National Response Rates for Surveys of College Students: Institutional, Regional, and Design Factors

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Abstract

College students are a unique population presenting special challenges to obtaining high response rates. Institutional, regional, and design characteristics each may impact response rates and deserve consideration. The College Alcohol Survey (CAS, lead by Harvard School of Public Health) includes a nationally representative, stratified random sample of US colleges and students. The CAS provides a particularly unique opportunity to study response rates in a probability sample of colleges and students. There have been 5 waves of data collection (4 by mail and 1 by web) all conducted by the Center for Survey Research at UMass Boston. In 2001, the college sample consisted of 120 colleges across the country with a total student sample of 30,100 (110 schools with n=215, and 10 schools with n=645). Institutional characteristics such as urbanicity of the campus, demographic make-up of the school, region of the country, research intensity, and other "school characteristics" are used to predict response rates at the school level by linking CAS information with institutional data from the Integrated Postsecondary Education Data System. The survey administration protocol for the 2001 CAS is also used in predicting response rates. In addition, response rate data for all 5 years of the CAS is presented to provide a historical trend and broader context for our statistical models. Findings suggest that the student make-up of a campus (whether the school has a transfer mission, and the percent of students receiving grant aid and loas) predicts lower response rates, while a school's location in the Midwest (relative to the West) positively predicts response rates. Methodological limitations are discussed and avenues for future research are proposed.

KEY WORDS: college students, response rates

1. Previous Research on College Students and Correlates of Response Rates

Survey methodologists have historically been concerned with response rates as a primary indicator of data quality, and have developed a body of literature around how likely certain groups of respondents are to respond to survey requests. Some work has been done to study response rates in samples of college students, but this population is severely understudied with respect to methodological research on response rates.

Studying college students provides a relatively clear sampling frame (university registrar enrollment databases), and relatively captive sample (most students are on or near campus for a defined period of time), thus potentially reducing coverage and contact problems associated with studying nonresponse in general population surveys (or even other list-based sample surveys). Given the possibility of directly sampling college students with known probabilities, it is surprising that little research has used this design either for substantive research or methodological research. We did not conduct a comprehensive literature review for this analysis, but to our knowledge, the College Alcohol Study is the only national probability sample of college students in existence. This design ideal, and the limitations of nonprobability student samples need to be considered when evaluating previous research on response rates in surveys of college students.

1.1 What We Know about College Students as Respondents

There has been little quantitative research on college student populations from a nonresponse perspective. The National Survey of Student Engagement (NSSE) provides a major source of current knowledge about college students as respondents. Using data from the NSSE, Porter and Umbach (2006) find that a campus's student body composition, public status, and urbanicity affect response rates to a web and mail survey of student life. This work sets up a general framework for understanding college student response rates that includes evaluating at school characteristics, student characteristics, and design features (e.g., mode in Porter and Umbach, 2006), all of which may increase or reduce response rates in surveys of college students.

1.2 Limitations of Previous Research on College Students for Understanding Causes of Response Rates

Porter and Umbach (2006) make headway into understanding response and nonresponse in this unique population. However, like any study, including the analysis reported here, their design includes some weaknesses that limit the findings they report. Perhaps the largest limitation involves the nonprobability nature of the sample of schools on which the NSSE is based. Schools opt-in to participation in the NSSE, but samples within schools are probability based and drawn by NSSE itself (not the schools). For accurate inference about nonresponse characteristics of colleges and students within colleges, both levels of the sample need to be random with known information about the sampling frame and selection mechanism. For example, if participation at the school level is nonprobability based, then we are left wondering whether schools that choose to participate are different from schools that do not participate. Within any given school, we can have confidence in the inference about characteristics of respondents, ignoring nonresponse bias within school for the moment. We cannot have confidence, however, about the inference from participating NSSE schools (and their constituent students) to all colleges and universities (and thus all college students) in the United States due to the non-probability nature of the sample of schools. Of course similar problems of representativeness and inference can arise even in probability samples if anything less than 100% response is obtained, but in those cases we can isolate differences between the respondents and the population to nonresponse, since the sampling mechanism is accounted for.

Additionally, the NSSE includes only first year and senior year students (Carini, Hayek, Kuh, Kennedy, & Ouimet, 2003), excluding sophomores and juniors (e.g., 2nd and 3rd year students). To the degree that first year and senior students' response rates and characteristics differ from sophomores and juniors, this is a weakness of using this design for understanding the full college student population.

A final limitation is that the NSSE allows schools to select the mode of administration (paper-and-pencil v. web). While our analysis does not address mode comparisons in detail, we do know that mode and response rates are associated (De Leeuw, 2005).

