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THE EFFECTS ON INCOME OF TYPE OF COLLEGE ATTENDED#

by

Lewis C. Solmon* and Paul Wachtel**

I. Introduction

The effects of particular attributes of colleges on the subsequent earnings of individuals who attend are much discussed but rarely studied systematically. Here we seek to compare the earnings patterns of people attending different types of colleges. The classification of colleges used in this study is the scheme developed by the Carnegie Commission on Higher Education based on the sense of commitments to research, types of programs offered, and selectivity of admission of students.[1]

Much of the recent research on the effects of schooling and school quality has placed little emphasis on the importance of schooling. It is widely felt that differences among schools are less likely to effect ultimate educational outcomes (such as earnings) than do differences in innate ability, family background or luck. For example, in a classic study James Coleman (1966) argued that differences in characteristics of elementary schools attended were unimportant when compared to other variables, in determining differentials in student achievements. Eric Hanushek (1972) found that differences in expenditures do not affect the learning of children, although there are characteristics of teachers which do have an impact. In particular, Hanushek found that teachers' verbal aptitudes, the newness of their training and racial differences, which he interprets as differences in the quality of teacher training, significantly influence children's learning facility. An implication of this study is that school expenditures differences are unimportant because monies are spent on the wrong things (e.g., teacher seniority).

Other studies have drawn similar conclusions for the whole educational system. Christopher Jencks (1972) has minimized the effects of schooling in reducing cognitive and economic inequality. Samuel Bowles (1972), an economist, and Alexander Astin (1968), a psychologist, have concluded that differences in schools at various levels ranging from elementary to higher education have only small effects on student characteristics, be they economic or cognitive. However, Astin does find that college students demonstrate differential changes in affective behavior depending upon the quality of the colleges they attended. Moreover, Spaeth and Greeley (1970) found that their measures of quality had effects on occupational prestige even after the addition of a number of other variables, which seemed to have reduced quality to insignificance in the studies previously referred to.

To jump ahead to the major conclusion of this study, we find that at the college level, differences in type of institution attended have highly significant effects on differences in lifetime earnings patterns of students. These results hold even after controlling for a wide array of other factors, including individual student ability. Our study differs from the recent literature in several ways. We focus on differences in individual earnings according to broad <u>type</u> of higher educational institution attended. Although we describe the significant differences among types of institutions we do not specify what it is about particular types of schools which causes the differences in earnings patterns. It might be the more efficient use of resources, it might be differences in some unmeasurable aspects of the learning environment. Our study stresses that institutional differences matter--an issue not previously well-documented and one certainly not universally acknowledged. Of course, institutional differences do not explain all of the variance in individuals earnings. However, the fact that much remains to be explained does not undermine the policy importance of the results.

We are fortunate to have a rather unique sample of individuals whom we can study in order to see the relationship between college type and life cycle income. The economic and social history of over 5,000 male World War II veterans who volunteered for pilot or navigator training is available through data from Air Force tests and follow-up surveys by Thorndike and the NBER.[2] About 75 per cent of the sample attended college and the Carnegie class could be determined for almost 3,700 respondents. Most of the respondents attended college in the early postwar period and received G. I. Bill subsidies. Although the Carnegie classifications are based on more recent descriptions of the colleges, the scheme probably does not vary greatly over time.[3] The type of institutions, the number of schools of each type and the proportion of respondents in each Carnegie class are as follows:

Carnegie Class	Number of Schools	Per Cent of Respondents
1. Leading research universities	47	33.5%
2. Other research universities	44	20.0
3. Large doctoral granting institutions	32	8.8
4. Small doctoral granting institutions	28	4.9
5. Comprehensive colleges with a substantial selection of programs	125	16.4
6. Comprehensive colleges with a limited selection of programs	57	3.7
7. Highly selective liberal arts colleges	57	5.7
8. Other liberal arts colleges	108	7.1

We did not consider people who attended various independent professional and specialized institutions and two-year colleges in order to focus the study on a more homogeneous type of general four-year education.

