



**California Center for Population Research**  
**University of California - Los Angeles**

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**PWP-CCPR-2010-028**

**November 2010**

*California Center for Population Research  
On-Line Working Paper Series*

RUNNING HEAD: Social Support and Achievement

Ethnic and Generational Differences in the Relations between Social Support and Academic  
Achievement across the High School Years

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## Abstract

Changes in adolescents' reports of social support from parents and friends were examined across the four years of high school in order to examine the extent to which support is associated with academic achievement. Results from 541 adolescents from diverse ethnic and immigrant generational backgrounds suggest that changes in encouragement from both parents and friends within individual adolescents are associated with concurrent changes in GPA. Between-person analyses indicate that adolescents who report higher levels of encouragement in ninth grade are more likely to enroll in courses and receive grades that make them eligible to enroll in California's public university system. Both GPA and eligibility, in turn, were associated with higher rates of enrollment in a college or university two years after high school. Many of these findings varied according to ethnicity and immigrant generation, reinforcing the importance of understanding the extent to which adolescents from diverse backgrounds have access to the information and support that is necessary to take advantage of the post-secondary educational system.

## Ethnic and Generational Differences in the Relations between Social Support and Academic Achievement across the High School Years

With the growing immigrant population in the United States (e.g., Zhou, 1997), an important question is the extent to which this group is able to take advantage of the post-secondary educational system that is critical for a successful transition to adulthood (Halperin, 1998). Most research examining ethnic and immigrant generational differences in educational experiences during adolescence has tended to focus on grades and test scores during high school (e.g., Fuligni, 1997; Kao & Tienda, 1995). These studies have demonstrated that youth from immigrant families often receive grades at least as good as those from non-immigrant families (Kao & Tienda, 1995; Fuligni, 1997; Fuligni and Witkow, 2004), and youth from Asian backgrounds perform better than youth from Latino families (Fuligni & Witkow, 2004). These ethnic differences are at least partially attributable to higher education levels of parents with Asian backgrounds prior to immigration.

Receiving good high grades in high school, however, isn't enough to ensure that an adolescent will qualify for college admissions, particularly a four-year college or university. The extent to which students successfully complete college preparatory courses is critical because even the highest of grades does not guarantee college admissions if high school course requirements are not met. In order to be eligible for many four-year colleges, adolescents have to have successfully completed a specific set of courses. For example, the two public university systems in the state of California, the University of California and the California State University, have a set of high school course requirements that go beyond the graduation requirements of many high schools in California, including the three schools reported on in this study. These requirements, termed the "a-g" requirements, include three years of math, including

Algebra I, Geometry, and Algebra II, two years of a foreign language, and a grade of at least a 'C' in each academic course (California State University Admissions, 2009; University of California Admissions, 2009). In contrast, high school graduation often requires only 2 years of math, without specifying what courses these should be, does not require a foreign language, and allows grades as low as 'D' as passing. Other requirements, including those of English, history/social science, and laboratory science, tend to be similar to high school graduation requirements.

Many youth from immigrant families report working hard in school and getting good grades out of a sense of obligation to their parents (Fuligni & Pedersen, 2002). Unlike working hard to get good grades, however, enrolling in a college preparatory curriculum and meeting postsecondary admissions requirements often involves external support and information. That is, the default curriculum may not be one that would allow a student to be UC/CSU eligible upon graduation. The purpose of this study is therefore to examine ethnic and generational differences in both the extent to which parents and friends are sources of support for academics, and whether this support is associated with high school academic achievement and UC/CSU eligibility. Additionally, we will examine the extent to which grades, UC/CSU eligibility, and high school math course enrollment are associated with enrollment in a four-year college or university two years after graduating from high school.

One important feature of the current study is our ability to examine within-person change in social support over the four years of high school. We are therefore able to model normative change within individual adolescents across the high school years as a function of their UC/CSU eligibility upon graduation. Yet individual adolescents may change quite a bit from year to year in their perceptions of support, without necessarily heading in a single linear direction (see also Green, Rhodes, Hirsch, Suarez-Orozco, & Camic, 2008). Analysis of normative change by itself

does not allow for examination of how that change is associated with concurrent changes within individual adolescents in other aspects of their lives. By longitudinally correlating within-person fluctuations in social support with fluctuations in grades, we can obtain important information on how these two experiences unfold simultaneously.

In all of the analyses, we will examine the extent to which patterns vary according to ethnicity, between Latino (primarily Mexican), Asian (primarily Chinese), and European-American adolescents. Further, for the Latino and Asian participants, we will examine differences according to immigrant generation. For both groups, the majority of the participants are of the second generation. Finally, we will examine the extent to which parent education, as a measure of socio-economic status, accounts for any ethnic differences that are observed.

It is our hope that these analyses will allow us to suggest specific ways in which schools can take advantage of parental and peer support to promote success beyond the high school classroom. In particular, given current economic realities, high schools should aim for preparing their students of all ethnic, immigrant, and socioeconomic backgrounds for college, and particularly for degrees and careers in math, science, and engineering. These are the fields that will allow the U.S. to continue to be competitive in the international field, and in which ethnic minority youth continue to be under-represented (Gándara & Maxwell-Jolly, 1999).