The purpose of this report is not to critique the NSSE, but rather to take account of some of the major methodological research on college students, comparing the strengths and weaknesses of various data sets. A full understanding of college student response rates will inevitably include comparison and integration of findings from multiple data sources, since we know that response rates can be a factor of the survey topic, the sponsor, the mode of data collection, the incentive offered, and the specific sample. The CAS analysis presented here does not answer all questions about nonresponse characteristics of college student samples. However, we take advantage of the probability framework of this multi-stage sample to begin exploring these questions in a design that provides relatively ideal inference properties.

Further information about the NSSE can be found at http://nsse.iub.edu. Details for the CAS can be found at http://www.hsph.harvard.edu/cas/.

2. Combining the College Alcohol Study and Integrated Postsecondary Education Data System

2.1 The College Alcohol Study (CAS)

The CAS has been conducted 5 times by the Center for Survey Research at UMass Boston, under a grant from the Robert Wood Johnson Foundation awarded to Dr. Henry Wechsler at the Harvard School of Public Health. Four of the 5 years have involved a paper-and-pencil self-administered mode, and one year has involved a self-administered Web survey. The data analyzed here come from the 2001 (paper-and-pencil) data collection. Table 1 provides response rates over all years of the CAS.

Table 1: Historical Response Rates for the College Alcohol Study

Year	Response Rate
1993	69%
1999	59%
2001	50.05%
2005 (web)	27.9%

All surveys in 2001 were mailed to respondents at the address for each student provided by the registrar's office of each participating university. Samples for each school were drawn by the Center for Survey Research to insure procedural quality and accuracy. In 2001, 120 schools provided student data. Prior to the 1993 field period, 196 schools where selected from a nationally representative frame of all four-year post-secondary educational institutions. Those schools were approached by the research team at HSPH for participation in the CAS. Of those, 140 schools agreed to participate in the study, and this became the base sample for the rest of the waves. Potential nonresponse error at this stage of cooperation is not addressed here, but warrants further investigation. Most schools (n=110) had a sample of 215 drawn for the

2001 data collection. Ten schools had a sample of 645 drawn, for a total of 30,100 students in the 2001 data collection.

A first mailing was conducted for each school as soon as the sample was provided by that school and prepared by the Center for Survey Research. The timing of the mailing involved one stipulation. Mailings could not occur near the beginning or end of the semester, or near spring break. Specifically, mailings could not occur 2 weeks after a break, or within one week before a break. In addition to the potential nonresponse induced by having mailings arrive at students' residences near or during a break, the primary reason for this protocol was due to the specific questions in the survey that asked about drinking behavior. These questions asked students to report about a two-week time period, and thus we wanted to make sure that reports of alcohol consumption were based on "average" weeks during the semester, and not weeks that included breaks (where drinking reports could be higher or lower, and would also likely not be due to the campus environment, such as not drinking while at a parent's residence, or drinking heavily in Daytona Beach over spring break.). The initial mailings to students began on February 7, 2001 and concluded on April 23, 2001. The large distance between these dates was necessitated by the facts that: 1) schools sent their sample files to CSR across a wide range of time, and 2) mailings had to be timed to avoid spring break dates. Second mailings to students began on March 1, 2001 and concluded on May 8, 2001. Two mailings and a reminder postcard were sent to each student in the following intervals: 1) first mailing, 2) postcard reminder (1 week after the first mailing), and 3) second mailing (2 weeks after postcard).

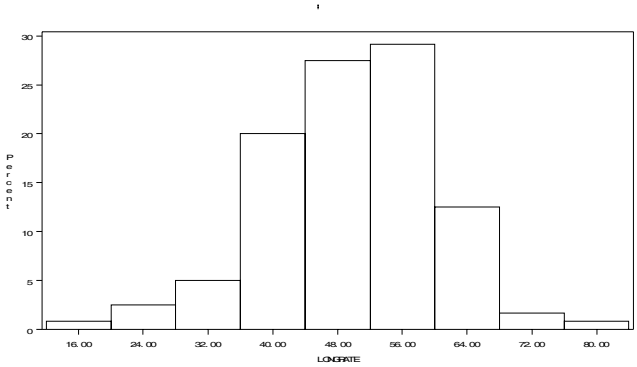
The mailing itself was designed to reduce respondent burden as much as possible. It included a cover letter from Harvard School of Public Health, a golf pencil for complete the questionnaire, a postage-paid return envelope, a postage paid return postcard with ID (to track response anonymously and enter the student in a prize drawing that served as the participation incentive), and the 20 page questionnaire which covered drinking behavior and other risk-taking, student life, academics, and similar topics.

