Do Parents' Social Skills Influence Their Children's Sociability?

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Abstract

This paper uses the U.S. National Longitudinal Survey of Youth 1979 (NLSY79) to examine the effect of parents' social skills on their children's sociability. Similar to many other national surveys, this survey lacks detailed information on parents. To remedy this deficiency, we construct a measure of parents' sociability skills based on their occupational characteristics extracted from the Dictionary of Occupational Titles (DOT). Even after controlling for a variety of background characteristics, including cognitive skills, we find that the sociability relationships between fathers and sons and between mothers and daughters remain statistically significant. We find that the dollar value to the sons of a given increase in their fathers' sociability is one-sixth of the value to the sons of the same standard-deviation increase in their fathers' education.

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1. INTRODUCTION

Several previous studies have indicated that social skills (e.g., skills in communication, interpersonal interactions, and leadership) are important determinants of labor market outcomes. Kuhn and Weinberger (2005) find positive returns for people who occupied leadership positions in high school, especially for those in managerial occupations. Borghans et al. (2006) demonstrate that people who are sociable early in life are more likely to hold jobs in which people skills are important and that the returns to people skills are greater in these jobs. Machin et al. (2001) find positive labor market returns to sociability for U.K. men. Scholars have established the predictive power of social skills for labor market outcomes by using large population samples. Although many studies also document the intergenerational transmission of earnings and education (Solon 1999; Black and Devereux 2011), fewer studies examine the link in sociability between parents and their children.[1] By examining the intergenerational transmission of sociability, we can evaluate whether the contribution of differences in parents' sociability affects the differences in sociability and earnings among their children.

However, studying the intergenerational link in social skills has been difficult due to the lack of data regarding parents' social skills. Nationally representative surveys, such as the National Longitudinal Survey of Youth 1979 (NLSY79), provide detailed information about the respondents, but this survey collects only limited information regarding the respondents' parents (e.g., their age, education, and occupation).[2] To resolve this data problem, we use

[1] In an exceptional work by Dohmen et al. (2012), the researchers investigate the intergenerational transmission of risk and trust attitudes using the 2003 and 2004 waves of the German Socio-economic Panel (GSOEP).

[2] Psychological studies examining the intergenerational link in traits and behaviors use homogenous subsamples. However, the disadvantages of using homogenous subsamples over large and representative population samples are the following: (1) homogenous subsamples suffer from attenuation bias, (2) they focus on maternal rather than paternal characteristics (Duncan et al. 2005), and (3) the estimated effect of parents' sociability on children's wages might not represent the population as a whole.

occupational characteristics from the Dictionary of Occupational Titles (DOT) to proxy for parents' skills. This proximization assumes the assignment model of interpersonal interaction developed by Borghans et al. (2008a). Their model indicates that a worker's behavior is determined by job circumstances and the worker's personality and that a worker with a comparative advantage in a certain behavior will be assigned to the job that demands more of that behavior. They empirically test and confirm these model implications.[3]

The purpose of this paper is to test the hypothesis that parents' social skills affect their children's sociability even after controlling for a variety of background characteristics (including cognitive skills). We take advantage of the fact that the NLSY79 respondents (the children of the parents in question) were asked about their own degree of sociability at age six and in early adulthood. Their parents' social skills are latent and are not directly described, but we observe people skills that are required in the parents' jobs (as extracted from the DOT). We use these people skills from the DOT as a proxy for the individuals' sociability because in a previous study using data from the NLSY79 and the British Cohort Study (BCS), Borghans et al. (2006) find that youthful sociability is strongly related to the importance of people skills in individuals' subsequent occupations. After controlling for the parents' education and income and for the children's education and cognitive skills, we find that many of the parents' DOT people-skill variables are positively associated with their children's sociability. However, many of the parents' DOT people-skill variables are also positively related to their DOT cognitive skills and negatively related to their DOT motor skills and physical strength. We thus investigate whether the intergenerational effects remain when we control for the correlation between parents' people skills and their other skill dimensions. Specifically, we

[3] The assumption that workers hold occupations that match their traits and personalities also corresponds to the following observation by Robert Hauser (1998, 5): "Job-holding tells us about the technical and social skills that we bring to the labor market. . . . As market labor has become nearly universal among adult women as well as men, it is increasingly possible to characterize individuals in terms of their own current or past jobs."

use two approaches to extract parents' social skills from their DOT skills to obtain a measure of sociability.

First, following studies that group the skill characteristics from the DOT with the factor analysis (e.g., Ingram and Neumann 2006; Bacolod and Blum 2010), we perform factor analyses on the parents' DOT characteristics to extract their people skills. Second, we apply the method used by psychometricians to estimate general intelligence (abbreviated *g*).[4] Specifically, each of the parents' DOT people skills is projected separately onto their DOT non-people skills (e.g., cognitive skills, motor skills, and physical strength) because the people skills are correlated with the non-people skills. The projection errors are then used as a measure of the social skills that do not overlap with the non-people skills. These projection errors are grouped by a principal component analysis. The first principal component, which explains the largest fraction of common variation among these errors, is referred to as the parents' people skills.

Both approaches yield a positive and significant link between white fathers' people skills and their sons' sociability in early adulthood.[5] Specifically, a one-standard-deviation increase in the fathers' people skills increases their sons' early-adulthood sociability by 0.085 standard deviations. A small and insignificant link is found with sons' sociability at age six. The father-daughter, mother-son, and mother-daughter links are much weaker for children's sociability both at age six and in early adulthood. The weak results for mothers might be

[4] Spearman (1904) proposes the existence of general intelligence, termed *g*, which is a single general factor that governs an individual's level of intelligence.

[5] The intergenerational link in sociability estimated in this paper is not necessarily causal, if there remain unobserved factors that affect children's sociability and that are correlated with parents' people skills.

caused by the fact that occupations of mothers in the 1970s may not have fully reflected their underlying abilities and personality traits.[6]

To focus on the mother-child relationship, we use the NLSY79 sample of female respondents and their children. In this sample, we have information regarding the degree of sociability for mothers (female respondents) at age six and as adults and for their sons and daughters between the ages of two and six. We also have information on the people skills extracted from the DOT of the NLSY79 female respondents whose employment rates are much higher than the rates of the mothers of the NLSY79 respondents. A positive relationship is found between mothers and daughters, but the relationship between mothers and sons is weaker. Therefore, we conclude that parents' social skills are positively related to their children's sociability along gender lines.

An emerging body of literature has established the importance of noncognitive skills to an individual's success in social and economic life (see Bowles et al. (2001), Groves (2005), Heckman et al. (2006), among many others). Noncognitive skills are multidimensional and include many aspects of personality traits, such as sociability, self-esteem, motivation, persistence, time preference, and risk aversion. Among these various noncognitive skills, we focus on sociability in this paper.[7] Using the U.K. National Child Development Study, Machin et al. (2001) find that being particularly sociable positively affects earnings by 2 percent (based on a 5-scale measure of sociability). For the NLSY79 respondents, we find both positive and significant labor market returns to sociability. For example, a one-standard-

[6] Lundberg (2005) reviews the literature on son preferences and documents that fathers spend more time and are more involved with their sons than with their daughters. This paternal behavior could explain why we find evidence of a stronger sociability link between fathers and sons than between fathers and daughters.

[7] The most widely accepted taxonomy of personality traits is called the Big Five or the five-factor model (FFM). The Big Five factors are openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism. Sociability is included under extroversion, which is characterized by facets such as gregariousness, assertiveness, activity, and outgoingness. See McCrae and John (1992) and Borghans et al. (2008b) for details.

deviation increase in early-adulthood sociability increases men's wages by 1.64 percent. Because sociability is found to have a positive effect on wages, the intergenerational sociability link that is identified in our paper leads to higher wages in the next generation. In fact, a one-standard-deviation increase in fathers' sociability would increase their sons' wages by 0.139 percent (= 0.085 × 1.64). For a comparison, a one-standard-deviation increase in fathers' education would increase their sons' wages by 0.874 percent. The strength of the intergenerational link in sociability is approximately the same as the strength of the intergenerational link in education, but the labor market returns to sociability are only one-sixth of the value of the labor market returns to education. Therefore, the dollar value to a son of a given increase in his father's sociability is one-sixth of the value of the same standard-deviation increase in his father's education. In summary, fathers' sociability has a positive and significant effect on their sons' sociability and a nonnegligible effect on their sons' wages.

The paper proceeds as follows. Section 2 describes the data used in the analysis and includes descriptive statistics for the NLSY79 sample. The estimation results are documented in Section 3. The paper concludes in Section 4.

2. DATA AND DESCRIPTIVE STATISTICS

2.1. Data

2.1.1. Dictionary of Occupational Titles (DOT)

We draw information regarding occupational characteristics from the fourth edition (1977) of the U.S. Department of Labor's Dictionary of Occupational Titles (DOT). Using guidelines supplied by the Handbook for Analyzing Jobs, the Department of Labor examiners evaluated over 12,000 occupations according to objective and subjective dimensions, including work functions, general educational development, worker aptitudes, temperaments, interests, physical strength, and environmental conditions. The DOT characteristics represent

skills related not only to education (e.g., reasoning ability, mathematical ability, and language development) but also to personality traits (e.g., adaptability in dealing with people and preferences for activities involving business contacts with people). Because the data in the fourth edition of the DOT (1977) were collected between 1966 and 1976, the DOT skill measures describe the occupations in the 1970s that overlap with the parents' occupations in the years of our study. Our DOT data construction follows Autor et al. (2003). All DOT variables are standardized to have a mean of zero and a standard deviation of one in the 1971 CPS distribution.