#### *Parents and Friends as Sources of Social Support*

Parents and friends can both be important sources of support and encouragement for education during adolescence (Brown, Mounts, Lamborn, & Steinberg, 1993). However, the extent to which they can help an adolescent prepare for postsecondary admissions depends upon the extent to which they have access to information about admissions requirements. Whether one's parents and friends have this information likely varies according to individual background

characteristics, including the ethnicity and immigrant status of the adolescent. On the one hand, ethnic minority youth and youth from immigrant families have parents who value education strongly and the youth themselves are likely to work hard in school out of a sense of obligation to their parents (Fuligni & Pedersen, 2002; Kao & Tienda, 1995). However, one challenge facing many youth from immigrant families, particularly those with Latino backgrounds, is that their parents may not have the social capital (e.g., Crosnoe, Cavanagh, & Elder, 2003) to enable them to make informed decisions about their educational careers, even if they value and encourage education strongly (see also Coleman, 1988). For example, parents may not have experience in navigating the college admissions process (Cooper, Chavira, & Mena, 2005), and are often unfamiliar with the U.S. educational system in general and the role that they are expected to play in their children's education (Kao & Tienda, 1995; Seidman, Chesir-Teran, Friedman, Yoshikawa, Allen, Roberts, & Aber, 1999). Parents may also feel uncomfortable interacting with school personnel if they are not comfortable speaking English or do not speak it well (Kao & Tienda, 1995). Further, while parents of Asian adolescents are more likely than parents of European-American adolescents to attempt to provide resources to help their children excel in school (Coleman, 1988), they tend to be somewhat less involved in the day to day experiences of their children's schooling, in terms of activities such as attending school programs and helping with homework (Crosnoe, 2001). Because of these differences in social capital and cultural practices, the sense of obligation that ethnic minority and immigrant youth feel is more likely to be related to grades than to enrollment in a college preparatory curriculum.

Regardless of the extent to which parents can and do provide support, friends can be an important source of information, social capital, and support, provided that they themselves have access to information. Peers whose parents do not face the barriers described above are able to

share the information they are in possession of with their friends. However, because adolescents tend to be friends with others who share their ethnic background (Kandel, 1978; Way & Chen, 2000), adolescents from ethnic minority backgrounds are more likely to be friends with adolescents who have similarly low levels of social capital, and therefore don't "come across" useful information about college. Whether or not they have information, there are also ethnic differences in the extent to which peer groups tend to be supportive of academics more generally, with Asian adolescents experiencing the most support from same-ethnic friends (e.g., Crosnoe et al., 2003; Steinberg, et al., 1992). These ethnic differences are likely to be exacerbated because of ethnic differences in patterns of enrollment in college preparatory courses. Enrollment in college preparatory courses therefore has multiple benefits: preparation for college admissions and a higher likelihood of access to friends with social capital. It is therefore expected that differences between adolescents in the extent to which support from friends is associated with achievement will be consistent with overall ethnic differences in achievement.

### *Forms of Social Support*

Social support can take multiple forms. From both parents and friends, we examine two forms of support in this study: *talking* about school, including future educational plans, and *encouragement* for taking high level courses and continuing one's education beyond high school. These may vary in terms of both the reasons for the support and the role that social capital plays in the existence of the support. While one parent and adolescent may talk about school as a form of parental monitoring because the adolescent has not done well in the past (Crosnoe, 2001), another parent and adolescent may talk about school because the adolescent is engaged and wants to share that with his/her parent. A low level of talking about school, however, is likely to be associated with poor achievement because it reflects negatively on the parent-child



relationship (Melby, Conger, Fang, Wickrama, & Conger, 2008), particularly because both the parent and adolescent have to be willing partners in the conversation. Some adolescents may choose not to share information about school with their parents, particularly in cases in which they feel as though they may not be living up to their standards (Qin, Way, & Mukherjee, 2008).

In terms of friends, talking about school is likely to be associated with higher levels of achievement because students who are engaged and achievement-oriented are likely to share that with their friends (e.g., Ryan, 2001). Further, adolescents with friends at school to talk with about school are likely to be more engaged, which is also associated with achievement (Goodenow, 1993). More so than for talking, encouragement is likely to reflect an assessment of the adolescents' actual prospects (Crosnoe, 2001). Encouragement, from both parents and friends, is therefore more likely when the adolescent is doing well in school and future prospects seem good, and is expected to be more strongly predictive of achievement than talking.

Because talking is less specific than encouragement, it is expected to be less strongly tied to social capital, and thus less variable according to ethnicity and generation. That is, a parent who doesn't understand the U.S. educational system can still talk with his/her child about school. Indeed, transmission of parents' values of the importance of school is likely one of the reasons that immigrant children work so hard in school (Fuligni, Tseng, & Lam, 1999). However, encouragement carries with it an expectation that the adolescent, if he/she works hard, will be able to attend college. Parents may be less likely to encourage their adolescent if they are unsure of his/her prospects and/or their ability to pay for postsecondary education. Immigrant and/or ethnic minority parents may therefore be less likely to encourage their adolescents to take high level courses and continue their education beyond high school than European-American parents.

*The Current Study*

The goal of this study is to examine both within- and between-person achievement-related correlates of social support from friends and parents. Within adolescents, we will examine year-to-year changes in social support as they relate to concurrent changes in GPA. Between adolescents, we will examine trajectories of social support according to UC/CSU eligibility. Finally, we will examine the extent to which these variables are associated with post-secondary enrollment.

