Comment on W. Norton Grubb, "The Varied Economic Returns to
Postsecondary Education: New Evidence from the Class of 1972"

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ABSTRACT

In "The Varied Economic Returns to Postsecondary Education: New Evidence from the Class of 1972", an article recently published in the *Journal of Human Resources* (Volume 28, no. 2, pp. 365-382), Norton Grubb reaches two main conclusions: (1) students who enroll in two-year colleges without completing degrees earn no more than comparable high school graduates; and (2) degrees from two-year colleges and vocational and technical institutes only indirectly lead to higher earnings by providing students with access to jobs in which they can accumulate experience and on-the-job training (i.e., access to "careers" instead of "jobs"). Given that roughly half of those entering college today do so at community colleges and that roughly a fifth of federal Pell Grant subsidies are spent at these institutions, such results are quite provocative.

However, in this comment we show that several of the variables used in Grubb's paper are severely mismeasured and that, when they are corrected with reasonable alternatives, his conclusions no longer receive empirical support. On the contrary, even those who enter but fail to complete degrees at community colleges do seem to earn significantly more than similar high school graduates. Further, controlling for work experience has relatively little effect on the estimated returns.

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I. Introduction

In "The Varied Economic Returns to Postsecondary Education: New Evidence from the Class of 1972", an article recently published in the *Journal of Human Resources* (Volume 28, no. 2, pp. 365-382), Norton Grubb reaches two main conclusions: (1) students who enroll in two-year colleges without completing degrees earn no more than comparable high school graduates; and (2) degrees from two-year colleges and vocational and technical institutes only indirectly lead to higher earnings by providing students with access to jobs in which they can accumulate experience and on-the-job training (i.e., access to "careers" instead of "jobs"). Given that roughly half of those entering college today do so at community colleges and that roughly a fifth of federal Pell Grant subsidies are spent at these institutions, such results are quite provocative.¹

However, in this comment we show that several of the variables used in Grubb's paper are severely mismeasured and that, when they are corrected with reasonable alternatives, his conclusions no longer receive empirical support. On the contrary, even those who enter but fail to complete degrees at community colleges do seem to earn significantly more than similar high school graduates. Further, controlling for work experience has relatively little effect on the estimated returns.

II. Grubb's Strategy

Grubb estimates a conventional earnings function of the form:

$$Y_i = \alpha + S_i\beta_1 + X_i\beta_2 + Z_i\beta_3 + \epsilon_i$$

where Y_i is an individual's annual earnings or wage rate; S_i is a vector of schooling variables including degrees (certificate, associate's degree, and bachelor's degree) and credits earned

distinguished by type of credit (academic or vocational) and type of school (proprietary school, public technical institute, public two-year college (community college), private two-year college, and four-year college); X_i is a vector of individual characteristics such as race, family background, test score, and high school grades; and Z_i is a vector of experience measures including specific experience (or tenure on the current job), other experience (months worked at previous jobs), formal on-the-job training, informal on-the-job training, and other types of employer provided training. Grubb estimates this model using the fifth wave of the *National Longitudinal Survey of the High School class of 1972* (NLS-72) for which detailed postsecondary transcript data are available as well as earnings at age 32.

Grubb reports three specifications separately for men and women. In his results, after adding the demographic variables, X_i , the coefficients on the credits from vocational schools and two-year colleges for those without degrees fall in magnitude and significance. Adding the experience variables, Z_i , drives the coefficients on the remaining credit variables to zero (or negative).

III. Problems with Grubb's Data

Using data that Grubb provided, we have been unable to replicate his analysis sample exactly to date (the author has been unable to provide the precise sample), nevertheless we believe we have replicated his results in all important aspects. The sample that we use includes 3735 men and 3527 women. (In reporting the sample size in the paper, Grubb used the weighted counts, 4039 men and 3637 women). Appendix Table I contains a comparison of Grubb's reported education coefficients and those we were able to replicate using Grubb's published

specification.

