Some Contacts Are More Equal than Others: Informal Networks, Job Tenure, and Wages

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The explanation typically given for longer tenure among workers who use informal contacts to find jobs is that relatives and friends reduce uncertainty about the quality of the match between worker and employer. An alternative explanation is that workers rely on informal information sources as a last resort. Such workers remain at their current jobs mainly because they have few alternative choices rather than because of better match quality. This article shows that the two different explanations are simultaneously valid for different types of contacts and can account for differences in the wage effects of job contacts.

I. Introduction

Most research on informal contacts indicates that roughly 50% of jobs are obtained through family, friends, or other acquaintances. Results for the portion of this literature analyzing employment consistently show that workers who find their jobs in this way subsequently have longer tenure. In contrast, results for the portion of the literature examining wages vary considerably. This article contends that the effects of job contacts can be better understood by combining these two generally separate strands of empirical analysis.

In particular, the rationale typically given for longer tenure is that relatives and friends reduce uncertainty about the quality of the match be-

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tween worker and employer. Related research finding higher wages for many workers who use informal contacts supports this explanation. This article argues that there is an alternative explanation for longer tenure on jobs found through informal contacts. Workers with limited access to wage offers through other channels may rely on informal information sources as a last resort. Such workers may remain at their current jobs mainly because they have few alternative choices rather than because of better match quality. Many of these workers would correspondingly have lower rather than higher wages compared with those using other means to find jobs.

II. Previous Literature on Wages

Some studies show that those who found their jobs through family, friends, and acquaintances earned more than those using formal and other informal job-search methods (Rosenbaum et al. 1999; Marmaros and Sacerdote 2002). Others indicate that the initial wage advantage declined over time (Corcoran, Datcher, and Duncan 1980; Simon and Warner 1992). Some analysts found no general initial or persistent wage effects (Bridges and Villemez 1986; Holzer 1987; Marsden and Gorman 2001). In fact, some studies (Elliott 1999; Green, Tigges, and Diaz 1999) show that those using contacts earned less than those using formal methods.

Related work identifies possible reasons for this variation. Montgomery (1991) argues that the greater the number of social ties between jobholders in an individual's network, the greater the competition among firms for referred workers and the higher their wages. He also shows that, if productive traits are correlated across acquaintances, firms will accept referrals only from their current high-ability workers. These high-ability workers can, therefore, pass along better-quality information to job seekers than can low-ability workers (see also Saloner 1985; Simon and Warner 1992). Topa (2001) states that employed social contacts are more likely to provide job information to others than unemployed social contacts. They are motivated partly by self-insurance, as they want to receive similar information when they themselves become unemployed. Similarly, Calvo-Armengol and Jackson (2002) contend that employed workers will pass along information only if they cannot use the information to improve their own wages. The higher the wages of contacts, the more information that they are willing to give to others.

This work indicates that individuals are likely to earn higher wages if their contacts (1) are located in more extensive networks, (2) are employed, (3) receive higher wages, and/or (4) more substantially reduce the employer's uncertainty about the job seeker's productivity. Reviews of the

literature on informal job contacts suggest that older male workers are more likely to fit these criteria than younger or female contacts.[1]

III. Previous Literature on Job Tenure

Another strand of research implies that workers who use informal contacts to find employment have longer job tenure. Some of this analysis, which this article labels as the "good matches" hypothesis, is based on imperfect information by workers and employers. For example, the job-shopping approach (Johnson 1978; Jovanovic 1979; Viscusi 1980) posits that prospective workers are heterogeneous in preferences and abilities and that jobs are heterogeneous in the skills required and in their nonpecuniary characteristics. Since many job characteristics cannot be easily ascertained without actual employment experience, some hired workers may be poor matches for the jobs they hold. Less uncertainty due, for example, to information provided by contacts reduces the chance that the match between worker and firm will turn out worse than it initially appeared to be.

In related work, Simon and Warner (1992) argue that, when the quality of the match between workers and firms is uncertain, part of the return to accepting an initial wage offer is the prospect of higher-than-expected productivity. Contacts reduce this uncertainty and, therefore, increase reservation wages and the wage offer accepted. Consistent with this hypothesis, Simon and Warner (1992) found that jobs obtained through contacts with more information (i.e., recruiters or acquaintances inside the firm) lasted significantly longer than jobs obtained through want ads or private agencies. Datcher (1983) also showed that, for African Americans and for college workers, knowing someone at the firm reduced the quit rate.

