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Construction of Full Sample and Replicate Weights for Project Talent, with Applications

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Abstract

Project Talent is a large, nationally representative longitudinal study developed by the American Institutes for Research and conducted from 1960 to 1974. The goals were to assess the interests, abilities, and demographics of 9^{th}–12^{th} graders and to follow their trajectories into adulthood. More than 1,200 junior and senior high schools participated. Replicate weights were not constructed at the time, preventing the estimation of standard errors. Today, Project Talent is being revived to study the physical, cognitive, economic, and social processes of aging. In this paper, the retrospective construction of 104 sets of student-level replicate weights is described. Partitioning analysis was performed to generate variance strata and variance primary sampling units. The student-level replicate weights were constructed using a jackknife procedure. The process included adjustment of the base year weights and calibration of (full sample and replicate weights) to the total number of secondary school students in the U. S. in the spring of 1960. The use of replicate weights is illustrated by estimating standard errors for means of composite cognitive scores constructed from student questionnaires. We also describe construction of mortality- and nonresponse-adjusted weights for the three Project Talent followup data collections.

KEYWORDS: Project Talent, Weight adjustment, Recursive partitioning, CHAID, Jackknife replicate weights, Survey analysis

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1 Introduction

Project Talent (PT) is a large, nationally representative, longitudinal study of nearly 400,000 American students in the 9^{th}–12^{th} grades in 1960. Conducted by the American Institutes for Research (AIR) during the period 1960–74, PT was designed to assess how early life experiences, interests, aptitudes, and cognitive abilities affect future educational attainment, occupation, and family formation. According to Shaycroft (1977), PT was "a massive project, which involved scientifically selecting a stratified random probability sample of all secondary schools (public, parochial, and private) in the United States, testing all their students in grades 9–12 (nearly half a million students) with a two-day battery of aptitude tests, information tests, other tests of ability and achievement, and inventories probing the examinees' background, interests and personality traits, and then following up the examinees over a very long period of time."

The motivation for this research was to create student-level replicate weights for PT, usable for estimating standard errors of national estimates calculated from PT data. We report more, however, in part reflecting the statistical detective work involved in dealing with a fifty-year dataset—the base year PT data collection took place in 1960—that had to be recovered from 9-track tapes, and for which essential documentation and paradata are missing. Moreover, partly deliberately and partly as a result of historical circumstances, the PT design was unlike today's prevailing method of cluster sampling of students-within-schools. (Instead, as we describe in more detail below, the design is a mixture of sampled schools in which all students were included and self-representing schools in which students were sampled.) The frame has been lost.

We describe here preliminary steps that included adjusting base year weights (§3.1); generating school-level variance strata and variance primary sampling units using recursive partitioning/CHAID, followed by construction of the jackknife replicate weights (§3.2); calibration of the weights to match statewide enrollment totals in 1960 (§3.3); application of the full sample and replicate weights to assess significance of comparisons of measures of student performance (§3.4); other replication methods (§3.5); design effects (§3.6); an alternative, reproducible set of base year weights (§4); construction of mortality-adjusted weights for the three followup data collections (§5); and use of weights to evaluate the performance measures themselves (§6). Background on PT appears in §2, and conclusions in §7.

2 Project Talent

For its day, PT challenged the limits of technical feasibility because of its large sample size and the complexity and quantity of data collected on each student sampled. Today, PT is being revived by AIR to study the physical, cognitive, economic and social processes of aging. Producing student-level replicate weights is an important step in having the base year data meet modern standards, and is one focus of this paper.

2.1 Overview

The main PT student dataset, which is maintained by AIR, contains records for 377,015 students surveyed in the base year of 1960. The PT sample, not all of which appears in this file, was meant to constitute approximately 5% of the U.S. high school student population in 1960. As discussed further in §3.3, we believe that the 377,015 students are approximately 4% of that population.

There were, in addition, three student-level followups, which were conducted one, five and eleven years following the nominal year of high school graduation, over a span of fourteen years, as summarized in Table 1. We refer to the followups as FY1, FY5 and FY11. Each followup data collection consisted of a mail questionnaire sent to all participants, followed by a special (telephone) survey of a sample of the mail survey nonrespondents. Table 4 shows the numbers of followup respondents by grade. Followup data, in general, fall into three categories: educational information, occupational information and personal information. The questionnaires are not identical across grades for each followup, nor are they identical across followups for any grade, which has hindered analysis of the followup data.

2.2 Sample Design

Conceptually, the PT design is straightforward. Except in New York City and Chicago, high schools were sampled randomly, and all students within each sampled school were tested. If a sampled high school did not have a ninth grade, then all of its "feeder" junior schools were included in the sample. In New York City, all senior and junior high schools were included, but only one in each twelve students was sampled. In Chicago, "20 of the 38 academic high schools" were selected (Wise et al., 1979), and 1 in 10 students in each was sampled.

That said, important details of the sampling process seem not to be recoverable. Perhaps most important, we do not know the sampling frame for schools nor do we have the values of the frame variables. Therefore, it is not possible to assess possible nonresponse bias. The school-level response rate was very high, however—approximately 93%. We do know (Wise et al., 1979) that schools participating in PT were selected primarily from a list of public schools, derived from the 1958–59 National Survey of Public Secondary Schools, provided to AIR by the National Center for Education Statistics (NCES); that the National Catholic Education Association provided a list of parochial schools; that NCES also provided a list of private schools; and that the Internal Revenue Service provided a supplementary list of schools (Shaycroft, 1977). We estimate that perhaps 40,000 schools were on these lists. Events that led to such phenomena as inclusion of all public schools in New York City, and other oddities, are recounted in Shaycroft (1977).

In the end, 1,226 schools participated in PT, of which 985 are senior high schools and 241 are junior high schools. Figure 1 shows their locations. Figure 2 shows geographically the state-level counts of PT participants and corresponding sampling percentages. The same information appears in tabular form in Table 3. Sampling percentages vary considerably by state, from 1.35% in Delaware to 8.85% in Montana. Some of this variation arises from sampling (especially in low-population states such as these two), but there are also external factors. For instance, state officials in California and New Jersey were not supportive of PT (Shaycroft, 1977). The feeder school-based selection of junior high schools also introduced non-random effects in the sampling (Shaycroft, 1977).

The school sample was stratified on the basis of four variables: school size (number of seniors), school control (public, private or parochial), geographical region, and a measure of school quality called the retention ratio (the ratio of graduates to tenth graders). Three of the four stratification variables are readily available: see Table 2, which we discuss in more detail below. The PT student file contains a variable labeled "retention rate;" however, we were not able to reproduce it from other variables in either the student or the school data files. Nor are we able to reconcile the values in the dataset with the stratification in Table 2. Parochial and private schools were not sub-stratified with respect to either size or retention ratio.

Base Year Grade	Base Year Age	Followup Year		
		1	5	11
9	15	1964	1968	1974
10	16	1963	1967	1973
11	17	1962	1966	1972
12	18	1961	1965	1971
Age at Followup		19	23	29

Table 1: Calendar years of PT followup data collections.

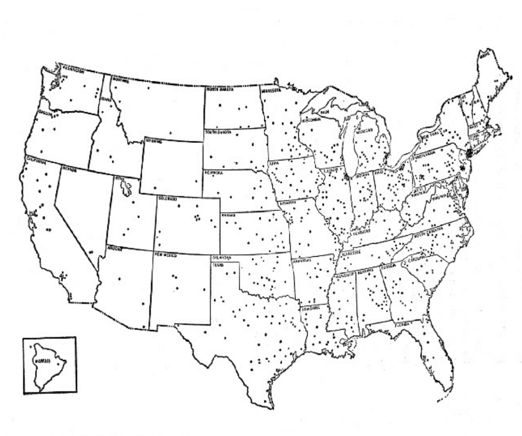


Figure 1: Locations of schools participating in PT.

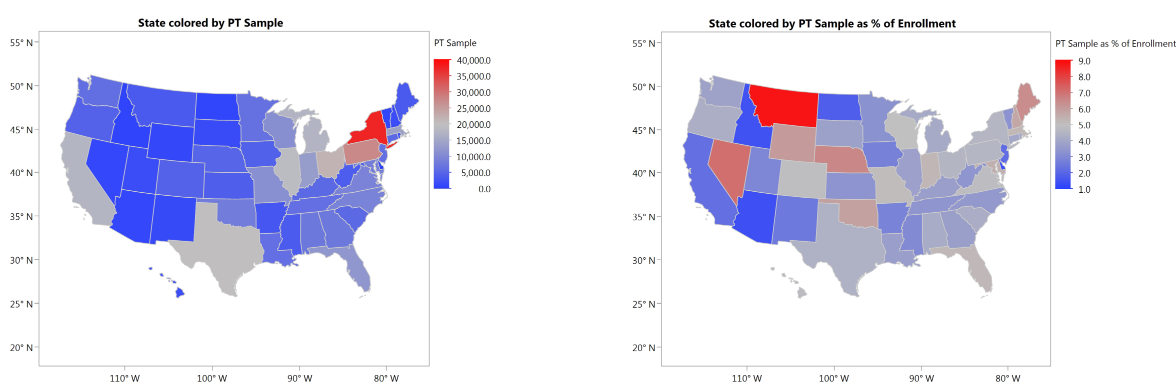


Figure 2: *Left:* State-level counts of PT participants. *Right:* State-level PT sampling percentages.

	State	PT Sample	1959-60 Enrollment	PT Sample as % of Enrollment
1	AL	7,562	180,136	4.20
2	AR	2,840	100,334	2.83
3	AZ	994	70,194	1.42
4	CA	17,737	776,951	2.28
5	CO	4,472	90,607	4.94
6	CT	5,377	133,033	4.04
7	DE	307	22,366	1.37
8	FL	12,200	232,753	5.24
9	GA	7,590	202,999	3.74
10	HI	1,932	40,241	4.80
11	IA	4,310	154,624	2.79
12	ID	629	42,301	1.49
13	IL	19,106	503,531	3.79
14	IN	13,306	249,780	5.33
15	KS	3,999	118,149	3.38
16	KY	5,484	147,966	3.71
17	LA	6,294	169,028	3.72
18	MA	14,202	268,710	5.29
19	MD	8,612	155,508	5.54
20	ME	3,356	52,258	6.42
21	MI	17,481	421,696	4.15
22	MN	6,546	197,625	3.31
23	MO	11,225	219,131	5.12
24	MS	3,515	115,268	3.05
25	MT	3,408	38,528	8.85
26	NC	9,152	257,749	3.55
27	ND	695	38,272	1.82
28	NE	4,883	74,580	6.55
29	NH	1,756	30,588	5.74
30	NJ	6,477	296,412	2.19
31	NM	1,369	54,032	2.53
32	NV	1,042	14,654	7.11
33	NY	37,763	824,429	4.58
34	OH	22,079	486,191	4.54
35	OK	8,205	138,453	5.93
36	OR	4,469	104,648	4.27
37	PA	27,657	604,432	4.58
38	RI	1,571	40,028	3.92
39	SC	5,414	127,944	4.23
40	SD	1,477	38,786	3.81
41	TN	6,345	186,400	3.40
42	TX	20,328	463,515	4.39
43	UT	1,718	58,048	2.96
44	VA	9,179	188,268	4.88
45	VT	716	21,415	3.34
46	WA	6,258	162,367	3.85
47	WI	11,066	221,867	4.99
48	WV	3,760	110,053	3.42
49	WY	1,152	18,982	6.07
50	TOTAL US	377,015	9,265,828	4.07

Figure 3: State-level counts of PT participants and PT participants as a percentage of total secondary school enrollment.

3 Base Year Weights

In this section, we describe construction of base year replicate weights for students. As far as we can determine, this was not done originally, in part because the concept of replication was nascent at the time.

3.1 Cleaning Up the Weights

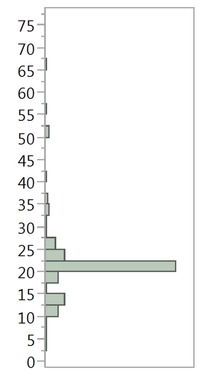
Table 2, which is reproduced with small changes from Wise et al. (1979), shows final sampling strata and weights for the schools participating in PT. Prior to construction of student replicate weights, we made two "housekeeping changes" to the school weights. First, for two schools in the version of Table 2 in Wise et al. (1979), there are no records in the student dataset. Therefore, we dropped those schools, and re-distributed their weights to other schools in their respective strata. Second, the student data file contains school weights only to the precision of one decimal digit with an implied decimal point (a necessary compromise at the time, given the cost of computer storage). Because the weights are ratios of known integer values, we re-calculated them to full precision. The principal school sampling rates are readily discerned from these tables, as are some deviations from them.

For the most part, student weights in the PT dataset are determined by three obvious rules: (1) In New York City, student weight is 12.0 (the school weight, which is one, divided by the sampling fraction of 1/12); (2) in Chicago, student weight is 19.0 ("20 of the 38 academic high schools" divided by the sampling fraction 1/10); (3) otherwise, the student weight is equal to the school weight, because all students in that school were selected for PT. (The weight calibration described in §3.3 addresses the issue that original PT weights do not reflect student-level non-participation.) There are, however, many exceptions to this rule for students in junior high schools. These are the result of judgements by the 90+ Regional Coordinators (Shaycroft, 1977) regarding assignment of junior high schools to senior high schools. In the data file, no junior high school has more than one "parent" senior high school, even though in reality a junior high school may feed more than one senior high school. On the other hand, in the data file, many senior high schools have more than one "daughter" junior high school. In any event, these judgements are both unrecoverable and unreproducible, so we simply accepted them. The weights of students subject to rules (1)–(3) were changed to full precision; all others were left unaltered. Figure 4 shows the distribution of our final base year weights.

3.2 Student Replicate Weights

Our core set of student replicate weights was constructed using a jackknife procedure, but see §3.5 for discussion of alternative replication methods. The key preliminary step in constructing replicate weights for either schools or students is to generate school-level variance strata (VStrata) and variance primary sampling units (VPSUs). As is common, we employ VStrata and VPSUs that differ from the sampling strata and PSUs. Also, because of the number of students involved (22,603, which is 6% of the total) we felt that is was essential to preserve the structure of student-level sampling in New York, together with the school-level sampling elsewhere. For simplicity, the 20 of 38 senior high schools in Chicago were treated in the same way as other senior high schools, and the student-level sampling in Chicago was ignored.

To begin, the 90 senior high schools and 125 junior high schools *in New York City* were assigned to four VStrata by splitting the senior schools randomly into three VStrata, and placing all of the junior high schools into a single VStratum.



