THE NATIONAL ASSESSMENT NO-SHOW STUDY: AN EXAMINATION OF NONRESPONSE BIAS[1/]

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1. INTRODUCTION

In any sample survey, nonresponse is a serious problem. Nonrespondents may either be difficult to locate or be reluctant to participate once they are located. Cochran and Kish [1,4] enumerate several types of nonrespondents who are difficult to locate, such as young marrieds who do not have small children, the employed females, the higher socioeconomic classes, and the lowest socioeconomic classes; nonrespondents who are sometimes reluctant to participate include the old and the widowed. There are certain individuals who will refuse to be interviewed no matter how skillful the interviewer, who are incapacitated, or who are away from the interview site for the duration of the field-work; these people compose the "hard core" [1] nonrespondents and represent a source of bias in virtually every sample survey.

Several methods have been proposed for reducing the number of nonrespondents. These methods include improved methodological techniques with emphasis on increased cooperation rates among respondents, repeated callings or mailings to nonrespondents, subsampling of nonrespondents, and use of a more expensive callback procedure such as personal interviews [2,3,6], imputation or editing of missing data [7], or a technique of weighting the data inversely proportional to its frequency of occurrence called the Politz Scheme [5]. None are completely satisfactory.

As Kish and Cochran [1,4] have noted, it has become standard practice for better sample surveys to report the size and sources of nonresponse. Nonresponse is a problem which must be handled in different ways for each survey. The National Assessment of Educational Progress[2/] (NAEP) has conducted a nonresponse study on a subsample of 17-year-olds who were enrolled in school. The subsample was composed of 17-year-olds who were intially selected for the National Assessment School sample but who failed to appear for exercise administration. Data on absenteeism and course grades were collected for respondents (original or regular National Assessment respondents) and nonrespondents (No-Shows). These data are termed auxiliary data (appendix A). In addition, data were also collected from No-Shows in an attempt to determine their reasons for failing to appear during the regular Assessment. These data are termed supplementary data, (appendix B).

Attempts were made, over a 3-week period, to contact selected individuals in school. A subsample of those individuals who had not been contacted in school was selected for an out-of-school follow up. Using the data from both in-school and out-of-school nonrespondents, as well as from the original National Assessment, respondents, a model was developed to estimate the nonresponse bias in exercises package performance.

2. SELECTING THE SAMPLE OF NONRESPONDENTS

The National Assessment sample is a three-stage national probability sample which is composed of a school sample, termed the in-school sample, and a household sample, termed the out-of-school sample. This particular nonresponse study involves only the in-school portion of the National Assessment sample.

An in-school sample has been drawn annually since the inception of National Assessment in 1969. The first year of National Assessment was termed Year 01. The nonrespondent sample was selected as a subsample of the Year 04 sample, i.e., 1972-73 school year. In order to understand the method by which the nonrespondent sample was selected, it is necessary to briefly explain the Year 04 sampling design.

The Year 04 Primary Sampling Units (PSU's) were composed of counties or groups of contiguous counties. The primary units were stratified by region, size of community, and socioeconomic characteristics before selection.

Primary units were selected using probabilities proportional to the population of the sampling unit. A total of 118 units were selected by this procedure. The secondary sampling units consisted of public and private schools within selected PSU's. Stratification of the secondary units by income characteristics and size of school took place before selection. Schools were selected using probabilities proportional to the estimated number of eligibles in each school. The tertiary sampling units were students who were enrolled in sample schools, who met certain age requirements, and who were not ineligible for any other reason.[3/] Although the in-school assessment is interested in student respondents from three different ages, 9-year-olds, 13-year-olds, and 17-year-olds, this particular study was limited to the 17-year-old subpopulation since it would appear that the nonresponse problem is most serious in that age class.

Students selected for National Assessment may be administered exercises on a group basis or be given individual interviews. Response rates for the three in-school age classes are recorded by type of administration in table 1. These data are from Year 03 of National Assessment and indicate that the response rates for individual packages tended to be slightly higher than those for group packages. This response difference might be explained by the fact that NAEP places particular importance on the administration of individual exercises. One purpose of the No-Show study is to determine the reasons for this relatively low rate of response among 17-year-olds.

