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ABSTRACT

Higher education administrators often wonder if the information they receive from the low response rates to surveys of non-matriculating applicants accurately reflects the entire population of these non-matriculants. These questions are exacerbated by evidence that response bias does exist. This paper describes how St. Mary's College in Notre Dame, Indiana, studied its response bias through mail and phone follow-up surveys. Results are reported from: (1) two mailed surveys, one sent to all accepted applicants who notified the institution of their intent to attend elsewhere and another shorter version (postcard) mailed to those who had not responded to the first survey; and (2) a final telephone follow-up to all remaining non-respondents. Findings from these efforts showed few differences between those who responded to the initial survey and those contacted in the subsequent surveys. It was concluded that there is no need to adjust for non-respondent bias in future surveys. The cost effectiveness of telephone follow-up, particularly when coupled with its high response rate, suggests that future surveys of non-respondents should utilize this method exclusively, rather than the postcard survey. (GLR)

WHO DOESN'T RESPOND TO APPLICANT SURVEYS?

AN ANALYSIS OF RESPONDENT BIAS

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Jean Endo
Chair and Editor
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Introduction

In an era of ever-increasing competition for students in a declining pool of traditional-age prospects, colleges and universities have stepped up their marketing efforts to seek ways to attract a larger segment of this population. Hossler (1986, p. 43) suggests that admissions personnel need to thoroughly understand what institutions are their chief competitors in order to devise strategies to lure applicants into their institution. Davis-Van Atta and Carrier (1986, p. 82) note that the most important step in the enrollment decision for a student is choosing one school. Market research can provide the admissions personnel with a list of the institution's primary competitors and the applicants' reasons for selecting these schools. One common tool for determining market information such as the institutional image and major competitors is the mail survey of applicants.

Because response rates are usually quite low on these surveys, particularly for the non-matriculants, whose responses are especially desired, the question of whether or not there is a response bias is often raised. When bias *is* detected using information already available (such as test scores and application information), it suggests that other biases may exist between the respondent group and the non-respondents. Light, Singer, and Willett (1990, p. 69) advise that if nonresponse exists, the best techniques for measuring nonresponse bias are callbacks, sampling nonrespondents, and the use of nonrespondents from earlier surveys as replacements for people who are nonrespondents in a current survey.

This paper presents the results of a study which sought to identify the important biases between the respondents and the non-respondents on a survey of non-matriculating accepted applicants. A second, but different, follow-up mail survey and a telephone follow-up gathered information from those who had not responded to previous surveys. The methodology of these surveys is presented, along with recommendations based on this particular study that should interest others contemplating similar research.

Saint Mary's College has been surveying its non-matriculating applicants for a number of years in an effort to discover as much as possible about the factors involved in the decision to choose another college or university, with the purpose of strengthening its own marketing strategies. Saint Mary's, a Catholic college for women, is a competitive, highly ranked comprehensive college in the liberal arts tradition. The 1,500-1,600 women enrolled are primarily residential students. While many of these women come from the Midwest region, the College attracts applicants from every state and many foreign countries.

In previous years, it had been noticed (see Table 1) that respondents to the non-matriculating survey tended to have higher scores on their SATs or ACTs than did the entire non-matriculating group as a whole. These respondents also tended to have better high school academic records (GPAs and class rank) than did the entire group[1]. There also appeared to be a higher response rate from applicants whose home states were closer to the College.

As administrators reviewed the results of these surveys and noted the generally low response rates (shown also on Table 1), they wondered about the validity of the findings. Was it possible that this bias was systematic, and there were important non-matriculant

Table 1

Previous evidence of response bias

Year	Resp Rate	SAT-Verbal		SAT-Math		High School GPA	
		Resp	All	Resp	All	Resp	All
1987	39.6%	565	545	521	505		
1988	40.1%	566	547	531	508		
1989	39.8%	561	549	518	507		
1990	37.7%	564	548	528	501		
1991	34.5%	579	547	539	511	3.48	3.40
1992	40.1%	571	541	513	496	3.34	3.36

subgroups who were not responding proportionately. Were the non-respondents more likely to be attending a particular type of college or university? Were these non-matriculants from diffe .. ethnic and religious backgrounds? Was the College losing potential students for whom appropriate modifications in the current marketing strategy might make a difference in their final decision as to which college to attend? Because there was an apparent response bias, it was decided to do a follow-up of the survey respondents in order to find out more about this group and to determine the degree of bias.