Within adolescents, it is hypothesized that support from both parents and friends in the forms of talking and encouragement will be positively associated with GPA. That is, in years in which an adolescent reports receiving support, he/she will also receive higher grades. However, it is hypothesized that the relations between support from parents and grades will be weaker for Asian and Latino students than for European-American students, particularly those from immigrant families, as their parents are likely to have less social capital and be less comfortable in their relationships with teachers and administrators at school.

Between adolescents, it is hypothesized that those who are UC/CSU eligible will report higher levels of support throughout high school, and that this difference will already exist by ninth grade. Even at the very beginning of high school, students are segregated from other peers through the courses in which they are enrolled. Those who are enrolled in college preparatory courses and doing well in those courses, and therefore more likely to be UC/CSU eligible upon graduation, are likely to have a high achieving friendship group (Ryan, 2001) that provides them with support. Ethnic differences in support from parents are expected, mirroring ethnic differences in parental involvement in their children's academic careers (see Crosnoe, 2001).

Across ethnic groups, the extent to which these differences will manifest themselves in different trajectories over time is unclear. On the one hand, for high achieving adolescents,

friends may continue with their same high levels of support and parents may actually reduce their levels of support as they stop needing to actively monitor their adolescent and can give him/her more independence (Crosnoe, 2001; Muller, 1998). On the other hand, both parents and friends may increase their levels of support as college planning becomes more immediate and students begin to have realistic assessments of their postsecondary prospects.

Finally, it is hypothesized that enrollment in a four-year college or university two years after high school graduation will be associated with both GPA and UC/CSU eligibility. In particular, we hypothesize that adolescents who are UC/CSU eligible upon graduation will be more likely to be enrolled in a four-year college or university. Additionally, consistent with our conceptualization of UC/CSU eligibility being associated with differences in social support as early as ninth grade, we hypothesize that differences will exist in high school grades according to enrollment in college. That is, differences in grades will be apparent in the high school data prior to college enrollment. Given that there are likely to be some students enrolled in a four-year college or university who were not UC/CSU eligible, we will further examine the extent to which high school math course enrollment in particular is associated with four-year college enrollment. Math enrollment may be particularly important given that most four-year colleges require three years of math coursework, while not necessarily following the other UC/CSU requirements.

## Method

### *Sample*

Beginning in ninth grade and continuing yearly through twelfth grade, students from three public high schools in the Los Angeles area were recruited for participation in a longitudinal study. The sample used in the present analyses was the 541 participants from European, Asian, and Latin American families who had participated in the study for at least two

of the four years during high school ( $M = 3.50$  years,  $SD = .70$ ). The sample was evenly split by gender (263 male, 278 female). The majority of the 244 participants from Asian families were from Chinese backgrounds (77.0%), and the majority of the 196 participants from Latin American families had Mexican backgrounds (87.8%). Of the Asian participants, 79 were of the first generation (i.e., the students were foreign-born themselves), 151 were of the second generation (i.e., the students were born in the United States), and 14 were of the third generation or greater (i.e., both the students and their parents were born in the United States). Asian first generation participants were on average 7.43 years old ( $SD = 3.92$ ) when they came to the U.S. Of the participants from Latin American families, 35 were of the first generation, 122 were of the second generation, and 39 were of the third generation or greater. Latino first generation participants were on average 4.09 years old ( $SD = 3.50$ ) when they came to the U.S. Of the 101 participants from European-American families, 8 were of the first generation, 6 were of the second generation, and 87 were of the third generation or greater. See Kiang, Witkow, Baldelomar & Fuligni (in press), for a more complete description of the high school sample.

Of the 541 participants included in the main sample, 341 participants also completed the follow-up study two years after high school and are included in the post-secondary analyses. The subsample was ethnically diverse: 30% Latino, 53% Asian, and 17% European-American, although compared to the full sample, Asian participants were over-represented while Latino participants were under-represented,  $\chi^2(2, N = 541) = 23.16, p < .001$ . Much of this difference is due to the fact that adolescents who were UC/CSU eligible were more likely to participate,  $\chi^2(1, N = 519) = 37.56, p < .001$ .

### *Procedure*

During high school, students completed a questionnaire during class time each spring. Consent forms and study materials were available in English, Chinese, and Spanish. Fewer than eight participants chose to complete the questionnaires in a language other than English during any single year. Students' courses and grades for each academic year were obtained from their official school records after the completion of the school year.

Two years after high school, those who had participated in twelfth grade were contacted by phone, email, and mail. Those who agreed to complete a follow-up survey were given access to an online survey; a paper survey was completed by ten participants without internet access.

### *Measures*

#### *Within-Person Variables*

*GPA.* Course grades were collected from school records and GPAs were computed for each year of high school based on participants' grades in their academic courses (i.e., those meeting UC/CSU a-g requirements; California State University Admissions, 2009; University of California Admissions, 2009). GPAs were computed on a 5-point scale (0="Fail" to 4 = "A").

*Social support from friends.* Each year, participants reported the extent to which they talked to their friends about academics and received encouragement from friends to take advanced courses and pursue postsecondary education. The *talk* variable consisted of three items, based on Fuligni and colleagues (1999). Participants reported how often, with their friends, they talk about "future job plans," "future educational plans," and "the classes you are taking in school." Participants responded to each item on a five-point scale (1 = *Almost never*, 5 = *Almost always*). Internal consistencies were similarly high for members of all three ethnic groups across the four years of the study,  $\alpha = .66-.87$ . The *encouragement* variable consisted of two items.

