

Acculturation, Discrimination, and Depressive Symptoms among Chinese American Adolescents: A Longitudinal Study

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Abstract This study focused on the perceptions of discrimination for Chinese American adolescents: how perceptions changed over time, how generational status and acculturation were related to these changes, and whether earlier discrimination experiences were related to subsequent depressive symptomatology. The sample included 309 Chinese American adolescents who participated in a 2 year, three-wave longitudinal study. Findings suggest that perceptions of discrimination became more acute over time for the majority of Chinese American adolescents in our study, that greater initial levels of perceptions of discrimination predicted a slower orientation to U.S. culture, that discrimination was not related to orientation to Chinese culture, and that an increase in perceptions of discrimination was associated with an increase in depressive symptoms. Greater orientation to Chinese culture was also related to fewer depressive symptoms. The findings are discussed in light of the unique cultural context of the study.

Keywords Acculturation · Discrimination · Depressive symptoms · Chinese American adolescents

Between 2005 and 2006 there was a 3.2% increase in the Asian American population, the highest of any racial/ethnic group during that time period (U.S.Bureau of the Census 2008). It is projected that between 2000 and 2050 the Asian American population will grow by an astounding 213% (U.S.Bureau of the Census 2008). Adolescents (10–19 year olds) constitute a significant proportion (13.4%) of this population (U.S.Bureau of the Census 2007). Notably, a majority

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(92%) of these adolescents have at least one parent who is foreign-born (U.S. Bureau of the Census 2003a). Due to their growing numbers, there is a continued need to understand the needs and challenges of the Asian American community.

Racial and ethnic discrimination, defined as unfair, differential treatment based on one's race or ethnicity, is one such challenge. Indeed, experiencing discrimination is a common stressor for immigrant youth as they adapt to the majority culture (Romero et al. 2007). It is one of the most significant stressors facing adolescents of immigrant families, especially those who are ethnic minorities (Portes and Rumbaut 1996, 2001). In our study, we focus on Chinese American adolescents.

In the U.S., there are 3.6 million Asians of Chinese descent, making up the largest Asian group (U.S. Bureau of the Census 2008). Chinese Americans have a long and rich history of immigration to the U.S., as they were the first Asian ethnic group to immigrate to the U.S. in significant numbers (Takaki 1998). Historically, the Chinese American community has experienced racial/ethnic discrimination from the early years of immigration. For instance, they are the only group in U.S. history to have been excluded for immigration based on their ethnic background (Chinese Exclusion Act, 1882). Although there are no longer such explicit and formal discriminatory practices in place, contemporary evidence—based on college students and adults—suggests that discrimination is still a part of life for many Chinese Americans (Goto et al. 2002; Ying 1996; Ying et al. 2000).

Researchers have only recently begun to examine the psychological impact of discrimination on Asian Americans, let alone specific Asian groups such as the Chinese (Alvarez et al. 2006). There is growing evidence that discrimination is robustly linked to a host of negative outcomes for Asian American college students and adults, including lower social competence, social connectedness, and self-esteem, and greater substance abuse, depressive symptoms, psychological distress, and risk for chronic illness (i.e., heart disease, pain, and respiratory illnesses; Gee et al. 2007; Lee 2005; Noh and Kasper 2003; Ying et al. 2000; Yip et al. 2008). Studies of younger populations that include Asian American adolescents, however, are still few in number.

Notably, the few studies that have included Asian American adolescents reported that Asian Americans experienced higher levels of peer discrimination compared to their African American and Latino counterparts (Fisher et al. 2000; Greene et al. 2006; Rosenbloom and Way 2004). These findings are a cause for concern for several reasons. One reason is that there is evidence that discrimination is linked to poorer adolescent adjustment in terms of lower self-esteem and greater depressive symptoms (Fisher et al. 2000; Greene et al. 2006). A second reason is that adolescents have fewer or less sophisticated coping strategies to deal with stressors (such as discrimination) than adults do (Garnefski et al. 2002). Thus, facing discrimination as an adolescent versus as an adult may be particularly harmful. Finally, personal narratives by Asian American college students who were asked to reflect back on their life histories reveal they did not discuss racism or discrimination with their parents when they were growing up. If they did, their parents often minimized or dismissed these experiences (Garrod

and Kilkenny 2007). In sum, discrimination is a part of life for many Asian American adolescents, and yet we still know little about these experiences. In our study, then, we focus on discrimination among Chinese American adolescents: how perceptions change over time, how acculturation relates to these changes, and whether earlier discrimination experiences are related to subsequent depressive symptomatology.

Theoretical Models to Understand Discrimination and its Correlates

We draw on two theoretical perspectives to understand how experiences of discrimination among Chinese American adolescents may relate to their development. The first is Garcia Coll et al.'s (1996) integrative developmental model of children and adolescents. Garcia Coll et al. (1996) argue that it is impossible to understand the development of minority children and adolescents without acknowledging how social position variables (e.g., race, ethnicity, class, gender) contribute to adolescent development. Social position variables indirectly contribute to adolescent development by exposing adolescents to social mechanisms such as racism and discrimination. Consequently, experiencing racism and discrimination may profoundly affect the developmental outcomes of adolescents. Ignoring these experiences impedes our knowledge of adolescents of color and may compromise our ability to serve these populations. Accordingly, in keeping with the integrative developmental model of minority children and adolescents, we expect that because Chinese American adolescents are adolescents of color, they are at risk for exposure to discrimination. Further, we account for social position variables by including gender and parental education in our analyses.

Because a majority of Chinese American families have at least one immigrant parent, the second perspective that provides a framework for our study is acculturative stress theory. This theory proposes that when individuals are exposed to two or more cultures, they must negotiate and adapt to cultural differences (e.g., in languages, customs, values, norms for appropriate behaviors; Berry and Kim 1988; Berry et al. 1987). With this adaptation comes certain stressors, such as being of minority (and therefore less powerful) status (Berry 2003). Individuals who are in the cultural minority, then, are likely to experience racial and ethnic discrimination as they attempt to navigate through the majority culture (Berry 2003; Berry et al. 2006; Romero et al. 2007; Verkuyten and Thijs 2006). These experiences can be challenging and may lead to greater psychological maladjustment for adolescents of immigrant families (Romero et al. 2007; Verkuyten and Thijs 2006).

