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Longitudinal relations among school context, school-based parent involvement, and academic achievement of Chinese American children in immigrant families

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Abstract

Immigrant families face multiple barriers to engaging with children's schools. Yet, school-based parent involvement has been associated with academic and behavioral benefits for children of immigrant families. Although past research has examined links between family contextual factors and parent involvement, less is known about the links between school contextual factors and parent involvement in immigrant families. Identifying socio-cultural barriers to parent involvement across home and school contexts can inform culturally competent family engagement interventions serving immigrant families. In a two-wave (1.5 years apart) longitudinal study of a community-based sample of Chinese American children ($N = 210$, beginning age = 5.8–9.1 years) attending over 80 schools in a metropolitan area, we assessed school-based parent involvement behaviors and parent involvement-related psychological processes (i.e., parent-teacher relationship quality, parents' endorsement of schools, teachers' perceptions of parents) using parent and teacher report. First, significant positive associations were found between school-based parent involvement behaviors and parent involvement-related psychological processes ($r_s = 0.36 - 0.53$). Next, multi-level modeling was conducted to test concurrent relations of Wave 1 school contextual factors to all four parent involvement constructs (controlling for family-level factors), as well as testing the prospective relations of parent involvement at Wave 1 to children's academic achievement at Wave 2. Student body diversity of schools was negatively associated with school-based parent involvement ($r_s = -0.18$ and -0.17), parent-rated parent-teacher relationship quality ($r = -0.18$), and parents' endorsement of schools ($r = -0.36$). The concentration of Asian students at schools and schoolwide achievement were negatively associated with teachers' perceptions of parents ($r_s = -0.18$ and -0.20). However, neither school contextual factors nor school-based parent involvement at Wave 1 uniquely predicted children's academic achievement at Wave 2. Implications of findings for understanding and addressing barriers to engaging Chinese American immigrant families in their children's schools are discussed.

Keywords

school context; parent involvement; achievement; immigrants

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Immigrant parents face unique barriers to involvement in their children's schools. Yet, school-based parent involvement has been associated with academic and behavioral benefits for children of immigrant families (Anicama, Zhou, & Ly, 2018; Antony-Newman, 2019; Jung & Zhang, 2016). Identifying which school- and family-level sociocultural factors are associated with parent involvement, both behaviorally through at-school involvement and psychologically through connections with the school and teachers, is a critical step to guide interventions that promote family engagement in education and family-school partnerships among diverse populations.

Chinese Americans are a rapid growing foreign-born population in the United States (Echeverria-Estrada & Batalova, 2020). Despite the overall higher socioeconomic status (SES) of Chinese Americans and the generally high academic achievement shown by Chinese American children as compared to children from other ethnic groups (Hernandez & Napierala, 2012), Chinese American children from low-income families face challenges in academic development and school adjustment related to their socioeconomic disadvantage (Li, Holloway, Bempechat, & Loh, 2008). Moreover, Chinese immigrant parents show overall lower levels of school-based parent involvement as compared to non-immigrant parents (Ji & Koblinsky, 2009; Huntsinger & Jose, 2009; Zhang et al., 2014), although considerable within-group heterogeneity exists. Whereas past research has examined family-level sociocultural factors (e.g., parental education, English proficiency, cultural orientations) related to parent involvement (Anicama et al., 2018; Ji & Koblinsky, 2009; Turney & Kao, 2009; Zhang et al., 2014), less is known about the links between school-level factors (e.g., schoolwide SES, achievement, and ethnic diversity) and school-based parent involvement among Chinese immigrant families. Additionally, although school-based involvement is a behavioral component of parent involvement with the potential to boost student achievement and socio-emotional outcomes, psychological factors that might promote or hinder partnerships between families and teachers/schools are highly relevant parent involvement processes, especially for immigrant families who often face increased barriers to parent involvement. Exploring how parents' in-person school involvement is related to their relationships with schools, teachers, and the broader school context can provide a more accurate picture of Chinese immigrant families' barriers to engaging with children's schools. Finally, we tested whether behavioral and psychological aspects of parent involvement are longitudinally related to Chinese American children's academic achievement.

School-Based Parent Involvement: A Conceptual Framework

Parent involvement, or related terms such as family involvement, is broadly defined as "parents' work with schools and with their children to benefit their children's educational outcomes and future success" (Hill et al., 2004, p. 491). Parent involvement is a multi-dimensional process occurring across multiple contexts (i.e., home, school, community). School-based parent involvement generally includes parents' participation in school activities (e.g., volunteering, Parent Teacher Organization meetings) and parents' interaction with school personnel (e.g., parent-teacher contact; Crosnoe, 2001). By contrast, home-based parent involvement includes practices such as helping children with homework, facilitating children's learning at home, or arranging children's extra-curricular activities

(Huntsinger & Jose, 2009; Ji & Koblinsky, 2009; Pearce, 2006). Although school-based parent involvement is often targeted by family engagement interventions aimed at maximizing family, student, and school outcomes (Garbacz et al., 2017), cross-cultural research has consistently shown that as compared to European American families, Chinese immigrant families display lower levels of school-based parent involvement compared to European American families (Huntsinger & Jose, 2009; Ji & Koblinsky, 2009). For this reason, it is important to study parent involvement-related psychological processes (e.g., parent-teacher relationships and parents' perceived connections with school and teachers) that might account for the overall lower levels of behavioral parent involvement among Chinese immigrant parents. Specifically, understanding school-level and family-level barriers to parent involvement for Chinese immigrant families can inform the adaptation and implementation of these interventions for this rapidly growing population.

Although researchers have sought to better understand family characteristics and school factors that create barriers to parent involvement by immigrant families, it is also necessary to consider how parent involvement-related psychological processes influence parents' decisions regarding in-person engagement at school. As shown in our conceptual framework (see Figure 1), we view parent-teacher relationships, parents' endorsement of schools (i.e., the degree to which parents believe that the school is a positive place for their children and prepares them for the future), and teachers' perception of parents (i.e., the degree to which teachers perceive parents as valuing and involving themselves in children's education) as parent involvement-related psychological processes that are closely tied to school-based parent involvement behaviors. These psychological processes have been theorized as mechanisms through which parent involvement behaviors (e.g., family engagement in school, collaborative interactions between parents and school staff) and family engagement interventions can improve students' academic and behavioral outcomes (Cheung, 2019; Garbacz et al., 2017). Consistent with this view, teachers' perception of parent involvement and parent-teacher bonding mediated the intervention effects of a classroom management program on students' behavior outcomes (Thompson et al., 2017). Moreover, parents' perceptions that their involvement was invited and teachers' beliefs about the helpfulness of parent involvement predicted increases in school-based parent involvement in a longitudinal study of primary school students in New Zealand (McDowall et al., 2017). Given the evidence that parent-teacher relationships and perceived sense of connection are interrelated, the current study tested whether Chinese immigrant parents' school-based involvement behaviors are related to these parent involvement-related psychological processes. We hypothesized that the four aspects of parent involvement (i.e., school-based parent involvement behaviors, parent endorsement of school, teacher perception of parents, and parent-teacher relationship quality) may be especially salient for immigrant families whose involvement is more impacted by perceived invitations and attitudes from school and teachers than non-immigrant families (Peña, 2000). Because past research has indicated that parents' and teachers' ratings of parent involvement are at most modestly correlated and relate differently to students' outcomes (Anicama et al., 2018; Kohl et al., 2000), it is important to assess parent involvement behaviors and psychological processes using both parent and teacher report.

Relations of School-Level Factors to School-Based Parent Involvement

Past research on immigrant families, including Chinese immigrant families, has identified several family-level sociocultural barriers to school-based parent involvement, including low parental education, limited English proficiency, demanding work schedules, and cultural beliefs about the value and appropriateness of parent involvement (Anicama et al., 2018; Ji & Koblinsky, 2009; Turney & Kao, 2006; Zhang et al., 2014). However, less research has examined specific school factors that might be associated with school-based parent involvement in immigrant families. Within the bio-ecological framework (Bronfenbrenner & Morris, 2006), school-based parent involvement can be viewed as a mesosystem underlying the interplay and interaction between family and school microsystems. Thus, family and school characteristics can jointly shape school-based parent involvement. Specifically, Crosnoe (2001) theorized that structural (e.g., school size), climate-related (e.g., schoolwide SES and achievement), and compositional (e.g., ethnic heterogeneity) features of children's schools can shape school-based parent involvement by influencing the degrees to which parents feel welcome to participate in school or interact with school staff. Based on this review of the limited literature on how school context influences parent involvement, we have identified four school contextual factors as relevant for school-based parent involvement and connections between parents, schools, and teachers: (a) schoolwide socioeconomic disadvantage, (b) schoolwide achievement, (c) ethnic diversity of the student body, and (d) concentration of co-ethnic students.