There were three errors (two critical and one less important) in the data used in the published work.² First, despite their importance to the author's conclusion, the variables representing public and private two-year college credits were apparently reversed. Though community colleges received considerable weight in his discussion, only ninety-five individuals in the sample were coded as having non-zero public two-year college (community college) credits. In contrast, 2261 had non-zero private two-year college credits. In other words, in Grubb's sample, 96% of two-year college students are considered to have attended a *private* two-year college. According to the 1976 *Digest of Education Statistics*, the picture is just the reverse: private two-year institutions contained only 4.2% of all two-year college enrollment. In order to verify that they were, in fact, simply mislabelled, we created a variable representing numbers of credits in private and public two-year colleges using the NLS-72 transcript file. The correlations among these variables are reported in Table 1 below:

Table 1. A Comparison of Private and Public Two-year College Credits

<i>Variables Created Directly from NLS-72 Transcripts:</i>	<i>Variables in Grubb's Analysis File:</i>	
	Public 2-Year College Credits	Private 2-Year College Credits
Public 2-Year College Credits	-0.05	0.93
Private 2-Year College Credits	0.97	-0.05

As reported above, the correlation between Grubb's measure of public two-year college credits with our measure of private two-year college credits is 0.97. Further, the correlation between our measure of public community college credits and the published measure of private

community college credits was 0.93. Thus, we conclude that the results for "Credits in Private Junior College" reported in Grubb's Table 2 actually represent returns to community college (*public* two-year college). Though little is made of the fact in the original paper, it is interesting to note that the coefficients on private two-year college credits (i.e., public community college credits) were generally positive.

Second, there appears to have been a mistake in the construction of the test score measure used to control for ability differences. Many individuals had test scores out of the theoretically possible range. In instructions to his programmer, Grubb asked that a composite consist of the sum of four test parts: the formula scores for vocabulary, reading, letter groups, and math. According to the NLS-72 codebook, the theoretically possible minimum score of these four components is -18.59 and the theoretically maximum score is 85. However, in Grubb's data, 147 individuals had scores below -18.59 and 69 individuals had scores above 85 (excluding those missing test scores to whom Grubb apparently allocated the value 299.97). Figure 1 portrays the histogram of the test score used in his paper and the one recalculated from the NLS-72 using the author's instructions to his programmer. Appendix Table II shows the means and standard deviations of the test scores. If the resulting measure were purely white noise, it would have posed little problem for the results reported in the paper (except that one would not truly be controlling for measured ability). However, since this flawed test score measure is correlated with several of the variables of interest, these errors may have contaminated the estimated returns to various types of education.

Finally, as illustrated in Figure 2, there appear to be important problems in the measure of work experience which figures importantly in Grubb's conclusions. These histograms present

Grubb's two experience measures which are reported in months. Two problems are immediately obvious: a good proportion of the sample have either *negative* experience or more labor market experience than their ages. In fact, 33 individuals have "specific experience" in excess of 390 months (or more than 32 years) and 2004 individuals have negative "other experience". Given that over 50% of those with negative "other experience" have no postsecondary education, inducing a *positive* correlation between other experience and education, it is not surprising that when Grubb includes the experience measures, the education coefficients decrease. Any problems would have been exacerbated as these values were squared and interacted with one another for the final specification. Because of the problems with these measures of experience, we constructed our own experience measures in Figure 3.³ Because the range in the published and corrected measures of experience were so different, we report the histograms with different scales. The differences would appear even more dramatic if we reported the corrected measures in the same scale.

In the tables that follow, we re-estimate Grubb's specifications before and after correcting these apparent mistakes.

IV. A Re-examination

Following Grubb, individuals are first categorized according to their highest degree (so that individuals are allocated at most one degree). The credits for those who have completed a degree are set to zero. Thus, the coefficients on the credits represent the returns for those who enroll, but fail to complete degrees. Further, the dependent variable is in levels rather than logs in order to be consistent with the original paper. There are several differences between Grubb's

specification and ours. First, to translate the schooling measures into years of schooling completed, we divided all credits by 30. Since this is the same rule of thumb that is suggested in the *Current Population Survey* interviewer's manual, the results can be more readily compared to CPS estimates. Second, we combine the academic and vocational four-year college credits to focus attention on the vocational/technical institutes and two-year colleges. We also combine the private and public vocational institutes since only 131 of the students who attended postsecondary school attended a private vocational school and 310 attended a public technical institute. Furthermore, the response rate on the transcript survey from vocational schools is substantially below that for two-year and four-year colleges (Jones, Baker, and Borchers 1986, p. 10). Although there may actually be different returns to the two types of vocational schools, we do not believe that we have enough data to distinguish them. Fourth, we did not include a dummy variable indicating discontinuous experience since we could not find the suitable variable in Grubb's sample. Finally, we include dummies for missing test scores, family income, and high school grades.

