OUT-OF-SCHOOL ACTIVITIES: JUST AN ENTERTAINMENT OR HIGHER FUTURE WAGES?

by

Iryna Sikora

A thesis submitted in partial fulfillment of
the requirements for the degree of

MA in Economics

Kyiv School of Economics

2009

Approved by _____

KSE Program Director

_____

_____

_____

Date _____

Kyiv School of Economics

Abstract

OUT-OF-SCHOOL ACTIVITIES: JUST AN ENTERTAINMENT OR HIGHER FUTURE WAGES?

by Iryna Sikora

KSE Program Director: Tom Coupé

In this work the relationship between High School clubs participation and future wages has been investigated. Using the data of the United States Longitudinal Survey of Youth (1979 cohort), we did not find strong evidence of premiums neither to any out-of-school activities, nor to activities-occupational correspondence (in terms of skills developed and demanded). We also found that family background can influence occupational choice, as well as choice of child's hobby, but this family-based selection does not have a statistically significant effect on future wages. The paper suggests that hobbies produce indirect effect on wages, rather then direct and can be considered as part of explanation of differential in earnings between occupations.

TABLE OF CONTENTS

LIST OF TABLES AND CHARTS

Number *Page*

ACKNOWLEDGMENTS

The author wishes to express genuine gratitude to her thesis advisor, Dr. Hanna Vakhitova, who guided the author throughout the process of writing and did not allow to lose courage.

The author thanks KSE research workshop faculty and especially Dr. Olena Nizalova and Dr. Denys Nizalov for academic and emotional impact.

The author expresses her special thanks to all 824 individuals from NLSY Survey who have at least once responded to all necessary for the research questions and especially to those of them who have participated in activities in spite of not being sure that it pays.

The author also wishes to acknowledge gratefully her friends' help and encouragement. The author thanks Andriy Logvinov for censoring, Yana Ponomar'ova for asking questions, Aleksey Khodakovskiy for cheering the author's laptop up and giraffes for their existence.

Chapter 1

INTRODUCTION

Long ago Adam Smith suggested in his "The Wealth of The Nations" (1776) that human capital is an important factor of production. This concept was theoretically justified (Mincer, 1958, Becker, 1965) and empirically tested. The evolution of the human capital theory stimulated by practical issues such as need for effective social policies gave birth to the concept of non-cognitive component of human capital stock (Heckman, 1999, Galunic, Anderson, 2000). Due to the diminishing marginal productivity of investments in educational part of human capital, non-cognitive skills investments were acknowledged as increasingly important factors that influence worker's productivity. For various research purposes different proxies for assessing unobserved abilities were proposed: height (Persico, Postlewaite, Silverman, 2004), health (Shultz, 2003), alcohol consumption (Bray, 2005), athletic participation (Barron, Ewing and Waddel, 2000), etc.

The importance of human capital is recognized not only by economists, but also in the real business life with the advanced hiring methods used nowadays: being open to new methodologies, companies use overall ability tests in addition to professional testing (for example, the first thing that a person is asked to do applying to any of the Consultant Agencies is often to take on-line ability test). Potential employees are asked to solve various problems from different fields of knowledge, even though, some particular fields seem unrelated to the position that the person intends to occupy. The purpose of those tests, as it is indicated for instance on the official web site of "Bain & Company"[1], is to

[1] http://joinbain.com/apply-to-bain/what-bain-looks-for/default.asp - video with the Partner of Bain & Company Bill Neuenfeldt

identify abilities and personal characteristics of the applicants which are particularly important at the workplace.

Possessing certain skills or personal characteristics in addition to the knowledge of field is recognized as a highly important factor of being successful at the workplace (Baron, 2000, Gaag, Snijders, 2003, Heckman, Lawler, 1971). Participation in non-scholastic activities does not only influence educational outcomes in the standard way (test scores, class rank) but it may also contribute to non-cognitive part of human capital. Since hobbies develop skills, knowledge and experience and are usually formed in the childhood, a period when all the activities the child is involved has a huge impact on his or her personality, hobbies can be a valid measure of non-cognitive stock of person's human capital.

Each particular occupation requires certain skills and they are different for different job positions. On the one hand, such interests as in sport, art and social life activities may contribute to a person's human capital, develop certain skills (sport makes people active and target oriented, art – creative, social activities develop communication skills, etc.). On the other hand – every job demands certain personal characteristics. For instance, a teacher should have good communication skills, a manager should be decisive, as the US Occupation Outlook Handbook suggests[2]. The possibility of finding this correspondence allows assuming of the fact that successful matching of required job characteristics and skills developed with the help of a hobby could provide a significant advantage in productivity and, consequently, increase wages.

The goal of this project is to find out if the fact of having a hobby in High School implies any alterations in an employee's performance. More specifically, we are going to estimate whether the fact of matching hobby and current occupation (whether the activity in which a person has participated at school

[2] http://stats.bls.gov/oco/ - online version

develops skills demanded by his current job) really helps to become more valuable (in terms of wages) on the labor market. The research is based on the United States National Longitudinal Survey of Youth (1979) with the help of robust standard errors OLS estimation procedure. It is expected that the fact of participation in activity, which corresponds to the current occupation, positively affects worker's wages.

Despite a huge number of papers about wages decomposition, the relationship between hobbies and wages has not been studied before and both employees and employers may find this topic interesting. Potential employees can use their hobbies as a signal for certain skills, abilities, personal characteristics or experience that are necessary for being successful in conducting some responsibilities (for example experience in arts may signal about creativity). Employers may use the results of this research to make hiring process more effective (it helps to find the right man for the job among a large number of applicants). The policy makers may take the obtained results into account while planning investment in the children out-of-school activity programs (to drive attention to the most effective ones or to expand the coverage, involve more children in case it is effective).

The work consists of four main parts. The first is literature review, which describes theoretical background of the work and presents some relevant empirical findings. The second part tells about methodology used in thesis. Next (third) part describes the data and, finally, the forth part presents the obtained results.

Chapter 2

LITERATURE REVIEW

This literature review consists of three main parts. The first part is dedicated to the theoretical background for models of wage determination based on the human capital theory. The second part of the literature review provides the examples of empirical studies. It contains findings of the human capital approach to the decomposition of wages (in particular non-cognitive part of the wage decomposition model). The section is particularly concentrated on the attempts to elaborate and expand the concept. The third part discusses papers that help to answer the question "why hobbies?": this section describes the importance of non-cognitive skills as a fundamental part of human capital, explains "hobby-wages" mechanism and supports the motivation of the investigation.

The theoretical background for models of wage decomposition was developed by Mincer (1958). The concept of human capital as of the factor which determines the person's income was suggested in his seminal paper «Investment in the human capital and personal income distributions». In this paper, Mincer developed and theoretically justified a wage equation where wage is the function of acquired human capital (which reflects person's skills). Mincer approximated human capital by age, trainings and working experience.

The structure of human capital and ways in which it can be formed was developed by Becker (1965) by means of the time-allocation model. The model was derived from the individual utility maximization problem by the introducing costs of non-working time. Moreover, Becker was the first who formally stated that the cost of human capital consists of both: direct and indirect costs. His

model allows assessing the impact of time costs of the human capital formation on the worker's productivity.

The extension of Becker's allocation of time theory of human capital acquisition was suggested by Ben-Porath (1967). He defines human capital as a stock of all individual's skills and looks on the process of human capital accumulation as on the investment project. In this paper, Ben-Porath derives the production function of human capital, which easily can be transformed into wage equation. It makes possible to distinguish the effects of different parts of human capital stock on the individual's productivity. All the empirical papers that investigate the impact of human capital (or at least of its part) on worker's wages are usually based on these works.

The following section discusses the empirical papers that use the concept of human capital to explain variations in earnings. These studies look at alcohol consumption, athletic participation, leadership skills, health status, various personal strengths and psychological characteristics to better measure human capital. There are several papers for each component but for our purposes describing the typical representatives is sufficient.

The effect of alcohol consumption as a factor that influences person's human capital on wages was studied by Bray (2005), Kenket and Ribar (1994), Mullarhy and Sindler (1996) and others. Bray argued that the alcohol consumption is usually associated with socializing, and as a result can contribute to the human capital through the social capital. The wage equation was estimated using the National Longitudinal Survey of Youth with the help of the Discrete Factor Method of estimation (in order to avoid endogeneity and sample selection problems). The estimation results have shown that moderate drinking can positively influence person's wages.

High school athletic participation as an activity that develops person's skills was incorporated into the human capital function by Barron, Ewing and Waddel (2000). Two datasets: the National Longitudinal Survey of Youth and the National Longitudinal Study of the High School Class were used to examine the existence of the relationship between high school athletic participation and labor market outcomes (in particular, wages). The authors have used the OLS estimation procedure and have found that the coefficient for dummy of athletic participation is positive and statistically significant. The main explanation of the positive relationship between athletic participation and future wages states that being involved in sport activities means acquisition of new skills, which increase stock of person's human capital.

Other out-school activities were included into regression by the authors, but it has resulted into statistically insignificant coefficient. The main argument against reliability of those results is that the variety of out-school activities participation was constructed in an inappropriate way. It was simply the number of clubs in which the person participated. But participating in huge number of clubs tells little about developing of skills. Our research aims to elaborate on this issue (using the more detailed information about all activities (which are interpreted as hobbies)[3]) and the correspondence of the developed skills to the current job placement's requirements. So, the important part of informational load is not lost in this case.

Betsey Stevenson (2006) has tried to investigate whether the measured effect of high school athletic participation is not correct due to presence of self-selection: only more able individual manages to participate in athletics and study at the same time, that is why we observe higher wages in case of participation. The scientist has studied the effect of female high school sports participation on

[3] A hobby is a spare-time recreational pursuit. So, in case of children we define hobbies as out-of-school activities, in case of adults as leisure-time activities.

the future labor market outcomes by exploiting the data of natural experiment Title IX. The conclusion she made is that self-selection is not confirmed: despite of changes in the selection of sportsmen the return on the sport participation does not change; it remains positive and statistically significant. This conclusion provides the reason why we shouldn't worry about self-selection in case of other activities as well. Another important conclusion of the paper is that the return on other activities (not sports) is also significant; so, it shows that other activities also develop skills that influence wages. Moreover, introduction of other activities does not reduce sports coefficient; so, sport and other activities develop different types of skills. This fact allows us to assume that accounting for all possible activities which potentially develop skills independently can help in explaining differences in earnings.

Another method of overcoming the self-selection issue was suggested by Michael Lechner (2008). He has used matching technique to estimate the returns to sports participation and has found that even controlling for self-selection the coefficient of high school athletics participation is positive and significant, so it really influence labor market outcomes (including wages).

The positive relationship between leadership qualities and wages was studied by Kuhn and Weinberger (2003). The results have shown the existence of positive relationship between leadership in the high school and abilities, which are valued in the labor market. Neither beauty nor height have an influence on the return to leadership, so the conclusion is that the leadership skills are independent and highly rewarded skills. By including various controls the authors have managed to divide the return to leadership in two parts: born and taught. The fact that leadership can be taught suggests that other skills also can be acquired, so at least part of the return to hobby activities is not due to self-selection and investment into these activities really pays back to the labor market. One more important issue is that reward to leadership is greater for managers, people whose

job demands leadership qualities. It allows us to assume that using skills which are appropriate for a certain job can help to explain more in wage variations. In addition, one of the paper's conclusions is that correlation between leadership and occupational choice does not influence the size of the leadership coefficient: it helps to explain variation of wages within occupations, not between.

The human capital acquisition was also used to explain the phenomena of height premium to wages (Persico, Postlewaite, Silverman, 2004). The authors linked height premium to an additional acquisition of human capital that is more likely (easy, less costly) for tall children since they are those who usually participate in sports and other types of out-school activities. The National Longitudinal Survey of Youth and British National Child Development Survey data and OLS estimation procedure were used to analyze the problem. The main conclusion of the paper is that the majority of the height premium is due to participation in different out-school activities in the childhood. It means that including the dummy for activities reduce height premium significantly.

The impact of health status on employees' wages was studied by Shultz (2003). The paper argues that the healthier a person is the less costly for him the acquisition of an additional human capital is. That is why good health results in higher productivity of workers with a better health status even if the job does not require any physical efforts. The wage equation was estimated using the US Survey of Income Dynamic data and IV estimation technique. It was pointed out that the coefficient of health status is positive and statistically significant.