Participants reported how often their friends "encouraged you to take college placement or honors courses" and "encouraged you to continue your education after high school." Participants responded to each item on a five-point scale (1 = *Almost never*, 5 = *Almost always*). These two items were highly correlated for members of all three ethnic groups across the four years of the study,  $r_s = .38-.75$ ,  $p_s < .001$ . For both variables, scores were recoded on a 0 to 4 scale for ease of interpretation.

*Social support from parents.* The talk with parents and encouragement from parents variables mirrored the social support from friends items described above. For the talk with parents variable, internal consistencies were similarly high for members of all three ethnic groups across the four years of the study,  $\alpha_s = .60-.87$ . For the encouragement from parents variable, the two items were highly correlated for members of all three ethnic groups across the four years of the study,  $r_s = .30-.48$ ,  $p_s < .01$ , with the exception of European-American adolescents in twelfth grade, for whom the correlation was somewhat weaker,  $r = .22$ ,  $p < .05$ .

#### *Between-Person Variables*

*UC/CSU eligibility.* Students were classified as being UC/CSU eligible if it could be determined that their courses and grades exceeded their high school graduation requirements to meet those required for admission to the University of California and the California State University (0 = did not meet UC/CSU eligibility requirements, 1 = did meet UC/CSU eligibility requirements). In particular, students were determined to be eligible if they had successfully completed algebra I, geometry, and algebra II, and two years of the same foreign language, and had received at least a "C" in all of their academic courses. Eligibility could be determined for some adolescents who were missing course record information in at least one year of the study. For example, a student who had record information from just one year and in that year received

many grades of 'D' could not be eligible. Eligibility could not be determined for 22 participants because they were missing at least one year of course records and the information from that missing year(s) was needed to determine whether or not they were eligible.

*Post-secondary enrollment.* Two years after completing high school, participants were asked whether they were currently taking courses at a two- or four-year college. If so, they were asked whether they were enrolled in a "community college," "four-year college or university," "vocational school," "technical school," or "trade school." Participants were classified as to whether or not they were enrolled in a four-year college of university (0 = not enrolled in a four-year college or university, 1 = enrolled in a four-year college or university).

## Results

### *Within-Person Associations Between Social Support and GPA*

Our first goal was to examine the concurrent relations between social support and GPA, within individual adolescents, across the high school years. Hierarchical Linear Models (HLM; Bryk & Raudenbusch, 1992) were used, given our longitudinally-nested, within-person data. This method allows for the partitioning of variance into within-person and between-person components to examine the extent to which within-person associations between social support and GPA vary according to features of the individual, such as gender and ethnicity. Since there was a maximum of four time points per person, and some participants had only two or three time points, we did not have enough degrees of freedom to estimate all of the support variables simultaneously. Separate models were therefore estimated for each of the four support variables (i.e., talk with friends, encouragement from friends, talk with parents, and encouragement from parents). The general form of the model used for these analyses was as follows:

$$\text{GPA}_{ij} = b_{0j} + b_{1j} (\text{Support}) + b_{2j} (\text{Year}) + e_{ij} \quad [1]$$

$$b_{0j} = c_{00} + c_{01} (\text{Gender}) + c_{02} (\text{Ethnicity}) + u_{0j} \quad [2]$$

$$b_{1j} = c_{10} + c_{11} (\text{Gender}) + c_{12} (\text{Ethnicity}) + u_{1j} \quad [3]$$

Equation 1 shows how adolescents' GPA in a particular year (i) for a particular individual (j) was modeled as a function of the individuals' average GPA ( $b_{0j}$ ) and social support. Equations 2 and 3 show how the average GPA and the effect of social support were modeled as a function of gender and ethnicity. Gender was effects coded such that males = -1 and females = 1. Ethnicity was indicated with two dummy codes representing Latino and Asian, leaving European-American as the baseline condition. Year of study was included in equation 1 as a control variable, given normative declines in GPA over the four years of high school, and was coded such that year 1 = 0, year 2 = 1, year 3 = 2, and year 4 = 3. Social support was uncentered, given that a score of zero on this scale is conceptually meaningful, allowing for straightforward interpretation of the results (see Schwartz & Stone, 1998).

As shown in Table 1, in contrast to our hypothesis, talking with friends was not associated with GPA, nor were there ethnic differences in this association. Consistent with our hypothesis, however, there was a positive association between encouragement from friends and GPA, a relation that held across ethnic groups. In contrast, the patterns for the relations between social support from parents and GPA did vary according to ethnic group. For Latino adolescents only ( $b = .12, p < .001$ ), talking with parents was positively associated with GPA. Encouragement from parents was positively associated with GPA for European-American adolescents and Asian adolescents, although the relation was weaker for Asian adolescents ( $b = .06, p < .05$ ), but not for Latino adolescents ( $b = .02, n.s.$ ).

For the two analyses in which ethnic differences were found (i.e., talking with parents and encouragement from parents), follow up analyses were conducted to determine whether



these differences could be explained by socioeconomic status. For these analyses, parent education was added to equations 2 and 3. In both of these tests, the ethnic differences were unchanged and parent education was not a significant predictor.

Finally, additional tests were performed to examine differences according to immigrant generation. Because generation and ethnicity were confounded, these tests were conducted within ethnic group. For Latino adolescents, Equations 2 and 3 were modified such that ethnicity was replaced with dummy codes representing second generation and third generation, with first generation serving as the baseline group. For Asian adolescents, because there were so few third generation participants, comparisons were only conducted between first and second generation adolescents. Generation analyses were not conducted for European American adolescents because so few were from immigrant families. For these analyses, there was no effect of generation for Latino adolescents, and just one for Asian adolescents. While there was no relation between parent encouragement and GPA for first generation Asian adolescents, there was a positive relation for second generation Asian adolescents ( $b = .13, p < .05$ ).

