The Role of Social Networks in Determining Earnings: A Comparison Analysis of Four Racial and Ethnic Groups[*]

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Previous literature shows that social networks built on weak ties provide greater advantages to individual earnings in the labor market. In this research, we evaluate the effect of social networks on earnings for different racial and ethnic groups by operationalizing social networks to the quality social network scores (QNS). We utilize the Multi-City Study of Urban Inequality (MCSUI) dataset to create the QNS for four different racial and ethnic groups: non-Hispanic Whites, Blacks, Hispanics and Asians. We assess how the earning disparities among these racial and ethnic groups are attributable to the quality of social networks of the subgroups in the US labor market. The findings suggest that significant differences exist among these groups concerning the extent to which the QSN predicts earnings. A positive association between the QSN and earnings is found only among non-Hispanic Whites. In contrast, Blacks and Hispanics gain higher wages from relying on strong ties. They benefit equivalently from the same QSN, whereas Asians earn significantly less than Blacks and Hispanics who have the same QSN. The results suggest that Asians are more likely to rely on human capital rather than social capital to improve earnings.

Keywords: Social Networks; Earnings; MCSUI; Race and Ethnicity; International Migration

Introduction

Earning differences among various racial and ethnic groups are evident in the labor market. Generally, non-Hispanic Whites are located at the top of the earning strata, followed by Asians, Blacks and Hispanics. A variety of explanations exist in regard to the earning differentials by race and ethnicity. For instance, some researchers have found that Hispanics' segregation patterns and immigrant status are the major reasons for their low socioeconomic status relative to other groups (Santiago & Wilder, 1991; Farley, 2001; Massey & Denton, 1993). Allen (1995) argues that continuing discrimination explains why Blacks are socioeconomically disadvantaged. Other researchers posit that because the educational attainments of Asian Americans have been higher than non-Hispanic Whites in the past two decades, Asian Americans have become socioeconomically more advanced than other minority groups (Kao, 1995; Alba & Nee, 2003). The existing literature has significantly improved our understanding of earning differentials among racial and ethnic groups in the US (*i.e.*, Green, Tigges, & Diaz, 1999; Mouw, 2002; Kmec & Trimble, 2009).

Beyond the above explanations, a group of work has focused on the role of social networks in determining earnings. In the literature, social networks usually include the social contacts who refer jobs to an individual (Granovetter, 1995). Prior research shows that the characteristics of the social contacts influence an individual's wages (Green et al., 1999; Mouw, 2002; Stainback, 2008; Kmec & Trimble, 2009). For instance, Green et al., (1999) illustrates that for Hispanics, if the social contacts are composed by neighbors or relatives which are indicators of

strong ties, then their annual income is likely to be negatively affected. In this paper, we attempt to extend the existing literature by exploring how the composition rather than merely the characteristics of the social contacts affects individual earnings across race and ethnicity. In this paper, the composition of the social contacts is mainly measured by their demographic characteristics and socioeconomic status. We argue that the quality of the social contacts determines the quality of the social networks. We rely on the social network theories as the theoretical guidance to investigate how the quality of social networks influences earnings across race and ethnicity. According to social network theories, diffused weak ties are better than strong ties since they lead to newer and better information, and therefore, better jobs and earnings (see Granovetter, 1973; Lin, 2000). Based on the theories, we hypothesize that the quality of the social networks affects earnings across racial and ethnic groups. Thus, we examine whether racial and ethnic groups that have a better quality of social networks tend to earn more than those who do not, net the effects of social and economic factors on earnings. To answer this research question we use the Multi-City Study of Urban Inequality (MCSUI) dataset to conduct an individual level analysis. We study four racial and ethnic groups, namely, non-Hispanic Whites, Hispanics, Blacks and Asians and their social networks and earnings in the US labor market. Below we review the theoretical framework and the existing literature.

Theoretical Framework and Previous Findings

Social network theories provide theoretical guidance to this current research. These theories contend that good quality social networks are often built on weak ties. This is because, as

Granovetter (1973) argues, strong ties formed by family members and close friends often circulate limited information. Weak ties formed by more distant friends and acquaintances, on the other hand, tend to circulate better quality information which leads to better jobs. Those who live in segregated communities are more likely to hold strong ties due to the content and quality of information that flows within their close and tight networks. Such information tends to be redundant and inefficient, and, therefore, new information which can potentially lead to better paying jobs tends to be very difficult to acquire. Nan Lin (2000) also emphasizes such disadvantages when looking at the social networks of different racial and ethnic groups. Although Granovetter (1982) has revised his theory by affirming that the strength of strong ties can be beneficial to those in times of risk and uncertainty, greater emphasis has always been placed on literature describing the role of sparse networks (the strength of weak ties) for acquiring economic benefits (Sanders, Nee, & Sernau, 2002). In addition, Smith (2000) notes that low-status individuals tend to concentrate on strong ties because they are more likely to provide assistance in a time of unemployment or any other severe hardship, whereas the individuals with financial stability can dedicate their time to new weak ties which can offer better employment opportunities.

To apply social network theories in our research, we hold the general assumptions that social networks influence an individual's earnings; an individual benefits more from weak ties than strong ties regardless of his/her racial and ethnic background. Based on these assumptions, we further hypothesize that if various racial and ethnic groups have different social ties (different quality of social networks), then their earnings will differ. Specifically, we hypothesize that racial and ethnic groups whose social networks are built on weak ties (high quality of social networks) tend to earn more than those whose social networks are built on strong ties (low quality of social networks). Thus, we have transformed the notion of strong ties/ weak ties to the notion of the quality of strong ties/weak ties. Therefore, the key research question is that how the quality of social networks (social ties) affects individual earnings across racial and ethnic groups.

Prior research has documented that the quality of social networks vary among racial and ethnic groups. It has been revealed that Hispanics are more likely to rely on strong ties than weak ties in the US labor market (Flores, 2005; Garcia, 2005). Researchers argue that in order for the Hispanic minority to protect themselves from discrimination and to better cope with poverty after migrating to the US, they choose to be self-segregated (Massey et al., 1987). As a consequence, strong kinship relations among Hispanics are often formed. They live close to one another, which is especially the case for undocumented Hispanics (Singer & Massey, 1998). Their lack of skills and English language proficiency further traps them in the lowest-paying jobs, which increases their poverty levels and financially hinders them from living in integrated communities (Falcon & Melendez, 2001; Farley, 2001). Although the minority groups may have cross-race contacts, Stainback (2008) indicates that for Blacks and Hispanics, cross-race contacts do not necessarily provide them an access to higher paying jobs nor jobs with authority. Theses contacts only help them to access lower-level supervisory positions.