II. Characteristics of Colleges and Attributes of Students

To get a sense of the differences among colleges of different Carnegie types, data on some attributes of colleges were gathered and the means are presented in Table 1. Each of these might be considered a dimension of college quality, and their effects on earnings of those who attended will be studied elsewhere (cf. Solmon, 1972). Table 1 summarizes measures of faculty compensation, total expenditures of institutions per full-time equivalent

(Table 1 here)

student, S.A.T. scores of entering freshmen, Astin's indexes of intellectuality, selectivity, and the overall Gourman rating of school quality. According to these measures, the leading research universities consistently rank first. Next highest come other research universities and highly selective liberal arts schools. The third range of these quality variables are found in the two classes of other doctoral granting institutions, followed by all other colleges. The calculated F statistics for the null hypothesis that the means are equal across Carnegie codes are also shown in Table 1. The hypothesis is rejected at the 1 per cent level in every case; that is, there are indeed statistically significant differences in quality of colleges as we measure it. The question posed below is whether this typing of colleges affects the returns to education.

Table 2 provides data on mean incomes of former students according to type of undergraduate college attended and years completed. The rankings of incomes by type of college attended vary depending upon years completed, but in general, do not match strongly the rankings of colleges according to their quality attributes. For example, the highest "quality" group is the leading research institutions, but for students not obtaining more than sixteen years of schooling the graduates of highly selective liberal arts colleges had the highest mean incomes in 1969.

(Table 2 here)

III. <u>The Earnings Model</u>

The human capital literature provides a simple framework for analyzing the effects of school type and quality on income. Mincer (1970) suggests an income generating function of the form:

$$\ln Y_{it} = a + rs_i + b_1 j_{it} + b_2 j_{it}^2 + U_{it} \qquad (1)$$

where Y_{it} is earnings, j_{it} experience in the labor force at year t, and s_i years of schooling of the i^{th} individual, whose coefficient, r, is the rate of return to schooling. Variables are added to the income generating function as shift factors to account for specific influences. In this manner, the regression equation is expanded to include a measure of intelligence and dummy variables for occupation groups with large non-pecuniary income.

To the model (1) plus the already mentioned shift variables, we add the type of college attended, designated by Q. It is suggested here that the original specification shifts systematically with Q. However, school type may not enter the income generating function as a shift factor, but through changes in the rate of return to schooling. That is, the effect of higher quality education will be a higher observed rate of return. This is not inconsistent with Mincer's derivation of the income generating function which assumes that the cost of a year of school is the same for any school. The modified income generating function is in this case:

$$\ln Y_{it} = a + r(Q_i)\, s_i + b_1 j_{it} + b_2 j_{it}^2 + U'_{it} \qquad (2)$$

where $r(Q_i)$ is a linear function of the school type variable. In summary, if college type is considered a shift factor, it enters as a separate independent variable; whereas if it is thought to enter by affecting the return to years in school, it enters the regression as an interaction with years of schooling. Both specifications of the model are tested below.

Regressions explaining 1969 earnings of the NBER-TH respondents are found in Table 3. The regressions include a standard collection of variables: years of schooling, IQ,[4] years of experience and experience squared, and dummy variables with a value of one if the respondent is a teacher, doctor, lawyer or airplane pilot. The college type, denoted by Q, is entered as a series of dummy variables, one for each Carnegie class. Each observation will have a value of one for the dummy variable representing the last undergraduate college attended by the respondent and a zero otherwise.

(Table 3 here)

The standard earnings function appears in column 1 of Table 3. Coefficients are as expected, except perhaps, for the relatively low schooling coefficient.[5] When IQ is added (Column 2), its coefficient is significant and the schooling coefficient is reduced. The interesting questions arise when the set of dummy variables representing the Carnegie class of the respondents undergraduate college are introduced. The specification shown in Columns 3 and 4 assumes that the earnings function has the same shape for all students and any differences due to a "college type effect" are manifested in different intercepts. The coefficients on the other variables do not change noticeably when the dummy variables are added. The coefficients on the dummy variables are differences from the intercept for the omitted group (comprehensive colleges with a substantial selection of programs, type 5). The coefficients can be adjusted (cf. Sweeney and Ulveling, 1972) to show the percentage deviation from the sample mean income for students who attended each type of college. With experience, years of college, IQ and occupational structure held constant (Column 4), the college type effects are:

(1)	5.15%	(5)	- 1.56
(2)	- 1.64	(6)	-11.95
(3)	5.16	(7)	- .68
(4)	- 9.65	(8)	- 9.16

Higher than average earnings are predicted for those who attended leading research universities (type 1) or large doctoral granting institutions (type 3) and lower earnings are predicted for smaller doctoral granting institutions, comprehensive colleges with a limited selection of programs and other liberal arts colleges. The ranking of schools by the predicted incomes of students is closely related to the attributes of the schools themselves shown in Table 1. For example, the rankings of school types by predicted income and by total expenditures per student have a correlation of .79.