Quantiles		
100.0%	maximum	75
99.5%		65
97.5%		50
90.0%		25
75.0%	quartile	22
50.0%	median	21.0526
25.0%	quartile	20
10.0%		13
2.5%		12
0.5%		5
0.0%	minimum	0.9

Summary Statistics	
Mean	21.384665
Std Dev	7.6224749
Std Err Mean	0.0124141
Upper 95% Mea	21.408996
Lower 95% Mean	21.360333
N	377015

Figure 4: Distribution of the final base year student weights.

Desirable characteristics of VStrata are internal homogeneity—schools in each VStratum should be similar—and size—each VStratum should have neither too few nor too many schools. We constructed the VStrata using *recursive partitioning (RP)* as implemented in SAS® JMP® (SAS Institute Inc., 2012). This technique is a variant of the well-known Chi-squared automatic interaction detection (CHAID) procedure of Kass (1980). The choice was made on the basis of the ability of RP/CHAID to handle both categorical and continuous predictors, ability to handle missing data (JMP allows missingness to be treated as informative, but we did not do this.), and the ease of implementing stopping rules.

The result is a binary tree such as that shown in Figure 6. All splits are binary, and based on one predictor variable. Each terminal leaf represents one VStratum; as noted previously, VPSUs were created by randomly splitting VStrata into two equal subsets. The termination criterion was a combination of statistical significance and VStratum size.

The CHAID/partitioning analysis was performed only for the 895 senior high schools *not in New York City*. Using the partition modeling functionality in SAS JMP, splits were made on the basis of five predictor variables, until either the split was not statistically significant or node size was less than 12.

The response variable was taken from the PT General School Characteristics (GSC) data file, which contains school-provided responses to several hundred questions dealing with student body, teachers, curriculum, counseling, adminstration, facilities and community. We employed the variable GSC62, which is the percentage of students in a college preparatory program, abbreviated as CPP. Roughly speaking, CPP measures the extent to which a school is academically oriented, as opposed to preparing students for vocational training or direct employment. As a point of reference, in 1960, approximately 45% of U.S. high school graduates were enrolled in college in the fall following graduation (Snyder, 1993). Accounting for dropouts, the enrollment rate was much lower. Current rates, of course, are considerably higher, although even today only approximately 30% of adults are college graduates (Snyder and Dillow, 2013).

CPP is categorized into 13 values: none (coded as 1), 0–9%—0 not included (2), 10%–19% (3), 20%–29% (4), 30%–39% (5), 40%–49% (6), 50%–59% (7), 60%–69% (8), 70%–79% (9), 80%–89% (10), 90%–99% (11), and 100% (12), as well as missing. The unweighted histogram of CPP for all 1,226 PT schools is shown in Figure 5. In the analyses, "missing" was treated as if it were a response.

The five predictors were:

Geographic area: The nine (present-day) U.S. Census Bureau divisions, plus New York City. The nine divisions are New England, Middle Atlantic, East North Central, West North Central, Mountain, Pacific, West South Central, East South Central and South Atlantic.

School control: Public, private, or parochial, taken from the GSC file.

Size of the senior class: Number of 12^{th} graders in each public school, from the GSC file.

Racial composition: Based on the GSC questionnaire, the distribution of students by race was categorized as predominantly Black, predominantly White, or predominantly Other, where predominantly refers to 50% or more enrollment. When all items identifying the school's student racial distribution were missing, the categorization was based on the racial distribution of students who responded to the 1-, 5-, or 11-year followups. In these cases, if 60% or more of the students reported Black or White as their race, then the school was categorized as being predominantly Black or predominantly White, respectively. If 60% of the respondents reported a race other than White or Black, then the school was categorized as predominantly Other. This higher percentage was based on an analysis that compared the accuracy of using student-reported data (given patterns in nonresponse and changes in reporting options) to school-reported data where school- and student-level information was present.

Gender composition: A school was classified as single-sex if either the male or female enrollment exceeded 90%, and otherwise as coeducational.

The retention ratio stratification variable was not used because it is available only for some of the public schools, and because of the previously noted inability to reproduce it.

Figure 6 shows the first 10 nodes in the partition. Perhaps not surprisingly given the CPP response variable, the most significant split is on control—public as opposed to parochial or private. Confirming the ID (interaction detection) capability of CHAID, for parochial/private schools, the next split is on coed or not, but for public schools the next split is on geography—essentially the center of the U.S. as opposed to the two coasts.

The remaining steps in the process were as follows:

1. Terminal nodes with more than 24 schools (because of lack of significance) were split randomly into two or more sets of size 12–24. Splitting based on statistical significance produced a final partition with 21 nodes.

2. Junior high schools were placed in the same node as their parent senior high school.

3. Further (random) splitting was performed in order to satisfy the “$12 \le \text{size} \le 24$” criterion.

Ultimately, the partitioning led to 48 VStrata containing the 1,011 senior and junior high schools not in New York City.

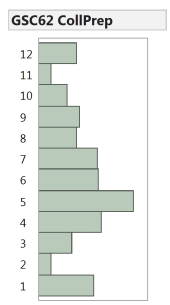
Figure 7 shows the final sizes of the 52 VStrata, in numbers of schools and (unweighted) numbers of students. Each VStatrum was split randomly into two VPSUs; we remind that this is at the school level.

The final step was to create the 104 sets of student-level replicate weights. We employed a jackknife procedure within SAS. When a VPSU was omitted, weights in its twin were doubled.

The method to estimate the standard error for a target statistic $\hat{\theta}$ is well-established (Stapleton, 2008; Wolter, 2007). Let $\hat{\theta}_{(ik)}$ be the statistic computed using the replicate weights associated with omitting VPSU k from VStratum i, and let $\hat{\theta}_0$ be the estimate calculated using the full set of base weights. Then, the estimated standard error is

$$\widehat{\mathrm{SE}}(\hat{\theta}) = \sqrt{\sum_{i=1}^{59} \sum_{k=1}^{2} \frac{1}{2} (\hat{\theta}_{(ik)} - \hat{\theta}_0)^2}. \tag{1}$$

For applications, see §3.4 and 6.



Frequencies

Level	Count	Prob
1	110	0.10338
2	24	0.02256
3	66	0.06203
4	124	0.11654
5	189	0.17763
6	120	0.11278
7	117	0.10996
8	75	0.07049
9	82	0.07707
10	56	0.05263
11	25	0.02350
12	76	0.07143
Total	1064	1.00000

N Missing 162
12 Levels

Figure 5: Histogram of values of CPP for PT schools.

3.3 Weight Calibration

The “cleaned up” base year weights described in §3.1 sum to approximately 8,062,339. Although there are inconsistencies, the consensus of multiple sources is that the number of high school students in the U.S. during the school year 1959–60 was approximately 9.3 million. Although we cannot document the discrepancy, our belief is that base year weights do not account for absentees or refusals, students who

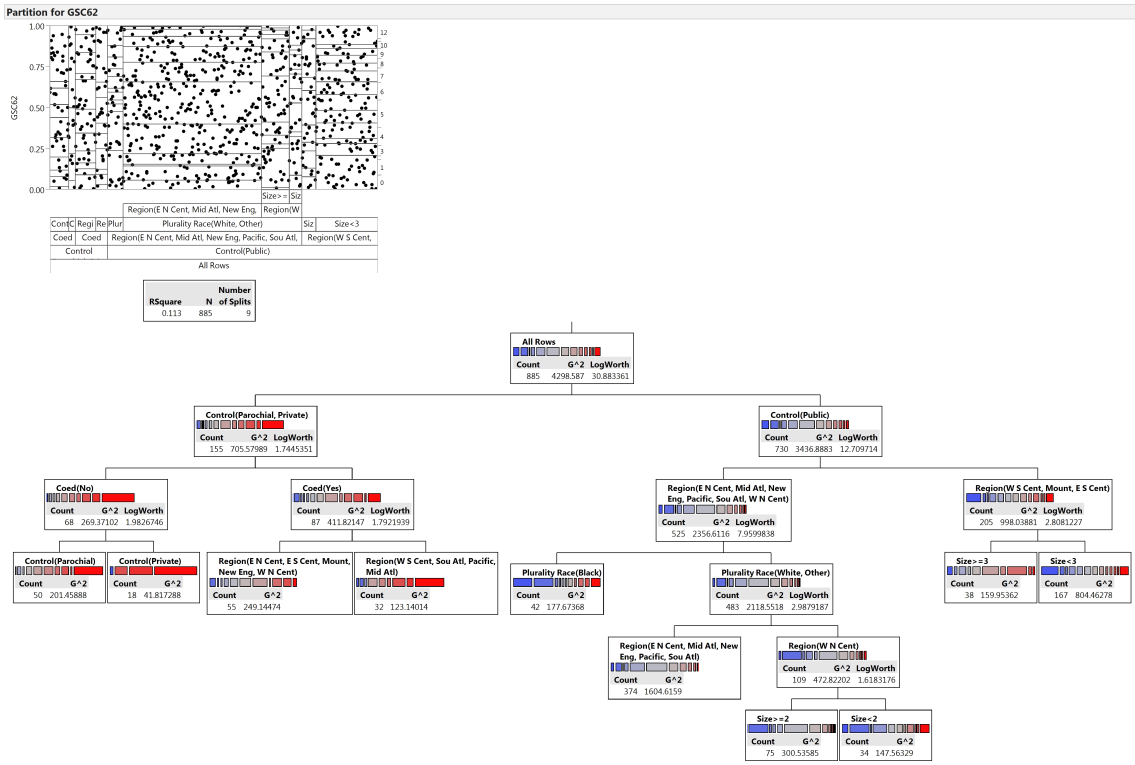


Figure 6: Initial splits in partition analysis for senior high schools not in New York City.

dropped out during the school year, or for the possibility—for which there is (only) anecdotal evidence—that some students' records have been lost. We think that refusals did not occur on a large scale, but daily school absenteeism is on the order of 8–10%. Coupled with possible dropouts and lost data, absenteeism seems to necessitate calibration of the weights.

The process employed for calibration is essentially a poststratification using enrollment counts by state and public/private, the latter including parochial schools. That is, students' base year weights were multiplied by state-and-public/private-specific factors in order to match estimates derived in a manner we describe momentarily. The resulting calibrated weights sum to approximately 9,241,243, which is a 14.6% increase over the sum of the first set of base year weights. This increase is plausible; the total is less than 9.3 million because the final PT sample contained no schools in Alaska or the District of Columbia. (The former is by design, and the latter, we believe, is because the two schools in DC selected in the sample declined to participate.)

However, the story is more complex: the factors by which weights are multiplied range (over states) from .5 to 3.05 for public schools and from .1 to 2.59 for private schools. Figure 8 contains maps showing the factors by state. That so many factors differ so much from 1.0 suggests that the "sample entire schools" strategy employed by PT produced a seriously—although redeemably—biased sample of students. The weight calibration is an essential part of that redemption. As we discuss further in §3.6, this strategy also produced a grossly inefficient sample. Modern surveys conducted by the NCES, which use a "sample schools and then sample students within schools" approach, address these issues in at least two ways. First,

	VStratum	School Count	Student Count
1	1	17	6167
2	2	17	6691
3	3	16	5196
4	4	16	3659
5	5	28	15420
6	6	24	15500
7	7	31	19377
8	8	25	16834
9	9	26	16048
10	10	21	13155
11	11	23	15287
12	12	26	16239
13	13	37	34058
14	14	35	31923
15	15	20	4664
16	16	23	5928
17	17	20	5037
18	18	21	4725
19	19	20	4362
20	20	20	5227
21	21	21	5030
22	22	20	4379
23	23	20	4435
24	24	21	4211
25	25	20	3544
26	26	17	995

	VStratum	School Count	Student Count
27	27	17	1219
28	28	21	4667
29	29	21	5025
30	30	21	5016
31	31	17	3483
32	32	25	3679
33	33	22	4072
34	34	20	3490
35	35	20	3143
36	36	22	4389
37	37	21	3475
38	38	21	3211
39	39	18	6286
40	40	17	5375
41	41	17	3805
42	42	13	4286
43	43	12	3353
44	44	21	3555
45	45	16	3080
46	46	16	5208
47	47	21	2950
48	48	12	2043
49	49	49	7957
50	50	36	7802
51	51	125	4235
52	52	20	4120

Figure 7: VStratum counts of schools and students.

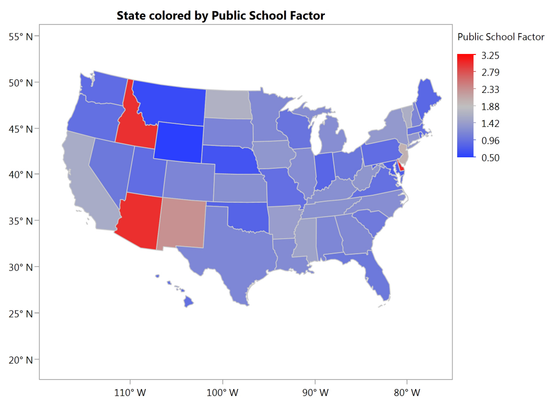
the designs for sampling schools are much more complex than the PT design; in particular, certain classes of schools are rather heavily over-sampled. And second, students *are sampled*, sometimes using entire classrooms (which may or may not be inefficient, depending on how students are assigned to classrooms), and sometimes not.

The part of the process that remains to be described is from where the student counts used in the calibration were obtained, as well as adjustments that were made to them. The principal steps in the process are as follows. First, state-level *public* secondary enrollment totals for 1959–60 were taken from documents provided by NCES (Hobson and Schoss, 1960). The total secondary enrollment in this source is 8,484,869. There are, however, no schools from either Alaska or the District of Columbia in the main PT student file, so the total number of students for the remaining 49 states is 8,451,658.

An identified issue with these counts is that they include all students enrolled at any time during the school year, as opposed to the point-in-time counts commonly reported currently. From Simon and Grant (1964), total public school enrollment in the fall of 1959 was 8,271,000. (The reported value is in thousands: 8,271, an unfortunate but unavoidable loss of precision.) It would have been better to have counts from the spring of 1960, when the PT administration took place, but these could not be identified. Accordingly, all state-level counts from Hobson and Schoss (1960) were reduced by a factor of 8,271,000/8,484,869, leading to an estimated spring 1960 public school enrollment for the 49 states of 8,238,538.