As to Blacks, researchers show that Blacks' social networks are mainly based on strong ties, and they face similar difficulties as Hispanics in expanding their social networks and developing or gaining access to weak ties. Because of their historical roots under slavery, Blacks have long faced a hierarchy of enforced discrimination. The emancipation of Blacks did not significantly improve their status, as they became defined as an "'untouchable' caste-like group," forcibly segregated from the rest of society (Allen, 1995: p. 573). The civil rights movement and the subsequent Supreme Court decisions also failed to completely desegregate racial groups of the US. As a result, much of the Black population consists of small and tight social networks (Allen, 1995). These close and tight social networks based on strong ties have made them more segregated than any other racial and ethnic groups in the US (Massey & Denton, 1993; Wilson, 1987). Elliott and Sims (2001) note that, in regards to employer preference, Blacks are at the end of the social line and are, therefore, less likely to get a job interview. As a result of this continued discrimination in the job market, using close contacts turns out to be a way for Blacks to minimize the work environment discrimination (Mouw, 2002). If the close contact refers an individual to a particular workplace environment, then the individual is likely to be accepted in the environment. Due to the above conditions, Blacks have developed strategies of social support, which are characterized by high reliance on family ties and extended family mechanisms (Martineau, 1977; Dominguez & Watkins, 2003). According to Lin (2000), members of minority groups and those with a lower socioeconomic status, such as Blacks and Hispanics in the US, tend to rely on *poor social capital*, or the information and resources acquired from strong ties. These strong ties are typically homogeneous in resources and likely to be members who live in isolated communities.

Asian Americans are found to have formed their social networks based on strong ties as well. They have historically formed distinct communities and been segregated from the mainstream US society. Taking the Chinese as an example, Chinese immigrants were targeted with racism by non-Hispanic White miners in competition for income after they arrived in America to pursue mining jobs. In response to accusations of spreading disease and immorality, the Chinese formed tight communities which were further tightened by their proliferation in railroad work (Boswell, 1986). Later, "Chinatowns" and other tight communities sprang up in American cities based on strong ties (Zhou, 1992). Though Chinatowns provided a degree of protection for the Chinese minority, they also led to a greater alienation from the mainstream American culture. Brothels, opium houses and gambling businesses in segregated Asian communities have provided job opportunities for Chinese gangs but have done nothing to integrate the community into the larger American business world (Light, 1974). Similar to the Chinese, other Asian American cultures have also formed their own versions of cultural communities. Today, although Asians and Asian Americans are considered the model minority group given their relatively higher levels of education and income than non-Hispanic Whites and other racial and ethnic groups (Kao, 1995; Alba & Nee, 2003), their social networks to a large extent are still considered to be based on strong ties. Recent studies also suggest that Asian Americans may utilize their social contacts with caution as they may be reluctant to ask for help and admit having trouble or stress in their lives as their culture places specific demands, such as to show success to others (Kim, Sherman, & Taylor, 2008). Asians are more likely to belong to ethnic niches and ethnic economies (Light, 1974).

Falling in line with the recent findings, the enclave-economy hypothesis developed by Portes and associates suggests that ethnic economic enclaves create important labor and economic opportunities for their members (see Wilson &Portes, 1980). Such economic opportunities have helped Asian-Americans to gain better quality social capital than their Blacks and Hispanic counterparts.

Compared to the minority groups, non-Hispanic Whites, as the majority of the US population, have formed their own exclusive social networks due to their privileged social and economic position and power. Most of the governmental jobs, legislature positions, white collar jobs, etc., are held by non-Hispanic Whites in the US. Studies have shown that Non-Hispanic Whites embrace a position of advantage in the US labor market and have maintained a higher socioeconomic status compared to any other racial or ethnic group in the US (Allensworth, 1997). They are less likely to live in disadvantaged segregated communities as compared to other racial and ethnic groups, particularly, Blacks who are more likely to live in socially isolated neighborhoods in poverty (Browne, Green, & Tigges, 1998). Non-Hispanic Whites' social networks are less dependent on strong ties as compared to other racial and ethnic groups. Prior research finds that they are more likely to utilize weak ties in the labor market, which leads to a positive effect on their employment outcomes (Smith, 2000).

Given the different nature of social ties for various racial and ethnic groups illustrated by prior literature, we are interested in investigating how different forms (quality) of social ties determine the earning status of various racial and ethnic groups in the US labor market. To do so, we first rely on social network measures drawn from the MCSUI dataset to obtain information on social network quality of various racial and ethnic groups. We then construct quality network scores (QNSs) for each racial and ethnic group by using the Ordinary Least Squares (OLS) technique to regress logged wages on social ties of an individual for each racial and ethnic group. Finally, we test whether there are significant differences among these four racial and ethnic groups in the relationship between social network quality and earnings. That is, we examine whether the earning differentials among non-Hispanic Whites, Blacks, Asians and Hispanics are partially caused by the difference in social network quality after controlling for other factors.

Data and Variables

Data

We use the 1992-1994 Multi-City Study of Urban Inequality (MCSUI) dataset that is based on cities of Atlanta, Boston, Detroit and Los Angeles to conduct the analysis. The MCSUI project, funded by the Russell Sage Foundation and the Ford Foundation, aims to broaden our understanding of how labor market, racial attitudes and residential segregation foster urban inequality in the US. An interdisciplinary team of more than forty scholars at fifteen US colleges and universities completed the MCSUI project. As a result, more than 8,500 households and 8916 respondents in those households in four cities were interviewed by the project team. The response rates for Detroit, Los Angeles, Boston and Atlanta were 78%, 68%, 71%, and 75%, respectively (Bobo et al., 2000). Since the MCSUI has a primary research focus on low-income minorities, the project team over sampled Blacks and low-income households in this

dataset. Overall, 2953 non-Hispanic Whites; 3179 Blacks; 1636 Hispanics and 1128 Asians are included in the dataset[1].