The coefficients on the education variables are presented in Table 2 for men and Table 3 for women. In these tables we present the same specifications as those presented in Grubb's original paper. In the first column we do not control for demographic information, family background, test scores, or experience. In specifications labeled (2) we include demographic information, family background and test scores; and in specifications labeled (3) we also include measures of experience. The only difference between the columns labeled "Grubb's Measures" and "Corrected Measures" is that we have replaced the flawed variables or, as in the case of public and private two-year college credits, have appropriately relabeled them. Otherwise, the

file is identical to that provided by the author.

As is clear from the first column of Tables 2 and 3, when we do not control for demographic information, family background, test scores or experience, we find, as does Grubb, that men and women who attend two-year colleges without completing an AA earn more than high school graduates with no postsecondary training. There are also significant gains to completing the AA. Thus there is descriptive evidence that community college attendance is correlated with higher earnings.

Specification (2) includes the corrected test score along with the measures of demographics, family background, and high school grades in order to control for possible self-selection into college. The estimated returns to postsecondary education fall, particularly for four-year college students and BA recipients. This reflects the fact that those who attend additional schooling have higher test scores, high school grades and family incomes than those who do not continue and that each of these factors is positively related to earnings.

The task at hand is to compare the results under the label of "Grubb's Measures" (where we use Grubb's test score and work experience measures) and those reported under "Corrected Measures". Comparing the two sets of estimates for specification (2), it is apparent that the miscalculated test score was not the most important programming error as the coefficient estimates are quite close to one another. In both cases, the estimated return to community college credits remain positive and significant at the .05 level for men and .03 level for women. We also find in all of the specifications, as does Grubb, little or no return to vocational school credits and degrees for both women and men. However, given the problems with reporting by vocational schools in the NLS-72 transcript file, we hesitate to conclude that these credentials

are "worthless". Therefore, for the rest of the comment we focus on the results for two-year colleges.

One of Grubb's main conclusions is that degrees matter because they allow those with credentials access to more stable employment, or "better" jobs. We explore this hypothesis more closely in the third specification where we add the corrected measures of work experience and job tenure. Using Grubb's measures we would conclude that there is no gain for men and women who attended a two-year college, but did not complete degrees, above what high school graduates earn. However, with the corrected experience measures the coefficient on community college credits for men increases slightly as does that on four-year college credits. An increase is the expected direction of change if labor market experience and schooling are negatively correlated, that is if individuals delay entry into the labor force in order to further their education. The estimated return to public two-year college credits for men remains positive at the 0.048 level. The results for women differ. Including labor market experience decreases the coefficient on community college credits by about 27% and the return to community college credits is only significant at the 10% level.

In his article, the author emphasizes the importance of degree completion. In each specification, we test the equivalence of having completed two-years of community college credits without a degree to having completed an associate's degree.⁴ Rejecting this hypothesis would be evidence for "sheepskin" effects. In fact, in no specification would such a hypothesis have been rejected at anything below the 0.399 level. Thus, in the NLS-72 it appears that completed two-year college coursework is as important for earnings as are AAs.

Finally, the author emphasizes the varied returns to sub-baccalaureate education. While

the point estimates of the coefficients attached to public and private two-year colleges do differ, we tested whether they were statistically similar, the p-values of which are reported in the bottom of Tables 2 and 3. Despite the differing magnitudes, one cannot reject the hypothesis that public and private two-year college returns are equivalent because of the large standard errors. There may simply be too few private two-year college students to estimate such an effect. Similarly, the author emphasizes that types of community college degrees have differing value in the labor market. Again, however, we find no evidence that the returns differ by type of AA.

In the final two columns of Tables 2 and 3 we examine the hypothesis that returns differ by type of two-year college credit. Here we had to substitute our credits since the author's data did not distinguish type of credit for community colleges. Given that we cannot statistically distinguish public and private two-year college credits, we combine them for these final two specifications, the results of which are reported in the "combined" column. The estimated return to two-year college is significant at the 0.01 level for men and the 0.02 level for women. Next we estimate separate effects for vocational and academic credits.⁵ Given the point estimates, it appears that vocational credits have the larger pay-off for men and academic credits have the larger pay-off for women. However, we reject the hypothesis that the returns are similar by type of credit at only the 0.23 level for women and the 0.057 level for men. Although the coefficient estimates suggest distinct returns by type of two-year college, type of AA, and type of two-year college credit, there are simply not enough data in the NLS-72 to allow us to statistically distinguish these effects.