Schoolwide socioeconomic disadvantage and achievement are two climate-related school characteristics theorized to shape school-based parent involvement (Crosnoe, 2001). Social capital theory posits that in schools with more affluent students, parents tend to have more institutional knowledge, higher self-efficacy, and greater resources (i.e., time, money), all of which contribute to higher rates of school-based involvement (Bourdieu, 1986; Hill, 2017; Lareau, 1987). Moreover, teachers may perceive parents as having greater interest in education and a better understanding of their pedagogical mission and thus may expect more involvement by parents (Hoover-Dempsey et al., 1987). Consistent with the theory, schoolwide socioeconomic advantage was associated with higher teacher-perceived parent support and school-based parent involvement, and greater parent-reported invitations and communications from schools (Griffith, 1998; Hoover-Dempsey et al., 1987). Similarly, in schools with higher overall student achievement, parents and teachers may perceive a more positive school climate, which in turn can promote school-based parent involvement (Crosnoe, 2001). It is important to note that the relations between schoolwide achievement and school-based parent involvement may be bidirectional, such that higher school-based parent involvement can further benefit student achievement. However, although positive relations between schoolwide achievement and school-based parent involvement have been reported in a nationally representative sample (Park et al., 2017), some researchers have failed to find direct relations between schoolwide SES or achievement and school-based parent involvement, especially in ethnically diverse samples (e.g., Crosnoe, 2001). These discrepant findings suggest that the social capital inherent in schools characterized by affluence and academic success may not equally motivate school engagement or

promote family-school connection for immigrant families, perhaps due to cultural and communication barriers.

Ethnic diversity of the student body and concentration of co-ethnic students are two compositional factors reflecting the cultural context of school. In the current study, diversity of the student body refers to the heterogeneity in students' race/ethnicity. Previous research (conducted primarily with students from non-Chinese or non-Asian backgrounds) has found that the associations between diversity of the student body or concentration of co-ethnic students and parent involvement are complex and may vary by ethnicity. According to the cultural fit hypothesis (Calzada et al., 2015), a higher concentration of co-ethnic students and lower student body diversity may promote school-based parent involvement, because greater cultural coherence makes immigrant parents feel more comfortable interacting with other parents and boosts positive perceptions of the school environment. In turn, social interactions among parents and parents' perceptions that school is a positive place can promote school-based parent involvement (Ee, 2017). Somewhat consistent with this finding, parent-teacher ethnic consonance was positively related to teacher-rated school-based parent involvement among Latino immigrant families, but not among Afro-Caribbean immigrant families (Calzada et al., 2015). Moreover, among a nationally representative sample of Latino immigrant parents, a higher concentration of Latino students was associated with greater school-based parent involvement (Klugman et al., 2012).

Although there is some evidence that school-contextual factors related to ethnic and/or cultural consonance can promote both behavioral and psychological aspects of parent involvement, this finding might not generalize to Chinese immigrant families. Previous research has shown that compared to parents of other ethnic groups, Chinese American parents tend to have lower rates of participation in school meetings, activities, and parent-teacher conferences (Pearce & Lin, 2007). Besides structural barriers, such as parents' low English proficiency and busy work schedules, cultural beliefs may be another barrier to school-based parent involvement. Because many Chinese parents view children's learning at school as the teacher's responsibility, they may tend to see themselves as playing a less active role in shaping children's experiences at school (Ji & Koblinsky, 2009). Moreover, because teachers are highly respected and regarded as authority figures in Chinese culture (Chen et al., 2016), parents' direct involvement at school may even be viewed as interfering with the teacher's job. Thus, it is possible that even in schools with high concentrations of co-ethnic students, Chinese American parents may still show lower rates of school-based parent involvement. Due to the lack of prior studies on parent involvement-related psychological processes in Chinese immigrant parents, we do not have an a priori hypothesis on the direction of relations between school cultural context and parent involvement-related psychological processes. For example, lower student body diversity and higher concentration of co-ethnic students might promote interactions among parents, which might lead to parents' higher sense of connectedness with the school. Conversely, if low levels of school-based parent involvement are a cultural norm at schools with high concentrations of Chinese families and teachers, then low rates of behavioral parent involvement may not be associated with lower perceived connectedness and other psychological aspects of parent involvement.

Prospective Relations between School-Based Parent Involvement and Children's Academic Achievement

Parent involvement is generally theorized to promote positive school outcomes (e.g., improved academic performance, reduction in school dropout and problem behaviors, and improved school attendance) through multiple mechanisms (e.g., improved teacher-child and parent-teacher relationships and increased parent and teacher efficacy; Cheung, 2019; Garbacz et al., 2017). Yet, the empirical associations between parent involvement and academic achievement reported in the literature varied by types of parent involvement and study methods (e.g., observational vs. experimental design). According to a recent meta-analysis (Castro et al., 2015), the average effect size of the relationship between parent involvement and academic achievement was 0.124, which is a small but significant effect. However, some types of parent involvement (e.g., attendance and participation in school activities) had no significant associations with achievement, whereas other types of parent involvement (e.g., parents' academic expectations, reading with children) had stronger associations to achievement. In another meta-analysis, Hill and Tyson (2009) found that parent involvement, most notably parent involvement in which parents communicate their expectations for academic success, was positively associated with academic achievement. It is possible that parents who engage in direct involvement at school, build strong relationships with teachers, and strongly endorse their child's school may be communicating through their behaviors the importance of educational success. Therefore, we hypothesized that parent involvement would be prospectively related to academic achievement in our sample of Chinese immigrant families.

Present Study

We investigated the associations (a) among behavioral and psychological aspects of parent involvement, (b) between school contextual factors and parent involvement, and (c) longitudinal relations between parent involvement and academic achievement among Chinese immigrant families with school-aged children. As shown in Figure 1, we identified four interrelated parent involvement constructs that capture both direct involvement at school (i.e., parents' school-based parent involvement behaviors) and psychological processes related to parent-school connectedness (i.e., parent-teacher relationship quality, parents' endorsement of school, teachers' perceptions of parents). We considered both parent and teacher reports of parent involvement given that these reports likely capture different aspects of and perceptions of parent involvement (Bakker et al., 2007; Kohl et al., 2000)

The study had three specific aims. Aim 1 was to examine interrelations between school-based parent involvement behaviors and parent involvement-related psychological processes, given known connections between perceptions of welcomeness and inclusivity and direct involvement behaviors. Based on our review, we expected school-based parent involvement to be positively associated with the quality of parent-teacher relationships, parents' endorsement of school, and teachers' perception of parents. Aim 2 was to examine the concurrent links between these four behavioral and psychological parent

involvement constructs and school contextual factors, such as schoolwide socioeconomic advantage, school-level achievement, student body diversity, and the concentration of co-ethnic students. Importantly, we controlled for family level sociocultural factors to better understand the specific contribution of the school environment to behavioral and psychological aspects of parent involvement. Drawing from social capital theory, we expected to find: (a) a negative relation between schoolwide socioeconomic disadvantage and parent involvement constructs, and (b) a positive relation between schoolwide achievement and parent involvement constructs. However, we acknowledge that the relation between a school's social capital and increased parent involvement may be weaker or less direct for immigrant families, who may encounter relational and instrumental barriers in benefitting from a school's socioeconomic and achievement strengths. Based on the cultural fit hypothesis, we expected that the (a) ethnic diversity of the student body would be negatively associated with parent involvement, given past findings linking high ethnic heterogeneity in schools to overall lower parent involvement; and (b) proportion of co-ethnic student would be positively related to parent involvement given the potential for increased connections between parents. Aim 3 was to test the prospective relations of parent involvement constructs at Wave 1 to children's academic achievement at Wave 2, controlling for Wave 1 achievement and family- and school-level factors. Based on past findings linking parent involvement to improved academic outcomes, we expected parent involvement to positively predict children's academic achievement.

Method

Participants

The sample consisted of 210 children (50% girls, age = 5.8–9.1 years, M age = 7.4, SD = .70) and their parents who participated in a longitudinal study of Chinese American children in immigrant families living in the San Francisco Bay Area. Data collection occurred between December 2007 and July 2009 for Wave 1 and between November 2009 and May 2011 for Wave 2. The relatively long duration of data collection for each wave was due to the need to individually assess parents and children in the lab during weekends when families were available. Although the full Wave 1 sample included 258 children, the present study only included the children for whom teacher data were collected. At Wave 1, the children were in first (45.2%), second (53.3%), or third (1.4%) grade. Children attended over 80 schools, with 94.2% of children attending public schools and 5.8% attending private schools. Most children (79%) were born in the U.S. and had at least one foreign-born parent (i.e., 2nd generation), whereas the rest of children were foreign born (i.e., 1st generation).

One parent of each child was invited to participate at Wave 1. The majority of children (82.9%) had mothers as the participating parent. Among participating parents, 95.2% were married or living with a partner and 4.3% were single parents (e.g., divorced, widowed, never married). The parents were between 29.8 to 54.8 years old (M = 39.8 years, SD = 5.2). Most parents (98.6%) were foreign born and had lived in the U.S. for an average of 12.3 years (range = 1–38 years, SD = 7.5). Parents' years of school education ranged from five (elementary school) to 20 years (doctorate or other advanced degree) with parents reporting an average of 13.2 years of education (i.e., some education beyond high school, SD = 2.5).