In sum, based on these two theoretical perspectives, one focusing on adolescents of color and the other on adolescents of immigrant families, we examine Chinese American adolescents' experiences of discrimination and consider these experiences within the context of acculturation. Further, we explore the link between discrimination and psychological maladjustment (i.e., depressive symptoms).

Trajectory of Discrimination

Only two studies to our knowledge have taken a longitudinal approach to explore how perceptions of discrimination change over time among adolescents (i.e., Greene et al. 2006; Wong et al. 2003). Both of these studies show that adolescents report increasing perceptions of discrimination over time. Greene et al.'s (2006) longitudinal study of Black, Latino and Asian American adolescents found an increase in perception of discrimination during the high school years. Greene et al. highlight cognitive and social changes during adolescence that may account for this age-related increase in discrimination. For instance, as adolescents become increasingly sophisticated cognitively, they are better able to understand abstract concepts (Inhelder and Piaget 1958; Keating 2004) such as racism, inequality, and oppression, which may lead to greater perceptions of discrimination. Adolescents are also increasingly able to think hypothetically and into the future and thus anticipate experiencing discrimination in different situations. They may also be in the process of exploring their ethnic identity and thus may become more aware of and sensitized to assaults on their ethnicity (Phinney 2003). Finally, adolescents widen their social networks and may be more likely to encounter discrimination by other ethnic groups (Phinney and Chavira 1995). Thus, in our study we expect that Chinese American adolescents will report increasing perceptions of discrimination over time.

Predictors of Discrimination

Importantly, Greene et al. (2006) focused on social position variables (i.e., gender and ethnicity) that predicted changes in discrimination. They found that gender did not predict changes (i.e., girls and boys showed similar trajectories in perceptions of discrimination) but that ethnicity did. More specifically, Black adolescents reported greater increases in discrimination by peers and adults compared to other ethnic groups. In our study of Chinese American adolescents, we focus on two key aspects of immigration to predict perceptions of discrimination: generational status (Fulgini 2001; Yip et al. 2008) and acculturation experiences (Berry 2003; Berry et al. 2006; Portes and Rumbaut 2001).

A study of Chinese American college students reported that foreign-born (first generation) students perceived higher levels of discrimination than American-born students (Ying et al. 2000). Because first generation immigrants may be less facile in English and less accustomed to the behaviors and customs of the U.S., they may be a more visible target for discrimination. It may also be the case that first generation immigrants may be more sensitive to perceiving discrimination if they are uneasy with their abilities to get along in the U.S. In fact, some Asian American immigrants expect discrimination because they moved to a country that is not their own (Garrod and Kilkenny 2007). Other researchers have also suggested that first generation immigrant adolescents might report greater discrimination than adolescents born in the U.S.; however, this was not explicitly tested (e.g., Greene et al. 2006).

In our study we expect that first generation adolescents will report more discrimination than second/later generation adolescents will.

In addition to generational status, it is important to assess the level of involvement or adaption to one's culture (i.e., acculturation). Generational status may be an important proxy for acculturation, but it is not precise. We do not know specifically what it is about being a first or second-generation immigrant that may lead to experiences of greater discrimination. Although acculturation has been hypothesized to play an important role in discrimination experiences, it has not been well studied (Greene et al. 2006; Phinney et al. 2006).

On an individual level, acculturation refers to the process of individual change and adaptation as a result of continuous contact with a new, distinct, culture (Graves 1967). Current studies of acculturation acknowledge that orientation to the traditional and the majority culture should be considered independently of one another (Berry 2003). Studies of immigrant adolescents (who are also ethnic minorities) show that many consider themselves to be bicultural (e.g., Berry et al. 2006; Phinney and Devich-Navarro 1997). Accordingly, in our study we examine Chinese and U.S. acculturation separately in relation to discrimination.

Assessing acculturation acknowledges that there is individual variation within the different generational statuses. That is, not all first-generation immigrants evidence the same level of cultural adaptation and involvement—some will stay more involved in their heritage culture and others will become more involved in the majority culture. Because greater familiarity and involvement in the majority culture may ease the quality of interactions with majority group members, we hypothesize that adolescents who are more adapted to and oriented toward U.S. culture will experience less discrimination than those less oriented to U.S. culture.

Second/later generation adolescents will also vary in the extent to which they maintain their heritage culture—some parents immerse their children in their heritage culture (such as by attending Chinese Saturday schools, celebrating Chinese holidays, speaking only Mandarin or Cantonese to their children) whereas others do not. Adolescents who are highly involved in Chinese culture may be at greater risk for being the target of discrimination because they may be seen by others as more “foreign” or “strange.”

On the other hand, we sampled from San Francisco, a city with a numerically significant and culturally strong Chinese community (Wong 1998). In this particular context, where being Chinese is regularly celebrated (e.g., having an annual, very visible and highly attended Chinese New Year parade) it may be the case that adolescents who are very oriented toward Chinese culture would not experience greater discrimination than those who are less oriented toward Chinese culture. In other words, because of the presence of many other Chinese (and Asian) individuals, adolescents who are very involved in Chinese culture may not be seen as foreign or strange. Considering the particular community from which we sampled, we predict that those who are more oriented toward Chinese culture would not experience greater discrimination than those less oriented toward Chinese culture.

Discrimination and Depressive Symptoms

Because acculturation stress theory suggests that negative acculturative experiences may lead to maladjustment, we also explore whether discrimination is associated with depressive symptoms. Several studies have indicated that depression is among the most important mental health concerns for Asian American youth. Compared to European–American youth, Asian American youth report more depressive symptoms and higher levels of psychological distress (Greenberger and Chen 1996; Portes and Rumbaut 2001). Experiences of discrimination may contribute to this distress. In a longitudinal study of high school adolescents, discrimination by peers was associated with increases in depressive symptoms and decreases in self-esteem over time (Greene et al. 2006). These findings are consistent with a number of cross-sectional studies documenting that experiences of discrimination are associated with more negative well-being (Gee et al. 2007; Lee 2003, 2005; Noh and Kaspar 2003; Yip et al. 2008). We expect, then, that adolescents perceiving greater discrimination over time would also experience greater depressive symptoms over time.

