## *Introduction*

School segregation is usually attributed to residential segregation; however, in a multi-ethnic city like Los Angeles, this may be an overly simplistic explanation. Clark (1992), Frey and Farley (1996) among others, have shown that segregation between specific neighborhoods has abated substantially since 1970, suggesting that resistance to integration has weakened or been overcome in the past generation. In addition, the continuing transition from neighborhood-based to choice-based attendance patterns among public school students further complicates the relationship. Advocates of choice-based school attendance argue that removing constraints to attendance will reduce segregation by removing neighborhood, district and municipal borders that have become social and bureaucratic barriers to integration (e.g.Finn, 1990). In contrast, critics assert that broadening the attendance options of students will merely add increase the levels of stratification in a system already characterized by racial and socioeconomic inequality (Astin, 1992).

This paper addresses both of these issues. First, I compare the ethnic composition of public schools to the composition of their neighborhoods to examine if school composition is a reflection of neighborhood composition in Los Angeles County. Then, following Sahoni and Saporito (2005), I examine whether the presence of private, magnet or charter schools affect the relationship between school and neighborhood composition. The second part of the paper will examine whether increased choice affects attendance at integrated versus own-race majority schools. Specifically, I focus on how family, neighborhood and school characteristics affect the odds of attending school outside one's residential area and whether there is evidence that attendance at "non-neighborhood" schools is related to racial and ethnic preferences or avoidance patterns.

***Data and Methods***

Following (Saporito and Sohoni, 2005), I use GIS methodology to overlay Census 2000 data on school attendance areas to construct a database with socioeconomic and racial data for each school neighborhood. This will then be linked with data about the public school in the attendance area, available from the Common Core of Data. In addition, I will add and private school data from the *Private School Survey.* This database will enable an analysis of residential and school segregation in Los Angeles County, using information pertaining to public and private schools.

To compare the ethnic composition of neighborhoods and schools, I use a method of threshold analysis to produce concentration profiles for different ethnic groups across schools and neighborhoods (Johnston et al, 2001; Poulsen et al, 2001). This method uses a sequence of prevalence thresholds with a range covering the full spread of values and which is sufficiently fine grained to illuminate changes according to the threshold criterion. The use of absolute values allows for comparative studies of ethnic group concentrations from place to place and over time, independent of individual city baseline values. Using concentration profiles enables me to focus on three main aspects of ethnic group segregation. First, the degree of *residential concentration* addresses the concept of ethnic enclaves or ghettos. Related to this, the *degree of assimilation* reflects how integrated a group is with regard to other groups in the city. Finally, the *degree of spatial isolation* involves both the existence of areas of the city in which an ethnic group formed a large proportion of the local population, and the extent to which the group is only located in those areas. In the context of schools, the degree of school concentration is the extent to which one ethnic group dominates in individual schools; the degree of school assimilation refers to the volume of ethnic mixing

in individual schools; and the degree of school encapsulation measures the extent to which individual ethnic groups are isolated from each other across the universe of schools. Separate concentration profiles will be used to classify schools, school neighborhood and residential neighborhoods in Los Angeles County. This will allow a detailed examination of the similarities and differences in the neighborhood contexts that are experienced by students.

These data will then be linked to each child in the Los Angeles Family and Neighborhood Survey (L.A.FANS), which is an ideal source for examining school attendance patterns and school composition in a multi-ethnic setting. The L.A. FANS is a planned longitudinal study of families in Los Angeles County,[1] which is specifically designed to answer key research and policy questions with regard to neighborhood, family, and peer effects on children's development.