Methodology

An initial one page (front and back) survey was mailed by the Admission Office to all accepted applicants who notified the institution of their intent to attend elsewhere. A month

later, a second and shorter survey was mailed to all nonrespondents from the Office of Institutional Research. This second survey, consisting of a few items printed on a prepaid postcard, was purposely kept brief to encourage response. The cover letter for each survey suggested different reasons for requesting information. At the end of the summer, phone calls were placed to all remaining nonrespondents, requesting a few items of information. For logistic reasons, the few internationa' subjects were excluded from this study.

Comparisons were made between various respondent groups on variables such as academic abilities (ACT/SAT scores, high school rank and GPAs), personal characteristics (ethnicity and religious affiliation—the student body at Saint Mary's is predominantly Roman Catholic), choices of post-secondary institutions (categorized as prime competitor, Catholic competitors, private competitors, and public competitors), home and college locations (by geographic region), time of application, and time of cancellations. The criterion variables for these analyses were the various response categories (appropriate combinations of non-respondent and survey, card, and/or phone respondents).

Results

The response rate for the initial two-page survey was 23.7% (actually, there was a 40.1% response, but 16.4% were anonymous and were not analyzed to avoid duplication of information) and the response rate for the card follow-up was 25.1%. An additional 40.4% were contacted through the telephone survey. Combining all three forms, information was obtained from nearly 90 percent of the population.

Goodness of fit tests were made using appropriate statistical techniques. Where the

variable being tested was categorical, chi-square analysis was used. Where the variable type was interval, t-tests or ANOVAs were utilized. Table 2 shows the summary of the results of these bivariate comparisons. Despite the preliminary evidence that there appeared to be response bias in previous years, the present data shows very little evidence of systematic bias.

Significant differences ($p < .05$) were found only for the choice of college, the ranking of Saint Mary's among competitor colleges and universities, ethnicity, region of home, the time of cancellation, and high school rank. No significant differences ($p < .05$) were found on the basis of the type of college selected, the region of the selected college, applicant's religious affiliation, the time of application, ACT/SAT scores, and high school GPA.

Looking at the areas in which response bias did occur, it was found (see Table 3) that non-matriculated applicants who considered Saint Mary's to be their first-choice college were more likely to respond to the initial survey than were those that ranked Saint Mary's lower on their list of preferred institutions.

The card and telephone survey follow-up was more successful in the states closest to the College and less successful in the states further away (see Table 4).

Further, the non-matriculated applicants who are more likely to respond to the initial survey are not from ethnic minority groups (see Table 5). The minority applicants were also more difficult to contact by telephone as well.

The time of notification of intended cancellation (see Table 6) was found to differ among the various respondent groupings, with those that cancelled earlier being more likely to respond to the initial survey.

Table 2

Summary of bivariate comparisons

	Survey vs. Card vs. Phone	Survey vs. Card vs. Phone vs. Non-Resp	Survey vs. Card/ Phone vs. Non-Resp	Survey vs. Card/ Phone	Card/ Phone vs. Non-Resp	Survey vs. Non-Resp
College type	NS[1]	NA[2]	NA	NS	NA	NA
SMC 1st choice	.008	NA	NA	.013	NA	NA
SMC rank	.031	NA	NA	.018	NA	NA
Home region	NS	NS	NS	NS	.017	NS
College region	NS	NA	NA	NS	NA	NA
Ethnicity	NS	.002	.001	NS	.001	NS
Religion	NS	NS	NS	NS	NS	NS
Apply date	NS	NS	NS	NS	NS	NS
Cancel date	NS	.031	NA	NS	NS	NS
SAT-Verbal	NS	NS	NS	NS	NS	NS
SAT-Math	NS	NS	NS	NS	NS	NS
Enhcd ACT Comp	NS	NS	NS	NS	NS	NS
HS Rank	NS	NS	NS	NS	.034	NS
HS GPA	NS	NS	NS	NS	NS	NS

