Toward Understanding How Social Capital Mediates the Impact of Mobility on Mexican American Achievement

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Abstract

This study links the social capital literature with research on student mobility to investigate low test score performance among Mexican origin youth. Specifically, it examines whether Mexican Americans learn less in school than non-Latino Whites, in part because they have limited social capital due to the fact that they are more mobile during their school careers. This study also considers whether different forms of peer social capital, like different kinds of currency, have differential exchange value, and if such differences influence the test-score gap. Findings encourage greater sensitivity to inter- and intra-ethnic distinctions in the socialization process that contribute to group differences in the availability and utility of the resources that inhere in social networks.

No group will do more to change the nation's schools in the next quarter century than the new ethnic mosaic of Latinos,[1] the largest and fastest growing minority population in the United States (Tienda 2001). The number of U.S. Latinos is increasing eight times more rapidly than the population as a whole; by 2025 a quarter of all U.S. K-12 students will be of Spanish-speaking origin (U.S. Department of Commerce, Bureau of the Census 2000a). This tectonic shift in U.S. demographics is accompanied by broadening concern regarding low average Latino educational achievement and attainment patterns (Fernández, Paulsen & Hirano-Nakanishi 1989; Latinos in Education 1998). While the gap in high school completion rates between non-Latino Blacks and Whites has narrowed significantly in the past 30 years, double-digit disparities in Latino and non-Latino White high school graduation rates have stubbornly persisted (U.S. Department of Education 2004).[2]

Although achievement differences between Latinos and non-Latinos are pronounced, they are perhaps not as disparate as within-group differences in student performance among Latino sub-populations (Valencia 2002). Illustratively, youth of Mexican descent – the most challenged of all Latino subgroups (Aguirre and Martinez 2000; Gibson, Gándara and Koyama 2004) – are dropping out of school at nearly twice the rate of their Cuban American counterparts (U.S. Department of Commerce, Bureau of the Census 2000b) and score significantly lower on Stanford achievement tests than Cuban, Nicaraguan, and Colombian Americans (Portes and Rumbaut 2001). Moreover, the two-thirds of all U.S. Latinos who are of Mexican origin have the lowest college completion rate among Latino sub-groups (Chapa and Valencia 1993; Vernez and Mizell 2002). That a growing proportion of the U.S. population will

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be made up of persons drawn from groups whose amount of schooling and educational performance is significantly below that of the rest of the nation is cause for serious concern about Latino student performance (College Board 1999) and low average levels of Mexican American achievement in particular (Ream 2005).[3]

This study links the emergent literature on social capital (resources embedded in social networks and unleashed via social exchange) with research on student mobility (non-promotional school changes that may or may not be associated with a change of residence)[4] to show that low average Mexican American test score performance is at least in part the result of the social network instability that accompanies high rates of transience among this particular group of students. This study also compares the utility of different forms of social capital by considering whether adolescents' more close-knit peer relationships impact student achievement differently than their educationally oriented peer networks.

Research Literature

Explaining Mexican American Underachievement

Most studies designed to explain low average student performance among Mexican origin youth appeal to theoretical notions of three interrelated kinds of capital including human capital, cultural capital, and physical/material capital. Neo-classical economists introduced human capital theory (Becker 1964; Schultz 1961) to explain how changing people to give them knowledge and skills will facilitate the most efficient use of economic capital (Coleman 1990). Cultural capital (Bourdieu 1979) has been employed in a variety of ways (Lamont and Lareau 1988), from explaining educational and consumptive tastes across social classes (DiMaggio 1982) to investigating the cultural underpinnings of the achievement gap (Gándara 1994). Framed at the intersection of human and cultural capital, language barriers are most frequently cited in association with Mexican American underachievement (Trueba 1988; Valdés 2001). Others appeal more broadly to the explanatory power of culture, noting that many youth of Mexican descent attend schools where teachers have limited knowledge of students' cultural backgrounds, which can lead to alienation and disengagement from school (Matute-Bianchi 1986; Valenzuela 1999). Socioeconomic disadvantage is also a well-researched contributor (Brooks-Gunn and Duncan 1997; Velez 1989) to a problem that is exacerbated by inequitable schooling and substandard educational facilities (Gándara et al. 2003).

Where Traditional Explanations Fall Short

Although contemporary research offers various reasons for Mexican American underachievement, some of the explanatory pieces are still missing from the puzzle. Studies based on human and material capital, for example, have yet to explain why some middle-class minority student groups consistently perform below non-Latino Whites with similar family and school backgrounds (Jencks and Phillips 1998; Miller 1995). Nor has research explained why racial/ethnic[5] disparities prove to be greater among students whose parents are college educated than students whose parents lack even a high school degree (College Board 1999). And while primary cultural differences, including language, distinguish many minorities from the mainstream, relevant research remains the subject of considerable debate (Darder, Torres and Gutierrez 1997; Erickson 1987). Research is also beginning to question "secondary cultural difference" theories (Ogbu 1992) by showing that many minority students, regardless of the terms of their incorporation in the U.S., share with their mainstream peers similar – if not more optimistic – perceptions about their educational experiences (Ainsworth-Darnell and Downey 1998; Cook and Ludwig 1997).

Social Capital

Given these limitations, social scientists have renewed the search for alternative perspectives that can inform our understanding of Mexican American underachievement (Gibson, Gándara and Koyama 2004; Valencia 2002). One view, based on social capital theory, calls for researchers to more carefully consider factors that distinguish the inter- and intra-ethnic socialization process among minorities from the socialization process more typical of mainstream students (Stanton-Salazar 1997). Broadly defined, social capital is the aggregate of the actual or potential resources embedded in social networks that may be ***converted*** into other manifestations of capital, including material capital (Bourdieu 1986), human capital (Coleman 1988), and healthy civic participation and community cohesion (Putnam 2000). The fungibility of the resources embedded within social networks, *via* social exchange, into other kinds of capital is a consistent theme among those who employ the social capital postulate to explain how people are made more (or less) productive by social ties (Lin 2001; Portes 1998; Woolcock 1998).