For private schools, state-level secondary enrollment counts for the 1960–61 school year were available in Simon and Grant (1964), as is a nationwide total of 1,035,000 for all private school enrollment in the fall of 1959. The nationwide 1960–61 count is 1,109,443. Therefore the 1960–61 counts were reduced by a factor of 1,035,000/1,105,443 to produce estimated secondary school counts for the 49 states for the spring of 1960.

The total of these counts is 1,027,290, so that the estimated total secondary enrollment for the 49 states in the spring of 1960 is 9,265,828. Finally, the derived base year weights were calibrated to these counts on a state-by-state and public-vs.-private basis, to these counts. The sum of the calibrated weights is 9,241,242.9501. This discrepancy arises because in some states PT has no students from private schools. The distributions of both the uncalibrated weights and the calibrated weights are shown in Figure 9.



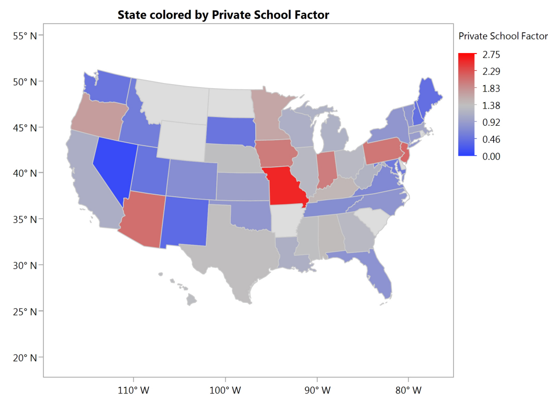


Figure 8: State- and public/private-specific factors used to construct the calibrated base year PT weights. *Left:* public school factors. *Right:* private school factors.

3.4 Application to PT Composite Scores

The PT data contain at total of 140 composite scores. We omit those of the form "three times number right minus number wrong," leaving 128 scores falling into five categories (Wise et al., 1979):

Information Composites: 69 scores, some of them sums of others, derived from the two-part, 395-item Information Test.

Personality Composites: 10 personality characteristics derived from the 150-item Student Activities Inventory.

Interest Composites: 17 interest scores derived from the 205-item Interest Inventory.

Characteristic Composites: 18 scores representing various student characteristics, derived from 395-Item Student Information Blank (SIB). Among these is a socioeconomic index derived using methodology described in Wise et al. (1979). Below we mention briefly an alternative socioeconomic index.

Cognitive Composites: 14 scores derived from 27 of the Information Composites, and, in some cases, from each other.

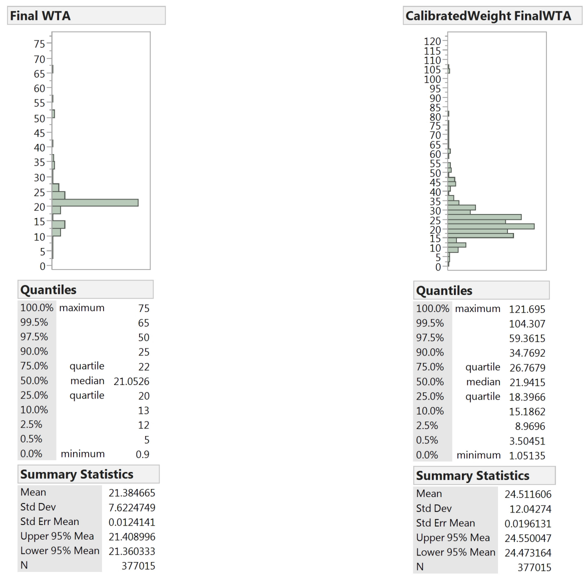


Figure 9: Distribution of the uncalibrated (left) and calibrated (right) base year weights.

Tables 7–12 contain the names of these composites. The main PT dataset contains item-level responses for the SIB, the Interest Inventory and 143 of the 395 Information Test Items. There is a four percent sample of participants for whom complete item-level response data are available.

A canonical application of replicate weights is to test significance of comparisons. Tables 7–12, in the Appendix, contain three such binary comparisons for the 128 PT composites, performed using the jackknife replicate weights described in §3. Specifically, Tables 7 and 8 compare males and females; Tables 9 and 10 compare students of different races (white and nonwhite), and Tables 11 and 12 compare students based on whether their value of our alternative socioeconomic index is above or below the median.

Each pair of tables has exactly the same set of columns: the composite name; the estimated mean for one group and the associated standard error, estimated using the jackknife replicate weights; the estimated mean and estimated standard error for the other group; which group has the higher mean (With the possible exception of Impulsiveness (R603), a higher mean is "better."); the z-statistic

$$z = \frac{|\text{Mean}_1 - \text{Mean}_2|}{\sqrt{\widehat{\text{SE}}_1^2 + \widehat{\text{SE}}_2^2}}, \tag{2}$$

where Mean_1 and Mean_2 are the means and $\widehat{\text{SE}}_1^2$ and $\widehat{\text{SE}}_2^2$ are the estimated errors; the p-value for this statistic; and whether the difference is significant at the .05 level. Because sample sizes are very large, under the null hypothesis of no difference, $z = |z^*|$, where z^* is approximately normally distributed with mean 0 and variance 1. Significance tests were adjusted for multiplicity within each set of comparisons using the false discovery rate (FDR) technique (Benjamini and Hochberg, 1995).

Concerning the three bases of comparison, sex is present in the PT data for all students. Race, on the other hand, was only part of the FY5 and FY11 followup data collections. Information about race was collected in the three followups, as well as recent pilot studies, but the level of missingness is extremely high notwithstanding. The race used in Tables 9 and 10 is a full-sample imputation performed using methodology described in Karr (2014) that combines information from student responses in the base year and followups; from sibling relationships—making the useful, if not absolutely perfect, assumption that siblings all have the same race (Recall that Project Talent was conducted in 1960–74, at which time conceptualizations of reported race were very different from those today.); and from participating schools regarding racial composition of the student body. Validation using a 2012 pilot study shows the race imputation to be more than 95% correct.

The socioeconomic index (P801) contained in the PT data is constructed from the categorical responses to 9 items: home value, family income, number of books in the home, number of automatic appliances, number of electronic devices, number of rooms, paternal occupation, paternal education and maternal education. There is good reason to suspect high measurement error in some of these, even given that responses were categorical, be we have no good way of assessing it, and no data edits were applied. Each of the nine variables was then converted to a numerical value z_i, as shown in Table 3.9 of Wise et al. (1979). Details of the rationale are not recoverable, but the notation suggests that the z_i were meant to be normally distributed with mean 0 and variance 1. Then, the nine numerical values z_i were combined, for each student using the formula

$$\text{P801} = 100 + 10 \times \frac{1}{\rho_K} \sum_{i=1}^{9} z_i \mathbf{1}\,(\text{Item } i \text{ is not missing})\,, \tag{3}$$

where $K = \sum_{i=1}^{9} \mathbf{1}\,(\text{Item } i \text{ is not missing})$ and the ρ_j are averaged correlations calculated as described in Wise et al. (1979, p. 37).

The number and nature of assumptions underlying this algorithm, as well as the fact that it ignores weights, led us to construct an alternative socioeconomic index that is simply equal to the first principal component of the 9 scores, where the analysis is performed using the calibrated base year weights. It is this variable that underlies Tables 11 and 12.

The results of the three comparisons are summarized in Table 3. They are interesting, and agree with expectations. First, 95% (365/384) of the comparisons are significant at the level of $\alpha = 0.05$, even adjusted for multiplicity. The very large sample size of 377,015 means that most differences will be significant. Whether these differences are substantively important is a different question; the most common course in this situation is to employ effect sizes.

Second, the split between females' achieving higher scores and males' achieving higher scores is approximately equal. Closer examination of Tables 7 and 8 shows that, as expected, in general females score higher on composites related to art, literature and verbal ability, while males score higher on science, engineering, and mathematics ability. For instance, females score higher on R104 Music, R114 Home Economics, R131 Art, R140 Practical Knowledge, R143 Etiquette, and R150 Theater/Ballet, all of the language composites R211–R250, C002 General Academic Composite, C003 Verbal Composite, and C009 Foreign Language Composite. Correspondingly, males score higher on R103 Literature, R105 Social Studies, R106 Mathematics, R107 Physical Science, R108 Biological Science, R110 Aeronautics, R111 Electronics, R112 Mechanics, all of the mathematics composites R311–R340, and all of the Cxxx composites other than C002, C003, and C009. Females do have higher estimated scores on R109 Scientific Attitude, but the difference is not significant.

For race and socioeconomic status, the stories are similar, albeit not identical. Predominantly, scores are higher for whites than nonwhites. Nonwhites' scores are higher only for some of the Personality, Interest, and Characteristics composites. For the 14 Cxxx cognitive composites, z-statistics all exceed 25, indicating an enormous gap between white and nonwhites.

Scores are higher for those whose socioeconomic status is above the median than those whose socioeconomic status is below the median for all composites except P712–P717, which indicate interest in occupations not requiring extensive education, and F838 Work Activities: not surprisingly, those with below median socioeconomic status are more engaged in chores and jobs. The gap with respect to the Cxxx cognitive composites is comparable to that for race. These findings echo, but earlier in time, the current attention to economic and educational inequality in the U.S.

3.5 Alternative Replication Methods

We also constructed replicate weights using two Hadamard matrix-based methodologies: balanced repeated replication (BRR) (Wolter, 2007) and Fay's modification of BRR (FBRR) (Dippo et al., 1984; Judkins, 1990; Rao and Shao, 1999). The latter is attractive in some situations because no replicate weights are set equal to zero. Figure 10 shows that for PT, there is no material difference among the jackknife, BRR, and FBRR replicate weights in terms of the estimate standard errors they generate. It contains a scatterplot matrix for all three methods, for the full set of 140 composite scores (§3.4).

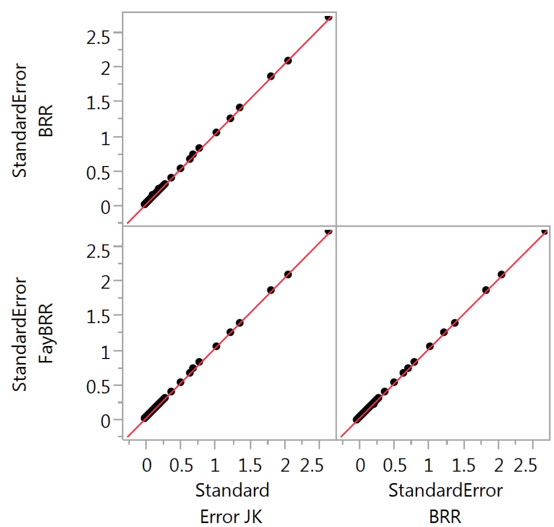


Figure 10: Scatterplot matrix of standard errors for the full set of 140 PT composites, calculated using jackknife replicate weights (JK), balanced repeated replication (BRR) and Fay's modification of BRR (FBRR).

3.6 Design Effects

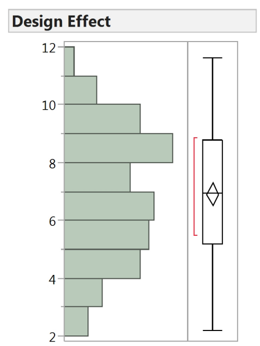
We conclude this section by examining design effects, a second canonical application of replicate weights to estimation of standard errors. We focus on the same 128 composite scores treated in §3.4.

We formulate the problem as follows. If the 377,015 student participants were a simple random sample (SRS) of the 9,241,243 U.S. high school students, each would have weight 24.512. Moreover, there is only one PSU, so we may create VStrata by assigning students randomly to them, and to randomly split each

VStratum into two VPSUs. Then, replicate weights can be constructed—according to §3.5, by any of JK, BRR and FBRR—and estimated standard errors calculated using them. To duplicate the jackknife replicate weights of §3.2 as nearly as possible, we employ 52 VStrata.

The distribution of the resultant design effects—that is, ratios of estimated standard errors—appears in Figure 11. To say that these design effects are large is an understatement. In other words, as a mechanism for sampling students, PT was quite inefficient. Of course, there are strong arguments in favor of the cluster sample design of sampling schools, namely, cost and school-level participation. However, unlike current NCES surveys, PT did not sample students within schools except in New York City and Chicago, where students *were* sampled within schools, but schools *were not* sampled.

The "statistical price" paid for not sampling students within schools is the extreme design effects. Not unexpectedly, the proximal cause is within-school student homogeneity. To illustrate, for the C001 IQ Composite, the national mean and standard deviation are 162.47 and 55.15, respectively. Figure 12 shows the distribution of the 1,224 within-school standard deviations for C001. (Two schools had only one student.) The national standard deviation is at the 93rd percentile of the within-school standard deviations! The behavior of other composites is similar.



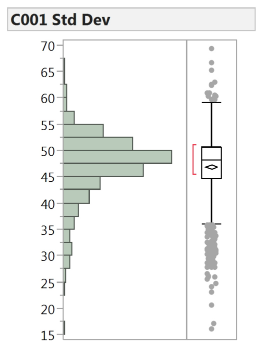
Quantiles

100.0%	maximum	11.6298
99.5%		11.6298
97.5%		10.666
90.0%		9.92892
75.0%	quartile	8.78484
50.0%	median	6.95875
25.0%	quartile	5.18069
10.0%		3.83895
2.5%		2.8389
0.5%		2.20457
0.0%	minimum	2.20457

Summary Statistics

Mean	6.9236862
Std Dev	2.251025
Std Err Mean	0.1989644
Upper 95% Mea	7.3174008
Lower 95% Mean	6.5299716
N	128

Figure 11: Distribution of design effects for 128 PT composites.



Quantiles

100.0%	maximum	69.3756
99.5%		62.2694
97.5%		57.0253
90.0%		53.351
75.0%	quartile	50.5424
50.0%	median	48.0584
25.0%	quartile	44.6842
10.0%		38.4714
2.5%		30.3043
0.5%		24.7199
0.0%	minimum	16.1452

Summary Statistics

Mean	46.920248
Std Dev	6.3266572
Std Err Mean	0.1808355
Upper 95% Mea	47.27503
Lower 95% Mean	46.565466
N	1224

Figure 12: Distribution of the within-school standard deviations for the C001 IQ Composite.

