

Social Capital and Career Mobility

A Structural Theory of Lower Returns to Education for Asian Employees

Raymond A. Friedman

Vanderbilt University

David Krackhardt

Carnegie-Mellon University

In this article, the authors examine the social conditions experienced by Asian employees in the workforce, focusing in particular on the lower returns to education that have been documented for both immigrant and U.S.-born Asians. The authors suggest that human capital translates into improved career outcomes by producing greater social capital and hypothesize that those who are more socially and culturally different from the dominant group—such as native-born and immigrant Asians—are less likely to be able to turn human capital into social capital. The theory is illustrated using data from five work teams at the computer services division of a major bank that was staffed with a sizable number of immigrant Asians. The authors found lower returns to education for Chinese and Asian Indians than for European Americans, in terms of managers' assessment of career potential, and also found that education translated into work team centrality only for European Americans.

Much attention has been paid in recent years to demographic projections that the U.S. workforce will be increasingly diverse over the next decade (Johnston & Packer, 1987). Although these projections have come under scrutiny recently (Friedman & DiTomaso,

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1996), there is one area where claims of increased diversity are unquestioningly valid: high-technology work teams. In computer science and engineering, there is a severe undersupply of Americans and correspondingly a need to hire foreign nationals,¹ mostly Chinese and Asian Indians (National Research Council, 1988; National Science Foundation, 1989), and Asian Americans are heavily represented in the sciences at top universities. This is probably the most clear and extreme case of companies being forced to deal with diversity. Yet, little attention has been paid to this segment of the workforce in current studies of diversity.

In this article we review existing research on returns to education for Asians² (which shows lower returns for Asians compared to European Americans) and develop a structural theory to explain these results. We propose that returns to education are mediated by one's ability to translate human capital (education) into social capital and that it is at this point of translating human capital into social capital that the payoff for education has been less for Asians than for European Americans. This theory is examined empirically using network data from five work teams at the computer services department of a major East Coast bank. These data allow us to compare the intraorganizational returns to education for Asian immigrants in those work groups to those of European Americans in the same work groups.

ASIAN EMPLOYEES

By any standards, the educational attainment of Asians in America has been extraordinary. Hirschman and Wong (1986) show that native-born Chinese and Japanese reached educational parity with European Americans early in the 20th century. Asian representation at top universities (including both foreign- and U.S.-born Asians) has skyrocketed in the past decades, and Asians have been especially prominent in science and engineering. College majors in engineering, life sciences, and physical sciences are heavily Asian, and at the postcollege level, this pattern is even more pronounced (Hsia, 1988). All of these factors contribute to the image of Asians as the Model Minority.

Other statistics, however, paint a more complicated picture. Although it is true that Asians have high educational levels and high incomes compared to European Americans, several studies indicate that their occupational achievements have not been proportional to their educational achievements. In other words, the returns to education have been significantly lower for Asians than for European Americans. Barringer, Takeuchi, and Xenos (1990) show that the addition of a college degree or higher produces an annual income gain of \$4,349 for European Americans, but it produces a gain of only \$1,936 for Chinese and \$1,297 for Asian Indians. Duleep and Sanders (1992) report that "men in all Asian groups earn less than comparable whites when occupation and industry are taken into account" (p. 429). Addressing engineering in

Raymond A. Friedman is an associate professor of management, Owen Graduate School of Management, Vanderbilt University, Nashville, TN.

David Krackhardt is a professor of organizations and policy, Heinz School, Carnegie-Mellon University, Pittsburgh, PA.

particular, Tang (1993) found that, although Asian immigrants are the most educated group in the engineering workforce, they earn 18% less than native-born Caucasians.

These findings are attributable in part to the fact that many Asians are immigrants who have the disadvantage of poorer English and lack familiarity with American norms and customs. Income differentials tend to diminish after 10 to 15 years in the United States (Chiswick, 1979; Tang, 1993); those who are born here do much better in terms of returns to education than those who came from abroad (Ko & Clogg, 1989); and several studies have documented the positive impact of language proficiency on earnings for Asians (Kossoudji, 1988; Tainer, 1988). However, studies have shown that even among immigrant Asians who have been in the United States for long periods of time and among native-born Asians, there still exists evidence of lower returns to education than for European Americans (Tang, 1993; Zhou & Kamo, 1994).