Other findings suggest an alternative explanation of longer tenure for workers using informal contacts, namely, the "limited choices" hypothesis. Topel and Ward (1992) argue that the average young worker holds seven jobs in the first 10 years of his working life and that job mobility accounts for one-third of wage growth during this period. Keith and McWilliams (1995) and Abbott and Beach (1994) show that the effects of job mobility on wages depend on the source of the job change. Involuntary mobility in the form of family-related quits, layoffs, and discharges reduces wages. Voluntary quits increase wages. Unlike the matching story, this research implies that workers may remain on the job and have longer tenure because they do not have access to the job offers that make voluntary quits attractive. Lower wages for those using contacts as a last

[1] See Marsden and Gorman (2001) and Ioannides and Loury (2004). Differences across firms may also generate differences in contact effects. See Pellizzari (2003).

resort (Korenman and Turner 1996; Elliott 1999; and Green et al. 1999) are consistent with this alternative story.

IV. Theoretical Model

In order to accommodate both the "good matches" and the "limited choices" alternatives, this article assumes that contacts include both high-wage-offer and low-wage-offer sources. It then follows the standard search literature by also assuming that job mobility decisions depend on comparisons between reservation wages and external offers from firms seeking new employees. Workers will leave their job (or unemployment) if the external offer exceeds their reservation wages. The size of external wage offers depends partly on the fraction received from high-wage sources (see Montgomery 1991; Mortensen and Vishwanath 1994).

The conventional good matches hypothesis focuses on informal contacts as high-wage-offer sources. In this case, workers who find jobs through contacts are likely to get better external wage offers. As a result, they may earn more, have higher reservation wages, be more satisfied with their jobs, and have lower turnover because of improved matches between workers and firms.

By contrast, the limited choices contacts story highlights the role of friends and family as low-wage-offer sources. Unemployed workers or workers receiving low wages from the current employer will accept jobs from low-wage-offer contacts mainly when the likelihood of external offers from high-wage sources is small. These workers may be willing to move to other jobs in subsequent periods. However, they do not yet have the contacts or access to formal sources that can provide external offers that exceed their reservation wages.[2] Since using low-wage-offer contacts signals a limited range of job alternatives, workers who find employment through such contacts may earn less, change jobs less often, and be less satisfied with their jobs. This reasoning implies different interpretations of longer job tenure for those who found their jobs through friends and family, depending on whether job seekers used high- or low-wage-offer informal contacts.

These differences are reflected in the estimated effects of contacts on wages. In particular, let $Y = \alpha' X + \delta_L C_L + \delta_H C_H + \beta' Z + \varepsilon$, where Y measures the hourly wages of the individual, X includes job tenure and

[2] Holzer (1988) examines determinants of search methods used by unemployed youth. The first-stage analysis estimates the likelihood that individuals will receive job offers based on their demographic characteristics and the local economic environment. Using this analysis, he calculates an estimated probability of receiving a job offer for each sample member. He shows that the probability of individuals using friends and relatives to find jobs does not depend on this estimated probability. He speculates that the relatively low cost of such sources accounts for their uniform use.

the other predetermined observed market-valued characteristics, C_L is a dummy variable indicating whether or not the individual used a low-wage-offer contact to find the job, and C_H is a dummy variable indicating whether or not the individual used a high-wage-offer contact to find the job. The Zs are unobserved determinants of wages, including fixed individual wage-enhancing characteristics and the quality of the networks to which individuals belong. The good matches hypothesis implies that workers accepting jobs found through high-wage-offer contacts will earn more ceteris paribus ($\delta_H > 0$). The limited choices hypothesis indicates that workers who accept jobs found through low-wage-offer contacts also earn more than they could have received elsewhere, but the wage gains are not as large as for high-wage-offer sources ($\delta_H > \delta L > 0$).

In addition, the limited choices hypothesis points to the negative correlation between unobserved network quality and the choice of low-wage-offer contacts. Workers who use low-wage-offer contacts to find jobs are likely to be in networks that generate few high-wage alternatives. Since the lack of high-wage offers reduces realized wages, ordinary least squares (OLS) coefficients for using low-wage-offer contacts could be biased downward and potentially negative.

Montgomery (1992) makes a similar observation when comparing informal contacts who are strong ties (family and close friends) with contacts who are weak ties (acquaintances).[3] The standard hypothesis (see Bridges and Villemez 1986) is that weak ties have a larger effect on earnings than strong ties because they provide more nonredundant information about jobs. However, suppose that reservation wages increase with the number of job offers. Suppose also that workers almost always get offers from weak ties but almost never get offers from strong ties. Even if weak ties provide more information, those who actually used strong ties to find their jobs may earn more. The rationale is that using strong ties signals that the worker had more offers (i.e., from both strong and weak ties rather than just weak ties).

In related work, Thomas (1997) questions the validity of results showing that public employment agencies increase the duration of unemployment. He finds that the negative estimated effects occur mainly because job seekers use such agencies only after other means have been exhausted. Alternative fixed-effects estimates indicate that, in fact, public employment agencies help workers to find jobs more quickly.