Over half of the parents (65.6%) were employed full time, 15.6% were employed part-time or occasionally, and 18.8% were not earning income (i.e., unemployed, full-time students, home makers, disabled, retired). Families' per capita income in the past year ranged from \$625 to \$50,000 ($M = \$12,049$, $SD = \$8,472$). More than half of the children in the sample (57.0%) were eligible for free or reduced school lunch based on parent report. Using 2000 Census data, Lee, Zhou, Ly, Main, Tao, and Chen (2014) compared the Wave 1 sample to the Chinese American population in the four counties where recruitment was conducted. Compared to the local Chinese American population, the sample had a higher percentage of families with income less than \$50,000, a lower percentage of parents with a bachelor's degree or higher, and a lower percentage of employed parents.

Of the 210 children who participated at Wave 1, 196 children (M age = 9.3 years, $SD = 0.7$, range = 7.5–11.0) were re-assessed at Wave 2, approximately 1.5–2.5 years after Wave 1 (retention rate = 93.3%). Attrition analyses were conducted to compare the children who were assessed at Wave 1 only ($N = 14$) with the 196 children with data at both waves on Wave 1 demographic variables and study variables (parent involvement and children's achievement). Two differences were found; as compared to the children who were assessed at the both waves, the children who dropped out at Wave 2 were younger (M ages = 7.0 and 7.4 years, $p = .02$) and had lower ratings on teacher-reported school-based parent involvement (M s = 1.90 and 1.98, $p = .03$).

Procedures

Recruitment—To recruit a socioeconomically diverse sample of Chinese American families, multiple recruitment strategies were used, including holding recruitment fairs in Asian American communities, seeking referrals from Asian American organizations, and recruiting at elementary schools with a large concentration of Asian students. All study procedures were approved by the Institutional Review Board at the authors' home university. The study was advertised as a longitudinal research project on socioemotional and academic development of Chinese American children in immigrant families. Interested parents filled out a contact sheet. A bilingual interviewer conducted a phone interview with the parent to determine whether the child met the eligibility criteria, consisting of the following: (a) the child was in first or second grade at the time of phone screening, (b) the child lived with at least one biological parent, (c) both biological parents were ethnically Chinese, (d) the child was either a first generation (i.e., foreign born) or a second generation immigrant (i.e., born in the U.S. with at least one foreign-born parent), and (e) the parent and child were able to understand and speak English or Chinese (Mandarin or Cantonese). Parents provided informed consent prior to participating in assessment. Three children who were in second grade at the time of the phone screening completed the lab assessment after they started third grade, resulting in a small proportion of third graders in the final Wave 1 sample.

Assessment—At both Wave 1 and Wave 2, a parent and the child attended a 2.5-hour lab assessment session administered by a team of bilingual undergraduate assessors. The session included (a) parent interview and questionnaires, (b) one-on-one child psychological assessment, and (c) parent-child interaction tasks. Parents completed the questionnaires in their preferred language (i.e., English, Mandarin, or Cantonese). Assessors received

intensive training on the assessment protocol via workshops, skill practice sessions, quizzes, and mock interviews. The majority of parents (83.7%) completed the assessment in Mandarin or Cantonese and 16.3% completed the assessment in English. After the lab assessment, the child's classroom teacher was mailed a set of questionnaires on the child's behavior and the parent's involvement at school. Teacher data were collected for 81.4% of children. A total of 138 teachers provided data at Wave 1 and all teachers completed the questionnaires in English. Although the majority of teachers (81.2%) completed a questionnaire packet for one student, some teachers ($N = 26$, 18.8%) completed questionnaires for up to 10 children. At each data collection wave, parents were paid \$50, teachers were paid \$20 per student, and children received a small prize.

Measures

The present study included data collected from parent and teacher questionnaires at Wave 1, children's academic achievement at Wave 1 and Wave 2, and publicly available school district records at Wave 1. Following procedures recommended by Knight et al. (2009), questionnaires that had not been previously used with Chinese-speaking samples (i.e., Family Demographics and Migration History and Parent-Teacher Involvement Questionnaire) were translated and back-translated by different bilingual speakers. Discrepancies were discussed and resolved in the translation team. The Chinese version was pilot tested with a small sample of Chinese speakers before being finalized.

School-level contextual factors (Wave 1)—School-level data for the 2007–2008 school year (Wave 1) was obtained using the School Accountability Report Card, which was downloaded from the California Department of Education website for every school that children in our study attended (School Accountability Report Card, 2007–2008). The following school-level variables were used in the current project: (a) the percentage of students receiving free- or reduced-price lunch (% FRPL), (b) the proportion of students in each racial/ethnic group (i.e., Whites, Latinos, Asians, African Americans, Filipinos, and Pacific Islanders), and (c) the school's Academic Performance Index (API) and API growth. To characterize school-level ethnic diversity in the student body, we computed a general variance (GV) diversity index using the proportion of students in these six racial/ethnic groups. The GV is computed as $1 - \sum_{i=1}^C P_i^2$, where C is the number of groups and P_i is the proportion of students in a given group (Budescu & Budescu, 2012). Similar to the approach used by Crosnoe (2001), a higher value on the diversity index reflects a higher degree of heterogeneity in student body race/ethnicity. Because the study focused on Chinese American children and the percentage of Chinese students at the school was not available in public data, we used the percentage of Asian students at the school as a proximal index of the concentration of co-ethnic students. Finally, we averaged the standardized scores of school API and API growth to create a composite score of schoolwide achievement.

Parent involvement (Wave 1)—To measure parent involvement, teachers and parents were asked to complete the Parent–Teacher Involvement Questionnaire (Conduct Problems Prevention Research Group, 1991), which assesses multiple domains of parent involvement. Domains of parent involvement used in this study included (a) school-based involvement

(parent and teacher report), (b) parent-teacher relationship quality (parent and teacher report), (c) parent endorsement of the school, and (d) teacher perceptions of the parent.

School-based Parent Involvement Behaviors (Parent and Teacher Report): The Parent–Teacher Involvement Questionnaire include four items regarding parent-teacher contact (e.g., “In the past year, how often have you called your child’s teacher/has this child’s parent called you”, “How often have you written to your child’s teacher/has this child’s parent written you a note”) and four items on parents’ volunteering or other school-based participation (e.g., “This child’s parent/you volunteered at the child’s school”, “This parent/you sent things to class like story books and other objects”). Items were rated from 1 (*not at all*) to 4 (*a lot*) or from 1 (*never*) to 5 (*more than once a week*). A confirmatory factor analysis previously conducted with the sample supported a two-factor structure: (a) a parent-reported school-based parent involvement factor, and (b) a teacher-reported school-based parent involvement factor (Anicama et al., 2018). Thus, two composite scores were formed: parent-reported school-based parent involvement (8 items, $\alpha = .75$), and teacher-reported school-based parent involvement (8 items, $\alpha = .79$).

Parent-Teacher Relationship Quality (Parent and Teacher Report): The parent report subscale includes six items (e.g., “You enjoy talking with your child’s teacher”, “You feel your child’s teacher cares about your child”) and the teacher report subscale includes five items (e.g., “How much is this parent interested in getting to know you”, “How well do you feel you can talk to and be heard by this parent”). The items were rated from 1 (*not at all*) to 4 (*a lot*). The α s for parent-teacher relationship quality in the present sample were .82 (6 items) for parent report and .74 (5 items) for teacher report.

Parent Endorsement of School (Parent Report): This subscale includes four items (e.g., “Your child’s school is a good place for your child to be”, “The staff at your child’s school is doing good things for your child”) rated from 1 (*strongly agree*) to 5 (*strongly disagree*). The alpha in the present sample was .96.

Teacher Perception of Parent (Teacher Report): This subscale includes three items (e.g., “How involved is this parent in his/her child’s education and school life?”, “How important is education in this family”) rated from 1 (*not at all*) to 4 (*a lot*). The alpha in the present sample was .75.

Family Level Socio-Cultural Factors (Wave 1)

Family Demographics and Migration History (Parent Report).—The Family Demographics and Migration History Questionnaire was adapted from a measure used in a longitudinal study of Mexican American immigrant families (Roosa et al., 2008). The measure was modified to better fit with our sample of Chinese American immigrant families by replacing items related to ethnicity (e.g., Mexican) or country of origin (e.g., Mexico) with responses relevant to our sample (e.g., Chinese and China, respectively). Demographic questions included maternal and paternal education and family annual income. Questions on migration history included mother and father’s country of birth and length of stay in the U.S.

Parent's Cultural Orientation (Parent Report).—The Cultural and Social Acculturation Scale (CSAS; Chen & Lee, 1996; Chen & Tse, 2010) is a bi-dimensional measure that assesses an individual's orientation towards their heritage culture (i.e., Chinese culture) and their host culture (i.e., U.S. American culture) independently. It includes 32 items that assessed cultural orientation in three domains: language proficiency (e.g., “How well do you understand spoken English/Chinese?”), social relationships (e.g., “How many Caucasian American/Chinese friends do you have?”), and media use (e.g., “How often do you read English/Chinese newspapers?”). Because the measure required parents to respond using Likert scales which vary from 1–4 to 1–7, the composites for Chinese and American cultural orientations were computed as the averages of standardized item scores across subscales. This measure has shown satisfactory internal reliabilities in a previous sample of Chinese American mothers (Chen & Tse, 2010; Garrett-Peters & Fox, 2007). For the present study, the alphas were .74 and .88 for parents' Chinese orientation and American orientation, respectively.