Moreover, several studies, which show equivalent *income* returns to education for native-born Asians, show differences in *career* returns to education. In her study of engineers, Tang (1993) found that native-born Asians had incomes that were proportional to those of European Americans but that they held fewer managerial positions and were less likely to be promoted than equivalently educated European Americans. Kim and Lewis (1994) also find that, although Asian/European American income differentials disappear at higher education levels in the U.S. civil service, differentials of *influence* remain. Among the highly educated, European Americans are more likely to be in supervisory positions, whereas Asian Americans are more likely to be in professional positions. Thus, at top-education levels, lower career returns to education for Asians appear to be even more persistent than lower financial returns to education.³

These findings are seen by Tang (1993) as evidence that the validity of human capital theory (Becker, 1964; Mincer, 1974) is highly limited. Human capital theory argues that education is an investment in a person's stock of "human capital," and this investment is made with the expectation that it will produce higher income (just as happens for investments in physical capital, such as machinery). Higher income is attained because a more educated human "asset" is more productive and valuable than a less educated one, so it can demand more in the marketplace. Consistent with human capital theory, Asians with more education do better financially than those with less education. However, if the marketplace were simply rewarding people for their investments in education, then returns to education would be the same for everyone. Because the returns to education are less for Asians, then some other factor must also be at work. That other factor, say Zhou and Kamo (1994) and Duleep and Sanders (1992), is discrimination.

Their conclusion, however, is not based on direct evidence of discrimination. Rather, the conclusion that discrimination explains lower returns to education for Asians was arrived at by deducing that any variance in income left unexplained by differences in education must be due to discrimination. These studies do not show what actually happens in organizations to produce these differences in returns to education. Any number of causes is possible. It could be that non-Asian employees dislike Asians and thus make overt efforts to deny them fair rewards; it could be that structural barriers are built into hiring and promotion systems that inadvertently make it harder for Asians; it could be that Asians are less aggressive at making wage demands; it could be that

Asians and European Americans each prefer interacting with similar others, isolating Asians from some information about labor markets. Any of these factors may explain differences in returns to education for Asians, and some more clearly are examples of discrimination than others.

To make matters more complicated, the conceptual distinction between human capital differences and discrimination may not always be easy to maintain. First, the term *discrimination* may be applied to a wide range of factors, not just overt acts of hatred or bias. Second, education is not the only source of human capital, and school-based knowledge is not the only human asset valued by employers—the marketplace rewards many kinds of “knowledge, skills, and abilities,” to borrow a phrase from personnel psychologists. Is it discriminatory to favor those who are better at impression management because that tends to disadvantage Asians (Xin, 1997), or is this a reasonable recognition of a necessary managerial skill?

Given this kind of ambiguity, we suggest that research not be framed in terms of human capital versus discrimination. Indeed, few would expect either to be absent; bias and discrimination certainly do exist, and, despite the weaknesses of human capital theory, “it would nevertheless be foolhardy to disregard the general importance of education” (Barringer et al., 1990, p. 41). Instead, what is needed is a theory that incorporates both human capital investments into education *and* differences in interpersonal responses to people from different social groups, and one that specifies the *processes* that occur within organizations to produce returns to education.

SOCIAL CAPITAL THEORY

We propose that the effects of education can be better understood by considering explicitly the role of a different kind of capital—social capital. Social capital is defined as the standing one has in a social organization and the concurrent ability to draw on that standing to influence actions of others in the organization. From a social capital perspective, what is critical to success is not individual attributes but the way one is embedded in an organization—that is, one’s position in a web of social relations that provide information and political support (Brass, 1994).

We begin analyzing social capital by describing Coleman’s (1988) seminal treatment of this approach. Although our own model emphasizes a different relationship between social capital and education than Coleman’s, his discussion of the elements of social capital provides a useful starting point. Coleman defines social capital as made up of three elements: obligations, information, and norms. Obligations represent capital that is accumulated through mutual support. After one person helps another, the second person then is obligated to help the first person in return. Information represents capital that exists in the very presence of relationships. The more people someone knows and the more informed are that person’s contacts, the more information that person has available to him or her. Lastly, norms are social capital that is contained in the community. Norms against criminal activity or those that reinforce study by students provide a resource that enables communities to operate effectively. In all of these cases, social capital “comes about through changes in the

relations among persons that facilitate action. If physical capital is wholly tangible, being embodied in observable material form, and human capital is less tangible, being embodied in the skills and knowledge acquired by an individual, social capital is less tangible yet, for it exists in the *relations* among persons" (Coleman, 1988, pp. S100-S101).

Coleman (1988) is concerned about social capital because he believes it is a precursor to human capital. That is, the obligations, information, and norms present in a community affect the ability of students in that community to succeed in school and move on to higher levels of education. For example, children in schools where parents know each other drop out of high school less than those from less tightly knit communities. In Coleman's model, social capital helps produce human capital (social capital → human capital). We suggest that social capital plays an additional role beyond that discussed by Coleman. That is, social capital can have a direct impact on success in organizations (social capital → organizational success).