F tests were used to see whether the addition of the college type dummies add significantly to the explanatory power of the original earnings functions of Columns 1 and 2.[6] The critical value of the F statistic at the 1 per cent significance level is roughly 2.75. If the calculated F exceeds this critical value, the implication is that the additional variables (the Carnegie type dummies) add significantly to the explanatory power of the model. When we compare Columns 2 and 4, the F obtained is 6.15; when we compare Columns 1 and 3, the F value is 8.38. We conclude that the type of college does indeed affect the income, in later life, of those who attended. If the type of college attended was merely a proxy for one's own innate abilities, we might have expected that college typing would add significantly when IQ was not entered in the earnings function, but would not be significant after controlling for individual abilities. This is clearly not the case, and it appears that college type has a significant influence independent of the individual's IQ.

Columns 5 and 6 interact college type with years of schooling. This is the specification of the model that suggests that college type affects the rate of return coefficient. If a particular dummy multiplied by the number of years attended is significant, we cannot attribute the significance explicitly to college type but rather to the interaction. Because the years variable is highly significant, we would predict significance on all the interacted dummy variables. This is indeed the case. The interesting question is whether the explanatory power of the model is significantly improved by the interaction dummies, which separate the rate of return coefficient into rates for each Carnegie class, as compared to the standard model of Columns 1 and 2. The F test comparing Column 2 with Column 6 (the latter omits years as a separate independent variable but includes the dummies which stand for college types multiplied by years) indicates that the categorization of the rate of return by Carnegie class is significant. The F value in this case was 5.40. A comparison of Column 5 with Column 1 indicates that this result holds when IQ is not included in the equation as well. When slope interactions are added to the equation with schooling coefficient interactions, it also adds significantly to the explanatory power of the model. However, the addition of the years of schooling interaction variables to the equation with slope interactions was not significant. These results indicate that the average earnings differences may be more important than differences in rates of return among Carnegie classes.

The rate of return to schooling for the whole sample is 5.11 per cent (years coefficient in Column 1, Table 3). When separate return of return are estimated for each college type (Column 5), the rates vary from 2.87 per cent for type 8 colleges to 6.61 per cent for type 1 colleges. The rates of return are significantly different from the average rate for all schools except types 2, 5, and 8. The schooling coefficients can, alternatively, be interpreted as the net percentage increase in income from an additional year of schooling. It should be noted that the ranking of school types by rate of return coefficients (the marginal increase in earnings per year of schooling) is not identically the same as the ranking by the average net deviation from the sample mean (shown above). The rank correlation of the two procedures is .67. For example, students from highly selective liberal arts colleges (type 7) rank higher on the average than at the margin relative to the other school types. This result is consistent with the expectation of decreasing marginal returns to schooling as the mean number of years and the observation that respondents from type 7 colleges have the highest mean number of years of college (4.43).

The last regression in Table 3 excludes IQ as a separate variable, but includes a set of dummies which interact college type with IQ. The F value for the comparison of Column 7 and Column 2 is 6.21, which implies that the interaction between IQ and school type is also significant. We conclude then that not only are college type, years attended, and IQ significant in themselves, but that college type and IQ in conjunction with the number of years attended make significant contributions. That is, if we know the college type attended, we can improve the predictive power of our earnings function. But if we know the college type attended according to the number of years attained or IQ, we can do even better.

The results in Table 3 ignore the possible influence on earnings of the type of graduate school attended. For this reason the tests were also made for regressions including only people with sixteen or fewer years of schooling (69.7 per cent of all those who attended college). For the subgroup not attending graduate school, the coefficient on the years variable is about one-third larger, indicating that there are differences in the returns to graduate and undergraduate study. The effects of college type in the truncated sample are substantially the same as those in Table 1.