Academic Achievement (Standardized Tests): Children were individually administered subtests from the Woodcock-Johnson Test of Achievement, 3rd edition (WJ III; Woodcock et al., 2001). Two clusters were used – the Basic Reading Skills cluster and the Math Calculations Skills cluster. The Basic Reading Skills cluster included two subtests: Letter–Word Identification and Word Attack. The Letter–Word Identification subtest requires children to name and read words from a list and the Word Attack subtest requires children to read nonsense words. The Math Calculation Skills cluster consists of two subtests that include Calculation and Math Fluency. The Calculation subtest requires children to solve arithmetic computations of increasing difficulty and the Math Fluency subtest required children to quickly and accurately complete basic math calculations within a time limit. The WJ III has demonstrated good psychometric properties for both individual subtests and Basic Reading Skills and Math Calculation Skills clusters with reliabilities at .80 or above (Woodcock et al., 2001). Standard scores on the WJ III are based on a mean score of 100 and a standard deviation of 15. The age standardized scores were used in data analyses. Because the reading subtests were intended to evaluate children's English reading skills, they were administered in English. On the math subtests verbal instructions were provided to children in the language of their choice (i.e., Mandarin, Cantonese, or English). Instructions were translated into Mandarin or Cantonese and back-translated to English by bilingual team members to ensure equivalence across languages. The majority of children (86%) chose to receive verbal instructions for the math subtests in English. Children's standardized scores on the Math Calculation cluster did not differ significantly by language of verbal instruction.

Results

Descriptive Statistics and Preliminary Analyses

Descriptive statistics are presented in Table 1. Based on the respective cutoff for skewness and kurtosis of 2 and 7 (West, Finch, & Curran, 1995), all study variables were normally distributed. We noted that the sample means on age-standardized achievement scores ranged from 109–114 for Basic Reading Skills and 126–127 for Basic Math Skills, suggesting that overall, the sample was above national averages on academic achievement. To better

understand relations between family characteristics and the schools they attended, we computed correlations between family-level factors and school-level contextual factors, and intercorrelations between school-level factors (see Table 2).

In our community-based sample of Chinese immigrant families living in the San Francisco Bay Area, we found some interesting associations between family-level socio-cultural factors and characteristics of the children's schools. Specifically, higher school-level socioeconomic disadvantage (measured as % FRPL) was associated with lower family income ($r = -.54, p < .001$) and parental education ($r = -.47, p < .001$), suggesting that the commonly observed pattern of children from lower-SES families attending lower-SES schools (Baker et al., 2002) is applicable to Chinese American immigrant families living in the Bay Area. Furthermore, we found that the Chinese American children from higher-SES families attended schools with higher ethnic diversity ($r = .24, p < .001$) and lower concentrations of Asian students ($r = -.28, p < .001$) as compared to those from lower-SES families. Child age was positively correlated with schoolwide socioeconomic disadvantage ($r = .16, p < .05$). With regard to child generation status, children born in the U.S. attended schools with lower schoolwide socioeconomic disadvantage (higher SES schools) and a lower proportion of co-ethnic students than foreign-born children ($r = -.16, p < .05$). Parents' American orientation was negatively related to schoolwide socioeconomic disadvantage and the proportion of co-ethnic students ($r = -.48$ and $-.34, p < .001$) and positively related to student body diversity ($r = .26, p < .001$). This suggests that children from families with higher SES and more acculturated parents were more likely to attend schools with lower poverty, fewer Asian students, and higher overall student diversity. Moreover, compared to the second-generation children, the first-generation children were more likely to attend schools with higher poverty and schools with more Asian students. Considering intercorrelations between school contextual factors, schoolwide socioeconomic disadvantage and the proportion of co-ethnic students were both negatively correlated with student body diversity ($r = -.57$ and $-.90, p < .001$). Furthermore, the proportion of co-ethnic students was positively correlated with schoolwide socioeconomic disadvantage ($r = .61, p < .001$). Schoolwide achievement was positively correlated with a higher proportion of co-ethnic students and negatively correlated with student body diversity ($r = .61$ and $-.64, p < .001$). Thus, the schools with high concentrations of Asian students tended to have higher schoolwide disadvantage, lower student body diversity, but higher schoolwide achievement. Furthermore, more ethnically diverse schools had lower schoolwide socioeconomic disadvantage and lower schoolwide achievement.

Aim 1: Examining the Interrelations among Parent Involvement Variables

There were significant relations both within and across reporters among parent involvement measures (see Table 3). Within parent-reported measures, there was a positive relation between school-based parent involvement and parent-teacher relationship quality ($r = .44, p < .001$). This suggests that parents who reported engaging in more school-based parent involvement also reported higher levels of relationship quality with teachers. Within teacher-reported measures, school-based parent involvement was positively related to both parent-teacher relationship quality and perception of parents ($r = .53$ and $.36, p < .001$), and parent-teacher relationship and teachers' perception of parents were positively related (r

= .59, $p < .001$). This suggests that teachers who reported higher levels of parental school-based parent involvement perceived having a better relationship with parents and viewed parents as being more engaged. Across reporters, parent and teacher report of school-based parent involvement and parent-teacher relationship quality were positively related ($r_s = .17$ and $.19$, $p_s < .05$). Correlations between family demographic and parent involvement and achievement variables are reported in Supplementary Table 1 (S1).

Aim 2: Testing Concurrent Relations between School Contextual Factors and Parent Involvement Variables

Because this is a community-based sample where the children were clustered by schools, there were unequal cluster sizes across schools: only four schools had more than 10 students and 48 schools had only one student (average cluster size = 2.6). The intraclass correlation coefficients (ICCs) for parent-reported parent involvement variables ranged from 0.10 to 0.45, and the ICCs for teacher-reported parent involvement variables ranged from 0.05 to 0.22. The moderate ICC values provided empirical justifications for the need to use multilevel models. Thus, six two-level random intercept models with level-1 and level-2 predictors were tested (see Table 4), including three models predicting parent-reported parent involvement variables and three models predicting teacher-reported parent involvement variables. Separate models were tested for parent- and teacher-reported parent involvement variables because parent- and teacher-reported parent involvement variables were weakly correlated with each other and had different correlations with school contextual factors and family characteristics. Moreover, previous studies, including a study using Wave 1 data from the same sample of Chinese immigrant families, suggested that parent- and teacher-reported parent involvement likely tap into different constructs because parents and teachers attend to different kinds of parent involvement behavior (e.g., Anicama et al., 2018; Bakker & Denessen, 2007; Bakker et al., 2007).

The models were estimated in Mplus 8.3 (Muthén & Muthén, 2019). Missing data were handled using the full information maximum likelihood method (Muthén & Muthén, 2019). The level-1 predictors were family socio-cultural variables (i.e., parental education, income, child age, gender, generation status, parent figure, parents' Chinese and American orientations). The level-2 predictors were school contextual factors (i.e., schoolwide socioeconomic disadvantage, proportion of co-ethnic students, student body diversity, and schoolwide achievement). Because our research questions focused on between-group differences among Chinese American children, the level-1 and level-2 continuous predictors were grand-mean centered.

Models Predicting Parent-Reported Parent Involvement—As shown in Table 4, among the level-1 predictors, family income was negatively associated with parent-reported school-based parent involvement ($b = -0.01$, $p < .05$) and parental education was negatively associated with parents' endorsement of schools ($b = -0.08$, $p < .05$). Parents' American orientation was positively associated with school-based parent involvement and parent-teacher relationship ($b_s = 0.38$ and 0.35 , $p_s < .001$), but it was negatively associated with parents' endorsement of schools ($b = -0.31$, $p < .05$). By contrast, parents' Chinese orientation was positively associated with parents' endorsement of school ($b = 0.83$,

$p < 0.001$). Child age was negatively associated with parent-teacher relationship quality ($b = -0.10, p < 0.05$). As for the level-2 predictors, only student body diversity was uniquely associated with parent-reported parent involvement as a higher student body diversity was negatively associated with parent-reported school-based parent involvement, parent-teacher relationship quality, and parents' endorsement of schools ($bs = -1.12, -1.10, \text{ and } -1.90$, respectively; $ps < 0.01$).

Models Predicting Teacher-Reported Parent Involvement—As shown in Table 4, among the level-1 predictors, parent figure was a significant predictor of all three teacher-reported parent involvement variables. As compared to the children whose fathers participated in the study, those children whose mothers participated had higher scores on teacher-rated school-based parent involvement ($b = 0.17, p < .05$), parent-teacher relationship quality ($b = 0.24, p < .001$), and teachers' perception of parents ($b = 0.25, p < .05$). Moreover, parents' Chinese orientation was negatively associated with teacher-rated school-based parent involvement ($b = -0.20, p < .05$) and parent-teacher relationship quality ($b = -0.17, p < .01$). Among the level-2 predictors, student body diversity was negatively associated with school-based parent involvement ($b = -0.90, p < .01$) and parent-teacher relationship quality ($b = -1.38, p < .001$). Schoolwide achievement was negatively associated with parent-teacher relationship quality ($b = -0.33, p < .001$) and teachers' perception of parents ($b = -0.18, p < .05$). Moreover, the proportion of co-ethnic students was negatively associated with teachers' perception of parents ($b = -0.01, p < .05$).