[1] $p < .05$; chi-square used for categorical variables; t-tests or ANOVA used with variables having ratio/interval scores

[2] NA indicates that test not possible due to unavailability of data from non-respondents

Table 3

Choice and ranking of Saint Mary's College by respondent categories

	Survey	Card	Phone	Survey	Card/ Phone
SMC 1st choice	38.0%	15.5%	46.5%	38.0%	62.0%
Not 1st choice	23.3%	31.7%	45.0%	23.3%	76.7%
Total	26.6%	28.1%	44.3%	26.6%	73.4%

Chi-square = 9.72006
df = 2
p = .0078
N = 320

Chi-square = 5.41705
df = 1
p = .0199
N = 320

	Survey	Card	Phone	Survey	Card/ Phone
SMC 1st choice	38.0%	15.5%	46.5%	38.0%	62.0%
SMC 2nd choice	25.4%	29.5%	45.1%	25.4%	74.6%
SMC 3rd or higher	18.8%	30.7%	50.5%	18.8%	81.2%
Total	26.2%	26.6%	47.3%	26.2%	73.8%

Chi-square = 10.60952
df = 4
p = .0313
N = 294

Chi-square = 8.02980
df = 2
p = .0180
N = 294

The final item shown on Table 2 showing a significant difference ($p < .05$), was based on the differences in high school rank between the non-respondents and those who responded to either the card or phone follow-up. This result was inconsistent with the other

Table 4

Response rates for non-matriculating applicants based on geographical region of home

	Non-Resp	Card/Phone
More distant[1]	19.4%	80.6%
Closer[2]	3.9%	96.1%
Prime Midwest[3]	9.0%	91.0%
Total	10.7%	89.3%

Chi-square = 8.19353
df = 2
p = .0166
N = 262

[1]New England, South, Southwest, and West
[2]Middle states, Midwest
[3]Illinois, Indiana, Michigan, Ohio

analyses based on academic ability and background, and is likely an artifact due to large differences in group size (39 vs. 235) and unequal variances.

Because of the ease in which the telephone survey was conducted and the greater success in obtaining useful information regarding the applicant using this method, a cost analysis of the two different follow-up methods was done in order to ascertain whether this particular method was most cost-effective. The results of this analysis are shown in Table 7. In addition to these direct costs, there was the indirect expense of labor involved in preparing the mailings, making the telephone calls (about 20 hours were spent in this endeavor), and processing the results.

Table 5

Response rates for non-matriculating applicants based on ethnicity

	Non-Resp	Survey	Card	Phone
Non-White	24.2%	14.5%	24.2%	37.1%
White	8.1%	25.6%	25.3%	41.1%
Total	10.9%	23.7%	25.1%	40.4%

Chi-square = 15.13849
df = 3
p = .0017
N = 359

	Non-Resp	Survey	Card/ Phone
Non-White	24.2%	14.5%	61.3%
White	8.1%	25.6%	66.3%
Total	10.9%	23.7%	65.5%

Chi-square = 15.11333
df = 2
p = .0005
N = 359

	Non-Resp	Card/ Phone
Non-White	28.3%	71.7%
White	10.9%	89.1%
Total	14.2%	85.8%

Chi-square = 9.27248
df = 1
p = .0023
N = 274

Table 6

Response rates based on date of admission cancellation

	Non-Resp	Survey	Card	Phone
Before April 1	15.0%	30.0%	25.0%	30.0%
Betw Apr 1 & May 1	5.3%	25.2%	29.8%	39.7%
Betw May 1 & June 30	12.8%	21.2%	25.6%	40.4%
After July 1	18.8%	21.9%	3.1%	56.3%
Total	10.9%	23.7%	25.1%	40.4%

Chi-square = 18.35196
df = 9
p = .0313
N = 359

Discussion

The findings that there were so few biases evident between the various respondent groups was surprising, particularly in light of previous evidence that some bias was probably present. While these results are valid only for this particular survey group, it provides evidence that it is possible that response bias is limited in such survey applications.