One of the unique features of the MCSUI dataset is that it contains rich information on earnings, employment history, detailed information on processes surrounding labor market entry, job search channels, characteristics of contact persons who are involved in the respondent's social relationships and neighborhood activities. Such information allows us to examine the effect of social networks on wages because the contacts can be considered part of the respondent's social networks. Although the MCSUI data were collected in the 1990s, its social networks data have not been extensively examined in the existing literature. Given the rich information presented by the MCSUI dataset, we believe there is room to improve our understanding of the current labor market through its analysis. We hope that the findings of this research will enrich theories of social networks and earnings as well.

Dependent and Independent Variables

The dependent variable in this analysis is logged hourly wage. The logged form of wage is used to normalize the distribution of hourly wages. Based on the descriptive analysis results shown in **Table 1**, the average hourly wage for all respondents is $13.4 with a standard deviation of 0.3. Earnings vary across racial and ethnic groups. On average, non-Hispanic Whites have reported the highest hourly wages ($15.4), followed by Asians ($14.1) and Blacks ($11.8). Hispanics have reported the lowest hourly wages ($8.8) among these four racial and ethnic groups. Indeed, the ranking of natural logged form of wages shows exactly the same pattern; that is, non-Hispanic Whites are located at the top and Hispanics are at the bottom of the wage stratum (see **Table 1**).

Since the major interest of this research is to examine how social networks influence earnings, variables representing social networks become the major independent variables. In this research, we operationalize social networks into two independent variables, namely, *contacts* and *quality network score*. The quality network score captures the quality of the social networks. The variable *contacts* is coded as "1" if the respondent has reported at least one contact person involved in the respondent's social relationships and neighborhood activities, and "0" otherwise. The question in the MCSUI survey that collects information on the respondent's contact(s) is as follows: "Looking back over the last six months, who are the people, other than people living in your household, with whom you discussed matters important to you?" The survey instrument allows the respondent to mention up to three contact persons and then questions the respondent about characteristics of each contact. We consider those contact(s) as an important component of the respondent's social networks.

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[1]The data for the Asian group in the MCSUI Los Angeles region had a data collection problem where one of the interviewers was not able to report any contacts from the Asian respondents. When looking at issues related to social networks, some scholars have decided to exclude the Asian group in their studies. For the purpose of comparison, we decided to include the Asians in our analysis considering the research question we had. We were interested in studying how the characteristics and the quality of the contacts could serve as predictors of wages for different racial and ethnic groups. Given that a good percentage of Asian respondents in the MCSUI (43.1%) had contacts and provided complete data about the characteristics of their contacts, we decided to include Asians in the analysis. We still advise readers to interpret the results presented here with caution regarding to the Asian group considering the underreporting issue.

Table 1.
Descriptive statistics for dependent, independent and control variables by race and ethnicity.

Variables	Whites			Blacks			Hispanics			Asians		
	Mean (or %)	S.E.	N	Mean (or %)	S.E.	N	Mean (or %)	S.E.	N	Mean (or %)	S.E.	N
Dependent variable												
Logged hourly wage[*]	$15.4	0.02	1791	$11.8	0.03	1773	$8.8	0.03	1156	$14.1	0.07	531
Independent variables												
Social network variables												
If R has a social contact			2953			3179			1636			1,128
Yes	86.4			83.8			62.0			55.8		
No	13.6			16.2			38.0			44.2		
Quality network score (QNS)	6.6	0.19	1010	3.6	0.18	1056	3.2	0.18	638	3.5	0.32	329
Control variables												
Demographic factors												
Age[**]	40.2		2374	38.2		2658	35.8		1572	36.9		940
Gender			2952			3177			1636			1128
Male	48.3			45.9			49.9			49.0		
Female	51.7			54.1			50.1			51.0		
If R is married			2809			3001			1474			1117
Yes	65.8			40.7			59.8			74.6		
No	34.2			59.3			40.2			25.4		
If R is native born			2215			2427			1636			1115
Yes	90.8			88.8			26.9			12.1		
No	9.2			11.2			73.1			87.9		
Human capital												
Years of education	13.8	0.09	2547	12.9	0.12	3157	9.9	0.19	1632	13.9	0.38	1127
Ability to Speak English			2123			2404			1186			949
Poor	0.3			0.6			15.9			6.9		
Fair	1.4			4.2			22.3			25.7		
Good	8.5			17.8			23.5			15.9		
Very good	16.5			25.6			18.6			28.0		
Excellent	73.4			51.9			19.7			23.4		
Work exp. Since left school			2103			2269			1574			989
Did not work	8.1			5.4			8.1			6.0		
Worked ¼ of the time	5.4			3.9			5.4			2.5		
Worked ½ of the time	12.4			10.6			12.4			8.5		
Worked ¾ of the time	13.6			12.8			13.6			13.7		
Worked all the time	60.5			67.2			60.5			69.3		
If R is a member of a labor union			2953			3179			1636			1128
Yes	40.0			31.0			46.3			39.1		
No	60.0			69.0			53.7			60.9		

Note: R refers to respondent. Some sub-categories may not add up to 100% due to rounding. [*]The average wage for all racial groups is 13.4. The average wages for Whites, Blacks, Hispanics and Asians are 15.4, 11.8, 8.8 and 14.1, respectively. [**]Respondents aged 65 and over are dropped from the analysis since we only consider working age people. QNSs are weighted.

One may argue that it is a drawback of the MCSUI data that its survey only collected information on three of each respondent's contacts. Therefore, the data may not capture the respondent's entire social network. We argue that asking up to three contacts may be sufficient if one utilizes the limited information in an efficient way. As previous research shows, the General Social Survey (GSS) data are highly reliable and representative. The GSS, however, only asked up to five contacts. In the GSS, the respondents on average only provided information on three contacts since some of the subsequent studies eliminated the spouse or a kin from the total number of contacts reported. As a consequence, studies using the GSS data ended up with

only taking into account three contacts (Marsden, 1987). Thus, we argue that asking information for only three contacts in the MCSUI survey should not have influenced the reliability of the data. Indeed, asking information about the contacts that are outside of the households diminishes the possibility of including only close kinship ties in the respondent's social networks.