Aim 3: Testing the Prospective Relations of Parent Involvement to Child Achievement

The ICCs for children's academic achievement across schools ranged from .21 to .39, supporting the need for multilevel analysis. Thus, four two-level random intercept models with level-1 and level-2 predictors were tested (see Table 5), including two models predicting Wave 2 reading and math achievement using parent-reported parent involvement variables and two models predicting Wave 2 reading and math achievement using teacher-reported parent involvement variables. Both models included family and school characteristics. The models were estimated in Mplus 8.3 (Muthén & Muthén, 2019). Missing data were handled using the full information maximum likelihood method (Muthén & Muthén, 2019). The level-1 predictors included (a) Wave 1 child reading or math achievement, (b) Wave 1 family socio-cultural variables (i.e., parent education, family income, child age, gender, generation status, parent figure, parents' Chinese and American orientations), and (c) Wave 1 parent involvement variables (i.e., school-based parent involvement, parent-teacher relationship, parent endorsement of school, teacher perception of parents). Level-2 predictors included school contextual factors (i.e., schoolwide socioeconomic disadvantage, proportion of co-ethnic students, student body diversity, schoolwide achievement). The level-1 and level-2 continuous predictors were grand-mean centered.

As shown in Table 5, none of the level-2 predictors (i.e., school contextual factors) significantly predicted Wave 2 academic achievement. As for level-1 predictors, Wave 1 achievement positively predicted Wave 2 achievement in the model using parent-reported parent involvement variables ($bs = 0.66, 0.58, ps < .001$ for reading and math,

respectively) and in the model using teacher-reported parent involvement variables ($bs = 0.69, 0.60, ps < .001$ for reading and math respectively), indicating cross-time consistency in achievement. However, none of the parent involvement variables predicted achievement. By contrast, a few family socio-cultural variables predicted achievement. Specifically, children's age negatively predicted Wave 2 reading and math skills ($bs = -2.63, -6.91, ps < .001$ in parent model; $bs = -2.29, -6.29, ps < .001$ in teacher model), suggesting that older children in the sample scored lower on achievement over time as compared to the younger children. Moreover, children's generation status predicted reading skills in that as compared to the first-generation children, the second-generation children in the sample scored lower on reading over time ($bs = -4.45, -4.16, ps < .01$ in parent and teacher models, respectively). Furthermore, in the model using parent-reported parent involvement variables, family income positively predicted Wave 2 reading ($b = 0.15, p < .05$) and parental education positively predicted Wave 2 math ($b = 0.96, p < .05$). Finally, parents' American orientation negatively predicted Wave 2 math in the model controlling for teacher-rated parent involvement ($b = -4.65, p < .05$).

We also conducted sensitivity analyses by testing the same models with Wave 1 reading or math achievement as the dependent variables (see Supplementary Table S2). The level-1 predictors included (a) Wave 1 family socio-cultural variables (i.e., parental education, income, child age, gender, generation status, parent figure, parents' Chinese and American orientations) and (b) Wave 1 parent involvement variables (i.e., school-based parent involvement, parent-teacher relationship, parent endorsement of school or teacher perception of parents). The level-2 predictors were Wave 1 school contextual factors (i.e., school socioeconomic disadvantage, proportion of co-ethnic students, school diversity index, schoolwide achievement). Similar to the results from the longitudinal models, none of the school-level predictors significantly predicted children's Wave 1 achievement scores. Moreover, none of the parent-reported parent involvement variables significantly predicted Wave 1 achievement. However, teacher-reported parent-teacher relationship was negatively associated with children's Wave 1 math achievement, and teachers' perceptions of parents were positively associated with children's Wave 1 math and reading achievement. Therefore, although parent-reported parent involvement did not relate to child achievement in either concurrent or longitudinal models, teacher-reported parent involvement showed unique associations with child achievement in concurrent models.

Discussion

This study examined the interrelations among behavioral and psychological aspects of parent involvement, links between school contextual factors and parent involvement, and prospective relations between parent involvement and children's academic achievement in a community-based sample of Chinese immigrant families. Our results indicate a few key takeaways. First, there is evidence that school-based parent involvement is higher among families with stronger psychological aspects of parent involvement, indicating a connection between behavioral engagement and positive regard between parents, teachers, and schools. Moreover, the strength of this finding was stronger within teacher report of parent involvement, rather than parent report, suggesting that parents' direct involvement in schools is more closely tied to teachers' perceptions of family-school connectedness.

Second, we found that some aspects of the school environment predicted parent involvement after controlling for family level factors. Specifically, the Chinese immigrant families in schools with higher student body diversity had lower school-based parent involvement behaviors, poorer parent-teacher relationships, and lower endorsement of schools. This finding suggests that immigrant parents are likely sensitive to the social, cultural, and ethnic match between themselves, the student body, and teachers, and that their perceived fit is likely related to their behavioral engagement. In sum, these findings suggest the need for teachers and schools to take proactive steps in bridging cultural gaps with immigrant parents to build a shared understanding of their educational practices and philosophy, methods of promoting achievement, and to build awareness of the potential for cultural factors to shape teachers' and parents' perceptions of each other. Finally, we did not find evidence for direct links between prior school-based parent involvement and children's later academic achievement, controlling for prior achievement, suggesting that other aspects of parent involvement (e.g., parental academic socialization practices) might have a more direct influence on children's achievement than the four parent involvement constructs considered in the present study.

Aim 1. Associations among School-Based Parent Involvement and Parent Involvement-Related Psychological Processes

Based on the conceptual framework (see Figure 1) that we adapted from Cheung (2019) and Garbacz et al. (2017), we hypothesized that Chinese immigrant parents' school-based parent involvement behaviors would be positively correlated with parent-teacher relationship quality and teachers' perceptions of parents/parents' endorsement of school. This hypothesis was partially supported. Teachers' ratings of parents' school-based involvement were positively correlated with the teacher-rated parent-teacher relationship quality and their perceptions of parents. Parents' ratings of their school-based involvement were positively correlated with their ratings of parent-teacher relationship quality. However, neither school-based parent involvement behavior nor relationship quality was correlated with parents' endorsement of schools. This suggests that Chinese American parents who are involved at their children's schools and have positive relationships with the teachers do not necessarily endorse or agree with the teaching philosophy and/or approaches of their children's schools. This is likely due to differences in educational systems, methods, and values between immigrants' home and host countries. Li et al. (2010) theorized that Chinese and European American cultures differ in learning-related values; whereas European American culture values self-expression, curiosity, and enjoyment in learning, Chinese culture values dedication, diligence, perseverance, and endurance of hardship in learning. These differences might shape how Chinese immigrant parents view a school's teaching philosophy and practice. One implication of this finding is that family engagement interventions serving immigrant families could include psychoeducation to help parents understand the rationale behind the school's teaching philosophy and practices, as well as educate parents and teachers about cultural differences in learning values and processes. Furthermore, it is important to note that these communications serve to highlight group-level norms in the context of appreciating and recognizing diversity between families, rather than reinforcing cultural stereotypes.

Aim 2. Relations of School-Level Contextual Factors to School-Based Parent Involvement Processes

Based on previous research on school-level contextual influences on parent involvement (Crosnoe, 2001), we examined two climate-related school characteristics (i.e., schoolwide socioeconomic disadvantage, achievement) and two school compositional characteristics (i.e., student body diversity, proportion of co-ethnic students) in relation to parent involvement. Contrary to the findings obtained from studies using national or school-based samples showing positive relations between schoolwide achievement and parent involvement (e.g., Bryk et al., 2010; Park et al., 2017), we found that schoolwide achievement was negatively associated with teacher-reported parent-teacher relationship quality and teachers' perception of parents in Chinese immigrant families (although it was unrelated to parent-reported parent involvement). Moreover, in contrast to past studies showing that schools with higher schoolwide socioeconomic advantage tended to have higher levels of parent involvement (e.g., Griffith, 1998; Hoover-Dempsey et al., 1987), socioeconomic advantage was mostly unrelated to school-based parent involvement among Chinese immigrant families. It is important to note that the present sample included children attending schools in Chinatown communities and that although schoolwide achievement was positively correlated with the proportion of Asian students, it was largely unrelated to socioeconomic disadvantage. This is partly reflective of the residential and socio-economic segregation of Chinese immigrants living in the San Francisco Bay Area. Chinese immigrants from low-SES backgrounds were more concentrated in ethnic enclaves (e.g., Chinatown) and their children attended schools with predominantly Asian students, whereas Chinese immigrants from higher-SES background lived in more culturally diverse and higher-SES neighborhoods, and their children attended schools with fewer Asian students. Thus, consistent with the segmented assimilation theory (Zhou, 2014), the diverse socioeconomic backgrounds of Chinese immigrant families can lead to diverse paths of acculturation and educational experiences for children. Zhou (2014) hypothesized that multiple cultural resources in ethnic communities support Chinese immigrant children's educational experiences, including ethnic supplementary educational institutions (e.g., Chinese language schools, afterschool tutoring) and information sharing among parents' informal ethnic networks (e.g., co-ethnic parents at children's school). Therefore, the culturally unique context of Chinese immigrant families living in ethnic enclaves might obfuscate the relations between school-level achievement, socioeconomic disadvantage, and parent involvement commonly observed in other samples. The negative association between schoolwide achievement and teachers' perceptions of parent involvement might reflect the mismatch between teachers' expectations of parent involvement and the actual involvement by Chinese immigrant parents. It is possible that in high-achieving schools, teachers perceive Chinese immigrant parents as less actively involved in children's learning experience at school as compared to native-born Chinese American parents or parents of other ethnic groups. The disconnect between teachers and immigrant parents can create further barriers to parent involvement.