Table 1. Student response rates by age class and package administration mode*

Description	Planned sample size	Sample students assessed	Response rate
9-year-olds			
Group packages	10,368	9,102	87.8
Individual packages	6,480	5,745	88.7
13-year-olds			
Group packages	18,144	15,489	85.4
Individual packages	6,480	5,629	86.9
17-year-olds			
Group packages	23,328	17,229	73.9
Individual packages	6,480	4,842	74.7

*Data recorded from Year 03 of National Assessment.

During any assessment year, two or three different subject matter areas are assessed. The subject matter areas for Year 04 were mathematics and science. Exercises are grouped together into packages. Every package in Year 04 contained a mixture of mathematics and science exercises. From the set of Year 04 packages for 17-year-olds, three group-administered packages and one individually administered package were arbitrarily selected. The group packages were numbered as 01, 03, 09; the individual package was numbered 13. These packages were designated as No-Show packages, and it is by means of these packages that the nonresponse bias in the NAEP-reporting of student performance is assessed.

As was mentioned earlier, the nonrespondent sample was a subsample of the Year 04 sample. The Year 04 PSU's were subdivided into two heterogeneous clusters. The clusters were constructed so as to be well balanced with respect to region, size of community, and socioeconomic characteristics. One cluster was then randomly selected for the No-Show study using equal probabilities. The No-Show primary sample was composed of 57 PSU's.

Eligible schools in the No-Show secondary sample consisted of all 17-year-old sample schools in No-Show PSU's in which at least one of the No-Show packages had been administered during regular National Assessment. Within selected schools, students eligible for the nonresponse study were selected for a particular No-Show package on a matched-sample basis. That is, all students who were originally selected for a group-administered package but who had not appeared for assessment were eligible for any of the No-Show group packages administered in the school during 17-year-old assessmwnt. Similarly, any student who was selected for an individually administered package but who had failed to appear for assessment was eligible for the No-Show individual package, provided that the same package had been administered in the school during 17-year-old assessment. This matched sampling procedure was adopted so that the analysis of differences between respondents and nonrespondents could be made on a within-school basis. Eligible students were selected for specific No-Show packages using cyclic systematic sampling. A subsample of 2,771 students was selected from an original 7,725 17-year-old nonrespondents in Year 04.

Attempts were made to contact selected individuals in school over a 3-week period following the regular assessment. Of the 2,771 students selected for the in-school portion of the study, 34 were determined to be ineligible; a total of 1,990 students out of the 2,737 who were eligible and selected were assessed; thus, the response rate for the in-school portion of the nonresponse study was 72.7 percent. At the

end of the 3-week period, the names and addresses of all individuals who had not been contacted were requested from the schools. Several schools refused to release this type of information; however, names and addresses were obtained for 598 of the 747 eligible in-school nonrespondents. A systematic subsample of 130 of No-Show study nonrespondents was selected for the out-of-school portion of the No-Show study. During the out-of-school phase of the study, selected individuals were encouraged to take all four No-Show packages and were given an incentive payment of five dollars for each package which they completed. Ten of the individuals selected for the out-of-school portion of this study were determined to be ineligible. The total number of out-of-school respondents was 102; thus, a response rate of 85 percent was achieved during the out-of-school portion of the No-Show study.

3. NOTATION

The notation given below and used in section 4.1 is defined by PSU (i.e., conditional upon selection of the first-stage PSU's). Furthermore, formulas are developed specifically to subject matter exercises within the package since the subsequent analytic development is similar in each case. A symbol is intended to define an entity, while the attached subscript serves to determine its applicability. A block symbol refers to a random variable, and a script symbol refers to a parameter. Finally, let an upper case script symbol refer to the population of all units and let the corresponding lower case script symbol refer to an estimate of the parameters associated with a sample of these units. Specifically, we define

Y = number of exercises answered correctly,

P (p) = population proportion of eligible NAEP participants,

$\bar{Y}$ ($\bar{y}$) = mean number of exercises answered correctly,

E (e) = number of eligible students.

The first-position subscript (α) associated with the above symbols refers to the total population (o), regular assessment respondents (1), and nonrespondents or No-Shows (2). Population totals F_α and C_α refer to the quantities

$$F_\alpha \equiv \sum_{j\in\Omega} E_{oj} \; P_{1j} \; \bar{Y}_{\alpha j} \; ; \; (\alpha=1,2)$$

$$C_\alpha \equiv \sum_{j\in\Omega} E_{oj} \; P_{2j} \; \bar{Y}_{\alpha j} \; ; \; (\alpha=1,2)$$

which are estimated by f_α and c_α respectively. These quantities will be combined to assess the magnitude of nonresponse bias in NAEP regular assessment statistics.