The L.A.FANS traces the neighborhood and family roots of children's successes and failures in several areas, including cognitive development, school performance and behavioral and emotional development. In each neighborhood, the L.A.FANS includes: (1) a household survey (including interviews with adults and children) and (2) a neighborhood survey with key informants and social service providers. Household members are asked questions about education, employment, use of social services, social ties, residential mobility, family life, neighborhood conditions and involvement, and children's well being. The L.A.FANS sample includes 65 neighborhoods with approximately 40-50 households in each neighborhood. Wave 1 includes approximately 3200 children and teens ages 0 to 17.Approximately 40 to 50 households were selected from each tract. Thus, the data set

[1] This section draws heavily on Sastry et al. (2000). For a more detailed description of the survey process, including the constructions of weights, their article is available at www.lasurvey.rand.org.

includes a very diverse sample from the 88 cities and unincorporated areas of Los Angeles County.

***Preliminary Results***

1. Neighborhood and School Segregation

If all children in Los Angeles County attended their local neighborhood school, there would be no disparity between the ethnic composition of their attendance zone and the school in which they were enrolled. Figures 1 through 3 below illustrate that this is clearly not the case. The hypothetical fit line (dashed) illustrates the above scenario, while the solid line is represents the best fit to the data.

At the elementary level (Figure 1), the percent of white students in schools in lower than the percent of whites in the neighborhood, indicating that these children are taking advantage of educational choices. Furthermore, this relationship is curvilinear, which suggests that white children are under-enrolled in school with lower levels of white students. Among Latino students, the opposite is true. There is a higher proportion of Latino students in schools than in the neighborhoods in which they are located. This relationship is also curvilinear but in the opposite direction. The relationship between school and neighborhood composition is similar relationships among black and Asian students and is more closely aligned to the hypothetical situation in which there is a one to one relationship between school and neighborhood composition.