Countering Weber's (1924/1947) view of formal organizations as places where employees are hired only for their skills and where they follow set rules and act only within defined areas of authority, researchers have identified many ways in which social relations affect work and decision making in organizations. Loyalty and community affect effort on the job and the quality of work that is done (Roethlisberger & Dickson, 1949), decisions are affected by political coalitions and emergent networks of relationships (Dalton, 1959), and top managers are distinguished by the number of contacts they maintain (Kotter, 1982) and by their ability to capture the resources inherent in emergent networks (Ibarra, 1992). As Kanter (1989) put it, "the ability to get things done depends more on the number of networks in which [managers] are centrally involved than on their height in the hierarchy" (p. 89). As a result, promotion decisions, especially to managerial positions, are likely to be based not just on technical competence but on judgments about a person's ability to develop, maintain, and use social capital.

What, then, affects the ability of people to gain social capital? Although it is possible to identify many aspects of a person that might influence their access to social capital, two are likely to be influential. First, building off of the basic findings of human capital theory, education should enhance access to social capital. Education provides people with knowledge and skills that others do not have. Compared to others, those with more education are likely to be respected for their expertise (French & Raven, 1959). Others will go to them for advice or assistance, which then creates obligations toward that person and provides them with more contacts and information. In these ways, education should translate into greater social capital. Education may also produce social capital due to its signaling effects. Some would argue, for example, that most of the impact of MBA programs occurs at the point when schools admit students. Recruiters hire students from elite MBA programs because these programs have identified and attracted the best students—not because the 2 years that students have spent in school produce greater skill. Regardless of the actual knowledge or expertise gained, education may be read as a signal of valued attributes, such as ambition or intelligence.

If peers and colleagues are looking around for a good place to invest their social energies and political support, those with more education seem like a better bet. If those with more formal education truly are smarter, more ambitious, or more skilled, it is more likely that the investment will pay off. In these ways, education draws attention to investments in a person and enhances his or her social capital. Thus, we agree with human capital theory that education is a human resource that pays dividends for individuals, but we suggest that this occurs by enhancing social capital (education → social capital → organizational success).

Proposition 1: Education enhances social capital, which in turn produces organizational success. In this way, social capital mediates the relationship between human capital and organizational success.

A second answer about the source of social capital is that relationships develop based on patterns of attraction and avoidance, both of which are influenced by group identities. In terms of attraction, affective ties are most likely to occur between people who are like each other in significant ways. The tendency for people to interact with similar others, or homophily, is well established (Marsden, 1988; Tsui & O'Reilly, 1989) and based on greater ease of communication, acceptance, trust, and predictability among those who are similar. People who are more alike are easier to understand and have more in common; contact among them is more likely to develop affective dimensions. For example, if a manager has gone to the same school or belonged to the same club as others in the organization, his or her chances of building a relationship is higher than if these commonalities did not exist. The problem faced by people from social groups that are in the numerical minority, such as Asians within the context of most American businesses, is that homophily creates a natural, unintended barrier between themselves and the majority of the group (Ibarra, 1993). European Americans are more likely to have more and easier contacts with the majority of group members, and they are more likely to have social (not just instrumental) ties with others in the group. Thus, the accumulation of social capital will be harder for minorities, such as Asians in the U.S. context, compared to European Americans.

Furthermore, group identities may introduce tensions into relationships that inhibit the development of social capital for those in less dominant groups. As social identity theory research has shown (Sherif, Harvey, White, Hood, & Sherif, 1961; Tajfel, 1981), when groups are in conflict, people are biased toward seeing greater accomplishments on the part of those who are in-group to themselves than those who are out-group to themselves. Within the racially charged environment of American society (as well as in most other societies), racial and ethnic groups are a dominant element of social organization and often involve conflict (see, e.g., Hacker, 1992). As a result, it is harder for nonwhites to gain the support of mentors or recognition for their achievements, both of which are elements of social capital. Thomas (1989), for example, found that there are greater tensions in cross-race/ethnicity (i.e., black/white) mentor relationships and that these relationships rarely include the deeper socioemotional aspects of mentoring that make mentoring more sustained and effective. Several researchers have

found that judgments about an employee's performance, by both peers and supervisors, are affected by the race of the evaluatee (Cox & Nkomo, 1986; Oppler, Campbell, Pulakos, & Borman, 1992). In terms of both attraction and aversion, people in organizations react not just to each individual's achievements and characteristics but to his or her status as a member of a social group (Alderfer & Thomas, 1988).