This first set of analyses suggests that, in general, support from parents and friends is associated with GPA. Some of these relations vary by ethnicity, with a weaker relation between encouragement from parents and GPA for Latino and Asian (particularly first generation) adolescents, compared to European-American adolescents.

#### *Change Over Time in Social Support According to UC/CSU Eligibility*

The goal of the next set of analyses was to examine the association between UC/CSU eligibility and social support trajectories across the high school years. Of the 519 participants for whom UC/CSU eligibility could be determined, 142 (27.4%) were eligible. This varied

according to ethnic group,  $\chi^2(2, N = 519) = 62.51, p < .001$ , such that Latino participants (7.3%) were less likely to be eligible than Asian (39.1%) and European-American (39.6%) participants.

HLM was used to examine the extent to which adolescents reported changing levels of social support across the high school years, and whether these trajectories varied according to UC/CSU eligibility. An interaction term was included to test whether the effect of eligibility was moderated by ethnicity. The general form of the model used for these analyses was as follows:

$$\text{Support}_{ij} = b_{0j} + b_{1j}(\text{Year}) + e_{ij} \quad [4]$$

$$b_{0j} = c_{00} + c_{01}(\text{Gender}) + c_{02}(\text{Ethnicity}) + c_{03}(\text{UC/CSU eligibility}) + c_{04}(\text{UC/CSU eligibility X Ethnicity}) + u_{0j} \quad [5]$$

$$b_{1j} = c_{10} + c_{11}(\text{Gender}) + c_{12}(\text{Ethnicity}) + c_{13}(\text{UC/CSU eligibility}) + c_{14}(\text{UC/CSU eligibility X Ethnicity}) + u_{1j} \quad [6]$$

As shown in Equation 4, adolescents' reports of social support (i.e., talk with friends, encouragement from friends, talk with parents, encouragement from parents) in a particular year (i) for a particular individual (j) was modeled as a function of the average level of social support by the individual ( $b_{0j}$ ) and the year of the study ( $b_{1j}$ ). Equations 5 and 6 show how both the average social support and the effect of the year of the study were modeled as a function of adolescents' gender, ethnicity, whether or not they were UC/CSU eligible, and an interaction between ethnicity and UC/CSU eligibility.

As shown in Table 2, there were increases over time in adolescents' reports of talking with their friends and encouragement from friends. While Asian and Latino adolescents reported higher levels of encouragement from their friends in ninth grade, compared to European-American adolescents, the increase over time did not vary according to ethnic group. In contrast, while there was no change over time for European-American adolescents in social support from

parents, Latino adolescents reported comparative decreases over time in encouragement from parents. Compared to European-American adolescents, Asian adolescents reported lower levels of talking with their parents in ninth grade, but higher levels of encouragement from their parents, differences that held steady across the high school years.

UC/CSU eligibility was not associated with changes over time in social support for members of any ethnic group. As hypothesized, however, it was associated with differences in adolescents' reports of encouragement from both friends and parents such that adolescents who were eligible reported higher levels of encouragement throughout high school. The effect of UC/CSU eligibility on encouragement from friends was weaker for Asian ( $b = .29, p < .05$ ) and Latino ( $b = .19, n.s.$ ) adolescents than for European-American adolescents. Similarly, the effect of UC/CSU eligibility on encouragement from parents was weaker for Asian ( $b = .12, n.s.$ ) adolescents compared to European-American adolescents.

Follow up analyses were again conducted to determine whether parent education could explain any of the ethnic differences. In no case was parent education a significant predictor. With parent education in the model, only one ethnic difference was changed. Controlling for parent education, the difference between Asian and European-American adolescents in talking with parents in ninth grade was no longer significant ( $b = -.23, n.s.$ ).

Finally, there were no generation differences for Asian adolescents and just one difference for Latino adolescents. In ninth grade, second ( $b = -.50, p < .01$ ) and third ( $b = -.58, p < .01$ ) generation Latino adolescents reported talking with their friends less about school than first generation Latino adolescents. However, they also reported increases in talking with their friends over time (second generation:  $b = .20, p < .05$ ; third generation:  $b = .26, p < .01$ ).

This set of analyses suggests that, even though support trajectories vary across the high school years, UC/CSU eligibility is more strongly related to support in ninth grade than to change in support across the high school years. The relation between eligibility and support in the form of encouragement varied by ethnicity, with a weaker relation for Latino (in the parent domain) and Asian adolescents (in both the parent and peer domains) than for European-American adolescents.

### *Post-Secondary Enrollment*

The final goal of this study was to examine the extent to which high school grades and UC/CSU eligibility were associated with post-secondary enrollment. Because almost 90% of participants reported being currently enrolled in some type of post-secondary education and because both the University of California and California State University are four-year institutions, participants were classified as to whether or not they were enrolled in a four-year college or university two years after completing high school. 203 participants (59.5%) reported being currently enrolled in a four-year college or university. This varied by ethnicity,  $\chi^2(2, N = 341) = 62.90, p < .001$ , such that Latino participants (27%) were less likely to be enrolled in a four-year college or university than Asian (72%) and European-American (78%) participants. While 99 (72%) of the students who were not enrolled in a four-year college or university were enrolled in a two-year college, we included these students in the group not currently enrolled in a four-year college or university because the transfer rate in California from two- to four-year colleges is very low, with only 40% of students attempting to transfer successfully doing so within 6 years (California Community College Chancellor's Office, 2009).