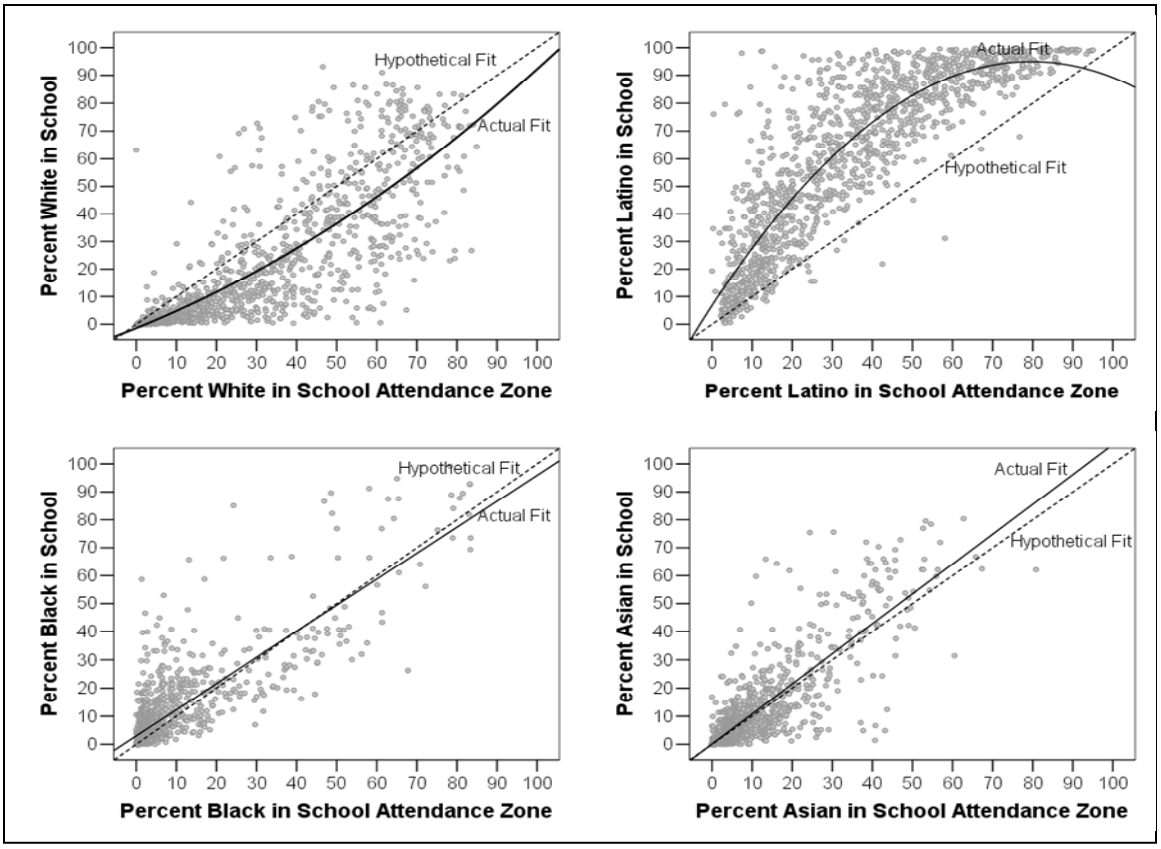

Figure 1. Relationship between Elementary School Composition and Elementary Attendance Zone Composition.

There are some differences at the middle and high school level. Among white students, the disparity between school composition and neighborhood composition remains, however, the direction of the fit line is changed. This suggests, that at both middle and high school level, white students are still under-enrolled in traditional public schools but are not avoiding schools with higher levels of minorities. There are also differences among Black and Asian students. For Blacks, the relationship becomes curvilinear, with higher levels of black enrolment in schools in neighborhoods with a lower proportion of black residents. This trend changes as the proportion of blacks in the neighborhood increases, suggesting that some black students in black majority neighborhoods are attending school elsewhere.