2.2 The Integrated Postsecondary Education Data System (IPEDS)

The IPEDS is a data collection system that is conducted annually by the National Center for Educational Statistics (http://nces.ed.gov/ipeds/). This data source has been used by the NSSE's studies of response rates, and is a valuable resource for any methodologist or researcher interested in higher education. It is a reporting system including all institutions of higher learning in the United States, and includes information about the demographic composition of campuses, the amount and type of student aid provided to students, the type of institution, the educational and research orientations of the institution, and other similar variables that can be used to describe colleges and universities. For these analysis we used variables to supplement what was available from the CAS, which included variables such as the urbanicity of the school (urban=town with 250,000 people or greater), whether the school was public or private, whether tuition varies by state residence, whether the school offers athletic-related financial aid, whether the school offers aid for football specifically, whether the school offers a PhD degree, whether the school has a 5-year program, and whether the school has a transfer mission, meaning that students who enroll are expected to transfer to another school after completing credits at this institution. All of these predictors can be thought of as "school-related" predictors, since they describe characteristics of the school that are determined at the institutional level.

Student-related predictors were also taken from the IPEDS. The term "student-level predictors" should be considered loosely because these are not variables for which we have values for each individual student. Rather, they are institutional level variables that reflect facets of the student body. These variables include the percentage of students receiving loan aid, the percentage receiving any aid, the percentage receiving federal, state, and institutional grant aid (3 different variables), whether the school had greater than 5% students of racial/ethnic minorities, and admissions criteria (whether the school used secondary school rank and whether they required recommendations).

Figure 1: Distribution of Response Rates for Colleges in the 2001 CAS



3. Data Analysis

Response rate for each school in the 2001 fielding of the CAS was used as the outcome of interest in this analysis. It is important to note that this analysis only used data at the school level, not the individual student level. This was due to the anonymous design of the survey instrument

that precluded linking of individual survey responses to individuals in the sample. While data from the sample frame (including year in school and sex of the student) could conceivably be gleaned from the original sampling files, the effort involved was not warranted for this initial analysis. The use of school-level response rates and information gives us information on nonrespondents, at least in an aggregate sense (e.g., we know the proportion of students receiving aid for the entire school regardless of who replies). However, this approach makes this analysis different from others on nonresponse that use individual level data (e.g., the NSSE), and this design limitation should be kept in mind when considering the results.

Figure 1 presents the distribution of response rates for colleges in the 2001 CAS. The distribution appears to be almost normal, with response rates ranging from 14.18% to 83.17%, and a mean of 49.44% and median of 49.7%. The CAS data files have two response rates, one representing response to the primary, 20-page survey after two mailings (LONGRATE), and one representing response to the primary survey plus response to a short, one-page nonresponse follow-up mailing (TOTRATE). Response rates including only the primary survey were included here since not all schools received the nonresponse follow-up. We wanted schools to be as comparable as possible with respect to mailing protocol. Response rates in Table 1 and Figure 1 differ slightly due to the source of the data reported. However, the distribution presented in Figure 1 is the one analyzed in this report. This includes all 120 participating schools, but not all 120 schools remain in all models due to casewise deletion resulting from missing data.

Ordinary Least Squares regression models were built to predict response rates. Although this analysis was considered preliminary, we held to basic best practices in model building. Initial bivariate plots and correlations influenced the selection of items into the final models. Plots of residuals against predicted values for the final models were reviewed for model fit, and they suggest a reasonable fit of the reported models. Selection algorithms, adjusted R-squared and *F* statistics were used to select and compare competing models.

Under a forced model, including all predictors of interest from the CAS and IPEDS data files (see Appendix 1), we find an adjusted R-squared of 0.0657 an F=1.32 (0.187), for n=98 schools. The reduced number of schools is due to missing data on predictors producing casewise deletion in the regression analysis. Selecting predictors that minimize missing data, (n=117), we find an adjusted R-squared of 0.0926 with F=1.74. Due to these low R-squared values under forced models, we decided to use forward inclusion, backward deletion and stepwise deletion algorithms to isolate more parsimonious (and hopefully explanatory) models to predict response rates. The selection algorithms and all of the analyses presented here were carried out in SAS 9.1. The sample size for all the models presented in Table 2 is 98 due to casewise deletion based on missing data.

Table 2: Regression Models Predicting Response Rate

Term	Stepwise (0.15 level) Coeff (SE)	Backward (0.1 level) Coeff (SE)	Forward (0.5 level) Coeff (SE)
Intercept	59.67 (3.11)	59.56 (3.06)	53.12 (6.07)
Transfer Mission (0,1)	-5.958 (2.43)	-6.302 (2.42)	-5.340 (2.44)
% Rec Federal Grant Aid	-0.145 (0.079)		-0.101 (0.093)
% Rec Percent Loan	-0.126 (0.059)	-0.137 (0.057)	-0.108 (0.071)
Region – Midwest v. West (0,1)	4.035 (2.32)	4.453 (2.30)	4.731 (2.42)
% Rec State Grant Aid		-0.010 (0.052)	- 0.123 (0.058)
Admissions Require Recc'n (0,1)			3.914 (2.59)
Aid for Football (0,1)			1.627 (2.39)
Tuition Varies by Residence (0,1)			5.945 (3.43)
5-year program (0,1)			3.175 (2.56)
Offered athletic aid (0,1)			-2.453 (3.04)
% Rec Inst'l Aid			0.051 (0.052)
Adjusted R-squared	0.1408	0.1437	0.1586
F-value (p-value)	4.97 (0.0011)	5.07 (0.0010)	2.66 (0.0055)