Cole, Daly and Mak (2008) have investigated the impact of personal characteristics and mental health on the labor market outcomes with the help of the 2SLS estimation procedure using the Australian annual labor survey. Regressing the employment status on personal strengths showed that worker's personality is vitally important for the labor market. These personal characteristics were considered as «psychological capital»: the mechanism of the

influence was explained as the stronger a person in the psychological aspect is the more human capital he/she can acquire.

Employing the same concept of «psychological capital» as a part of human capital Bowles, Ginits and Osborne (2001) have used the US Income Dynamics Survey to estimate the wage equation including personality variables (such as church attendance, participation in clubs, TV-viewing and reading) while controlling for standard human capital components. The results demonstrate strong relationship between personality and earnings. In our view this paper has an important drawback as changes in personality were incorporated into the wage equation without any attempts to match personality and job requirements. We are going to correct this.

All these empirical studies illustrate the validity of human capital approach toward wage determination and obtained results allow to assume the fact that the human capital can be better evaluated using information about all skills developed out of school and work.

The next section helps to understand why hobbies may serve as a good proxy for not observed parts of human capital.

The paper by Heckman suggests that for better assessing human capital we should pay more attention to childhood. Heckman (1999) argues that, for being more efficient, social policies should be targeted on pre-school children's skills development rather than on increase in amount of training costs for adults or even subsidies for college students. Using the data of National Longitudinal Survey of Youth, Heckman has demonstrated that the younger the person is the more effective investment in his skills is. So, to assess better non-cognitive part of human capital we need something which was developed in the childhood since effect of the skills developed at that time on ability is really significant. Hobbies approximated by out-of-school activities fall in the described category. Hence,

they can tell a lot about the person and consequently about human capital acquired.

Another justification of our assumption about importance of out-of-school activities is that such non-formal institutions as families, clubs, and hobby groups also affect the process of skills formation. Looking at non-cognitive part of the personality such as creativity, the confirmation of the concept comes with number of sociological papers (e.g. Wolfradt and Pretz, 2000), which have employed comparative method of inquiry to demonstrate that hobbies, as non-cognitive activities, can reflect an increasingly important part of the human capital stock. It is exactly what we are going to test using the economic approach.

«Engaging in a hobby can lead to acquiring substantial skill, knowledge, and experience» - states Wikipedia. It confirms that hobby may contribute to the person's human capital. All these papers give an opportunity to assume that hobbies could be added to the human capital function.

The next two papers describe the way in which the mechanism of human capital-wages works. An implicit relationship between hobbies and wages was described by Crowther and Kahn (1983). Having analyzed the huge data set of people's preferences, the sociologists clustered all possible leisure activities and named 6 groups. By studying each of the clusters they came to the conclusion that certain groups of population tend to certain types of activity. For example, there was suggested that more educated and rich people tend to be interested in art. It means that there is some relationship between social class and types of hobby (earnings and hobby as well). There is no information about the reason for that facts in the paper but even based on the information presented it could be seen that from this point of view hobbies catch unobservable personal characteristics (e.g. motivation) in addition to demographic and economic ones, so, the type of activity can contribute to better description of the person's human capital.

The importance of possessing certain skills in job-matching was described by Heckman and Lawler (1971). The authors have used mathematical techniques and employee-employer surveys to cluster the features demanded for certain jobs and, as a result, six major characteristics (namely variety, autonomy, task identity, feedback, dealing with others and friendship opportunities) were presented. The validity of those characteristics is shown by research of Sims, Szilagyi and Keller (1976).

A lot of information about the link between jobs (specifically, for every occupation) and skills and characteristics required by those jobs is presented in "Occupational outlook quarterly", the official edition of the United States Bureau of Labor Statistics (the US Department of Labor), the tables are given in Appendix 1. The official United States Occupational Outlook Handbook was used to match occupations and personal and job characteristics required.

Using all those sources makes possible for us to build a link between hobbies (out-of-school activities that develop certain skills) and jobs (that require certain skills) and theoretically justifies our assumption about the relationship between non-cognitive skills developed with the help of these activities and work-productivity and comes to the conclusion that this relationship can be estimated using the human capital framework.

There is no existing literature about the direct link between past hobbies and current wages, however, as it can be seen, the general concept of human capital acquisition through the non-cognitive skills is well recognized among economists. It allows to assume that participation in the out-of school activities linked with current job placement is a valid measure for such skills and can be incorporated into the model.

Chapter 3

METHODOLOGY

To study the effect of former hobbies on wages the standard form of wage composition was used. It was suggested by Mincer (1958) and generalized and adapted by Willis (1992). The model suggests that wage can be determined by individual demographic characteristics, human capital stock and error term, which contains unobservable factors. In the literature unobservables are usually decoded as motivation, attitude towards work and other psychological traits. All these components of the error term are hard to assess and in this work we are trying to extend the set of observable factors by introducing measure for unobservable skills. High school hobbies as activities which stimulate the development of certain skills are added as an extra component to the human capital part of wages determination. So, it contains standard elements such as years of schooling and experience plus an additional part, which refers to non-cognitive skills developed approximated with the help of past out-of-school activities; the introduction of this part helps to answer the research question. So, the following specification of the wages model is used:

$$\ln w_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 K_{it} + \beta_3 H_{it} + \varepsilon_{it} \qquad (1)$$

where $\ln \omega_{it}$ is the real wages (in logs) for individual *i* at time *t*, *X* is a set of observable demographic characteristics, *K* is a set of variables concerning human capital stock for individual *i* at the time period *t*, H_i is part of human capital

stock described by High School hobbies and ε_{it} is an error term which reflects remained unobservable characteristics such as motivation, etc.

Being more specific, $H_{\_corr}$ is a dummy created by the following rule:

$$H_{it} = \begin{cases} 1 & if \quad the \quad skills \quad that \quad hobby \quad developes \\ & correspond \quad to \quad the \quad demanded \quad job \quad characteristics, \\ 0 & otherwise \end{cases} \qquad (2)$$

The conclusion about value of this dummy is made relying on the information about job characteristics demanded, which is presented in Occupational Outlook of Labor Statistics Bureau).

It means that if past out-of-school activity in which the person was involved does not develop skills demanded by the current job there should not be any 'premium' for the activity. So, we assume that not all, but only necessary skills are rewarded.

However, we have started from the following model:

$$\ln w_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 K_{it} + \beta_3 H_i + \varepsilon_{it} \qquad (3)$$

where H_i stands for hobbies-related variables.

At first we created dummy for any activity: H_{any} is dummy for participation in any of clubs, it is equal to one if the person has participated in at least one club and it is equal to zero if he participated in none of them.

Then we introduced set of dummies for every possible High School activity. H_{scout}, H_{athl}, H_{NHSC}, H_{art}, H_{sch}, H_{gov}, H_{paper}, H_{other} are dummies for Scout club, Athletics, National Honor Scholastic club, Performing Arts, School sponsored scientific hobbies, Student government, Staff of yearbook or journal and other clubs participation correspondingly. Dummy is equal to one if the individual have participated in corresponding activity. This model set up allows to investigate whether activities cause themselves benefits in the future life and if it is true – to understand which ones are the most important.

Moving further, we introduced dummies for active participation (H_{scout_act}, H_{athl_act}, H_{NHSC_act}, H_{art_act}, H_{sch_act}, H_{gov_act}, H_{paper_act}, H_{other_act} are dummies for active participation in corresponding activities), and only then occupation-activity correspondences dummy.

By using pooled OLS estimation technique with robust standard errors and by inspecting of the sign and the level of significance of the hobby variables we are able to conclude about the impact of hobby-developed skills on person's productivity and, consequently, their wages.

However, using OLS we face serious problems that include:

1) Self-selection problem: it is possible that people with certain abilities tend to choose certain types of hobbies. So, the estimated return on activities participation is overestimated in this case. To minimize this problem we add supplementary controls, which allow obtaining pure effect as it was done in the literature (e. g. self-reported level of ability before hobby participation or parents' occupations). Another way of overcoming the self-selection problem is to compare individuals, which are similar in probabilities to participate in a certain activity (Propensity Score Matching).

2) Causality problem: possessing special skills can influence person's occupational choice. So, hobbies and occupations are highly correlated. However, as it was estimated by Kuhn and Weinberger (2003), the occupation is unlikely to have a

great influence on the hobby coefficient since it helps to explain wages variation within occupations rather then between.

The main argument against OLS is that participation in hobby-activities and, moreover, the correspondence between activities and occupational choice should not be considered as a random event. Family background is thought to be a highly important factor, which defines participation: the family plays a crucial role for child activities and there is no doubt that it influences occupational choice. This issue can be overcome by using the matching technique. Propensity score matching allows comparing similar individuals (to find an appropriate comparison group) and, therefore, estimate pure effect of hobby-activities participation.

Two major assumptions of PSM are satisfied in our case:

1). Conditional Independence Assumption: basing on the literature, we can state that selection to out-of-school activities participation is made on observables. Moreover, family background characteristics, which are thought to have an influence on person's choice of activities, are extensively presented in the data set and can serve as appropriate selection criteria for activities participation.

2). Stable Unit Treatment Value Assumption: due to representativeness of the survey we are going to use, the fact that one individual participates in certain type of activity does not affect participation of others (taking in account family background) and it is highly likely that there is no hidden treatment, namely it seems obvious that having an opportunity to participate in the activity in which the person is interested, he will prefer to participate rather than do it at home in solitude.

So, we are going to compute propensity scores for individuals based on their families' background and then to compare individuals with similar scores. Performing this procedure allows to receive the effect of hobby-activities participation on wages separated from innate abilities and other family influence.

Chapter 4

DATA DESCRIPTION

The data from the US National Longitudinal Survey of Youth (1979 cohort) is used. It is a nationally representative sample of more then 12,000 young men and women born in 1950s -1960s, that were interviewed annually starting from 1979 till 2006. The data set contains detailed information about individuals' demographic characteristics, education, labor market records and family background. It also includes information about High School years of respondent (test scores, class rank, free-time activities).

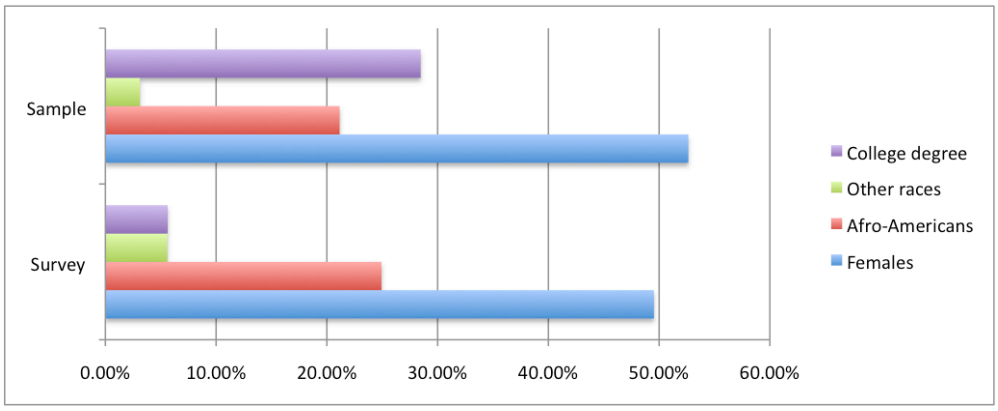
In order to perform Pooled-OLS estimation method the panel data set was constructed. However, due to certain limitations of data the sample size was significantly reduced.

It should be mentioned that the observations on year 2004 and 2006 were excluded from the sample due to inconsistencies of measurement (4-digit occupational codes do not fully correspond to 3-digit ones of the previous years). At first, we dropped those individuals who had not provided information about their *race* in the 1979 when the questionnaire was started, it reduced sample to 12,610 individuals. Since test scores are used as proxies for ability in our regression, we dropped out those who had not provided *math and verbal test scores* (2,416 observations left). As the goal of the paper is to investigate the impact of high-school out-of-class activities, we had to include only those individuals who had provided information about *clubs participation*, and it restricted sample to 2,320 observations. *Family background* is also needed for investigation purposes, so those who had failed to provide such information were also dropped from the sample (highest grade completed by mother – 2,259 left, highest grade completed by

father – 2,136 left, information about siblings – 1,963 left, information about respondent's religion – 1,961 left, information about family poverty status – 1,841 individuals left). Then we transformed data into the long form and obtained sample consisting of 36,820 observations. As we are interested only in *working part* of the sample, the person who was unemployed in certain year was not taken into the account at that year (25,201 observations left, on average 1300 per year). Then we dropped out *part-time* workers and ended up with 5,774 observations. Moving further, we deleted observations where *wage rate* was not observed (3,755 left), *tenure* (3,706) and *urban or rural* community indicator (3,673). Then we took a look at the patters of our sample and it appeared that the majority of observations belonged to 5 last years. In order to reduce potential noise we restricted sample to 1994-2002 years where major part of observations belonged, so our final sample consisted of 3,426 observations (5 years, 416-824 individuals annually).