Obviously, the t-statistics on the two-year college credit variables in Tables 2 and 3 are only marginally significant conditional on family background and experience and as such do not

provide overwhelming evidence of the value of a community college education. Nevertheless, the t-statistics are statistically significant at conventional critical levels, thus providing strongly suggestive evidence that such returns do exist.

The Economic Significance of the Returns to Community College

Thus far, we have focused on the sign and statistical significance of the coefficients, neglecting the more difficult issue of whether their magnitudes are of economic significance. Both women and men who attend two-year college for one year (30 credits) without completing a degree earn approximately \$900-1000 (1985 dollars) per year more than comparable high school graduates. Given that approximately 45% of those who attend two-year colleges complete one semester or less, and 66% complete at most one year, one may ask whether those few credits are "worth it". When youth entering college are uncertain about their suitability to college life, it is presumably the *ex ante* returns to college which justify the public and private benefits. What we have estimated above are simply the *ex post* returns to dropping out and completing. Nevertheless, a simple cost-benefit calculation can provide guidance in judging the importance of the sizes of the estimated ex-post returns.

In 1980, the average public two-year college tuition was \$510 per year and the average hourly wage for high school graduates was \$7.61.⁶ Assuming that an individual does not work while in school, that they attain 15 credits (1 semester) and that a semester represents 13 weeks, the opportunity cost of attending two-year college is \$3957. Thus, the total cost of the 15 credits is \$4212, or \$5492 in 1985 dollars. Further assuming an interest rate of 3% and that the individual works for 40 years, we estimate that two-year college students need to earn \$236/15

credits per year (or \$472/30 credits/year, both figures are in 1985 dollars) more than a comparable high school graduate in order to break-even on their college investment. The point estimates presented in specification (3) ("Corrected") of Tables 2 and 3 are larger than and statistically indistinguishable from these break-even figures (the p-value for men is 0.30 and the p-value for women is 0.54) reminding us that over a lifetime seemingly small magnitudes can be economically significant. We have only observed the difference in earnings at age 32. If the returns to experience also rise with education, then the lifetime returns will be even larger.

V. Conclusion

Grubb concludes that students who attend community colleges without completing a degree do not earn significantly more than their high school graduate counterparts and that the return to the two-year college credential does not persist after accounting for labor market experience. After correcting the mismeasured and mislabelled variables in Grubb's analysis file, we conclude, to the contrary, that there is some evidence that both men and women earn more than comparable high school graduates after attending a two-year college whether or not they complete the degree and these effects remain even after controlling for labor market experience. Unfortunately, there are not enough data in the NLS-72 to distinguish statistically whether such returns vary by the control of the two-year college, or by type of credit and degree program.

Endnotes

1. For other studies see Blair, Finn, and Stevenson 1981, Breneman and Nelson 1981, Heineman and Sussna 1977, and Kane and Rouse 1993.
2. The author has since confirmed that programming errors led to these mistakes.
3. See Appendix II for a comparison of means and standard deviations.
4. We averaged the returns for vocational and academic AA degrees.
5. To categorize academic and vocational credits, we used the taxonomy suggested by Grubb 1987.
6. The tuition figure is from the Washington State Board of Higher Education and the wage estimate is the authors' calculation using the CPS Annual merge file of the outgoing rotation groups.

REFERENCES

- Blair, Larry, Michael Finn, and Wayne Stevenson. "The Returns to the Associate Degree for Technicians." *Journal of Human Resources* 16,no.3 (1981): 449-458.
- Breneman, David W., and Susan C. Nelson. *Financing Community Colleges: An Economic Perspective*. Washington, D.C.: The Brookings Institution, 1981.
- Digest of Education Statistics*. Washington, D.C.: U.S. Department of Health, Education, and Welfare, Education Division, National Center for Education Statistics, 1976.
- Grubb, W. Norton. "Classification of Postsecondary Courses." National Assessment of Vocational Education (1987).
- Grubb, W. Norton. "The Varied Economic Returns to Postsecondary Education: New Evidence from the Class of 1972." *Journal of Human Resources* 28,no. 2 (1993): 365-382.
- Heineman, Harry N., and Edward Sussna. "The Economic Benefits of a Community College Education." *Industrial Relations* 16,no.3 (1977): 345-354.
- Jones, Calvin, Reginald Baker, and Robert Borchers. *National Longitudinal Study of the High School Class of 1972 Post-secondary Education Transcript Study Data File User's Manual*. Chicago: National Opinion Research Center, 1986.
- Kane, Thomas J. and Cecilia Elena Rouse. "Labor Market Returns to Two- and Four-year College: Is a Credit a Credit and Do Degrees Matter?" NBER Working paper # 4268.