				REGIONS																				
				New England			Mideast			Great Lakes			Plains			Southeast			Southwest			Rockies		
		Sampling Ratio	Retention Ratio	Participating	Invited	Weight	Participating	Invited	Weight	Participating	Invited	Weight	Participating	Invited	Weight	Participating	Invited	Weight	Participating	Invited	Weight	Participating	Invited	Weight
Public High Schools	1-24 seniors	$\frac{1}{50}$	Low	2	2	50.0	2	2	50.0	8	8	50.0	22	23	52.3	17	19	57.1	12	12	52.2	5	5	50.0
			High	2	2		1	1		7	7	50.0	12	13	54.2	11	12		11	11		3	3	
			Unk.													0	1		0	1				
			Spec. Cases													5	5	20.0	1	1	20.0			
	25-99 seniors	$\frac{1}{20}$	Low	10	10	20.0	21	21	20.0	45	45	20.0	34	35	20.6	77	82	21.3	19	21	22.1	6	8	26.7
			High	6	6	20.0	21	22	21.0	40	40	20.0	27	28	20.7	64	66	20.6	16	18	22.5	5	6	24.0
			Unk.										1	1	20.0	0	1							
			Spec. Cases							1	1	16.2	1	1	16.2	1	1	32.5						
	100 -- 399 seniors	$\frac{1}{20}$	Low	8	8	20.0	20	22	22.0	16	17	21.3	8	9	22.5	19	20	21.1	6	6	20.0	2	4	40.0
			High	4	4	20.0	13	15	23.1	14	15	21.4	4	5	25.0	17	18	21.2	4	5	25.0	1	1	20.0
			Unk.																					
			Spec. Cases													1	1	17.0						
	400+ seniors	$\frac{1}{13}$	Low	0	0	13.0	2	3	26.0	2	2	18.6	2	2	13.0	2	2	13.0	1	1	13.0	1	1	13.0
			High	1	1		1	3		5	7		1	1		1	1		2	2		1	1	
			Unk.							0	1					1	1							
			Spec. Cases							1	1	20.0							1	1	3.0			
Parochial High Schools		$\frac{1}{20}$	N/A	13	13	20.0	23	25	21.7	21	21	20.0	15	16	21.3	13	15	23.1	7	7	20.0	2	2	20.0
Private High Schools		$\frac{1}{20}$	N/A	**8**	**9**	**22.5**	8	10	25.0	6	7	23.3	4	4	20.0	7	11	31.4	4	4	20.0	2	2	20.0
													1	1	50.0	1	1	50.0						
Totals				54	55		112	124		166	172		132	139		237	257		84	90		28	33	

				REGIONS																				
				New England			Mideast			Great Lakes			Plains			Southeast			Southwest			Rockies		
		Sampling Ratio	Retention Ratio	Participating	Invited	Weight	Participating	Invited	Weight	Participating	Invited	Weight	Participating	Invited	Weight	Participating	Invited	Weight	Participating	Invited	Weight	Participating	Invited	Weight
Public High Schools	1-24 seniors	$\frac{1}{50}$	Low	2	2	50.0	2	2	50.0	8	8	50.0	22	23	52.3	17	19	57.1	12	12	52.2	5	5	50.0
			High	2	2		1	1		7	7	50.0	12	13	54.2	11	12		11	11		3	3	
			Unk.													0	1		0	1				
			Spec. Cases													5	5	20.0	1	1	20.0			
	25-99 seniors	$\frac{1}{20}$	Low	10	10	20.0	21	21	20.0	45	45	20.0	34	35	20.6	77	82	21.3	19	21	22.1	6	8	26.7
			High	6	6	20.0	21	22	21.0	40	40	20.0	27	28	20.7	64	66	20.6	16	18	22.5	5	6	24.0
			Unk.										1	1	20.0	0	1							
			Spec. Cases							1	1	16.2	1	1	16.2	1	1	32.5						
	100 -- 399 seniors	$\frac{1}{20}$	Low	8	8	20.0	20	22	22.0	16	17	21.3	8	9	22.5	19	20	21.1	6	6	20.0	2	4	40.0
			High	4	4	20.0	13	15	23.1	14	15	21.4	4	5	25.0	17	18	21.2	4	5	25.0	1	1	20.0
			Unk.																					
			Spec. Cases													1	1	17.0						
	400+ seniors	$\frac{1}{13}$	Low	0	0	13.0	2	3	26.0	2	2	18.6	2	2	13.0	2	2	13.0	1	1	13.0	1	1	13.0
			High	1	1		1	3		5	7		1	1		1	1		2	2		1	1	
			Unk.							0	1					1	1							
			Spec. Cases							1	1	20.0							1	1	3.0			
Parochial High Schools		$\frac{1}{20}$	N/A	13	13	20.0	23	25	21.7	21	21	20.0	15	16	21.3	13	15	23.1	7	7	20.0	2	2	20.0
Private High Schools		$\frac{1}{20}$	N/A	**8**	**9**	**22.5**	8	10	25.0	6	7	23.3	4	4	20.0	7	11	31.4	4	4	20.0	2	2	20.0
													1	1	50.0	1	1	50.0						
Totals				54	55		112	124		166	172		132	139		237	257		84	90		28	33	

Table 2: The PT sample design for schools.

	Female	Male	White	Nonwhite	Above Median SES	Below Median SES	TOTAL
Significantly Different Composites	54	62	99	26	116	8	365
Not Significantly Different Composites	2	10	1	2	4	0	19
TOTAL	56	72	100	28	120	8	384

Table 3: Results and statistical significance ($\alpha = 0.05$) of comparisons of scores on 128 PT composites, on three bases—race, sex and socioeconomic status. Counts are of which group scored higher, on the average.

4 Reproducible Weights

Both as an intellectual exercise—to understand what differences arise—and for potential application, we constructed a set of what we term "reproducible" school- and student-level base year weights. That is, all of the heuristic and/or unexplained assumptions described in §3 are eliminated, so that we can describe *exactly* how these alternative sets of weights were constructed.

As in §3, Table 2 is the starting point for school weights. Two principal changes were made. First, all schools in Chicago, Detroit, Los Angeles, New York and Philadelphia were placed in their respective states, i.e., this "special" stratum was dropped. Second, the retention ratio was eliminated from the stratification. Therefore, except in New York City and Chicago, public schools senior high schools are stratified on geography and size of the senior class, while parochial and private senior high schools are stratified solely on geography. All school weights were then calculated to full precision. All junior high schools have weight equal to that of their (unique) parent senior high school. All senior and junior high schools in New York City have weight 1. All senior high schools in Chicago have weight $1.9 = 38/20$.

At the student level, the following rule applies

$$\text{StudentWeight} = \begin{cases} 12.0 & \text{in New York City} \\ 10.0 & \text{in Chicago} \\ \text{SchoolWeight} & \text{otherwise.} \end{cases} \tag{4}$$

Our "reproducible weights" were also calibrated, using the procedure described in §3.3; replicates have also been constructed. They are not identical to the calibrated base year weights. Figure 13 shows both a scatterplot and the distribution of the relative difference—the difference divided by the mean. However, operationally, they are nearly identical, as shown in Figure 14, which shows scatterplots of the estimated means and standard errors for the same 128 composite scores that appear in §3.4.

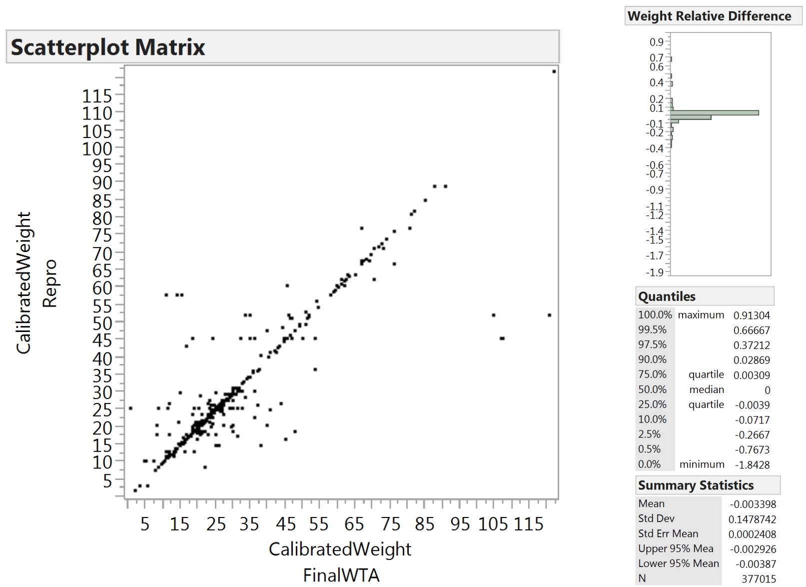


Figure 13: Relation between calibrated weights and calibrated reproducible weights. *Left:* Scatterplot. *Right:* Distribution of the relative difference.

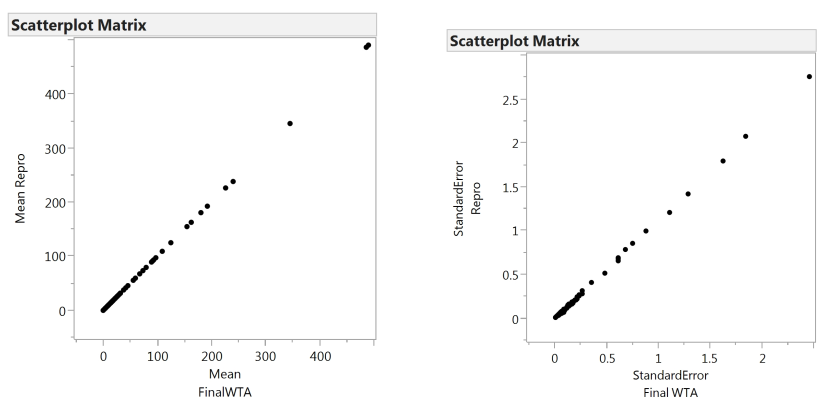


Figure 14: Comparison between estimates for 128 composites (§3.4) from calibrated reproducible weights to estimates from calibrated base year years in §3.3. *Left:* Estimated means for 128 composites. *Right:* Estimated standard errors for 128 composites.

5 Followup Weights

There are insufficient paradata regarding PT to definitively resolve followup nonresponse into its two primary components—failure to locate a participant and failure of a participant to respond who has been located. In research to be reported elsewhere, we describe efforts to do this, as well as models for response in the followups. Not surprisingly, for FY5 and FY11, response to an earlier followup is the most influential predictor.

Followup weights reflect two adjustments to the *calibrated* base year weights. The first, and more important, is for nonresponse. The second, which does matter, is for mortality. Adjustment for nonresponse is straightforward; we give details momentarily. However, because the only randomization in the followups is in selection of the special survey sample from the mail survey nonrespondents, the weights of *all nonrespondents* must be re-distributed to only the special survey respondents, leading to some very high followup weights, as can be seen in Figure 15.

The grade-specific strata used for construction of the followup weights are shown in Table 5. Effectively the strata are sex crossed with year of birth. However, for ninth graders, because of the way followup samples were selected, we must also account for whether they participated in the 1963 re-test (Wise et al., 1979, p. 18–19). Year of birth was coarsened to $\leq$ 1942, 1943, 1944, 1945 and $\geq$ 1946 for ninth graders, and analogously for other grades.

The year-of-birth-and-sex-specific mortality adjustment was based on life tables downloaded from the Human Mortality Database (University of California, Berkeley (USA), and Max Planck Institute for Demographic Research (Germany), 2014). For simplicity, students with years of birth of the form $\leq$ *nnnn* and $\geq$ *nnnn* were assigned the mortality factor associated with *nnnn*. The numbers involved were sufficiently small that no harm was done. Table 6 shows the effect of the mortality adjustment. By FY11—which in view of Table 1, spans the calendar years 1971–1974—mortality was approximately 3%. Not surprisingly, mortality is higher for males than females, reflecting both general characteristics and the Vietnam war.

Steps involved in construction, for *each followup and each stratum*, were then:

1. Base year calibrated weights were adjusted for mortality.

2. All mail survey respondents were assigned the mortality-adjusted, calibrated base year weight. (Recall that there was no sampling involved at the mail survey stage.)

3. Mortality-adjusted calibrated base year weights of all nonrespondents (to either the mail survey or both the mail survey and the special survey) were reassigned to special survey respondents, by multiplying each special survey respondent weight by the same factor. In other words, we performed a standard weighting class adjustment.

Figure 15 shows the distribution of the weights for the three followups.

Grade	BY	FY1			FY5			FY11		
		Mail Resp	SS Resp	Nonresp	Mail Resp	SS Resp	Nonresp	Mail Resp	SS Resp	Nonresp
9	103,893	47,051	2,742	54,100	27,686	1,574	74,633	19,937	3,105	80,851
10	99,573	42,424	2,432	54,717	31,647	1,989	65,937	19,773	2,019	77,781
11	92,419	43,549	2,622	46,248	32,406	2,001	58,012	22,962	2,077	67,380
12	81,130	50,483	1,270	29,377	30,753	1,797	48,580	22,670	1,491	56,969

Table 4: Numbers of respondents and nonrespondents for the PT base year and followups, by grade. "Mail Resp" means respondents to the mail survey; "SS Resp" means respondents to the special survey; "Nonresp" means nonrespondents.

Grade	Stratification
9	Sex $\times$ Year of Birth $\times$ Retest/NoRetest
10	Sex $\times$ Year of Birth
11	Sex $\times$ Year of Birth
12	Sex $\times$ Year of Birth

Table 5: Strata used to construct PT followup weights.

Data Collection	Sum of Weights
Base Year	9,241,242.9501
1-Year Followup	9,169,072.9773
5-Year Followup	9,124,598.8197
11-Year Followup	8,972,845.8258

Table 6: Sums of mortality-adjusted, calibrated followup weights.

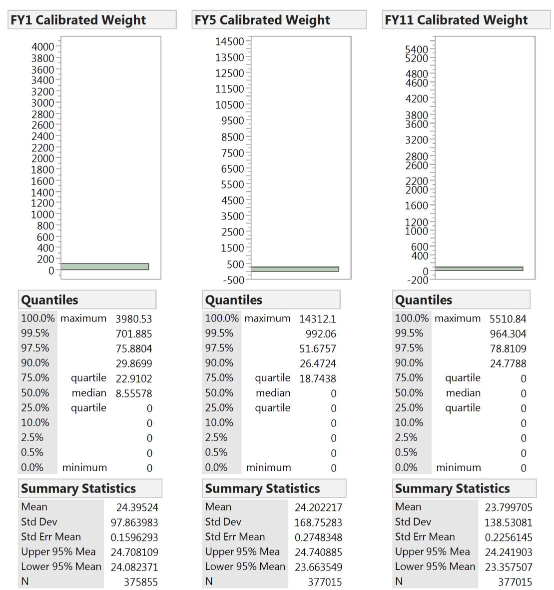


Figure 15: Distributions of the calibrated weights for the three PT followups.