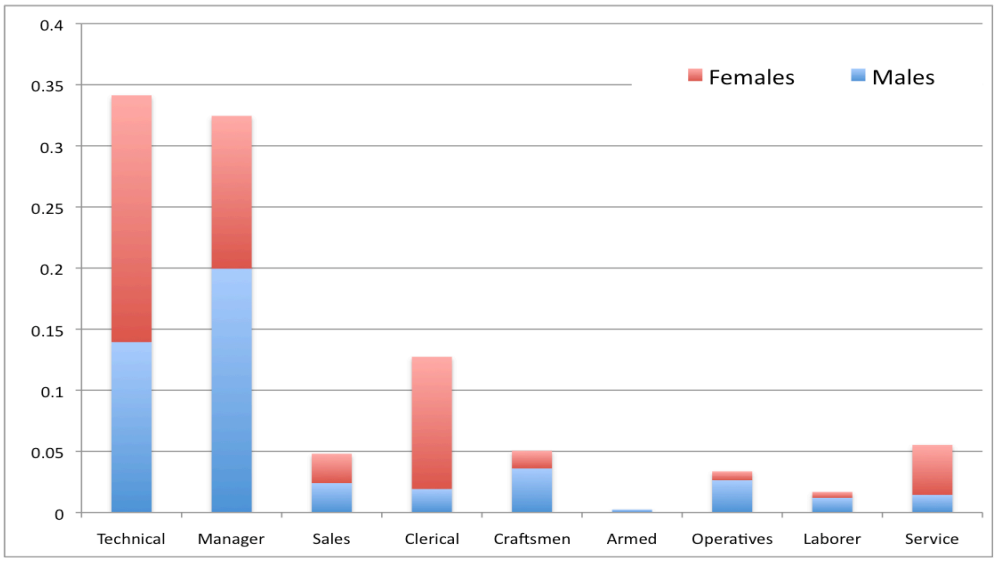
To be able to make a conclusion about representatives of the sample we have measured share of females and shares of people of different races. There are 49,53% of females among respondents in the original sample, final sample contains 46.42-52.64% of women depending on year. Speaking about Afro-Americans, their share in initial sample is 24.93%, but final sample contains only 20.63-21.62% of those people, which is not so far from the original value. The share of Afro-Americans declined due to control for education (which is highly correlated with race). Share of people of other race is 1.73-3.12% in final sample and it is significantly less then 5.6% in original one. The reason is similar to the case with Afro-Americans. The share of college-educated people in final sample is 22.33-28.47%, however, only 4.71-5.63% of respondents of initial sample have college degree. We have selected the most educated part of surveyed population because it is expected that the effect of hobbies will not be so clearly seen on unskilled workers. The sample is representative for educated population.

Chart 1. Final sample vs. initial one (shares of females, Afro-Americans, other races and people with college degree, year 2000).



Since the information about occupations is used we present some descriptive statistics on occupations (year 2000). Numerical values are presented in Appendix 2.

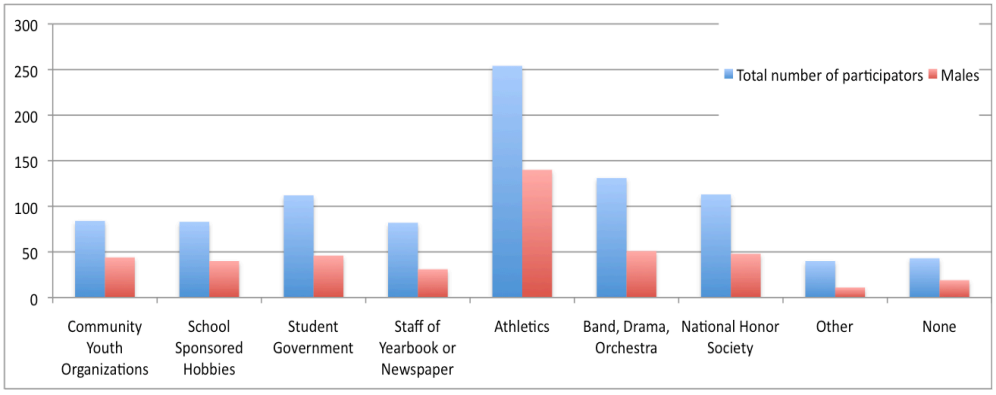
Chart 2. Sample characteristics: shares of people with different occupations (total and separated by gender), year 2000.



The largest groups are technical workers and managers; the third place is for clerical positions. Due to relatively big share of clericals (but not the largest) this category was chosen as a base for occupational dummies. More then two thirds of males are technical workers or managers, while 20% of females are clericals and 8% are service workers.

In our analysis we follow the survey's hobby division into groups (clubs), namely: Community Youth Organizations such as Scouts; School Sponsored Hobbies such as Photo, History, Science; Student Council, Government; Staff of Yearbook or Newspaper; Athletics, Cheerleading, PEP Clubs; Band, Drama, Orchestra; National Honor Society, Scholastic Achievement Club; Other. Dummy variable for each type of activity was created. The majority of individuals in our sample (88,5%) has participated in at least one activity. The most popular is Athletics (63% of respondents participated) and the rest have more or less equal participation rates. Barron et al. (2000) present similar (58%) Athletics participation rates in their paper, which means that our final sample is close to representative regarding Athletic participation rates. Numerical values of participation rates are presented in Appendix 3.

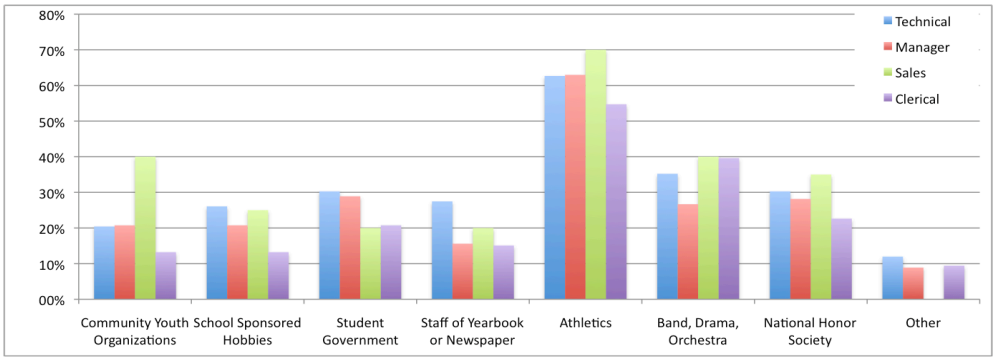
Chart 3. Sample characteristics: distribution of out-of –school activities (number of people participated), whole sample and males.



The gender difference can be observed: females are more likely to be involved in Band, Drama, Orchestra and Staff of Yearbook or Newspaper while males tend to participate in Athletics more then females, the rest of the clubs are more or less equally popular among males and females. Concerning the data on the most active participation in clubs, we have created dummies for active participation in each of the clubs: the same gender difference is observed, the majority of those who prefer Athletics are males, and the majority of those who are likely to participate in Drama, Orchestra are females.

There are some differences between occupations (year 2000) in patterns of clubs participation. The share of sales workers who have participated in Performing Arts is greater then share of managers, while the share of managers who have participated in national Honor Scholastic Club is greater then share of sales workers. Numerical values are presented in Appendix 4.

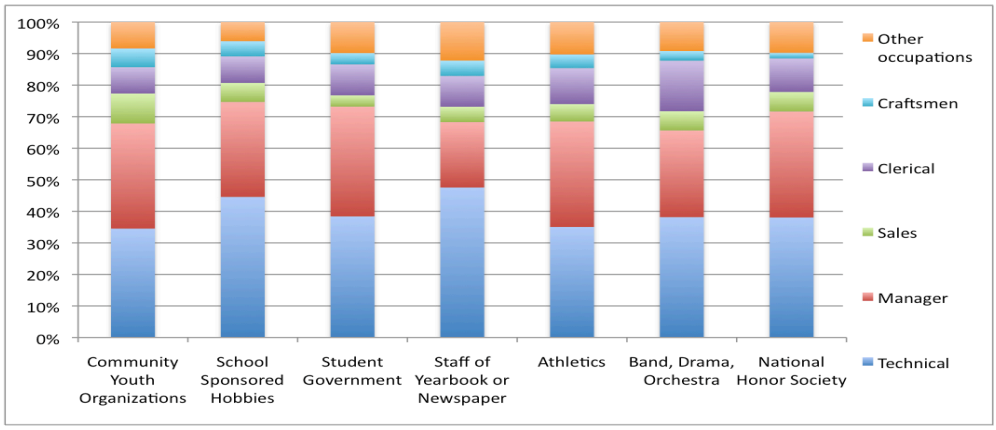
Chart 4. Sample characteristics: distribution of out-of-school activities for the most popular occupations (year 2000).



The data also provide some evidence about relationship between hobbies and occupations. The share of managers and technical workers vary among club-activities. For example, managers are likely to participate in Scout clubs, but less likely to do paper work such as yearbooks or journals. Clerical workers are

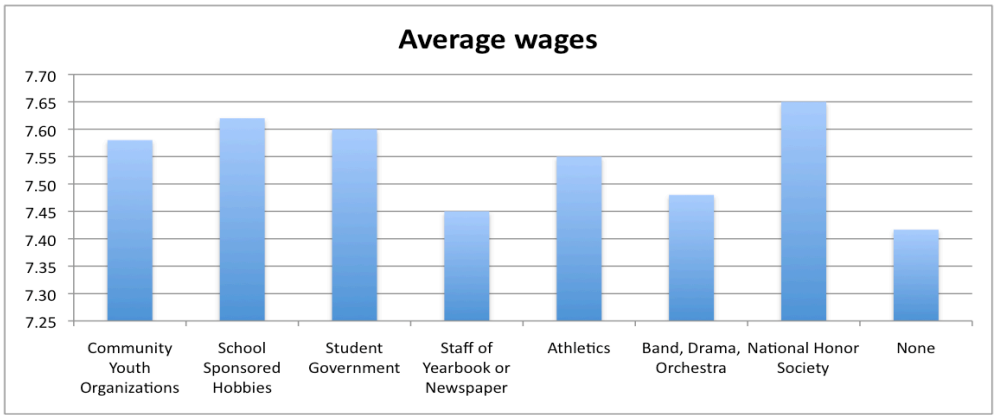
represented mostly in Performing arts. Numerical values are presented in Appendix 5.

Chart 5. Sample characteristics: distribution of occupations for each out-of-school activity (year 2000).



Speaking about wages, the highest wages are paid to those, who have participated in the National Honor Scholastic Club. Student government participators receive more then athletes but less then School sponsored hobbies participants (year 2000 data). Numerical values are presented in Appendix 6.

Chart 6. Sample characteristics: average wages for different out-of-school activities, year 2000.



In order to investigate the research question we have constructed dummy variable, which links High School activities and current occupation (through the skills developed and demanded). The information about skills demanded by occupations was taken from Occupational outlook quarterly, the information about skills developed by activities is taken from the organizations' websites (mission/vision)[4]. For example, let's suppose that one individual occupies managerial position while in high school he had participated in student government organization. The value of dummy in this case is equal to one. As it is stated in table of occupations and skills, manager should possess communicational and interpersonal skills, and as the official mission of Student Government organization states, participation in this organization develops such skills. If this individual was participating in Staff of Yearbook or Newspaper (or was not participating in any club) the dummy would be equal to zero in this case as paper work does not develop necessary skills (the absence of participation does not produce any skills as well).