The textual definitions of the DOT variables are utilized to identify a given DOT people-skill category.[8] The identified DOT people-skill variables are as follows:

(1) Talking and/or hearing.

(2) Adaptability to dealing with people beyond giving and receiving instructions.

(3) Adaptability to situations involving interpretations of feelings, ideas, or facts from personal viewpoints.

(4) Adaptability to influencing people in their opinions, attitudes, or judgments about ideas or things.

(5) A preference for activities concerned with the communication of data versus a preference for activities for dealing with things and objects.

(6) A preference for working for the presumed good of the people versus a preference for activities that are carried out in relation to processes, machines, and techniques.

(7) A preference for activities involving business contacts with people versus a preference for activities of a scientific and technical nature.

[8] Autor et al. (2003) and Bacolod and Blum (2010) also utilize textual definitions to classify the DOT variables and thereby analyze changes in skill requirements and skill returns in the U.S. Ingram and Neumann (2006) perform a factor analysis on the revised fourth-edition DOT data to reduce the data to a smaller set of dimensions. We also implement a factor analysis to corroborate our choice of skill categories. Most of our skill categorizations are consistent with the grouping from the factor analysis.

(8) Complexity of function in relation to people.

The remaining DOT non-people-skill variables are broadly classified into three categories: cognitive skills, motor skills, and physical strength. These DOT skill variables are described in detail in Appendix Table 1.

2.1.2. National Longitudinal Survey of Youth 1979 (NLSY79)

This survey is sponsored by the Bureau of Labor Statistics of the U.S. Department of Labor and features a panel data set begun in 1979 to gather information on individuals between the ages of 14 and 22. The survey covers a large range of topics, including the respondents' education, aptitudes, cognitive test scores, and labor-force experiences. We restrict the sample to whites because we are using occupational characteristics to proxy for parental skills in this study; there is good reason to believe that minorities in the 1970s might have encountered barriers and discrimination that prevented them from working in occupations fully reflective of their abilities and personal traits.

In the selected survey years, the NLSY79 collected information from the respondents regarding their sociability. We utilize the questionnaires from the 1985 wave, in which directly asked the respondents between the ages of 20 and 28 about their degree of sociability. Specifically, the NLSY79 asked the following:

(i) How sociable they were at age six. ("Thinking about when you were six years old, would you describe yourself as [1] extremely shy, [2] somewhat shy, [3] somewhat outgoing, or [4] extremely outgoing?")

(ii) How sociable they were in early adulthood. ("Thinking about yourself as an adult, would you describe yourself as [1] extremely shy, [2] somewhat shy, [3] somewhat outgoing, or [4] extremely outgoing?")

Because the sociability measure is unavailable for the NLSY79 parents, we match the parents' occupations at the three-digit level when the respondents were age 14 to the DOT skills, and we let the DOT people skills represent the parents' people skills.[9] Borghans et al. (2006) find that the NLSY79 respondents' sociability measures (as shown above) have a large positive effect on the people-skill measure summing the DOT people skills (2), (3), (4), (6), and (7), as listed in Section 2.1.1. In Appendix Table 2, we confirm their findings using our measures of the DOT people skills. In that table, all of the respondents' DOT people skills, except for DOT people skill (3) ("interpret feelings"), are positively and significantly related to their self-reported sociability measures.

To aid our comparison, we examine the sociability link between the NLSY79 female respondents and their children. Beginning in 1986, the children of the NLSY79 female respondents were given assessments biennially in the NLSY79 Children and Young Adult Survey. From this survey, we obtain the following information regarding children's sociability: attitude tests on sociability as assessed by mothers who were surveyed when their children were between the ages of two and six. As attitude tests on sociability tend to increase in number with children's age, the scores are age-standardized to have a mean of zero and a standard deviation of one. For the mothers of the NLSY79 children, we use both the sociability measures obtained in the 1985 wave and their DOT people skills.

Because individuals' sociability tends to be positively associated with their cognitive skills, the parents' and children's education and the children's cognitive test scores — specifically, their scores on the Armed Forces Qualification Test (AFQT) — are used as a control to estimate the effect of the intergenerational link in sociability. The AFQT score measures basic numeracy and literacy skills and was administered to almost the entire

[9] If information on the parents' occupations when the respondent was 14 is unavailable, we use their occupation in 1978, when the respondent was between the ages of 13 and 21.

NLSY79 sample. The test scores have been age-standardized such that they have a mean of zero and a standard deviation of one.

2.2. Descriptive Statistics

We provide summary statistics of the children's sociability and their parents' DOT skill variables in the NLSY79 sample.

Table 1 presents the means and standard deviations of the children's variables. We divide the sample into those with high school or less-than-high-school education and those with greater-than-high-school education. The children with greater education are more likely to report that they are sociable both at age six and as adults. For both education groups, the children are more likely to report that they are more sociable in their 20s than they were at age six.

Table 2 displays the means and standard deviations of the parents' variables. For both the fathers and mothers, education is positively associated with the DOT cognitive-skill and people-skill variables. However, education is inversely associated with the DOT motor-skill and physical-strength variables. Among the fathers, 95.8 percent worked for pay, while only 52.4 percent of the mothers did so. A strong positive relationship can be observed between a mother's education and her participation in the labor force, although her decision to work could have also been influenced by her spouse's earnings or health. Therefore, the analysis in Section 3 that uses the mothers' DOT skills as a proxy for their people skills is subject to sample selection bias. However, the analysis in that section that uses the direct measures of sociability between mother and child is free of selection bias.

3. INTERGENERATIONAL LINK IN SOCIABILITY

In Section 3.1, we begin by estimating the effects of the parents' DOT people-skill variables on their children's sociability by controlling for various background characteristics. However, because the DOT people-skill variables are correlated with the DOT non-people-skill variables, we address the possibility that the link between the parents' DOT people skills and their children's sociability might arise from the link between the parents' DOT non-people skills (such as cognitive skills) and their children's sociability. To isolate the parents' people skills from their non-people skills, we adopt two different approaches in Sections 3.2 and 3.3.

3.1. Raw DOT People Skills as Sociability Measures

We present ordered probit estimates of the relationship between parents' DOT people-skill variables and their children's sociability in Appendix Table 3. We control for the children's education, a quadratic of the children's AFQT score, the age of children and parents, parents' education, dummies for not living with both parents, place of residence (region and urban area) when the children were 14 years old, and three-year averages of family size and household income in 1978-1980. In addition to using the raw DOT people-skill variable as a regressor, we also use the following: (i) the average of all DOT people skills in Section 2.1.1 and (ii) the people-skill measure of Borghans et al. (2006).

The father's DOT people-skill variables (except "interpret feelings" and "influencing people") have positive and significant effects on their children's sociability at age six and in early adulthood. The mother's DOT people-skill variables also have positive and significant effects on their children's sociability in early adulthood. However, fewer variables have significant effects on the children's sociability at age six. Therefore, after controlling for the parents' education and income and the children's cognitive skills, we find that the parents'

DOT people-skill variables are still positively associated with their children's sociability at age six and in early adulthood.

When we match the fathers and sons, many of the fathers' DOT people-skill variables have positive and significant effects on their sons' sociability in early adulthood but have insignificant effects on their sons' sociability at age six. In contrast, for the father-daughter pairs, many effects are positive and significant for the daughters' sociability at age six, but these effects are rarer for the daughters' sociability in early adulthood. Between the mother-son and mother-daughter pairs, only small differences in the estimates of sociability are observed, and only a scattering of variables is significant. Overall, the results in Appendix Table 3 provide weaker evidence for mothers than for fathers with respect to the intergenerational link in social skills.

The mothers' results shown in Appendix Table 3 may be biased because their occupations in the 1970s may not have fully reflected their personality traits. Therefore, we estimate the relationship in the degree of sociability between the NLSY79 female respondents and their children as shown in Table 3. The OLS estimates control for mothers' education, a quadratic in the mothers' AFQT score, the age of the mothers and children, mothers' marital status, place of residence, three-year averages of family size and household income from 1983 to 1985, and year dummies.[10] The mothers' sociability (at age six and in early adulthood) is positively related to their children's sociability when the children are between two and six years old. Specifically, the estimated coefficients for the effect of the mothers' sociability at age six on their children's sociability when the children are between two and six years old are 0.049 (0.019) for daughters and 0.027 (0.018) for sons, whereas the corresponding effects of the mothers' sociability in early adulthood are 0.035 (0.020) for daughters and 0.028 (0.018) for sons. The effect of the mothers' sociability on their daughters' sociability is larger and

[10] We report robust standard errors clustered by mothers.

more significant than their effect on their sons.[11] Because the NLSY79 female respondents are active in the labor market and 84.4 percent of them work for pay, it is even more sensible to proxy their skills using the DOT rather than the scanty data for mothers in the NLSY79. Many of the NLSY79 female respondents' DOT people skills have positive and significant effects on their daughters' sociability, but the effects are small and insignificant for their sons. For example, in Table 3, the estimated coefficients for the effect of the mothers' "relation to people" score on their children's sociability are 0.076 (0.031) for daughters and 0.002 (0.031) for sons; for the mothers' "dealing with people" score, the estimates are 0.048 (0.028) for daughters and 0.027 (0.028) for sons.