6 More on the PT Cxxx Composites

As described in detail in Shaycroft (1977), an essential decision during the development of PT was to create a new test battery, rather than use one of the commercial batteries available at the time. Much effort was devoted to implementing this decision. However, analyses involving the base year replicate weights suggest that the composites are less informative than they might have been.

By way of background, Figure 16 shows the state-level means of the C001 IQ composite by sex and test grade. The Cxxx composites are convex combinations of raw scores (numbers correct, unadjusted for incorrect responses) on subsets of questions on the 395-item Information Test (Wise et al., 1979, p. Table 3.3). They are not normed by grade, as might be done today. Therefore, in Figure 16, there is a clear grade effect, as well as some, but not profound, gender effect. According to Table 8, males have higher estimated scores than females on C001, but the difference is not statistically significant. The most striking feature of Figure 16 is the extent to which the states of the southeast (the former Confederacy) lag the remainder of the country. Visually, students in these states in one grade are approximately comparable to those in other states who are two grades below them, regardless of sex.

At one extreme, students in Arkansas have very low scores; at the other extreme, those in Montana gave high scores. Based on general knowledge of the U.S. in 1960, the first of these is not surprising. The second, however, is quite unexpected. It may be the result of who in Montana remains in high school as opposed to dropping out. Another possible explanation is sampling variation: the PT school sample contains only eleven high schools in Montana, five of which were located in Billings, then as now the largest city in the state.

The maps in Figure 16 show that there is clear signal in the Cxxx composites. How much signal, though, is a different question. As another application of the base year weights, we consider this question from a modern perspective. The C014 Composite S [*sic*] is directly a function of C001–C013, so it has been dropped from the analysis. Figure 17 contains the results of a weighted principal components analysis (PCA)—on correlations, to remove scaling issues—of the remaining 13 Cxxx composites. The results are sobering, to say the least. The first two principal components (PCs) explain 92.1% of the variation in the data! Moreover, these components are completely interpretable. The first PC is, of course, an overall ability, while the second PC (from the loading matrix) differentiates between technical ability and verbal (including foreign language) ability.

Although we do not include full results here, it is possible to drill down further. The thirteen composites C001–C0013 are based on 23 Ryyy raw scores derived from the Information Test. A principal components analysis of these 23 scores shows that they are at most 7–8 dimensional. The conclusion is that a more informative set of composites could have been constructed using PCA. There are hints in the PT documentation that this issue was thought about, but it was never addressed.

Via (1), the replicate weights can be used to estimate the standard errors associated with the principal component loadings that appear in Figure 17. The results appear in Figure 18; the standard errors are negligible.

7 Conclusion

In this paper, we have described construction and application of calibrated full-sample and replicate student-level weights for the base year Project Talent dataset. We have also tried to convey the challenges and

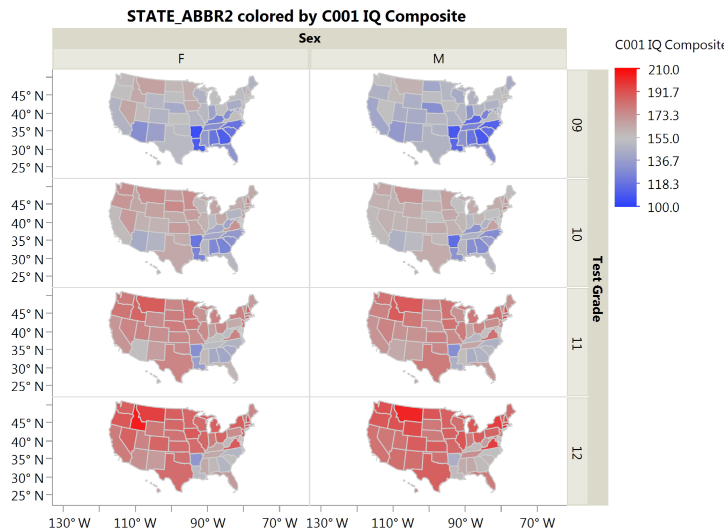


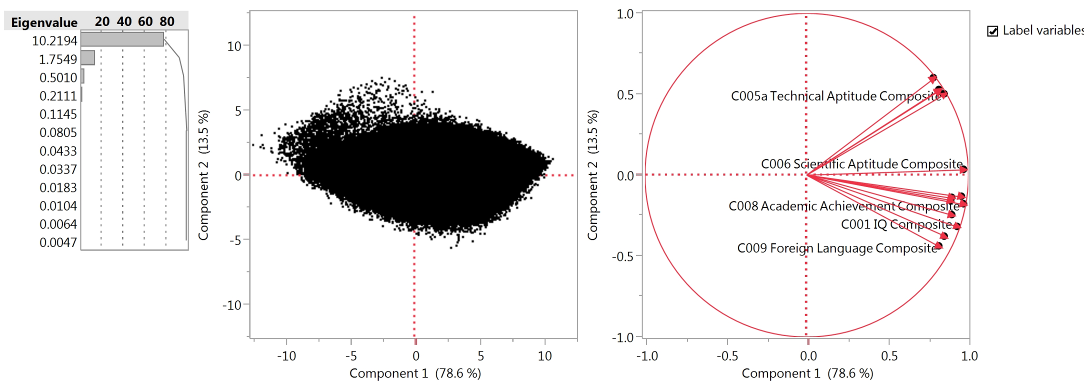
Figure 16: State-level means of the C001 IQ Composite by test grade and sex.

excitement of dealing with 50-year old data that are incompletely documented, and are compromised in some ways by computer limitations in 1960. Project Talent is both a window into the past and a pathway to the future, as additional data are collected that allow linkage of early adulthood and life trajectory data.

Principal Components: on Correlations

Weight: CalibratedWeight FinalWTA

Summary Plots



Loading Matrix

	Prin1	Prin2	Prin3	Prin4	Prin5	Prin6	Prin7	Prin8	Prin9	Prin10	Prin11	Prin12	Prin13
C001 IQ Composite	0.89964	-0.24743	0.14848	-0.28554	-0.13926	-0.01106	-0.00511	0.07519	0.00726	0.00711	0.00972	0.02102	0.00122
C002 General Aptitude Composite	0.93665	-0.32197	0.06248	-0.03600	0.00740	-0.05642	0.07473	-0.01376	-0.02394	-0.05799	0.00488	-0.02246	-0.01878
C003 Verbal Composite	0.85467	-0.37698	0.24938	0.19497	0.04105	-0.14855	0.04788	0.00198	0.00370	0.02362	-0.01169	0.01944	0.00897
C004a Quantitative Aptitude Composite	0.89591	-0.15667	-0.40617	-0.01044	0.06837	0.00190	0.02911	0.01279	-0.00494	-0.02980	0.02171	0.00808	0.02430
C004b Mathematics Composite	0.89965	-0.14330	-0.40363	-0.01519	0.05468	0.00574	0.01690	0.02626	0.01117	0.03768	-0.03036	0.00913	-0.01975
C005a Technical Aptitude Composite	0.85597	0.50013	0.05539	0.05992	-0.04262	0.03249	-0.02615	-0.00895	0.04712	-0.05256	-0.03699	0.02310	0.00090
C005b Technical Information Composite	0.82010	0.52600	0.03618	0.12960	-0.09973	0.09786	0.08329	0.03187	-0.06998	0.01668	0.00365	0.00172	0.00096
C006 Scientific Aptitude Composite	0.97633	0.03251	0.00235	-0.13281	-0.04940	0.01554	0.01622	-0.15669	-0.00175	0.02380	0.00025	0.00293	0.00375
C007 High School Academic Achievement Composite	0.95908	-0.13526	-0.06555	0.19083	-0.07865	-0.00160	-0.11370	-0.01324	0.00057	-0.00112	0.04048	0.00930	-0.01213
C008 Academic Achievement Composite	0.97319	-0.18251	-0.02319	0.04112	-0.10242	-0.00257	-0.05417	0.02319	0.01123	0.01104	-0.02609	-0.04801	0.01267
C009 Foreign Language Composite	0.82206	-0.44274	0.25473	0.00552	0.16446	0.18931	-0.01739	0.00748	0.00521	0.00271	-0.00050	0.00017	0.00086
C010 Technical Composite	0.81754	0.51962	0.07532	-0.11623	0.15065	-0.08820	-0.08818	0.01183	-0.06337	0.00148	-0.00565	-0.00257	0.00055
C011 Composite T	0.78788	0.59773	0.07216	-0.01710	0.07115	-0.02518	0.04923	0.02191	0.07858	0.01967	0.03116	-0.01803	-0.00285

Figure 17: Results of principal components analysis of 13 of the Cxxx PT composites.

	Composite	PC1	PC2	PC3	SE PC1	SE PC2	SE PC3
1	BY_C001 IQ Composite	0.89964	-0.24743	0.14848	0.0011296292	0.0028884517	0.0031276844
2	BY_C002 General Academic Composite	0.93665	-0.32197	0.06248	0.0006712776	0.0017530685	0.0013457179
3	BY_C003 Verbal Composite	0.85467	-0.37698	0.24938	0.0016660186	0.0027831209	0.0025616585
4	BY_C004a Quantitative Aptitude Composite	0.89591	-0.15667	-0.40617	0.0010005164	0.0026253901	0.002314632
5	BY_C004b Mathematics Composite	0.89965	-0.14330	-0.40363	0.0008865167	0.0025729194	0.002074549
6	BY_C005a Technical Aptitude Composite	0.85597	0.50013	0.05539	0.001955148	0.0032728186	0.0013449378
7	BY_C005b Technical Information Composite	0.82010	0.52600	0.03618	0.0024411483	0.0035474633	0.0023998247
8	BY_C006 Scientific Aptitude Composite	0.97633	0.03251	0.00235	0.0002856626	0.0007214295	0.0016698387
9	BY_C007 High School Academic Achievement Composite	0.95908	-0.13526	-0.06555	0.0004821599	0.0013744544	0.0016608712
10	BY_C008 Academic Achievement Composite	0.97319	-0.18251	-0.02319	0.0002552661	0.0009621076	0.0007503255
11	BY_C009 Foreign Language Composite	0.82206	-0.44274	0.25473	0.0023883638	0.0034700528	0.0014927548
12	BY_C010 Technical Composite	0.81754	0.51962	0.07532	0.002363557	0.0033027854	0.0019878778
13	BY_C011 CompT	0.78788	0.59773	0.07216	0.0029598653	0.0038243188	0.0013711043

Figure 18: Estimated standard errors for loadings for the first three principal components in Figure 17.

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Appendix: Tables of Composite Comparisons

	Composite	Mean Female	StandardError Female	Mean Male	StandardError Male	Higher Value	z Stat	p-Value	FDR Significant?
1	R101 Screening	11.516158	0.010054	11.144933	0.021393	Female	15.704749966	0	Yes
2	R102 Vocabulary Part I	11.182826	0.066126	12.374028	0.06967	Male	12.401253484	0	Yes
3	R103 Literature	11.763814	0.07917	11.878199	0.086417	Male	0.9759831191	0.3290728298	No
4	R104 Music	6.239323	0.04632	5.596715	0.042641	Female	10.206818925	0	Yes
5	R105 Social Studies	12.853783	0.085213	14.608911	0.1004	Male	13.328047268	0	Yes
6	R106 Mathematics	7.131608	0.078565	8.881525	0.088109	Male	14.823602323	0	Yes
7	R107 Physical Science	6.849461	0.056872	9.157708	0.07265	Male	25.018143099	0	Yes
8	R108 Biological Science	5.282025	0.032022	6.165856	0.039265	Male	17.443905154	0	Yes
9	R109 Scientific Attitude	5.771262	0.024568	5.72495	0.026827	Female	1.2731176999	0.202976279	No
10	R110 Aeronautics	2.635073	0.015	4.551533	0.031008	Male	55.637372012	0	Yes
11	R111 Electronics	5.276781	0.037659	8.901244	0.05588	Male	53.787169998	0	Yes
12	R112 Mechanics	7.445664	0.027709	11.731474	0.044454	Male	81.817286261	0	Yes
13	R113 Farming	6.933911	0.036714	7.64062	0.033761	Male	14.16901365	0	Yes
14	R114 Home Economics	12.114949	0.039562	8.084834	0.026096	Female	85.035009666	0	Yes
15	R115 Sports	5.32849	0.034525	7.736225	0.046689	Male	41.46439311	0	Yes
16	R190 Part I Total	117.353338	0.591295	133.79451	0.711242	Male	17.775590845	0	Yes
17	R131 Art	6.052196	0.039824	5.792525	0.04052	Female	4.5705525199	0.0000048644	Yes
18	R132 Law	4.160474	0.021028	4.707382	0.025962	Male	16.369779654	0	Yes
19	R133 Health/Medicine	5.857093	0.027511	5.392805	0.031861	Female	11.029561384	0	Yes
20	R134 Engineering	2.504917	0.013045	3.102327	0.013987	Male	31.235306602	0	Yes
21	R135 Architecture	2.504438	0.014364	2.5414	0.017696	Male	1.621713043	0.1048648048	No
22	R136 Journalism	1.627148	0.011558	1.618474	0.013654	Female	0.4848768857	0.6277636794	No
23	R137 Foreign Travel	2.215275	0.01735	2.632804	0.018631	Male	16.400358881	0	Yes
24	R138 Military	1.846278	0.013668	2.46157	0.021304	Male	24.308742974	0	Yes
25	R139 Accounting/Business/Sales	4.354009	0.024888	4.376822	0.031337	Male	0.5700720665	0.5686288201	No
26	R140 Practical Knowledge	3.022136	0.010073	2.935616	0.012777	Female	5.3177209894	1.0507503e-7	Yes
27	R141 Clerical	1.99206	0.007986	1.553096	0.008025	Female	38.772531419	0	Yes
28	R142 Bible	6.90501	0.045531	6.686437	0.053316	Female	3.1174912959	0.0018239733	Yes
29	R143 Colors	1.586036	0.009638	1.112496	0.006615	Female	40.509139078	0	Yes
30	R144 Etiquette	1.095314	0.007802	0.842101	0.005575	Female	26.406194181	0	Yes
31	R145 Hunting	1.079524	0.006074	2.170743	0.015235	Male	66.532957318	0	Yes
32	R146 Fishing	0.997554	0.005971	1.701886	0.014944	Male	43.767090812	0	Yes
33	R147 Outdoor Activities (other)	4.142836	0.025924	4.753461	0.027598	Male	16.126678445	0	Yes
34	R148 Photography	1.271762	0.004893	1.217055	0.007708	Female	5.9920829876	2.0717015e-9	Yes
35	R149 Games (sedentary)	1.96157	0.008638	2.338501	0.014126	Male	22.764633689	0	Yes
36	R150 Theater/Ballet	4.302786	0.025452	3.746515	0.025036	Female	15.581114118	0	Yes
37	R151 Food	1.383717	0.017854	1.118764	0.014377	Female	11.558396459	0	Yes
38	R152 Miscellaneous	4.321851	0.025701	4.630328	0.031901	Male	7.5300691295	5.062617e-14	Yes
39	R162 Vocabulary Part II	5.761825	0.027975	5.492103	0.037646	Female	5.7507250865	8.8861509e-9	Yes
40	R192 Part II Total	65.164382	0.304115	67.418279	0.37913	Male	4.6373586597	3.5288976e-6	Yes
41	R172 Vocabulary Total	16.949736	0.095658	17.887582	0.108747	Male	6.4753975371	9.456258e-11	Yes
42	R100 Total Parts I and II	182.166474	0.906295	201.278992	1.098477	Male	13.420896877	0	Yes
43	R211 Memory for Sentences	9.351968	0.022231	8.61185	0.018099	Female	25.817859522	0	Yes
44	R212 Memory for Words	12.12064	0.056457	10.416746	0.057103	Female	21.219012114	0	Yes
45	R220 Disguised Words	15.113136	0.07788	13.698131	0.079027	Female	12.753196461	0	Yes
46	R230 English Total	83.207224	0.204496	76.676252	0.248584	Female	20.289507066	0	Yes
47	R231 Spelling	9.84907	0.034997	8.334218	0.042477	Female	27.52418295	0	Yes
48	R232 Capitalization	29.670007	0.043188	28.348068	0.059663	Female	17.94801695	0	Yes
49	R233 Punctuation	18.168095	0.065222	16.219972	0.069821	Female	20.389547754	0	Yes
50	R234 English Usage	16.86567	0.043404	15.809392	0.049032	Female	16.130528833	0	Yes
51	R235 Effective Expression	8.732657	0.025254	8.052425	0.031673	Female	16.792302604	0	Yes
52	R240 Word Function in Sentences	10.522128	0.086514	9.054017	0.073828	Female	12.908374304	0	Yes
53	R250 Reading Comprehension	29.40303	0.169758	28.255525	0.189759	Female	4.5069123749	6.5777781e-6	Yes
54	R260 Creativity	8.064889	0.039248	8.746668	0.054092	Male	10.201575431	0	Yes
55	R270 Mechanical Reasoning	8.297432	0.035315	12.161873	0.039979	Male	72.445214232	0	Yes
56	R281 Visualization in Two Dimensions	11.389752	0.041497	13.485454	0.051468	Male	31.698689577	0	Yes
57	R282 Visualization in Three Dimensions	7.854253	0.020495	8.814398	0.025771	Male	29.159779322	0	Yes
58	R290 Abstract Reasoning	8.51007	0.035424	8.730281	0.038444	Male	4.212452455	0.0000252613	Yes
59	R311 Arithmetic Reasoning	7.71196	0.052918	8.324052	0.05995	Male	7.654549121	1.931788e-14	Yes
60	R312 Introductory Mathematics	9.686531	0.079568	10.504367	0.081863	Male	7.1639146139	7.840395e-13	Yes
61	R320 Mathematics Total	17.40357	0.130178	18.833964	0.140355	Male	7.472111653	7.904788e-14	Yes
62	R333 Advanced Mathematics	2.696309	0.023011	3.327965	0.030985	Male	16.36625231	0	Yes
63	R334 Mathematics II+III	12.415191	0.099749	13.872738	0.111453	Male	9.7448175657	0	Yes
64	R340 Mathematics I+II+III	20.141695	0.149177	22.214024	0.168831	Male	9.1983050049	0	Yes