According to the social networks theories, having a contact person is more beneficial than having no contacts in terms of earnings. According to **Table 1** which presents the descriptive information of the variables, we see that there are higher percentages of non-Hispanic Whites (86.4%) and Blacks (83.8%) who have reported having at least one contact person as com-

pared to Hispanics (62.0%) and Asians (55.8%). In the latter part of this article, we will conduct a regression analysis to further examine whether having contacts (social networks) improves earnings of the respondent and whether such an effect varies across racial and ethnic groups.

One important caveat is that our research aggregates all Latino subpopulations into a single group. We admit that the Hispanics are composed of a great diversity of individuals "whose culture, language, and/or geography have Latin roots" (Massey, 1991: 23). As Massey (1991) indicates, Latinos (Hispanics) come from different places, share different cultural values, and have experienced very different social and migratory trajectories throughout history. The importance of social networks driven by the Mexican culture of supporting extended family in migration, which is found in prior research, may not be applicable to other Hispanic groups. Earning differentials among sub-groups of Asians shown by previous research speaks to the same issue that subpopulations of a racial and ethnic group should not be aggregated to a single group. Despite the variation of Latinos, we aggregated all Latino groups into a single group which we called, Hispanics, in order to simplify this empirical exercise. For the sake of simplicity, we have also aggregated Asians, although Asians are composed of a variety of nationalities. Aggregating sub-groups to a single group also helps us to preserve a good number of cases for each of the groups being analyzed in the analysis and offers parsimony to the results.

The second independent variable that we use to operationalize the respondent's social networks is the *quality network score* (QNS). The QNS is constructed by applying the OLS regressions to predict the respondent's natural logged hourly wage based on the characteristics of the contacts. For the purpose of conducting a diagnostic exercise, we ran one regression model in which all four racial and ethnic groups are included. Even though prior literature suggests that social networks may work differently for each of the racial and ethnic groups, we assume that social networks operate in the way that weak ties and more heterogeneous networks lead to jobs with higher wages. Thus, we consider combining all four racial and ethnic groups in one regression model as an acceptable approach to create the weighting coefficients. The same approach that combines all four racial and ethnic groups is applied when we generate the weighting coefficients for the dependent variable. As to independent variables in the diagnostic model, we utilize characteristics of the contact variables to conduct the analysis.

The MCSUI survey asks about the following characteristics of the contacts: sex, marital status, educational attainments, race and ethnicity, the contact's relationship to the respondent, if the contact lived in the same neighborhood as the respondent, if the contact was getting social welfare and if the contact had a steady job. Depending on the regression coefficients, we then recode the variables containing information on characteristics of the contacts. For instance, if the regression coefficient for the *sex* variable is 0.12 for contact 1 (females are the reference category), we recode the *sex* variable as "0" if female, and "0.12" if male. All other variables that represent characteristics of the contact(s) are recoded following the same strategy. After we finish recoding all variables representing the contacts' characteristics, we generate the QNS for each contact by adding all recoded variables (variables with non-significant regression coefficients are not added). Finally, we obtain an overall QNS by adding the QNSs for each contact. The reason we prefer one QNS is because we believe a single score better captures the

overall quality of the respondent's social networks. The higher the QNS is, the better the quality of the respondent's social networks.

In Appendix 1, we list names of variables that we use to generate the QNSs. We show descriptive results of the respondent's contacts in Appendix 2. We find that contacts are slightly overrepresented by females than males. In our samples, over half of the contacts are married, and the majority (around 65%) of the contacts are non-Hispanic Whites. With regard to educational attainments of the contacts, most contacts are either high school graduates or college graduates. Over 70% of contacts had steady jobs when the survey was conducted. Less than 5% of contacts depended on social welfare. In terms of the respondent's relationship with the contacts, a large number of contacts were friends of the respondent; over 60% of the contacts did not live in the same neighborhood as the respondent. These descriptive results seem to suggest that, in general, samples of our analysis are more likely to have weak ties than strong ties.

In Appendix 3, we present the OLS regression coefficients that we use to generate the QNSs. We would like to draw the readers' attention to the fact that respondents with no contacts are excluded from this part of the analysis. The reason that we exclude those respondents is because including respondents with no contacts would result in a multicollinearity problem in regression models since there is no variation in the number of cases for each group with no contacts. Thus, when we examine how the quality of social networks influences wages, we only assess how the quality of social networks affects wages of those who have reported contacts. In fact, our coding based on the regression coefficients shown in Appendix 3 show strong consistency with findings of previous research. For example, the *sex* variable for contact 2 is coded as "0" for females and "0.13" for males. This coding corroborates findings of previous work that having a male contact is better than having a female contact, considering that women are more socioeconomically disadvantaged than men; they receive lower wages than men even though they have the same occupation as men. In terms of the marriage variable, if we use contact 2 as an example again, we code variable *marriage* as "0.12" if the respondent is married and "0" otherwise based on regression coefficients (see Appendix 3). Such coding results echo findings of previous literature that marriage carries a greater degree of economic or household responsibility, which has a positive influence on earnings.

The regression coefficient for variable *welfare* for contact 3 is –0.39, meaning a contact receiving social welfare is assigned a lower (negative) score relative to a contact who did not depend on welfare (–0.39 versus 0). In addition, living in the same neighborhood as the respondent is coded as "–0.06" and "0" otherwise for contact 1. This coding is consistent with Massey and Denton's (1993) finding regarding the disadvantages of minority members who live in (the same) segregated neighborhoods. Regarding race and ethnicity, researchers have documented relatively higher levels of poverty and segregation among minority groups than among non-Hispanic Whites. The coefficients we use to recode the contact's characteristics, in most cases, reflect a similar pattern; minority groups receive lower (or negative) scores as compared to the majority, non-Hispanic Whites.

As far as human capital, we code contacts having higher educational attainments with higher scores, meaning the regression coefficients are larger for contacts with more years of schooling. Our coding for the *relationship* variable that measures the relationship

of contacts with the respondent also shows clear evidence which supports the weak tie theories. That is, the more distant the relationship, the weaker the ties and the better the social network quality. By adding scores representing characteristics of all contacts, we receive an overall QNS, which is a continuous variable that ranges from 0 to 12.2 with a mean value of 3.8.