To examine whether postsecondary enrollment was associated with trajectory of high school grades, equations 4, 5, and 6 were modified such that GPA was the outcome variable in

equation 4 and enrollment and enrollment by ethnicity interactions replaced eligibility in equations 5 and 6. As shown in Table 3, as hypothesized, participants who were enrolled in a four-year college or university had higher grades in ninth grade. This effect was stronger for Latino than European-American participants, although significant for members of all three ethnic groups. For European-American adolescents, while grades declined over time for participants who were not enrolled, this effect was reduced for those who were enrolled. For Latino and Asian adolescents, grades declined over time regardless of enrollment status.

Parent education was also a significant predictor in this set of analyses. Adolescents whose parents had more education had higher grades in ninth grade ( $b = .05, p < .05$ ), but a sharper decrease in their grades over time ( $b = -.02, p < .01$ ). Inclusion of parent education reduced to non-significance the main effects of ethnicity on change in GPA over time. However, the interactions between enrollment and ethnicity remained unchanged. There were no differences according to generation for Latino or Asian adolescents.

As hypothesized, as with grades there was a significant association between UC/CSU eligibility and enrollment in a four-year college or university,  $\chi^2 (1, N = 329) = 87.79, p < .001$ . While 92.5% of UC/CSU eligible high school students were enrolled in a four-year college or university 2 years after high school (although not necessarily a UC or CSU), only 39.7% of non-UC/CSU eligible high school students were enrolled. This relation was similar across ethnic groups,  $\chi^2 (1, Ns = 56 - 173) = 16.40 - 27.81, ps < .001$  and did not vary according to generation.

Given that many students in our sample were enrolled in a four-year college or university without having met UC/CSU requirements, a final analysis was conducted to determine the extent to which math course enrollment during high school was associated with four-year college enrollment. While 75.0% of participants who had completed algebra I, geometry, and algebra II

during high school were enrolled in a four-year college or university, only 18.6% of those who did not complete these courses were enrolled,  $\chi^2(1, N = 330) = 84.48, p < .001$ .

This final set of analyses confirms that UC/CSU eligibility during high school is associated with enrollment in a four-year college or university after graduation. Adolescents who were enrolled in college also had higher grades throughout high school, although the association between enrollment and trajectory of grades varied according to ethnic group.

### Discussion

To identify the extent to which adolescents from immigrant families are able to realize their parents' wishes for them in terms of financial and occupational success (Fuligni, 1997), it is critical that they are able to access the postsecondary education system (Halperin, 1998). The current study extends previous research examining adolescents' grades during high school (e.g., Fuligni, 1997) to understand ethnic and immigrant generational differences in adolescents' access to social supports that can enable them to navigate college eligibility requirements during high school, and enroll in a four-year college or university after graduation. In line with other work on social capital (e.g., Coleman, 1988; Crosnoe, 2001), we found that patterns of support for education, particularly for pursuing high level course work in high school and college admissions, is related to the likelihood one is able to access educational information.

Consistent with work examining ethnic differences in achievement during high school, we found many ethnic differences in the roles of support from parents and friends on academic achievement. As hypothesized, within-adolescents, the relation between encouragement from parents and GPA was stronger for European-American adolescents than for Asian or Latino adolescents, with the relation being significant only for European-American adolescents and second generation Asian adolescents. This suggests that immigrant parents may not feel

confident in their abilities to specifically encourage their sons and daughters to take high level courses and pursue postsecondary education, potentially because of a lack of understanding of the United States educational system (Cooper et al., 2005).

In contrast, the relation between encouragement from friends and GPA was consistent across groups, suggesting that even though members of some ethnic groups are less likely to have engaged and supportive friends (e.g., Steinberg, et al., 1992), when encouragement is received it operates similarly across groups. This finding may also reflect differences in one's friendship group as a function of one's academic track. Regardless of ethnicity, adolescents in college preparatory classes are more likely to have high achieving and academically supportive friends than those enrolled in lower level classes. Further, college planning is likely to be more relevant for those in college preparatory courses.

In contrast to the relation between encouragement and GPA, with the exception of the association between talking with parents and GPA for Latino adolescents, neither talking about school with parents nor friends was associated with GPA for members of any group. This may reflect the different reasons for talking about school. For instance, some adolescents may talk with their friends about school to complain, while others to seek out support or study together. Similarly, some low achieving adolescents may talk with their parents about school because their parents are actively monitoring their progress. High achieving adolescents, in contrast, may talk with their parents about school to obtain help or to discuss future opportunities (Crosnoe, 2001; Muller, 1998). The significant relation for Latino adolescents between talking with parents about school and GPA potentially reflects the importance of education that Latino parents, particularly those from immigrant families, convey to their children (Fuligni et al., 1999).

While the relations between support and GPA were examined within adolescents, to determine the extent to which change in support in a given year was associated with concurrent changes in GPA, the relations between support and UC/CSU eligibility were examined somewhat differently. Because UC/CSU eligibility was not a time-varying predictor, we instead examined the extent to which eligibility was associated with changes in perceptions of support over time. It is important to note that eligibility is not something that could be determined prior to the completion of high school. However, our results suggest that by the time they are in ninth grade, at least for European-American adolescents, the experiences of those who are going to be eligible are different than those who are not going to be eligible, with those who are going to be eligible reporting much higher levels of encouragement from both their parents and friends. This higher level of encouragement held constant across the high school years.