Table 7: Comparison of student scores on the first 64 of the 128 PT composites, by sex.

	Composite	Mean Female	StandardError Female	Mean Male	StandardError Male	Higher Value	z Stat	p-Value	FDR Significant?
65	R410 Arithmetic Computation	38.120661	0.15447	36.079397	0.166327	Female	8.9926445827	0	Yes
66	R420 Table Reading	12.54669	0.134119	12.131194	0.131627	Female	2.2110370228	0.0270332734	Yes
67	R430 Clerical Checking	38.704748	0.207831	35.372114	0.217442	Female	11.079596128	0	Yes
68	R440 Object Inspection	23.240569	0.091648	22.253401	0.097427	Female	7.3802180717	1.580958e-13	Yes
69	A500 Preferences: Number Answered	58.069222	0.343692	58.749146	0.339809	Male	1.4067897864	0.1594897321	No
70	R601 Sociability	7.00258	0.015778	6.054114	0.016173	Female	41.977746877	0	Yes
71	R602 Social Sensitivity	5.107892	0.019585	3.940287	0.014412	Female	48.017561063	0	Yes
72	R603 Impulsiveness	1.96993	0.010245	1.913769	0.007839	Female	4.3535665978	0.000013394	Yes
73	R604 Vigor	3.577202	0.011296	3.5784	0.011518	Male	0.0742591234	0.940804202	No
74	R605 Calmness	4.32436	0.014606	3.93673	0.016725	Female	17.456899687	0	Yes
75	R606 Tidiness	6.078291	0.016234	4.942922	0.014961	Female	51.428721749	0	Yes
76	R607 Culture	5.705771	0.018911	4.464401	0.013701	Female	53.157707849	0	Yes
77	R608 Leadership	1.324099	0.006915	1.239218	0.006059	Female	9.2322674502	0	Yes
78	R609 Self Confidence	5.077091	0.015365	4.954638	0.016997	Female	5.3443825803	9.0725765e-8	Yes
79	R610 Mature Personality	11.339431	0.033188	10.470879	0.027444	Female	20.168275601	0	Yes
80	P701 Phyiscal Science/Engineering/Mathematics	11.989462	0.072463	20.687578	0.058032	Male	93.692935914	0	Yes
81	P702 Biological Science Medicine	16.266956	0.086062	18.437837	0.075333	Male	18.980316409	0	Yes
82	P703 Public Service	11.683648	0.094971	17.657845	0.085622	Male	46.721035208	0	Yes
83	P704 Literary/Linguistic	20.809589	0.083043	15.622507	0.063706	Female	49.559277316	0	Yes
84	P705 Social Service	23.99231	0.065917	15.774656	0.049776	Female	99.48776625	0	Yes
85	P706 Artist	20.518963	0.092918	16.409105	0.059913	Female	37.173391476	0	Yes
86	P707 Music	18.148153	0.098172	13.699492	0.074663	Female	36.068808687	0	Yes
87	P708 Sports	19.471465	0.080494	26.238043	0.052617	Male	70.363771498	0	Yes
88	P709 Hunting/Fishing	14.75933	0.081637	27.222397	0.076769	Male	111.21498871	0	Yes
89	P710 Business/Management	15.980622	0.05728	19.593369	0.048572	Male	48.104848362	0	Yes
90	P711 Sales	13.710112	0.062946	16.740102	0.051563	Male	37.237567823	0	Yes
91	P712 Computation	15.767432	0.061598	15.855315	0.063174	Male	0.9960200786	0.3192403895	No
92	P713 Office Work	24.065727	0.087357	12.744065	0.070616	Female	100.78995437	0	Yes
93	P714 Mechical/Technical	8.212471	0.048109	20.175159	0.086774	Male	120.56978779	0	Yes
94	P715 Skilled Trades	8.684145	0.047235	13.552183	0.102899	Male	42.995298348	0	Yes
95	P716 Farming	13.720645	0.079222	20.620012	0.117454	Male	48.698838492	0	Yes
96	P717 Labor	7.677801	0.072772	12.374544	0.105098	Male	36.741153177	0	Yes
97	P801 Socioeconomic Index	97.337649	0.205308	97.590261	0.207224	Male	0.8659775807	0.3865024564	No
98	D802 High School Curriculum: Academic/Other	0.359361	0.007557	0.435951	0.00653	Male	7.6686244501	1.731948e-14	Yes
99	F803 High School Courses: Academic	27.864864	0.173996	31.013349	0.194317	Male	12.070897688	0	Yes
100	P820 High School Grades	26.402203	0.130688	24.255271	0.105848	Female	12.765986534	0	Yes
101	F822 High School Guidance Received	20.961108	0.142943	23.16091	0.139809	Male	11.001862915	0	Yes
102	F823 Guidance Elsewhere	15.086149	0.050222	13.078919	0.046791	Female	29.242248825	0	Yes
103	P827 Study Habits	26.251725	0.040747	23.181113	0.04586	Female	50.053151655	0	Yes
104	P828 Self-Perception of Writing	23.981825	0.055528	20.716382	0.071717	Female	36.002248369	0	Yes
105	P829 Self-Perception of Reading	23.720237	0.045821	23.185721	0.047062	Female	8.1376819718	4.440892e-16	Yes
106	F830 Extracurricular Reading	33.332159	0.165453	30.604183	0.1989	Female	10.544135413	0	Yes
107	P831 Extracurricular Variety	32.226083	0.159319	32.389532	0.232483	Male	0.5799459983	0.5619510349	No
108	F832 Degree of Extracurricular: Not Sports	20.821726	0.110598	19.155205	0.140561	Female	9.317691742	0	Yes
109	P833 Variety of Hobbies	50.928199	0.133499	60.454979	0.267133	Male	31.901233595	0	Yes
110	F834 Degree of Hobbies	23.308278	0.065166	23.805861	0.131906	Male	3.3820397648	0.0007194973	Yes
111	F835 Sports Participation	11.991246	0.067396	15.358312	0.045096	Male	41.521689726	0	Yes
112	F836 Leadership Roles	19.474856	0.225902	17.269092	0.184844	Female	7.5568664991	4.13003e-14	Yes
113	F837 Social Life	45.070034	0.166926	45.072964	0.153574	Male	0.0129174873	0.989693623	No
114	F838 Work Activities (chores+jobs)	14.564697	0.066856	18.275485	0.062047	Male	40.683292801	0	Yes
115	C001 IQ Composite	161.633413	0.877624	161.753624	0.971813	Male	0.0918030644	0.9268545093	No
116	C002 General Aacademic Composite	491.07256	2.11847	481.579571	2.470823	Female	2.9167279404	0.0035372416	Yes
117	C003 Verbal Composite	112.125282	0.363783	106.65172	0.436128	Female	9.637722361	0	Yes
118	C004a Quantitative Aptitude Composite	87.194816	0.696762	98.320227	0.785228	Male	10.597743051	0	Yes
119	C004b Mathematics Composite	67.75878	0.541836	77.265297	0.623244	Male	11.511265901	0	Yes
120	C005a Technical Aptitude Composite	35.949106	0.172975	52.881599	0.245279	Male	56.415905227	0	Yes
121	C005b Technical Information Composite	22.307633	0.117258	34.477091	0.179115	Male	56.8445226	0	Yes
122	C006 Scientific Aptitude Composite	455.008567	2.43405	526.046118	3.040837	Male	18.237980174	0	Yes
123	C007 High School Academic Achievement Composite	231.172726	1.189982	246.851762	1.44653	Male	8.3706316855	0	Yes
124	C008 Academic Achievement Composite	336.676011	1.816424	353.739336	2.166717	Male	6.0350378207	1.5892545e-9	Yes
125	C009 Foreign Language Composite	188.339453	0.759335	171.535017	0.802818	Female	15.207127607	0	Yes
126	C010 Technical Composite	127.54242	0.437779	182.455025	0.682136	Male	67.748953475	0	Yes
127	C011 Composite T	23.692403	0.096113	37.433947	0.154754	Male	75.431847717	0	Yes
128	C012 Composite S	195.438106	1.149503	257.551359	1.476841	Male	33.189474833	0	Yes

Table 8: Comparison of student scores on the remaining 64 of the 128 PT composites, by sex.

