arguments against the use of proxy measures or a predetermined set of acculturation profiles. Efforts to promote positive psychological adjustment in Chinese American immigrant youth may benefit from considering youth’s developmental stage, with a particular focus on their perception of English proficiency.

As the population of immigrant youth continues to grow, it is crucial to the health and cohesion of the country to develop a more nuanced understanding of acculturative change.

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Table 1*Acculturation Domains and Profiles in Studies using Person-Centered Approaches with Asian American or Chinese Immigrant Samples*

	N	Sample	% Foreign Born	% ≥ High School Education	Setting	Domain(s)			# of Profiles	Berry's Profiles Identified				Additional Profile(s) Identified
						Beh	Val	Id		I	A	S	M	
Chia (2006)	234	CC College Students	86.4%	100%	Western Canada	x	x	x	5	x	x	x		Integrated (without Chinese practices) Marginalized (with Chinese practices)
Jang (2017)	2,602 ^a	AA Adults	90.8%	81.0%	Central Texas	x		x	4	x		x		Moderately bicultural Alienated from heritage culture
Ren (2021)	240	CA Mothers	--	--	Washington D.C. Area	x	x	x	4		x	x		Psychologically-Assimilated/ Behaviorally Undifferentiated Psychologically-Undifferentiated/ Behaviorally-Integrated
Salas-Wright (2015)	968 ^b	AA Adults	82.1%	89.4%	National Survey in USA	x		x	5	x	x	x		Partial bilingual/bicultural English dominant/Asian oriented
Suh (2020)	161 ^c	AA College Students	30.4%	100%	National Survey in USA		x		3	x	x	x		
Tahseen (2012)	83	CA Mothers	100%	97.6%	Maryland	x	x		4	x	x	x		Psychologically-Behaviorally Undifferentiated
Weaver (2008)	451	CA Parents	90%	68.4%	Northern California	x	x		3	x	x	x		
Weaver (2008)	451	CA Adolescents	25.0%	--	Northern California	x	x		3	x	x	x		

Note.

^a 24.5% Chinese; ^b 23.0% Chinese; ^c 30.4% Chinese

AA = Asian American; CA = Chinese American; CC = Chinese Canadian; Beh = Behavior; Val = Values, Id = Identity, I= Integration, A = Assimilation, Sep = Separation, Mar = Marginalization

Table 2*Demographic Characteristics of Chinese American Immigrant Sample at Wave 1 (N=258)*

	Mean	SD	Minimum	Maximum	Skewness	Kurtosis
Child Age	7.38	0.71	5.81	9.14	0.07	-0.84
Parent Age	39.47	5.20	27.88	54.68	0.35	-0.35
Parent Years in the U.S.	11.82	7.63	0.50	38.00	0.76	0.02
Parent Age of Immigration	27.50	7.72	1.35	46.51	-0.30	0.36
Parent Years of Education	13.29	2.50	5	20	0.52	0.24
Family Per Capita Income	11,609	8,309	625	50,000	1.32	1.92

Table 3*Latent Profile Analyses Fit Indices, Statistics, and Profile Distributions for Three Waves of Child Cultural Orientations*