Summary of Hypotheses

- 1) Adolescents' perceptions of discrimination will increase over time.
- 2) First generation adolescents will report more discrimination than second/later generation adolescents.
- 3) Adolescents with greater orientation toward U.S. culture will report less discrimination than those with less orientation toward U.S. culture. Adolescents with greater orientation toward Chinese culture will not report more discrimination than those with less orientation toward Chinese culture.
- 4) Adolescents who perceive greater discrimination will report more depressive symptoms over time (i.e., an increase in discrimination will relate to an increase in depressive symptoms).

Method

Setting

We sampled from San Francisco, an ethnically diverse city with 43.3% European Americans, 33% Asian and Pacific Islanders, 14% Latino Americans, 6% African Americans, 2.5% mixed race, 0.2% Native Americans, and 0.6% other (U.S. Bureau of the Census 2003b). Among the Asian and Pacific Islander group, the Chinese are the largest group (65.8%) followed by 16.5% Filipino, 4.2% Japanese, 3.3% Korean, 3.3% Vietnamese, 1.3% Native Hawaiian or other Pacific Islander, and 3.3% other Asian (U.S. Bureau of the Census 2003b). San Francisco has a rich history of Chinese immigration, starting in the mid 1800s. In 1960s, there was a large wave of Chinese immigrants to the U.S., and in particular to San Francisco.

Most of these immigrants were from Hong Kong. Today, San Francisco is a culturally vibrant city with a very strong Chinese community. The Chinese community enjoys institutional support in the form of Chinese churches, language schools, and community youth centers. Furthermore, a vibrant Chinatown (the oldest Chinatown in the U.S.) provides a focal point for community members (Wong 1998).

We recruited adolescents from two high schools that were ethnically diverse. Both schools had 53% of adolescents with Chinese backgrounds. The representation of other ethnic groups was similar between the two schools; one school reported 17.8% White, 5.6% Latino, 4.9% Filipino, 2.3% African American, 1.9% Korean, 1.4% Japanese, 0.3% Asian Indian, and 11.9% other non-White students. The other high school reported 14.4% White, 6.1% Latino, 5.1% African American, 4.5% Filipino, 1.7% Japanese, 1.6% Korean, 0.5% Asian Indian, and 13.0% other non-White students. Overall, the school contexts reflected a diversity of ethnic groups as did the broader community, but they included an over-representation of Asians and in particular, students of Chinese backgrounds. We targeted these two schools precisely because they had a higher proportion of students of Chinese background; thus, these two schools do not represent the ethnic distribution of the broader San Francisco community.

Procedure

Adolescents were recruited from two high schools when the first author made announcements to school assemblies and after-school clubs geared towards students of Chinese background (e.g., Chinese Club, Chinese Cultural Arts Club) and by posting fliers. The study was presented as a project entitled “Chopsticks and Forks: Understanding the Experiences of Chinese and Chinese American Adolescents.” The first author told the students that we were interested in finding out about their experiences as Chinese and Chinese American adolescents growing up in the Bay Area. Adolescents who obtained a signed guardian/parent consent form and signed an assent form were invited to participate. The survey was completed during classroom hours or immediately after school. Parents were not present at the time. Adolescents were told their responses were confidential and that responses would not be shared with either the parent or other adolescents. Adolescents were compensated \$15 each for participating in the first two waves of data collection and \$20 each for the third wave.

Surveys were offered in English and Chinese. The English version was translated into Chinese by three bilingual adults who were fluent in both English and Chinese. All of the adults were born outside of the U.S. (two in Taiwan and one in Hong Kong) and had subsequently immigrated to the U.S. in adolescence and young adulthood. We chose translators who were of differing generations (one translator was over 60 years old, the other two between 25 and 30 years old) and who were familiar with both Mandarin and Cantonese to account for variations in the Chinese language due to cohort and geographical differences. A majority of adolescents (86%) completed the surveys in English and the rest completed it in Chinese. All

study procedures and measures were approved by the first author's university institutional review board.

Participants

The sample included 309 9th and 10th grade Chinese American adolescents who identified their father or mother to be of Chinese descent. At Time 1 the adolescents' mean age was 14.7 years ($SD = 0.71$) with a range from 13 to 17 years, and 54% were female. At Time 2 (1 year later) the mean age was 15.8 years ($SD = 0.73$). At Time 3 (2 years after Time 1) the mean age was 16.8 years ($SD = 0.71$). Twenty-nine percent of adolescents were first-generation (foreign-born), born in China ($n = 54$), Hong Kong ($n = 19$), Taiwan ($n = 3$), Macaw ($n = 4$), Vietnam ($n = 2$), Thailand ($n = 1$), Germany ($n = 1$), South America ($n = 1$), and Myanmar (Burma) ($n = 1$). One adolescent did not report his/her nativity or where he/she was born. On average, foreign-born adolescents had lived in the U.S. for 5.67 years ($SD = 4.08$) and U.S.-born adolescents for 14.6 years ($SD = 0.84$). Most of the adolescents grew up with both parents (91%) and most had at least one sibling (89%).

Concerning maternal education, 4% of mothers had completed elementary school or less, 11% attended middle school, 15% attended some high school, 31% graduated from high school, 19% attended some college or university, and 20% graduated from college/university or more. Concerning paternal education, 7% of fathers had completed elementary school or less, 15% attended middle school, 16% attended some high school, 28% graduated from high school, 16% attended some college or university, and 19% graduated from college/university or more. Maternal and paternal education were correlated at $r = 0.64$ ($p < 0.001$). A new variable was created (parent education) representing the highest level of education attained by either parent. This variable was used in all analyses.

Of the 309 adolescents in the first assessment, 234 participants (76%) were retained in the second wave, and 218 participants (71% of the original 309) completed the survey in the third wave. A comparison of adolescents who had complete data at all three waves versus incomplete (data only at one or two waves) revealed that they did not differ in birth order ($t(307) = 1.61, ns$), generational status ($t(306) = -0.35, ns$), years lived in the U.S. ($t(307) = -1.42, ns$), level of U.S. acculturation at Time 1 ($t(307) = -1.17, ns$), or Chinese acculturation at Time 1 ($t(307) = -0.06, ns$).