The NLSY data set contains all necessary variables for our purposes: hourly wage rate, tenure with current employer, marital status, spouse income, number of children, age, race, current occupation, test scores (mathematics and verbal) and educational attainment. Short descriptive statistics is presented in Table 1, more detailed descriptive statistics can be found in Appendix 7.

As it can be seen from the table, treated individuals (skills developed by hobbies correspond to skills demanded by job or dummy=1) receive higher wages. They also are more likely to have college degree, both mathematical and verbal tests scores and richer spouse, their average age does not significantly differ from non-treated average age, but their average tenure is significantly less then average tenure of non-treated people.

[4] http://www.scout.org/en/about_scouting/mission_vision - Scouts organization or http://www.asgaonline.com/ME2/Default.asp - Student Government association

Table 1. Sample characteristics: comparison of variable means between treated (hobby-job correspondence) and non-treated (no hobby-job correspondence) groups.

	Non-treated (dummy=0)	Treated (dummy=1)	Difference (treated -non-treated)	Significant
Log of wages	7,38	7,56	0,18	+
Income of spouse, $1000	15,4	21,3	5,9	+
Age, years	38,7	38,9	0,2	-
College degree, dummy	0,17	0,26	0,09	+
Tenure, years	5,56	4,56	-1	+
Math score, percentile	0,41	0,51	0,1	+
Verbal score, percentile	0,4	0,48	0,08	+
Sample size	708	2,708		

Chapter 5

RESULTS

This section consists of five main parts (steps). The first part contains the results from basic regressions (wage, age, tenure, education, race, sex, marital status, occupations). It is done in order to insure operability of selected sample and check whether the results are consistent with theoretical predictions and previous empirical findings. The next stage is to include all out-of-school activities and investigate their impact on outcome. The third step is to create a dummy for the fact that the person was involved in any of listed activities. The last (fifth) part supposes to investigate the impact of those activities that develop skills needed for current occupation, which is our direct research question. All these five steps are done with help of OLS estimation procedure corrected for robustness and clusters. All tables and charts are presented in Appendixes.

Then we are going to investigate selection issues by performing probit and instrumental variables estimation procedures. The base of selection is family background as it is thought to be correlated with personal attitudes toward one or another activity or occupation. At first, we check whether family background influences hobby and occupational choices. Then we use family background as an instrument for hobby-job correspondence variable. After doing that we are going to use Propensity Score Matching technique to overcome self-selection into hobbies issue and obtain pure (due to participation, not to selection) effect of hobby-job correspondence on wages.

We have started from the very basic wage regression to show that our empirical results are consistent with theoretical suggestions. The estimation was made using the pooled OLS method with robust standard errors and clustering.

All the coefficients are consistent with previous empirical findings signs and almost all of them are significant. The results are shown in Table 2.

Table 2. Basic wage regression[5]: log of wage as a function of demographic and human capital characteristics.

	Log of wages
Age of individual	0.1442*** (0.0391)
Age, square term	-0.0015*** (0.0005)
Tenure with current employer, years	0.0380*** (0.0060)
Tenure with current employer, square term	-0.0012*** (0.0003)
College degree	0.1224*** (0.0307)
The individual is married	0.0450 (0.0305)
Female	-0.2089*** (0.0352)
Female with children	-0.0808** (0.0338)
Dummy for urban community	0.0880*** (0.0226)
Income of spouse, $1000	0.0019*** (0.0005)
Math score, percentile	0.4423*** (0.1132)
Verbal score, percentile	0.2349* (0.1339)
Constant	3.5591*** (0.7180)
Observations R-squared	3426 0.32
Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%	

All coefficients have expected (theoretically justified) signs and almost all of them are statistically significant. Non-linear dependence on age and tenure is observed (positive significant linear terms and negative significant quadratic terms); females earn on average 20% less then men, female with children – 28% less. Both mathematical and verbal scores coefficients are positive and significant.

[5] Race and occupations are also included (also have expected signs and are significant), the full version of this regression results is presented in Appendix 7.

Since only high school graduates are included into the sample, we have used dummy for college diploma as a proxy for educational attainment, it is also positive and significant. Such occupations as service worker, farmer laborer and armed worker provide lower earnings then clerical positions, while sales workers, managers and technical workers earn significantly more. Taking into account quadratic dependence on age and tenure, we have calculated maximum points: 48 years for age and 15 years for tenure. These numbers also correspond to other empirical findings.

So, descriptive statistics suggests that people who have participated in certain activities in High School earn more then others after graduation. At first using pooled OLS with we have checked whether participation in any club is rewarded by higher future wages (Appendix 11b). But it turns out that the coefficient of dummy for participation in any club does not significantly differ from zero. But the theory of human capital wages tells us that only firm-specific human capital should be taken into account; so we decided to look at the activities separately.

We have run the regression with log of wages and dummies for each activity and results show that really those who have participated in Athletics, National Honor society club and school sponsored hobbies earn significantly more. These effects preserve even when we control for age, tenure, educational attainment and demographic characteristics. However, once occupations and test scores are added to control for ability, none of the coefficients (even for Athletics) becomes significant (the results of regression are shown in Table 3). So, in general, the fact of participation in separate of out-of-school-activity does not mean that the person should expect higher (or lower) wages.

Table 3. OLS regression. The effect of various activities participation on log of wages[6].

Activities	Log of wages
Community Youth Organizations	0.0279 (0.0306)
School Sponsored hobbies	0.0291 (0.0361)
Student government	0.0004 (0.0314)
Yearbook, journal, paper work	0.0093 (0.0343)
Athletics	0.0286 (0.0267)
Performing Arts	-0.0111 (0.0286)
National Honor Society Club	0.0078 (0.0301)
Other club	0.0575 (0.0430)
Constant	3.5879*** (0.7172)
Observations R-squared	3426 0.32
Robust standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%	

These results contradict to the results obtained by authors of athletic participation paper by Barron et al., 2000: they received positive and significant coefficient for athletic participation. We have tried to replicate their part of work by constructing of the same sample but have failed to obtain similar results. All coefficients have the same signs, however, they are different in magnitudes. It may be due to irreversible changes in the data set. The problem with their estimation is that some of important variables of wage equation were not included (for example occupations, marital status). The comparison of two tables is presented in Appendix 9.

[6] This is reduced form, full version can be seen in Appendix 8a.

If we exclude variables that were not included in that paper we also receive significant coefficient of Athletics. However, it is not due to their real importance but rather due to omitted variables that correlate with dummies for activities (Appendix 10).

So, if we take into account all potentially important explanatory variables, none of the activities produces significant premium to wages. This finding suggests that it is not sufficient to participate; some another things should be taken into account. If it is not sufficient only to participate, we checked whether participation matters for active members of clubs. The results show that basically none of the active participation coefficients is significant (Appendix 8b). So, active membership does not help to understand the rewarding mechanism.

By this work we claim that the type of activity should matter and the correspondence between occupations and hobbies must be taken into account. As the wage is paid for usage of human capital, its non-productive part should not produce any additional revenues. Only those activities should be taken into account, which develop demanded skills.

The last step was to create dummy only for those high school activities, which correspond to the current occupation of individual (skills developed – skills demanded). In this case we obtain positive coefficient, however, it is not significant (t-statistics is only 1.4). Positive sign of coefficient means that some part of skills earned in the childhood is actually rewarded by higher wages in future only if the skills developed correspond to the skills demanded by the person's current job (Appendix 11a). But we cannot end with that because of insignificance. So, there is no evidence that hobby-job correspondence positively influences wages.

In order to check whether the fact that certain activity indicated as the main one by the respondent improves the situation, we have created the dummy for

main activity – job correspondence (through the skills developed and needed) and have included it into regression. The coefficient is insignificant (Appendix 11c). One of possible explanations of this fact is that main activity is a self assessed indicator and as different people have different criteria for main activities, the results do not reflect real situation. Second explanation is that due to decreasing marginal productivity of any kind of skills, non-active membership in two clubs can produce better outcome then active participation in one.

As it is stated in the literature it is highly likely that individuals are not assigned to activities randomly, as well as occupational choice probably is made in accordance with personal (or family) preferences, which are reflected by out-of-school activities.

We have used probit regression to check whether family background influences activity-job correspondence. Parental occupations, educational attainments and such characteristics as frequency of religion attendance, family poverty status are used as explanatory variables. According to the concept of transmission of abilities across generations (Mayer, 2008), family background is thought to be perfect explanation for dummy; the match of activity and job is random or is indirectly pushed by parents through their own example and personal attitudes (which are closely correlated with occupations, parental abilities and family characteristics). As it can be seen from the regression results (Appendix 12) these family variables do not explain much of variation in dummy (low R^2) but we still have some significant coefficients (for example for parental education, number of older siblings, religion attendance, several parental occupations). One of the interesting facts is that it appears that father's occupation has more influence on child's choice compared to occupation of mother. For example, father manager occupation has a huge impact on clubs-job correspondence. This fact confirms the concept of parental example: as managers are usually very organized and farseeing they force their children to participate in

those activities, which can produce some experience that may be useful at future job-place. So, we have an evidence of family background influence on clubs-jobs correspondence.

Family background also influences hobby choice as well (Appendix 13). In spite of low (0.02-0.06) R^2, some of the coefficients are significant. Frequently they are parental education, family size and parental occupations such as manager and sales. For example, technical occupation of father positively affects participation in school-sponsored hobbies; the fact that parents live together negatively affects probability of participation in performing arts (people who participate in arts usually thought to be more vulnerable and weak; and those things are direct consequences of not full families).

In addition, we have found the evidence of the fact that hobby (activity) influences future occupation (Appendix 14). Using the same estimation technique (probit) the following results were obtained. Participation in Nation Honor Society club positively affects probability of becoming a technician or manager, at the same time it negatively influence probability of becoming a clerk, craftsmen, operative worker, laborer and service worker. Participation in Community Youth Organizations such as scouts increases probability of becoming a technician, sales worker and decreases probability of becoming a manager and laborer. Paper work as activity increases probability of becoming a technical worker while decreases probability of becoming sales worker, craftsmen or laborer. Participation in student government organizations increases probability of becoming a manager, clerical worker and negatively affects probability of becoming a craftsman. Participation in athletics club significantly increases probability of becoming a sales worker and decreases probability of becoming a clerk. Participation in school sponsored hobbies decreases probability of becoming a clerk, operative and service workers. So, the data shows that in fact people choose their occupations rather close to recommendations of National Bureau of Labor

Statistics, namely they tend to choose occupations, which correspond to the skills developed by high school activities or at least they do not choose inappropriate occupations. For example, the table of demanded skills says that manager should possess interpersonal and communicative skills; student government develops such skills and data tells us that actually people who have participated in student government organizations are highly likely to become a manager.

These results allow to conclude that family background really influence 'child's choice': we have a selection to hobbies based on family variables and, moreover, the selection to hobby-job correspondence due to family background is also present (selection 'family-hobby', selection 'hobby-job' and as a result selection 'family to activity-job correspondence'). It means that at least partially the effect of activity-occupation correspondence should be due to self-selection. Individuals that have selected themselves to participate in certain activities and occupational choice possess special characteristics or motivation (dismotivation) and the observed effect is not pure effect of participation. Part of the effect is due to inborn traits *or* family influence. Our aim is to investigate does participation matters, so we are interested in taught part of the effect. Does participation (not family or motivation) help individuals to become more valuable on the labor market?

To measure the effect of family-based selection we use family background as an instrument for hobby-occupation correspondence. However, it appears that family background cannot be considered as a good instrument for occupation-activity correspondence (Appendix 15). The coefficient of dummy is positive but insignificant; tests of instrument say that underidentification hypothesis cannot be rejected, as well as overidentification hypothesis. It means that instruments are not valid, which leads to conclusion that in spite of family influence on choices, basing only on family characteristics there is no premium to hobby clubs attendance.

To overcome selection issue we controlled for family factors in wage regression (Appendix, 17). As it can be seen, some coefficients of family variables are really significant but including them does not make coefficient of dummy of less magnitude or standard error of the estimate greater or lower.

Then we have performed matching estimation. It allows to compare similar individuals taking into account not only family background characteristics but demographic and human capital characteristics as well. The results show that there is a significant difference in hourly wage rate for unmatched sample, and it preserves for matched sample as well. The difference in log of earnings between treated (dummy=1) and control (dummy=0) groups is 0.12 and this value is significant even at 5% level (see Table 4).