Early Elementary School (Wave 1)											
# of Profiles	BIC	AIC	Entropy	LMR <i>p-value</i>	LRT <i>p-value</i>	C1 <i>n (%)</i>	C2 <i>n (%)</i>	C3 <i>n (%)</i>	C4 <i>n (%)</i>	C5 <i>n (%)</i>	C6 <i>n (%)</i>
2	2509.875	2463.687	0.847	0.0001	0.0001	204 (79.1%)	54 (20.9%)				
3	2498.700	2434.746	0.846	0.0225	0.0199	170 (66%)	22 (8.5%)	66 (25.5%)			
4	2512.844	2431.126	0.837	0.7856	0.7856	42 (16.3%)	65 (25.2%)	141 (54.7%)	10 (3.9%)		
5	2502.329	2402.846	0.935	0.0002	0.0002	109 (42.2%)	45 (17.4%)	77 (29.8%)	17 (6.6%)	10 (3.9%)	
6	2542.714	2425.467	0.806	0.8683	0.8683	130 (50.4%)	48 (18.6%)	33 (12.8%)	23 (8.9%)	18 (7.0%)	6 (2.3%)
Late Elementary School (Wave 2)											
# of Profiles	BIC	AIC	Entropy	LMR <i>p-value</i>	LRT <i>p-value</i>	C1 <i>n (%)</i>	C2 <i>n (%)</i>	C3 <i>n (%)</i>	C4 <i>n (%)</i>	C5 <i>n (%)</i>	C6 <i>n (%)</i>
2	2393.256	2347.068	0.791	0.0184	0.0161	220 (85.3%)	38 (14.7%)				
3	2395.597	2331.643	0.791	0.0413	0.0368	128 (49.6%)	106 (41.1%)	24 (9.3%)			
4	2426.205	2344.487	0.687	0.8820	0.8804	133 (51.6%)	22 (8.5%)	16 (6.2%)	87 (33.7%)		
5	2434.326	2334.843	0.718	0.8410	0.8430	38 (14.7%)	99 (38.4%)	10 (3.9%)	24 (9.3%)	87 (33.7%)	
6	2456.875	2339.627	0.684	0.2160	0.2177	70 (27.1%)	52 (20.2%)	26 (10.1%)	14 (5.4%)	28 (10.9%)	68 (26.4%)
High School (Wave 3)											
# of Profiles	BIC	AIC	Entropy	LMR <i>p-value</i>	LRT <i>p-value</i>	C1 <i>n (%)</i>	C2 <i>n (%)</i>	C3 <i>n (%)</i>	C4 <i>n (%)</i>	C5 <i>n (%)</i>	C6 <i>n (%)</i>
2	2274.138	2227.950	0.963	0.0006	0.0007	208 (80.6%)	50 (19.4%)				
3	2242.051	2178.098	0.78	0.0002	0.0003	44 (17.0%)	10 (3.9%)	204 (79.1%)			
4	2242.869	2161.151	0.802	0.1174	0.1280	10 (3.9%)	44 (17.1%)	131 (50.8%)	73 (28.3%)		
5	2168.178	2068.695	0.951	0.2403	0.2525	34 (13.1%)	34 (13.1%)	10 (3.9%)	11 (4.3%)	152 (58.9%)	
6	2176.965	2059.718	0.947	0.6538	0.6635	10 (3.9%)	10 (3.9%)	9 (3.5%)	147 (57.0%)	34 (13.1%)	11 (4.3%)

Note. BIC = Bayesian information criterion; AIC = Akaike information criterion; LMR = Lo-Mendel-Rubin test; LRT = Likelihood ratio test. Distribution of the number of profiles is displayed as C1 through C6. Bolded profiles were selected as the optimal solution.

Table 4*Latent Transition Probability Matrix Across Three Waves of Child Acculturation Profiles*

Latent Profile at Prior Wave		Latent Profile at Subsequent Wave	
W1 → W2		W2	
W1	Moderately Marginalized	Moderately Integrated - Low English	Moderately Integrated
Marginalized with Chinese Language	0.298	0.314	0.387
Assimilated	0.000	0.000	1.000
Moderately Integrated	0.000	0.048	0.952
W2 → W3		W3	
W2	Moderately Integrated - Low English	Moderately Integrated	
Moderately Marginalized	0.165	0.835	
Moderately Integrated - Low English	0.507	0.493	
Moderately Integrated	0.093	0.907	

Note. Measurement invariance restriction was not imposed across all three waves. W1 = Wave 1, W2 = Wave 2, W3 = Wave 3.

Table 5*Classification of Acculturation Latent Transition Profiles Across Wave Transitions*

	W1 → W2	W2 → W3
Increasing Integration	142 (55.0%)	73 (28.3%)
Decreasing Integration	53 (20.5%)	14 (5.4%)
Stable Integrated	63 (24.4%)	171 (66.3%)

Note. Increasing integration profiles are characterized by transitioning to a more integrated profile. Decreasing integration profiles are characterized by transitioning to a less integrated profile.