Given these limits on social capital accumulation for people from some groups in organizations, we expect a corresponding limit on the ability of people from these groups to translate education into enhanced career outcomes. Those people in groups that are in the numerical minority and are seen by the majority as a threat or otherwise represent an out-group will have a difficult time garnering the attention and credibility that come from higher levels of education. At the same time, people in groups that are in the numerical majority and are in-group to the dominant coalition will have a much easier time garnering the attention and credibility that come from higher education. In this way, social group membership can amplify or dampen the beneficial effects of education on the development of social capital. For example, when Piore (1983) studied the learning of new technical skills among factory workers, he found that most workers who picked up new skills did so through informal contacts with the people who installed new equipment. Where failures occurred in learning, "such failures were most often social, rather than economic, and were generated by racial or class distinctions which inhibited the necessary contacts between skilled and unskilled employees" (Piore, 1983, p. 73). Thus, we propose the following:

Proposition 2: The ability of organizational members to translate education into social capital is enhanced by being in the dominant group within an organization and diminished by being in one of the nondominant groups within an organization.

As a result of this factor, we expect that the overall relationship between education and career outcomes is moderated (i.e., dampened or amplified) by the person's social group.⁴ The overall relationship between education and career outcomes that we expect is shown in Figure 1. As a result, we expect that observed differences across groups in returns to education can be explained by corresponding differences across groups in their ability to translate education into social capital.

Proposition 3: Differences in returns to education across groups can be explained by differences between groups in their ability to translate education into social capital.

Social Capital and Asian Immigrants

In this section, we develop specific hypotheses referencing immigrants from India and China (primarily Taiwan and mainland China) because these groups are currently represented in large numbers within computer science and engineering departments of many U.S. companies, and these are the Asian groups about which we have data in our study. Both groups are highly distinct from European Americans (and from each other) in terms of food, politics, religion, and social norms, suggesting that tendencies to interact with similar others would produce natural social segregation. Homophily

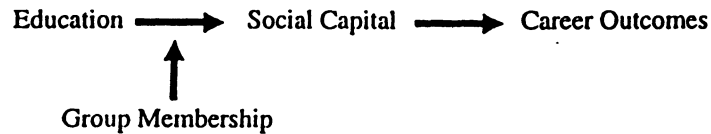


FIGURE 1: Overall Model of Relationship Between Education and Career Outcomes

is further reinforced by language barriers for Chinese—though not for Indians, who are typically educated in English from a young age (although Indian-accented English may be hard for Americans to understand). At the same time, anti-Asian sentiments have been documented historically (Miller, 1969) and have reappeared more recently as Asians abroad are seen as a threat to the U.S. economy and Asian Americans are seen as a threat in educational institutions and the job market (“America’s Asians,” 1989; Yee, 1992).

As a result, we expect that immigrant Chinese and Indians will have a harder time than European Americans gaining social prominence in white-majority/white-controlled organizations (as is typically the case in the United States) and thus will have a harder time than European Americans translating educational achievements into social capital and enhanced careers. Consistent with previous findings, we expect to find lower career returns to education for Chinese and Indians compared to European Americans.

H1: In an American company, career returns to education will be lower for Chinese and Indians than for European Americans.

We also expect parallel differences in the effects of education on social capital.

H2: In an American company, social returns to education will be lower for Chinese and Indians than for European Americans.

Finally, we expect that this difference in ability to generate social capital from education can explain the first effect of lower returns to education for Chinese and Indians. Thus, we hypothesize that social capital mediates the relationship between being Chinese or Indian and having lower career returns to education.

H3: Where Chinese or Indians experience lower career returns to education, this outcome can be explained by their lower *social* returns to education. Conversely, where European Americans experience higher career returns to education, this outcome can be explained by their higher *social* returns to education.

Examining these patterns does not resolve the question of whether lower social capital returns to education for Asians are due to human capital differences or discrimination. The pattern of social isolation we have described could be due to discrimination (e.g., overt avoidance of Asians), general patterns of homophily, or factors that could be deemed differences in human capital (e.g., language differences).

Indeed, we expect that all three are likely to be present. Despite this ambiguity, we do provide a greater level of specificity than previous studies by suggesting the exact way in which Asian/European American differences in returns to education are produced. We argue that intergroup differences become manifest in the social structure of the organization, not just in skill levels or personal prejudices. Thus, the dynamic is much more subtle than envisioned either by human capital theory or by those who label all variance left unexplained by educational differences as "discrimination." Those who obtain social capital after increased education, we argue, are likely to reap rewards for their educational investment. The point is that education does not always translate into social capital—whether and to what degree this happens is affected by social similarity with the dominant group in an organization.