Note that, in addition to the negative correlation between unobserved network quality and whether the job seeker used low-wage-offer contacts, fixed unobserved individual wage-enhancing characteristics can generate biased estimated effects. These fixed unobservables may be positively correlated with whether the individual used a high-wage-offer contact to find

[3] See Granovetter (1995) for a discussion of tie strength.

his current job and negatively correlated with whether the individual used a low-wage-offer contact. In this case, OLS estimates of δ_H would be biased upward, and estimates of δ_L would be biased downward.

V. Description of Data

The data used in this article come from the 1979 National Longitudinal Survey of Youth (NLSY). The NLSY is nationally representative panel of 12,686 individuals ages 14–21 in 1979 who were interviewed annually to determine information about schooling, work, and other experiences. This article estimates the effect of different types of informal contacts on tenure and wages for the 1982 job. It also examines the effects of contacts on wage growth from 1982 to 1993 and on other indicators of the desirability of the 1982 job. The focus is on young workers (ages 17–24 as of 1982) since job mobility is most closely associated with wage growth for this age group. Most of the analysis is restricted to men since young women's job tenure involves more complicated labor force participation decisions. However, wages of young women are analyzed for comparison purposes.

The NLSY has 6,403 male observations. A total of 3,168 observations were not included in the analysis. Most exclusions resulted directly from the age of sample members in 1982 (1,857 individuals were still in school). Others were missing key dependent or explanatory variables (336 had invalid data for years of schooling in 1982, and 975 did not work in 1982 or had invalid data for 1982 wages or 1982 job tenure). The remaining number of observations (3,235) is similar to that in other studies using 1982 NLSY data for men (Holzer 1987; Korenman and Turner 1996).

Informal contact variables for the job held in 1982 were based on responses to the following questions: (1) Was there anyone specifically who helped you get a job with your most recent employer? (2) Was this person male or female? (3) Was this person a relative? (4) If yes, what was the person's relationship to you? (5) Was this person working for your employer when you were first offered a job? (6) How did this person help you get the job?[4]

Means and standard deviations of job tenure, contact type, and some of the other variables used in the analysis are listed in table 1. Job turnover among these young workers was substantial. About 22% of workers left their 1982 jobs before 1983, 49% had left before 1984, 73% by end of 1986, and 84% by the end of 1992.[5] Friends and relatives helped slightly

[4] The NLSY reports information about only one contact who helped the individual to find his current job.

[5] The total tenure ends either when the 1982 job ends or in 1992 (the end of the observation period for this article). Sixteen percent of the sample was still on the 1982 job as of the 1992 interview.

Table 1
Variable Means and Standard Deviations (in Parentheses) for Men

Contact Variables	Total	White	Black	Hispanic
Had help to find job with present employer from friends and family, total	.5591	.5593	.5475	.5832
	(.4966)	(.4966)	(.4981)	(.4936)
Prior generation male relatives (fathers, including in-law and step, grandfathers, or uncles)	.1097	.1171	.0740	.0801
	(.3126)	(.3216)	(.2619)	(.2718)
Prior generation male relatives (fathers, including in-law and step, grandfathers, or uncles) who knew the boss or served as a reference	.0380	.0442	.0371	.0196
	(.1913)	(.2056)	(.1891)	(.1387)
Female friends and relatives (mothers, including in-law and step grandmothers, aunts, sisters, or female cousins)	.0925	.0899	.1043	.1041
	(.2898)	(.2862)	(.3059)	(.3058)
Male friends and contemporary generation male relatives (brothers and male cousins)	.3436	.3405	.3460	.3840
	(.4750)	(.4740)	(.4760)	(.4869)
Other relatives	.0133	.0117	.0232	.0149
	(.1145)	(.1075)	(.1505)	(.1214)
Friends and relatives who knew the boss or served as a references, total	.1697	.1743	.1444	.1588
	(.3754)	(.3794)	(.3518)	(.3660)
Other variables, turnover on 1982 job:				
Left before 1983	.2211	.2212	.2275	.2047
	(.4151)	(.4152)	(.4195)	(.4039)
Left before 1984	.4897	.4800	.5551	.4872
	(.4999)	(.5000)	(.4973)	(.5004)
Left before 1987	.7332	.7236	.7934	.7404
	(.4424)	(.4473)	(.4051)	(.4389)
Left before 1993	.8394	.8307	.8995	.8343
	(.3672)	(.3751)	(.3008)	(.3723)
Ln 1982 wages	6.2791	6.3045	6.1384	6.2171
	(.5165)	(.5212)	(.4893)	(.4481)
Ln 1993 wages − ln 1982 wages	.7347	.7517	.5787	.7943
	(.6956)	(.6822)	(.6491)	(.9034)
Expected tenure on 1982 job (in years)	5.1044	5.1538	4.9303	4.6762
	(4.6608)	(4.6727)	(4.6187)	(4.5483)
Whether would keep 1982 job if could choose any different job	.3430	.3528	.2568	.3570
	(.4748)	(.4778)	(.4374)	(.4798)