Measures

Perceived Discrimination (Gil and Vega 1996)

Students' perceptions of discrimination were measured by three items: "How often have you been treated unfairly because you are Asian?" "How often do people dislike you because you are Asian?" and "How often have you seen friends or family be treated unfairly because they are Asian?" Respondents answered on a

Likert scale ranging from 1 = never to 5 = always. Mean scores were calculated so that a higher score indicated greater discrimination. This scale has demonstrated criterion validity by correlating with more negative adjustment in Mexican and Vietnamese youth (Nguyen 2004). In this study Cronbach's alphas were 0.82, 0.82, and 0.87 at Times 1, 2, and 3, respectively.

The Acculturation Scale (Nguyen et al. 1999)

The original scale measured orientation toward U.S. culture and orientation toward Vietnamese culture separately. We adapted this measure to our Chinese sample by substituting the word “Vietnamese” with “Chinese.” Adolescents completed this scale at three time points. This 50-item scale is based on a bidimensional view of acculturation and was operationalized in terms of attitudes, behaviors, and values along two dimensions—orientation toward majority U.S. culture (25 items) and orientation toward heritage Chinese culture (25 items). For each item, respondents were asked to rate on a 5-point Likert scale the extent to which they agree with the attitude or behavior in question (1 = strongly disagree to 5 = strongly agree). Mean scores were calculated so that higher scores indicated greater orientation toward U.S. and Chinese culture. Both the U.S. and Chinese dimensions correlated with years lived in the U.S. in the expected directions, demonstrating convergent validity. For instance, U.S. acculturation was positively correlated to length of time lived in the U.S. ($r = 0.33, 0.25, 0.26, p < 0.001$ at Times 1, 2, and 3, respectively) whereas Chinese acculturation was negatively correlated to length of time lived in the U.S. ($r = -0.37, -0.35, -0.22, p < 0.001$ at Times 1, 2, and 3, respectively). The reliabilities for the present sample were good for the U.S. acculturation subscale ($\alpha = 0.85, 0.82, \text{ and } 0.83$ at Times 1, 2, and 3, respectively) and Chinese acculturation subscale ($\alpha = 0.82, 0.82, \text{ and } 0.83$ at Times 1, 2, and 3, respectively).

Center for Epidemiological Studies—Depression (CES-D; Radloff 1977)

This 20-item scale measured depressive symptoms. Using a scale ranging from 1 = rarely to 4 = most of the time, adolescents indicated how often they felt or behaved in certain ways during the past week. They responded to items such as: “I was bothered by things that usually don't bother me.” Positively worded items were reverse-coded and mean scores calculated so that a higher score indicated higher levels of depressive symptoms. In line with previous literature with Asian American adolescents and the use of the CES-D (Brown et al. 2007; Castro and Rice 2003; Kim et al. 2006; Nguyen et al. 1999), we used the overall score. The CES-D demonstrated adequate reliability with Chinese American populations (Ying 1988). In the present study, Cronbach's alphas were 0.85, 0.86, and 0.87 at Times 1, 2, and 3, respectively.

Results

Preliminary Analyses

The percent who answered “never” to all three discrimination items at Times 1, 2, and 3 was 22%, 16%, and 20%, respectively, meaning that at all three times, a majority of adolescents (between 78% and 84%) perceived discrimination based on being Asian.

Age was not associated with depressive symptoms. Age was negatively associated with U.S. acculturation ($r = -0.18, -0.14, -0.16, p < 0.05$, at Times 1, 2, and 3, respectively) and positively associated with Chinese acculturation ($r = 0.21, 0.18, 0.16, p < 0.05$, at Times 1, 2, and 3, respectively). Age was also positively correlated with discrimination ($r = 0.20, 0.23, 0.19, p < 0.01$, at Times 1, 2, and 3, respectively).

There were no sex differences in U.S. acculturation, Chinese acculturation, or discrimination at three time points. However, at Time 1, females ($M = 1.75, SD = 0.44$) reported higher depressive symptoms than males ($M = 1.63, SD = 0.39; t(277) = -2.23, p = 0.026$). There were no sex differences in depressive symptoms at Times 2 and 3.

Parent education was positively associated with adolescents' U.S. acculturation ($r = 0.19, 0.13, 0.23, p < 0.05$, at Times 1, 2, and 3, respectively) and negatively associated with adolescents' Chinese acculturation ($r = -0.32, -0.30, -0.27, p < 0.001$, at Times 1, 2, and 3, respectively). Parent education was not associated with adolescent discrimination or depressive symptoms at any of the three time points. In light of the significant relationships with age, sex, and parent education for the main study variables, we controlled for these three demographic variables in later analyses.

Bivariate correlations among the main study variables and their means and standard deviations are reported in Table 1. The correlations suggest that generational status was related to perceived discrimination only at Time 1 (i.e., first generation adolescents reported more discrimination). U.S. acculturation at Times 2 and 3 (but not Time 1) was related to perceived discrimination at all three times (i.e., adolescents more oriented to U.S. culture reported less discrimination). In contrast, Chinese acculturation at Times 1 and 2 was associated with perceived discrimination only at Time 1 but not for Times 2 and 3 (i.e., adolescents more oriented to Chinese culture reported greater discrimination). Depressive symptoms were not related to generational status or U.S. acculturation. However, depressive symptoms at Time 2 were negatively related to Chinese acculturation at Times 2 and 3, such that greater depressive symptoms were associated with less orientation to Chinese culture. Depressive symptoms (at all three time points) were also correlated to perceived discrimination at all three times (i.e., greater depressive symptoms were associated with greater perceived discrimination) with the exception of one correlation, the link between depressive symptoms at Time 1 with depressive symptoms at Time 3 ($r = 0.10, p = 0.09$).