The overall results in Table 3 indicate a stronger sociability link between mothers and daughters than between mothers and sons, a pattern that is not observed in the mother-child results in Appendix Table 3. We obtain clearer results regarding the mother-child relationship when we compare direct measures of sociability between mothers and children or when we proxy the skills with the DOT variables for the NLSY79 female respondents.

3.2. Sociability Measures Extracted from Factor Analysis

Factor analysis methods have been developed to reduce the dimensions of original observations and extract the common, usually independent components. In our study, we apply a factor analysis to the DOT skill variables to reduce the dimensions of the data and to extract the measures of the social skills that approximate the parents' sociability.

[11] Duncan et al. (2005) estimate standardized regression coefficients for mother-child links in sociability (both at age six) for a sample that includes all racial groups. They cluster the answers on the mothers' sociability at age six into two values: zero for shyness (answers 1 or 2) and one for outgoing (answers 3 or 4). They find that the estimate for sociability is 0.13 for both mother-daughter and mother-son pairs (standard errors are not reported in their article). When we restrict the age range of children to six, as in Duncan et al., the estimate for sociability is 0.039 (0.034) for the mother-daughter link and 0.004 (0.030) for the mother-son link. The effect for daughters is greater than the effect for the sons, although the difference is insignificant.

Previous studies using the DOT adopted two different methods to identify people skills. The first method, used by Bacolod and Blum (2010), assumes that a subset of the DOT variables measures a single skill. This method constructs a people-skill index that is derived from the first component of the principal component analysis for the DOT people skills (for textual definitions, see Appendix Table 1). This method is also used to construct a cognitive-skill index, a motor-skill index, and a physical-strength index. The second method, used by Ingram and Neumann (2006), assumes that a DOT variable contains information regarding several underlying skills that are orthogonally distributed. This method thus employs a factor analysis for all of the DOT skills and extracts the latent factors to represent the underlying skills. These factors are then labeled on the basis of the items loading on them, as people skills, cognitive skills, motor skills, and physical strength. In this paper, we employ both of these methods to identify the parents' people skills and estimate the relationship between the parents' people skills and their children's sociability.

In the first method, we construct a latent skill index for each of the four skill groups: people skills, cognitive skills, motor skills, and physical strength. Specifically, by taking the corresponding occupational characteristics from the sample of the NLSY79 parents (separately for fathers and mothers), we use a principal component analysis to reduce each skill dimension to one.[12] Using the ordered probit model, we then regress the children's sociability on all of the parents' skill indices while controlling for the same covariates as in Section 3.1. The results are presented in Table 4, Panel A. The estimated coefficient of the effect of the fathers' people skills on their sons' sociability in early adulthood is 0.100 (0.046) (Table 4, Panel A, Column 4). This association is the only positive and significant association

[12] For people skills, the first principal component explains 62.8 percent of the variance in the matrix correlations for fathers and 55.8 percent of the variance for mothers. For cognitive skills, they are 71.7 percent for fathers and 68.8 percent for mothers, respectively; for motor skills, they are 43.1 percent for fathers and 33.8 percent for mothers; and for physical strength, they are 67.2 percent for fathers and 42.1 percent for mothers.

observed. The effect of the fathers' people skills on their sons' sociability at age six is 0.052 (0.044), which is smaller than the effect in early adulthood. In contrast to the results in Appendix Table 3 (which do not include the fathers' non-people-skill indices as regressors), the fathers' people skills no longer positively affect their daughters' sociability at age six.

In the second method, we use a factor analysis on all of the DOT skill variables from the sample of the NLSY79 fathers and mothers (separately for each group) to extract the latent orthogonal skill factors. Each of the factors is identified and labeled on the basis of the DOT skill variables with high loading values.[13] We regress the children's sociability on parents' skill factors, and the results are reported in Table 4, Panel B. Similar to the first method, the second method also indicates a positive relationship with respect to sociability in the father-son pairs. Specifically, the estimated effect on the sons' sociability at age six is 0.039 (0.021), which is significant at the 10 percent level (Table 4, Panel B, Column 3). There is a significant relationship of the sons' sociability in early adulthood at the 5 percent level, for which the estimate is 0.059 (0.022) (Table 4, Panel B, Column 4). All of the fathers' non-people skills have an insignificant effect on the sons' early-adulthood sociability. Consistent with the results from the sample of the NLSY79 female respondents and their children in Table 3, a positive but weak sociability association between the mothers and daughters is found. Specifically, the effect of the mothers' people skills on their daughters' sociability at age six is 0.043 (0.024), which is significant at the 10 percent level (Table 4, Panel B, Column

[13] The estimated factor loadings for each DOT variable are displayed in Appendix Table 4, Panel A for the sample of NLSY fathers and in Panel B for the NLSY mothers. For fathers, the first, second, and third factors are identified as cognitive skills, motor skills and physical strength, respectively. The fourth and fifth factors are identified as people skills; the fourth factor has a relatively higher loading on "interpret feelings" and "influence people"; and the fifth factor has a relatively higher loading on "deal with people," "communicate data," and "talking/hearing." We label the fifth factor as people skills, because when using the sample of NLSY respondents, we find DOT people-skill variables that are highly loaded on the fifth factor are more strongly linked with their own sociability measures (see Appendix Table 2). For mothers, the first, second, third, and fourth factors are labeled cognitive skills, motor skills, people skills, and physical strength, respectively.

5). However, the effect of the mothers' people skills on their daughters' sociability in early adulthood is only 0.025 (0.026), and the effects of the mothers' people skills on their sons' sociability at age six and as an adult are also both small and insignificant.

We also find that the fathers' education has a significant positive effect on their sons' sociability at age six. The fathers' education appears to play an important role in shaping their sons' sociability when the sons are young, whereas the fathers' people skills help shape their sons' sociability as adults. In contrast, the mothers' cognitive skills have a significant positive effect on their sons' sociability at both stages and on their daughters' sociability only as adults (Table 4, Panel B, Columns 3-6).

One weakness of the factor analysis employed in this section is that we cannot determine whether our people-skill factors capture the true set of social skills. In particular, the people-skill factor in the first method may be correlated with the non-people-skill factors, whereas the estimated factors in the second method do not offer an immediate economic interpretation. Consequently, in Section 3.3, we construct an alternative measure of the social skills that are extracted from the DOT people-skill variables but that are orthogonal to the other DOT non-people-skill variables.

3.3. Sociability Measures Extracted from the Projection Approach

Cawley et al. (1997) construct measures of general intelligence by estimating the principal components from the matrices of the correlations of ten Armed Services Vocational Aptitude Battery (ASVAB) test scores. Each of these ASVAB scores is "adjusted" by regressing the scores on the appropriate demographic characteristics of the respondents. The principal components are subsequently estimated from these residuals. Cawley et al. employ this projection approach because it is well known that test takers with certain demographic

characteristics score higher on ability tests. We apply their approach to our analysis because our eight DOT people-skill variables are related to the DOT non-people-skill variables.

The residual of the linear projection of the parents' DOT people-skill variable on their DOT non-people-skill variables is used as a measure of "adjusted" sociability for the parents. With this procedure, all overlaps of people skills with non-people skills are attributed to the non-people skills. Specifically, we residualize each of the eight DOT people-skill variables for the parents in Section 2.1.1 on their non-people-skill variables, and the residuals are standardized to have a mean of zero and a variance of one. We take the principal components of the correlation matrix of these standardized residuals. The adjusted parents' people-skill component is the first principal component, which is defined by the eigenvector associated with the largest eigenvalue of the correlation matrix of the standardized residuals.[14] The results reported in Table 5 estimate the effect of the adjusted parents' people-skill component on their children's sociability while controlling for the same covariates as before and the parents' DOT non-people-skill variables.

The fathers' adjusted people-skill component has a positive and significant effect (an estimate of 0.085 (0.024) (Table 5, Column 4)) on their sons' sociability in early adulthood, but the effect of the father's adjusted people-skill component on their sons' sociability at age six is only 0.027 (0.022), which is small and insignificant (Table 5, Column 3). The fathers' education has significant positive effects on their sons' and daughters' sociability at age six. The effect of the mothers' people-skill component on their children's sociability is small and insignificant. The results in Table 5 are similar to the results obtained using the factor analysis (Table 4, Panels A and B): there is a positive relationship between the fathers' people skills

[14] The first principal component explains 32.2 percent of the variance in the matrix of correlations for fathers and 46.5 percent of the variance for mothers.

and their sons' sociability in early adulthood, whereas a much weaker relationship is observed in the other parent-child pairs.