While it perhaps goes without saying that social networks have the potential to improve quality of life for individuals and the broader community (Durkheim's emphasis on group life as an antidote to anomie and suicide is but one example of similar notions that can be traced back to the 19th century classics of sociology), social capital does not always work to the benefit of those who tap it (Portes and Landolt 1996; Ream 2003). Moreover, transactions involving social capital sometimes disguise what might otherwise be characterized as unfair market exchange (hence the existence of sanctions against insider trading and nepotistic hiring practices).[6] It is in part the enigmatic nature of the social capital postulate that makes it worthy of more careful examination – not only for its potential to influence student performance, but also for suspected group-level differences in the way it does so (Horvat, Weininger and Lareau 2003).

The Mobility/Social Capital Dynamic

While most people experience life as participants in various social networks that influence their values and priorities, adolescence marks a time when peer interaction becomes particularly important in the formation of subsequent life trajectories (Claes 1992; Laursen 1993). Adolescents spend nearly twice as much time with same-age peers than with family (Larson and Richards 1991), and peers exhibit extraordinary influence on adolescents' day-to-day school behavior (Carnegie Council 1995; Steinberg, Dornbusch and Brown 1992), including how much time they spend on homework, whether they enjoy coming to school each day (Epstein 1983; Phelan, Davidson and Yu 1998), and their attitudes toward education (Schneider and Stevenson 1999). But like the frequent re-potting of plants, mobility tends to disrupt social root systems and the social context for peer interaction. By inhibiting the establishment and maintenance of secure and trusting friendships, changing schools and/or residences can impinge on adolescents' self-confidence and their overall well being (Rumberger et al. 1999). It follows that the *mobility/social capital dynamic* whereby student

mobility impacts the availability and convertibility of the resources inherent in social networks merits attention on the basis of its sway over peer group stability and academic achievement (McLanahan and Sandefur 1996; Mehan at al. 1994) – particularly at the secondary school level.

If transience were not so commonplace, such concern about its potential association with declining stocks of social capital (Putnam 2000) and educational under-performance among particularly mobile student groups (Wood et al. 1993; Rothstein 2004) might seem unwarranted. There is no getting around the fact, however, that student mobility is widespread (Hudis and Rathnam 1994; U.S. General Accounting Office 1994), with the majority of U.S. school children making a non-promotional school change by the 12th grade and some transferring schools much more frequently (Rumberger et al. 1999). Student mobility is not only commonplace, but can also inhibit educational achievement and school completion. Numerous studies document its negative impact on student performance in the primary grades (Rumberger 2003; Tucker, Marx and Long 1998). Students who make unscheduled school changes are also much less likely to graduate from high school than their more stable counterparts (Astone and McLanahan 1994; Rumberger and Larson 1998; Teachman, Paasch and Carver 1996). Of the achievement-related research that includes mobility at the secondary level, however, the findings are mixed. One study of 30,000 6th and 8th graders in Chicago found that mobile students had significantly lower test scores even after controlling for prior achievement and other background characteristics (Lee and Smith 1999). Another concurrent investigation reported that despite some negative short-term consequences, student mobility early in high school can lead to modest gains in mathematics achievement for those mobile students who remain in school through the 12th grade (Swanson and Schneider 1999). Thus, the impact of student mobility may have something to do with its timing, and timing might be associated with the *reasons* students change schools (Ream 2005).

James Coleman (1988, 1990) was the first to address the *mobility/social capital dynamic* and others have followed suit (Hagan, Macmillan and Wheaton 1996; Pribesh and Downey 1999). This study takes Coleman's assertion one step further by suggesting the impact of student mobility on peer social capital development may be particularly detrimental to Mexican origin youth, per the following hypothesis:

> *Mexican Americans learn less in school than non-Latino Whites, in part because they have less access to peer social capital due to the fact that they are more mobile during their school careers.*

Social Capital and its Convertibility

It is a rather axiomatic notion that some groups of people have more ample resources embedded in their social networks than others, but it has rarely been investigated whether different *forms* of social capital,[7] like different kinds of currency, give evidence of differential exchange value. So just as newly minted *Euros* are good for *crêpes* on the Left Bank – but won't buy a hotdog at Chavez Ravine no matter how international the Dodger's fan base may now be – the convertibility of social capital may also be conditioned by the people who possess it and the places where they attempt its exchange. Are some forms of social capital in the school setting more convertible into academic achievement than others? Stanton-Salazar (1997) posits that social capital can facilitate the conversion of culture-based "funds of knowledge" (Vélez-Ibañez and Greenberg 1992) into mainstream educational achievement, but he also shows how social networks can inhibit the conversion of culture-based attributes

(Stanton-Salazar 2001). Social capital inhering in minority students' relationships with mainstream school personnel, for example, can facilitate the conversion of gifted students' biliterate Spanish/English skills into student engagement and leadership positions – but only if biliteracy is *valued* by school personnel (Valencia 2002).[8]

This is perhaps the point of departure for emergent research suggesting that minority students fortify social ties in ways that differ from their mainstream counterparts, and that these differences can influence the accumulation and transmission of important resources embedded within social networks. For example, close-knit and trusting peer interactions – what some anthropologists and cultural psychologists have termed *confianza en confianza* (Vélez-Ibañez 1997) – may be of particular value to Mexican American adolescents (Stanton-Salazar 2001). Roughly translated into "trusting mutual trust," *confianza en confianza* is a construct learned through intimate and often family-based social interaction among U.S. Latinos. As such, it functions as a vehicle for self-reference, social esteem, and cultural meaning-making (Montero-Sieburth and Villarruel 2000). A much more extensive literature shows that students whose friends like school, get good grades, and are interested in school or attend class regularly are more likely to encounter educational success (Berndt 1999; Hallinan and Williams 1990). But school orientation and its social construction among adolescent peers may also differ across groups of students, in one instance encouraging educational advancement while in another catalyzing school disengagement among disaffected youth sharing anti-school attitudes (Eckert 1989; Flores-González 2002). This study places the Bourdieuian notion that the convertibility of resources embedded in social networks may differ between groups in the broader context of the *mobility/social capital dynamic* to test a second hypothesis:

> *Different forms of peer social capital, like different kinds of currency, have differential exchange value – hence the process of academic achievement differs across groups in a manner that disadvantages Mexican origin youth.*

Hypotheses and Research Questions

This investigation pursues two hypotheses. The first suggests that Mexican American adolescents learn less in school because they have less access to peer social capital because they are more mobile during their school careers. The second hypothesis draws the distinction between the *availability* of social capital and its *convertibility* by considering whether different forms of social capital evidence differential exchange value to the disadvantage of Mexican origin youth. These hypotheses are examined via the following research questions:

> *To what extent do student mobility rates and the availability of various forms of peer social capital differ between Mexican American and non-Latino White adolescents?*
>
> *What is the relationship between student mobility, peer social capital and 12th grade test score performance among the two groups?*
>
> *Do group-level differences in the relationships between these factors contribute to Mexican American underachievement?*

Research Design

Base-year (1988) and second year follow-up (1992) data from the National Education Longitudinal Study of 1988 (*NELS:88*), a national longitudinal panel study of a cohort of approximately 25,000 8th graders, are employed in this investigation. These data are well suited for this study because they contain extensive information on family background, mobility, social interaction among adolescent peers, and educational achievement among Mexican American and non-Latino White students in the United States during the high school years between 1988 and 1992. Follow-up students are tracked whether they remained in school or dropped out, as long as they continue to reside in the United States. Minority students are over-sampled to increase their respective sample sizes, facilitating comparative analyses of different groups. Sample weights are imputed to compensate for non-random sampling techniques and unequal selection probabilities.

Data drawn from the panel of base-year students who were re-surveyed in 1990 and 1992 (N = 16,489), excluding students who drop out of school, are employed in this study. The final sample includes 1,141 Mexican Americans and 10,907 non-Latino Whites.[9] The descriptive analyses include weighted values for all the *valid-responses* for each variable. While a considerable portion of students in the final sample are missing at least some important follow-up (12th grade) information,[10] they are retained in the predictive analyses through imputation techniques to make the sample larger and more plausibly representative of disadvantaged students who did not answer all the questions in the survey.[11]

Dependent Variables

In order to ascertain the impact of student mobility and peer social capital on academic achievement, statistical models include measures of mathematics and reading performance based on cognitive tests given to students who participated in the *NELS:88* second year follow-up survey when most were enrolled in 12th grade. That students were administered achievement tests in each year of the survey enables researchers to examine changes in test scores over time because all scores are re-scaled to the same metric (the IRT-estimated number right).[12]

Independent Measures of Mobility and Control Variables

Student mobility is measured in 1988 and then again in 1992 in the *NELS:88* data. In the 8th grade survey (1988), parents are asked to identify how many times their children changed schools between 1st and 8th grade, excluding changes due to promotion from one school to another. In the 12th grade survey (1992), students are asked how many times they had changed schools non-promotionally over the previous four years. Parent reports of students who made non-promotional school changes by 1988 when the *NELS:88* students were in 8th grade, and students who report changing schools between grades eight and twelve are included in the survey analyses.[13] While the survey data lack a measure of K-8 residential mobility, students in the 1992 second-year follow-up survey identify the number of residential changes they had undergone since 8th grade. This measure is included in the descriptive analyses and also employed as a control measure in the predictive models to ensure that the effects of student mobility are the consequences of the school changes themselves rather than coincident residential changes.

A number of control variables reflecting students' family background and academic background are also included. The *NELS:88* composite measure of socioeconomic status (SES) reflecting parental education, income, and occupation is employed as the family background measure, since the effects of stressful life events, including school transfer, may be particularly problematic for children who live in homes characterized by socioeconomic disadvantage (DuBois et al. 1994). One recent study using NELS:88 data uncovered a spurious correlation between mobility and student achievement once prior achievement was accounted for (Heinlein and Shinn 2000), so this investigation also includes 8th grade math and reading test scores as control variables. Finally, prior student mobility, which measures the number of times students changed schools non-promotionally between grades K-8, is also used as a control variable.

Intervening Measures of Peer Social Capital

Scholarship on social capital suffers from fuzziness in terms of its conceptualization and inconsistency in how it has been operationalized (Dika and Singh 2002). Indeed, the dynamic nature of social interaction makes its measurement problematic. With this concern in mind, I searched *NELS:88* for variables approximating direct peer-to-peer interaction, since variables of this nature enable social capital to be measured both in terms of quantity (i.e. the existence of a relationship) and quality (i.e. the nature of that relationship). Based on research emphasizing the multi-dimensionality of the social world of adolescents (Borman and Schneider 1998; Laursen 1993), I constructed three composite measures of peer social capital, including an omnibus composite and two sub-composites reflecting qualitative differences in the density and range of peer relationships. The two sub-composites distinguish more intimate and trusting peer relationships from broader notions of educationally oriented peer networks.