Table 6

Results from Tests of Demographic Differences Between Acculturation Profiles and Acculturation Transition Profiles

	Acculturation Latent Profiles			Acculturation Latent Transition Profiles	
	Early Elementary School (Wave 1; 6-9 yrs)	Late Elementary School (Wave 2; 9-11 yrs)	High School (Wave 3; 14-17 yrs)	Wave 1 → Wave 2	Wave 2 → Wave 3
	(1) Marginalized with Chinese Language (M-CL) (2) Moderately Integrated (MI) (3) Assimilated (A)	(1) Moderately Marginalized (MM) (2) Moderately Integrated with Low English (MI-LE) (3) Moderately Integrated (MI)	(1) Moderately Integrated with Low English (MI-LE) (2) Moderately Integrated (MI)	(1) Increasing Integration (2) Decreasing Integration (3) Stable Integrated	(1) Increasing Integration (2) Decreasing Integration (3) Stable Integrated
Child Age (yrs)	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>
Child Sex	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>
Child Generation (1=1 st , 2=2 nd)	MI > M-CL*	MI > MM*	<i>ns</i>	Stable Integrated > Decreasing Integration*	<i>ns</i>
Per Capita Income	A > M-CL*** A > MI* MI > M-CL*	MI > M-LE*	<i>ns</i>	<i>ns</i>	<i>ns</i>
Parental Education	A > M-CL*** A > MI*	MI > M-LE*	<i>ns</i>	<i>ns</i>	<i>ns</i>
Parent Age	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>
Parent Years in U.S.	MI > M-CL*	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>

Figure 1

Parameter Estimates and Prevalence of Acculturation Latent Profiles

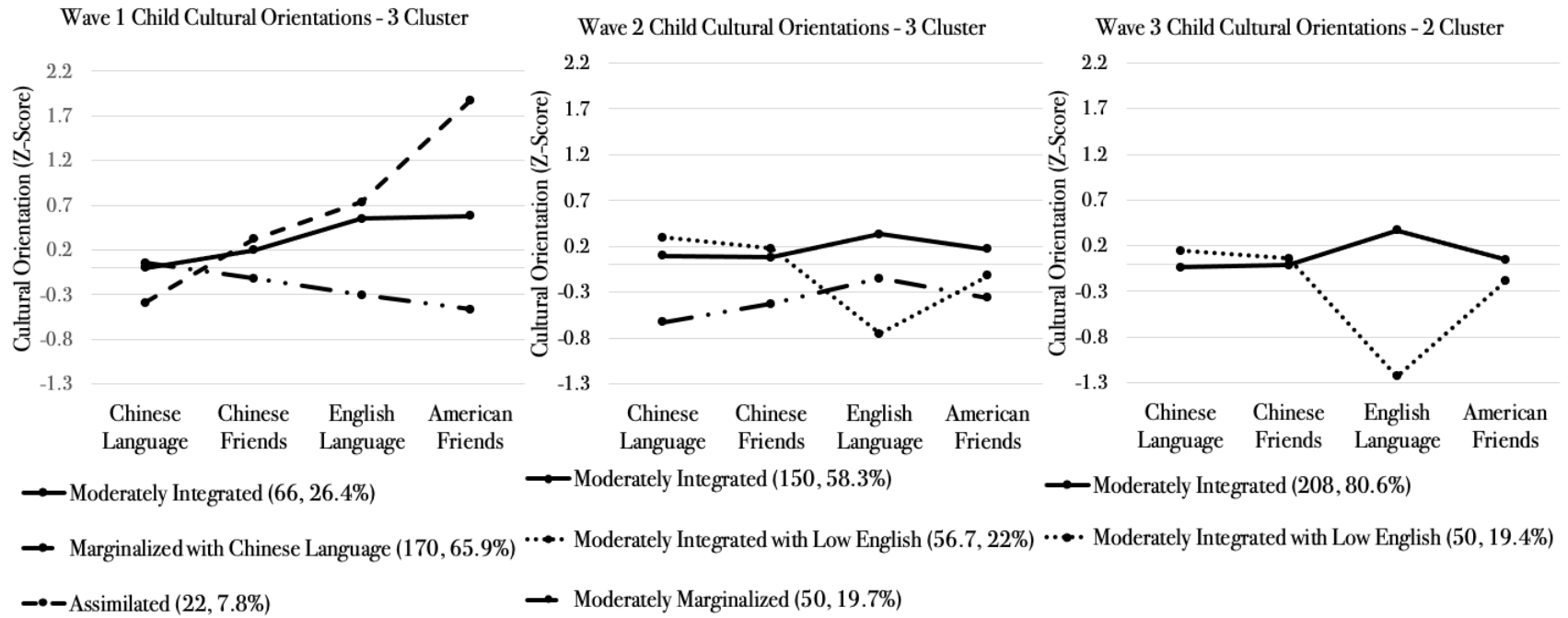


Figure 2

Psychological Adjustment by Acculturation Profiles and Acculturation Transition Profiles