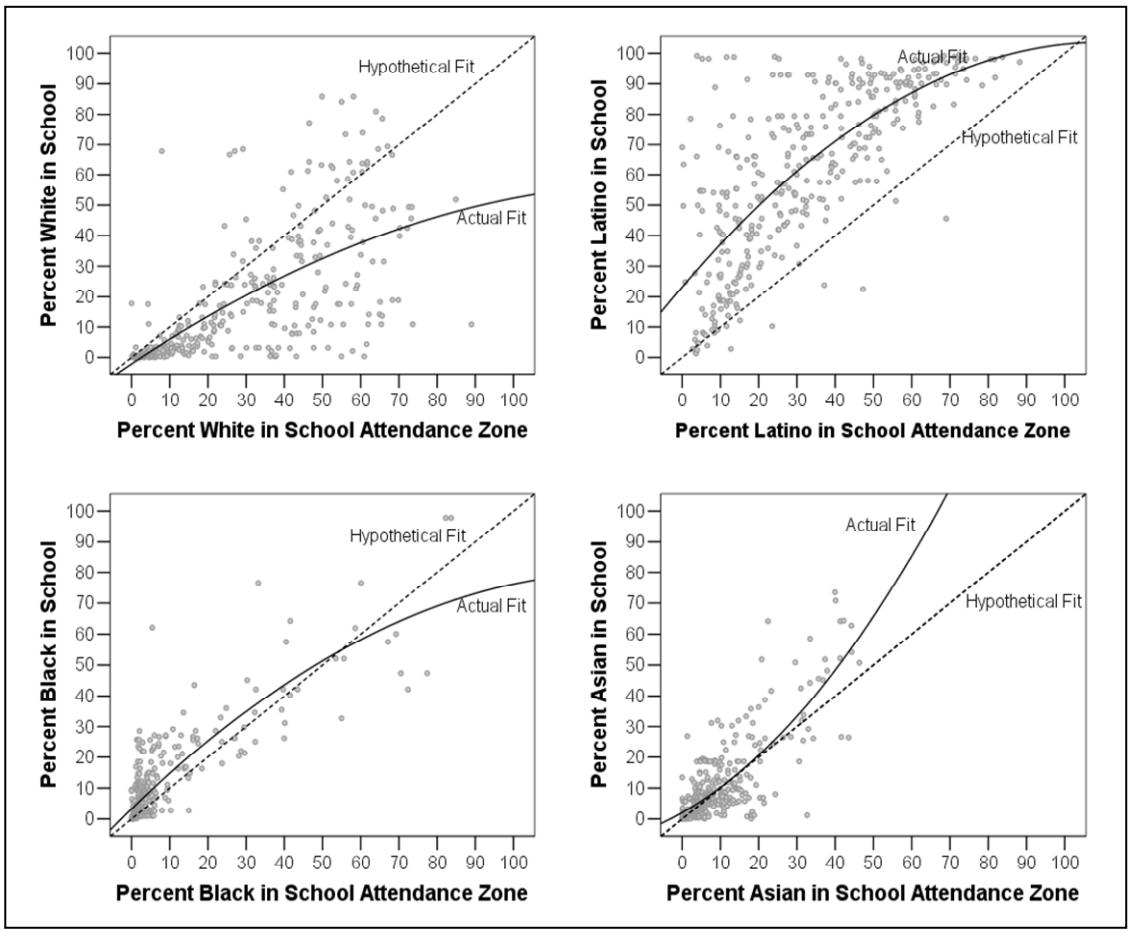


Figure 2. Relationship between Middle School Composition and Middle School Attendance Zone Composition.