Analytic Methods

Structural Equation Modeling (SEM) techniques were employed to construct composite measures of peer social capital and to test the relationship between mobility, peer social capital and student achievement. The composites were developed in two steps. First, the omnibus composite casts a broad net by merging numerous *NELS:88* items that reflect peer social interaction of varying quality, density and range into a single construct (Chronbach's alpha = .68 and .70 for Mexican Americans and non-Latino Whites, respectively). Then, measurement models assess convergent and discriminant validity, suggesting variable groupings in the two distinct sub-composites. These steps led to the removal of three variables initially identified as potential contributors,[14] resulting in the eight-item omnibus composite (PSC), and two moderately correlated (.35, $p < .01$) sub-composites, including *Peer Connectedness* (PSC1) and *Peers Value Education* (PSC2).[15] The indices used to test the fit of the measurement models are the Tucker-Lewis index (TLI), comparative-fit index (CFI), and root-mean-square-error-of-approximation (RMSEA).[16]

To investigate whether the *NELS:88* items included in latent measures of peer social capital load differently for Mexican Americans and non-Latino Whites, I compared an unconstrained measurement model with a model in which factor loadings are constrained to equality for both groups. Group-level differences proved insignificant, however, so the paths connecting the social capital constructs to their respective indicator variables were set to unity across groups in the structural models. Regardless of the care with which the composites were developed, the instruments employed in the *NELS:88* educational survey were not designed with an eye toward studies on social capital or any other single basic

research agenda. I return to this issue in the concluding section, offering recommendations for developing survey instruments more sensitive to the multi-dimensionality of social life.

While the measurement models provide an assessment of the convergent and discriminant validity of the social capital composites, structural models assess their predictive validity. There are several reasons for using structural equation models to conduct the survey analyses. First, SEM can confirm measurement models where multiple variables are hypothesized to define forms of peer social capital (SEM allows for estimating the relationships between latent constructs free of measurement error). Moreover, SEM improves upon the predictive capacity of multiple regression by allowing for true multivariate estimation, including the estimation of direct and indirect effects. Third, SEM is able to take advantage of the longitudinal nature of the *NELS:88* data by facilitating path analysis to relate variables in the *mobility/social capital dynamic* over time in a manner that is relational (causal), not additive.

Equality Constraints and Critical Ratios Analyses

While factor loadings in the *measurement models* are group invariant, this does not necessarily mean that a fixed unit change in a latent measure of peer social capital will correspond to the same change of an endogenous variable(s) independent of whether the respondent is Mexican American or non-Latino White. This distinction is important for ascertaining whether different groups of students rely on different forms of social capital to varying degrees in the learning process. To get at this question, I tested for and found group-level differences in the overall fit of the *structural models*. Critical ratios analyses then facilitate comparisons that illuminate, for example, whether the impact of *Peer Connectedness* on reading test scores among Mexican Americans differs significantly from the same parameter associating *Peer Connectedness* and reading test scores among non-Latino Whites.

Results

The results are presented in two main sections. In the first section, descriptive analyses of the weighted 8th through 12th grade panel data offer group-level comparisons of family background characteristics, mobility patterns, peer social capital and 12th grade test scores. The second section is divided into two parts. First, the omnibus measure of peer social capital is included in predictive analyses, then sub-composites reflecting (a) students' sense of connectedness with their peers, and (b) the value that peers place on education, are introduced as intervening latent variables within structural models so as to further investigate forms of peer social capital within the *mobility/social capital dynamic*.

Descriptive Findings

Although informal social networks embodied, for example, in Mexican *familism* (Suárez-Orozco and Suárez-Orozco 1995; Valenzuela and Dornbusch 1994) can act to mitigate the challenges associated with minority status in the U.S. (Zhou and Bankston 1998), Mexican Americans in the *NELS:88* sample are nonetheless at a significant family-based resource disadvantage as evidenced by low average socioeconomic status – more than a standard deviation below mean-level SES among non-Latino Whites, per Table 1. This discrepancy may be partly attributable to schooling- and employment-related challenges faced by immigrant parents (Trejo 1997) who constitute approximately one third of the Mexican American parents who answered survey questions included in the composite SES measure. In any event,

differences in both socioeconomic status and nativity status (only 43 percent of the Mexican American students in the sample hail from families with U.S. born heads-of-household) are not surprising in light of corroborative research that similarly describes Latino social demographics throughout the U.S. (Hayes-Bautista 2004; Portes and Rumbaut 2001).

Descriptions of mobility in Table 1 also confirm the findings in other studies showing that U.S. school children in general, and Latinos in particular, are highly mobile (Rumberger 2003). Although Mexican Americans evidence only slightly higher mobility rates than non-Latino Whites during the primary (K-8) school years (53 percent made at least one non-promotional school change compared with 49 percent of non-Latino Whites), the gap in the incidence of mobility is more pronounced at the secondary level, where 30 percent of Mexican Americans made at least one non-promotional school change between 8th and 12th grade, compared to 21 percent of Whites. Residential mobility rates show a similar trend – 37 percent of Mexican Americans changed residences between 8th and 12th grade, compared to 31 percent of Whites. Moreover, high rates of mobility among youth of Mexican descent are likely understated in this investigation, since dropouts (a disproportionate number of whom are Mexican Americans) are not included in the analyses.

In addition to the burdens of socioeconomic disadvantage and high rates of transience, Mexican origin youth may also face obstacles inhibiting the accumulation of peer social capital. The premise behind this assertion – that available stocks of certain forms of social capital may vary by race/ethnicity – has largely escaped the attention of social scientists (Fuller and Hannum 2002). Mean comparisons in Table 1 reveal significant shortfalls among Mexican origin youth in terms of the availability of the omnibus social capital construct (-.05 SD) and also with regard to *Peer Connectedness* (-.12 SD).[17] Examination of the *Peers Value Education* composite, however, suggests parity between Mexican Americans and non-Latino Whites – a finding that corroborates others (Ainsworth-Darnell and Downey 1998; Cook and Ludwig 1997) and contradicts notions about the emergence of oppositional identity in the context of schooling among minority students.[18] It seems that the relative distribution of peer social capital across racial/ethnic groups is partly dependent on the form in which it is measured.