As in Table 1, the addition of the Carnegie class dummies to the basic earnings function adds significantly to the explanatory power of the model. It is interesting, however, that when we allow the Carnegie classification to interact with IQ, we do not add significantly to the explanatory power of the model. The implication is that the interaction between college type and ability does not matter for those who did not go beyond college.

The aggregate earnings functions in Table 3 demonstrate conclusively that the type of college attended increases the explanatory power of the earnings model. It is, however, possible that these observed differences are due to the innate differences of the students themselves rather than the differences among colleges. The process by which colleges increase the earnings potential of students is complex and may be fundamentally different for different types of students. Thus, the results have not categorically shown that there are productivity differences among different types of colleges. To explore the question further, the sample was divided into groups based on pre-college differences among respondents. We examine whether the basic earnings function (Table 3, Column 2) and the basic function augmented by the college type dummies (Table 3, Column 4) differ according to the socio-economic status and ability of the respondents.[7]

Estimates of the earnings function including dummy variables for the type of college attended for each of three SES and three ability groups are shown in Table 4. Chow tests (cf. Chow, 1960) are used to test whether the vector of coefficients in each of the subgroups differed in a statistically significant way from the corresponding regression for the whole sample in Table 3. There is no structural difference in the

(Table 4 here)

equations divided into low, medium, and high ability groups compared to the aggregate equation including the Carnegie types which appears in Table 3, Column 4. On the other hand, there are significant differences in the structure of the earnings function depending upon socio-economic status compared to the function for the pooled sample.

The predicted mean earnings, cet. par., are consistently higher for respondents from type 1 schools and consistently lower for respondents from type 4, 6, and 8 schools compared to the mean for each ability and socio-economic status group. Thus, the within group patterns of college type effects reproduce the major effects observed for the whole sample. The range of the predicted percentage differences from the sample mean due to college type are larger for the SES and ability groups than for the whole sample in all but one case.

For the sample as a whole, the F tests among equations in Table 3 indicated a definite effect of college type on the explanatory power of the earnings function. The same question is posed within ability and socio-economic status group. The tests comparing each equation in Table 4 to a corresponding equation without college type dummies are not as conclusive. The dummy shift variables for Carnegie college type increase the explanatory power of the model at the 1 per cent level of significance for the low and high ability groups and the medium and high SES groups only.

These results indicate that socio-economic status, if not ability, does alter the process by which schooling affects earnings. The question remains whether college type affects earnings when the function explaining earnings is allowed to vary fully for each group. That is, does allowing for differences in the structure of the educational process in each type of school (by estimating separate earnings functions for each college type), improve the predictive ability of the model. These results are not shown; because the sample sizes are very small for some college types, estimates of the basic earnings function for each college type are difficult to interpret. A summary of the results are presented in Table 5. The schooling coefficient and summary statistics are presented from an earnings function for each college type. The specification corresponds to the overall equation in Table 4, Column 2. A Chow test across the eight sets of coefficients rejects the null hypothesis that the vectors of coefficients are equal across college types (F = 12.32). The structure of the earnings functions do differ and the categorization by college type increases the predictive power of the model.

(Table 5 here)

It appears that the extra income associated with more years of higher education is statistically significant for all types of colleges attended, except types 4 and 7. However, this payoff is largest at the research institutions (leading and other) and at the highly selective liberal arts colleges. On the other hand, controlling for years attended, the payoff to IQ seems largest at the large doctoral granting institutions and at liberal arts colleges. Since college quality probably varies widely among these types of schools, the importance of IQ may stand for the impact of colleges of higher quality. The research universities may be more homogeneous in terms of student quality and other measures.

The effects of entering particular occupations (which are not shown in Table 5) vary widely depending upon the type of undergraduate college attended. However, the patterns are not systematic. For example, MD's who went to highly selective liberal arts colleges had the largest increment in earnings, whereas lawyers who attended comprehensive colleges with substantial programs did best. Yet lawyers graduating from the former type of school were only the third highest earning group, and doctors graduating from the latter type ranked fourth in earnings among doctors.