Probit part of the estimation procedure shows rather high R^2 for the wage regression determinants and high enough percentage of correctly predicted outcomes (81% of correctly predicted positive outcomes and 61% of correctly predicted negative outcomes).

Table 4. Propensity Score Matching estimation. Difference in log of wages between treated and non-treated individuals, matched and non-matched samples (treatment is hobby-job correspondence).

	Not matched sample	Matched sample
Difference in log of wages	0.1984***	0.1264**
	(0.0252)	(0.0589)
Observations	3416	3416
Standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%		

So, the results show that if individuals similar in terms of family background and demographic characteristics are compared, there is statistically significant difference between treated and control groups' wages and this result is stable to different matching mechanisms. Speaking about quality of matching, t-

tests for equality of means in the treated and non-treated groups shows that matching is performed quite successfully (really similar individuals are compared, the majority of means does not significantly differ between treated and non-treated groups).

When we use Propensity Score Matching estimation procedure to measure the effect of each separate activity it turns out that Athletic participants earn significantly more while Performing arts participants earn significantly less, the rest activities do not produce significant rewards or losses. However, in both cases of significant impact on wages the difference between treated and non-treated groups is less significant than in case of hobby-occupation correspondence. The results of PSM estimations for each separate activity participation are presented in Table 5.

Table 5. Propensity Score Matching estimation. Difference in log of wages between treated and non-treated individuals, matched and non-matched samples (each activity is considered as treatment).

	Log of wages							
	Unmatched				Matched			
	Treated	Controls	Difference	t-statistics	Treated	Controls	Difference	t-statistics
Community Youth Organizations	7.5156	7.4240	.0915***	3.54	7.5156	7.5129	.0026	0.07
School Sponsored Hobbies	7.5505	7.4172	.1332***	5.08	7.5505	7.5036	.0468	1.14
Student Government	7.4558	7.4365	.0193	0.82	7.4558	7.4578	-.0020	-0.06
Staff of Yearbook or Newspaper	7.4434	7.4408	.0025	0.10	7.4434	7.4767	-.0332	-0.86
Athletics	7.4911	7.3620	.1290***	6.12	7.4911	7.4241	.0670*	1.92
Band, Drama, Orchestra	7.4213	7.4515	-.0301	-1.35	7.4213	7.4844	-.0631*	-1.88
National Honor Society	7.5566	7.3942	.1623***	7.24	7.5566	7.5735	-.0169	-0.38
Other	7.4802	7.4394	.0408	1.05	7.4802	7.4267	.0534	1.00

* - significant at 10%, ** - significant at 5%, *** - significant at 1%

Chapter 6

CONCLUSIONS

In this work we tried to investigate whether those people whose high school hobbies correspond to current occupation (in terms of skills developed and requested) earn more. Using the data of the US Longitudinal Survey of Youth we have re-estimated regression of Barron, John M., Bradley, T. Ewing, Glen, R. Waddell and have made a conclusion that all the effect of athletic participation presented in the paper is the result of bias due to omitted variables (namely, occupations).

Using different specifications of the model we received no evidence that participation in certain activities lead to higher earnings. The effect of athletics participation described in the literature is the result of omitted variables bias (namely occupations). Speaking about hobby-occupation correspondence, we did not receive significant coefficient even in case when only relevant part of human capital proxied by High School activity participation pretends to be rewarded while irrelevant parts (skills developed do not correspond to occupation) are not rewarded (comparing to average person). But going deeper we have learned that there exists self-selection to hobbies and occupations based on family background.

Family background in fact has a great influence on 'child's choice': it affects (a) the choice of hobby, (b) occupational choice, (c) hobby-occupation correspondence, but it does not imply any additional earnings. And, moreover, cannot be considered as a valid measure of hobby-occupational correspondence (tests of instrumental variables validity are not passed). In addition to that, we found that participants of certain hobbies tend to choose occupations, which

demand skills developed during those activities. Taking into account the fact that in regression without occupations dummy for skills developed and demanded correspondence is positive and significant, it leads to conclusion that the major part of potential 'hobby-effect' is transmitted to the effect of occupations on earnings. Meaning that people who have chosen certain occupation can signal about ability by occupational choice itself.

However, when we compare similar individuals (Propensity score matching) we receive strong positive difference between wages of treated and non-treated people.

As it can be seen, different methods produce different outcomes and there is no strong evidence that hobby-occupational premium exists. But basing on obtained results we can point out importance of family in child's decisions and high correlation between out-of-school activities and occupational choice. We definitely observe indirect effect: participation in activities makes a person more appropriate for certain occupation, but wage actually depends not on part of human capital acquired through hobby participation but it is actually reflected in occupational earnings differentials. Including dummy for hobby-occupation correspondence make coefficients of some occupations of less magnitude.

So, due to high correlation between dummy for occupation-activity correspondence and test scores and occupational choice, potential employees can use their activities as a strong signal of ability and appropriateness for this particular occupation, but not only. PSM estimation results suggests that hobbies itself do help to become valuable (to receive return on the additional part of human capital acquired during hobby participation) as well as help to indicate the person's skills.

Speaking about directions of further research, it is reasonable to pay more attention not on direct effect of hobby participation on wages but rather on their

influence on other wage determinants (e. g. educational attainment, level of ability, occupational choice). Also, may be it is good idea to look on another labor market outcomes (not wages) such as labor force participation, hours worked, overtime, etc.

BIBLIOGRAPHY

Baron, Robert A., Markman Gideon D., 1993. *Beyond Social Capital: How Social Skills Can Enhance Entrepreneurs' Success.* The Academy of Management Executive, Vol. 14, No. 1, pp. 106 – 116.

Barron, John M., Bradley, T. Ewing, Glen, R. Waddell, 2000. *The Effects of High School Athletic Participation on Education and Labor Market Outcomes. The Review of Economics and Statistics, Vol. 82, No. 3, pp. 409 – 421.*

Becker, G., 1965. *A Theory of the Allocation of Time.* The Economic Journal, Vol. 75, No. 299, pp. 493 – 517.

Ben-Porath, Y., 1967. *The Production of Human Capital and the Life Cycle of Earnings.* The Journal of Political Economy, Vol. 75, No. 4, Part 1, pp. 352 – 365.

Bowles, S., Gintis,„H. Osborne, M., 2001. *The Determinants of Earnings: A Behavioural Approach.* Journal of Economic Literature, Vol. 39, No. 4, pp. 1137 – 1176.

Bray, J., 2005. *Alcohol Use, Human Capital, and Wages.* Journal of Labor Economics, 2005, Vol. 23, Is. 2, pp. 279 – 312.

Cole, K., Daly, A., Mak, A., 2008. *Good for the soul: The relationship between work, wellbeing, psychological capital.* University of Canberra, Working paper.

Crawther, B., Kahn, A., 1983. *Arts and Leisure Activities.* American Behavioural Scientist, Vol. 26, Is. 509.

Gaag, V., Martin P. J., Snijders, Tom A. B., 2003. *Proposals for the measurement of individual social capital.* H. Flap and B. Völker (eds.), London: Routledge, 2003, pp. 199 – 218.

Galunic, D. Charles, Anderson, E., 2000. *From Security to Mobility: Generalized Investments in Human Capital and Agent Commitment.* Organization Science, Vol. 11, No. 1, pp. 1 – 20.

Heckman, James J., 2000. *Policies to foster human capital.* Research in Economics, Elsevier, vol. 54(1), pp. 3 – 56.

Heckman, J. Richard, Lawler, Edward E., 1971. *Employee reactions to job characteristics.* Journal of Applied Psychology, Vol. 55, No. 3, pp. 259 – 286.

Kao, C., Polachek, Solomon W., Wunnava, Phanindra V., 1994. *Male-Female Wage Differentials in Taiwan: A Human Capital Approach.* Economic Development and Cultural Change, Vol. 42, No. 2, pp. 351 – 374.

Kasper, Henry T., 2004. *Matching*

yourself with world of work. Occupational Outlook Quarterly, Vol. 43, No.1, pp. 2 – 21.

Kenkel, D. S., David C. Ribar, 1994. *Alcohol Consumption and Young Adults' Socioeconomic Status*. Brookings Papers on Economics

Activity: Microeconomics, pp. 119 – 175.

Kuhn, P., Weinberger, C., 2002. *Leadership skills and wages*. University of California Working paper No 2'02.

Lencher, M. 2008. *Long-run labor market effects of individual sports activities*. University of St. Gallen Discussion paper No 2008-13.

Mayer, A., 2008. *Education, Self-Selection, and Intergenerational Transmission of Abilities*. Journal of Human Capital, Vol. 2, Is. 1, pp. 106-128.

Mincer, J., 1958. *Investment in human capital and personal income distribution*. The Journal of Political Economy, Vol. 66, No. 4, pp. 281 – 302.

Mullahy, J., Jody L. Sindelar, 1991. *Gender Differences in Labor Market Effects of Alcoholism*. American Economic Review (Papers and Proceedings) , pp. 161 – 165.

Orazem, Peter F., Mattila J. Peter, 1991. *Human Capital, Uncertain Wage Distributions, and Occupational and Educational Choices*. International Economic Review, Vol. 32, No. 1, pp. 103 – 122.

Persico, N., Postlewaite, A., Silverman, D., 2004. *The Effect of Adolescent Experience on Labor Market Outcomes: The Case of Height*. Department of Economics, University of Pennsylvania Working paper.

Schultz, T. Paul, 2003. *Human capital, schooling and health returns*. Yale University Center Discussion paper No. 853.

Sims, Henry R., Szilagyi, A., Keller, R., 1976. *The Measurement of Job Characteristics*. Academy of Management Journal, Vol. 26, No. 2, pp. 195 – 212.

Stevenson, B., 2006. *Beyong the classroom: using Title IX to measure the return to high school sports*. The Wharton School, University of Pennsylvania Working paper No 2006-44.

Willis, Robert J. 1992. *Wage determinants: A survey and reinterpretation of human capital earnings functions*. Handbook of labor economics, vol. 1, ed. Orley Ashenfelter and Richard Layard. New York: North Holland.

Wolfradt, U., Pretz Jean E., 2000. *Individual differences in creativity: personality, story writing and hobbies*. European Journal of Personality, Vol. 15, Is. 4, pp. 297 – 310.

Appendix 1

EXAMPLE OF SKILLS-OCCUPATION CORRESPONDENCE TABLE

	Personal skills							Job characteristics				
	Artistic	Communication	Interpersonal	Managerial	Mathematics	Mechanical	Science	Economically sensitive	Geographically concentrated	Hazardous conditions	Outdoor work	Physically demanding
Management, business, and financial operations occupations												
Management occupations												
Administrative services managers	○	●	●	●	⊙			○				
Advertising, marketing, promotions, public relations, and sales managers	●	●	●	●	●	⊙		●				
Computer and information systems managers		●	●	●	●	●	●	●				
Construction managers	○	●	●	●	●	●	⊙	●		⊙	●	○
Education administrators		●	●	●	⊙		○					
Engineering and natural sciences managers		●	●	●	●	●	●	⊙				
Farmers, ranchers, and agricultural managers		●	●	●	⊙	●	⊙	○	●	⊙	●	⊙
Financial managers		●	●	●	●		○	⊙				
Food service managers	⊙	●	●	●	⊙	⊙	○	⊙				○
Funeral directors	○	●	●	⊙	⊙	○	○					○
Human resources, training, and labor relations managers and specialists		●	●	●	○			○				
Industrial production managers		●	●	●	●	○	⊙	○		⊙		○
Lodging managers	○	●	●	●	⊙	○		○				
Medical and health services managers		●	●	●	⊙	⊙	⊙					
Property, real estate, and community association managers	○	●	●	●	○	○		○			○	
Purchasing managers, buyers, and purchasing agents		●	●	●	⊙		○	○				
Top executives	○	●	●	●	●		⊙	○				
Business and financial operations occupations												
Accountants and auditors		○	○	⊙	●			○				
Budget analysts		○	○	○	●							
Claims adjusters, appraisers, examiners, and investigators		⊙	○	⊙	⊙	⊙	○				⊙	
Cost estimators		○	○	○	●	○		⊙			⊙	
Financial analysts and personal financial advisors		●	●	○	●		○	●				