Previous research examining school compositional factors such as student body ethnic diversity and proportion of co-ethnic students did not yield consistent findings, suggesting that the impacts of these school features on parent involvement might vary by ethnicity

or community (Crosnoe, 2001). Based on the cultural fit hypothesis (Calzada et al., 2015; Klugman et al., 2012), we expected that lower student body diversity and a higher proportion of co-ethnic students would be associated with higher school-based parent involvement behaviors among Chinese immigrant families. We found mixed results. Consistent with this hypothesis, we found that higher student body diversity, reflecting larger proportions of students from different ethnic and racial backgrounds rather than from any one group, was associated with lower school-based parent involvement and lower quality of parent-teacher relationship by both parent and teacher report, and lower parent endorsement of school. It is possible that in schools with a greater racial/ethnic mix of parents, Chinese immigrant parents find it more difficult to form close connections with other parents, which might make them reluctant to engage in school-based parent involvement activities and develop a close relationship with their child's teacher. Peña (2000) suggested that the dynamics between parents, such as cliques and concentration of power within a small group of parents, can be a significant barrier to parent involvement for immigrant parents. However, contrary to our hypothesis, the concentration of Asian students was negatively associated with teachers' perceptions of parents. Thus, simply increasing the number of co-ethnic students at school might not promote school-based parent involvement or psychological processes that motivate parent involvement among Chinese immigrant parents. Because Chinese immigrant families tend to focus on parent involvement strategies that support children's learning outside the school (e.g., private lessons, afterschool academic tutoring, supplementary learning materials; Louie, 2001), schools with high concentrations of Asian students might encounter more cultural barriers to encouraging school-based parent involvement (e.g., volunteering in school activities, attending parent teacher organization meetings) because parents might not view these as culturally normative practices. Because the present study did not examine home-based parent involvement, this interpretation is speculative and should be tested in future research with Chinese immigrant families.

In addition to school-level factors, we found a few significant relations between family level socio-cultural factors and school-based parent involvement that are worth discussing. First, consistent with previous analyses conducted with the same sample (Anicama et al., 2018), we found a positive relation between parents' American cultural orientation and school-based parent involvement. Moreover, by including parent involvement-related interpersonal processes, we found that parents' American orientation was positively linked to parent-rated parent-teacher relationship quality, suggesting that the more acculturated Chinese immigrant parents perceived a more positive relationship with their children's teachers. Interestingly, this trend did not hold for teacher-reported relationship quality. Parents' American orientation was negatively related to their endorsement of schools. The discrepancy in findings between parent and teacher ratings and between parents' parent involvement behaviors and endorsement of schools might be due to the cultural mismatch between teachers and parents. Although the Chinese immigrant parents with higher American orientation displayed higher levels of behavioral engagement at schools (likely facilitated by their higher English proficiency; Anicama et al., 2018), they may not necessarily agree with the educational philosophy or approach of American schools. Because we did not collect data on parents' or teachers' cultural values and educational

beliefs, we are unable to test this hypothesis. Future research can examine whether the teacher-parent cultural match is associated with psychological processes of parent involvement.

By contrast, parents' Chinese orientation was associated with lower teacher-rated school-based parent involvement and poorer parent-teacher relationships, although parents with higher Chinese orientation expressed a higher endorsement of school and teachers. Because these findings were found after controlling for family SES, parents' American orientation (which also reflects parents' English proficiency), and school-level contextual factors, this suggests that cultural beliefs about parent involvement (e.g., children's learning at school is the primary responsibility of teachers, and/or parents should not interfere with teachers' job) might be a potential barrier to Chinese American parents' school-based parent involvement.

Aim 3. Prospective Relations of School-Based Parent Involvement to Children's Academic Achievement

Our last aim was to examine the prospective relations of parent involvement processes, as well as school and family factors to children's academic achievement. We found that after controlling for Wave 1 achievement, neither parent involvement processes nor school context factors significantly predicted academic achievement. Because of the relatively short time interval between Wave 1 and Wave 2 assessment (1.5 years), the cross-time stability in children's academic achievement (as indicated by the positive autoregressive effects of Wave 2 achievement predicted by its Wave 1 counterpart) might have left little variance in Wave 2 achievement to be explained by other constructs. Moreover, our school-based parent involvement measure captured parents' participation in school activities and parent-teacher contact, which according to the meta-analysis by Castro et al. (2015) had weaker associations to children's achievement than other types of parent involvement (e.g., parents' academic expectations, reading with children). This finding adds additional clarity to the mixed literature linking parent involvement to achievement by providing evidence that school-based parent involvement and relationship factors between parents, schools, and teachers are not directly related to achievement, suggesting that other parent involvement constructs may be more relevant.

Past research has indicated that both the direction of relations between school-based parent involvement and student achievement and the underlying pathways are complex, and bidirectional and indirect relations might exist among these constructs (Hill & Tyson, 2009; Seginer, 2006). Thus, the null findings are not surprising. Additionally, Cheung (2019) found positive relations between parent involvement, student-teacher relationship, and student achievement in adolescents, an age group for whom this relational factor may be more important given the increased social demands of adolescence as compared to the early elementary years. Past research also suggests that parents can promote students' academic motivation by increasing their desire to build their own goals for academic success and demonstrate responsibility, which may be particularly important for Chinese American immigrant families. Unfortunately, the present study did not consider motivation- or socialization-related parent involvement (Cheung & Pomerantz, 2012).

In contrast to the lack of prediction by parent involvement and school factors, a few family and child socio-cultural factors significantly predicted academic achievement. Specifically, as compared to the first-generation (foreign-born) children, the second-generation (U.S.-born) Chinese American children scored lower on reading achievement over time. These findings seem somewhat consistent with the Immigrant Paradox (i.e., the phenomenon that immigrant students tend to perform better in school than their U.S.-born peers; Marks et al., 2014). Moreover, the older children in the sample scored lower on standardized tests of reading and math achievement as compared to the young children in the sample. This finding is somewhat consistent with findings from a national study that showed that although children of East Asian families outperformed their peers from other cultural groups on tests of academic achievement at kindergarten, their advantages decreased in later grades as peers from other cultural groups caught up, resulting in narrowed achievement gaps (Han, 2008).

Study Limitations and Implications

There are several limitations to this study. First, because the study sampled Chinese immigrant families living in the San Francisco Bay Area, a metropolitan area with high cultural and socioeconomic diversity, the findings may not generalize to Chinese immigrant families living in other parts of U.S. Second, because the study used a community-based sample to examine school contextual factors, the unequal cluster sizes across schools and the small average cluster size (2.6) might have underestimated the school-level effects. Third, school context was measured by compositional variables (e.g., socioeconomic advantage, proportion of co-ethnic students) available in the School Accountability Report Card, which did not capture interpersonal processes at the school (e.g., school climate, concentration of ethnic Chinese students versus the broader Asian category). Future research on school influences on parent involvement and academic development of immigrant children should consider both structural and interpersonal characteristics of the school. Fourth, we measured academic outcomes by standardized tests and did not measure children's learning processes (e.g., academic motivation and school engagement). As past research has indicated that parent involvement indirectly shapes children's achievement by building academic motivation and promoting self-regulated learning (Cheung & Pomerantz, 2012), including measures of children's learning processes in future research can help elucidate the mechanisms through which parent involvement shapes students' achievement. Finally, home-based parent involvement was not assessed in the present study despite evidence that immigrant parents in particular are likely to show their engagement in children's education through home-based practices (Antony-Newman, 2019). Inclusion of these practices may reveal important associations between primary modes of parent involvement among Chinese American immigrant families and could influence parent-teacher relationships if teachers are aware of these efforts by parents.