Table 1 Bivariate correlations, means, standard deviations, and ranges for the main study variables

	1	2	3	4	5	6	7	8	9	10	11	12	M	SD	Range
1. Generational status	–												1.78	0.54	1–4
2. U.S. acculturation—T1	0.22***	–											3.65	0.47	1–5
3. U.S. acculturation—T2	0.19**	0.72***	–										3.63	0.46	1–5
4. U.S. acculturation—T3	0.22***	0.51***	0.66***	–									3.65	0.44	1–5
5. Chinese acculturation—T1	–0.39***	–0.21**	–0.30***	–0.28***	–								3.47	0.43	1–5
6. Chinese acculturation—T2	–0.32***	–0.30***	–0.26***	–0.30***	0.72***	–							3.48	0.45	1–5
7. Chinese acculturation—T3	–0.22***	–0.20***	–0.31***	–0.17**	0.63***	0.68***	–						3.41	0.40	1–5
8. Discrimination—T1	–0.25***	–0.09	–0.17**	–0.17**	0.16**	0.16*	0.10	–					1.80	0.69	1–5
9. Discrimination—T2	–0.12	–0.10	–0.24***	–0.13*	0.11	0.05	0.05	0.51***	–				1.98	0.76	1–5
10. Discrimination—T3	–0.08	–0.09	–0.18**	–0.17**	0.09	0.07	0.04	0.46***	0.56***	–			2.00	0.80	1–5
11. Depressive symptoms—T1	–0.01	0.05	–0.02	0.01	–0.01	–0.12	–0.02	0.34***	0.25***	0.23***	–		1.70	0.42	1–4
12. Depressive symptoms—T2	–0.05	0.01	–0.12	–0.05	–0.03	–0.18**	–0.17*	0.18**	0.30***	0.24***	0.51***	–	1.85	0.46	1–4
13. Depressive symptoms—T3	–0.02	0.04	–0.07	–0.03	0.02	–0.05	–0.07	0.10	0.23***	0.34***	0.44***	0.46***	1.86	0.48	1–4

Note: T1, T2, and T3 refer to data collected at Times 1, 2, and 3, respectively. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Latent Growth Curve Modeling

To test the hypotheses we chose latent growth curve modeling for two reasons: (a) we were interested in examining developmental trajectories of constructs (such as discrimination) and individual variation in these trajectories; and (b) we were interested in modeling how two developmental trajectories relate to one another (e.g., testing how change in one construct relates to change in another). These are not possible to do with other types of longitudinal analyses such as autoregressive modeling (Curran and Bollen 2001).

For the remaining analyses we included those cases with data from at least two time points. Because we had missing data (some cases were lost across times and some parents did not provide data), we carried out analyses using missing data in MPLUS v2.13 (Muthén and Muthén 2001), which does not impute missing data but estimates the parameters only with the cases present by employing maximum likelihood estimation. To ensure appropriate estimates given this method of managing missing data, we excluded cases with data from only one time of measurement ($n = 60$). We also reran models without imputing missing data and there were no major changes in the results (e.g., directionality and magnitude of association did not change). With the missing imputation included we observed (a) slightly better fitting models and (b) greater power in the analyses.

Our plan of analyses follows the suggestions of Duncan et al. (2006). First, we estimated unconditional (no covariates) latent growth curve models to describe the trajectory for adolescent perceptions of discrimination. Second, we examined how adolescent generational status predicted perceptions of discrimination. We also included three control variables in this conditional model and in the remaining models described: adolescent age, sex, and parental education. Third, we estimated two dual processes models (i.e., modeling two trajectories simultaneously). In these models, the latent growth curve parameters (i.e., intercept and slope) are estimated for each trajectory. In addition, the relations between latent growth curve parameters for each trajectory are estimated in relation to one another. We did this to test whether discrimination was associated with acculturation: discrimination with U.S. acculturation and discrimination with Chinese acculturation. Fourth, we estimated a dual process model for discrimination and depressive symptoms. For each of these four analyses we also estimated multiple group cohort models to test whether the two cohorts (9th and 10th graders at Time 1) differed in their growth trajectories. Based on chi-square difference tests of model fit, the results suggest that the multiple group models do not significantly differ from the models based on the entire sample (i.e., there were no significant cohort effects). Thus, the results we report are based on the entire sample.

To test our first hypothesis that perceptions of discrimination would increase over time, we estimated a latent growth curve model in which the repeated measures of perceptions of discrimination were specified as indicators of two growth parameters: a latent intercept factor representing initial status at Time 1 and a latent slope factor representing change over time. For the slopes that estimated discrimination over three points in time, the indicators were fixed at 0, 1, and 2 to represent the distance of 1 year between measurements. This model assumes that the rate of change is

similar in the first time interval (between Times 1 and 2) and the second interval (between Times 2 and 3). Thus, we estimated linear growth over time. The model showed an acceptable fit to the data (CFI = 0.986, TLI = 0.958, RMSEA = 0.09, $\chi^2(1) = 3.393$, $p = 0.065$). The estimated mean level of discrimination at Time 1 was 1.81 ($p < 0.001$) and the estimated average rate of change was 0.10 ($p < 0.001$), indicating, as hypothesized, that adolescents perceived greater discrimination over time. The estimated variance of the intercept (0.286) was significant ($p < 0.001$), which indicates there were individual differences in adolescent perceptions of discrimination in terms of mean levels at Time 1. The estimated variance of the slope (0.056) approached significance ($p < 0.10$), which suggests individual variation in the rate of change over time.

To test the second hypothesis that first generation adolescents would perceive more discrimination than second/later generation adolescents, we estimated a conditional process model in which the latent growth factors were explained by generational status. We included adolescent age, sex, and parent education as controls. We estimated betas for the paths from generational status to discrimination initial status and slope. The model showed a good fit to the data (CFI = 0.988, TLI = 0.965, RMSEA = 0.04, $\chi^2(5) = 7.295$, $p = 0.20$). Adolescent generational status predicted initial levels in discrimination ($b = -0.287$, $p < 0.001$) and change over time in discrimination (0.12, $p < 0.01$). As hypothesized, first generation adolescents reported greater discrimination at Time 1. However, second/later generation showed a steeper increase in discrimination over time than first generation. To describe this in more detail, we used *t*-tests to show that at Time 1, first and second/later generation adolescents differed significantly in perceived discrimination ($t(277) = 4.26$, $p < 0.001$). However, by Time 3, this difference in perceived discrimination had diminished and was no longer significant ($t(254) = 1.24$, *ns*). The mean levels of perceived discrimination for first generation adolescents were 2.07, 2.11, and 2.10 for Times 1, 2, and 3, respectively. The mean levels of perceived discrimination for second/later generation adolescents were 1.69, 1.91, and 1.96 for Times 1, 2, and 3, respectively.