Like the results described for GPA, the relations between eligibility and support varied according to ethnicity. In particular, eligibility had a weaker effect on encouragement from friends for Asian than European-American adolescents, and was not significant for Latino adolescents. For Asian adolescents, this difference may reflect high levels of support for academics within the peer group (Steinberg, et al., 1992). Indeed, non-UC/CSU eligible Asian adolescents reported higher levels of encouragement from friends than European-American adolescents. For Latino adolescents, this difference may reflect both higher levels of encouragement overall, as well as the very small percentage of Latino adolescents who were actually eligible. Similar to the finding regarding support from friends, the effect of eligibility on encouragement from parents was not significant for Asian adolescents, potentially reflecting generally higher levels of encouragement and support from parents (Coleman, 1988).



Finally, we demonstrated that patterns of adolescents' grades in high school and whether or not they were UC/CSU eligible were related to their post-secondary enrollment two years after graduation. Students who are able to enroll in college do not necessarily do so, as needs to contribute financially to the family and/or a lack of ability to finance one's education could prevent enrollment. Other work has demonstrated that youth from immigrant and Latino families are more likely to support their families financially in the years immediately after high school, and that Asian youth are less likely than other youth to work at a job while enrolled in college (Fuligni & Witkow, 2004). It is therefore important that there were not ethnic or generational differences in the relation between eligibility and enrollment in that potential obligations such as these did not seem to interfere with eligible students' ability to enroll in a four-year college or university. Instead, virtually everybody who was eligible to enroll in a UC or CSU campus was enrolled in a four-year college two years after graduating from high school.

Some non-UC/CSU eligible students also managed to be enrolled in a four-year college or university two years after graduation. While this number was substantially smaller than that of those who were eligible, it is still important to understand how these students were able to do so. One explanation is that these students may have been enrolled in private or out-of-state schools with different requirements than UC/CSU. Even though requirements can vary, most schools require three years of math coursework, as supported by our follow-up analyses examining patterns of college enrollment according to high school math courses. Another explanation is that students who had not met UC/CSU requirements were able to remedy missing courses after high school graduation and prior to college enrollment.

It is important to note that for most analyses, parent education was not a significant predictor and did not account for ethnic differences (see also Azmitia, Cooper, & Brown, 2009).

This suggests that differences in parental support, and its correlates, are not just due to education levels but are instead likely due to a constellation of factors which prevent ethnic minority parents from having access to the same kinds of information as European-American parents.

### *Limitations*

While this study helps advance our understanding of the relations between social support and academic success among a diverse sample of adolescents, it is important to consider a number of limitations. First, we argued that adolescents may vary in their social capital, in the form of access to information about the U.S. educational system and college entrance requirements. However, we did not directly ask adolescents the extent to which they, their parents, or their friends were in possession of this information. While no amount of information can be conveyed without talking and encouragement, it is possible that some adolescents talk with their parents and friends about school without getting useful information and this possibility should be explored in future research.

We were also not able to directly test whether support from friends or parents was more important, or to test their interactive effects. In fact, it is likely that they are related to each other, as adolescents with good relationships with their parents are likely to have good relationships with their friends (Brown et al., 1993). These adolescents are likely to share information obtained from their parents with their friends, as well as the reverse. In future work it will be important to consider support from other sources as well, such as older siblings, teachers, and school counselors (Azmitia, et al., 2009; Green et al., 2008). However, while teachers are important in adolescents' achievement, the teachers one encounters are largely determined by one's course enrollment. Further, as demonstrated by Woolley, Kol, and Bown (2009), it is likely that support from teachers and other adults at school mediate the relations between support from

parents and friends and achievement outcomes. That is, support from parents and/or friends enables adolescents to obtain support and information from teachers and counselors at school.

Additionally, our encouragement variable consisted of only two items, which were potentially tapping somewhat different constructs, depending on a students' track in school. In particular, the items asking about the extent to which participants' friends and parents have encouraged them to take college placement or honors courses likely has very different meanings for students already in AP or honors classes, compared to those who are not. Future studies should attempt to develop items that measure encouragement for academics more globally.

Finally, the participants in the follow-up sample were not entirely representative of the full high school sample, but instead were more likely to have been UC/CSU eligible during high school. Because of this, the majority of participants were enrolled in college two years after graduation. A more representative sample would have allowed us to better examine the extent to which high school experiences (both academically and in terms of support) predicted attending a two-year college versus not attending college, instead of collapsing these two categories as we did in this study. Examining this sample as they continue on in their educational experiences will allow us to further distinguish between those who go on to graduate with a four-year degree and those who do not. If patterns of support in high school are predictive of the extent to which adolescents go on to graduate from college, the findings reported here would have even larger implications in terms of policy and intervention.