The bias found related to choice and ranking of Saint Mary's College was not felt to be particularly damaging to the analysis of the results obtained by the surveys. The applicants who consider Saint Mary's College to be their first choice are those whom the College would prefer to have as students; hence their decision not to matriculate and their reasons for this decision are more important than had they not been as interested in attending

Table 7

Cost analysis of follow-up methods

	Attempts	Contacts	Cost[1]	Cost/ Contact
Post Card Survey	275	90	$162	$1.80
Telephone Survey	165	145	$ 70	$0.48

[1]Costs include printing, postage, and telephone charges; labor not included

the College and had applied to Saint Mary's as their second (or lower) choice.

The results related to the home region of the applicants are probably due to the greater difficulty in contacting these persons at times when they were home and that were convenient to the telephone survey, factors arising from the different time zones involved.

The findings related to the ethnicity of the applicants concern the College, particularly since it is making a strong effort to improve the diversity of the student body. Why these applicants decide to attend another college or university is crucially important to the analysis of the marketing strategy used particularly for this group of applicants. That so many of these fail to respond provides only minute evidence for the review of present strategies. Further study may need to be given to this group in subsequent years.

The higher response rate to the initial survey for those who had cancelled earlier is probably simply the result of having a longer time to respond to the survey. Also, these applicants received their survey earlier in the process, and had perhaps not yet been inundated

by the follow-up surveys of other institutions; hence, they were more likely to cooperate with the request from Saint Mary's College.

The cost analysis showed that the telephone survey is nearly three times as efficient in terms of direct cost per contact. Not only is there little expense for the non-respondents, but it is possible to obtain valuable information from parents and/or siblings even if the subject is not available.

Conclusions

This particular study found very little bias between those who responded to the initial survey and the subsequent surveys; hence there is little need to adjust for this bias in future surveys. The cost-effectiveness of telephone follow-up, particularly when coupled with its high response rate suggests that future surveys of non-respondents utilize this method exclusively, rather than the postcard survey. Finally, whether or not any bias is detected, it is recommended that follow-up studies of survey non-respondents be conducted periodically in order to validate (or adjust) the results obtained from a low-response group.

Endnotes

1. It should be noted that the SAT scores are self-reported for the respondent group. A cross-check of the validity of these self-reported scores in 1990 showed that they were quite accurate. In 1992, 95% of those providing scores on their survey were within 20 points of the SAT score submitted to the College. Where there was error, it usually was in reporting a higher score (though this may also be a result of retesting which had not been reported to the College); it was also noted that the students with lower scores tended to not report these scores. These trends probably account for much of the apparent bias in the SAT scores. The 1992 averages for these groups based on scores officially submitted to the College was 554 for the SAT-V and 498 for the SAT-M; these figures are based on 85% of those who reported scores on the survey, as a number of these had not submitted SAT scores to the College. The high school grade-point average was not self-reported, but determined from information provided by high school transcripts and high school counselors.

Bibliography

Davis-Van Atta, D. L., & Carrier, S. C. (1986). Using the institutional research office. In D. Hossler (Issue Ed.), Managing college enrollments. New directions in higher education (No. 53, pp. 41-70). San Francisco: Jossey-Bass.

Hossler, D. (1986). Creating effective enrollment management systems. New York: College Entrance Examination Board.

Light, R., Singer, J., & Willett, J. (1990). By design: Planning research on higher education. Cambridge, MA: Harvard University Press.

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ABSTRACT

Higher education administrators often wonder if the information they receive from the low response rates to surveys of non-matriculating applicants accurately reflects the entire population of their non-matriculants. These questions are exacerbated by evidence that response bias indeed does exist. This paper describes how one institution studied its response bias through mail and phone follow-up surveys. It should be of interest to institutional research professionals whose institutions are interested in the characteristics of their non-matriculants.