The following symbols are used in the preceding and subsequent formulation:

h = pseudo stratum,

i = PSU within pseudo-stratum,

j = school,

k = student within school,

m = number of eligible sample students taking a package,

w = package sample nonresponse adjusted weight (i.e., inverse of the probability of selection into the study),

Ω = set of all eligible schools,

ω = sample set of elibible schools,

+ = summation over all possible subscript values.

4. METHODOLOGY

4.1 First-Order PSU Estimators

First, note that the "true" value of $\bar{Y}$ is

$$\bar{Y}_o = \frac{\sum_{j\in\Omega} E_{oj} \; \bar{Y}_{oj}}{E_o}$$

$$= \frac{\sum_{j\in\Omega} E_{oj} \; (P_{1j} \; \bar{Y}_{1j} + P_{2j} \; \bar{Y}_{2j})}{E_o} \; ;$$

$$E_o = \sum_{j=\Omega} E_{oj} .$$

If one lets

$$\bar{y}_1 = \frac{\sum_{j\in\omega_1} \sum_{k=1}^{m_{1j}} w_{1jk} \; Y_{1jk}}{\sum_{j\in\omega_1} \sum_{k=1}^{m_{1j}} w_{1jk}} ,$$

then the expectation of the estimator $\bar{y}_1$ is

$$E(\bar{y}_1) = \frac{\sum_{j\in\Omega} E_{oj} \; \bar{Y}_{1j}}{E_o} .$$

Computation of the w_{1jk}, the regular assessment weights adjusted for total nonresponse, is documented elsewhere [8].

Thus,

$$\text{Bias } (\bar{y}_1) = E(\bar{y}_1) - \bar{Y}_o \qquad (4.1.1)$$

$$= \frac{C_1 - C_2}{E_o} ,$$

since $P_{2j} = 1 - P_{1j}$ by definition

Similarly,

$$\text{Rel-Bias } (\bar{y}_1) = \frac{\text{Bias } (\bar{y}_1)}{\bar{y}_o} \qquad (4.1.2)$$

$$= \frac{C_1 - C_2}{F_1 - F_2} .$$

Ratio-type estimators are used to estimate values associated with equations (4.1.1) and (4.1.2)

$$\text{bias } (\bar{y}_1) = \frac{c_1 - c_2}{e_o} \equiv \frac{\gamma}{\Delta} \qquad (4.1.3)$$

$$\text{rel-bias } (\bar{y}_1) = \frac{c_1 - c_2}{\delta_1 + \delta_2} \equiv \frac{\gamma}{\xi} \qquad (4.1.4)$$

where

$$e_o = \sum_{j \in \omega_1} \sum_{k=1}^{m_{1j}} w_{1jk}$$

$$c_1 = \sum_{j \in \omega_1} p_{2j} \sum_{k=1}^{m_{1j}} w_{1jk} Y_{1jk}$$

$$\delta_1 = \sum_{j \in \omega_1} p_{1j} \sum_{k=1}^{m_{1j}} w_{1jk} Y_{1jk}$$

$$c_2 \equiv \delta_2 = \sum_{j \in \omega_2} \sum_{k=1}^{m_{2j}} w_{2jk} Y_{2jk} .$$

The parameters P_{1j} and P_{2j} are estimated from school response rates during regular assessment. The estimate for a No-Show study group package is found as the response rate to all group packages given in that school. Similarly, the No-Show study individual package response rate is obtained from the response rate to all individual packages given in the school. Recall that the w_{2jk} weights denote the reciprocals of No-Show selection probabilities adjusted for No-Show nonresponse.

The preceding statistics yield bias estimates involving in-school regular assessment respondents and all No-Show respondents. Another set of meaningful bias estimates involves in-school regular assessment respondents and in-school No-Show respondents. The definition changes indicated by the (*) were motivated by the attempt to form a matched school bias estimator based exclusively on in-school No-Shows. The set of schools ω_1^* is the subset of regular assessment ω_1 schools which provided in-school No-Show responses for the particular package in question. The deleted schools either had no cooperating in-school No-Show respondents for the package, or were subsampled out at the No-Show package assignment stage to control the package yield per PSU. The regular assessement respondent for the set of ω_1^* schools with in-school No-Show responses for the package were inflated to account for the deleted schools, hence the adjusted w_{1jk}^* weights.