To test the third hypothesis that discrimination would be related to U.S., but not Chinese, acculturation, we estimated two parallel process models. One model was estimated for discrimination and U.S. acculturation and the other for discrimination and Chinese acculturation. We included adolescent age, sex, parent education, and generational status as controls. In these models, we estimated covariances for discrimination and acculturation initial statuses and slopes and betas for the paths from discrimination initial status to acculturation slope and acculturation initial status to discrimination slope. For U.S. acculturation, the latent growth curve model showed an adequate fit to the data (CFI = 0.983, TLI = 0.957, RMSEA = 0.046, $\chi^2(15) = 23.93$, $p = 0.07$). Initial mean levels of discrimination and U.S. acculturation were not correlated with one another ($b = -0.013$, *ns*), nor were changes in discrimination and U.S. acculturation over time ($b = 0.01$, *ns*). Further, initial mean levels of U.S. acculturation were not related to changes in discrimination over time ($b = -0.03$, *ns*). However, there was a trend where initial levels of discrimination were related to changes in U.S. acculturation over time ($b = -0.06$, $p < 0.10$) such that those who experienced greater discrimination at

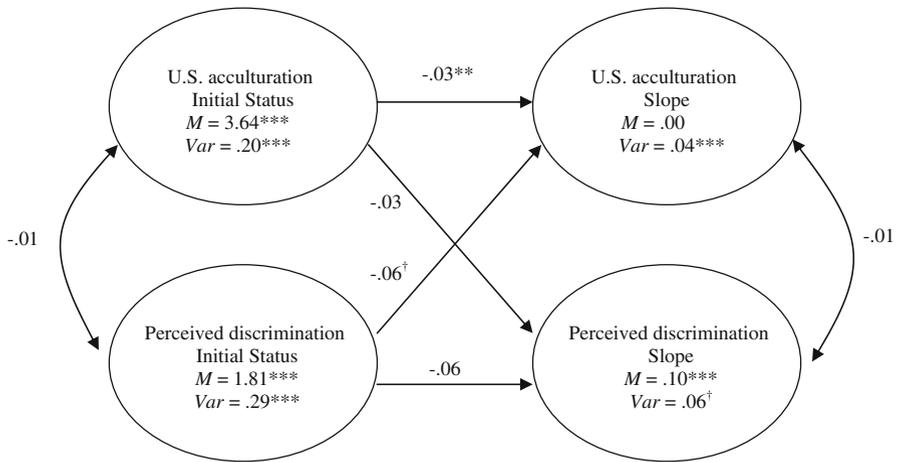


Fig. 1 Summary of parameter estimates for parallel process latent growth models of adolescent U.S. acculturation and perceived discrimination. *Note:* Adolescent age, sex, generational status, and parent education were used as controls but are not depicted here. Numbers in the latent circles are based on the unconditional models. $^{\dagger}p < 0.10$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$

Time 1 became oriented toward U.S. culture over time at a slower rate. Thus, the hypothesis that discrimination would be negatively related to U.S. acculturation was only partially supported (see Fig. 1).

Concerning the relationship of discrimination with Chinese acculturation, the latent growth curve model showed a good fit to the data (CFI = 0.993, TLI = 0.983, RMSEA = 0.03, $\chi^2(15) = 18.94$, $p = 0.22$). Initial mean levels of discrimination and Chinese acculturation were not correlated with one another ($b = 0.01$, *ns*), nor were changes in discrimination and Chinese acculturation over time ($b = 0.00$, *ns*). Initial mean levels of Chinese acculturation were not related to changes over time in discrimination ($b = 0.02$, *ns*) and initial levels of discrimination were not related to changes over time in Chinese acculturation ($b = 0.00$, *ns*). Thus, the hypothesis that discrimination would not be related to Chinese acculturation was supported (see Fig. 2).

Finally, to examine the fourth hypothesis that discrimination and depressive symptoms were associated over time, we again estimated a parallel process model. However, because we were more interested in understanding adolescents' resultant depression the growth model was changed such that the intercept for depression was estimated at Time 3 with growth in the slope weighted appropriately to capture change over time from the first to the third year (Time 1 = -2, Time 2 = -1, Time 3 = 0). This change in the model allowed us to explain how earlier experiences with discrimination and change over time in those experiences explained the end product of change over time in depressive symptoms. In this model, we estimated betas for the paths from initial levels of discrimination (Time 1) to depressive symptoms at Time 3, initial levels of discrimination to changes in depressive symptoms, and changes in discrimination to Time 3 level of depressive symptoms.

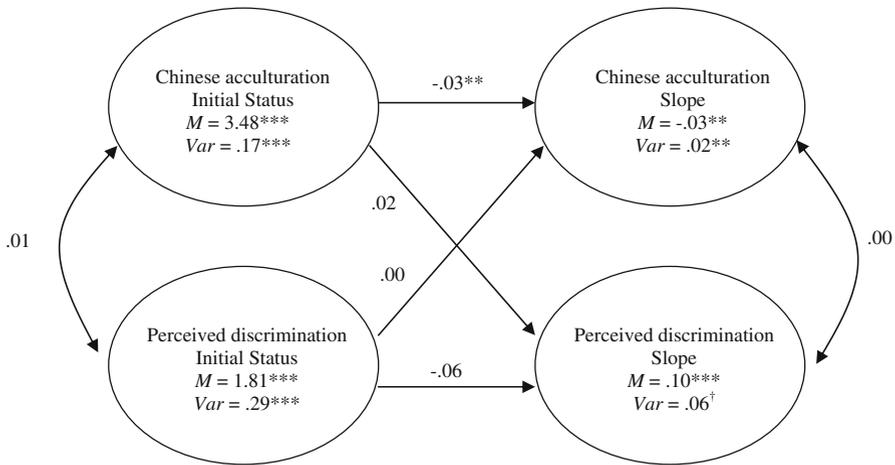


Fig. 2 Summary of parameter estimates for parallel process latent growth models of adolescent Chinese acculturation and perceived discrimination. *Note:* Adolescent age, sex, generational status, and parent education were used as controls but are not depicted here. Numbers in the latent circles are based on the unconditional models. † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