4. Results and Conclusions

Reviewing the results of the three inclusion algorithms used, it can be seen that the common predictors between all three are 1) whether the school as a transfer mission, 2) percent of students receiving federal grant aid, 3) percent receiving loans, 4) whether the school is in the Midwest (relative to the West). The models developed here can explain up to 15% of the variance in response rates of the colleges in the 2001 CAS. This is not a large amount by any stretch of the imagination, but is also not an inconsequential amount either. The conservative Adjusted R-squared was used so that the inclusion of many predictors did not over-inflate the R-squared estimate. We are still left with 85% of the variance in response rates unexplained by the variables used here.

A number of predictors were entered into the analysis but did not remain in the final models. Those included institutional predictors, such as the number of students, urbanicity of the school, private v. public status of the school, whether tuition varies by residence, whether the school offered athletic-related aid, and the highest degree offered (PhD or not); student characteristics such as percent of students receiving any aid, percent receiving institutional grant aid, a student body with greater than 5% ethnic/racial minority, whether admissions criteria includes secondary school rank and whether admissions requires recommendations; regional variables, including the political leaning of the state in the 2001 president election; and a single design variable represented whether the mailing schedule was adapted to the school's break schedule (all the mailings before v. split mailing schedule).

The absolute importance of each individual predictor should be taken with a grain of statistical salt, since we did not test all possible predictors of response rates, just those that were available to use and which had reasonable amounts of complete data. However, given these models, some speculation can be made about the mechanisms that might be behind the trends found. The negative relationship of transfer mission and response rate might be explained by the relatively "transient" quality of students at such schools. Students who plan to move on from their school of initial enrollment may feel less connected to the school, and therefore see any reporting about the school to be uninteresting and particularly burdensome. These schools may also tend to attract students with particular challenges, relative to "typical" college students, such as working while attending school or those with difficulty in academic matters (thus requiring more time and effort just to achieve in college, and thus less time to do surveys). The same underlying causes may be responsible for the negative relationship of receiving aid and response rates. It's reasonable to think that students who need aid to attend college, rather than having it paid by their parents, are under resource constraints that may reduce their tendency to take the time to respond to a survey request. Finally, the effect of being in the Midwest (relative to the West) is a curious one. This is the only regional characteristic that was significant. Schools were not selected to maximize comparisons across regions, so inference from this finding should be cautious. Is this an indication of stereotypical "Midwestern helpfulness", or just an artifact of the types of schools that happen to be in the Midwest in this sample? More thorough analyses would need to be conducted to say for sure.

Unmeasured predictors that could add to these models (or might be confounded with some of these variables) include socio-economic status or income of students' families. This might relate to the transfer mission (with students of lower incomes being more likely to attend less expensive schools from which they expect to transfer eventually). Student achievement and ability might be confounded in this variable too (with poorer performing

students ending up at transfer schools). Porter and Umbach (2006) include a measure of student achievement in the form of SAT scores. Attaching such a measure to the analysis of CAS data would likely improve our models, at least conceptually.

In short, this analysis presents an attempt to understand college student response rates using two empirically strong data sources. We believe that the CAS has a unique strength that can be found in its sample design, and plan to work with this data further to match the extent of the comprehensive analyses that have been done with NSSE. Our work certainly benefits from their initial forays into this unique population.

Acknowledgements

The authors would like to recognize Dr. Henry Wechsler for his ongoing investigation into college student behavior, without which this type of methodological exploration would not be possible. We also credit the CAS funding source, the Robert Wood Johnson Foundation, for its continuing support of this important and unique study.

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Appendix 1: All Predictors Used in the Regression Models

Institutional Characteristics

Admissions requires recommendations
Admissions criteria includes secondary school rank
Aid for football is offered
Athletic aid is offered
Number of students enrolled in 2001
Highest degree offered (PhD or not)
Private v. public status of the school
School has 5-year program
School has a transfer mission
Tuition varies by residence
Urbanicity of the school

Student Characteristics
Percent of students receiving any aid
Percent of students receiving federal grant aid
Percent of students receiving institutional grant aid
Percent of students receiving loan aid
Percent of students receiving state grant aid
Student body with greater than 5% ethnic/racial minority

Regional Characteristics
Census region
Political leaning of the state in the 2001 president election

Design Characteristics
Whether the mailing schedule was split across the school's break schedule