Regardless of apparent group-level differences in the availability of peer social capital – or perhaps in part as a result – there remains a persistent gap in 12th grade test score performance according to which Mexican origin youth average nine points below non-Latino Whites in mathematics (41.5 compared to 50.7, respectively), and five points lower in reading (29.3 compared to 34.6, respectively).[19] Thus, low SES, high mobility rates and perhaps the noted deficit in certain forms of peer social capital overshadow the buffer that comparably favorable school oriented peer networks (as measured by *Peers Value Education*) might offer Mexican American adolescents.

Predictive Analyses with the Omnibus Measure of Peer Social Capital

Having described group-level differences in background characteristics, mobility rates, and the *availability* of various forms of peer social capital, this section addresses resource *convertibility* within the *mobility/social capital dynamic* by associating (a) peer social capital and academic achievement, (b) student mobility and peer social capital, and (c) student mobility and academic achievement. The standardized parameter estimates in Tables 2 and 3 enable direct within-group comparison of the magnitude of effect of each path in the predictive models. Underlined parameters such as the paired estimates associating 8th-12th grade student mobility with 12th grade mathematics test scores represent statistically significant *between*-group differences in matched paths.

Table 1: Variable Descriptions, Means, Standard Deviations and Mean Comparisons in the Sample

	Mexican Americans (N=1,141)			non-Latino Whites (N=10,907)			Mean Difference
(NCES Variable Name) Description	Mean	SD	N	Mean	SD	N	M.A.-W.
Family Background, 8th Grade							
Socioeconomic Status (BYSES) NCES composite	-.72	.67	1,141	.08	.71	10,907	-.80**
Immigrant (KIDIMMIG) student born outside U.S. BYP17 = 2,3	.17	.37	975	.01	.12	10,238	.16**
Second Generation (GEN2) U.S. - born student/foreign - born parents BYP17 = 1 BYP11 = 2,3 or BYP14 = 2,3	.40	.49	975	.05	.21	10,238	.35**
Third Generation (GEN3) U.S.-born student/ U.S.-born parents BYP17 = 1 BYP11 = 1 BYP14 = 1	.43	.50	975	.94	.24	10,238	-.51**
Mobility, Grades K-8							
Never Changed Schools BYP40 = 0	.47	.50	999	.51	.50	10,340	-.04
Changed Schools Once BYP40 = 1	.22	.42	999	.23	.42	10,340	-.01
Changed Schools 2+ Times BYP40 = 2 thru 5	.31	.46	999	.26	.44	10,340	.05
Academic Achievement, 8th Grade							
Math IRT Score (BY2XMIRR) math estimated number right	30.33	9.25	1,085	38.13	11.57	10,567	-7.80**
Reading IRT Score (BY2XRIRR) reading estimated number right	23.21	6.94	1,085	28.59	8.45	10,561	-5.38**
Mobility, Grades 8-12							
Never Changed Schools F2S103 = 0	.70	.46	818	.79	.41	9,627	-.09**
Changed Schools Once F2S103 = 1	.19	.39	818	.15	.36	9,627	.04**
Changed Schools 2+ Times F2S103 = 2,3	.11	.32	818	.06	.24	9,627	.05**
Never Changed Residences F2S102 = 0	.63	.48	820	.69	.46	9,643	-.06**
Changed Residences Once F2S102 = 1	.20	.40	820	.19	.39	9,643	.01
Changed Residences 2+ Times F2S102 = 2,3	.17	.37	820	.12	.33	9,643	.05**
Peer Social Capital, 12th Grade							
Omnibus Peer Social Capital PSC	-.06	.59	1,070	-.01	.57	10,325	-.05**
Peer Connectedness PSC1	-.08	.64	1,093	.04	.58	10,649	-.12**
Peers Value Education PSC2	-.03	.74	953	-.04	.79	10,156	.01
Academic Achievement, 12th Grade							
Math IRT Score (F22XMIRR) math estimated number right	41.47	12.20	901	50.66	13.71	8,805	-9.19**
Reading IRT Score (F22XRIRR) reading estimated number right	29.32	8.81	901	34.62	9.71	8,806	-5.30**

NOTE: M.A.: Mexican American; W.: non-Latino White. Mean Difference = difference in mean (Mexican Americans – non-Latino Whites), **p < .01 *p < .05. For mean-level comparisons of social capital, items that contribute to the three composites (PSC, PSC1 and PSC2) are standardized to a mean of zero and a standard deviation of one, then averaged. Statistics weighted by *f2pnlwt/mean f2pnlwt*.

Table 2: The Mobility/Social Capital Dynamic: Structural Models Including Omnibus Peer Social Capital

	Endogenous Variables										Dependent Variables			
	8th Grade				Grades 8-12						12th Grade			
	Mathematics		Reading		Residential Mobility		Student Mobility		PSC		Mathematics		Reading	
	M.A.	W.	M.A.	W.	M.A.	W.	M.A.	W.	M.A.	W.	M.A.	W.	M.A.	W.
Exogenous Variables														
K-8 Student mobility	-.01	-.06**	.05	-.05**	.27**	.25**	.25**	.23**	.	.	.	.	.	.
SES	.28**	.44**	.30**	.38**	-.10**	-.14**	-.05	-.02**	.05	.18**	.07**	.11**	.04*	.11**
Endogenous Variables														
8th grade mathematics	.	.	.	.	.	.	.	.	.	.	.75**	.77**	.	.
8th grade reading	.	.	.	.	.	.	.	.	.	.	.	.	.67**	.67**
8-12 student mobility	.	.	.	.	.	.	.	.	-.08**	-.04**	-.06**	-.01	.01	.00
8-12 residential mobility	.	.	.	.	.	.	.38**	.40**	.02	-.02**	-.01	-.03**	-.05	-.01
Omnibus Peer Social Capital														
PSC	.	.	.	.	.	.	.	.	.	.	.05*	.06**	.05*	.09**

NOTES. M.A.: Mexican American; W.: non-Latino White. PSC: Omnibus latent measure of peer social capital. Effects marked with a period (.) are not estimated in the models. The parameters are presented in standard deviation units, **p < .05, *p < .10. Underlined coefficients differ significantly from corresponding coefficient for other racial/ethnic group (critical ratios greater than 1.96). The models explain 61 percent of the variance in 12th grade mathematics test scores and 49 percent of the variance in 12th grade reading test scores among Mexican origin youth. For non-Latino Whites, the models explain 70 percent of the variance in 12th grade math and 54 percent of the variance in 12th grade reading. Fit Indices for both models (mathematics and reading): TLI = .93, CFI = .95, RMSEA = .09.