We also estimated a covariance for discrimination and depressive symptoms slopes. We included adolescent age, sex, parent education, and generational status as controls. The latent growth curve model showed an adequate fit to the data (CFI = 0.981, TLI = 0.951, RMSEA = 0.04, $\chi^2(15) = 22.79, p = 0.09$). Initial mean levels of discrimination predicted Time 3 levels of depressive symptoms ($b = 0.30, p < 0.001$) such that higher levels of discrimination at Time 1 predicted higher subsequent levels of depressive symptoms. Neither changes in depressive symptoms ($b = 1.37, ns$), nor change in discrimination ($b = 0.26, ns$) predicted Time 3 level of depressive symptoms. However, changes in discrimination were associated with changes in depressive symptoms ($b = 0.03, p < 0.001$), such that an increase in discrimination was associated with an increase in depressive symptoms. Thus, the hypothesis that greater discrimination would be related to greater depressive symptoms was partially supported (see Fig. 3).

To assess whether these results held when acculturation was taken into account, we ran two final models. The models were similar to this last set, except one included U.S. acculturation and the other Chinese acculturation, as additional predictors of depression. For the model that included U.S. acculturation, the results showed an adequate fit to the data (CFI = 0.973, TLI = 0.944, RMSEA = 0.05, $\chi^2(34) = 53.94, p = 0.02$). The relations among discrimination and depressive symptoms held, and U.S. acculturation did not additively contribute to the prediction of depressive symptoms. For the model that included Chinese acculturation, the results showed an adequate fit to the data (CFI = 0.982, TLI = 0.961, RMSEA = 0.04, $\chi^2(34) = 48.90, p = 0.05$), and the relations among discrimination and depressive symptoms held. There was one notable trend: changes in Chinese acculturation were associated with changes in depressive symptoms

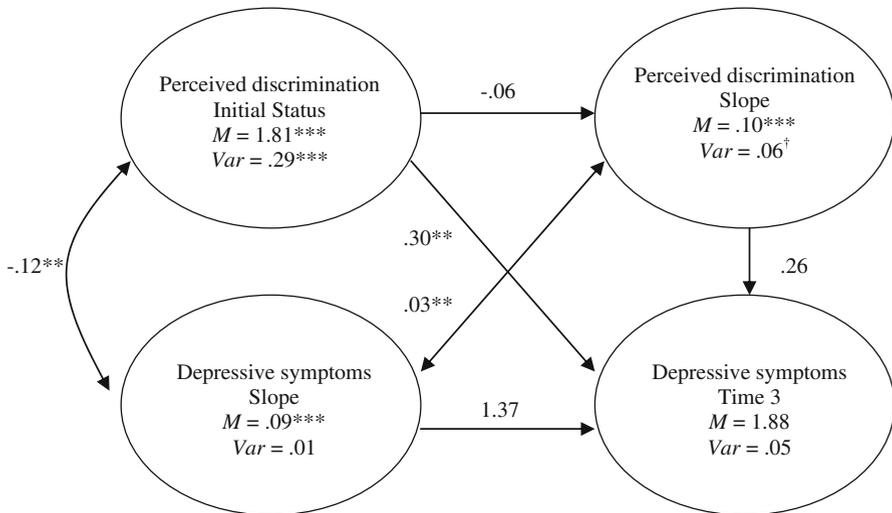


Fig. 3 Summary of parameter estimates for parallel process latent growth models of perceived discrimination and depressive symptoms. *Note:* Adolescent age, sex, generational status, and parent education were used as controls but are not depicted here. Numbers in the latent circles are based on the unconditional models. † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

($b = -0.43$, $p = 0.05$), such that adolescents who became more oriented toward Chinese culture over time also reported a decrease in depressive symptoms.

Discussion

The purpose of this study was to examine how perceptions of discrimination changed over time, how generational status and acculturation related to these trajectories, and how discrimination was associated with depressive symptoms for Chinese American adolescents. Findings suggest that perceptions of discrimination become more acute over time for the majority of Chinese American adolescents in our study, that greater initial perceptions of discrimination predicted a slower orientation to U.S. culture, that greater orientation to Chinese culture was associated with fewer depressive symptoms, and that an increase in perceptions of discrimination are associated with an increase in depressive symptoms.

Consistent with previous work, adolescents perceived greater discrimination over time (Greene et al. 2006). Cognitive and social changes during adolescence may explain this trajectory. As adolescents continue to mature cognitively, they may become more aware of the broader historical and social contexts that contribute to discrimination and racism. In addition, as the social circles of adolescents widen and opportunities to interact with more individuals expand, these experiences may expose them to more instances of discrimination (Phinney and Chavira 1995). We sampled from the ethnically and culturally diverse context of San Francisco where the peer (school) contexts were characterized by significant numbers of Chinese and

other Asian Americans. Even in this culturally supportive context, a majority of adolescents reported experiencing discrimination and these experiences occurred more frequently over time. Future research should examine other, more ethnically homogenous contexts to see if adolescents report similar levels of discrimination. In both contexts (i.e., culturally diverse and homogenous) adolescents may experience increasing levels of discrimination, but in the culturally supportive environment adolescents may also have the resources and supports to connect to their ethnic group and build a strong ethnic identity (Phinney 2003). Having a cohesive, supportive cultural network available to counter the increasing perceptions of discrimination is important as there is evidence that having positive feelings toward one's ethnic group buffers the negative effects of discrimination (Greene et al. 2006; Lee 2005).

As predicted, first generation adolescents reported more perceptions of discrimination than second/late generation adolescents, at least at the start of the study. This finding is consistent with a study of Chinese American college students (Ying et al. 2000). Further research to clarify reasons behind these generational differences would be valuable. Is it the case that first generation adolescents are more visible targets of discrimination because they may have difficulties with the majority culture language or customs? Or is it the case that first generation adolescents are primed to experience discrimination as they know they are immigrants to a country that is not theirs (yet)? Notably, however, although second-generation adolescents in our study reported lower perceptions of discrimination at the outset of the study, 2 years later their perceptions had risen to match those of the first generation. Thus, over time, the differences between the two generations may be minimized as the first generation increasingly is able to navigate the majority culture more comfortably. Or, it may be the case that second and later generation adolescents become increasingly aware of discrimination. Even though they are born in the U.S., they are often still considered foreigners. For instance, it is sometimes assumed that even U.S. born Asians do not speak English (Takaki 1998). This phenomenon of being the 'perpetual foreigner' is a common source of discrimination for Asian American youth (Liang et al. 2004).