Appendix 2

STATISTICS ON OCCUPATIONS

(SAMPLE, MALES, FEMALES), YEAR 2000

Occupations	Total	Males	Females
Technical worker	176	74	102
Manager	168	100	68
Sales worker	29	14	15
Clerical worker	67	11	54
Craftsman	29	21	8
Armed worker	1	1	0
Operative worker	18	15	3
Laborer	11	8	3
Service worker	33	10	23
All	532	254	276

Appendix 3

STATISTICS ON HIGH SCGOOL ACTIVITIES PARTICIPATION
(SAMPLE, MALES, FEMALES)

Out-of-School activities	Total	Males	Females
Community Youth Organizations	84	44	40
School Sponsored Hobbies	83	40	43
Student Government	112	46	66
Staff of Yearbook or Newspaper	82	31	51
Athletics	254	140	114
Band, Drama, Orchestra	131	51	80
National Honor Society	113	48	65
Other	40	11	29
None	43	19	24
All	942	430	512

Appendix 4

STATISTICS ON ACTIVITIES PARTICIPATION CONDITIONAL ON OCCUPATIONS: (TECHNICAL WORKERS, MANAGERS, SALES WORKERS AND CLERICAL WORKERS), YEAR 2000

Out-of-School activities	Technical	Manager	Sales	Clerical
Community Youth Organizations	20,4%	20,7%	40,0%	13,2%
School Sponsored Hobbies	26,1%	20,8%	25,0%	13,2%
Student Government	30,3%	28,9%	20,0%	20,8%
Staff of Yearbook or Newspaper	27,5%	15,6%	20,0%	15,1%
Athletics	62,7%	63,0%	70,0%	54,7%
Band, Drama, Orchestra	35,2%	26,7%	40,0%	39,6%
National Honor Society	30,3%	28,2%	35,0%	22,6%
Other	12,0%	8,9%	0,0%	9,4%

Appendix 5

STRUCTURE OF ACTIVITIES PARTICIPATIONS (BY OCCUPATIONS), YEAR 2000

	Commu-nity Youth Organiza-tions	School Sponso-red Hobbies	Student Govern-ment	Staff of Yearbook or Newspaper	Athletics	Band, Drama, Orchestra	National Honor Society
Technical	34,52%	44,57%	38,39%	47,56%	35,04%	38,16%	38,05%
Manager	33,33%	30,12%	34,82%	20,73%	33,46%	27,48%	33,62%
Sales	9,52%	6,02%	3,57%	4,88%	5,51%	6,10%	6,19%
Clerical	8,33%	8,43%	9,82%	9,76%	11,41%	16,03%	10,62%
Craftsmen	5,95%	4,82%	3,57%	4,87%	4,33%	3,05%	1,77%
Other occupation	8,35%	6,04%	9,83%	12,20%	10,25%	9,18%	9,75%

Appendix 6

AVERAGE LOG OF WAGES FOR PARTICIPANTS OF DIFFERENT ACTIVITIES, YEAR 2000

Out-of-School activities:	Log of wages:
Community Youth Organizations	7,58
School Sponsored Hobbies	7,62
Student Government	7,60
Staff of Yearbook or Newspaper	7,45
Athletics	7,55
Band, Drama, Orchestra	7,48
National Honor Society	7,65
None	7,42

Appendix 7

DISCRIPTIVE STATISTICS OF ALL VARIABLES USED (SAMPLE, TREATED, NON-TREATED), YEAR 2000

Variable	All sample	Treated	Non-treated
Log of wages	7.5273 (.6853)	7.5626 (.7276)	7.3813 (.4466)
Age of individual	38.8894 (2.1881)	38.9313 (2.2114)	38.716 (2.0931)
Tenure with current employer, years	4.758 (5.5265)	4.5626 (5.2427)	5.5665 (6.5469)
College degree	.2476 (.4321)	.2657 (.4424)	.1728 (.3805)
The individual is married	.613 (.4877)	.6567 (.4755)	.4321 (.4985)
Female	.5264 (.4999)	.4925 (.5007)	.6667 (.4743)
Female with children	.351 (.4778)	.3463 (.4765)	.3704 (.4859)
Dummy for urban community	.762 (.443)	.7433 (.4575)	.8395 (.3694)
Income of spouse, $1000	20.1314 (30.0087)	21.2738 (31.4089)	15.4068 (22.9062)
Math score, percentile	.4983 (.1832)	.5173 (.1834)	.4198 (.1615)
Verbal score, percentile	.4648 (.162)	.4796 (.1608)	.404 (.1534)
The individual is Afro-American	.2115 (.4089)	.197 (.3983)	.2716 (.4476)
Other race	.0313 (.1742)	.0239 (.1529)	.0617 (.2422)
Service worker	.0553 (.2288)	.0418 (.2004)	.1111 (.3162)
Laborer	.0168 (.1288)	.009 (.0943)	.0494 (.218)
Operative worker	.0337 (.1806)	.0299 (.1704)	.0494 (.218)
Armed worker	.0024 (.049)	.003 (.0546)	- -
Craftsman	.0505 (.2192)	.0418 (.2004)	.0864 (.2827)
Clerical worker	.1274 (.3338)	.1254 (.3316)	.1358 (.3447)
Sales worker	.0481 (.2142)	.0567 (.2316)	.0123 (.1111)
Managerial position	.3245 (.4688)	.3433 (.4755)	.2469 (.4339)
Technical worker	.3413 (.4747)	.3493 (.4774)	.3086 (.4648)

DISCRIPTIVE STATISTICS OF ALL VARIABLES USED (SAMPLE, TREATED, NON-TREATED), YEAR 2000 (CONT'D)

Variable	All sample	Treated	Non-treated
Highest grade completed by mother	12.2764 (3.0973)	12.4776 (2.9281)	11.4444 (3.6194)
Highest grade completed by father	12.6947 (3.7379)	12.9403 (3.6969)	11.679 (3.7577)
Parents live together	.0673 (.2509)	.0746 (.2632)	.037 (.19)
Number of siblings	3.2428 (2.1207)	3.1522 (2.1313)	3.6173 (2.0468)
Number of siblings older then respondent	1.8077 (1.8722)	1.6985 (1.888)	2.2593 (1.7448)
Mother: Technical worker	.5889 (.4926)	.6179 (.4866)	.4691 (.5022)
Mother: Managerial position	.024 (.1534)	.0239 (.1529)	.0247 (.1561)
Mother: Sales worker	.0264 (.1606)	.0269 (.1619)	.0247 (.1561)
Mother: Clerical worker	.1442 (.3517)	.1433 (.3509)	.1481 (.3575)
Mother: Craftsman	.0096 (.0977)	.006 (.0772)	.0247 (.1561)
Mother: Operative worker	.0793 (.2706)	.0657 (.2481)	.1358 (.3447)
Mother: Farmer	- -	- -	- -
Mother: Farm laborer	.0024 (.049)	.003 (.0546)	- -
Mother: Laborer	.0048 (.0693)	.003 (.0546)	.0123 (.1111)
Mother: Service worker	.0913 (.2884)	.0836 (.2772)	.1235 (.331)
Father: Technical worker	.3846 (.4871)	.3821 (.4866)	.3951 (.4919)
Father: Managerial position	.1298 (.3365)	.1373 (.3447)	.0988 (.3002)
Father: Sales worker	.0529 (.2241)	.0507 (.2198)	.0617 (.2422)
Father: Clerical worker	.0192 (.1375)	.0149 (.1214)	.037 (.19)
Father: Craftsman	.1683 (.3746)	.1701 (.3763)	.1605 (.3694)
Father: Operative worker	.0913 (.2884)	.0925 (.2902)	.0864 (.2827)
Father: Laborer	.0409 (.1982)	.0418 (.2004)	.037 (.19)
Father: Farmer	.0264 (.1606)	.0269 (.1619)	.0247 (.1561)
Father: Service worker	.0481 (.2142)	.0478 (.2136)	.0494 (.218)

DISCRIPTIVE STATISTICS OF ALL VARIABLES USED (SAMPLE, TREATED, NON-TREATED), YEAR 2000 (CONT'D)

Variable	All sample	Treated	Non-treated
Frequency of religious attendance	3.738 (1.6165)	3.7881 (1.6268)	3.5309 (1.5659)
Family size	4.6995 (1.9185)	4.6448 (1.8929)	4.9259 (2.0173)
Family poverty status	.1274 (.3338)	.1194 (.3247)	.1605 (.3694)
Not English language at home	.0481 (.2142)	.0478 (.2136)	.0494 (.218)
Ideal number of children	2.899 (1.0996)	2.9164 (1.1156)	2.8272 (1.0343)
Seek more education if not able to support family	1.1178 (.3227)	1.1224 (.3282)	1.0988 (.3002)
Observations	416	335	81
Standard deviations in parentheses			

Appendix 8

BASIC REGRESSION. LOG OF HOURLY WAGES AS A FUNCTION OF HUMAN CAPITAL AND DEMOGRAPHIC CHARACTERISTICS

	Log of wage
Age of individual	0.1442*** (0.0391)
Age, square term	-0.0015*** (0.0005)
Tenure with current employer, years	0.0380*** (0.0060)
Tenure with current employer, square term	-0.0012*** (0.0003)
College degree	0.1224*** (0.0307)
The individual is married	0.0450 (0.0305)
Female	-0.2089*** (0.0352)
Female with children	-0.0808** (0.0338)
Dummy for urban community	0.0880*** (0.0226)
Income of spouse, $1000	0.0019*** (0.0005)
Math score, percentile	0.4423*** (0.1132)
Verbal score, percentile	0.2349* (0.1339)
The individual is Afro-American	0.0062 (0.0318)
Other race	-0.1489** (0.0641)
Other occupation	0.5877* (0.3053)
Household occupation	-1.0188*** (0.3744)
Service worker	-0.2410*** (0.0509)
Farm laborer	-0.5232** (0.2339)
Farmer	-0.4299 (0.3013)

BASIC REGRESSION. LOG OF HOURLY WAGES AS A FUNCTION OF HUMAN CAPITAL AND DEMOGRAPHIC CHARACTERISTICS (CONT'D)

	Log of wage
Laborer	-0.2710*** (0.0579)
Operative worker	-0.1110** (0.0461)
Armed worker	-0.1913* (0.1120)
Craftsman	-0.0317 (0.0351)
Sales worker	0.1703*** (0.0491)
Managerial position	0.1166*** (0.0336)
Technical worker	0.1726*** (0.0308)
Constant	3.5591*** (0.7180)
Observations R-squared	3426 0.32
Robust standard errors in parentheses	
* significant at 10%; ** significant at 5%; *** significant at 1%	

Appendix 9

OLS ESTIMATION. WAGE REGRESSION INCLUDING ACTIVITIES DUMMIES AND DUMMIES FOR ACTIVE PARTICIPATION

	Log of wages	
	(a)	(b)
Age of individual	0.1417***	0.1429***
	(0.0390)	(0.0390)
Age, square term	-0.0014***	-0.0015***
	(0.0005)	(0.0005)
Tenure with current employer, years	0.0385***	0.0382***
	(0.0060)	(0.0059)
Tenure with current employer, square term	-0.0012***	-0.0012***
	(0.0003)	(0.0003)
College degree	0.1170***	0.1228***
	(0.0314)	(0.0306)
The individual is married	0.0432	0.0456
	(0.0302)	(0.0304)
Female	-0.2077***	-0.2122***
	(0.0370)	(0.0362)
Female with children	-0.0785**	-0.0812**
	(0.0340)	(0.0340)
Dummy for urban community	0.0914***	0.0887***
	(0.0228)	(0.0227)
Income of spouse, $1000	0.0019***	0.0020***
	(0.0005)	(0.0005)
Math score, percentile	0.4257***	0.4565***
	(0.1142)	(0.1131)
Verbal score, percentile	0.2185	0.2056
	(0.1347)	(0.1340)
The individual is Afro-American	-0.0004	0.0033
	(0.0333)	(0.0318)
Other race	-0.1554**	-0.1451**
	(0.0662)	(0.0653)
Other occupation	0.5836*	0.6120**
	(0.3055)	(0.2958)
Household occupation	-1.0024***	-1.0243***
	(0.3758)	(0.3752)
Service worker	-0.2403***	-0.2430***
	(0.0509)	(0.0510)
Farm laborer	-0.5210**	-0.5277**
	(0.2358)	(0.2355)
Farmer	-0.4281	-0.4340
	(0.3049)	(0.2996)
Laborer	-0.2703***	-0.2692***
	(0.0580)	(0.0568)
Operative worker	-0.1131**	-0.1114**
	(0.0464)	(0.0460)