These results might reflect sorting patterns of undergraduates into types of colleges according to traits important for particular careers but not reflected in IQ. Perhaps those who go from highly selective liberal arts colleges to medical schools are more creative or innovative, harder working, or motivated than are those entering medicine from other types of colleges. Perhaps in order to make this particular move, one needs these superior traits. On the other hand, it might be that a particular type of college better prepares graduates for particular careers.

More detailed studies of the educational process and differences therein depending upon type of college are necessary. Perhaps there is something about highly selective liberal arts colleges which leads their brightest students to earn more than bright students from other types of schools, or which results in those graduates who become doctors earning more than other doctors. Speculation could be unending, but the major lesson so far is that different types of colleges do have different effects on earnings.

IV. Conclusion

The question we set out to study was whether the type of college attended has an influence on the subsequent earnings of those who attend. It is quite apparent that the earnings function, or the relationship between income and its determinants, do differ depending upon college type. There are different returns to extra years, different rewards to IQ, different rewards to occupational choice.

The initial tests of the impact of college type as an additional explanatory set of explanatory variables in an earnings function suggested that college type is a significant determinant of earnings. When the tests are made within ability and socio-economic status groups, the results were less conclusive. These results suggest that the effectiveness of different types of school may vary with different types of students. A final test of whether the earnings function has the same shape for people attending different types of colleges, also indicated that college types differ. The importance of college type is demonstrated conclusively, although differences among students may be of equal importance.

Differences among students and in the educational process of colleges prevents us from making any statements about which college types should be preferred. Although the earnings model suggests that college type is not the overwhelming determinant of earnings, the relationships do differ according to this factor. These results indicate, therefore, that the educational production process varies with college type and the nature of these differences should be explored in future research.

FOOTNOTES

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1. For a more detailed description of the Carnegie Codes, see Carnegie Commission, (1971, Appendix C).

2. A full description of the data can be found in R. L. Thorndike and E. Hagen (1959) and a forthcoming NBER study (Juster, 1974).

3. Time series information for one measure of quality, average faculty salaries, is available for a group of thirty-six schools. The Spearman rank correlations for all parts of 1939-40, 1953-54, 1959-60, 1969-70 data are between .55 and .88.

4. The IQ variable was constructed by Albert Beaton of the Educational Testing Service from a factor analysis of the battery of Air Force tests taken by respondents. It has a mean for all respondents of 100 and standard deviation of 10. The variable is a combined measure of innate ability and pre-test (pre-college for almost all respondents) achievement. The experience variable is measured as the number of years from the respondents initial job.

5. The interpretation of the rate of return (schooling) coefficient is discussed by Wachtel (1973). It is expected that the respondents' returns to college education would be low because they attended college at a relatively advanced age under G.I. Bill subsidies.

6. The test of a general linear hypothesis is found in F. Graybill (1961: 135). Throughout the paper the term significance will be used to refer to significance at the one per cent level.

7. The SES classification is based on a ranking of the occupation of the respondent's father. The scheme used is: high (SESH): managerial, proprietor, professional or technical; medium (SESM): officer worker, salesman, foreman, skilled blue collar; low (SESL): service worker, semi- or unskilled and others. Of the respondents who attended college, 49.8 per cent are from high and 14.0 per cent from low socio-economic backgrounds.

TABLE 1

Attributes of Colleges by Type[a]

Carnegie Class	Faculty Compensation Per Student[b]	Average Faculty Salary[b]	SAT Verbal[c]	SAT Math[c]	Total Expenditure per FTE Student[d]	Overall Gourman Index[e]	Astin[f] Intellectuality	Astin[f] Selectivity
1	789	11,536	599	628	2,368	597	63	63
2	570	9,561	536	575	1,459	495	57	57
3	518	9,087	533	561	1,306	440	53	55
4	505	8,945	538	556	1,229	426	52	53
5	400	8,359	508	524	960	382	46	48
6	447	8,043	503	525	938	358	42	45
7	683	9,502	571	589	1,599	427	58	61
8	471	7,856	509	525	1,154	368	49	49
Per cent of schools responding	92.8	74.3	60.2	60.2	95.8	100.0	92.8	97.8
F[g]	18.1	45.9	18.2	20.3	40.8	125.4	42.4	49.4