RESEARCH

Research Site

Our study was conducted at the computer services division of a major U.S. investment bank. This site was discovered through contacts with an Asian American management consultant who provided advice to Asian employees regarding networking and other aspects of career development. She had been working with an immigrant Chinese manager at this company and contacted the first author due to his prior research on employee network groups (Friedman, 1996) and the possibility that an Asian network group might form at this company. Initial discussions with that manager indicated that he and his superiors would support an extensive study of the ways in which Asians fit into their organization. The bank was very concerned that it be able to effectively include, motivate, and retain Asian immigrants in its computer services division because they represented a large portion of available programmers.

Methodology

The research method chosen was structural or "network" analysis. This method requires the researcher to measure connections between all members of a defined population to analyze the overall pattern of connections. Typically, this involves surveys where people are asked to identify who in the group they have a tie with on a given dimension (e.g., friendship). This allows the researcher to analyze either the overall pattern of ties (e.g., for density or clustering) or to analyze any individual's position in a social network (e.g., his or her centrality). For our purposes, we wanted to measure individual positions in these networks and compare the positions of Indians, Chinese, and European Americans. To analyze social structures in this way, it is necessary to study entire populations. Because we could not realistically expect all members of this division to respond to our survey, we decided to target particular work teams.

The survey was done in two phases. First, all Asian employees within one of the computer services units of the bank were surveyed. The response rate was 69%,

TABLE 1
Demographic Information From Five Work Groups

	<i>Work Group</i>					<i>Total</i>	<i>Total With M.A.</i>
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>		
Group size	12	13	22	16	11	74	
# respondents	10	10	20	10	11	61 (100%)	
# respondents with M.A.	4	1	6	2	7	20	
Chinese	3	1	5	4	1	14 (23%)	9 (69%)
Indian	—	2	1	—	4	7 (11%)	5 (71%)
Korean	1	—	—	—	—	1 (2%)	—
Filipino	1	—	2	—	—	3 (5%)	1 (18%)
European American	4	7	9	5	5	30 (49%)	5 (17%)
African American	—	—	—	1	1	2 (3%)	1 (50%)
Hispanic	1	—	3	—	—	4 (7%)	1 (25%)

NOTE: Master's degrees are abbreviated as M.A. All those without master's degrees have bachelor's degrees.

yielding 82 survey responses. Second, five work groups were identified where the Asian response rate from the first survey was high. For these groups, non-Asian members were asked to fill out the same survey, and a second appeal was made to those Asians in these work groups who did not fill out the survey the first time. For this study, the only data used were those from the five work teams. This sample included 61 people, including 25 Asians. All Chinese and Indians in this sample were immigrants. For all Chinese, their highest degree was from the United States, whereas just over half of the Indians received their highest degree from the United States. Among the 61 people in the survey, 22 had M.A. degrees, and the rest had B.A. degrees. The overall pattern of data and demographic information is shown in Table 1.

Measures

The particular dimensions of social relations that we chose to measure in our surveys were advice and feedback—both of which represent influence and respect within work teams. To measure advice, we asked each respondent to list every individual (as few or as many as appropriate) that he or she could go to for advice about work-related matters. To measure feedback, we asked them to list every individual they could ask for feedback about their performance on the job. These work-related contacts are likely to be influenced by expertise but also likely to be constrained by social similarity and comfort with the individuals listed. Respondents were also asked to identify their ethnic background (e.g., Chinese, Indian, European American, African American), education level, and place of birth.

Social capital was operationalized as advice and feedback centrality, calculated for members of each work team, using UCINET IV. Centrality is measured by the number of contacts ego has with others on the team, weighted by the number of contacts each of those contacts has. Thus, this measure looks at how many people ego is connected to and at how well those people are connected. Those with higher centrality scores

have access to greater amounts of information and can be presumed to have greater social standing within the work team. To create the centrality measure, we made the data symmetric (a contact from or to any party was scored as a social tie) and calculated the score using Bonacich's (1972) method, normalizing the score based on the size of the group. Advice and feedback centrality are distinct structural measures but are highly correlated ($r = .71, p < .001$).⁵

In addition to the data collected from individual respondents, one other piece of information was gathered from supervisors (two of whom were female, including one woman of Chinese heritage who was born and educated in the Philippines). They were asked to specify which individuals in their groups were considered "high potential"—that is, likely to move up in the organization. High potential was used as an indicator of career mobility because it provides a way to see who is likely to move up (in the eyes of those who have influence over promotions) before it actually happens, avoiding the potentially confounding effects of rank. High potential also has the benefit of being perceptual. As Kilduff and Krackhardt (1994) showed, it is others' perceptions of one's social capital that actually produces the reputational benefits of that capital. The disadvantage of this measure of high potential is that it is a dichotomous measure that requires logistic regression, which is especially sensitive to our small sample size. Means and standard deviations of all independent variables are shown in Table 2, along with correlations with the dependent variable, high potential.