The factor analysis method used in Table 4, Panel B extracts latent skill factors from the DOT skills, which are orthogonal to one another. The factor with a high loading on the DOT people skills is perceived to measure the parents' people skills. However, because the extraction is arbitrary, obtaining an economic interpretation of the factor is not a straightforward process. In contrast, the adjusted people-skill component constructed in Table 5 does not overlap with the other DOT skills; this approach therefore provides a "stricter" definition of people skills.[15] Thus, the results in this section imply that the fathers' people skills are positively related to their sons' sociability in early adulthood.

We have used occupational characteristics from the DOT to represent the parents' skills. This proximization is supported by the following evidence. First, the estimates from the assignment model of Borghans et al. (2008a) indicate that individuals self-select into jobs that match their skill types. Second, through job experience, individuals can acquire skills and/or human capital. For example, McFarlin (2007) finds that school teacher parents significantly lower the incidence of behavioral problems in their male children after controlling for potential bias from self-selection into teaching. Therefore, parents' people skills developed through their jobs may influence their children's sociability. However, occupational characteristics from the DOT may not be able to fully capture parents' skills. To examine this issue, we estimate the intergenerational link in sociability for blacks, because black fathers in the 1970s were less likely to be assigned to jobs that match their skill types. For blacks, the

[15] The fathers' "verbal" skill (the DOT cognitive-skill variable) has a positive effect of 0.210 (0.111) on their sons' sociability in early adulthood (result not reported in Table 5). "Verbal" skill is likely to be related to both cognitive and people skills because according to the DOT variable description in Appendix Table 1, this skill refers to the ability to understand the meaning of words and use them effectively, to comprehend language, to understand the relationships between words, and to understand the meanings of whole sentences and paragraphs. Therefore, both the adjusted people skills (which do not overlap with "verbal") and "verbal" skill of fathers have a positive effect on their sons' sociability.

sociability link between fathers and sons is insignificant. Specifically, for blacks, the estimated coefficient of the effect of the fathers' adjusted people-skill component on their sons' sociability at age six is -0.048 (0.049) and that on their sons' sociability in early adulthood is 0.038 (0.047). Therefore, the people skills extracted from the DOT may not capture the latent people skills for black fathers.

3.4. Robustness Check and Discussion

To fit our sociability measures to the broader literature on noncognitive skills, we examine how our results are affected by including other aspects of noncognitive skills as regressors. Among the many other aspects of noncognitive skills that are related to labor outcomes, the NLSY79 administered the Rotter Locus of Control Scale during the 1979 interviews and the Rosenberg Self-Esteem Scale during the 1980 interviews. The Rotter scale measures the degree of control that individuals feel they possess over their lives, and the Rosenberg scale measures perceived self-esteem. These measures are used in the work of Goldsmith et al. (1997) to show that psychological capital makes a significant contribution to wages. Both the Rotter and Rosenberg scales are positively correlated with sociability at age six and as an adult.[16] When the Rotter and Rosenberg scales are included as regressors in our estimation, the effect of the fathers' people skills on their sons' sociability at age six is 0.025 (0.023), and the effect in early adulthood is 0.081 (0.024).[17] Both estimates are approximately equal to the estimates obtained in Section 3.3 (see Table 5, Columns 3 and 4). From these facts, the positive effect of the fathers' people skills on their sons' sociability is independent of these noncognitive skills. Therefore, fathers' people skills are positively related to their

[16] The correlation coefficient between the Rotter scale and early-adulthood sociability is 0.083. The correlation coefficient between the Rosenberg Self-Esteem Scale and early-adulthood sociability is 0.157.
[17] For the regression on the sons' sociability at age six, the coefficient of the Rotter score is 0.060 (0.025), and the coefficient of the Rosenberg Self-Esteem Scale is 0.101 (0.027). For the regression on the sons' early-adulthood sociability, the coefficient of the Rotter score is 0.033 (0.027), and the coefficient of the Rosenberg Self-Esteem Scale is 0.186 (0.028).

sons' sociability in early adulthood, but the relationship with the sons' sociability at age six is small and insignificant.

In the remainder of this subsection, we discuss the reasons why fathers' people skills have a smaller and less significant link with their sons' sociability at age six than as adults. We find in Sections 3.2 and 3.3 that sons' sociability at age six is related to their fathers' education, whereas sons' sociability as an adult is related to their fathers' people skills. These results suggest that sons' sociability is nurtured by their fathers' sociability during adolescence or early adulthood and is thus not likely to be genetically transmitted from fathers to sons. However, potential recall bias can be a particular concern in retrospective data, and because the respondents were in their 20s when they were asked about their degree of sociability at age six, they may not have correctly recalled their level of sociability at age six. Thus, the measurement error arising from this recall bias may cause the weak association between fathers' people skills and their children's sociability at age six.

3.5. Relationship between Fathers' Sociability and Sons' Wages

To summarize our findings in Sections 3.1-3.4, we find a positive and significant intergenerational link between fathers' and sons' sociability. Specifically, a one-standard-deviation increase in the fathers' people skills increases their sons' early-adulthood sociability by 0.085 standard deviations (Table 5). In comparison, a one-standard-deviation increase in the fathers' education level increases their sons' education by 0.084 (0.023) standard deviations in the 1990 wave of the NLSY79.[18] Therefore, the intergenerational effect on sociability is approximately the same as the effect on education.

To guide interpretations of the magnitudes of our estimates, we place a dollar value on an increase in the fathers' people skills to their sons. To do so, we first estimate the effect of

[18] The estimate controls for the same covariates as in Table 5.

early-adulthood sociability on wages for the sample of NLSY79 respondents. For the men, the effect of early-adulthood sociability on wages is 0.0164 (0.0066).[19] This result is also found in Machin et al. (2001), who report small but positive labor market returns to sociability for men.

Multiplying the wage effect of sociability and the intergenerational effect on sociability, we find that the monetary value of a one-standard-deviation increase in the fathers' people skills to the sons is 0.139 percent (=0.085×1.64). However, the monetary value of a one-standard-deviation increase in the fathers' education to the sons is 0.874 percent (= 0.084 × 10.40, as the labor market returns to education is 0.1040 (0.0086)). Because the labor market returns to sociability are smaller than the labor market returns to education, the monetary value of the intergenerational transfer of sociability is one-sixth of the value of the transfer of education. In summary, when compared with the effect of the fathers' education on their sons' wages, the effect of the fathers' sociability on their sons' wages is small but nonnegligible.

4. CONCLUSION

This paper examines whether parents' social skills affect their children's sociability after controlling for the parents' and children's cognitive skills and other background characteristics. Because we often lack data on parents' sociability, we construct measures of their sociability using the occupational characteristics from the Dictionary of Occupational Titles (DOT). For the NLSY79 fathers and their children, we find that the fathers' people skills are positively associated with their sons' sociability in early adulthood. For the NLSY79 female respondents and their children, we find a stronger sociability link between the mothers and daughters than between the mothers and sons. Therefore, the parents' people skills are

[19] Sociability in early adulthood is standardized to have a mean of zero and a variance of one. The regression controls for education, a quadratic in the AFQT score and age, marital status, place of residence (region and urban area), and year dummies.

positively linked with the sociability of their children, but this link exists only between those of the same gender.

Although previous studies have found a positive association in the cognitive skills of parents and children (e.g., Black et al. (2005, 2011)), we find a positive intergenerational link with respect to sociability. Additionally, we document that some portion of the wage differentials among sons is attributable to the differences in not only education and cognitive skills but also sociability among the fathers. Given the presumably complex interactions and the timing needed to transfer cognitive and social skills from parents to children, future research could use a sophisticated multidimensional human capital model and data to further explore the interplay of these transmissions.

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Table 1: Comparison of Means and Standard Deviations of Selected Variables for Children

Sample: Children (NLSY Respondents)

	Sons				***Daughters***			
	High School or Less than High School		**More than High School**		**High School or Less than High School**		**More than High School**	
Variable	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Age	23.52	2.295	23.92	2.326	23.62	2.290	23.77	2.295
Education	11.34	1.191	14.94	1.568	11.43	1.183	14.81	1.379
AFQT	-0.212	0.884	0.855	0.660	-0.232	0.823	0.720	0.664
School Enrollment	0.025	0.156	0.357	0.479	0.026	0.160	0.335	0.472
Sociability at Age Six								
Extremely shy	0.140	0.347	0.098	0.297	0.205	0.404	0.134	0.341
Somewhat shy	0.469	0.499	0.426	0.495	0.415	0.493	0.434	0.496
Somewhat outgoing	0.276	0.447	0.346	0.476	0.248	0.432	0.270	0.444
Extremely outgoing	0.114	0.318	0.131	0.337	0.132	0.339	0.163	0.369
Sociability in Early Adulthood								
Extremely shy	0.011	0.102	0.004	0.061	0.010	0.101	0.006	0.079
Somewhat shy	0.266	0.442	0.250	0.433	0.252	0.434	0.209	0.407
Somewhat outgoing	0.562	0.496	0.576	0.494	0.557	0.497	0.591	0.492
Extremely outgoing	0.161	0.368	0.170	0.376	0.181	0.385	0.193	0.395
NLSY Children: Sociability Score					-0.025	1.008	0.039	0.969
Family Size	4.007	1.617	3.858	1.668	3.868	1.545	3.821	1.535
Household Income	28720	15899	37279	21274	26138	15248	35810	21016
Living in the South	0.270	0.444	0.255	0.436	0.303	0.460	0.293	0.455
Living in Urban Area	0.720	0.449	0.815	0.388	0.744	0.436	0.795	0.404
Not Living with Both Parents	0.091	0.287	0.081	0.273	0.105	0.306	0.087	0.282
N	1832		1246		1895		1354	

Note: The numbers in the table are the means of the row variables, which are conditional on the column segments of the sample.