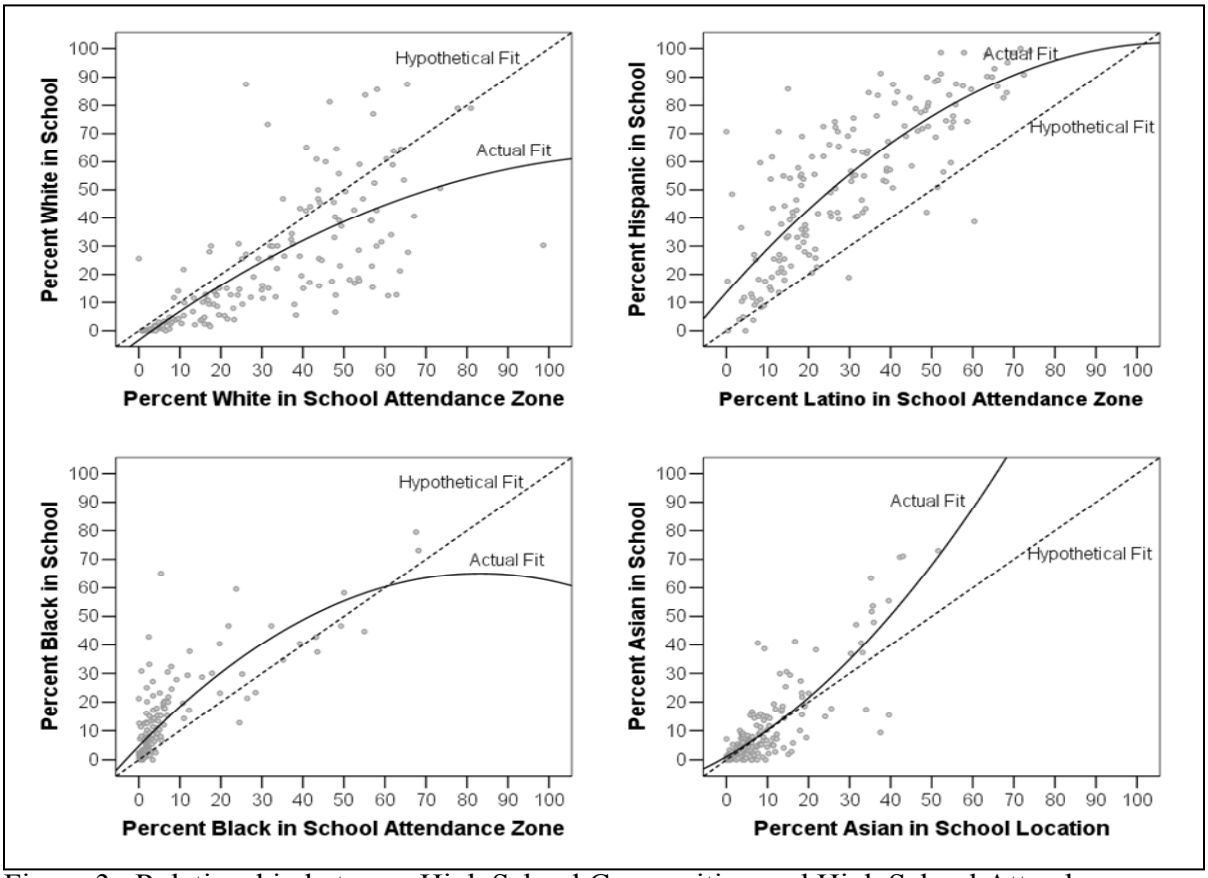

Figure 3. Relationship between High School Composition and High School Attendance Zone Composition.

To examine the disparities in school and neighborhood composition more closely, I use OLS regression to determine whether these differences are affected by the racial composition of the attendance zone and the number of school alternatives in a neighborhood – private, magnet or charter schools. The results are shown in Table 1. The first model presents the basic relationship between the ethnic composition of the school attendance zone and the proportion of white students enrolled. The presence of Hispanic and Asian children has a greater negative impact on White student enrolment than does the percent of black

children, a finding that warrants further examination. Models 2 and 3 provide strong evidence that the presence of private and magnet schools reduce the enrolment of white children in neighborhood schools. Conversely, the presence of charter schools increase the percent of white students enrolled in the neighborhood school.

Table 1. Regression of Percent White Students enrolled in Elementary School by Elementary School Attendance Zone Characteristics

| | Model 1 | | Model 2 | | Model 3 | |
|---|---|---|---|---|---|---|
| | *b* | *p* | *b* | *p* | *b* | *p* |
| Percent White | .550 | .000 | .557 | .000 | .560 | .000 |
| Percent Latino | -.329 | .000 | -.328 | .000 | -.330 | .000 |
| Percent Black | -.265 | .000 | -.253 | .000 | -.257 | .000 |
| Percent Asian | -.317 | .000 | -.318 | .000 | -.322 | .000 |
| Private (=1) | | | -2.124 | .004 | -2.377 | .001 |
| Magnet (=1) | | | | | -6.567 | .000 |
| Charter (=1) | | | | | 6.595 | .007 |
| Constant | | | 21.180 | .00 | 21.673 | .000 |
| $R^2$ | 0.711 | | 0.713 | | 0.722 | |

Further analysis is necessary to examine whether similar trends emerge for other ethnic groups and whether the effects of neighborhood composition and the presence of private, magnet or charter schools diminish at the middle and high school level. In the level of separation among children of different ethnic and racial backgrounds needs to be examined using isolation and entropy measurements.

2. Attendance Outside Residential Neighborhood by Public School Students

Table 4 highlights the patterns of attendance at non-neighborhood schools by ethnicity and level of education for children sampled in the LAFANS survey. It is clear that

a sizeable proportion of students attend school outside their residential neighborhood, although

Table 2. Attendance Patterns for Public School students in LAFANS Survey by School Location (n= 1757)

| | Latino | White | Black | Asian |
|---|---|---|---|---|
| **Elementary Students** | | | | |
| Inside Residential Neighborhood | 426 | 81 | 41 | 35 |
| | 61.7 | 56.6 | 51.9 | 60.3 |
| Outside Residential Neighborhood | 264 | 64 | 38 | 27 |
| | 38.3 | 43.4 | 48.1 | 39.7 |
| **TOTAL** | 690 | 143 | 79 | 58 |
| | 100.0 | 100.0 | 100.0 | 100.0 |
| **Middle School Students** | | | | |
| Inside Residential Neighborhood | 173 | 59 | 34 | 22 |
| | 78.6 | 77.6 | 79.1 | 68.8 |
| Outside Residential Neighborhood | 47 | 17 | 9 | 10 |
| | 21.4 | 22.4 | 20.9 | 31.3 |
| **TOTAL** | 220 | 76 | 43 | 32 |
| | 100.0 | 100.0 | 100.0 | 100.0 |
| **High School Students** | | | | |
| Inside Residential Neighborhood | 176 | 67 | 30 | 17 |
| | 72.7 | 71.3 | 57.7 | 60.7 |
| Outside Residential Neighborhood | 66 | 27 | 22 | 11 |
| | 27.3 | 28.7 | 42.3 | 39.3 |
| **TOTAL** | 242 | 94 | 52 | 28 |
| | 100.0 | 100.0 | 100.0 | 100.0 |