OLS ESTIMATION. WAGE REGRESSION INCLUDING ACTIVITIES DUMMIES AND DUMMIES FOR ACTIVE PARTICIPATION (CONT'D)

	Log of wages	
	(a)	(b)
Armed worker	-0.1993* (0.1154)	-0.2029* (0.1149)
Craftsman	-0.0348 (0.0352)	-0.0344 (0.0354)
Sales worker	0.1639*** (0.0492)	0.1738*** (0.0489)
Managerial position	0.1136*** (0.0334)	0.1150*** (0.0335)
Technical worker	0.1690*** (0.0307)	0.1694*** (0.0308)
Community Youth Organizations	0.0279 (0.0306)	
School Sponsored hobbies	0.0291 (0.0361)	
Student government	0.0004 (0.0314)	
Yearbook, journal, paper work	0.0093 (0.0343)	
Athletics	0.0286 (0.0267)	
Performing Arts	-0.0111 (0.0286)	
National Honor Society Club	0.0078 (0.0301)	
Other club	0.0575 (0.0430)	
Active: Community Youth Organizations		-0.0082 (0.0700)
Active: School Sponsored hobbies		-0.0714 (0.0763)
Active: Student government		0.0339 (0.0641)
Active: Yearbook, journal, paper work		0.0918 (0.0631)
Active: Athletics		0.0037 (0.0318)
Active: Performing Arts		0.0152 (0.0376)
Active: National Honor Society Club		-0.0280 (0.0782)
Active: Other club		0.1022 (0.0914)
Constant	3.5879*** (0.7172)	3.5767*** (0.7183)
Observations	3426	3426
R-squared	0.32	0.32
Robust standard errors in parentheses		
* significant at 10%; ** significant at 5%; *** significant at 1%		

Appendix 10

OLS ESTIMATION. REPLICATION OF WORK ON EFFECT OF ATHLETIC PARTICIPATION ON WAGES (BARRON ET AL., 2000)

Replication results:

	Log of wage
Athletic participation	0.2753*** (0.0274)
The individual is Afro-American	-0.3254*** (0.0315)
Other race	-0.1025* (0.0621)
Urban community	0.2073*** (0.0353)
Log of age	0.8911*** (0.1913)
Log of tenure with current employer	0.1246*** (0.0101)
Constant	2.7649*** (0.6558)
Observations R-squared	3293 0.12
Standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%	

Results obtained by Barron, John M., Bradley, T. Ewing, Glen, R. Waddell:

	Log of wage
Athletic participation	0.279** (6.25)
The individual is Afro-American	-0.339** (5.98)
Other race	-0.187 (1.43)
Urban community	0.050 1.11
Log of age	0.210 (0.50)
Log of tenure with current employer	0.190** (6.33)
Constant	5.220** (3.61)
Observations R-squared	891 0.12
Standard errors in parentheses * significant at 10%; ** significant at 5%	

Appendix 11

OLS ESTIMATION. WAGE REGRESSION WITH OMITTED VARIABLES

	Log of wage
Age of individual	0.1000* (0.0592)
Age, square term	-0.0007 (0.0008)
Tenure with current employer, years	0.0429*** (0.0096)
Tenure with current employer, square term	-0.0016*** (0.0006)
Dummy for urban community	0.0957** (0.0371)
Verbal score, percentile	0.8683*** (0.1365)
The individual is Afro-American	-0.1883*** (0.0573)
Other race	-0.2599* (0.1554)
Athletics	0.1005** (0.0474)
Constant	4.2181*** (1.0921)
Observations R-squared	1762 0.19
Robust standard errors in parentheses	
* significant at 10%; ** significant at 5%; *** significant at 1%	

Appendix 12

OLS ESTIMATION. WAGE REGRESSION WITH DUMMIES FOR ACTIVE PARTICIPATION, ANY CLUB AND APPROPRIATE ONE

	Log of wages		
	(1)	(2)	(3)
Age of individual	0.1455***	0.1445***	0.1432***
	(0.0391)	(0.0391)	(0.0393)
Age, square term	-0.0015***	-0.0015***	-0.0015***
	(0.0005)	(0.0005)	(0.0005)
Tenure with current employer, years	0.0382***	0.0381***	0.0379***
	(0.0059)	(0.0060)	(0.0060)
Tenure with current employer, square term	-0.0012***	-0.0012***	-0.0012***
	(0.0003)	(0.0003)	(0.0003)
College degree	0.1206***	0.1215***	0.1240***
	(0.0309)	(0.0309)	(0.0310)
The individual is married	0.0428	0.0444	0.0455
	(0.0305)	(0.0305)	(0.0305)
Female	-0.2050***	-0.2091***	-0.2096***
	(0.0354)	(0.0352)	(0.0352)
Female with children	-0.0821**	-0.0807**	-0.0797**
	(0.0338)	(0.0338)	(0.0338)
Dummy for urban community	0.0899***	0.0890***	0.0873***
	(0.0226)	(0.0226)	(0.0227)
Income of spouse, $1000	0.0019***	0.0019***	0.0020***
	(0.0005)	(0.0005)	(0.0005)
Math score, percentile	0.4333***	0.4378***	0.4469***
	(0.1129)	(0.1131)	(0.1134)
Verbal score, percentile	0.2339*	0.2318*	0.2348*
	(0.1336)	(0.1339)	(0.1340)
The individual is Afro-American	0.0043	0.0046	0.0070
	(0.0318)	(0.0317)	(0.0317)
Other race	-0.1462**	-0.1498**	-0.1511**
	(0.0648)	(0.0641)	(0.0641)
Other occupation	0.6084**	0.6015**	0.5842*
	(0.3012)	(0.3029)	(0.3063)
Household occupation	-1.0010***	-1.0040***	-1.0216***
	(0.3712)	(0.3727)	(0.3752)
Service worker	-0.2405***	-0.2459***	-0.2418***
	(0.0507)	(0.0512)	(0.0511)
Farm laborer	-0.5279**	-0.5322**	-0.5248**
	(0.2338)	(0.2337)	(0.2348)
Farmer	-0.4293	-0.4386	-0.4303
	(0.3060)	(0.3014)	(0.3011)
Laborer	-0.2739***	-0.2775***	-0.2714***
	(0.0578)	(0.0578)	(0.0579)
Operative worker	-0.1105**	-0.1152**	-0.1110**
	(0.0457)	(0.0462)	(0.0462)

OLS ESTIMATION. WAGE REGRESSION WITH DUMMIES FOR ACTIVE PARTICIPATION, ANY CLUB AND APPROPRIATE ONE (CONT'D)

	Log of wages		
	(1)	(2)	(3)
Craftsman	-0.0343 (0.0350)	-0.0359 (0.0353)	-0.0319 (0.0352)
Managerial position	0.1092*** (0.0339)	0.1376*** (0.0444)	0.1193*** (0.0335)
Technical worker	0.1666*** (0.0307)	0.1673*** (0.0310)	0.1733*** (0.0306)
Dummy for activity-occupation correspondence	0.0417 (0.0296)		
Dummy for any activity participation		0.0292 (0.0369)	
Active: Dummy for activity-occupation correspondence			-0.0142 (0.0250)
Constant	3.5061*** (0.7209)	3.5340*** (0.7200)	3.5814*** (0.7235)
Observations R-squared	3426 0.32	3426 0.32	3426 0.32
Robust standard errors in parentheses			
* significant at 10%; ** significant at 5%; *** significant at 1%			

Appendix 13

PROBIT ESTIMATION. HOBBY-JOB CORRESPONDENCE AND FAMILY BACKGROUND

	Log of wage
Highest grade completed by mother	0.0341*** (0.0114)
Highest grade completed by father	0.0287*** (0.0094)
Parents live together	-0.0433 (0.1214)
Number of siblings	0.0170 (0.0233)
Number of siblings older then respondent	-0.0381* (0.0224)
Mother: Technical worker	-0.0645 (0.0669)
Mother: Managerial position	-0.3047* (0.1584)
Mother: Craftsman	-0.4772** (0.2327)
Mother: Operative worker	-0.1582 (0.1047)
Mother: Farm laborer	0.6952 (0.4453)
Mother: Service worker	-0.0877 (0.1004)
Mother: Household occupation	0.3237* (0.1956)
Father: Technical worker	0.1488 (0.1014)
Father: Managerial position	0.2775** (0.1160)
Father: Sales worker	0.2357 (0.1455)
Father: Craftsman	0.2756** (0.1109)
Father: Operative worker	0.1827 (0.1194)
Father: Laborer	0.1095 (0.1612)
Father: Farmer	0.5473*** (0.1674)
Father: Service worker	0.5010*** (0.1594)
Frequency of religious attendance	0.0378** (0.0159)
Family size	-0.0083 (0.0198)

PROBIT ESTIMATION. HOBBY-JOB CORRESPONDENCE AND FAMILY BACKGROUND (CONT'D)

	Log of wage
Family poverty status	-0.0825 (0.0795)
Not English language at home	0.0678 (0.1150)
Ideal number of children	0.0956*** (0.0268)
Seek more education if not able to support family	0.0684 (0.0789)
Constant	-0.5304** (0.2132)
Observations	3416
Standard errors in parentheses * significant at 10%; ** significant at 5%; *** significant at 1%	

Appendix 14

PROBIT ESTIMATION. FAMILY BACKGROUND AND HOBBY CHOICE

	Probability of particular activity choice							
	Community Youth Organizations	School Sponsored Hobbies	Student Government	Staff of Yearbook or Journal	Athletics	Performing Arts	National Honor Society Club	Other Club
Highest grade completed by mother	0.012 (0.012)	0.016 (0.012)	0.048*** (0.011)	0.077*** (0.012)	0.014 (0.010)	0.090*** (0.011)	0.036*** (0.011)	-0.011 (0.014)
Highest grade completed by father	0.021** (0.009)	0.015 (0.010)	-0.016* (0.009)	-0.028*** (0.009)	0.026*** (0.008)	0.001 (0.009)	0.003 (0.009)	0.001 (0.012)
Parents live together	0.451*** (0.117)	-0.208 (0.127)	-0.042 (0.120)	-0.042 (0.124)	0.181* (0.108)	-0.483*** (0.116)	-0.210* (0.116)	-0.011 (0.155)
Number of siblings	-0.008 (0.024)	-0.023 (0.025)	-0.043* (0.022)	-0.042* (0.024)	-0.031 (0.020)	0.004 (0.021)	0.023 (0.022)	-0.011 (0.030)
Number of siblings older then respondent	-0.054** (0.023)	-0.025 (0.024)	0.044** (0.021)	0.016 (0.022)	0.000 (0.020)	-0.037* (0.021)	-0.026 (0.021)	0.064** (0.029)
Mother: Technical worker	-0.046 (0.066)	0.155** (0.067)	0.150** (0.064)	-0.014 (0.066)	-0.127** (0.059)	0.101* (0.061)	-0.065 (0.060)	-0.104 (0.085)
Mother: Managerial position	0.122 (0.153)	0.292* (0.155)	-0.150 (0.167)	0.112 (0.157)	-0.110 (0.146)	-0.117 (0.149)	-0.288* (0.153)	0.127 (0.200)
Mother: Craftsman	0.152 (0.245)	0.382 (0.238)	-0.174 (0.262)	-0.072 (0.264)	-0.385* (0.227)	-0.725** (0.309)	-0.204 (0.239)	0.517* (0.265)
Mother: Operative worker	-0.059 (0.115)	0.002 (0.118)	0.213** (0.103)	0.275*** (0.105)	-0.386*** (0.095)	0.196* (0.101)	-0.184* (0.102)	-0.165 (0.148)
Mother: Service worker	0.186* (0.100)	0.118 (0.106)	0.133 (0.097)	0.154 (0.099)	-0.220** (0.090)	0.090 (0.094)	-0.213** (0.095)	0.265** (0.121)
Mother: Household occupation	0.857*** (0.166)	0.244 (0.188)	-0.390** (0.193)	-0.113 (0.187)	0.014 (0.161)	-0.049 (0.176)	0.142 (0.164)	-0.108 (0.241)
Father: Technical worker	0.353*** (0.119)	0.453*** (0.1323	0.439*** (0.119)	0.149 (0.114)	0.026 (0.095)	-0.087 (0.101)	-0.088 (0.100)	0.311* (0.160)
Father: Managerial position	0.347*** (0.129)	0.614*** (0.140)	0.503*** (0.129)	0.389*** (0.124)	0.022 (0.106)	-0.046 (0.112)	-0.085 (0.112)	0.274 (0.174)
Father: Sales worker	0.200 (0.157)	0.572*** (0.163)	0.650*** (0.152)	0.196 (0.154)	0.313** (0.135)	-0.273* (0.142)	-0.062 (0.138)	0.014 (0.223)
Father: Craftsman	0.198 (0.129)	0.464*** (0.140)	0.522*** (0.126)	0.288** (0.122)	-0.014 (0.102)	0.017 (0.110)	0.252** (0.107)	0.223 (0.171)
Father: Operative worker	0.171 (0.139)	0.651*** (0.148)	0.639*** (0.133)	0.079 (0.134)	0.073 (0.111)	0.145 (0.119)	0.142 (0.117)	0.174 (0.187)
Father: Laborer	-0.310 (0.216)	0.134 (0.213)	0.662*** (0.168)	0.584*** (0.166)	0.011 (0.150)	0.218 (0.159)	-0.164 (0.164)	0.567*** (0.216)