NOTE.—Statistics for most variables are based on 3,235 observations. Due to missing data, statistics for ln 1993 wages − ln 1982 wages are based on 2,025 observations, expected tenure for 1982 job on 2,315 observations, and whether workers would keep their job on 2,403 observations. Background variables were measured as of 1979. Means are weighted to reflect nonrandom sample selection and attrition (see nn. 8–9).

over half of the sample (56%) to get 1982 jobs. Brothers (including in-laws), male cousins, and male friends accounted for much of this fraction (34%). Prior generation male relatives (fathers, stepfathers, uncles, and fathers-in-law) accounted for an additional 10%. All female relatives and friends also made up about 10% of the 56% total. In addition, about 30% of the friends and relatives (17% of the 56%) who helped workers to find their jobs either knew the boss or gave the worker a recommendation. African American and Hispanic workers were similar to whites except that they were somewhat less likely to have received help from prior generation male relatives or from friends and relatives who knew the boss or gave the worker a recommendation.

VI. Empirical Results

A. Job Tenure Results

Column 1 of table 2 presents the estimated effects of informal contact variables on male job tenure between 1982 and 1992 using the Cox pro-

Table 2
Job Tenure and Job Satisfaction Estimates for Men

	Cox Hazard Estimates—Exits from 1982 Job	OLS Estimates—1982 Expected Job Tenure	Probit Estimates—Whether to Select a Different Job
Had help to find 1982 job from:			
Prior generation male relatives (fathers, including in-law and step, grandfathers, or uncles)	−.3516	2.1249	−.4137
	(.0750)	(.5042)	(.1390)
Male friends and contemporary generation male relatives (brothers and male cousins)	−.1052	.0087	.0708
	(.0468)	(.2843)	(.0776)
Female friends and relatives (mothers, including in-law and step grandmothers, aunts, sisters, or cousins)	−.1403	−.2805	.2634
	(.0696)	(.4299)	(.1273)
Found job through direct contact with employer, newspaper ads, employment agencies, or other formal means	—	—	—
χ^2	238.42		67.02
R^2		.135	
N	3,235	2,315	2,403

NOTE.—Dashes signify an intentionally left-out variable. Other variables included in each column are the same as those in table A1, col. 1. Standard errors are in parentheses. The number of observations in each column equals the number of respondents with valid responses for the dependent variable. The ordinary least squares (OLS) and probit analyses were weighted to control for nonrandom sample selection and for sample attrition (see nn. 8–9).

portional hazard model. (The full results are listed in table A1.)[6] The hazard specification is given by $h(t|X_j) = h(t_0)\exp(X_j\beta)$, where X_j is a vector of time-invariant individual characteristics; $h(t_0)$ is the baseline hazard; and, relative to the baseline hazard, $h(t|X_j)$ is the probability density associated with individual j leaving his 1982 job at time t given that he has tenure of at least t.[7]

Consistent with previous literature, the results show that workers who had help from informal contacts remained at their job uniformly longer than those using direct contact with employers or formal methods. Exponentiated coefficients from the Cox model can be interpreted as the ratio of hazards $[h(t|X_j)/h(t_0)]$ for a one-unit change in the covariates. This means that young men who found their 1982 jobs through prior generation male relatives were about 70% less likely to leave the job as those who found their job through direct contact with employers or formal means (using the coefficient listed in col. 1, $\exp[-0.3516] = 0.704$). Workers using help from young male or female relatives and friends were about 90% as likely to leave the 1982 job as those who found their job through direct contact with employers or formal methods—for female friends and relatives $\exp(-0.1403) = 0.869$ and for male friends and young male relatives $\exp(-0.1052) = 0.900$.[8]

B. Interpretation of Job Tenure Results

The implications of these findings depend on whether the increase in job tenure results from "better matches" or from "limited choices." Evidence that can be used to make this distinction includes (1) differences in the characteristics of older male compared with other contacts and (2) the relationship between type of contact and job satisfaction or attractiveness.

In the case of the first type of evidence, auxiliary Current Population Survey data in table 3 show that, compared with younger men and all women, older men (e.g., prior generation male relatives) were much more

[6] All analyses are available by request from the author.

[7] Unlike many other estimation choices, the hazard model can accommodate right censoring (individuals may still be on the 1982 job at the end of the observation period in 1992) and left truncation (most individuals in the sample began their 1982 job before 1982).

[8] The NLSY includes a nationally representative sample and two additional samples. The first includes Hispanic, black, and economically disadvantaged non-Hispanic, nonblack youth. The second includes active duty military personnel. The analyses in this article exclude the military personnel. If the sample for the Cox proportional hazard model is restricted only to the nationally representative sample, the coefficients (and standard errors) would be −0.4740 (0.1051) for prior generation male relatives and friends, −0.2522 (0.1053) for all female relatives and friends, and −0.1625 (0.0685) for contemporary generation male relatives and friends. These estimates imply that the job tenure results are robust to whether the nationally representative sample is used or whether the entire sample is used.