there are variations by school level and across ethnic groups. At the elementary level, the proportion of Latino students attending outside their neighborhood is 38.3 percent, lower than all other ethnic groups. Black students have the highest proportion of elementary students attending school outside their residential area – 48.1 percent. 43.4 percent of white

students attend a school that is not located in their residential neighborhood, while 39.7 percent of Asians attend school outside where they live. The high level of attendance at non-neighborhood schools among black students is most likely related to the proportion of black elementary students attending magnet schools. For example, in Los Angeles Unified School District, the programs are specifically designed to ensure integration. To this end, priority is given to non-Anglo students and transportation is provided to the magnet school a child is enrolled in. These attendance patterns also suggest a greater desire among black parents to send their children to integrated elementary schools.

Rates of attendance outside the residential neighborhood are lower at the middle school level. This suggests lower mobility among middle school students. However, this may be due to the fact that middle schools are often located in close proximity to elementary schools and their attendance zones are larger than those at the elementary level, giving the impression that mobility has dropped.

There is a return to high rates of mobility at the high school level, with black students having the highest rate of attendance outside their residential neighborhood (42.3 percent). As with elementary students, it is probable that the rate of attendance at non-neighborhood schools is related to high levels of attendance at magnet schools. It is also interesting to note that Asian high school students have rates more similar to black students than whites, given the fact that similarities among Asians and whites are often highlighted in research addressing racial and ethnic differences in social processes including home ownership, graduation rates, employment and earning patterns.

While it is likely that the attributes of particular schools act as "pull factors" in the decision making process regarding school attendance, it is also feasible that the school

neighborhood itself is important. Indeed, it is possible that attendance at certain schools is related to the ethnic composition of the neighborhood in which the school is located.

Table 3. Attendance Patterns for Students living in and attending school in Own Race Majority Neighborhoods

| | Students Living In and Attending School in Own-Race Majority Neighborhoods | | | | | |
|---|---|---|---|---|---|---|
| | Latino | | White | | Black | |
| | Inside | Outside | Inside | Outside | Inside | Outside |
| Number of Students | 512 | 178 | 130 | 28 | 3 | 2 |
| Proportion of Total | 44.4 | 15.4 | 41.5 | 8.9 | 1.7 | 1.1 |
| TOTAL | 1152 | | 313 | | 172 | |
| | 100.0 | | 100.0 | | 100.0 | |

From table 5, it is clear that a similar proportion of white and Latino students attending school inside their residential area are living in own-race majority neighborhoods (41.5 percent and 44.4 percent respectively). In contrast, only 1.7 percent of black students attending their neighborhood school live in a majority black neighborhood. None of the 118 Asian students lived in and attended school in majority Asian neighborhoods.

Among students attending outside their residential neighborhood, Latinos had the highest rate of living in and attending school in a neighborhood with a Latino majority (15.4 percent). 8.6 percent of white students attending non-neighborhood schools attended in majority white neighborhoods, while only 1.1 percent of black students attending outside were in schools located in black majority neighborhoods. This is an important finding, given the belief in much of the literature that the most important determinant of school composition is the residential mosaic that exists (Reardon et al., 2000; Clotfelter, 1998). This raises the question of whether children living in and attending school in own race majority neighborhoods are also attending own-race majority schools. For those wishing to promote

integration and assimilation, this is a further constraint, since such ethnic separation would limit students' contacts with members of other ethnic groups.