### *Implications and Conclusions*

Overall, these results demonstrate the importance of intervention early in the high school years in making sure that adolescents know and understand college eligibility requirements. The strong associations between reports of support and UC/CSU eligibility in the ninth grade suggest

that at the very beginning of high school many adolescents are already on a path that will either lead them towards or away from college. Part of the explanation for the importance of course enrollment in ninth grade has to do with the sequential nature of many courses. A student who doesn't start on a college preparatory trajectory early enough in math, for example, will not be able to catch up by taking multiple courses in a single year. Math course enrollment in high school is critical not only for college admissions, but also in preparing adolescents for careers in science and engineering. These are fields in which ethnic minority youth continue to be under-represented (Gándara & Maxwell-Jolly, 1999). Equality in our society across ethnic and immigrant groups is dependent on equal access to careers in these domains.

Math also offers opportunities for intervention in that unlike subjects such as English, adolescents are not required to enroll in advanced math courses during high school. Changing high school graduation requirements, or having school personnel actively encourage more adolescents to enroll in advanced math courses early in high school may help offset a lack of parental knowledge and encouragement that may exist for some adolescents. This may be particularly important Latino adolescents, who are striking in the tremendous difference in their rate of UC/CSU eligibility, compared to European-American and Asian adolescents.

Given that parents who have gone to college are more easily able to guide their children through the college admissions process, interventions aimed at increasing college eligibility, enrollment, and graduation will have benefits for future generations as well. There is no time like the present to begin this process of increasing college access through high school course enrollment.

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Table 1

*Hierarchical linear models predicting GPA according to social support*

	Talk with friends <i>b (SE)</i>	Encouragement from friends <i>b (SE)</i>	Talk with parents <i>b (SE)</i>	Encouragement from parents <i>b (SE)</i>
Intercept	2.89 (.13)	2.87 (.10)***	3.05 (.16)***	2.42 (.18)***
Gender	.08 (.05)	.14 (.05)**	.24 (.06)***	.22 (.07)**
Asian	.15 (.14)	.09 (.12)	-.01 (.18)	.47 (.21)*
Latino	-.65 (.16)***	-.54 (.13)***	-1.07 (.19)***	-.15 (.22)
Support	.06 (.05)	.08 (.03)*	-.01 (.05)	.19 (.05)***
Gender	.01 (.02)	-.02 (.01)	-.05 (.02)**	-.03 (.02)
Asian	-.05 (.06)	-.03 (.04)	.02 (.05)	-.13 (.05)*
Latino	-.02 (.06)	-.08 (.04)	.12 (.06)*	-.17 (.06)**
Year	-.11 (.02)***	-.10 (.02)***	-.09 (.02)***	-.09 (.02)***
Gender	.01 (.01)	.01 (.01)	.00 (.01)	.00 (.01)
Asian	.01 (.03)	.00 (.03)	.00 (.03)	.00 (.03)
Latino	-.01 (.03)	.00 (.03)	-.01 (.03)	-.03 (.03)

*Note.* Gender was coded boys = -1, girls = 1. Gender, ethnicity, year, and support were uncentered.

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

Table 2

*Hierarchical linear models predicting change over time in social support as a function of UC/CSU eligibility*

	Talk with friends <i>b (SE)</i>	Encouragement from friends <i>b (SE)</i>	Talk with parents <i>b (SE)</i>	Encouragement from parents <i>b (SE)</i>
Intercept	2.09 (.12)***	1.61 (.16)***	2.88 (.10)***	3.04 (.12)***
Gender	.15 (.04)***	.21 (.05)***	.00 (.04)	-.01 (.04)
Asian	.11 (.14)	.58 (.18)**	-.30 (.13)*	.28 (.13)*
Latino	.10 (.14)	.43 (.18)*	-.11 (.12)	.21 (.13)
UC/CSU eligibility	.28 (.16)	.99 (.23)***	.10 (.15)	.52 (.15)***
Asian X eligibility	-.17 (.20)	-.70 (.27)**	-.08 (.19)	-.40 (.18)*
Latino X eligibility	-.10 (.27)	-.80 (.37)*	.36 (.25)	-.28 (.21)
Year	.18 (.05)***	.17 (.06)**	.05 (.04)	-.03 (.04)
Gender	-.01 (.02)	-.03 (.02)*	.04 (.02)*	.02 (.01)
Asian	-.01 (.06)	-.01 (.07)	-.03 (.05)	-.08 (.05)
Latino	-.04 (.06)	-.07 (.07)	-.06 (.05)	-.11 (.05)*
UC/CSU eligibility	-.01 (.07)	-.01 (.08)	-.02 (.05)	-.01 (.05)
Asian X eligibility	.02 (.08)	.03 (.10)	.01 (.07)	.06 (.07)

Latino X eligibility	-0.01 (.10)	.02 (.13)	-0.05 (.10)	-0.05 (.11)
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*Note.* Gender was coded boys = -1, girls = 1. Gender, ethnicity, and year were uncentered.

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

Table 3

*Hierarchical linear model predicting change over time in GPA as a function of whether or not a participant is enrolled in a four-year degree program two years after high school*

	GPA
	<i>b (SE)</i>
Intercept	2.89 (.14)***
Gender	.06 (.03)
Asian	-.28 (.17)
Latino	-.60 (.16)***
Enrollment	.45 (.15)**
Asian X Enrollment	.32 (.17)
Latino X Enrollment	.45 (.21)*
Year	-.22 (.04)***
Gender	-.01 (.01)
Asian	.11 (.05)*
Latino	.10 (.05)*
Enrollment	.17 (.04)***
Asian X Enrollment	-.13 (.06)*
Latino X Enrollment	-.23 (.07)***

*Note.* Gender was coded boys = -1, girls = 1. Gender, ethnicity, and year were uncentered.

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