	Composite	Mean White	StandardError White	Mean Nonwhite	StandardError Nonwhite	Higher Value	z Stat	p-Value	FDR Significant?
1	R101 Screening	11.437296	0.01191	10.262812	0.042664	White	26.514925416	0	Yes
2	R102 Vocabulary Part I	12.152155	0.0636	8.05836	0.137145	White	27.079941725	0	Yes
3	R103 Literature	12.175609	0.075723	8.283959	0.160637	White	21.91367396	0	Yes
4	R104 Music	6.109351	0.042457	4.004454	0.111416	White	17.65388445	0	Yes
5	R105 Social Studies	14.191436	0.087688	9.153733	0.156927	White	28.023906439	0	Yes
6	R106 Mathematics	8.287445	0.07656	5.216897	0.10837	White	23.141517067	0	Yes
7	R107 Physical Science	8.271332	0.067743	5.348964	0.085208	White	26.846308331	0	Yes
8	R108 Biological Science	5.854319	0.034819	4.429545	0.059709	White	20.61315107	0	Yes
9	R109 Scientific Attitude	5.917042	0.022975	4.0623	0.052055	White	32.5967032	0	Yes
10	R110 Aeronautics	3.714949	0.029173	2.39351	0.037731	White	27.706763159	0	Yes
11	R111 Electronics	7.335177	0.054511	4.659249	0.083427	White	26.851385911	0	Yes
12	R112 Mechanics	9.911786	0.044827	6.394835	0.08695	White	35.951394387	0	Yes
13	R113 Farming	7.522578	0.034522	4.94467	0.06102	White	36.770236634	0	Yes
14	R114 Home Economics	10.298078	0.03658	8.093431	0.081638	White	24.644298873	0	Yes
15	R115 Sports	6.736425	0.042215	4.513793	0.078538	White	24.92729526	0	Yes
16	R190 Part I Total	129.389436	0.629562	87.625511	1.35735	White	27.912501943	0	Yes
17	R131 Art	6.121598	0.036642	3.934876	0.105989	White	19.499211772	0	Yes
18	R132 Law	4.551157	0.022344	3.275115	0.044008	White	25.854136383	0	Yes
19	R133 Health/Medicine	5.791544	0.02737	3.959341	0.065442	White	25.829327652	0	Yes
20	R134 Engineering	2.892046	0.01384	1.932342	0.025513	White	33.064577478	0	Yes
21	R135 Architecture	2.58853	0.013831	1.870271	0.025285	White	24.921710631	0	Yes
22	R136 Journalism	1.67921	0.011393	1.061184	0.02153	White	25.371984573	0	Yes
23	R137 Foreign Travel	2.515099	0.016612	1.523802	0.045853	White	20.326201056	0	Yes
24	R138 Military	2.207696	0.018266	1.627904	0.023323	White	19.571389649	0	Yes
25	R139 Accounting/Business/Sales	4.507516	0.026146	2.951053	0.044887	White	29.962712271	0	Yes
26	R140 Practical Knowledge	3.051579	0.010509	2.253755	0.027289	White	27.282953332	0	Yes
27	R141 Clerical	1.824569	0.007598	1.248323	0.029965	White	18.640727075	0	Yes
28	R142 Bible	6.970908	0.038383	5.048333	0.053847	White	29.074065397	0	Yes
29	R143 Colors	1.381685	0.00824	1.019345	0.011709	White	25.307029441	0	Yes
30	R144 Etiquette	1.002345	0.006427	0.629992	0.015245	White	22.506319719	0	Yes
31	R145 Hunting	1.678376	0.010371	1.111589	0.023035	White	22.43634318	0	Yes
32	R146 Fishing	1.391086	0.010462	0.948559	0.016016	White	23.132340798	0	Yes
33	R147 Outdoor Activities (other)	4.614223	0.026091	2.804004	0.050803	White	31.696412103	0	Yes
34	R148 Photography	1.28966	0.005657	0.793065	0.021888	White	21.966216929	0	Yes
35	R149 Games (sedentary)	2.207016	0.011058	1.588465	0.022805	White	24.405658597	0	Yes
36	R150 Theater/Ballet	4.151201	0.023446	2.756329	0.046433	White	26.815842954	0	Yes
37	R151 Food	1.306166	0.015365	0.700405	0.017843	White	25.725736371	0	Yes
38	R152 Miscellaneous	4.599222	0.028196	3.254896	0.046204	White	24.836124584	0	Yes
39	R162 Vocabulary Part II	5.80683	0.030365	3.832186	0.066413	White	27.040481941	0	Yes
40	R192 Part II Total	68.304827	0.310208	46.279671	0.635638	White	31.140033577	0	Yes
41	R172 Vocabulary Total	17.967103	0.096155	11.920728	0.194955	White	27.815015164	0	Yes
42	R100 Total Parts I and II	197.537295	0.950919	133.37871	1.990457	White	29.084480876	0	Yes
43	R211 Memory for Sentences	9.062304	0.017635	8.15773	0.094507	White	9.4090941464	0	Yes
44	R212 Memory for Words	11.481871	0.042864	9.088416	0.114128	White	19.632653355	0	Yes
45	R220 Disguised Words	14.859508	0.062019	9.808152	0.225586	White	21.591053316	0	Yes
46	R230 English Total	81.138675	0.209762	67.794855	0.490508	White	25.012903323	0	Yes
47	R231 Spelling	9.23195	0.035672	7.649723	0.084727	White	17.211183271	0	Yes
48	R232 Capitalization	29.330784	0.047861	25.742015	0.198439	White	17.580874201	0	Yes
49	R233 Punctuation	17.546141	0.063264	13.615275	0.108337	White	31.332595394	0	Yes
50	R234 English Usage	16.562707	0.042855	14.052704	0.106119	White	21.93184542	0	Yes
51	R235 Effective Expression	8.528867	0.026339	7.007858	0.039938	White	31.792824822	0	Yes
52	R240 Word Function in Sentences	10.087582	0.074051	6.743788	0.102807	White	26.391478016	0	Yes
53	R250 Reading Comprehension	29.760988	0.161589	19.440434	0.344217	White	27.140906466	0	Yes
54	R260 Creativity	8.700077	0.042574	5.449489	0.113346	White	26.847076399	0	Yes
55	R270 Mechanical Reasoning	10.560622	0.044287	6.959685	0.092749	White	35.035407869	0	Yes
56	R281 Visualization in Two Dimensions	12.743523	0.04367	9.396256	0.156821	White	20.562138488	0	Yes
57	R282 Visualization in Three Dimensions	8.529747	0.021543	6.389319	0.086927	White	23.900252891	0	Yes
58	R290 Abstract Reasoning	8.866667	0.033485	6.141015	0.105031	White	24.724812887	0	Yes
59	R311 Arithmetic Reasoning	8.303563	0.05364	5.156559	0.067868	White	36.378960133	0	Yes
60	R312 Introductory Mathematics	10.404547	0.074436	7.004533	0.111675	White	25.333748232	0	Yes
61	R320 Mathematics Total	18.711578	0.126252	12.17339	0.1734	White	30.482097292	0	Yes
62	R333 Advanced Mathematics	3.083831	0.024995	2.292157	0.034475	White	18.59150156	0	Yes
63	R334 Mathematics II+III	13.518686	0.097035	9.343256	0.14232	White	24.240232006	0	Yes
64	R340 Mathematics I+II+III	21.832294	0.147671	14.523653	0.202187	White	29.191088294	0	Yes

Table 9: Comparison of student scores on the first 64 of the 128 PT composites, by race.

	Composite	Mean White	StandardError White	Mean Nonwhite	StandardError Nonwhite	Higher Value	z Stat	p-Value	FDR Significant?
65	R410 Arithmetic Computation	37.892826	0.139154	29.094142	0.432049	White	19.384397447	0	Yes
66	R420 Table Reading	12.474082	0.12146	10.967105	0.554346	White	2.6554835212	0.0079194803	Yes
67	R430 Clerical Checking	36.822032	0.201334	39.216372	0.683726	Nonwhite	3.3592850678	0.0007814441	Yes
68	R440 Object Inspection	22.886923	0.081966	21.32609	0.407081	White	3.7587702943	0.0001707505	Yes
69	A500 Preferences: Number Answered	58.323029	0.286274	59.270024	1.924653	Nonwhite	0.4866800042	0.6264851176	No
70	R601 Sociability	6.606413	0.01436	5.749918	0.057195	White	14.524214691	0	Yes
71	R602 Social Sensitivity	4.550948	0.018011	4.260107	0.033685	White	7.614068324	2.664535e-14	Yes
72	R603 Impulsiveness	1.947056	0.008841	1.889897	0.01988	White	2.6271249761	0.0086109701	Yes
73	R604 Vigor	3.622711	0.009438	3.127491	0.044214	White	10.953745727	0	Yes
74	R605 Calmness	4.169151	0.014827	3.745223	0.050485	White	8.0568252431	8.881784e-16	Yes
75	R606 Tidiness	5.535738	0.015612	5.263785	0.032663	White	7.5120377096	5.817569e-14	Yes
76	R607 Culture	5.090976	0.019021	5.031681	0.034354	White	1.5099983893	0.1310438352	No
77	R608 Leadership	1.245428	0.005494	1.645316	0.035831	Nonwhite	11.031468251	0	Yes
78	R609 Self Confidence	5.042908	0.014616	4.745261	0.033834	White	8.0759374495	6.661338e-16	Yes
79	R610 Mature Personality	10.940991	0.02857	10.549793	0.095982	White	3.9063609862	0.0000936965	Yes
80	P701 Phyiscal Science/Engineering/Mathematics	16.141725	0.064771	18.448426	0.206304	Nonwhite	10.667674022	0	Yes
81	P702 Biological Science Medicine	17.036558	0.068537	20.53414	0.191178	Nonwhite	17.22166568	0	Yes
82	P703 Public Service	14.267703	0.076417	18.79022	0.31154	Nonwhite	14.098711458	0	Yes
83	P704 Literary/Linguistic	17.84954	0.079279	21.778265	0.25661	Nonwhite	14.627902886	0	Yes
84	P705 Social Service	19.506023	0.091485	23.502969	0.156636	Nonwhite	22.034422747	0	Yes
85	P706 Artist	18.241321	0.079774	20.620643	0.134581	Nonwhite	15.208401178	0	Yes
86	P707 Music	15.429589	0.086513	20.784696	0.318781	Nonwhite	16.212283287	0	Yes
87	P708 Sports	22.808069	0.061896	23.433529	0.172289	Nonwhite	3.4165078853	0.0006342983	Yes
88	P709 Hunting/Fishing	21.097356	0.099623	19.769313	0.160549	White	7.0286776826	2.084999e-12	Yes
89	P710 Business/Management	17.504187	0.049708	20.665077	0.18089	Nonwhite	16.849496614	0	Yes
90	P711 Sales	14.961995	0.052381	17.898774	0.190311	Nonwhite	14.878199893	0	Yes
91	P712 Computation	15.456864	0.05536	19.342226	0.172545	Nonwhite	21.44139386	0	Yes
92	P713 Office Work	17.986835	0.100522	22.387063	0.19029	Nonwhite	20.446291568	0	Yes
93	P714 Mechical/Technical	14.042831	0.082814	15.908196	0.203859	Nonwhite	8.4774737413	0	Yes
94	P715 Skilled Trades	10.864445	0.072838	13.728464	0.180202	Nonwhite	14.735186513	0	Yes
95	P716 Farming	17.282245	0.089368	16.177037	0.159381	White	6.0484303955	1.462638e-9	Yes
96	P717 Labor	9.808643	0.087332	12.271504	0.203389	Nonwhite	11.126757276	0	Yes
97	P801 Socioeconomic Index	98.165387	0.195941	90.442833	0.362574	White	18.738059897	0	Yes
98	D802 High School Curriculum: Academic/Other	0.405528	0.006119	0.318289	0.011168	White	6.8506260387	7.352785e-12	Yes
99	F803 High School Courses: Academic	29.611149	0.142368	27.712212	0.226744	White	7.0926258031	1.315836e-12	Yes
100	P820 High School Grades	25.223566	0.110532	26.358941	0.353889	Nonwhite	3.0623826476	0.0021958256	Yes
101	F822 High School Guidance Received	21.706455	0.116165	25.573391	0.39472	Nonwhite	9.3981166762	0	Yes
102	F823 Guidance Elsewhere	14.159826	0.049445	13.293484	0.075343	White	9.613345904	0	Yes
103	P827 Study Habits	24.795878	0.03975	23.892088	0.053438	White	13.570233271	0	Yes
104	P828 Self-Perception of Writing	22.292292	0.046486	22.879597	0.169526	Nonwhite	3.3410607163	0.0008345897	Yes
105	P829 Self-Perception of Reading	23.511733	0.042789	22.867047	0.066379	White	8.1631527736	4.440892e-16	Yes
106	F830 Extracurricular Reading	31.850936	0.173244	33.094175	0.556583	Nonwhite	2.1327705727	0.0329435514	Yes
107	P831 Extracurricular Variety	30.956081	0.15255	45.840625	0.959239	Nonwhite	15.324456306	0	Yes
108	F832 Degree of Extracurricular: Not Sports	19.128256	0.104313	28.522078	0.62894	Nonwhite	14.734673336	0	Yes
109	P833 Variety of Hobbies	55.45279	0.153859	58.220438	0.491346	Nonwhite	5.3754066959	7.6410013e-8	Yes
110	F834 Degree of Hobbies	23.344372	0.085215	25.682982	0.260219	Nonwhite	8.540790067	0	Yes
111	F835 Sports Participation	13.873474	0.051841	11.742246	0.186491	White	11.010550491	0	Yes
112	F836 Leadership Roles	18.237395	0.194594	19.672393	0.357487	Nonwhite	3.5256363281	0.0004224667	Yes
113	F837 Social Life	45.371617	0.149238	42.116507	0.462127	White	6.702904997	2.043166e-11	Yes
114	F838 Work Activities (chores+jobs)	16.410087	0.061428	16.579001	0.103679	Nonwhite	1.4016560362	0.1610179849	No
115	C001 IQ Composite	166.816029	0.83775	109.869417	1.754779	White	29.286014936	0	Yes
116	C002 General Aacademic Composite	497.518419	2.098159	371.953758	3.901478	White	28.344960384	0	Yes
117	C003 Verbal Composite	111.461417	0.366685	88.469737	0.78071	White	26.655949938	0	Yes
118	C004a Quantitative Aptitude Composite	95.596546	0.68433	63.55361	0.956149	White	27.251804354	0	Yes
119	C004b Mathematics Composite	74.756281	0.53883	49.427113	0.732301	White	27.859451462	0	Yes
120	C005a Technical Aptitude Composite	45.774611	0.246177	30.556535	0.403727	White	32.182902014	0	Yes
121	C005b Technical Information Composite	29.319971	0.177651	19.042707	0.267027	White	32.044042093	0	Yes
122	C006 Scientific Aptitude Composite	505.544279	2.607025	333.341582	5.180367	White	29.693306104	0	Yes
123	C007 High School Academic Achievement Composite	244.77534	1.235368	179.880827	2.085262	White	26.774681219	0	Yes
124	C008 Academic Achievement Composite	354.426109	1.854374	250.414442	3.124951	White	28.623908995	0	Yes
125	C009 Foreign Language Composite	183.951342	0.674877	139.007977	1.612365	White	25.712671102	0	Yes
126	C010 Technical Composite	159.568942	0.682986	108.421483	1.433379	White	32.213190719	0	Yes
127	C011 Composite T	31.552848	0.161628	20.493722	0.281832	White	34.039701953	0	Yes
128	C012 Composite S	233.286752	1.339958	155.804526	2.101243	White	31.090770008	0	Yes

Table 10: Comparison of student scores on the remaining 64 of the 128 PT composites, by race.