Table 2: Comparison of Means and Standard Deviations of Selected Variables for Parents

	Fathers							
	Less than High School		**High School**		**Some College**		**More than College**	
Variable	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Age	44.38	7.742	42.94	6.891	43.53	6.101	44.22	6.100
Education	8.254	2.430	12.00	0.000	13.88	0.654	17.08	1.472
Work for Pay	0.915	0.280	0.977	0.151	0.969	0.173	0.984	0.126
DOT Variables								
Average of All DOT People Skills	-0.524	0.730	-0.235	0.857	0.135	0.924	0.573	0.871
Relation to People	-0.325	0.747	-0.022	0.791	0.304	0.740	0.852	0.605
Dealing with People	-0.476	0.736	-0.214	0.830	0.072	0.855	0.409	0.755
Talking and/or Hearing	-0.459	0.760	-0.159	0.815	0.168	0.804	0.495	0.626
Communicating Data	-0.492	0.630	-0.237	0.766	0.138	0.826	0.552	0.734
Business Contact with People	-0.247	0.656	-0.062	0.784	0.065	0.951	-0.146	1.107
Working for Good of People	-0.628	0.603	-0.502	0.665	-0.200	0.717	0.303	0.885
Interpreting Feelings	-0.061	0.562	-0.069	0.469	0.019	0.803	0.132	1.037
Influencing People	-0.198	0.502	-0.029	0.756	0.181	0.935	0.558	1.122
Math	-0.149	0.805	0.168	0.764	0.465	0.771	0.986	0.570
Reasoning	-0.207	0.718	0.124	0.680	0.485	0.703	1.074	0.551
Language	-0.337	0.674	-0.007	0.675	0.399	0.720	1.045	0.549
Relation to Data	-0.116	0.880	0.245	0.819	0.577	0.766	1.025	0.500
Relation to Things	0.352	0.794	0.251	0.886	-0.052	0.867	-0.225	0.908
Strength	0.581	0.693	0.308	0.793	-0.126	0.864	-0.564	0.585
N	2534		2467		723		1244	

	Mothers							
	Less than High School		**High School**		**Some College**		**More than College**	
Variable	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Age	40.37	6.664	40.74	6.056	41.58	5.927	42.76	6.038
Education	8.745	2.329	12.00	0.000	13.86	0.695	16.45	0.915
Work for Pay	0.466	0.499	0.535	0.499	0.543	0.498	0.605	0.489
DOT Variables								
Average of All DOT People Skills	-0.193	0.793	0.192	0.802	0.372	0.696	0.858	0.655
Relation to People	-0.455	0.666	-0.059	0.706	0.088	0.684	0.833	0.791
Dealing with People	-0.089	0.903	0.237	0.867	0.476	0.775	0.764	0.556
Talking, Hearing	-0.183	0.894	0.181	0.840	0.438	0.720	0.682	0.508
Communicating Data	-0.204	0.759	0.240	0.845	0.509	0.739	0.973	0.621
Business Contact with People	0.077	0.776	0.361	0.840	0.059	1.068	-0.190	0.898
Working for Good of People	0.060	0.836	0.208	0.748	0.549	0.846	1.073	0.742
Interpreting Feelings	-0.031	0.500	-0.021	0.576	-0.025	0.699	0.305	1.355
Influencing People	-0.237	0.421	-0.088	0.636	-0.046	0.666	0.291	0.916
Math	-0.618	0.659	-0.110	0.719	0.288	0.717	0.534	0.570
Reasoning	-0.663	0.659	-0.144	0.716	0.329	0.767	0.971	0.637
Language	-0.628	0.680	-0.077	0.786	0.423	0.808	1.046	0.615
Relation to Data	-0.619	0.651	-0.206	0.633	0.064	0.593	0.588	0.567
Relation to Things	-0.126	0.726	0.046	0.782	0.018	0.741	-0.392	0.721
Strength	0.042	0.682	-0.431	0.792	-0.454	0.858	-0.434	0.636
N	1546		2349		554		499	

Table 3: Effect of Mothers' Sociability on Children's Sociability: NLSY Female Respondents and their Children

Independent Variable (Separate Regression)	*Dependent Variable* **Sociability Score** Children (1)	Sons (2)	Daughters (3)
Mothers' Sociability			
Sociability at Age Six	0.037 **	0.027	0.049 **
	(0.014)	(0.018)	(0.019)
N	7755	3993	3762
Sociability in Early Adulthood	0.031 **	0.028	0.035 *
	(0.014)	(0.018)	(0.020)
N	7761	3995	3766
Mothers' DOT People Skills			
Relation to People	0.037	0.002	0.076 **
	(0.022)	(0.031)	(0.031)
N	4811	2410	2401
Dealing with People	0.036 *	0.027	0.048 *
	(0.020)	(0.028)	(0.028)
N	4811	2410	2401
Talking	0.042 **	0.021	0.067 **
	(0.021)	(0.029)	(0.029)
N	4811	2410	2401
Hearing	0.040 *	0.014	0.071 **
	(0.023)	(0.031)	(0.030)
N	4811	2410	2401
Communicating Data	0.039 *	0.014	0.067 **
	(0.022)	(0.030)	(0.029)
N	4811	2410	2401
Average of all the DOT People Skills	0.025	0.001	0.053 **
	(0.020)	(0.028)	(0.026)
N	4666	2334	2332

Note: Each estimate represents the coefficient from a different regression. The column headings identify the dependent variable, and the row headings indicate the independent variable used. The regressions are estimated by OLS. For this analysis of the NLSY females and their children, the mothers' self-reported sociability at age six and early adulthood is standardized to have a within-sample mean of zero and a variance of one. The children's sociability is age-standardized. The mothers' DOT people skills are taken from the revised fourth edition of the DOT (1991), whose data were collected from 1978 to 1990, a time span that overlaps with the years (1986-2000) for which the NLSY79 information on the mothers' occupation is available. Note that "talking and/or hearing" in the DOT (1977) is separated into two variables–"talking" and "hearing"–in the DOT (1991). Additionally, "communicating data" is not available in the DOT (1991). Thus, for this variable, the DOT (1977) is used. The regressions control for mothers' education, a quadratic in mothers' AFQT score, age of mothers and children, mothers' marital status, place of residence (region and urban area), three-year averages of family size and household income, and year dummies. Robust standard errors clustered by the mothers are in parentheses.
* Significant at 10 percent. ** Significant at 5 percent.

Table 4: Effect of Parents' People Skills on Children's Sociability

Panel A: Using the textual definitions of the DOT variables, we construct four skill types: people-skill index, cognitive-skill index, motor-skill index, and physical-strength index.

	Dependent Variable:					
	Sociability at Age Six	**Sociability in Early Adulthood**	**Sociability at Age Six**	**Sociability in Early Adulthood**	**Sociability at Age Six**	**Sociability in Early Adulthood**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Fathers' Variable	***Father-Child***		***Father-Son***		***Father-Daughter***	
People-Skill Index	0.024	0.039	0.052	0.100 **	0.002	-0.011
	(0.030)	(0.031)	(0.044)	(0.046)	(0.041)	(0.043)
Cognitive-Skill Index	0.039	0.007	0.001	-0.043	0.067 *	0.049
	(0.028)	(0.028)	(0.040)	(0.041)	(0.038)	(0.040)
Motor-Skill Index	-0.042	-0.016	0.008	0.029	-0.084 **	-0.051
	(0.026)	(0.027)	(0.038)	(0.040)	(0.037)	(0.037)
Physical-Strength	0.027	0.009	0.030	0.013	0.021	0.006
Index	(0.031)	(0.032)	(0.045)	(0.047)	(0.044)	(0.045)
Fathers' Education	0.021 **	0.001	0.029 **	-0.002	0.014 *	0.004
	(0.006)	(0.006)	(0.008)	(0.008)	(0.008)	(0.008)
Log likelihood	-6240.6	-4996.5	-2929.8	-2377.3	-3291.6	-2605.0
N	4982	4991	2401	2408	2581	2583
Mothers' Variable	***Mother-Child***		***Mother-Son***		***Mother-Daughter***	
People-Skill Index	0.032	0.041	0.008	0.046	0.050	0.032
	(0.025)	(0.026)	(0.036)	(0.038)	(0.034)	(0.036)
Cognitive-Skill Index	0.021	0.034	0.068	0.029	-0.020	0.037
	(0.030)	(0.031)	(0.044)	(0.045)	(0.041)	(0.042)
Motor-Skill Index	0.041 **	0.020	0.021	0.006	0.059 **	0.031
	(0.019)	(0.020)	(0.028)	(0.029)	(0.027)	(0.028)
Physical-Strength	-0.035	-0.024	-0.033	-0.035	-0.042	-0.014
Index	(0.023)	(0.025)	(0.033)	(0.037)	(0.033)	(0.033)
Mothers' Education	0.001	-0.003	-0.004	-0.016	0.004	0.010
	(0.008)	(0.009)	(0.012)	(0.012)	(0.011)	(0.012)
Log likelihood	-4653.9	-3696.6	-2123.0	-1744.9	-2514.5	-1938.9
N	3691	3695	1739	1741	1952	1954

Note: All regressions are estimated by an ordered probit. They control for children's education, a quadratic in the children's AFQT score, age of children and parents, parents' education, dummies for not living with both parents and for place of residence (region and urban area) when the children are 14 years old, and three-year averages of family size and household income in childhood. * Significant at 10 percent. ** Significant at 5 percent.