It is clear from table 6 that Latino students who live in and attend school in majority Latino neighborhoods also go to majority Latino schools. There is greater variation in attendance patterns among white students. Among those attending school in their residential neighborhood, 5.7 percent attend predominantly white schools and 36.7 percent attend majority white schools. However, there is also evidence of school integration – 24.1 percent of white students attending their neighborhood school in white majority neighborhoods are enrolled in an ethnically mixed school and 2.5 percent are enrolled in schools with no ethnic majority. There are also small proportions of white students attending Black majority and Latino majority schools.

Table 4. Attendance patterns for students living in and attending school in own race majority neighborhoods by school composition.

| | **Latino** | | **White** | |
|---|---|---|---|---|
| | Inside | Outside | Inside | Outside |
| Predominantly White | | | 9<br>5.7 | 6<br>3.8 |
| Majority White | | | 58<br>36.7 | 13<br>8.2 |
| Ethnically Mixed | | | 38<br>24.1 | 8<br>5.1 |
| No ethnic majority | | | 4<br>2.5 | 1<br>0.6 |
| Majority Black | | 1<br>0.1 | 6<br>3.8 | |
| Majority Latino | 512<br>74.2 | 177<br>25.7 | 15<br>9.5 | |
| TOTAL | 690<br>100.0 | | 158<br>100.0 | |

To more formally examine the results above, I use logistic regression models to examine the odds of attending school outside one's residential neighborhood. Table 7 presents the parameter estimates for all students and for white and Latino students living in and attending school in own race majority neighborhoods. In model 1, none of the student and household variables significantly affect the odds of attending school outside one's residential neighborhood. Nor do the variables associated with school quality or ethnic composition significantly affect the likelihood of attending a non-neighborhood school. In fact, only the neighborhood variables are significant predictors. As the median house price and median income of the residential neighborhood increases, the odds of attending school outside the area decreases. This may be related to the fact that wealthier neighborhoods provide higher quality education and reduce the desire of parents to send their children to non-neighborhood schools. This would also explain the lack of significance of school quality variables, since their effects are subsumed within the neighborhood effects.

Model 2 is restricted to white children living in and attending school in majority white neighborhoods. Overall, the model is a very strong predictor of attendance patterns, with 95.0 percent classified correctly and an $R^2$ of 0.72. Among this group the odds of attending a non-neighborhood school are positively related to attendance at a magnet school. As in model 1, the odds of attending school outside one's residential area falls as median neighborhood income and house price increases. In addition, the proportion of adults in the neighborhood with a college education becomes a significant predictor. Attendance at schools outside the home neighborhood increases with every unit increase in the proportion of college educated adults. This may be evidence that adults with higher levels of education are more likely to pursue a wider variety of schooling choices. The school neighborhood

also exerts an influence on the likelihood of attending a non-neighborhood school. Median income and median house price in school neighborhoods become pulls factor as it rises, increasing the odds of a child attending school outside their residential area. The effect of the proportion of college-educated adults in the school neighborhood is less clear. The significant negative relationship suggests that it may act as a barrier to entry for student wishing to attend school outside their own neighborhoods. In contrast to model 1, school related variables are significant predictors of attendance at non-neighborhood schools. Higher ranked schools act as a pull factor for white students living in and attending school in white majority neighborhoods. School composition is also significant in predicting the odds of attending inside or outside the residential attendance zone for students in this group. It is interesting to note, however, that increasing proportions of each ethnic group has a positive effect on the odds of a child being enrolled in a school outside their residential area. This suggests that for children living in and attending school in white majority neighborhoods, increased diversity in the actual school is viewed positively when parents the decision to enroll their child in a school outside the residential area.

The third model, which focuses on Latino students living in and attending school in Latino majority neighborhoods, has limited predictive ability ($R^2$ of 0.18). However, in keeping with the previous models, neighborhood factors remain important in predicting the odds of attending school outside the residential neighborhood. It is worth noting the reversal in the direction of the residential neighborhood effects. An increase in the proportion of college-educated adults now reduces the odds of attending school outside the residential neighborhood, while increased median income increases the odds.