	Composite	Mean Above Median	StandardError Above Median	Mean Below Median	StandardError Below Median	Higher Value	z Stat	p-Value	FDR Significant?
1	R101 Screening	11.65341	0.014225	11.441923	0.008415	Above	12.795959565	0	Yes
2	R102 Vocabulary Part I	13.948083	0.061184	11.425428	0.05021	Above	31.872325619	0	Yes
3	R103 Literature	14.155367	0.08564	11.351273	0.053384	Above	27.786386413	0	Yes
4	R104 Music	7.443975	0.04212	5.481467	0.035516	Above	35.620310509	0	Yes
5	R105 Social Studies	16.364486	0.078041	13.5454	0.071407	Above	26.650524044	0	Yes
6	R106 Mathematics	10.54154	0.088692	7.374846	0.053801	Above	30.526952206	0	Yes
7	R107 Physical Science	9.722875	0.069874	7.755299	0.055401	Above	22.064951608	0	Yes
8	R108 Biological Science	6.623258	0.030331	5.663228	0.024743	Above	24.526135028	0	Yes
9	R109 Scientific Attitude	6.524079	0.022858	5.66052	0.018748	Above	29.210725518	0	Yes
10	R110 Aeronautics	4.355345	0.034327	3.402555	0.024241	Above	22.672825802	0	Yes
11	R111 Electronics	8.398242	0.072313	6.921856	0.042787	Above	17.571171815	0	Yes
12	R112 Mechanics	10.768378	0.05629	9.681083	0.034412	Above	16.480316069	0	Yes
13	R113 Farming	8.020882	0.034349	7.528855	0.035317	Above	9.9871399967	0	Yes
14	R114 Home Economics	11.069316	0.050973	10.083364	0.035379	Above	15.890219591	0	Yes
15	R115 Sports	7.751774	0.05038	6.422354	0.037746	Above	21.118126254	0	Yes
16	R190 Part I Total	147.097116	0.560668	123.178815	0.471806	Above	32.641011061	0	Yes
17	R131 Art	7.104705	0.039104	5.671471	0.030437	Above	28.923053791	0	Yes
18	R132 Law	5.108295	0.027846	4.352609	0.015983	Above	23.536526687	0	Yes
19	R133 Health/Medicine	6.439095	0.025687	5.604645	0.020461	Above	25.409456783	0	Yes
20	R134 Engineering	3.231975	0.013527	2.806411	0.011985	Above	23.547430602	0	Yes
21	R135 Architecture	2.980132	0.015348	2.436296	0.011695	Above	28.183928584	0	Yes
22	R136 Journalism	2.00705	0.012618	1.563874	0.010013	Above	27.512447832	0	Yes
23	R137 Foreign Travel	2.975279	0.017346	2.279172	0.017593	Above	28.175373115	0	Yes
24	R138 Military	2.621036	0.024647	2.047454	0.009613	Above	21.681152494	0	Yes
25	R139 Accounting/Business/Sales	5.151134	0.028746	4.299225	0.015835	Above	25.957883427	0	Yes
26	R140 Practical Knowledge	3.311236	0.008888	2.958148	0.008324	Above	28.995699197	0	Yes
27	R141 Clerical	2.01101	0.00754	1.811246	0.007859	Above	18.341993636	0	Yes
28	R142 Bible	7.838866	0.045566	6.75061	0.031624	Above	19.620680424	0	Yes
29	R143 Colors	1.57489	0.009959	1.290978	0.005891	Above	24.536740854	0	Yes
30	R144 Etiquette	1.161277	0.006954	0.918022	0.005009	Above	28.383843667	0	Yes
31	R145 Hunting	1.718339	0.013568	1.714857	0.01124	Above	0.1976278594	0.843336236	No
32	R146 Fishing	1.483481	0.013791	1.406906	0.010376	Above	4.4369647106	9.1236244e-6	Yes
33	R147 Outdoor Activities (other)	5.262041	0.022821	4.312508	0.02101	Above	30.610702215	0	Yes
34	R148 Photography	1.447645	0.006176	1.232379	0.00466	Above	27.823531405	0	Yes
35	R149 Games (sedentary)	2.505501	0.012895	2.046818	0.008141	Above	30.077935516	0	Yes
36	R150 Theater/Ballet	4.813279	0.028225	3.838227	0.018639	Above	28.827223651	0	Yes
37	R151 Food	1.675922	0.020187	1.058992	0.012201	Above	26.154738389	0	Yes
38	R152 Miscellaneous	5.218425	0.029634	4.345113	0.023011	Above	23.276487569	0	Yes
39	R162 Vocabulary Part II	6.634592	0.026175	5.486365	0.024724	Above	31.890189837	0	Yes
40	R192 Part II Total	77.62184	0.288259	64.727947	0.219163	Above	35.607394731	0	Yes
41	R172 Vocabulary Total	20.574628	0.089273	16.906671	0.075593	Above	31.355820976	0	Yes
42	R100 Total Parts I and II	224.448935	0.846821	187.547053	0.692987	Above	33.72409877	0	Yes
43	R211 Memory for Sentences	9.314464	0.019933	9.052672	0.023189	Above	8.5612657073	0	Yes
44	R212 Memory for Words	12.689911	0.051685	11.090552	0.039059	Above	24.687626301	0	Yes
45	R220 Disguised Words	17.046971	0.066495	13.997117	0.065754	Above	32.613306622	0	Yes
46	R230 English Total	85.847026	0.190071	79.770396	0.152143	Above	24.959100296	0	Yes
47	R231 Spelling	9.98053	0.034119	9.134835	0.031447	Above	18.225931508	0	Yes
48	R232 Capitalization	30.134417	0.054541	29.10774	0.045052	Above	14.513016142	0	Yes
49	R233 Punctuation	19.036347	0.066444	17.007303	0.047477	Above	24.846505543	0	Yes
50	R234 English Usage	17.516764	0.041691	16.230727	0.027979	Above	25.613572012	0	Yes
51	R235 Effective Expression	9.157689	0.025464	8.300407	0.021352	Above	25.797380364	0	Yes
52	R240 Word Function in Sentences	11.959231	0.088189	9.417328	0.051152	Above	24.932810452	0	Yes
53	R250 Reading Comprehension	34.066003	0.137983	28.288013	0.117533	Above	31.877715556	0	Yes
54	R260 Creativity	10.024642	0.037646	8.169712	0.039114	Above	34.168675967	0	Yes
55	R270 Mechanical Reasoning	11.701901	0.054229	9.966025	0.036765	Above	26.495132338	0	Yes
56	R281 Visualization in Two Dimensions	13.775318	0.054731	12.230193	0.05138	Above	20.582672116	0	Yes
57	R282 Visualization in Three Dimensions	9.2765	0.026828	8.131098	0.02278	Above	32.544689338	0	Yes
58	R290 Abstract Reasoning	9.789949	0.026659	8.388717	0.0314	Above	34.018279436	0	Yes
59	R311 Arithmetic Reasoning	9.516192	0.049584	7.8692	0.039605	Above	25.95336739	0	Yes
60	R312 Introductory Mathematics	12.249154	0.083039	9.648867	0.047521	Above	27.178310129	0	Yes
61	R320 Mathematics Total	21.767023	0.131066	17.519959	0.083831	Above	27.297815418	0	Yes
62	R333 Advanced Mathematics	3.747647	0.033601	2.826366	0.016594	Above	24.583773952	0	Yes
63	R334 Mathematics II+III	16.016163	0.114863	12.494091	0.060206	Above	27.158610965	0	Yes
64	R340 Mathematics I+II+III	25.538072	0.162561	20.370126	0.095765	Above	27.391207803	0	Yes

Table 11: Comparison of student scores on the first 64 of the 128 PT composites, by alternative socioeconomic index.

	Composite	Mean Above Median	StandardError Above Median	Mean Below Median	StandardError Below Median	Higher Value	z Stat	p-Value	FDR Significant?
65	R410 Arithmetic Computation	40.386203	0.122401	37.491224	0.109231	Above	17.646598485	0	Yes
66	R420 Table Reading	13.2324	0.11444	12.414126	0.130372	Above	4.7169722935	2.3938027e-6	Yes
67	R430 Clerical Checking	38.364378	0.180177	36.970908	0.218752	Above	4.9169532284	8.7901542e-7	Yes
68	R440 Object Inspection	23.857646	0.077695	22.46598	0.107581	Above	10.487043344	0	Yes
69	A500 Preferences: Number Answered	58.08548	0.29735	59.86411	0.334232	Below	3.9758649936	0.0000701239	Yes
70	R601 Sociability	7.077054	0.01536	6.531239	0.015373	Above	25.116288891	0	Yes
71	R602 Social Sensitivity	5.064911	0.019086	4.454547	0.014248	Above	25.626531531	0	Yes
72	R603 Impulsiveness	2.146552	0.013098	1.890244	0.007231	Above	17.131228062	0	Yes
73	R604 Vigor	4.070824	0.01544	3.523264	0.014931	Above	25.493334099	0	Yes
74	R605 Calmness	4.738202	0.012426	4.088059	0.015567	Above	32.640556725	0	Yes
75	R606 Tidiness	6.068504	0.015241	5.486675	0.019215	Above	23.723348763	0	Yes
76	R607 Culture	5.673893	0.021904	4.972177	0.01577	Above	25.998789288	0	Yes
77	R608 Leadership	1.546422	0.007694	1.168075	0.00629	Above	38.071144874	0	Yes
78	R609 Self Confidence	5.520025	0.014669	4.916193	0.01395	Above	29.829065891	0	Yes
79	R610 Mature Personality	12.177314	0.040269	10.865143	0.03174	Above	25.591367503	0	Yes
80	P701 Phyiscal Science/Engineering/Mathematics	17.87971	0.102902	15.950159	0.05807	Above	16.3304755	0	Yes
81	P702 Biological Science Medicine	19.326703	0.10349	16.528545	0.055159	Above	23.860433065	0	Yes
82	P703 Public Service	15.987019	0.108413	14.193346	0.07934	Above	13.35137988	0	Yes
83	P704 Literary/Linguistic	19.514704	0.119351	17.691735	0.06731	Above	13.304111381	0	Yes
84	P705 Social Service	20.030278	0.139001	19.931802	0.072416	Above	0.6283026289	0.5298057098	No
85	P706 Artist	19.743605	0.117812	17.88553	0.068487	Above	13.635017254	0	Yes
86	P707 Music	16.687458	0.130165	15.383341	0.083271	Above	8.4396958892	0	Yes
87	P708 Sports	23.741995	0.071824	23.085737	0.060876	Above	6.9702068593	3.164802e-12	Yes
88	P709 Hunting/Fishing	21.36517	0.131084	21.337917	0.091976	Above	0.1701897069	0.8648609463	No
89	P710 Business/Management	18.181084	0.054075	17.890686	0.053052	Above	3.8334506327	0.0001263582	Yes
90	P711 Sales	15.474088	0.056997	15.380675	0.050424	Above	1.2275003405	0.2196345939	No
91	P712 Computation	15.500016	0.062179	16.388342	0.060517	Below	10.238047191	0	Yes
92	P713 Office Work	16.43483	0.136729	19.546115	0.088295	Below	19.115780778	0	Yes
93	P714 Mechical/Technical	13.766656	0.105946	14.898053	0.068336	Below	8.9741525566	0	Yes
94	P715 Skilled Trades	9.910604	0.081796	11.914041	0.057115	Below	20.081911116	0	Yes
95	P716 Farming	16.960784	0.08695	17.730024	0.065481	Below	7.0670500328	1.582734e-12	Yes
96	P717 Labor	8.743713	0.08457	10.778064	0.062204	Below	19.377915638	0	Yes
97	P801 Socioeconomic Index	107.296626	0.130497	91.855865	0.081734	Above	100.27754975	0	Yes
98	D802 High School Curriculum: Academic/Other	0.609635	0.007117	0.298049	0.003808	Above	38.602214255	0	Yes
99	F803 High School Courses: Academic	35.002593	0.14959	27.554101	0.100035	Above	41.390624098	0	Yes
100	P820 High School Grades	27.240818	0.146256	25.083687	0.123212	Above	11.279817642	0	Yes
101	F822 High School Guidance Received	25.204197	0.180816	21.085582	0.145491	Above	17.746378071	0	Yes
102	F823 Guidance Elsewhere	16.070674	0.043258	13.904414	0.044354	Above	34.964554946	0	Yes
103	P827 Study Habits	26.149028	0.045554	24.353972	0.045269	Above	27.950849916	0	Yes
104	P828 Self-Perception of Writing	24.265253	0.058824	21.592598	0.055026	Above	33.180531796	0	Yes
105	P829 Self-Perception of Reading	25.19225	0.05665	23.134853	0.045814	Above	28.238830682	0	Yes
106	F830 Extracurricular Reading	35.903612	0.230088	30.753661	0.136202	Above	19.260873353	0	Yes
107	P831 Extracurricular Variety	33.543888	0.18782	31.479465	0.237619	Above	6.8158708553	9.369394e-12	Yes
108	F832 Degree of Extracurricular: Not Sports	21.949455	0.143291	19.020207	0.150479	Above	14.097228262	0	Yes
109	P833 Variety of Hobbies	57.663277	0.16571	54.853648	0.136609	Above	13.082650654	0	Yes
110	F834 Degree of Hobbies	24.669684	0.11273	22.887352	0.08171	Above	12.801487611	0	Yes
111	F835 Sports Participation	15.079088	0.058116	13.160965	0.055085	Above	23.954414808	0	Yes
112	F836 Leadership Roles	20.526889	0.093562	16.722059	0.107704	Above	26.669223926	0	Yes
113	F837 Social Life	47.429469	0.164249	44.670027	0.124454	Above	13.390533229	0	Yes
114	F838 Work Activities (chores+jobs)	16.297299	0.079455	16.854054	0.056575	Below	5.7080331434	1.1428917e-8	Yes
115	C001 IQ Composite	189.174976	0.718382	158.26265	0.631536	Above	32.317845361	0	Yes
116	C002 General Aacademic Composite	550.415323	2.005539	477.542116	1.473035	Above	29.285439732	0	Yes
117	C003 Verbal Composite	120.637336	0.349062	108.095612	0.264284	Above	28.645549428	0	Yes
118	C004a Quantitative Aptitude Composite	113.714775	0.775436	88.323653	0.443762	Above	28.419670492	0	Yes
119	C004b Mathematics Composite	89.197826	0.609504	69.015997	0.353259	Above	28.647983105	0	Yes
120	C005a Technical Aptitude Composite	51.621384	0.29121	43.489075	0.192029	Above	23.313481057	0	Yes
121	C005b Technical Information Composite	33.295331	0.214253	27.836018	0.140916	Above	21.288819878	0	Yes
122	C006 Scientific Aptitude Composite	579.128216	2.489974	476.174767	1.989289	Above	32.303755648	0	Yes
123	C007 High School Academic Achievement Composite	21.161404	0.076058	18.405991	0.053755	Above	29.584654059	0	Yes
124	C008 Academic Achievement Composite	21.673569	0.087037	18.435409	0.061573	Above	30.372574592	0	Yes
125	C009 Foreign Language Composite	34.026774	0.098586	30.179093	0.075755	Above	30.947255073	0	Yes
126	C010 Technical Composite	9.513238	0.044727	8.179185	0.029306	Above	24.948228653	0	Yes
127	C011 Composite T	9.327519	0.053964	7.964679	0.032609	Above	21.614797349	0	Yes
128	C012 Composite S	80.883174	0.4722	64.675706	0.295019	Above	29.10904694	0	Yes

Table 12: Comparison of student scores on the remaining 64 of the 128 PT composites, by alternative socioeconomic index.