TABLE 2
Mean Incomes of Individuals According to Carnegie Type of School Attended and Years Completed[a]

Carnegie Class	13-15 Years 1969	16 Years 1969	17 Years or More 1969
1	$16,729	$19,236	$21,803
2	14,954	18,131	18,719
3	16,645	18,618	19,818
4	12,864	19,559	16,142
5	15,464	17,392	16,647
6	11,730	15,960	16,937
7	19,724	21,172	19,812
8	13,216	14,557	17,758
All	15,621	18,501	19,377
F[b]	3.26	2.77	3.33

[a] Business proprietors, self employed, teachers, zero income excluded.

[b] See Table 1, note g.

TABLE 3
Earnings Functions for All Respondents[a,b]

	I	II	III[c]	IV[c]	V[d]	VI[d]	VII[e]
Constant	2.1132	1.5155	2.0955	1.5710	2.1116	1.5783	1.5865
S	.0511	.0432	.0505	.0436			.0435
	(.0051)	(.0051)	(.0050)	(.0051)			(.0051)
j	.0261	.0225	.0254	.0224	.0251	.0221	.0223
	(.0083)	(.0082)	(.0082)	(.0082)	(.0082)	(.0082)	(.0082)
j^2	-.0005	-.0005	-.0005	-.0004	-.0005	-.0004	-.0004
	(.0002)	(.0002)	(.0002)	(.0002)	(.0002)	(.0002)	(.0002)
IQ		.0066		.0059		.0059	
		(.0008)		(.0008)		(.0008)	
Pilot	.5020	.4901	.5006	.4901	.4976	.4877	.4894
	(.0921)	(.0912)	(.0914)	(.0908)	(.0915)	(.0908)	(.0908)
Teacher	-.3545	-.3285	-.3278	-.3093	-.3280	-.3093	-.3090
	(.0330)	(.0328)	(.0330)	(.0329)	(.0331)	(.0330)	(.0329)
M.D.	.7359	.7481	.7464	.7535	.7475	.7546	.7542
	(.0898)	(.0890)	(.0894)	(.0887)	(.0896)	(.0890)	(.0889)
Lawyer	.2119	.2367	.2208	.2410	.2159	.2375	.2411
	(.0469)	(.0465)	(.0466)	(.0463)	(.0466)	(.0464)	(.0463)
Q_1			.0841	.0670	.0661	.0561	.0064
			(.0242)	(.0241)	(.0056)	(.0058)	(.0008)
Q_2			.0037	-.0008	.0496	.0430	.0057
			(.0268)	(.0266)	(.0063)	(.0063)	(.0008)
Q_3			.0687	.0672	.0616	.0552	.0064
			(.0336)	(.0333)	(.0077)	(.0077)	(.0009)
Q_4			-.0816	-.0809	.0317	.0260	.0050
			(.0414)	(.0411)	(.0090)	(.0090)	(.0009)
Q_5					.0479	.0421	.0057
					(.0066)	(.0066)	(.0008)
Q_6			-.1145	-.1039	.0308	.0270	.0047
			(.0458)	(.0455)	(.0095)	(.0094)	(.0009)
Q_7			.0166	.0088	.0426	.0350	.0058
			(.0388)	(.0385)	(.0081)	(.0081)	(.0009)
Q_8			-.0935	-.0760	.0287	.0259	.0050
			(.0361)	(.0359)	(.0079)	(.0078)	(.0009)
R^2	.1089	.1261	.1237	.1368	.1222	.1355	.1369

FOOTNOTES TO TABLE 3

[a] There are 3,489 observations in all regressions. The dependent variable is the natural log of 1969 earnings. The standard errors are shown in parentheses below each coefficient.

[b] The variables are:

S:	Years of schooling
j:	Years of experience
IQ:	Constructed ability measure
Pilot, Teacher, M.D., Lawyer:	Dummy variables with a value of one if the respondent is in the stated profession.
Q_i	College type variable for the i^{th} Carnegie Class.

[c] The Q_i are dummy variables with a value of one if the respondent attended an i^{th} Carnegie class college.

[d] The Q_i are the respective Carnegie class dummies multiplied by S.

[e] The Q_i are the respective Carnegie class dummies multiplied by IQ.