Table 2
Returns to Postsecondary Schooling -- Men

Dependent Variable=Annual Earnings (1985)

	No Controls		Grubb's Measures		Corrected Measures		Recomputed 2yr Coll Credits	
	(1)		(2)	(3)	(2)	(3)	Combined	Acad vs. Voc
Public Two-year (Community) College Credits	1685 (524)		980 (513)	823 (517)	1004 (514)	986 (498)		
Private Two-year College Credits	3114 (2959)		2295 (2874)	1166 (2790)	2284 (2875)	1978 (2783)		
Two-year College (Public and Private) Credits							1337 (507)	
Academic Credits								143 (817)
Vocational Credits								3478 (1250)
Vocational School Credits	-1063 (989)		-1491 (961)	-1520 (942)	-1461 (961)	-1301 (929)	-1267 (929)	-1316 (929)
Four-year College Credits	1149 (286)		236 (291)	266 (292)	258 (293)	588 (286)	618 (286)	609 (286)
Certificate	93 (1556)		-810 (1517)	-1369 (1505)	-751 (1517)	-891 (1468)	-810 (1468)	-851 (1468)
Vocational AA	3363 (1223)		1508 (1203)	625 (1209)	1573 (1205)	1230 (1167)	1406 (1167)	1354 (1167)
Academic AA	4198 (1741)		1430 (1708)	1056 (1681)	1519 (1713)	2139 (1662)	2256 (1662)	2182 (1662)
BA	8873 (606)		4917 (689)	4857 (719)	4990 (703)	6411 (722)	6510 (723)	6436 (723)
P-value H ₀ : Public 2-year Coll Credit=0	0.001		0.056	0.111	0.051	0.048	0.008	NA
P-value H ₀ : Public=Private 2-year Coll Credit	0.635		0.653	0.904	0.662	0.726	NA	NA
P-value H ₀ : Vocational AA=Academic AA	0.684		0.969	0.824	0.979	0.664	0.660	0.668
P-value H ₀ : 2yrs Public Two-year Credit=AA	0.773		0.724	0.550	0.740	0.851	NA	NA
P-value H ₀ : Voc Credits=Academic Credits	NA		NA	NA	NA	NA	NA	0.057
Family Background/Test Score Included ?	no		yes	yes	yes	yes	yes	yes
Experience Included?	no		no	yes	no	yes	yes	yes
R ²	0.063		0.124	0.181	0.124	0.185	0.185	0.186

Note: There are 3735 observations (4039 weighted observations). Other regressors include a constant and self-reported education as of 1986. Family background/test score measures include race, family SES raw score, family income, high school grades, a test score. The experience measures are a quadratic in both specific experience and other experience, an interaction between specific and other experience, formal on-the-job training, informal on-the-job training, and other employer training. (1), (2), and (3) match Grubb's (1993) column numbers and specifications.

Table 3
Returns to Postsecondary Schooling -- Women

Dependent Variable=Annual Earnings (1985)