Table 5. Logit Estimates for Attending School Outside Residential Neighborhood for Students living in Different Ethnic neighborhoods

| | Model 1 All (N=1525) | | Model 2 White in White Majority (N=154) | | Model 3 Latino in Latino Majority (N=656) | |
|---|---|---|---|---|---|---|
| *Student & Household* | | | | | | |
| Age | -.015 | .566 | .041 | .875 | -.023 | .605 |
| Gender | .049 | .677 | 1.327 | .160 | .138 | .484 |
| Latino | -.125 | .601 | | | | |
| White | -.124 | .608 | | | | |
| Black | -.075 | .791 | | | | |
| Asian | .146 | .595 | | | | |
| Foreign Born | .079 | .650 | 1.603 | .221 | -.023 | .605 |
| Charter School | -.711 | .355 | [b] | | -6.074 | .138 |
| Magnet School | .070 | .697 | *4.332* | *.023* | -.194 | .444 |
| Hhld Income (000) | .001 | .533 | .004 | .375 | -6.074 | .438 |
| # Children | -.069 | .181 | -.163 | .698 | -.024 | .943 |
| Mother working | .222 | .074 | -.972 | .318 | -.002 | .614 |
| *Residential Area* | | | | | | |
| %White | -.007 | .458 | | | | |
| House Price (000) | *-.007* | *.012* | *-.173* | *.001* | -.034 | .685 |
| Median Inc (000) | *-.078* | *.000* | *-.345* | *.048* | *.594* | *.004* |
| % college educated | .020 | .462 | *1.948* | *.000* | *-.229* | *.001* |
| *School Area* | | | | | | |
| % White | .017 | .090 | | | | |
| House Price (000) | *.006* | *.044* | .182 | .001 | .005 | .617 |
| Median Inc (000) | *.084* | *.000* | .275 | .034 | .036 | .269 |
| % college educated | -.039 | .147 | -2.242 | .001 | *.164* | *.007* |
| Sch*ool Related* | | | | | | |
| School Rank | .085 | .154 | 1.559 | .004 | .050 | .705 |
| Pupil-Teacher Ratio | -.034 | .223 | -.441 | .185 | *-.163* | *.001* |
| % White | -.193 | .057 | 4.251 | .022 | .203 | .524 |
| % Hispanic | -.181 | .077 | 4.332 | .021 | .246 | .428 |
| % Black | -.170 | .098 | 4.251 | .022 | .235 | .452 |
| % Asian | -.184 | .071 | 4.335 | .020 | .272 | .386 |
| Constant | 17.951 | .08 | 1.325 | .872 | 49.782 | .709 |
| % Correct Classification | 79.3 | | 95.0 | | 79.7 | |
| $R^2$ | .25 | | .72 | | .18 | |

a Each unit increase in School Ethnicity denotes a move from one classification category to another.
b Automatically dropped from analysis

**Conclusion**

The first section of the paper highlights the fact that the relationship between school composition and neighborhood composition remains an important dimension of discussions regarding school segregation and integration. It is also clear that there is a large proportion of the student population in Los Angeles County attending schools that are located outside their residential neighborhoods. The trends in attendance are different as students move through the different levels of education, with evidence of white student avoidance of traditional public schools most apparent at the elementary level. Given the extensive research on "White flight" from public schools, it seems likely that these attendance patterns are related to the ethnic composition of the school.

However, as the second half of this paper shows, the transition to choice based education is not merely a result of the attendance patterns of white students. While this analysis certainly highlights the possibility that school choice will exacerbate segregation, it also highlights the fact that in multi-ethnic settings like Los Angeles, it is not merely due to white flight from the public schools. There is a complex relationship between income, ethnic preferences, school, and neighborhood characteristics that are involved in the parental decision to send their children to school in non-neighborhood schools.

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