The Impact of Peer Social Capital on 12th Grade Test Scores

Even after controlling for various background factors including socioeconomic status, 8th grade test scores and student mobility, a standard deviation increase in the omnibus measure of peer social capital (PSC) is associated with mild 12th grade test score improvement for both groups, per Table 2. Among youth of Mexican descent, one standard deviation increase in PSC boosts 12th grade math and reading test scores by approximately one-half point (.05 SD), and Whites experience similar test score improvements in association with omnibus peer social capital (.06 and .09 SD, respectively).[20] While the effect-sizes are small, they should be considered in light of the fact that year-to-year correlations in *NELS:88* test scores are particularly large during high school (8th grade test scores are far-and-away the most powerful predictor of 12th grade test scores). Thus, in models that include prior achievement and SES, it is difficult to identify other significant 12th grade achievement-related predictors in the *NELS:88* data (Phillips 2000). In short, the omnibus measure of peer social capital encompasses robust and fungible resources that bolster test score performance for both groups at the secondary school level.

The Impact of Student Mobility on Peer Social Capital

Although the results in Table 2 suggest that peer social capital can improve test scores, student mobility may impinge on its accumulation. To wit, a single non-promotional school change (a standard deviation increase in student mobility between 8th and 12th grade) diminishes PSC by .08 SD among Mexican origin youth, and by .04 SD among non-Latino Whites. Research suggests that post-mobility anomie can be understood in reference to notions of reciprocity – the *quid pro quo* function of social capital embodied in person-to-person relationship investment with the normative expectation of return.[21] Choosing up sides in a kickball game when students have yet to even learn the names of their classmates is only the most trivial of playground problems. One recent study found that neither mobile students nor their new acquaintances are particularly inclined to invest in relationships lacking time-earned trust, rendering the reciprocal and normative elements of social capital a valued yet elusive commodity, particularly among transient adolescents (Ream 2005).

The Impact of Student Mobility on 12th Grade Test Scores

While student mobility may impinge on test score performance *via* its negative impact on peer social capital, 12th grade math test scores among Mexican origin youth are also *directly* susceptible to student mobility (-.06 SD), even with residential mobility and other background controls in place. Non-Latino Whites are somehow impervious to the direct negative impact of student mobility on 12th grade test scores (group-level differences are statistically significant, per the underlined matched parameters in Table 2). Perhaps because reading success may be less dependent on classroom learning than mathematics achievement (Bryk et al. 1993), the negative impact of student mobility on 12th grade reading appears to be limited to its mediated effect *via* peer social capital.

Comparative Analyses with Sub-composites of Peer Social Capital

Few studies have investigated whether different forms of social capital, like different forms of currency, evidence different educational exchange value. As shown in Table 3, the latent

Table 3: The Mobility/Social Capital Dynamic: Structural Models Including *Peer Connectedness* and *Peers Value Education*

	Endogenous Variables												Dependent Variables			
	8th Grade				Grades 8-12								12th Grade			
	Mathematics		Reading		Residential Mobility		Student Mobility		PSC1		PSC2		Mathematics		Reading	
	M.A.	W.	M.A.	W.	M.A.	W.	M.A.	W.	M.A.	W.	M.A.	W.	M.A.	W.	M.A.	W.
Exogenous Variables																
K-8 Student mobility	-.01	-.06**	.05	-.05**	.27**	.25**	.25**	.23**	.	.	.	.	.	.	.	.
SES	.28**	.44**	.30**	.38**	-.10**	-.14**	-.05	-.02**	.20**	.20**	-.01	.12**	.07**	.11**	.04*	.11**
Endogenous Variables																
8th grade mathematics	.	.	.	.	.	.	.	.	.	.	.	.	.75**	.77**	.	.
8th grade reading	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.67**	.67**
8-12 student mobility	.	.	.	.	.	.	.	.	-.05	-.01	-.08*	-.05**	-.06**	-.01	.01	.00
8-12 residential mobility	.	.	.	.	.	.	.38**	.40**	-.02	.01	.04	-.03**	-.01	-.03**	-0.05	-.01
Peer Connectedness																
PSC1	.	.	.	.	.	.	.	.	.	.	.	.	.06	.03**	.09*	.04**
Peers Value Education																
PSC2	.	.	.	.	.	.	.	.	.	.	.	.	.01	.04**	.01	.06**

NOTES. M.A.: Mexican American; W.: non-Latino White. PSC1:Peer Connectedness; PSC2:Peers Value Education. Effects marked with a period (.) are not estimated in the models. The parameters are presented in standard deviation units, **p < .05 and *p < .10. Underlined coefficients differ significantly from corresponding coefficient for other racial/ethnic group (critical ratios greater than 1.96). The errors are correlated between PSC1 and PSC2; the estimated error correlation is .39 (p < .01) for Mexican Americans and non-Latino Whites. The models explain 61 percent of the variance in 12th grade mathematics test scores and 49 percent of the variance in 12th grade reading test scores among Mexican origin youth. For non-Latino Whites, the models explain 70 percent of the variance in 12th grade math and 54 percent of the variance in 12th grade reading. Fit Indices for both models (mathematics and reading): TLI = .99, CFI = .99, RMSEA = .04.

forms of *Peer Connectedness* and *Peers Value Education* compare favorably as significant predictors of 12th grade math and reading test scores for Whites. Among Mexican origin youth, however, there appear to be within group differences in the magnitude of association between the two latent measures – *Peer Connectedness* and *Peers Value Education* – and 12th grade reading test scores. The difference (.08 SD) hints at the particular educational utility of *Peer Connectedness* among Mexican American adolescents.