Table 3
Income and Employment Characteristics by Sex and Age

	Men	Men	Women	Women
Characteristics	20–24	45–54	20–24	45–54
Median income	7,651	23,347	5,692	8,205
Employment to population ratio	64.9	85.5	60.9	58.2
Year-round, full-time workers (%)	38.4	75.4	36.9	59.8
Median years of tenure with current employer, 1983	1.5	12.8	1.5	6.3

SOURCES.—U.S. Bureau of the Census 1984, table 658, 1985, table 46; U.S. Bureau of the Census, Division of Labor Force Statistics, Bureau of Labor Statistics 1997, table 1, http://www.bls.census.gov/cps/pub/tenure_0296.htm.

likely to have the contact characteristics that would result in better matches and higher wages for job seekers. In particular, median income, employment rates, job tenure, and the percentage of full-time workers were substantially higher for men ages 45–54 than for the other groups. The previous discussion suggests that these are the characteristics that provide more access to high-wage-offer distributions, that would encourage employers to place greater weight on recommendations, and that would imply that contacts are more likely to act on behalf of and pass on information to job seekers rather than use it themselves.

The relationship between the type of contact and job satisfaction or attractiveness is the second type of evidence useful to distinguish between the better matches and the limited choices interpretations of longer job tenure. For example, while column 1 of table 2 shows that all three types of contacts significantly reduced turnover relative to individuals who found their jobs through other sources, the size of the effect because of prior generation male relatives was significantly greater than that for younger male or female contacts. This gap would be expected if the better matches hypothesis (which assumes that workers have found desirable employment) accounts for longer tenure for workers using prior generation male relatives and the limited choices hypothesis (which implies less attachment to the original 1982 job over time as workers gain access to more lucrative options) is the source of longer tenure for workers using other contact types.

In addition, NLSY respondents were asked, in 1982, how many years they expected to keep their current job. Column 2 of table 2 shows that workers using female or young male sources expected to be on these jobs for 2 fewer years than those using older male contacts and about the same length of time as those using direct contact with employers or formal search procedures. One interpretation of this combination of longer actual tenure after 1982 (col. 1) but relatively short expected tenure as of 1982 (col. 2) is that these workers may be frustrated in their attempts to find better employment.

Table 4
Estimated Effects of Contact Variables on ln 1982 Wages by Gender and on Male Wage Growth, 1982–93

	Ln 1982 Wages for Men	Ln 1982 Wages for Women	Ln 1993 Wages − Ln 1982 Wages for Men
Had help to find job with 1982 employer from:			
Prior generation male relatives: fathers (including in-law and step), grandfathers, or uncles	−.0256	.1288	.0634
	(.0553)	(.0621)	(.0732)
Prior generation male relatives who knew the boss or served as a reference	.1507		−.2024
	(.0733)		(.1022)
Male friends and contemporary generation male relatives (brothers and male cousins)	.0232	.0342	−.0611
	(.0257)	(.0348)	(.0460)
Female friends and relatives (mothers, including in-law and step, grandmothers, aunts, sisters, or cousins)	−.0664	−.0151	−.0134
	(.0333)	(.0231)	(.0563)
Found job through direct contact with employer, newspaper ads, employment agencies, or other formal means	—	—	—
N	3,235	2,932	2,025

NOTE.—Dashes signify an intentionally left-out variable. Other variables included in cols. 1 and 2 are the same as those in table A1, col. 2. The wage growth analysis also includes a dummy variable for whether the subject held same job in 1993 as in 1982.

This interpretation is supported by the results in column 3 of table 2. Respondents were asked, if given the opportunity to select any job, whether they would take one different from the 1982 choice. Probit estimates in column 3 indicate that, compared with those using direct contact with employers or formal methods, young men using prior generation male relatives to find their jobs were 16 percentage points less likely (based on the −0.4137 estimate) and young men using female friends or relatives were 9 percentage points more likely (based on the .2634 estimate) to report that they would select a different job.