(*continued on next page*)

Table 4: Effect of Parents' People Skills on Children's Sociability (*continued*)

Panel B: We use factor analysis to extract the latent factors from the DOT variables.

	Dependent Variable:					
	Sociability at Age Six	**Sociability in Early Adulthood**	**Sociability at Age Six**	**Sociability in Early Adulthood**	**Sociability at Age Six**	**Sociability in Early Adulthood**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Fathers' Variable	***Father-Child***		***Father-Son***		***Father-Daughter***	
People Skills	0.022	0.029 *	0.039 *	0.059 **	0.008	0.006
	(0.015)	(0.015)	(0.021)	(0.022)	(0.021)	(0.022)
Cognitive Skills	0.027	0.016	0.011	0.003	0.038	0.027
	(0.019)	(0.020)	(0.028)	(0.029)	(0.026)	(0.027)
Motor Skills	-0.044 **	-0.033 **	-0.005	-0.016	-0.078 **	-0.045 **
	(0.015)	(0.016)	(0.022)	(0.023)	(0.022)	(0.022)
Physical Strength	-0.015	-0.026	-0.004	-0.028	-0.025	-0.025
	(0.017)	(0.018)	(0.025)	(0.026)	(0.024)	(0.025)
Fathers' Education	0.021 **	0.002	0.029 **	-0.003	0.015 *	0.005
	(0.006)	(0.006)	(0.009)	(0.009)	(0.008)	(0.008)
Log likelihood	-6239.7	-4994.9	-2928.9	-2376.0	-3291.4	-2604.0
N	4982	4991	2401	2408	2581	2583
Mothers' Variable	***Mother-Child***		***Mother-Son***		***Mother-Daughter***	
People Skills	0.038 **	0.035 *	0.029	0.039	0.043 *	0.025
	(0.018)	(0.019)	(0.026)	(0.028)	(0.024)	(0.026)
Cognitive Skills	0.062 **	0.078 **	0.089 **	0.079 **	0.042	0.073 **
	(0.022)	(0.022)	(0.032)	(0.033)	(0.029)	(0.031)
Motor Skills	0.047 **	0.015	0.031	-0.002	0.062 **	0.031
	(0.017)	(0.018)	(0.025)	(0.025)	(0.024)	(0.025)
Physical Strength	-0.024	-0.027	-0.027	-0.031	-0.024	-0.026
	(0.017)	(0.018)	(0.025)	(0.027)	(0.024)	(0.024)
Mothers' Education	0.003	-0.004	-0.002	-0.017	0.007	0.010
	(0.008)	(0.009)	(0.012)	(0.013)	(0.012)	(0.012)
Log likelihood	-4649.1	-3694.6	-2121.3	-1743.8	-2510.7	-1937.3
N	3691	3695	1739	1741	1952	1954

Note: All regressions are estimated by an ordered probit. They control for children's education, a quadratic in the children's AFQT score, age of children and parents, parents' education, dummies for not living with both parents and for place of residence (region and urban area) when the children are 14 years old, and three-year averages of family size and household income in childhood. * Significant at 10 percent. ** Significant at 5 percent.

Table 5: Effect of Parents' People Skills on Children's Sociability

	Dependent Variable:					
	Sociability at Age Six	**Sociability in Early Adulthood**	**Sociability at Age Six**	**Sociability in Early Adulthood**	**Sociability at Age Six**	**Sociability in Early Adulthood**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Independent Variables	***Father-Child***		***Father-Son***		***Father-Daughter***	
Fathers' People-Skill	0.007	0.037 **	0.027	0.085 **	-0.008	0.0002
Component	(0.016)	(0.016)	(0.022)	(0.024)	(0.022)	(0.022)
Fathers' Education	0.021 **	0.002	0.028 **	-0.004	0.017 **	0.007
	(0.006)	(0.006)	(0.009)	(0.009)	(0.008)	(0.009)
Log likelihood	-6218.4	-4980.2	-2914.4	-2360.3	-3276.6	-2591.5
N	4982	4991	2401	2408	2581	2583
	Mother-Child		***Mother-Son***		***Mother-Daughter***	
Mothers' People-Skill	-0.003	0.006	-0.015	-0.008	0.007	0.021
Component	(0.017)	(0.018)	(0.025)	(0.026)	(0.024)	(0.025)
Mothers' Education	0.003	-0.001	-0.002	-0.014	0.007	0.012
	(0.009)	(0.009)	(0.013)	(0.013)	(0.012)	(0.013)
Log likelihood	-4634.8	-3680.7	-2110.0	-1736.0	-2498.0	-1925.5
N	3691	3695	1739	1741	1952	1954

Note: The parents' people skills are constructed by taking the first principal component of the correlation matrix of the residuals of the effects of DOT people skills on non-people skills. All regressions are estimated by an ordered probit and control for children's education, a quadratic for the children's AFQT score, age of children and parents, parents' education, parents' DOT non-people skills, dummies for not living with both parents and for place of residence (region and urban area) when the children are 14 years old, and three-year averages of family size and household income in childhood. * Significant at 10 percent. ** Significant at 5 percent.

Appendix Table 1: Definitions of the Variables from the Dictionary of Occupational Titles (DOT)

VARIABLE	DESCRIPTION
People-Skill Variables	
Relation to People	Complexity at which worker performs job in relation to people, from highest to lowest: Mentoring, Negotiating, Instructing, Supervising, Diverting, Persuading, Speaking-Signaling, Serving. Taking Instructions-Helping.
Dealing with People	Adaptability to dealing with people beyond giving and receiving instructions.
Influencing People	Adaptability to influencing people in their opinions, attitudes or judgments about ideas or things.
Interpreting Feelings	Adaptability to situations involving the interpretation of feeling, ideas or facts in terms of personal viewpoint.
Talking and/or Hearing	Presence or absence of talking and/or hearing.
Communicating Data	A preference for activities concerned with the communication of data versus a preference for activities for dealing with things and objects.
Business Contact with People	A preference for activities involving business contact with people versus a preference for activities of a scientific and technical nature.
Working for Good of People	A preference for working for the presumed good of people versus a preference for activities that are carried on in relation to processes, machines, and techniques.
Non-People-Skill Variables	
	Cognitive-Skill Variables:
Relation to Data	Complexity at which worker performs job in relation to data, from highest to lowest: Synthesizing, Coordinating, Analyzing, Compiling, Computing, Copying, Comparing.
Reasoning	General educational development (GED) in reasoning required for job, ranging from being able to apply logical or scientific thinking to wide range of intellectual and practical problems, to being able to apply commonsense understanding to carry out simple instructions.
Mathematics	GED in mathematics required for job, from knowledge of advanced calculus, modern algebra and statistics; algebra, geometry and shop math; to simple addition and subtraction.
Language	GED in language required for job, from reading literature, writing editorials and speeches, and conversant in persuasive speaking and debate; to reading at rate of 95-120 words per minute or vocabulary of 2500 words and writing and speaking simple sentences.
Specific Vocational Preparation	SVP is the amount of time required to learn the techniques, acquire the information, and develop the facility needed for average performance in a specific job-worker situation.
General Learning	Ability to “catch on” or understand instructions and underlying principles; ability to reason and make judgments.
Verbal	Ability to understand meaning of words and to use them effectively. Ability to comprehend language, to understand relationships between words, and to understand meanings of whole sentences and paragraphs.
Numerical	Ability to perform arithmetic operations quickly and accurately.
Clerical Perception	Ability to perceive pertinent detail in verbal or tabular material. Ability to observe differences in copy, to proofread words and numbers, and to avoid perceptual errors in arithmetic computation. A measure of perception which is required in many industrial jobs even when the job does not have verbal or numerical content.
Plan Activity	Adaptability to accepting responsibility for the direction, control or planning of an activity.