For the statistical analysis we utilize the "svy" procedure in STATA 10.0 software to correct for over sampling of minority groups and multilevel sampling of the MCSUI data. Thus, in addition to the raw QNS, we also use the "svy" command to generate a weighted QNS. The weighted QNS has a mean value of 5.29 and a standard deviation of 0.14. Please note that the values of weighted QNS are different from the values of unweighted QNS. **Table 1** exhibits the QNSs for different racial and ethnic groups. Obviously, non-Hispanic Whites have the highest QNS mean value (6.6) while the QNS mean value for the other racial and ethnic groups is about half of that of non-Hispanic Whites: 3.6 for Blacks, 3.5 for Asians and 3.2 for Hispanics. Such results echo the findings of previous research that non-Hispanic Whites have the privilege of forming weak ties.

Control Variables

In addition to the dependent and independent variables discussed above, we also include a series of control variables that capture characteristics of the respondent. In terms of the demographic characteristics, we control for the respondent's age, sex, marital status and If the respondent was native born. As seen in **Table 1**, female respondents are slightly overrepresented in comparison to males for all racial and ethnic groups. Hispanics show a relatively younger age with an average age of 35.8; non-Hispanic Whites have reported the oldest average age (40.2) among all racial and ethnic groups. Marriage rates for Asians is the highest (74.6%), followed by non-Hispanic Whites (65.8%) and Hispanics (59.8%). Blacks are less likely to be married (40.7%) as compared to other racial and ethnic groups. In addition to the differences in the above demographic characteristics, significant racial and ethnic differences are also shown regarding the respondent's place of birth. Only 12.1% of Asians and 26.9% of Hispanics were born in the US as compared to 90.8% of non-Hispanic Whites and 88.8% of Blacks who were native born.

For human capital measures, we control for years of education, work experience since the respondent has left school (5 = worked all/nearly all the time; 4 = worked three-fourths of the time; 3 = worked about half of the time; 2 = worked about one-fourth of the time; 1 = did not work/or nearly not worked at all) and English speaking ability (5 = excellent, 4 = very good, 3 = good, 2 = fair, 1 = poor). In addition, we include a control variable measuring whether the respondent is a member of a labor union or a collective bargaining in their current job. We control for this factor because we assume being a member of a labor union could possibly increase an individual's bargaining power in the labor market and that this individual has access to a broader network.

According to the descriptive results shown in **Table 1**, except for working experience, racial and ethnic differences exist in human capital measures. On average, Asians and non-Hispanic Whites have reported more years of education (13.9 and 13.8, respectively) than Blacks (12.9) and Hispanics (9.9). Non-Hispanic Whites and Blacks have stronger capabilities of speaking English than Asians and Hispanics. In addition, a higher percentage of blacks tend to participate in a labor union (69.0%), fol-

lowed by Asians (60.9%), non-Hispanic Whites (60.0%) and Hispanics (53.7%). In sum, the descriptive results have exhibited that the respondent's demographic characteristics, social capital and human capital vary across race and ethnicity.

In addition to the above control variables, we added two additional controls: the respondent's skin tone and percentages of non-Hispanic Whites and other racial groups living in the same block as the respondent (these are controls of the neighborhood characteristics). Those variables turned out to be non-significant in the regression models, so we did not to control for them. Detailed information on all variables discussed above is presented in **Table 1**. We then use the OLS regression models as the statistical methods to predict the respondent's natural logged wages.

Results

Table 2 presents the OLS regression results when we use the social networks variable *contacts* along with other control variables to predict the respondent's natural logged hourly wage. Results presented in models 1 through 4 show regression results for non-Hispanic Whites, Blacks, Hispanics and Asians, respectively. After controlling for the demographic characteristics and human capital of the respondent, the results show that having a contact person appears to have a significant effect only on non-Hispanic Whites' wages but not on earnings of other racial and ethnic groups. With everything else being equal, having a contact increases a non-Hispanic White individual's natural logged hourly wage by 8%.

Besides racial and ethnic differences shown in the effects of having contacts on wages, we observe that the influence of some control variables on the respondent's earnings varies across race and ethnicity. For instance, being native born has a significant effect only on Hispanics' wages after controlling for other factors. This finding suggests native born status is likely to be an important social characteristic for Hispanics, which significantly improves their socioeconomic status and bargaining power in the labor market. Another factor that differentiates wages of various racial and ethnic groups is marital status. Everything else being equal in characteristics, being married increases non-Hispanic Whites' and Hispanics' wages by 9% and 8%, respectively. Marital status does not have a significant effect on Blacks' and Asians' wages. The non-significant effect on Blacks' wages could be due to their relatively lower marriage rate (40.7%) as compared to other racial and ethnic groups (see **Table 1**). The small number of Asian cases in the analysis could be the reason for the non-significant effect of marital status on Asians' wages. Interestingly, belonging to a labor union significantly enhances Blacks', Hispanics' and Asians' wages but not non-Hispanic Whites' earnings. Such a finding indicates that participating in a labor organization could be an efficient way to protect minority groups' earnings in the labor market.

Results shown in **Table 2** reveal that having contacts (having social networks) only has a significantly positive effect on non-Hispanic Whites' wages. We then ask if these results mean that having social networks do not affect other racial and ethnic groups' earnings. In order to better answer this question, we conduct our next analysis which predicts wages by QNS and other control variables. We want to remind the reader that a larger number of Asians reported not having any contacts. In

Table 2.
OLS regression of logged hourly wage on the contact variable and other control variables by race and ethnicity: four cities, US.

Variables	Whites	Blacks	Hispanics	Asians
Social network variable				
If R has at least one social contact (ref. = no)	0.08[*] (0.06)	−0.06 (0.07)	0.09 (0.03)	−0.18 (0.05)
Control variables				
Demographic factors				
Age	0.01[***]	0.01[***]	0.01[***]	0.01[***]
Sex (ref. = females)	0.12[***]	0.10[*]	0.15[***]	0.01[***]
If R is married (ref. = no)	0.09[**]	0.06	0.08[***]	0.01
If R is native born (ref. = no)	0.02	−0.17	0.11[**]	−0.28
Human capital				
Years of education	0.07[***]	0.09[***]	0.02[***]	0.05[***]
Ability to Speak English	0.07[*]	0.13[***]	0.04[***]	0.07[***]
Work exp. Since left school	0.18[***]	0.07[**]	0.07[***]	0.12[**]
If R is a member of a labor union (ref. = no)	0.05	0.20[***]	0.32[***]	0.22[*]
Constant	−0.26	−0.11	0.98	0.77
N	992	1,143	686	336
Design df	407	340	330	150
R-squared	0.32	0.39	0.33	0.27

Sources: derived from the MCSUI dataset. Numbers in parentheses are standard errors associated with regression coefficients. "R" represents the respondent. [*]indicates significant at the .05 level, [**]indicates significant at the 0.01 level and [***]indicates significant at the 0.001 level (two tailed test).