One of the most important indicators of job desirability is wages. Given similarities in the influence of contacts on job tenure, differences in wage effects would suggest that the limited choices and better matches interpretations apply for different types of contacts. The ln 1982 male wage results reported in column 1 of table 4 do, in fact, show that the estimated coefficients vary by type of contact.[9] (The full results are listed in table

[9] As in the case of Korenman and Turner (1996), the OLS wage analysis is weighted to adjust for the initial sample design, which disproportionately included

A1.) For example, according to the results, the coefficient for the variable whether the individual had help getting the 1982 job from female contacts is negative and significant (−0.0664).[10] This result suggests that young men who used this type of contact earned substantially less than those who directly applied to the employer or used formal methods. The other coefficients in column 1 of table 4 imply that there were no wage advantages or disadvantages for workers who had help from most other contact categories. The coefficients were small and insignificant for workers who had help from young male friends and relatives, for the typical worker who had help from the prior generation male relatives, and for the typical worker who had help from friends and relatives who knew the boss or served as a reference. In contrast, however, the coefficient for the interaction term of these last two categories (0.1507) implies that young men who found their jobs through prior generation male relatives who knew the boss or served as a reference earned substantially more than those who directly applied to the employer or used formal methods.[11]

Table 3 suggests that prior generation male relatives would typify high-wage-offer contacts. The combination of higher wages (table 4) and longer actual and expected tenure (table 2) from using older male relatives can be accounted for by the better matches hypothesis. According to the better matches hypothesis, higher wages could generate larger reservation wages that would, in turn, produce longer job tenure.

The limited choices hypothesis can account for the combined effects of lower wages (table 4) and longer tenure (table 2) for those using female contacts.[12] Young male workers have lower wages since women apparently

Hispanics, blacks, and economically disadvantaged whites (see n. 8). The weights also adjust for nonrandom sample attrition from 1979 to 1982. MaCurdy, Mroz, and Gritz (1998) describe the derivation of the weights used in NLSY in more detail.

[10] Part of the effects of those using female contacts is mediated through respondent's occupation. If the son's occupational categories were excluded from the model, the coefficient (and standard error) of female friends and family would be −0.0785 (0.0341).

[11] If the effects of all friends and all family contacts are combined into a single variable, young men who found their jobs through family or friends did not, in the aggregate, earn significantly more than those who found their jobs through direct contact with employers or formal channels. In addition, unlike the wage results, the Cox tenure analysis effects of prior generation male relatives did not differ significantly by whether the contact knew the employer or recommended the job seeker. The tenure results reported in col. 1 of table A1 constrain the coefficients of two interaction terms for relatives and friends who knew the boss or served as a reference to be the same (0.0285) since the separate estimates were both insignificant.

[12] The variable of "found job through friends and relatives" could also be negatively correlated with the other omitted variable—general unobserved wage-enhancing characteristics. In this case, the negative coefficient would occur due

(according to table 3) have less access to high-wage offers. These young men would be willing to move to other jobs but, as implied by their initial reliance on female contacts, have difficulty generating higher wage offers. Other work (Loury 2005) shows that, after longer periods of unemployment, male job seekers are more likely to use help from female relatives and friends to find their subsequent job (compared with prior generation male relatives). This suggests that young men may rely on female relatives and friends only as a last resort when they are unable to find lucrative jobs through other means.

The effects of different types of contacts are not uniform for all young men. Grant and Hamermesh (1981) show that teenage men and women are closer substitutes in the labor market than older men and women. This implies that female friends and relatives are likely to be especially poor sources of good job offers for older men compared with younger men. Consistent with this observation, the coefficient on the variable indicating that the individual had help from female friends and relatives to find the current job (in separate 1982 wage regression analysis by age not shown here) was −0.1215 (0.0518) for men ages 22–24 and −0.0258 (0.0436) for men ages 17–21.[13]

The limited choice hypothesis would similarly imply that female contacts would not have the same effect on women's compared with men's wages. Older men would be high-wage-offer contacts for both young men and young women. However, the choice of female contacts is less likely to signal limited access to the types of jobs that are typically sought by young women than limited access to the types of jobs typically sought by young men. While only 10% of men used female contacts to find their jobs (table 1), 30% of women from the same NLSY sample used this source. Furthermore, in table 3, the earnings and employment differences between men by age are much larger than those between women by age or those between young men and older women.

For comparison purposes, column 2 of table 4 shows estimated effects of job contacts for women. The 0.1288 older prior generation male contacts coefficient for women is comparable with the effect discussed earlier for prior generation male contacts who knew the employer or served as a reference. This coefficient applies for all women using older male contacts and not just those contacts who knew the employer or served as a reference. It is not possible to distinguish between prior generation male

to selection bias. Low-quality workers may have lower wages and lower access to alternative jobs because they are unattractive to employers and not because they have poorer quality contacts. For reasons discussed below, this type of bias does not appear to explain the results.

[13] In contrast, the coefficients for prior generation male contacts were not significantly different at 0.2088 (0.0971) for the 22–24-year-olds and 0.1059 (0.1076) for the 17–21-year age group.

relatives and other male contacts given the relatively small fraction of women (0.03) using any male contacts.

In contrast with young men, the female contacts coefficient for women (−0.0151 [0.0231]) is not significantly different from zero. A plausible explanation is that any downward bias because of negative correlation between using female contacts and unobserved individual wage-enhancing characteristics may be smaller for women than for men.