This is somewhat surprising, since research confirms that peer networks can encourage school success (or disengagement from school), but in any event one might reasonably expect *Peers Value Education* to be a comparably powerful achievement-related predictor. Perhaps *effectiveness* in conveying educational norms among youth of Mexican descent is rooted in the *confianza* shared among close-knit peers through whom mutual trust flows as a resource capable of fortifying normative expectations (Stanton-Salazar 2001). Given the difficulty in measuring social capital with the *NELS:88* data, however, further research and more precise measures of various forms of social capital will be required to confirm that *confianza en confianza* is indeed a fundamental organizing principle underlying the formation of interpersonal networks among Mexican origin youth.

Conclusions and Implications

Over the next 20 years, the number of U.S. Latinos, the vast majority who are of Mexican descent, will approach 60 million – nearly one quarter of the entire U.S. population (U.S. Department of Commerce, Bureau of the Census 2000a). Yet low average test score performance continues to differentiate growing numbers of Mexican origin youth from their same-age peers. By linking research on student mobility and social capital, this study investigated whether Mexican Americans learn less in school than non-Latino Whites because they have less access to social capital, which follows from the fact that they are more mobile during their school careers. While the results at least partly support the underlying premise of this study, findings effectively qualify concern regarding the *mobility/social capital dynamic*, leading to a more tempered conclusion about what was initially presumed to be the *problem* of mobility, the *utility* of social capital, and the anticipated tension between the two.

The idea that informal friendship networks influence school performance is by no means novel. But this study investigated particular *forms* of peer social capital, whether they operate differently across racial/ethnic groups, and whether differences of this nature influence Mexican American test score performance. That *Peer Connectedness* proves to be a robust predictor of 12th grade reading test scores among Mexican origin youth suggests, for example, that *confianza en confianza* may be especially important among adolescents who bear psychocultural expectations for ongoing exchange and mutual generosity in the context of trusting and intimate relations (Stanton-Salazar and Spina 2004). The descriptive data offer a paradoxical twist on this finding however since Mexican American adolescents appear to be comparably disadvantaged in terms of the availability of *Peer Connectedness*. Perhaps cross-generational barriers that inhibit relationship development between peers of different nativity status (Conchas 2001; Valenzuela 1999) partly explain this difference. School organizational practices, e.g. tracking, can also interrupt the flow of social possibilities, contributing to the social cohesion of certain groups of students over Mexican origin youth (Gibson, Gándara and Koyama 2004; Ruiz-de-Velasco, Fix and Clewell 2000). And to the degree that student mobility impinges on peer social capital, its high incidence among youth of Mexican descent may also represent a centrifugal force straining potentially valuable, if not vulnerable, social ties.[22]

While findings suggest that different forms of social capital may be important, limitations in the *NELS:88* survey data hamper efforts to model the social capital postulate. Several changes

in the development of future survey instruments would enable a more thorough and accurate investigation of social capital. First, survey data should facilitate its examination across time – base year and follow-up items should be matched to facilitate longitudinal analyses sensitive to issues of endogeneity and time-order sequence. Second, survey instruments should enable the examination of social capital across domains, since interaction takes place in informal family and peer social networks, and also in more formal public social networks within schools and communities. This would offer the added benefit of encouraging data analysis across academic disciplines (Woolcock 1998). Third, survey data should include both direct and indirect measures of social capital. More direct measures reflecting person-to-person interaction (e.g. the degree to which adolescents confide in their peers about personal issues) can be particularly valuable since they not only indicate the existence of a relationship, but also offer some reflection of the *quality* of that relationship. It is difficult though to cross-validate items of this nature since they largely reflect a respondent's attitudes. Since behaviors, as opposed to attitudes, are more amenable to external verification, survey instruments should facilitate the collection of data that might be employed in both direct *and* indirect measures of social capital.

Notes

1. On the west coast the meta-categorical term *Latino* is generally preferred to *Hispanic* – the latter adopted in the 1970s and first employed in the 1980 U.S. Census (Bean and Tienda 1987). As mere labels, however, neither term adequately acknowledges the diverse ethnic and cultural heritage in the populations they describe.

2. Disproportionately high Latino dropout rates are partly attributable, however, to relatively greater dropout rates among immigrants. The dropout rates for Latino 16 to 24 year olds born outside the United States (44 percent) is double the rate for those born in the U.S. (21 percent) (NCES, 1998). In fact, foreign-born Latinos are the only immigrants in the U.S. who have a lower average level of education than their native-born counterparts (Vernez and Mizell 2002).

3. Within the diverse Latino population, the terms *Mexican American, Mexican origin, Mexican descent* and *Chicano* are commonly interchanged to reference individuals of Mexican ancestry who were either born in the U.S. or Mexico (Matute-Bianchi 1986; Valencia 2002).

4. While students typically make scheduled school changes due to promotion from one type of school to another, such as elementary school to middle school or from middle school to high school (Scott et al. 1995), increasing numbers of students are moving from one school to another for reasons other than normal promotion (Rumberger 2003; Swanson and Schneider 1999; U.S. General Accounting Office 1994).

5. The term "racial/ethnic" refers to the major racial and ethnic groups in the United States – namely Latinos/Hispanics, non-Latino Whites, African Americans, Asian Americans and Native Americans. Race is a problematic categorization, however, fraught with ethical and philosophical tensions that have been eloquently set forth in deliberations in philosophy and cultural studies about the ontological status of race (Appiah 1992; Loury 2002).