As predicted, we found that greater orientation to U.S. culture was related to lower perceptions of discrimination. Importantly, we found a trend suggesting that initial levels of discrimination predicted changes in U.S. acculturation over time but not the other way around (i.e., that initial levels of orientation to U.S. culture predicted changes in perceptions of discrimination). So, those who experienced greater discrimination at the beginning of the study became oriented toward U.S. culture over time at a slower pace than those who experienced less discrimination. Thus, it appears that one's involvement in U.S. culture does not necessarily predict whether he or she is the target of discrimination. Rather, it is those who experience discrimination who are more reluctant to become more involved in U.S. culture. This would be consistent with Portes and Rumbaut's (2001) work with ethnically diverse adolescents showing that over time, some adolescents tended to drop the word "American" in their ethnic label (e.g., stating they were "Chinese American" at Time 1 but 2 years later saying they were "Chinese"). One predictor of whether adolescents dropped the "American" label was how much discrimination they

faced; those adolescents who faced more discrimination chose to identify less with American culture and more with their culture of origin compared to peers targeted less often for their ethnicity. Thus, one consequence of discrimination may be that adolescents will become more reluctant to become fully involved in the majority culture.

As predicted, we found that orientation to Chinese culture, on the other hand, did not relate to discrimination. The analyses also revealed that adolescents more oriented to Chinese culture reported fewer depressive symptoms. In the community context from which we sampled, Chinese culture was visible, strong, and celebrated. In such a supportive context, it appears that adolescents immersed in Chinese culture did have an elevated risk for being the target of discrimination. Indeed, those more immersed in Chinese culture even reported greater well-being. In a different context defined by fewer cultural supports and where adolescents are a very visible minority, being highly involved in Chinese culture may show differential relations to discrimination and well-being. A study of Vietnamese adolescents living in Lansing, Michigan, for instance, found that greater orientation to Vietnamese culture was related to greater distress. In this context, with few supports to maintain Vietnamese culture, it may be more difficult to be Vietnamese (Nguyen et al. 1999). Future studies examining acculturation and discrimination in different cultural compositions (e.g., low versus high density of same-ethnic members) would shed light on the possible moderating role of community context to understanding correlates of discrimination.

Finally, we also found that an increase in discrimination was associated with an increase in depressive symptoms. These findings support a growing body of literature demonstrating a link between discrimination and negative adjustment for Asian Americans (Gee et al. 2007; Greene et al. 2006; Lee 2003, 2005; Noh and Kaspar 2003). Because we tested these relations over time, we could show that the discrimination-depressive symptom link is a dynamic one. That is, changes in one lead to changes in the other. Importantly, however, other studies have shown that experiences of discrimination do not always lead to negative outcomes. A strong connection to one's ethnic group (Greene et al. 2006; Lee 2005) or the use of positive, effective coping strategies (Noh and Kasper 2003) can buffer the effects of discrimination.

Prevention Implications

Our study, along with others, suggests that adolescents of color perceive increasing levels of discrimination over the high school years. Identifying buffers (such as particular coping strategies) will be important to help adolescents best deal with personal experiences of discrimination during this challenging time. However, we must also move beyond focusing solely on individual-level instances of discrimination and consider the broader issues of institutional and societal racism and discrimination (Garcia Coll et al. 1996). Adolescents of color and immigrant origin who experience discrimination are part of a larger society that is discriminatory; only by recognizing and addressing societal as well as individual level experiences

of discrimination can we move beyond individually-focused solutions (e.g., help adolescents develop a stronger ethnic identity or better coping strategies).

Our study, situated in a very strong Chinese community, also found that adolescents with greater orientation to Chinese culture reported fewer depressive symptoms. This suggests that involvement with one's heritage culture can be an important link to positive youth development. On a community level, then, community-based ethnic institutions could provide opportunities for adolescents and families to connect with one another (Phinney 2003; Zhou and Bankston 1998). Doing so establishes a foundation for the creation of a strong ethnic identity, which is important for countering the negative effects of discrimination (Greene et al. 2006; Lee 2005). These ethnic-based communities would also facilitate the creation of supportive networks whereby both parents and adolescents could address the challenges of acculturation. For instance, if foreign-born parents did not experience school-based racial discrimination in their home country, it will be important for them to recognize the pervasiveness of racial discrimination in their children's schools, and, further, to understand the distress arising from these experiences (Garrod and Kilkenny 2007; Greene et al. 2006).

Limitations and Future Research

There were several strengths to our study: it was longitudinal (most studies of discrimination are cross-sectional), focused on adolescents (most focus on college students and adults), and focused on Chinese Americans specifically (most focus on Asian Americans in general). Nonetheless, there were several limitations that must be noted. First, our measure of discrimination did not distinguish the source of discrimination. This is important to do as previous studies have found that adolescent outcomes associated with discrimination by adults versus peers are different. For instance, discrimination by peers appears to be even more detrimental to mental health (at least for depression and anxiety) than discrimination by adults (Greene et al. 2006). Future research should include questions about the source of discrimination. Second, we only used questionnaire data. Using other methods such as personal narratives or in-depth interviews, would offer a rich perspective on how adolescents view their acculturation experiences and how this may relate to their experiences of discrimination. Third, we followed adolescents for a relatively short time within a rather stable context. Following adolescents through a transitional period, such as the transition to college, would offer important information as to how contextual changes (e.g., entering a more diverse environment) raises new challenges for adolescents in terms of perceiving and coping with discrimination. Fourth, we sampled from San Francisco, a unique context with a very strong Chinese community. Consequently, we cannot generalize our findings to other community contexts with far fewer Chinese. Nonetheless, as immigration continues to increase in the U.S., more communities will become increasingly ethnically diverse. Thus, it will be worthwhile to continue our efforts toward a greater understanding of the complex relations between acculturation, discrimination and adolescent mental health.

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