C. Comparison with Other Empirical Research

Previous work examining the effects of informal sources on earnings combines the effects of all types of informal contacts rather than distinguishing between high- and low-wage-offer sources. It is, therefore, not surprising that the estimated effects vary considerably. Many studies that report positive correlations between earnings and informal contacts are likely to be estimating the effects of high- rather than low-wage-offer contacts. Such studies include Marmaros and Sacerdote (2002), which analyzed the effects of job networks for Dartmouth College seniors, and Simon and Warner (1992), which examined data from the 1972 Survey of Natural and Social Scientists and Engineers. Rosenblum et al. (1999) found that the effect of job contacts through relatives increased as men aged from 19 to 28 years. That is, contacts had more impact as male cousins, brothers-in-law, and brothers moved from characteristics similar to those of contemporary generation males in this article toward characteristics similar to those of the prior generation males (higher earnings, longer job tenure, and lower unemployment).

Similarly, many studies that report negative correlations between earnings and informal contacts are likely to be estimating the effects of low-wage-offer contacts. Beggs and Hurlbert (1997), Mencken and Winfield (2000), and Smith (2000) showed that women who used female contacts found employment in lower-paying occupations. Elliott (1999) reported that jobholders in some urban neighborhoods who found their jobs through nonwhite contacts earned substantially less than jobholders using other means. According to Green et al. (1999), earnings of Hispanics who found their jobs through family members or friends were significantly lower than for those using formal or other informal sources.[14]

Korenman and Turner (1996) reported, using a nationally representative NLSY sample, that contacts raised wages by roughly the same amount

[14] See also Korenman and Turner (1996). Results not shown here suggest that the effects of older generation male relatives for blacks and Hispanics were not significantly different from those for whites.

for African American and white young men.[15] However, the effect was larger for whites in the National Bureau of Economic Research (NBER) Survey of Inner-City Boston Youth sample. As suggested by the authors, less access to high-wage-offer contacts for the NBER African Americans than for the NLSY African Americans may account for the differences. That is, the estimated coefficient for contacts may also be biased downward for the NBER sample if the choice of informal contacts captures part of the effect of limited access to high-wage-offer contacts.

D. True Effect versus Spurious Correlation?

One possible alternative explanation for the variation in wage effects is unobserved job characteristics that may generate compensating wage differentials. This explanation does not seem likely to explain fully the findings in table 4 since the type of job contacts had no significant effects on a variety of nonpecuniary job characteristics. These include those measured by answers to the following questions: (1) Does the job give you a chance to do what you do best? (2) Are the physical surroundings pleasant? (3) Are the skills that you are learning valuable in getting a better job? (4) Is job security good?

Another alternative explanation of the findings in this article is fixed unobserved individual heterogeneity. High-quality workers would more frequently receive recommendations from high-wage-offer contacts if, for example, these referees are concerned about their own reputations at the firm. Regardless of whether they find jobs through contacts, high-quality-referred workers would be more productive and have higher wages. Similarly, low-quality workers may have lower wages and lower access to alternative jobs because they are unattractive to employers and not because they have poorer quality contacts.

In the analysis here, it is unlikely that unobserved individual heterogeneity accounts for the findings in tables 2 and 4. Armed Forces Qualifying Test (AFQT) scores and family background characteristics were added to all analyses. Ability and other difficult-to-measure individual characteristics captured by these variables are, therefore, not the sources of the estimated effects.

[15] Consistent with the insignificant estimate of the effects for contemporary generation male friends and relatives (col. 1 of table 4), Korenman and Turner (1996) found no wage effects for those using contacts who were friends. By contrast, they reported significant and positive wage effects for contacts who were relatives. Their estimate (0.046 [0.026]) combines the effects of older generation male relatives, contemporary generation male relatives, and female relatives. Their analysis differs from this article since their sample included only urban men. If the data used here are restricted to men living in a central city standard metropolitan statistical area, the estimated effect for all relatives (0.052) is similar to the Korenman and Turner estimate.

The AFQT scores and the included family background variables may not account for all unobservables. However, the effects of any remaining fixed unobserved individual productivity factors can be distinguished from the effects of differences in job contacts. The former would persist over time, raising future wages for the same reasons they raise 1982 wages. In contrast, the effects of the latter are likely to fade. This occurs, in part, because intrafirm wage growth is higher for nonreferred workers. Employers are more likely to underestimate the productivity of such workers ultimately found to be "good matches" (Simon and Warner 1992) and adjust their wages accordingly. Job contact effects also may decline since workers who are poor initial matches leave to find more suitable employment and correspondingly increase their wages (Topel and Ward 1992). Even workers with limited access to high-wage-offer distributions may eventually find better paying jobs. Table 1 showed that 84% of workers had left their 1982 job by the end of 1992. This high rate of turnover points to extensive job search for many of these relatively young workers.