FINDINGS

To test Hypothesis 1—that career returns to education are lower for Chinese and Indians than European Americans—we examined descriptive statistics and ran logistic regression models. At a descriptive level, Chinese and Indians in this sample are better educated than European Americans but are relatively unlikely to be seen as high potential (especially among Chinese) (see Tables 3a, 3b). Logistic regressions were run with high potential as the dependent variable, controlling for time in the company. The first model, which included education as an independent variable, contained no significant predictors of high potential. Model 2 included dummy variables for European Americans, Indians, and Chinese. In this model, education is a significant predictor of high potential (in the positive direction), and being Chinese is significant (but in the negative direction). Models 3 through 5 focus on each ethnic group separately (due to the small size of the sample) and include an interaction term to test whether education has a significant effect on perceptions of high potential for that particular group. Only for European Americans is this interaction term significant, indicating that only for European Americans does education increase their chances of being deemed high potential.⁶ These results provide support for Hypothesis 1, that Chinese and Indians have lower career returns to education than European Americans. These results also indicate that the baseline findings of previous research regarding returns to education for Asians are applicable to this sample and can be documented within as well as across organizations.

TABLE 2
Means, Standard Deviations, and Correlations for Variables

	M	SD	(1)	(2)	(3)	(4)	(5)
1. High potential							
2. Education	.35	.48	.07				
3. Time in company	3.65	3.37	.05	-.27*			
4. Advice centrality	33.83	22.43	.35**	-.02	.13		
5. Feedback centrality	32.39	24.50	.47***	.03	.09	.71***	
6. European American	.49	.50	.08	-.36***	.37**	.10	.22
7. Indian	.11	.32	-.03	-.20	-.23	.21	.12
8. Chinese	.23	.42	-.21	.34***	-.16	-.08	-.32**
9. Education × European American	.08	.28	.29*	—	-.04	.21	.31*
10. Education × Indian	.08	.28	.05	—	-.17	.21	.13
11. Education × Chinese	.15	.36	-.19	—	-.12	-.26*	-.31*

NOTE: Correlations between interaction terms and their component variables are omitted, as are those between ethnic groups (European American, Indian, and Chinese), given their definitional independence from each other.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

To test Hypothesis 2—that social returns to education are lower for Chinese and Indians than for European Americans—we ran regression models predicting advice and feedback centrality for European Americans, Chinese, and Indians separately (see Table 4), including as predictors time in company, education, ethnicity, and an interaction term for ethnicity by education. As expected, higher education predicted greater advice and feedback centrality for European Americans (Models 1 and 2) but not for Indians or Chinese (Models 3–6). For Chinese, the relationship was significant and negative—that is, among Chinese, higher levels of education are associated with lower chances of being deemed high potential.

To test Hypothesis 3—that intergroup differences in career returns to education can be explained by intergroup differences in social capital—we followed Baron and Kenny's (1986) approach to studying mediating effects. This analysis involves three steps. First, as was already done in support of Hypothesis 1, we showed that a positive relationship exists between education and high potential for European Americans only. Second, as was already done in support of Hypothesis 2, we showed that there was a positive relationship between education and centrality for European Americans only. The final step needed to show that social capital (measured by centrality) mediates the relationship between education and perceptions of high potential is to include centrality measures in the first model. If the addition of centrality eliminates the European American by education effect, then it is plausible that the mechanism that caused European Americans to have higher returns to education was their higher social returns to education. The results of this third part of the analysis are shown in Table 5. The addition of advice and feedback centrality (Model 4) does eliminate the significance of the education by European American interaction term for predicting high potential. Looking at advice and feedback centrality separately (Models 2 and 3), the education by European American interaction for high potential is made nonsignificant by the

TABLE 3A
Test of Hypothesis 1: Lower Career Returns to
Education for Chinese and Indians—Descriptive Statistics