Regarding the components of equations (4.1.3) and (4.1.4),

$$\text{bias}^* (\bar{y}_1) = \frac{c_1^* - c_2^*}{e_o^*} \equiv \frac{\gamma^*}{\Delta^*} \qquad (4.1.5)$$

and

$$\text{rel-bias}^* (\bar{y}_1) = \frac{c_1^* - c_2^*}{\delta_1^* + \delta_2^*} \equiv \frac{\gamma^*}{\xi^*} \qquad (4.1.6)$$

where

$$e_o^* \equiv \sum_{j \in \omega_1^*} \sum_{k=1}^{m_{1j}} w_{1jk}^*$$

$$c_1^* \equiv \sum_{j \in \omega_1^*} p_{2j} \sum_{k=1}^{m_{1j}} w_{1jk}^* Y_{1jk}^*$$

$$\delta_1^* \equiv \sum_{j \in \omega_1^*} p_{1j} \sum_{k=1}^{m_{1j}} w_{1jk}^* Y_{1jk}$$

$$c_2^* \equiv \delta_2^* = \sum_{j\varepsilon\omega_1^*} \frac{p_{2j}\, m_{1j}}{m_{2j}^*} \sum_{k=1}^{m_{2j}^*} w_{1jk}^*\, Y_{2jk}^* .$$

With m_{2j}^* denoting the number of in-school No-Show responses from school $j\varepsilon\omega_1^*$, the definition of the set of schools ω_1^* assures that $m_{2j}^* > 0$. Since the adjusted weights $w_{1jk}^* = w_{1j}^* E_{oj} / m_{1j}$ with w_{1j}^* denoting the adjusted school by package weight, one can recast c_1^* and c_2^* as follows:

$$c_1^* = \sum_{j\varepsilon\omega_1^*} w_{1j}^*\, p_{2j}\, E_{oj}\, \bar{y}_{1j}^* ,$$

$$c_2^* = \sum_{j\varepsilon\omega_1^*} w_{1j}^*\, p_{2j}\, E_{oj}\, \bar{y}_{2j}^* .$$

The numerator of equations (4.1.5) and (4.1.6) is therefore

$$(c_1^* - c_2^*) = \sum_{j\varepsilon\omega_1^*} w_{1j}^*\, p_{2j}\, E_{oj}\, (\bar{y}_{1j}^* - \bar{y}_{2j}^*). \qquad (4.1.7)$$

4.2 Overall First-Order Estimates

To facilitate the ensuing discussion, attach subscripts to γ, Δ, and ξ of (4.1.3) and (4.1.4) and γ^*, Δ^*, and ξ^* of (4.1.5) and (4.1.6) (i.e., subscripts "hi" to indicate PSU-i within pseudo stratum-h). Using these quantities, one obtains the overall estimate involving all No-Shows as

$$\text{bias}\ (\bar{y}_1) = \gamma_{++} / \Delta_{++} \qquad (4.2.1)$$

$$\text{rel-bias}\ (\bar{y}_1) = \gamma_{++} / \xi_{++} \qquad (4.2.2)$$

and involving only in-school No-Shows as

$$\text{bias}^*\ (\bar{y}_1) = \gamma_{++}^* / \Delta_{++}^* \qquad (4.2.3)$$

$$\text{rel-bias}^*\ (\bar{y}_1) = \gamma_{++}^* / \xi_{++}^* \qquad (4.2.4)$$

4.3 Second-Order Estimators

The second-order estimators of variance for expressions (4.2.1) through (4.2.4) are based upon a form of the "jackknife" technique introduced by Quenouille [9] and advanced for interval estimation by Tukey [10]. The exact form used here was presented by Frankel [11]. The procedure is presented for estimates involving all No-Shows, although the procedure for estimates involving only in-school No-Shows is similar.