The findings have a few implications for how to promote school-based parent involvement in Chinese American immigrant families. First, in ethnically diverse schools, school-based interventions for promoting parent involvement can target building strong social connections between parents and teachers and promoting teachers' cultural competency in engaging and connecting with families from diverse cultural backgrounds. Second, schools with high ethnic diversity and high overall achievement should work to ensure that parents of all

cultural and socioeconomic backgrounds feel welcome and are provided with opportunities to participate in and make social connections within the school community. Third, in schools with high proportions of Asian students, family engagement interventions can educate parents on the rationales behind the school's teaching philosophy and practices and cultural differences in learning values and processes (e.g., presenting rationales for how school-based parent involvement in the American education context can promote student achievement, and helping families and teachers work collaboratively to set shared goals for student growth and wellbeing). Fourth, teachers can utilize parents' informal social networks (e.g., by soliciting help from parent leaders in the informal parent networks) to augment existing school-wide efforts to encourage school-based parent involvement.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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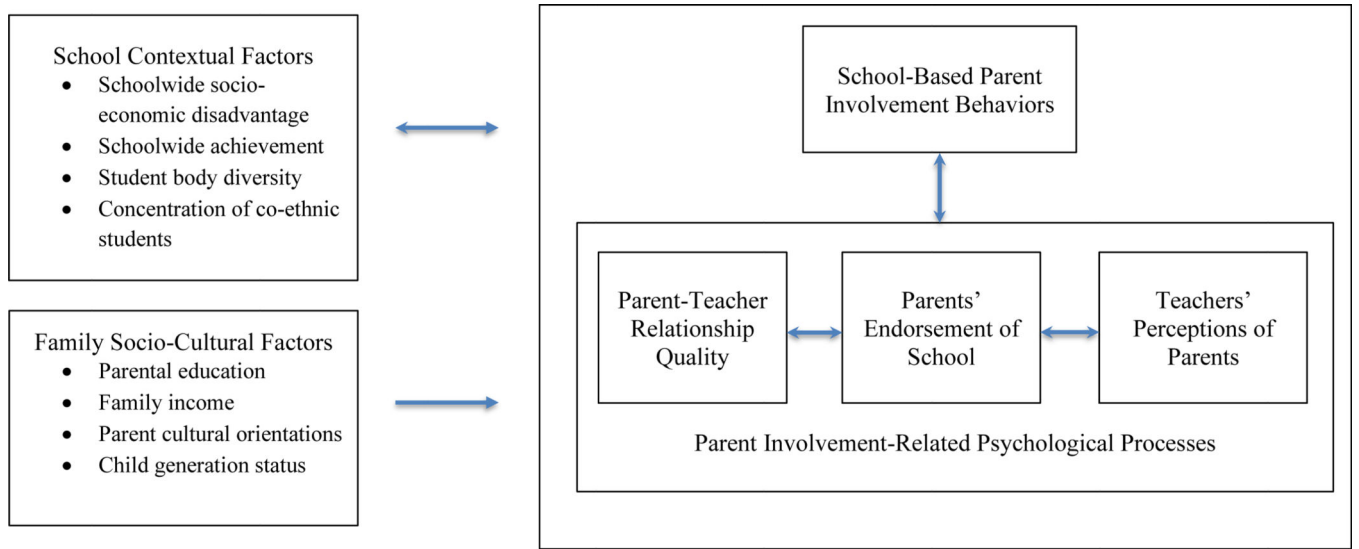


Figure 1.
A Conceptual Model of School-Based Parent Involvement Processes

Table 1

Descriptive Statistics of Study Variables

| Variable | <i>M</i> | <i>SD</i> | Min | Max | Skewness | Kurtosis |
|---------------------------------|-----------|-----------|--------|-----------|----------|----------|
| Parent education | 13.18 | 2.52 | 5.50 | 20.0 | 0.47 | 0.59 |
| Per capita income | 12,049.47 | 8,472.38 | 625.00 | 50,000.00 | 1.32 | 1.99 |
| Child gender ^a | 0.50 | 0.50 | 0.00 | 1.00 | 0.00 | -2.02 |
| Child age | 7.43 | 0.70 | 5.81 | 9.14 | -0.03 | -0.78 |
| Child generation ^b | 0.79 | 0.41 | 0.00 | 1.00 | -1.44 | 0.07 |
| Parent figure ^c | 0.83 | 0.38 | 0.00 | 1.00 | -1.76 | 1.10 |
| Parent American orientation | 0.03 | 0.62 | -1.16 | 2.09 | 0.47 | -0.09 |
| Parent Chinese orientation | 0.01 | 0.50 | -1.98 | 1.15 | -0.82 | 2.07 |
| % FRPL ^d | 58.72 | 25.26 | 0.00 | 88.00 | -0.83 | -0.51 |
| % Asian ^e | 57.59 | 31.03 | 1.00 | 94.00 | -0.15 | -1.44 |
| Student body diversity | 0.46 | 0.26 | 0.12 | 0.82 | -0.33 | -1.51 |
| Schoolwide achievement | 0.003 | 0.85 | -2.22 | 1.88 | -0.35 | -0.73 |
| School-based PI – P | 2.04 | 0.55 | 1.00 | 4.50 | 1.33 | 3.09 |
| Relationship quality – P | 3.22 | 0.58 | 1.33 | 4.00 | -0.71 | 0.04 |
| School endorsement – P | 3.85 | 1.10 | 1.00 | 5.00 | -1.04 | 0.12 |
| School-based PI – T | 1.98 | 0.52 | 1.00 | 4.25 | 1.22 | 2.76 |
| Relationship quality – T | 3.28 | 0.52 | 1.80 | 4.00 | -0.56 | -0.31 |
| Perception of parent – T | 3.54 | 0.54 | 1.33 | 4.00 | -1.27 | 1.42 |
| Child reading (W1) ^f | 114.27 | 10.45 | 79.00 | 144.00 | -0.21 | 1.10 |
| Child math (W1) | 126.87 | 15.29 | 77.00 | 179.00 | 0.50 | 0.77 |
| Child reading (W2) | 109.04 | 10.84 | 79.00 | 134.00 | 0.03 | -0.36 |
| Child math (W2) | 125.69 | 15.02 | 89.00 | 168.00 | 0.05 | 0.23 |

Note. PI = Parent Involvement; P = Parent report; T = Teacher report; W1 = Wave 1; W2 = Wave 2.

^aChild gender is coded as: 0 = females, 1 = males;

^bChild generation is coded as: 0 = 1st generation, 1 = 2nd generation;

^cParent figure is coded as: 0 = fathers, 1 = mothers;

^d% FRPL = percent of students at the school receiving free- or reduced-price lunch;

^e = proportion of Asian students;

^fWJ III standard scores were based on a mean of 100 and standard deviation of 15.

Table 2

Correlations between School Contextual and Family Level Factors

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|----------------------------------|---------|---------|-------|-------|-------|------|---------|-------|---------|---------|---------|----|
| 1. Parent education | -- | | | | | | | | | | | |
| 2. Per capita income | .63*** | -- | | | | | | | | | | |
| 3. Child gender ^a | -.03 | -.02 | -- | | | | | | | | | |
| 4. Child age | -.16* | -.21** | .001 | -- | | | | | | | | |
| 5. Child generation ^b | .13 | .22** | -.02 | -.10 | -- | | | | | | | |
| 6. Parent figure ^c | -.04 | .01 | -.03 | -.12 | .08 | -- | | | | | | |
| 7. Parent American ^d | .56*** | .51*** | -.003 | -.17* | .16* | -.02 | -- | | | | | |
| 8. Parent Chinese ^e | -.03 | -.07 | .03 | .03 | .13 | .07 | .002 | -- | | | | |
| 9. % FRPL ^f | -.47*** | -.54*** | .03 | .16* | -.16* | .001 | -.48*** | .14 | -- | | | |
| 10. % Asian ^g | -.34*** | .28*** | -.002 | .06 | -.16* | .05 | -.34*** | .04 | .61*** | -- | | |
| 11. Student body diversity | .30*** | .24*** | .01 | -.09 | .13 | .03 | .*** | -.009 | -.57*** | -.90*** | -- | |
| 12. Schoolwide achieve | -.04 | .05 | -.07 | -.06 | -.11 | .04 | -.04 | -.07 | -.07 | .61*** | -.64*** | -- |

Notes. Pearson correlations were reported between two continuous variables. Point-biserial correlations were reported between a dichotomous variable (e.g., child gender, parent figure) and a continuous variable. Phi coefficients were reported as correlations between two dichotomous variables.

^aChild gender is coded as: 0 = females, 1 = males;

^bChild generation is coded as: 0 = 1st generation, 1 = 2nd generation;

^cParent figure is coded as: 0 = fathers, 1 = mothers;

^dParent American cultural orientation;

^eParent Chinese cultural orientation;

^f% FRPL = percent of students at the school receiving free- or reduced-price lunch;

^g% Asian = proportion of co-ethnic students.

* $p < .05$.

.100 > d

.10 > d
**

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Table 3

Correlations between Parent Involvement Variables and Children's Achievement

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|--------------------|--------------------|----|
| 1. School-based PI - P | -- | | | | | | | | | |
| 2. Relationship quality - P | .44 ^{***} | -- | | | | | | | | |
| 3. School endorsement - P | -.03 | .08 | -- | | | | | | | |
| 4. School-based PI - T | .17 [*] | .24 ^{***} | -.13 | -- | | | | | | |
| 5. Relationship quality - T | .32 ^{***} | .19 ^{***} | .53 ^{***} | .53 ^{***} | -- | | | | | |
| 6. Perception of parent - T | .02 | -.02 | .36 ^{***} | .36 ^{***} | .59 ^{***} | -- | | | | |
| 7. Child Reading (W1) | .13 | .07 | -.10 | .14 | .08 | .11 | -- | | | |
| 8. Child Math (W1) | -.05 | -.10 | .06 | .03 | -.02 | .15 [*] | .37 ^{***} | -- | | |
| 9. Child Reading (W2) | .03 | .02 | -.13 | .06 | .12 | .07 | .68 ^{***} | .27 ^{***} | -- | |
| 10. Child Math (W2) | -.17 [*] | .01 | .17 [*] | -.003 | .06 | .19 ^{**} | .33 ^{***} | .51 ^{***} | .49 ^{***} | -- |

Notes. PI – Parent Involvement; P = Parent report; T = Teacher report; W1 = Wave 1; W2 = Wave 2.