Table 3, we replace variable *contacts* by variable *QNS*. The QNS here is the overall QNS generated by adding QNSs of up to three contacts. Again, models 1 through 4 show regression results that examine samples of non-Hispanic Whites, Blacks, Hispanics and Asians, respectively. As shown in the table, the QNS only has a statistically significant effect on non-Hispanic Whites' natural logged wages, meaning for non-Hispanic Whites, with every one unit increase in QNS, their natural logged wages increase by 2% controlling for all the other variables. This finding suggests that the quality of social networks plays a positive role in determining non-Hispanic Whites' earnings. The quality of social networks, however, does not show significant effects on earnings for the other racial and ethnic groups. These results are consistent with results shown in **Table 2** when we used the variable *contacts* to predict earnings. Such a consistency makes sense because the QNS itself is constructed by predicting the respondent's natural logged hourly wage based on characteristics of the contacts. Results presented in both tables suggest that social networks influence different racial and ethnic groups' earnings. That is, earning differentials could be partly due to different forms and strengths of social ties held by respondents with various racial and ethnic backgrounds. We do not find much difference in terms of the effects of control variables on earnings which are shown in **Tables 2** and **3**. This again demonstrates the consistency in our two sets of regression models.

In order to statistically test whether there is a significant difference among the racial and ethnic groups regarding the effects of *contacts* and QNS on earnings, we perform a Z-test as our final step of analysis. Our Z-test analysis is shown in Equation (1)[2]. The calculated Z test values for two independent variables measuring social networks in the regression models are presented in **Table 4** (detailed comparison procedures are not

shown but available upon request from the authors)[3]. In **Table 4**, "No" (in parentheses) indicates rejection of the null hypothesis, meaning that the coefficients are *not* the same. "Yes" indicates acceptance of the null hypothesis, meaning that the coefficients *are* the same.

Table 4, regarding the effects of having contacts on earnings, shows that significant racial and ethnic differences are mainly shown among three comparison groups, that is, between non-Hispanic Whites and Asians, between Blacks and Hispanics, and between Hispanics and Asians. Specifically, having contacts yields a stronger positive effect on non-Hispanic Whites' earnings than on Asians' earnings; Hispanics benefit more from having contacts than their Black and Asian counterparts. As far as the effects of QNS on earnings, we find that except for the comparison groups of Blacks and Hispanics, all other comparison groups show significant differences. This means that Blacks and Hispanics tend to gain similar advantages from the same quality of social networks. Results based on other comparison groups suggest that the same quality of social networks tend to increase non-Hispanic Whites' earnings to a greater extent compared to their Blacks, Hispanic and Asian counterparts, holding everything else equal. In addition, Blacks and Hispanics tend to benefit more from the same quality of social networks than Asians.

These findings suggest a very interesting story, that is, non-Hispanic Whites' earnings benefit the most from having contacts and having good quality social networks as compared to other minority groups. Though Blacks, Hispanics and Asians share a similar level of QNS, the effects of the quality of social networks on their earnings are not the same. Blacks and Hispanics seem to gain equivalent benefits from the same level of QNS, whereas Asians earn significantly less than Blacks and Hispanics who have the same QNS, holding constant the effects of other variables. These findings probably suggest that in terms of

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[2]Our Z-test follows the formula recommended by Paternoster and colleagues for contrasting the effects of two regression coefficients: $Z = (b_1 - b_2)/\sqrt{SEb_1^2 + SEb_2^2}$ where b_1 is the regression coefficient of independent variable X for group 1 (for instance, non-Hispanic Whites), b_2 is the regression coefficient of the same variable X for group 2 (for example, Blacks), and SEb_1 and SEb_2 are the coefficient variances associated with the first and second groups, respectively.

[3]If the value of Z for any one variable is less than 1.96, this indicates that we accept the null hypothesis that the coefficients for two racial and ethnic groups are not statistically different from each other. If the Z test value is greater than 1.96, the null hypothesis is rejected, signifying that the coefficient in the equation predicting one of the racial or ethnic groups is significantly greater than the coefficient in the equation predicting another racial or ethnic group.

Table 3.
OLS regressions of logged hourly wage on the QNS variable and other control variables by race and ethnicity: four cities, US.

Variables	Whites	Blacks	Hispanics	Asians
Social network variable				
QNS	0.02*** (0.01)	0.01 (0.01)	0.01 (0.01)	–0.02 (0.01)
Control variables				
Demographic factors				
Age	0.01***	0.01***	0.01***	0.01***
Sex (ref. = females)	0.15***	0.11*	0.15***	0.14***
If R is married (ref. = no)	0.11**	0.09***	0.07***	0.06
If R is native born (ref. = no)	0.05	–0.10	0.11**	–0.30
Human capital				
Years of education	0.07***	0.09***	0.02***	0.06***
Ability to Speak English	0.06***	0.09***	0.06***	0.13***
Work exp. Since left school	0.18***	0.08***	0.04***	0.11**
If R is a member of a labor union (ref. = no)	0.04	0.25***	0.35***	0.20*
Constant	–0.33	–0.05	1.01***	0.70
N	907	1056	638	329
Design df	379	298	315	145
R-squared	0.36	0.41	0.33	0.34

Sources: derived from the MCSUI dataset. Numbers in parentheses are standard errors associated with regression coefficients. "R" represents the respondent. *indicates significant at the 0.05 level, **indicates significant at the 0.01 level and ***indicates significant at the 0.001 level (two tailed test). Appendix 3 shows the coefficients utilized to construct the QNS variable.

Table 4.
Z-tests to determine if regression coefficients for racial and ethnic groups are significantly different from each other: four cities, US.