<i>Education</i>	<i>B.A.</i>	<i>M.A.</i>
Chinese	5	9
Indian	2	5
European American	24	5
<i>High Potential</i>	<i>No</i>	<i>Yes</i>
Chinese	13	2
Indian	5	2
European American	19	11

TABLE 3B
Test of Hypothesis 1: Lower Career Returns to
Education for Chinese and Indians—Regression Models

	<i>Dependent Variable: High Potential</i>				
	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>	<i>(5)</i>
Time in company	.06	.05	.06	.04	.06
Education	.43	1.3*	-.37	.31	1.2*
European American		-.6	-.34		
Indian		-1.6		-6.3	
Chinese		-2.5*			-.52
Education × European American			2.8*		
Education × Indian				6.4	
Education × Chinese					-1.9
χ^2	.77	7.3	5.7	2.1	6.5

* $p \leq .05$. ** $p \leq .01$.

addition of either advice or feedback centrality. These results are consistent with Hypothesis 3.

DISCUSSION

Asian immigrants provide U.S. companies with a major source of talent in areas such as science, engineering, and computer science. These skilled professionals are found in large numbers in many organizations. Yet, for these professionals, investments in education appear not to produce centrality in work groups, as such investments do for European Americans. The problem appears to be more severe for Chinese; this may be due to additional language barriers for Chinese, differences in desire for leadership

TABLE 4
Test of Hypothesis 2: Lower Structural Returns to Education for Chinese and Indians

	<i>Dependent Variable</i>	
	<i>Advice Centrality</i>	<i>Feedback Centrality</i>
Models 1 and 2		
Time in company	.91	.48
Education	-6.9	-2.9
European American	-4.9	3.9
Education × European American	25.5*	27.8*
Model R^2	.08	.12
Models 3 and 4		
Time in company	1.2	.88
Education	14.6*	16.4*
Chinese	20.3*	7.3
Education × Chinese	-44.7*	-26.2*
Model R^2	.17*	.17*
Models 5 and 6		
Time in company	1.1	.93
Education	-3.5	-.07
Indian	9.5	3.7
Education × Indian	12.9	10.3
Model R^2	.02	.03

* $p \leq .05$. ** $p \leq .01$.

TABLE 5
Test of Hypothesis 3: Centrality as the Mediator for Returns to Education

	<i>Dependent Variable: High Potential</i>			
	(1)	(2)	(3)	(4)
Time in company	.05	.04	.04	.04
Education	-.37	-.19	-.37	-.34
European American	-.34	-.21	-.56	-.51
Education × European American	2.8*	2.3	2.1	2.1
Advice centrality		.04*		.01
Feedback centrality			.04**	.04*
Model χ^2	5.7	11.9*	16.2**	16.3*

* $p \leq .05$. ** $p \leq .01$.

roles,⁷ or differences in the degree of discrimination or homophily. However, both Indians and Chinese in this sample were unable to translate added education into added social capital within the teams where they worked. For both, the social returns to education were lower than they were for European Americans. This suggests that the relationship between human capital and social capital is moderated by group membership.

Moreover, social capital attainment appears to be the mechanism that transforms education into workplace gains. Within our sample, Asian/European American differences in supervisors' perceptions of employee potential could be accounted for by Asian/European American differences in social capital, supporting the idea that social capital mediates the relationship between human capital (education) and career outcomes. Although our dependent variable is different from other studies, our findings suggest that differences in social capital gains from education help explain the lower returns to education that have been found in much research on Asians in the United States. We need to be cautious, however, about inferring a causal direction in our findings. It is possible that career recognition produces centrality. Still, we do not expect that this is likely because being deemed high potential is a private judgment of supervisors; being deemed high potential should not inherently provide access to resources and information within work teams. To be certain of the causal direction, additional longitudinal research is needed.

We also have to be cautious about interpreting these findings as evidence of discrimination. What we have documented is differences between groups in their ability to translate human capital into social capital. This may be due to the lack of acceptance of Chinese or Indians (either due to homophily or more overt forms of discrimination), but it also may be due to Chinese and Indian lack of interest in networking with Americans or an inability to do so. Xin (1997), for example, documents Asian/European American differences in the level of impression management, and some Asian organizational development consultants have begun training programs intended to enhance Asian employees' awareness of the importance of networking. In other words, these consultants are training Asians to be more aware of the role of social capital in career development. At this point, we cannot say anything definitive about whether the pattern we have documented is due to actions on the part of Asians or European Americans. Additional research needs to be done to determine the reason (or reasons) for Asian/European American differences in attaining social status within work groups. Nonetheless, our data support the conclusion reached by others—that Asians are not achieving influence in organizations proportionate to their high education levels—suggesting that they might do better in careers that are not dependent on social and political support. Barringer et al. (1990), for example, find that, except for Japanese Americans, highly educated Asian Americans achieve much higher financial returns to education (even higher than European Americans) when they are self-employed professionals.