* $p < .05$.** $p < .01$.*** $p < .001$.

Table 4
 Multilevel Models Predicting Parent- and Teacher-Reported Parent Involvement from School Contextual and Student Socio-Cultural Factors

| Fixed effects | School-Based PI (P) | | Parent-Teacher Relationship (P) | | Endorsement of School (P) | | School-Based PI (T) | | Parent-Teacher Relationship (T) | | Perception of Parents (T) | |
|-------------------------------|---------------------|----------------|---------------------------------|----------------|---------------------------|----------------|---------------------|------------|---------------------------------|------------|---------------------------|------------|
| | Coeff (SE) | Coeff (SE) | Coeff (SE) | Coeff (SE) | Coeff (SE) | Coeff (SE) | Coeff (SE) | Coeff (SE) | Coeff (SE) | Coeff (SE) | Coeff (SE) | Coeff (SE) |
| Intercept | 1.90*** (0.12) | 2.90*** (0.21) | 3.98*** (0.26) | 2.49** (0.76) | 3.07*** (0.10) | 3.49*** (0.11) | | | | | | |
| Level-2 predictors | | | | | | | | | | | | |
| % FRPL ^a | 0.000 (0.003) | 0.000 (0.002) | -0.001 (0.004) | -0.001 (0.003) | -0.003 (0.002) | -0.002 (0.003) | | | | | | |
| % Asian ^b | -0.01 (0.003) | -0.004 (0.003) | -0.01 (0.01) | -0.001 (0.003) | -0.004 (0.002) | -0.01* (0.002) | | | | | | |
| Student body diversity | -1.12** (0.40) | -1.10** (0.35) | -1.90** (0.61) | -0.90** (0.35) | -1.38*** (0.31) | -0.65 (0.37) | | | | | | |
| Schoolwide achieve | 0.01 (0.08) | -0.02 (0.08) | 0.09 (0.15) | -0.13 (0.07) | -0.33*** (0.06) | -0.18* (0.08) | | | | | | |
| Level-2 R ² | 0.98 | 0.95 | 0.96 | 0.96 | 0.998 | 0.99 | | | | | | |
| Level-1 predictors | | | | | | | | | | | | |
| Parent education | 0.005 (0.02) | 0.015 (0.02) | -0.08* (0.03) | 0.04 (0.02) | 0.02 (0.02) | 0.02 (0.02) | | | | | | |
| Per capita income | -0.01* (0.004) | -0.01 (0.01) | -0.01 (0.01) | -0.01 (0.01) | 0.002 (0.004) | 0.002 (0.01) | | | | | | |
| Child gender ^c | 0.02 (0.08) | -0.05 (0.10) | -0.20 (0.16) | -0.04 (0.06) | 0.04 (0.06) | -0.10 (0.09) | | | | | | |
| Child age | 0.04 (0.03) | -0.10* (0.05) | 0.15 (0.08) | 0.01 (0.09) | 0.05 (0.06) | 0.04 (0.04) | | | | | | |
| Child generation ^d | 0.07 (0.09) | 0.13 (0.22) | -0.16 (0.21) | 0.03 (0.07) | -0.03 (0.06) | -0.04 (0.07) | | | | | | |
| Parent figure ^e | 0.01 (0.10) | 0.17 (0.09) | -0.01 (0.18) | 0.17* (0.07) | 0.24*** (0.07) | 0.25* (0.10) | | | | | | |
| Parent American ^f | 0.38*** (0.06) | 0.35*** (0.07) | -0.31* (0.15) | -0.03 (0.07) | -0.10 (0.08) | -0.04 (0.08) | | | | | | |
| Parent Chinese ^g | -0.13 (0.10) | -0.01 (0.07) | 0.83*** (0.18) | -0.20* (0.09) | -0.17*** (0.06) | -0.14 (0.07) | | | | | | |
| Level-1 R ² | 0.19 | 0.18 | 0.38 | 0.07 | 0.07 | 0.06 | | | | | | |

Notes. PI = Parent Involvement; P = Parent report; T = Teacher report; Coeff = unstandardized regression coefficient; SE = standard error of regression coefficient.

^a% FRPL = percent of students at the school receiving free- or reduced-price lunch;

^b% Asian = proportion of co-ethnic students;

^cChild gender is coded as: 0 = females, 1 = males;

^dChild generation is coded as: 0 = 1st generation, 1 = 2nd generation;

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^eParent figure is coded as: 0 = fathers, 1 = mothers;

^fParent American = Parent American orientation;

^gParent Chinese = Parent Chinese orientation.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Multilevel Models Predicting Wave 2 Achievement from Wave 1 School Contextual, Family Level Factors, and Parent Involvement

Table 5

| Fixed effects | Models Using Parent-Reported PI Variables | | Models Using Teacher-Reported PI Variables | |
|-------------------------------|---|-------------------------------|--|-------------------------------|
| | Child Reading (W2) Coeff (SE) | Child Math (W2) Coeff (SE) | Child Reading (W2) Coeff (SE) | Child Math (W2) Coeff (SE) |
| Intercept | 111.54 ^{***} (2.42) | 124.57 ^{***} (3.23) | 111.55 ^{**} (2.46) | 123.52 ^{***} (3.58) |
| Level-2 predictors | | | | |
| % FRPL ^a | 0.04 (0.03) | 0.06 (0.09) | 0.06 (0.03) | 0.07 (0.09) |
| % Asian students ^b | 0.02 (0.04) | -0.002 (0.09) | 0.01 (0.04) | -0.01 (0.09) |
| Student body diversity | 2.83 (4.62) | 7.51 (10.81) | 5.02 (5.19) | 3.34 (9.95) |
| Schoolwide achievement | -1.04 (0.98) | -0.85 (2.34) | 0.04 (1.11) | 0.01 (2.57) |
| Level-1 R ² | 0.96 | 0.23 | 0.95 | 0.12 |
| Level-1 predictors | | | | |
| Child achievement at Wave 1 | 0.66 ^{***} (0.06) | 0.58 ^{***} (0.08) | 0.69 ^{***} (0.06) | 0.60 ^{***} (0.07) |
| Parent education | -0.14 (0.34) | 0.96 [*] (0.43) | -0.23 (0.31) | 0.67 (0.37) |
| Per capita income | 0.15 [*] (0.07) | 0.17 (0.13) | 0.15 (0.08) | 0.17 (0.12) |
| Child gender ^c | -1.58 (1.46) | 2.20 (1.61) | -2.69 (1.57) | 1.23 (1.39) |
| Child age | -2.63 ^{**} (0.85) | -6.91 ^{***} (1.36) | -2.29 ^{**} (0.77) | -6.29 ^{***} (1.16) |
| Child generation ^d | -4.45 ^{**} (1.56) | -3.61 (2.07) | -4.16 ^{**} (1.44) | -2.77 (1.90) |
| Parent figure ^e | 0.84 (1.26) | 3.49 (2.21) | 1.32 (1.56) | 4.08 (2.43) |
| Parent American ^f | 1.60 (1.40) | -4.35 (2.05) | 1.52 (1.34) | -4.65 [*] (1.94) |
| Parent Chinese ^g | -0.68 (1.53) | -0.39 (1.73) | -0.14 (1.37) | 1.65 (1.79) |
| School-based PI | -0.02 (0.87) | -1.88 (2.05) | -2.04 (1.45) | -1.69 (1.52) |
| Parent-teacher relationship | 0.22 (1.25) | 2.98 (2.46) | 4.43 (2.51) | 1.84 (2.39) |
| P. endorsement/T. perception | 0.18 (0.62) | 1.93 (1.15) | -2.37 (1.45) | 1.51 (1.71) |
| Level-2 R ² | 0.53 | 0.47 | 0.56 | 0.48 |

Notes. WJ III standard scores were based on a mean of 100 and standard deviation of 15. PI = Parent Involvement; W2 = Wave 2; Coeff. = unstandardized regression coefficient; SE = standard error of regression coefficient.

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^a% FRPL = the percentage of students receiving free or reduced price lunch;

^b% Asian = proportion of co-ethnic students;

^cChild gender is coded as: 0 = females, 1 = males;

^dChild generation is coded as: 0 = 1st generation, 1 = 2nd generation;

^eParent figure is coded as: 0 = fathers, 1 = mothers;

^fParent American = Parent American cultural orientation;

^gParent Chinese = Parent Chinese cultural orientation.

* $p < .05$.

** $p < .01$.

*** $p < .001$.