6. The potential for social exchange to perpetuate inequality is likely to be less discernible than the more obvious role that economic resources might play in the stratification process through, for example, inequitable school funding schemes (Condron and Roscigno 2003). Note, for example, Glen Loury's (1977) research addressing the way social connections facilitate differential access to opportunities for minority and non-minority youth, and Mark Granovetter's (1985) critique of the pure market approach to economic action and the "embeddedness" of economic behavior.

7. *Forms* of social capital conjure notions of the strength and diversity of social networks including relationship depth and levels of commitment, the range of one's social "portfolio" across socioeconomic, racial/ethnic and generational borders, and the informal domains (e.g. family, peer) or more formal domains (e.g. school, community) in which relationships are made manifest (McNeal 1999).

8. Under different circumstances where, say, Spanish/English bi-literacy is perceived as somehow threatening to mainstream society, school personnel might just as well employ normative constraints to limit the instrumental utility of minority students' culture-based attributes.

9. The data commingle immigrants with their second- and third-generation counterparts. Although most Mexican American students in the sample spoke Spanish before entering school (immigrants and the children of immigrants constitute 57 percent of the sample of Mexican origin youth), by the 8th grade nearly all report understanding English at least "pretty well." The *NELS:88* base-year cohort excludes about 5 percent of the 8th grade population who were deemed ineligible to participate due to insufficient English language proficiency.

10. Illustratively, 21 percent and 19 percent of Mexican Americans and non-Latino Whites, respectively, are missing 12th grade math and/or reading test scores, while 28 percent and 12 percent of each respective group are missing information regarding student mobility during grades 8 through 12.

11. The software employed in the predictive analyses confronts missing data with *estimation* by full information maximum-likelihood (FIML) instead of relying on ad-hoc methods like list-wise or pair-wise deletion, or mean imputation. Unlike many other imputation methods, FIML estimation uses *all* the information from the observed data, estimating a coefficient for the relationship between variables (the missing data are built directly into the estimation method), as opposed to imputing a value for an otherwise observed variable. For details regarding FIML estimation, see Arbuckle (1996).

12. Item response theory (IRT) facilitates the estimation of students' test scores even when they have not all taken the same version of the test.

13. In the 12th grade survey, parents were also asked how many times their adolescents changed schools between 8th and 12th grade, excluding changes due to promotion. Since parents tend to under-report student mobility at the secondary level (Rumberger et al. 1999), I rely on student reports of mobility between 8th and 12th grade.

14. Variables measuring time spent with friends (f2s33g) and whether friends influence a student's decision to take math (f2s22bd) were removed from the constructs since fit indices show that neither item is a strong indicator. Another item, f2s112e, was removed from consideration because of limited variance in the spread of responses to this question.

15. *Peer Connectedness* (Chronbach's alpha=.47 for Mexican Americans and .39 for non-Latino Whites) includes items describing whether students (a) think it is important to have strong friendships (f2s40d), (b) have close friends who value spending time together (f2s68l), (c) expect to have good friends in the future (f2s67j), and (d) make friends with others who are not of the same race/ethnicity (f2s7b). While f2s7b shows a weak loading, it is included in *Peer Connectedness* since cross-racial friendships can be a critical source of "bridging" social capital that may, in turn, contribute to solidarity among school children (Phelan, Davidson and Yu 1998). *Peers Value Education* (Chronbach's alpha = .85 for Mexican Americans and .84 for non-Latino Whites) includes variables that describe whether students' friends think it is important to (a) attend class regularly (f2s68a), (b) study (f2s68b), (c) get good grades (f2s68d), and (d) continue education past high school (f2s68h). The omnibus composite incorporates the *NELS:88* items in *Peer Connectedness* and *Peers Value Education* within an eight-item measure of peer social capital.

16. The single-factor (omnibus) and two-factor measurement models of peer social capital demonstrate strong fit indices. For the two-factor models, TLI and CFI = .99 for both groups, while RMSEA = .05 and .06 for Mexican Americans and non-Latino Whites, respectively. TLI and CFI are practical fit indices designed to address sample size issues; values of .9 and above indicate reasonable model fit. RMSEA is sensitive to the number of estimated parameters, acting as a barometer in estimating model parsimony. RMSEA values of .08 or less indicate reasonable model fit (Browne and Cudeck 1993).

17. For this analysis, each item contributing to a social capital construct was converted to a Z-score, then averaged. Mean comparisons of this nature help answer questions about the availability of certain forms of peer social capital in comparable "less" and "more" terms (but do not answer the more direct "how much" question).

18. There may, however, be a difference between abstract notions of the value of schooling and concrete class- and race-specific experiences regarding its payoff. This distinction may partly explain the paradox of poor grades but positive attitudes toward education (Mickelson 1990).

19. Even when the comparison groups are matched according to nativity status (e.g. Mexican immigrants *vis à vis* non-Latino White immigrants), significant group-level differences in 12th grade test score performance stubbornly persist (see Ream 2005).

20. If students improve their test scores by approximately one standard deviation over four years of high school, or about .25 SD per year (see Table 1), a .05 SD improvement represents about one-fifth of a school year – approximately two months of learning.

21. Coleman's (1988) reference to the efficiency of the New York City wholesale diamond market is perhaps the most often cited example of how *sustained* social interaction among merchants provides the insurance necessary to secure reciprocal relations that preclude malfeasance within the tightly knit community of Jewish diamond traders (Portes 1998).

22. Although this study considers the *dynamic* without taking the school context into full account, student mobility may have a collective impact, above and beyond its individual-level effects, made manifest at the school level. Illustratively, even stable students who attended California high schools with high mobility rates (where 40 percent of 10th graders left high school by the 12th grade) score 1.5 points lower on the NELS:88 standardized 10th grade math test than otherwise similar students who attended high schools with mobility rates of ten percent (Rumberger et al., 1999). Thus, a more definitive conclusion regarding the differential impact of student mobility across racial/ethnic groups may depend on closer scrutiny of the aggregate impact of student and residential mobility at the individual and the collective or systemic level.

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