One striking aspect of our findings is that computer science is an area where employees in U.S. companies should have a high level of exposure to Asians. This should minimize intergroup differences because Asians often exceed the 20% mark that is frequently cited (Pettigrew & Martin, 1987) as a point beyond which minority groups are no longer identifiable as out-groups. One might also expect that, in such situations, American managers would have learned to "manage diversity." The fact that differences in returns to education persist in this industry indicates that intergroup barriers are unlikely to lessen simply due to greater experience managing diverse workforces. This implies that more overt efforts need to be made to ensure Asian inclusion in advice networks. This might be accomplished by feeding data on social

centrality back to work teams, training engineers and managers in cross-cultural communication, or generating discussion among top managers about the nature and appropriateness of corporate managerial styles. Among immigrant Asian engineers in particular, efforts could be made to ensure that they understand how important informal networks are in U.S. companies and provide training in networking skills of the sort discussed above. It is unclear, however, if these types of training efforts would be powerful enough to overcome the basic forces that inhibit social returns to education for Asians.

It may also be the case that, although the total number of Asians is above the 20% mark in the units we studied, the percentages of Indians and Chinese (as separate groups) each are well below that mark. If so, each group is still a numerical minority and suffers from the effects of being present in small numbers. This leaves open the possibility that if the number of Asians in an American company were even greater (as might be the case in some West Coast companies), these differences in career returns to education would diminish. In that case, additional training and feedback would not be needed among companies with such high concentrations of Asian employees.

Given the importance of Asian immigrants in key sectors of the U.S. economy and industry's high level of dependence on these employees, more attention must be paid to the structural dynamics that result in lower returns to education for Asians, and ways must be found to ensure their full inclusion into organizations. More broadly, social capital must take a central place in our understanding of career mobility, and more research needs to be done on cross-group differences in social capital as a way of understanding differences in career outcomes.

NOTES

1. "More than a fourth of the science Ph.D.s and fully 60 percent of the engineering Ph.D.s awarded in 1986 went to noncitizens, according to figures compiled by the National Science Foundation. . . . A survey of R&D directors in 20 major high-technology companies indicates that they are increasingly dependent on foreign talent" (Beardsley, 1988, p. 22).

2. In this article, we specify whether we are referring to immigrant or native-born Asians whenever appropriate. At the same time, there does exist a category "Asian" that has been used in public (e.g., when observers see large numbers of Asians at MIT, they do not necessarily differentiate between those who were born in the United States and those who were born abroad). Moreover, much of the literature reviewed here uses the term *Asian*, does not differentiate between Asian immigrants and U.S.-born Asians, and uses data sources that do not always differentiate between these categories. Although this literature has, over time, disentangled the effects of being immigrants from those of being ethnically non-European, it is fair to say that the core effect discussed below—lower returns to education—applies to both immigrant and native-born Asians, so it is valid to talk about lower returns to education for "Asians." In cases where we are referring to this core phenomenon or where our discussion does not distinguish between immigrant and native-born Asians, we use the term *Asian*.

3. Tang (1993) speculates that there may be far more resistance to Asians having equivalent authority than equivalent pay, so that in technical and professional areas (where specialized career tracks allow for pay increases without promotions), Asians can receive equivalent pay despite lack of access to top levels of the organization.

4. Miller, Lincoln, and Olson (1981) proposed that there would be "significant variations across race and gender categories in the coefficients of experience, education, age, rank, workplace and occupation"

(p. 317) for models predicting network centrality. Thus, they identified a link between race/gender and social structure, but they did not conceive of this as a mechanism that in turn affected returns to education.

5. In response to reviewer requests, we created a scale that combined advice and feedback centrality. The results discussed below do not change if that scale is used instead of the two separate measures. However, because advice and feedback centrality are distinct structural measures and conceptually provide different information, we report the results for advice and feedback centrality separately.

6. Although the model chi-square is not significant, it should be noted that there is a significant zero-order correlation between the Education by European American interaction term and high potential (see Table 2). This suggests that the lack of significance of the overall regression model is due to the loss of degrees of freedom and not to insignificance of the primary relationship.

7. As Tang (1993) reports (based on Gordon, DiTomaso, & Farris, 1991), "Among minority professionals, only Asian Indians indicate the strongest desire for leadership positions" (p. 488).

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