(*continued on next page*)

Appendix Table 1: Definitions of the Variables from the Dictionary of Occupational Titles *(continued)*

VARIABLE	DESCRIPTION
Make Evaluations	Adaptability to making generalizations, evaluations, or decisions based on sensory or judgmental criteria.
Creative Activity	A preference for activities of an abstract and creative nature versus a preference for activities of a routine, concrete, organized nature.
Esteem of Others	A preference for activities resulting in prestige or the esteem of others versus a preference for activities resulting in tangible productive satisfaction.
	Motor-Skills Variables:
Relation to Things	Complexity at which worker performs job in relation to things: Setting-Up, Precision Working, Operating-Controlling, Driving-Operating, Manipulating, Tending, Feeding-Offbearing, Handling.
Finger Dexterity	Ability to move fingers, and manipulate small objects with fingers, rapidly or accurately.
Motor Coordination	Ability to coordinate eyes and hands or fingers rapidly and accurately in making precise movements with speed. Ability to make a movement response accurately and swiftly.
Manual Dexterity	Ability to move the hands easily and skillfully. Ability to work with the hands in placing and turning motions.
Eye-Hand-Foot Coordination	Ability to move the hand and foot coordinately with each other in accordance with visual stimuli.
Spatial Perception	Ability to think visually of geometric forms and to comprehend the two-dimensional representation of three-dimensional objects. Ability to recognize the relationships resulting from the movement of objects in space.
Form Perception	Ability to perceive pertinent detail in objects or in pictorial or graphic material. Ability to make visual comparisons and discriminations and see slight differences in shapes and shadings of figures and widths and lengths of lines.
Color Discrimination	Ability to match or discriminate between colors in terms of hue, saturation, and brilliance. Ability to identify a particular color or color combination from memory and to perceive contrasting color combinations.
Precisely Set Limits	Adaptability to situations requiring the precise attainment of set limits, tolerances or standards.
Repetitive Work	Adaptability to performing repetitive work, or to continuously performing the same work, according to set procedures, sequence, or pace.
Make Judgments	Adaptability to making generalizations, judgments, or decisions based on measurable or verifiable criteria.
Perform Variety of Duties	Adaptability to performing a variety of duties, often changing from one task to another of a different nature without loss of efficiency or composure.
Under Stress	Adaptability to performing under stress when confronted with emergency, critical, unusual, or dangerous situations; or in situations in which working speed and sustained attention are make or break aspects of the job.
	Physical-Strength Variables:
Strength	Strength Rating reflects the estimated overall strength requirement of the job.
Climbing	Indicate the presence or absence of climbing.
Stooping	Indicate the presence or absence of stooping.
Reaching	Indicate the presence or absence of reaching.
Seeing	Indicate the presence or absence of seeing.

Appendix Table 2: Effect of NLSY Respondents' Sociability on Their Job Characteristics

Sample: NLSY Respondents

Dependent Variable (Separate Regression)	*Independent Variable* **Sociability at Age Six** **(1)**	**Sociability in Early Adulthood** **(2)**
DOT People Skills		
Dealing with People	0.033 ** (0.007)	0.041 ** (0.007)
Talking	0.034 ** (0.007)	0.041 ** (0.007)
Hearing	0.033 ** (0.006)	0.040 ** (0.006)
Communicating Data	0.031 ** (0.007)	0.034 ** (0.007)
Business Contact with People	0.040 ** (0.008)	0.056 ** (0.008)
Working for Good of People	0.027 ** (0.007)	0.036 ** (0.007)
Interpreting Feelings	0.010 (0.008)	0.007 (0.008)
Influencing People	0.028 ** (0.006)	0.028 ** (0.006)
Relation to People	0.030 ** (0.006)	0.035 ** (0.006)
Average of all the DOT People Skills	0.040 ** (0.007)	0.046 ** (0.007)
People-Task of Borghans et al. (2006)	0.044 ** (0.007)	0.056 ** (0.007)

Note: Each estimate represents the coefficient from a different regression. The column headings identify the independent variable, and the row headings indicate the dependent variable used. This analysis uses the sample of NLSY respondents since 1985. Self-reported sociability at age six and in early adulthood is standardized to have a mean of zero and a variance of one. The DOT people skills are taken from the revised fourth edition of the DOT (1991), whose data were collected from 1978 to 1990, which is a time span that overlaps with the years (1985-2000) for which the NLSY79 information on occupations is available. Note that "talking and/or hearing" in the DOT (1977) is separated into two variables—"talking" and "hearing"—in the DOT (1991). Additionally, "communicating data," "business contact with people," and "working for good of the people" are not available in the DOT (1991). Thus, for these three variables, the DOT (1977) is used. The regressions control for education, a quadratic in the AFQT score and age; dummies for sex, marital status, and place of residence (region and urban area); three-year averages of family size and household income in childhood, and year dummies. The robust standard errors clustered by respondents are in parentheses. * Significant at 10 percent. ** Significant at 5 percent.

Appendix Table 3: Effect of Parents' DOT People Skills on Children's Sociability

Independent Variable (Separate Regression)	Children		Sons		Daughters	
	Dependent Variable					
	Sociability at Age Six	Sociability in Early Adulthood	Sociability at Age Six	Sociability in Early Adulthood	Sociability at Age Six	Sociability in Early Adulthood
	(1)	(2)	(3)	(4)	(5)	(6)
Fathers						
Dealing with People	0.062 **	0.057 **	0.029	0.066 **	0.090 **	0.051 *
	(0.020)	(0.020)	(0.028)	(0.029)	(0.028)	(0.029)
Talking and/or Hearing	0.054 **	0.050 **	0.036	0.075 **	0.069 **	0.030
	(0.021)	(0.021)	(0.031)	(0.032)	(0.029)	(0.029)
Communicating Data	0.064 **	0.042 *	0.037	0.050	0.090 **	0.034
	(0.021)	(0.022)	(0.031)	(0.031)	(0.030)	(0.030)
Business Contact with People	0.049 **	0.056 **	0.031	0.061 **	0.068 **	0.048 *
	(0.018)	(0.019)	(0.025)	(0.027)	(0.026)	(0.027)
Working for Good of People	0.040 *	0.054 **	0.016	0.064 **	0.061 **	0.046
	(0.021)	(0.022)	(0.031)	(0.031)	(0.030)	(0.030)
Interpreting Feelings	-0.019	0.005	-0.007	0.035	-0.033	-0.032
	(0.020)	(0.022)	(0.030)	(0.033)	(0.025)	(0.026)
Influencing People	0.022	-0.0001	0.009	-0.002	0.035	0.0002
	(0.019)	(0.019)	(0.028)	(0.027)	(0.027)	(0.027)
Relation to People	0.048 **	0.056 **	0.001	0.037	0.088 **	0.074 **
	(0.021)	(0.022)	(0.031)	(0.032)	(0.030)	(0.030)
Average of all the DOT People Skills	0.051 **	0.050 **	0.025	0.059 **	0.076 **	0.042
	(0.019)	(0.019)	(0.027)	(0.027)	(0.026)	(0.027)
People-Task of Borghans et al. (2006)	0.044 **	0.046 **	0.022	0.058 **	0.065 **	0.035
	(0.018)	(0.018)	(0.026)	(0.026)	(0.025)	(0.026)
Mothers						
Dealing with People	0.043 **	0.058 **	0.044	0.063 *	0.040	0.046
	(0.021)	(0.023)	(0.031)	(0.033)	(0.029)	(0.031)
Talking and/or Hearing	0.039 *	0.056 **	0.030	0.051	0.044	0.054 *
	(0.022)	(0.023)	(0.033)	(0.034)	(0.030)	(0.032)
Communicating Data	0.065 **	0.082 **	0.061 *	0.089 **	0.069 **	0.072 **
	(0.023)	(0.024)	(0.033)	(0.035)	(0.032)	(0.034)
Business Contact with People	0.057 **	0.047 **	0.048	0.051 *	0.064 **	0.039
	(0.020)	(0.021)	(0.029)	(0.031)	(0.028)	(0.028)
Working for Good of People	0.004	0.018	0.032	0.055	-0.020	-0.019
	(0.022)	(0.023)	(0.033)	(0.034)	(0.030)	(0.031)
Interpreting Feelings	-0.0001	-0.028	0.042	-0.005	-0.040	-0.052
	(0.023)	(0.023)	(0.030)	(0.031)	(0.034)	(0.033)
Influencing People	0.038	0.064 **	0.039	0.065	0.038	0.060
	(0.028)	(0.029)	(0.043)	(0.040)	(0.038)	(0.043)
Relation to People	0.036	0.075 **	0.043	0.077 **	0.028	0.070 *
	(0.025)	(0.026)	(0.037)	(0.038)	(0.035)	(0.037)
Average of all the DOT People Skills	0.053 **	0.068 **	0.063 *	0.082 **	0.044	0.049
	(0.023)	(0.024)	(0.034)	(0.035)	(0.032)	(0.034)
People-Task of Borghans et al. (2006)	0.055 **	0.060 **	0.075 **	0.084 **	0.036	0.029
	(0.025)	(0.026)	(0.036)	(0.037)	(0.034)	(0.036)

Note: Each estimate represents the coefficient from a different regression. The column headings identify the dependent variable, and the row headings indicate the independent variable used. All regressions are estimated by an ordered probit, and they control for children's education, a quadratic in children's AFQT score, children's age and fathers' age, fathers' education, dummies for not living with both parents and for place of residence (region and urban area) when the children are 14 years old, and three-year averages of family size and household income in childhood. * Significant at 10 percent. ** Significant at 5 percent.