First, these definitions are given:

$$\beta_{h1} = \frac{2\gamma_{++}}{\Delta_{++}} - \left[\frac{\gamma_{++} + \gamma_{h1} - \gamma_{h2}}{\Delta_{++} + \Delta_{h2} - \Delta_{h2}}\right]$$

$$\beta_{h2} = \frac{2\gamma_{++}}{\Delta_{++}} - \left[\frac{\gamma_{++} + \gamma_{h2} - \gamma_{h1}}{\Delta_{++} + \Delta_{h2} - \Delta_{h1}}\right]$$

$$\zeta_{h1} = \frac{2\gamma_{++}}{\xi_{++}} - \left[\frac{\gamma_{++} + \gamma_{h1} - \gamma_{h2}}{\xi_{++} + \xi_{h1} - \xi_{h2}}\right]$$

$$\zeta_{h2} = \frac{2\gamma_{++}}{\xi_{++}} - \left[\frac{\gamma_{++} + \gamma_{h2} - \gamma_{h1}}{\xi_{++} + \xi_{h2} - \xi_{h1}}\right].$$

Since the 57 PSU's make up a half-sample of NAEP regular assessment PSU's, the desirable condition of having two PSU selections per stratum does not hold. Instead, pseudo strata were formed by sequentially pairing the No-Show PSU's according to region and size. Since the number of PSU's is odd, one pseudo stratum (h^o) was assigned three PSU's The associated jackknife estimators of variance are

$$\text{var}\{\text{bias } (\bar{y}_1)\} = 1/4 \sum_{\substack{h=1 \\ h\neq h^o}}^{H} \left[\beta_{h1} - \beta_{h2}\right]^2 + 1/8 \sum_{i=1}^{2} \sum_{j=i+1}^{3} \left[\beta_{h^o i} - \beta_{h^o j}\right]^2$$

and

$$\text{var}\{\text{rel-bias } (\bar{y}_1)\} = 1/4 \sum_{\substack{h=1 \\ h\neq h^o}}^{H} \left[\zeta_{h1} - \zeta_{h2}\right]^2 + 1/8 \sum_{i=1}^{2} \sum_{j=i+1}^{3} \left[\zeta_{h^o i} - \zeta_{h^o j}\right]^2 .$$

To assess the significance of the bias and rel-bias estimates, one might be willing to assume that

$$T = \frac{\text{bias } (\bar{y}_1)}{\left[\text{var}\{\text{bias } (\bar{y}_1)\}\right]^{\frac{1}{2}}}$$

$$T' = \frac{\text{rel-bias } (\bar{y}_1)}{\left[\text{var}\{\text{rel-bias } (\bar{y}_1)\}\right]^{\frac{1}{2}}}$$

are distributed as a "Student's" t-statistic with 29 degrees of freedom. Under this assumption, significance with a Type I error of 0.05 is indicated when $|T| \geq 2.045$ or $|T'| \geq 2.045$.

5. RESULTS AND DISCUSSION

Results obtained by applying the methodology of section 4 to group packages, 01, 03, and 09 and individual package 13 are now presented and discussed. Sample sizes associated with these findings are found in table 2. The actual results are presented in table 3. Weighted estimates of the mean correct response for subject matter exercises within a package are found in table 4.

In many instances, comparisons involving all No-Shows are statistically significant subject to the assumptions made previously. Since most biases and rel-biases are positive, it would appear that the regular assessment respondents are somewhat better students than No-Shows. These results parallel the results of appendix A in which regular assessment and No-Show data are compared with respect to other auxiliary measures. These data indicate that regular assessment respondents tend to miss school less frequently, get better course grades, take more courses, and have more academic-oriented goals. The figures of table 4 indicate a similar type of performance differential between regular assessment and No-Show respondents.

As one might anticipate from these preliminary findings, most of the bias values in table 3 are positive. The only negative results are small and could be attributable to sampling variation.

With the group packages, the magnitude of bias is reduced and generally not statistically significant when only in-school No-Shows are involved. The figures of table 4 imply similar results when one notices the intermediate performance of the in-school No-Shows relative to regular assessment and out-of-school No-Show respondents. This indicates that in-school No-Shows may be more similar to the regular assessment respondents and have been absent from the regular assessment for different reasons than the out-of-school No-Shows.

The results of table B.1 in appendix B indicate that the majority of in-school No-Shows were not absent from school on the day in which they were originally scheduled to be assessed. Furthermore, a moderate proportion of those who said they were not absent from school indicated that they had other school-oriented commitments.