TABLE 4

Augmented Earnings Function by Ability and SES Group[a,b]

	Ability Groups			Socio-Economic Groups		
	Low (1)	Medium (2)	High (3)	Low (4)	Medium (5)	High (6)
Constant	1.6790	1.0201	1.2593	1.3948	1.3539	1.7920
S	.0386 (.0094)	.0392 (.0085)	.0510 (.0087)	.0540 (.0110)	.0531 (.0082)	.0332 (.0077)
j	.0314 (.0141)	.0243 (.0142)	.0092 (.0144)	.0203 (.0196)	.0292 (.0129)	.0191 (.0124)
j^2	-.0007 (.0004)	-.0006 (.0004)	.0001 (.0004)	-.0004 (.0005)	-.0005 (.0003)	-.0004 (.0003)
IQ	.0041 (.0033)	.0122 (.0055)	.0085 (.0021)	.0069 (.0018)	.0064 (.0013)	.0051 (.0012)
Pilot	.4499 (.1972)	.4140 (.1375)	.5724 (.1533)	.4455 (.1589)	.2750 (.1718)	.6118 (.1347)
Teacher	-.2700 (.0586)	-.3285 (.0559)	-.3286 (.0576)	-.2793 (.0682)	-.2928 (.0514)	-.3358 (.0522)
M.D.	.7826 (.2020)	.7844 (.1548)	.7345 (.1284)	1.0214 (.2004)	.6854 (.1561)	.7250 (.1260)
Lawyer	.1808 (.0968)	.2461 (.0783)	.2668 (.0719)	.3149 (.1081)	.2780 (.0729)	.1908 (.0703)
Q_1^c	.0777 (.0446)	.0452 (.0416)	.0825 (.0403)	.0338 (.0512)	.0566 (.0376)	.0826 (.0381)
Q_2	.0620 (.0482)	-.0421 (.0451)	-.0091 (.0458)	.0026 (.0587)	-.0008 (.0418)	-.0096 (.0413)
Q_3	.0042 (.0605)	.0660 (.0557)	.1308 (.0580)	-.0258 (.0722)	.1177 (.1514)	.0525 (.0525)
Q_4	-.1145 (.0737)	-.0795 (.0679)	-.0442 (.0733)	-.1443 (.0901)	.0015 (.0648)	-.1332 (.0633)
Q_6	-.0945 (.0726)	-.0958 (.0832)	-.1102 (.0848)	-.1421 (.0855)	-.0982 (.0679)	-.0727 (.0784)
Q_7	-.0424 (.0785)	-.0046 (.0634)	.0579 (.0627)	.0159 (.0931)	.0526 (.0627)	-.0183 (.0571)
Q_8	-.0878 (.0579)	-.0369 (.0632)	-.1120 (.0690)	-.0541 (.0742)	-.1125 (.0560)	-.0571 (.0567)
R^2	.0918	.1175	.1595	.2365	.1631	.1111
Observations	1,052	1,189	1,248	489	1,264	1,736

[a]The dependent variable is the natural log of 1969 earnings. Standard errors are in parentheses below the regression coefficients.

[b]See Table 3, note b.

[c]See Table 3, note c.

Table 5

Summary of Separate Earnings Functions for Carnegie College Types[a]

College Type	S[b]	IQ[b]	R^2	Number of Observations
I	.0547 (.0098)	.0056 (.0014)	.1208	1175
II	.0653 (.0118)	.0028 (.0019)	.0991	694
III	.0357 (.0158)	.0119 (.0028)	.1879	303
IV	.0383 (.0243)	.0077 (.0040)	.1170	169
V	.0286 (.0123)	.0043 (.0020)	.1656	571
VI	.0719 (.0200)	.0037 (.0035)	.1240	131
VII	-.0052 (.0211)	.0101 (.0040)	.1435	201
VIII	.0336 (.0156)	.0071 (.0029)	.1648	245

[a]The equation for each college type is of the form:

$$\ln Y = f(S, j, j^2, IQ, \text{Pilot}, \text{Teacher}, \text{M.D.}, \text{Lawyer})$$

For descriptions see Table 3, n.b.

[b]Standard errors are in parentheses below the regression coefficients.

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