Appendix Table 4: Factor Analysis for DOT Skills

Panel A: NLSY Fathers

	Factor Loadings						
Variables	**1**	**2**	**3**	**4**	**5**	**6**	**Uniqueness**
Data	0.951	-0.069	-0.138	-0.008	0.064	0.002	0.067
Math	0.941	0.025	-0.104	0.015	-0.145	0.025	0.081
Reasoning	0.937	-0.020	-0.199	0.139	0.036	0.018	0.061
Language	0.893	-0.163	-0.218	0.238	0.012	0.058	0.068
SVP	0.934	0.138	-0.002	-0.050	-0.039	-0.052	0.103
General Learning	0.880	-0.185	-0.214	0.179	0.012	0.158	0.088
Verbal	0.872	-0.199	-0.301	0.185	0.058	-0.055	0.069
Numerical	0.868	0.005	-0.208	0.114	-0.167	-0.069	0.157
Clerical Perception	0.659	-0.310	-0.451	0.199	-0.013	0.116	0.213
Plan Activity	0.868	0.131	0.046	0.168	0.080	-0.203	0.151
Make Evaluations	0.692	-0.473	-0.155	-0.275	0.005	0.208	0.155
Creative Activity	0.537	-0.177	0.031	0.511	0.262	0.136	0.331
Esteem of Others	0.196	-0.613	-0.542	-0.165	0.152	-0.039	0.240
Relation to People	0.617	-0.463	-0.316	0.276	0.293	0.106	0.132
Dealing with People	0.418	-0.553	-0.399	0.196	0.405	-0.258	0.091
Talk and/or Hearing	0.538	-0.418	-0.355	0.147	0.418	-0.250	0.151
Communicate Data	0.468	-0.445	-0.430	0.390	0.344	-0.201	0.088
Business Contact	0.034	-0.498	-0.293	0.003	0.420	-0.530	0.208
Work for Good of People	0.185	-0.613	-0.312	0.397	0.181	-0.089	0.294
Interpret Feeling	0.100	-0.006	-0.047	0.521	-0.057	0.068	0.708
Influencing People	0.189	-0.360	-0.178	0.729	0.007	-0.241	0.213
Relation to Things	0.083	0.843	0.340	-0.118	-0.029	0.164	0.126
Motor Coordination	-0.232	0.854	0.001	0.052	0.118	0.053	0.198
Form Perception	0.593	0.630	0.016	-0.062	-0.017	-0.096	0.237
Spatial Perception	0.326	0.677	0.210	-0.174	0.105	0.252	0.287
Finger Dexterity	0.190	0.855	0.028	0.024	-0.151	-0.250	0.147
Manual Dexterity	-0.327	0.819	0.195	-0.142	0.024	0.000	0.164
Eye-Hand-Foot Coord.	-0.335	0.252	0.565	-0.066	0.275	0.369	0.289
Color Discrimination	0.036	0.530	0.132	0.158	0.202	0.427	0.453
Precisely Set Limits	-0.015	0.752	0.152	-0.242	-0.374	-0.234	0.158
Repetitive Work	-0.860	-0.097	-0.100	-0.087	-0.114	0.317	0.120
Make Judgments	0.501	0.543	0.219	-0.316	-0.193	-0.079	0.264
Perform Variety of Duties	0.539	0.152	0.485	-0.271	0.135	-0.019	0.359
Under Stress	-0.070	0.041	-0.012	-0.046	0.776	0.029	0.388
Strength	-0.527	0.344	0.656	-0.072	-0.001	0.067	0.164
Climb	-0.064	0.155	0.870	-0.080	-0.090	-0.007	0.200
Stoop	-0.292	0.267	0.823	-0.100	-0.089	0.070	0.144
Reach	-0.509	0.649	0.325	-0.155	-0.029	0.235	0.134
See	-0.061	0.780	0.185	-0.205	0.135	0.288	0.211
Eigenvalue	12.457	8.693	4.464	2.268	1.923	1.483	
% of Variance	0.319	0.223	0.115	0.058	0.049	0.038	

Note: Definitions of DOT skill variables are described in Appendix Table 1. The factor analysis extraction method is principal component analysis, and the rotation method is varimax with Kaiser normalization. The first, second, and third factors are identified as cognitive skill, motor skill, and physical strength, respectively. While both the fourth and fifth factors are labeled as people skills, the fourth factor has a relatively higher loading on "interpret feelings" and "influence people" and the fifth factor has a relatively higher loading on "deal with people," "communicate data," and "talking/hearing."

(*continued on next page*)

Appendix Table 4: Factor Analysis for DOT Skills (*continued*)

Panel B: NLSY Mothers

	Factor Loadings								
Variables	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Uniqueness**
Data	0.910	-0.147	0.110	0.071	-0.095	-0.129	-0.069	0.157	0.079
Math	0.902	0.061	0.031	0.027	-0.179	0.146	-0.104	-0.014	0.117
Reasoning	0.954	0.044	0.107	0.073	-0.079	0.126	0.024	0.023	0.048
Language	0.927	-0.015	0.208	-0.002	-0.007	0.116	0.043	-0.047	0.079
SVP	0.908	0.106	0.040	0.235	0.048	-0.002	0.033	0.146	0.084
General Learning	0.917	0.157	0.213	0.014	-0.122	-0.050	-0.056	-0.060	0.064
Verbal	0.884	0.077	0.361	0.037	-0.119	-0.027	-0.022	-0.082	0.060
Numerical	0.820	0.164	-0.041	-0.173	-0.315	0.002	-0.176	-0.044	0.136
Clerical Perception	0.773	0.233	0.087	-0.383	-0.200	-0.002	-0.112	-0.100	0.132
Plan Activity	0.822	-0.007	0.135	0.082	0.058	-0.082	0.358	0.145	0.140
Make Evaluations	0.576	-0.456	0.034	0.238	0.069	-0.231	-0.334	0.053	0.230
Creative Activity	0.600	0.047	0.273	-0.139	0.078	-0.360	0.480	0.188	0.143
Esteem of Others	0.280	-0.338	0.295	0.187	0.042	-0.088	-0.558	-0.374	0.225
Relation to People	0.710	-0.297	0.473	-0.103	-0.129	-0.066	0.143	0.013	0.132
Dealing with People	0.410	-0.095	0.842	0.002	-0.073	0.252	0.017	-0.067	0.041
Talk and/or Hearing	0.482	-0.135	0.785	-0.053	-0.094	0.260	0.011	-0.057	0.052
Communicate Data	0.645	-0.058	0.664	-0.146	-0.049	0.089	0.104	-0.091	0.090
Business Contact	0.024	0.035	0.802	-0.320	-0.123	-0.340	-0.155	0.055	0.095
Work for Good of People	0.345	-0.391	0.405	-0.134	0.185	0.549	0.043	-0.169	0.180
Interpret Feeling	0.153	0.008	-0.040	0.057	-0.004	-0.080	0.056	0.854	0.234
Influencing People	0.285	-0.492	0.154	-0.049	-0.416	-0.091	0.192	0.077	0.427
Relation to Things	0.106	0.854	-0.174	0.000	0.028	-0.052	0.145	0.246	0.145
Motor Coordination	0.100	0.849	0.226	0.013	-0.180	-0.133	0.097	-0.110	0.147
Form Perception	0.547	0.666	0.002	-0.012	0.004	-0.213	0.275	-0.033	0.135
Spatial Perception	0.054	0.242	-0.109	0.819	-0.085	0.018	0.182	0.135	0.198
Finger Dexterity	0.099	0.873	0.100	-0.040	-0.121	0.018	0.079	-0.141	0.176
Manual Dexterity	-0.478	0.677	-0.006	0.100	0.233	0.157	0.084	0.228	0.165
Eye-Hand-Foot Coord.	-0.301	-0.103	-0.003	0.574	0.359	0.257	0.213	-0.161	0.303
Color Discrimination	0.049	0.256	0.017	0.196	-0.014	0.048	0.814	-0.020	0.227
Precisely Set Limits	0.158	0.843	-0.334	0.004	-0.120	-0.040	-0.053	-0.112	0.122
Repetitive Work	-0.692	0.067	-0.306	0.109	-0.092	-0.267	-0.134	-0.220	0.265
Make Judgments	0.210	0.051	-0.151	0.742	-0.059	0.128	-0.141	-0.022	0.339
Perform Variety of Duties	0.418	0.123	0.094	-0.416	0.631	0.156	0.204	-0.018	0.163
Under Stress	0.050	0.151	0.091	0.289	0.028	0.852	0.019	-0.046	0.154
Strength	-0.501	-0.228	-0.237	0.392	0.226	0.345	0.304	0.178	0.193
Climb	-0.227	-0.150	-0.149	0.135	0.661	-0.171	-0.072	-0.024	0.414
Stoop	-0.384	-0.237	-0.103	-0.106	0.700	0.305	-0.002	0.098	0.182
Reach	-0.606	0.632	0.013	0.005	0.107	0.163	-0.005	0.171	0.167
See	0.081	0.838	-0.101	0.196	-0.087	0.107	0.093	0.080	0.209
Eigenvalue	12.319	6.226	3.703	2.614	2.150	2.120	1.995	1.383	
% of Variance	0.316	0.160	0.095	0.067	0.055	0.054	0.051	0.036	

Note: Definitions of DOT skill variables are described in Appendix Table 1. The factor analysis extraction method is principal component analysis, and the rotation method is varimax with Kaiser normalization. The first, second, third, and fourth factors are labeled as cognitive skills, motor skills, people skills, and physical strength, respectively.