The results for individual package 13 do not conform to the patterns established with the group packages. The magnitude of the biases associated with comparisons involving only in-school No-Shows are somewhat greater than comparisons involving all No-Shows. Both science exercise biases are small and not significant while significance is indicated with the latter explanation for these findings is not clear; however, it should be noted that the content and administration of this individual package 13 differ from the group package. Group packages are administered to a much greater proportion of participating students and are essentially self-administered. Individual packages on the other hand, require continual interaction by exercise administrators and contain several exercises which involve opinion, probing, and branching among parts of the exercise.

Table 2. No-Show study sample sizes

Package	Regular Assessment Respondents	No-Show Respondents		
	Total	In-School	Out-of-School	Total
01	1148	522	100	622
03	1209	536	100	636
09	1144	492	98	590
13	1086	439	99	538

Table 3. Bias estimates and estimates of precision

Package	Number of Exercises	Bias (B) or Rel-Bias (RB)	All No-Shows		In-School No-Shows Only	
			Estimate	Variance	Estimate	Variance
MATHEMATICS:						
01	16	B	0.3385^{*}_{*}	$(0.0780)^2_2$	0.0721	$(0.0472)^2_2$
		RB	0.0374^{*}_{*}	$(0.0089)^2_2$	0.0078_{*}	$(0.0051)^2_2$
03	19	B	0.5545^{*}_{*}	$(0.1012)^2_2$	0.1771^{*}_{*}	$(0.0670)^2_2$
		RB	0.0554^{*}	$(0.0106)^2_2$	0.0172^{*}	$(0.0065)^2_2$
09	19	B	0.3316	$(0.2166)^2_2$	0.0148	$(0.1278)^2_2$
		RB	0.0360	$(0.0243)^2_2$	0.0016_{*}	$(0.0136)^2_2$
13	22	B	0.1387	$(0.1650)^2_2$	0.2284^{*}_{*}	$(0.0856)^2_2$
		RB	0.0113	(0.0136)	0.0191^{*}	$(0.0072)^2$
SCIENCE:						
01	23	B	0.3801^{*}_{*}	$(0.0935)^2_2$	0.1445	$(0.0508)^2_2$
		RB	0.0327^{*}_{*}	$(0.0082)^2_2$	0.0124	$(0.0044)^2_2$
03	13	B	0.2510^{*}_{*}	$(0.0570)^2_2$	0.0674	$(0.0488)^2_2$
		RB	0.0425^{*}	$(0.0102)^2_2$	0.0111	$(0.0081)^2_2$
09	28	B	0.3874	$(0.4517)^2_2$	-0.0345	$(0.1832)^2_2$
		RB	0.0210	$(0.0249)^2_2$	-0.0018	$(0.0097)^2_2$
13	7	B	0.0001	$(0.0384)^2_2$	0.0120	$(0.0271)^2_2$
		RB	0.0000+	$(0.0122)^2$	0.0038	(0.0087)

*Probable significance with a Type I error of 0.05

Table 4. Weighted estimates of mean number correct responses*

Package	Regular Assessment Respondents	No-Show Respondents		
	Total	In-School	Out-of-School	Total
MATHEMATICS:				
01	9.4	8.8	5.7	8.1
03	10.6	9.8	6.4	9.0
09	9.5	9.1	5.8	8.4
13	12.4	11.0	8.1	10.3
SCIENCE:				
01	12.0	11.3	8.9	10.7
03	6.2	5.9	4.6	5.6
09	18.9	18.5	15.7	17.9
13	3.2	3.0	2.3	2.8

* $$\bar{y}_\alpha = \frac{\sum_{j \epsilon \omega_\alpha} \sum_{k=1}^{m_{\alpha j}} w_{\alpha jk} Y_{\alpha jk}}{\sum_{j \epsilon \omega_\alpha} \sum_{k=1}^{m_{\alpha j}} w_{\alpha jk}}$$

Appendix A

Absentee and course grade data were collected for certain in-school respondents and nonrespondents. These data were termed auxiliary data. The data were collected for all in-school respondents who were selected for either the first group administered No-Show package (i.e., package 01) or the individually administered No-Show package (i.e., package 13). Auxiliary data were also collected for all nonrespondents who were selected for the in-school portion of the study and who were assigned either the first group administered No-Show package or the individually administered No-Show package.

Appendix B

A special supplementary questionnaire was developed for the nonresponse study to ascertain the reason a selected student failed to appear for assessment. Separate questionnaires were developed for the in-school and out-of-school portions of the study. These supplementary data were collected from all individuals who were selected for either the in-school or out-of-school portions of the nonresponse study and who participated in the study.