Independent Variables	W vs. B	W vs. H	W vs. A
	Z value	Z Value	Z Value
If having contact(s)	1.52 (Yes)	0.13 (Yes)	3.33(No)
QNS	2.12 (No)	2.12 (No)	2.83 (No)
Independent Variables	B vs. H	B vs. A	H vs. A
	Z value	Z Value	Z Value
If having contact(s)	1.97 (No)	1.39 (Yes)	4.63 (No)
QNS	0 (Yes)	2.12 (No)	2.12 (No)

Note: H_0: b_1 for racial and ethnic group 1 = b_2 for racial and ethnic group 2. "Yes" means the regression coefficients are not significantly different from each other.

earnings, social networks are more important to non-Hispanic Whites, followed by Blacks and Hispanics. Other factors, such as educational attainments rather than social networks, are more likely to result in a relatively higher socioeconomic status for Asians than racial and ethnic groups.

Conclusion and Discussion

In this research, we focus on examining the manner in which social networks determine earnings across race and ethnicity. We find that both the characteristics and quality of social networks for the four racial and ethnic groups vary. Regarding the composition of the respondents' social networks, 86% of non-Hispanic Whites and 84% of Blacks reported having at least one contact. In contrast, lower percentages of Hispanics (62%) and Asians (56%) reported having contacts. As far as the quality of their social networks, we consider the social networks to be of good quality when they are composed of contacts who are male and married and who have steady jobs, do not rely on social welfare and have weak ties with the respondents. According to our results, non-Hispanic Whites show the highest quality network score, followed by Blacks, Asians and Hispanics.

As far as earnings, non-Hispanic Whites reported higher hourly wages than all the other racial and ethnic groups, with Hispanics having the lowest hourly wages. This finding echoes Massey's (2007) statement that with the increasing number of new immigrants from Latin America (including Mexico), especially those with no legal status in the United States, a new population of second-class citizens with low income is quickly formed in the US society(Massey, 2007).

Through out the research, we have tested two general hypotheses: 1) having contact(s) should have a stronger positive effect on earnings than having no contact(s); and 2) the better the quality of social networks, the higher the wages. Our results show that the variation in having contact(s), the characteristics of the contact(s), and the quality of social networks do influence individual earnings. These findings to a certain extent support our general hypotheses. Some interesting findings emerge in this research as well. We find that after controlling for the respondent's demographic characteristics, human capital as well as social capital, having contacts has the strongest positive effect on non-Hispanic Whites' earnings, followed by Blacks' and Hispanics' earnings. Earnings of Asians benefit the least from having contacts.

As far as the effect of the quality of social networks on earnings, we find that good quality social networks positively influences non-Hispanic Whites' earnings to a greater extent as compared to other racial and ethnic groups. Though Blacks and Hispanics gain more benefits in earnings from having a good quality network score than Asians, the magnitude of their earning benefits from QNS does not seem to be significantly different from each other. These findings again support our general hypothesis and imply that social networks could be a factor that differentiates earnings across race and ethnicity in the US labor market.

The "weak ties advantage" theory highlighted by prior research is corroborated by findings of this research when non-Hispanic whites are examined, meaning weak ties improve non-Hispanic

whites' earnings. Non-Hispanic Whites have held most of the social, economic and political power in the US (Massey, 2007). It is not surprising that the "weak ties advantage" functions just as expected for non-Hispanic Whites. This study finds, however, the "weak ties advantage" may not be applied to other racial and ethnic groups, especially the minority groups. Our results raise an important question, that is, why is the "weak ties advantage" not applicable to other racial and ethnic groups in the US? Results presented in this research may have provided an explanation for this question. For example, the results for Asians suggest that the number of contacts and the QNS are not as important determinants for their success as other racial and ethnic groups. Instead, human capital, such as the level of education, English-speaking ability and work experience, seems to matter more than their social capital in improving Asians' wages. Such a finding suggests that human capital rather than social capital may be the key that elevates Asians into higher income strata in the US labor market. This explains why the "weak tie advantage" does not apply to the Asian group. Allensworth (1997) also offers a reasonable claim that Asians in the US may be reluctant to rely on social networks to look for jobs given their cultural demands to show self-sufficiency to others.

For Hispanics and Blacks, our research also shows a completely different pattern as compared to non-Hispanic Whites: the "strong ties advantage" works for these two minority groups. For Hispanics, the research shows that having more contacts and especially more similar contacts helps them to earn higher wages. This finding echoes the research result that strong ties rather than weak ties are more important when predicting Mexicans' earnings (Amuedo-Dorantes & Mundra, 2007). Granovetter (1982) argues that strong ties work especially well for those who experience conditions of risk and uncertainty. A good example is the large number of undocumented immigrants from Latin America who are currently living in the US. Their unlawful status forces them to rely on their homogenous networks or what Flores-Yeffal (forthcoming) calls, "Migration-Trust Networks" which are networks mostly formed by other immigrants from the same places of origin and are driven by relations of trust and solidarity. For those Hispanics, jobs are found mainly through utilizing immigrant networks (Garcia, 1997). Flores-Yeffal and Aysa-Lastra (2011) suggest that Mexican immigrants relay on a different type of "weak ties" such as *paisanos* or countryman which serve as substitutes in the absence of family ties. Such "weak ties" also play a role when those Hispanics are looking for jobs (Garcia, 1997). Human capital is also found to determine Hispanics' earnings. The most important human capital uncovered in this study is their citizenship status. Being a US citizen is found to be an even better predictor than having social contacts or good quality social networks when determining Hispanics' earnings.

As for Blacks, the research suggests that their social networks function more similarly to those of Hispanics than those of non-Hispanic Whites, that is, Blacks reply on strong ties to improve earnings. This is not surprising because both groups share a similar socioeconomic status in the US. Redlining practices, among other forms of racial oppression, forced Blacks to be segregated in the inner city ghettos (Massey & Denton, 1993). The American system has also failed to provide them with a quality education. Along with several other economic disadvantages, Blacks have been placed in a perpetual cycle of poverty, especially for those who live in the inner city ghettoes

(Massey, 2007). Similar to Hispanics in the US, those Blacks who live in conditions of risk and uncertainty are also more likely to rely on strong ties to look for jobs and improve earnings. Strong ties offer a more secure choice for them to avoid discrimination and racial oppression. The findings for Hispanics and Blacks shown in this research are largely consistent with Granovetter and Smith's (2000) finding that weak ties are not likely to benefit groups in the low socio-economic spectrum although we have applied a different measure of social networks in the research. We have used the quality network score to predict earnings whereas Granovetter and Smith (2000) have applied an individualized variable approach. Regardless the variation of measurements, the findings are consistent with each other.