Column 3 of table 4 presents results for wage growth between 1982 and 1993 using the same variables as for the 1982 regression. It shows equal gains for those who found their 1982 jobs through young male and female sources and those who found their jobs through formal means. Wage growth for all of these groups was, in turn, significantly larger than that for workers who found their jobs through older male relatives who knew the employer or served as a reference. Comparing the −0.202 deficit in wage growth (col. 3 of table 4) with the 0.151 wage advantage in 1982 (col. 2 of table 4) implies that all of the initial wage gain for workers using older male relatives (who knew the employment or who served as a reference) was eliminated by 1993. This indicates that the 1982 advantage was not due to higher values of fixed unobserved wage-enhancing characteristics.

In contrast to the declining wage advantage for workers using older male relatives with access to employers, the effects of observed variables measuring fixed individual heterogeneity persist over time. In results not shown here, they either had no effect on wage growth (years of schooling) or were positive and significant at least at the 10% level (AFQT scores: father: professional worker; father: clerical worker; and father: craftsman).

VII. Summary

This article argues that the effects of job contacts can be better understood by combining the two previously separate strands of empirical analysis. Uncovering the role of contacts on job tenure can help explain the disparate wage findings, and the wage findings can provide insight into the job tenure results. More specifically, the article indicates that the better matches and the limited choices hypotheses may be simultaneously

valid for different types of contacts. In the case of the better matches story, using high-wage-offer contacts results in higher compensation, greater worker satisfaction because of improved matches between workers and firms, and reduced turnover. In the case of the limited choices story, using low-wage-offer contacts also generates longer job tenure. However, it also signals a limited range of job alternatives and results in greater worker dissatisfaction and in lower rather than higher wages.

Appendix

Table A1
Estimated Effects of Selected Variables on Job Tenure and ln 1982 Wages for Men

	Cox Hazard Estimates—Exits from 1982 Job	Ln 1982 Wages
Years of schooling	−.0985	.0556
	(.0151)	(.0096)
Potential work experience (age − years of schooling)	−.0643	.0395
	(.0109)	(.0065)
1982 job tenure (in weeks: 1–52 weeks)	.0024	
	(.0015)	
1982 job tenure (in weeks: 52–104 weeks)	.0037	
	(.0009)	
1982 job tenure (in weeks: more than 104 weeks)	−.0030	
	(.0011)	
1982 job tenure:		.0010
		(.0002)
Union member	−.2226	.2330
	(.0503)	(.0289)
Married	−.0646	.1123
	(.0490)	(.0265)
African American	.0871	−.0591
	(.0545)	(.0278)
Hispanic	−.0864	.0260
	(.0620)	(.0301)
Had help to find job with 1982 employer from:		
Prior generation male relatives: fathers (including in-law and step), grandfathers, or uncles	−.3516	−.0256
	(.0750)	(.0553)
Prior generation male relatives who knew the boss or served as a reference	.0285	.1507
	(.0579)	(.0733)
Male friends and contemporary generation male relatives (brothers and male cousins)	−.1052	.0232
	(.0468)	(.0257)
Female friends and relatives (mothers, including in-law and step, grandmothers, aunts, sisters, or cousins)	−.1403	−.0664
	(.0695)	(.0333)
Friends or relatives who knew the boss or served as a reference	.0285	.0168
	(.0579)	(.0346)

Table A1 (*Continued*)

	Cox Hazard Estimates—Exits from 1982 Job	Ln 1982 Wages
Found job through direct contact with employer, newspaper ads, employment agencies, or other formal means	—	—
Lived in two-parent household at age 14	−.1045	−.0183
	(.0446)	(.0253)
AFQT score (percentile rank)	−.0015	.0012
	(.0010)	(.0006)
Father: professional/technical worker	−.1126	.0284
	(.0983)	(.0448)
Father: manager/proprietor	−.0453	.0739
	(.0792)	(.0356)
Father: clerical worker	.0589	−.0001
	(.0877)	(.0491)
Father: craftsman	.0359	.0226
	(.0451)	(.0264)
Father's years of schooling	.0074	.0079
	(.0069)	(.0038)
Son: professional/technical worker	−.2363	.2342
	(.0983)	(.0646)
Son: manager/proprietor	−.0289	.0514
	(.1042)	(.0566)
Son: clerical worker	−.1261	.0554
	(.0661)	(.0333)
Son: craftsman	−.1617	.1654
	(.0446)	(.0253)
χ^2	238.42	
R^2		.2197
N	3,235	3,235

NOTE.—AFQT = Armed Forces Qualifying Test; dashes signify an intentionally left-out variable. Also included was a constant term and dummy variables for whether urban, do not know father's schooling, and do not know AFQT score. The data are weighted to control for nonrandom sample selection and for sample attrition (see nn. 8–9).

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