	No Controls		Grubb's Measures		Corrected Measures		Recomputed 2yr Coll Credits	
	(1)		(2)	(3)	(2)	(3)	Combined	Acad vs. Voc
Public Two-year (Community) College Credits	1144 (479)		1038 (479)	60 (473)	1033 (479)	748 (454)		
Private Two-year College Credits	2087 (2587)		1791 (2580)	1141 (2475)	1796 (2580)	520 (2437)		
Two-year College (Public and Private) Credits							1044 (447)	
Academic Credits								1794 (735)
Vocational Credits								-188 (1182)
Vocational School Credits	1061 (651)		881 (650)	-228 (633)	906 (651)	167 (616)	199 (616)	200 (616)
Four-year College Credits	579 (261)		283 (267)	-109 (263)	265 (269)	363 (255)	371 (255)	368 (255)
Certificate	3214 (1156)		2803 (1156)	21 (1142)	2798 (1157)	1315 (1097)	1389 (1097)	1389 (1097)
Vocational AA	3434 (921)		2755 (927)	785 (924)	2752 (928)	2171 (880)	2237 (880)	2241 (880)
Academic AA	3153 (1293)		2263 (1308)	193 (1275)	2218 (1312)	2097 (1243)	2173 (1242)	2191 (1242)
BA	5179 (483)		3879 (550)	1890 (575)	3823 (557)	3830 (541)	3889 (540)	3903 (540)
P-value H_0 : Public 2-year Coll Credit=0	0.017		0.030	0.898	0.031	0.100	0.020	NA
P-value H_0 : Public=Private 2-year Coll Credit	0.720		0.773	0.667	0.771	0.927	NA	NA
P-value H_0 : Vocational AA=Academic AA	0.854		0.748	0.687	0.728	0.959	0.965	0.973
P-value H_0 : 2yrs Public Two-year Credit=AA	0.399		0.716	0.748	0.726	0.571	NA	NA
P-value H_0 : Voc Credits=Academic Credits	NA		NA	NA	NA	NA	NA	0.230
Family Background / Test Score Included ?	no	yes	yes	yes	yes	yes	yes	yes
Experience Included?	no	no	no	yes	no	yes	yes	yes
R ²	0.039		0.053	0.133	0.053	0.158	0.159	0.159

Note: There are 3527 observations (3638 weighted observations). Other regressors include a constant and self-reported education as of 1986. Family background/test score measures include race, family SES raw score, family income, high school grades, a test score. The experience measures are a quadratic in both specific experience and other experience, an interaction between specific and other experience, formal on-the-job training, informal on-the-job training, and other employer training. (1), (2), and (3) match Grubb's (1993) column numbers and specifications.

APPENDIX I

A Comparison of Grubb's Results and Results Using Our Sample

	Men		Women	
	Grubb*	Current	Grubb*	Current
Certificate	-988 (1627)	-1405 (1501)	-190 (1168)	167 (1141)
Vocational AA	589 (1266)	459 (1207)	507 (923)	946 (923)
Academic AA	-803 (1701)	969 (1677)	1498 (1201)	435 (1273)
BA	4707 (737)	4685 (715)	1987 (567)	2042 (574)
Vocational Credits				
Community College	-129 (57.8)	-297 (441)	-62.7 (45.2)	-153 (332)
Technical Institute	-530 (510)	-107 (56.2)	-408 (336)	-63.3 (46.1)
Private Vocational School	-189 (84.3)	-134 (74.6)	42.2 (33.8)	46.1 (33.8)
Four-year College	117 (24.0)	100 (28.5)	43.0 (23.5)	-17.8 (32.5)
Academic Credits				
Community College	131 (96.7)	89.9 (122)	12.0 (76.8)	157 (209)
Technical Institute	70.7 (124)	105 (95.2)	268 (219)	8.42 (78.5)
Four-year College	-26.3 (15.4)	-35.3 (16.4)	-13.3 (13.6)	3.22 (14.5)
Total Credits, Private Two-year College	11.6 (18.7)	23.8 (17.2)	-19.7 (16.9)	4.34 (15.8)
R ²	0.221	0.183	0.175	0.133
N (weighted)	3939	4039	3607	3638

* These coefficients are from Grubb's Table 2, specification 3, pp. 372-373.

APPENDIX II

Descriptive Statistics (Unweighted) for Selected Variables: A Comparison of Grubb and Corrected Measures

	Mean	Standard Deviation	Minimum	Maximum
Grubb's Variables				
Test Score	37.9	37.1	-367.8	154.0
Other Experience	30.7	88.1	-637.9	344.4
Specific Experience	90.4	93.3	0.0	713.0
Corrected Variables				
Test Score	47.9	18.7	-8.1	85.0
Other Experience	54.9	36.4	0.0	158.0
Specific Experience	62.2	44.0	0.0	166.0

There are 7967 observations.

Figure 1. Grubb's and Corrected Test Score Measures

Figure 2. Grubbs' Experience Measures

Figure 3. Corrected Experience Measures