In sum, our research clearly shows that the earning differentials across racial and ethnic groups are attributable to the quality of an individual's social networks. For non-Hispanic Whites, the better the qualit of social networks, the higher the earnings. For other racial and ethnic groups, having better qual- ity of social networks does not necessarily lead to higher wages. Our research suggests that human capital as well as the social and economic situations of the respondent also play a role in the social networks and earnings relationship. Future research may look more closely at the cultural, social, economic and historical factors that may have affected various racial and ethnic groups, which may help us to better understand why the quality of social networks influences earnings in different ways for different racial and ethnic groups. This empirical exercise based on analyzing the MCSUI data is a beginning for understanding the role of social networks in shaping earnings across different racial and ethnic groups in the United States. Results presented in this research also provide directions for future research to further explore the determinants of earnings of various racial and ethnic groups.

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Appendix 1.
Variables used to generate the quality network scores (QNSs) of three contacts.

Variables	Description
Demographic Characteristics	
Sex	Male =1, female = 0
Marital Status	Married = 1, 0 otherwise.
Ethnicity of contact	Series of dummy variables: Blacks = 1, 0 otherwise. Hispanic = 1, 0 otherwise. Asian = 1, 0 otherwise. White = 1, 0, otherwise.
Socioeconomic characteristics	
Level of education	Series of dummy variables: Less than high school =1, 0 otherwise. Some high school =1, 0 otherwise. High school graduate=1, 0 otherwise. Technical or trade school =1, 0 otherwise. Some college =1, 0 otherwise. College graduate =1, 0 otherwise.
If having a steady job	Yes = 1, no = 0
If getting welfare	Yes = 1, no = 0
Relationship variables	
If living in the same neighborhood	Yes = 1, no = 0
Relationship to the respondent	Series of dummy variables: Relative = 1, 0 otherwise. Friend = 1, 0 otherwise. Co-worker = 1, 0 otherwise. Other = 1, 0 otherwise.

Note: variables presented in this table are based on questions in the MCSUI asking the respondent's social relationships with up to three most important contact persons in the past six months. Those three people are the ones that the respondent discussed matters important to him/her. To create the Quality Network Score, we utilized the coefficient values shown in Appendix 3.

Appendix 2.
Descriptive statistics for characteristics of three contacts in four cities.

Variables	Contact 1		Contact 2		Contact 3	
	%	N	%	N	%	N
Demographic Characteristics						
Sex						
Male	46.7	4786	48.0	3884	48.2	2889
Female	53.3		52.0		51.8	
Marital Status						
Yes	62.0	4771	65.4	3878	60.0	2890
No	38.0		34.6		40.0	
Race and ethnicity of contact		4782		3884		2884
Non-Hispanic White	64.6		64.2		63.8	
Hispanic	17.7		17.0		19.0	
Blacks	12.7		12.7		10.8	
Asian	4.2		5.3		5.0	
Other	0.7		0.8		1.3	
Socioeconomic characteristics						
level of education		4586		3730		
Less than high school	8.5		7.2		7.4	2792
Some high school	5.6		5.3		6.0	
High school graduate	28.5		27.3		26.0	
Technical or trade school	4.6		4.5		4.2	
Some college	17.4		17.5		16.8	
College graduate	35.4		38.2		39.7	
If having a steady job		4776		3885		2891
Yes	71.7		75.9		75.4	
No	28.3		24.1		24.6	
If getting welfare		4740		3857		2872
Yes	4.6		3.4		2.8	
No	95.4		96.6		97.2	
Relationship variables						
If living in the same neighborhood		4786		3887		2888
Yes	37.1		32.8		30.9	
No	62.9		67.2		69.1	
Relationship to the respondent		4711		3853		2864
Relative	27.7		30.3		28.5	
Friend	54.5		52.3		54.4	
Co-worker	8.2		9.6		9.5	
Other	9.5		7.8		7.7	

Note: some sub-categories may not add up to 100% due to rounding. All cases are weighted in this table.

Appendix 3.
Regression of logged hourly wage on characteristics of contacts in four US cities.

Variables	Contact 1	Contact 2	Contact 3
Demographic characteristics			
Sex			
Male	0.12^{**}	0.13^{**}	-
Female	0	0	0
If Married			
Yes	0.10^{**}	0.12^{***}	0.08^{*}
No	0	0	0
Race and Ethnicity of contact			
Non-Hispanic Whites	0	0	0
Blacks	-0.17^{***}	-0.17^{***}	-0.10^{*}
Hispanics	-0.29^{***}	-0.28^{***}	-0.25^{***}
Asians	0.03	-0.09	-0.00
Other racial groups	-0.14	-0.15	0.12
Socioeconomic characteristics			
level of education			
Less than high school	-0.17^{**}	-0.12	-0.14
Some high school	-0.13	-0.22	-0.11
High school graduate	0	0	0
Technical or trade school	-0.20^{***}	0.09	0.16
Some college	0.07	0.11^{*}	-0.07
College graduate	0.26^{***}	0.32^{***}	0.19^{***}
If getting welfare	-	-	
Yes			-0.39^{***}
No			0
Social Relationships			
If living in the same neighborhood		-	-
Yes	-0.06^{*}		
No	0		
Relationship to the respondent	-		
Relative		0.02	0.04
Friend		0	0
Co-worker		0.17^{**}	0.21^{*}
Other		0.18^{**}	0.15^{*}
Constant	2.38^{***}	2.26^{***}	2.42^{***}
N	3141	2620	2018
Design df	920	851	756
R-squared	0.18	0.20	0.16
Average quality network score (QNS)	**0.10**	**0.23**	**0.17**

Note: *indicates significant at the 0.05 level, **indicates significant at the 0.01 level and ***indicates significant at the 0.001 level (two tailed test). If had a steady job is dropped due to non-significant regression coefficients. The QNSs are weighted which are calculated by adding all regression coefficients and they have different values than unweighted scores.