PROBIT ESTIMATION. FAMILY BACKGROUND AND HOBBY CHOICE (CONT'D)

	Probability of particular activity choice							
	Commu-nity Youth Organiza-tions	School Sponso-red Hobbies	Student Govern-ment	Staff of Yearbook or Journal	Athletics	Perfor-ming Arts	National Honor Society Club	Other Club
Father: Service worker	0.222 (0.166)	0.658*** (0.170)	0.551*** (0.162)	0.063 (0.167)	0.137 (0.140)	-0.002 (0.147)	-0.216 (0.150)	0.378* (0.211)
Frequency of religious attendance	0.063*** (0.016)	0.025 (0.016)	0.093*** (0.015)	0.078*** (0.016)	0.000 (0.014)	0.107*** (0.015)	0.034** (0.014)	-0.011 (0.020)
Family size	-0.022 (0.020)	-0.048** (0.021)	0.039** (0.019)	0.011 (0.020)	0.046*** (0.017)	-0.069*** (0.018)	-0.003 (0.018)	-0.049** (0.024)
Family poverty status	-0.249*** (0.090)	-0.293*** (0.097)	0.240*** (0.078)	0.100 (0.083)	-0.178** (0.072)	0.091 (0.078)	-0.060 (0.078)	0.001 (0.106)
Not English language at home	-0.234* (0.135)	-0.044 (0.127)	0.260** (0.108)	-0.027 (0.117)	-0.151 (0.102)	-0.189 (0.116)	0.092 (0.107)	0.444*** (0.128)
Ideal number of children	0.039 (0.025)	-0.033 (0.026)	-0.001 (0.024)	0.050** (0.025)	0.124*** (0.023)	0.017 (0.023)	-0.075*** (0.024)	0.058* (0.030)
Seek more education if not able to support family	-0.105 (0.082)	0.036 (0.078)	-0.163** (0.077)	0.051 (0.077)	0.224*** (0.071)	-0.180** (0.075)	-0.232*** (0.075)	-0.030 (0.102)
Mother: Farm laborer			1.003*** (0.362)	0.862** (0.372)	-0.228 (0.370)			
Constant	-1.574*** (0.237)	-1.541*** (0.242)	-2.000*** (0.222)	-2.140*** (0.230)	-0.856*** (0.195)	-1.565*** (0.213)	-0.641*** (0.206)	-1.505*** (0.293)
Observations	3403	3403	3416	3416	3416	3403	3403	3403
Standard errors in parentheses								
* significant at 10%; ** significant at 5%; *** significant at 1%								

Appendix 15

PROBIT ESTIMATION. HIGH SCHOOL ACTIVITIES PARTICIPATION AND OCCUPATIONAL CHOICE

	Probability of occupational choice										
	Technical worker	Mana-ger	Sales worker	Clerical worker	Craftsman	Armed worker	Opera-tive worker	Laborer	Farmer	Farm Laborer	Service worker
Community Youth Organiza-tions	0.141** (0.055)	-0.107* (0.062)	0.173* (0.091)	-0.122* (0.073)	0.110 (0.073)	0.232 (0.216)	-0.202* (0.113)	-0.325** (0.164)	-0.313 (0.372)		-0.125 (0.094)
School Sponsored hobbies	0.097* (0.057)	0.013 (0.062)	0.079 (0.097)	-0.158** (0.076)	0.042 (0.078)	-0.168 (0.281)	-0.171 (0.117)	-0.066 (0.147)		0.124 (0.399)	-0.172* (0.101)
Student government	-0.028 (0.053)	0.097* (0.057)	-0.042 (0.093)	0.072 (0.067)	-0.140* (0.075)	-0.546 (0.338)	-0.020 (0.101)	-0.029 (0.132)	0.087 (0.264)	-0.073 (0.399)	0.043 (0.085)
Year-book, journal, paper work	0.175** (0.055)	-0.028 (0.061)	-0.255** (0.106)	-0.022 (0.071)	-0.143* (0.079)	-0.115 (0.270)	0.069 (0.101)	-0.359** (0.167)	0.183 (0.263)	0.012 (0.393)	-0.025 (0.091)
Athletics	-0.0103 (0.0459)	0.0464 (0.0502)	0.2702** (0.0848)	-0.2677** (0.0558)	0.0283 (0.0610)	0.0639 (0.1928)	0.0379 (0.0834)	0.2329** (0.1145)	0.0893 (0.2378)	0.3470 (0.3568)	-0.0163 (0.0722)
Performing Arts	-0.029 (0.049)	-0.004 (0.054)	0.139 (0.085)	0.043 (0.061)	-0.090 (0.068)	-0.152 (0.230)	-0.033 (0.093)	0.104 (0.119)	-0.478 (0.329)	0.261 (0.316)	0.097 (0.078)
National Honor Society Club	0.281** (0.049)	0.154** (0.054)	-0.028 (0.088)	-0.248** (0.066)	-0.272** (0.072)	0.219 (0.212)	-0.191* (0.098)	-0.141 (0.128)	0.365 (0.239)		-0.328** (0.088)
Other club	0.122 (0.082)	0.016 (0.090)	-0.011 (0.149)	-0.057 (0.105)	-0.183 (0.121)	0.290 (0.282)	0.114 (0.142)	-0.303 (0.266)			-0.111 (0.141)
Constant (** in all cases)	-0.50 (0.04)	-0.85 (0.04)	-1.92 (0.08)	-0.87 (0.04)	-1.14 (0.05)	-2.67 (0.17)	-1.69 (0.07)	-2.10 (0.10)	-2.78 (0.22)	-3.11 (0.34)	-1.46 (0.06)
Observa-tions	3426	3426	3426	3426	3426	3426	3426	3426	2572	1838	3426

Standard errors in parentheses
* significant at 10%; ** significant at 5%

Appendix 16

IV ESTIMATION. FAMILY BACKGROUND AS AN INSTRUMENT FOR OCCUPATION-HOBBY CORRESPONDENCE

	Log of wages
Dummy for activity-occupation correspondence	0.0556 (0.1959)
Age of individual	0.1455*** (0.0397)
Age, square term	-0.0015*** (0.0005)
Tenure with current employer, years	0.0384*** (0.0059)
Tenure with current employer, square term	-0.0012*** (0.0003)
College degree	0.1177*** (0.0325)
The individual is married	0.0404 (0.0327)
Female	-0.2062*** (0.0378)
Female with children	-0.0825** (0.0340)
Dummy for urban community	0.0897*** (0.0243)
Income of spouse, $1000	0.0019*** (0.0005)
Math score, percentile	0.4324*** (0.1197)
Verbal score, percentile	0.2318* (0.1332)
The individual is Afro-American	0.0027 (0.0316)
Other race	-0.1453** (0.0665)
Other occupation	0.6136* (0.3133)
Household occupation	-0.9953*** (0.3783)
Service worker	-0.2412*** (0.0506)
Farm laborer	-0.5303** (0.2332)
Farmer	-0.4308 (0.3065)
Laborer	-0.2762*** (0.0594)
Operative worker	-0.1116** (0.0455)

IV ESTIMATION. FAMILY BACKGROUND AS AN INSTRUMENT FOR OCCUPATION-HOBBY CORRESPONDENCE (CONT'D)

	Log of wages
Armed worker	-0.1926* (0.1115)
Craftsman	-0.0351 (0.0367)
Sales worker	0.1611*** (0.0613)
Managerial position	0.1056** (0.0483)
Technical worker	0.1647*** (0.0377)
Constant	3.4992*** (0.7697)
Observations	3416
Robust standard errors in parentheses	
* significant at 10%; ** significant at 5%; *** significant at 1%	

Appendix 17

OLS ESTIMATION. WAGE REGRESSION INCLUDING FAMILY BACKGROUND

	Log of wages
Age of individual	0.1339***
	(0.0393)
Age, square term	-0.0013**
	(0.0005)
Tenure with current employer, years	0.0390***
	(0.0057)
Tenure with current employer, square term	-0.0012***
	(0.0003)
College degree	0.1000***
	(0.0307)
The individual is married	0.0495
	(0.0307)
Female	-0.2014***
	(0.0354)
Female with children	-0.0753**
	(0.0341)
Dummy for urban community	0.0814***
	(0.0222)
Income of spouse, $1000	0.0018***
	(0.0005)
Math score, percentile	0.4250***
	(0.1115)
Verbal score, percentile	0.1827
	(0.1343)
The individual is Afro-American	-0.0019
	(0.0350)
Other race	-0.0836
	(0.0648)
Other occupation	0.5756*
	(0.3142)
Household occupation	-0.9913**
	(0.4101)
Service worker	-0.2376***
	(0.0497)
Farm laborer	-0.5279**
	(0.2567)
Farmer	-0.3853
	(0.2993)
Laborer	-0.2811***
	(0.0564)
Operative worker	-0.1240***
	(0.0444)
Armed worker	-0.2243**
	(0.1003)

OLS ESTIMATION. WAGE REGRESSION INCLUDING FAMILY BACKGROUND (CONT'D)

	Log of wages
Craftsman	-0.0497 (0.0346)
Sales worker	0.1380*** (0.0499)
Managerial position	0.0955*** (0.0334)
Technical worker	0.1589*** (0.0306)
Highest grade completed by mother	0.0187*** (0.0058)
Highest grade completed by father	-0.0028 (0.0046)
Parents live together	-0.0380 (0.0577)
Number of siblings	-0.0232** (0.0110)
Number of siblings older then respondent	0.0152 (0.0104)
Mother: Technical worker	0.0331 (0.0334)
Mother: Managerial position	-0.0798 (0.0869)
Mother: Craftsman	0.2078* (0.1185)
Mother: Operative worker	0.1336** (0.0547)
Mother: Farm laborer	0.0311 (0.2799)
Mother: Service worker	0.0274 (0.0470)
Mother: Household occupation	0.0824 (0.0909)
Father: Technical worker	0.0316 (0.0482)
Father: Managerial position	0.0886 (0.0548)
Father: Sales worker	0.0970 (0.0735)
Father: Craftsman	-0.0000 (0.0530)
Father: Operative worker	-0.0071 (0.0585)
Father: Laborer	-0.0293 (0.0812)
Father: Farmer	-0.0696 (0.0749)
Father: Service worker	0.0124 (0.0864)

OLS ESTIMATION. WAGE REGRESSION INCLUDING FAMILY BACKGROUND (CONT'D)

	Log of wages
Frequency of religious attendance	-0.0018 (0.0081)
Family size	0.0234** (0.0094)
Family poverty status	-0.0297 (0.0401)
Not English language at home	0.0265 (0.0586)
Ideal number of children	-0.0006 (0.0114)
Seek more education if not able to support family	-0.0345 (0.0394)
Dummy for activity-occupation correspondence	0.0402 (0.0293)
Constant	3.4509*** (0.7275)
Observations	3416
R-squared	0.34
Robust standard errors in parentheses	
* significant at 10%; ** significant at 5%; *** significant at 1%	