Table A.1. Auxiliary comparative frequency data by percent days absent through February 1973

Percent Days Absent	Selected Respondents		No-Show Respondents	
	Absolute	Adjusted Relative (Percent)	Absolute	Adjusted Relative (Percent)
0-10	1362	81.3	674	61.2
11-20	253	15.1	254	23.1
21-30	39	2.3	89	8.1
31-40	14	0.8	34	3.1
41-50	5	0.3	18	1.6
51-60	0	0.0	23	2.1
61-70	2	0.1	4	0.4
71-80	0	0.0	3	0.3
81-90	0	0.0	2	0.2
91-100	0	0.0	0	0.0
NA	78	-	223	-
Total	1753	100.0	1324	100.0
Mean	5.9		11.3	
Median	4.2		7.3	

Table A.2. Auxiliary comparative frequency data by individual grade point average for the most recent available reporting period ending prior to March 1, 1973

Grade Point Average*	Selected Respondents		No-Show Respondents	
	Absolute	Adjusted Relative (Percent)	Absolute	Adjusted Relative (Percent)
0.0-0.5	10	0.6	73	6.6
0.6-1.0	35	2.1	62	5.6
1.1-1.5	119	7.1	125	11.3
1.6-2.0	198	11.8	164	14.8
2.1-2.5	315	18.8	233	21.1
2.6-3.0	339	20.2	159	14.4
3.1-3.5	387	23.1	191	17.3
3.6-4.0	275	16.4	99	9.0
NA	75	-	218	-
Total	1753	100.0	1324	100.0
Mean	2.60		2.15	
Median	2.66		2.22	

*Based upon a four-point system: A = 4, B = 3, C = 2, D = 1, F = 0; involves only those courses for which a letter grade was given.

Table A.3. Auxiliary comparative frequency data by number of courses taken in the most recent available reporting period ending prior to March 1, 1973

Number of Courses	Selected Respondents		No-Show Respondents	
	Absolute	Relative (Percent)	Absolute	Relative (Percent)
0	0	0.0	56	4.2
1	74	4.2	159	12.0
2	21	1.2	13	1.0
3	43	2.5	54	4.1
4	178	10.2	152	11.5
5	536	30.6	342	25.8
6	598	34.1	364	27.5
7	181	10.3	112	8.5
8	122	7.0	72	5.4
Total	1753	100.0	1324	100.0
Mean	5.40		4.69	
Median	5.54		5.17	

Table A.4. Auxiliary comparative frequency data by curriculum type

Curriculum	Selected Respondents		No-Show Respondents	
	Absolute	Adjusted Relative (Percent)	Absolute	Adjusted Relative (Percent)
College Preparatory - Academic	935	55.6	446	39.5
Vocational - Occupational	329	19.6	307	27.2
Other	258	15.3	199	17.6
Cannot Determine	159	9.5	177	15.7
Left Blank	72	-	195	-
Total	1753	100.0	1324	100.0

Table B.1. In-school No-Show supplementary frequency data by whether the respondent was absent from school on the scheduled participation date

Were you absent from school the day in which you were scheduled to participate?	Absolute	Adjusted Relative (Percent)
Yes	715	36.1
No	1032	52.0
Cannot Remember	236	11.9
Refused	0	-
Blank	6	-
Total	1989	100.0

Table B.2. In-school No-Show supplementary frequency data by reason for nonparticipation in original assessment

If you were not absent, why then did you not participate?	Absolute	Relative (Percent)	Adjusted Relative (Percent)
Was late and the session had begun	126	6.3	17.5
Had extracurricular activities	63	3.2	8.7
Had an examination or important class	95	4.8	13.2
Was notified but forgot	79	4.0	10.9
Went home sick	18	0.9	2.5
Was late for school	17	0.9	2.4
Had work study commitments	45	2.3	6.2
Had job commitments	31	1.6	4.3
Cannot remember	32	1.6	4.4
Other	216	10.9	29.9
Refused	0	0.0	0.0
Blank	1267	63.7	-
Total	1989	100.0	100.0

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Footnotes

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2/ A project of the Education Commission of the States (ECS).

3/ Individuals who are emotionally or mentally retarded, functionally disabled, non-English speaking, or nonreaders, are excluded from the NAEP sample.