Methodology Report for the Texas College Survey of Drug and Alcohol Use, 2005

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Introduction

Over the past decade the Department of State Health Services Substance Abuse Services (DSHS, formerly TCADA), in conjunction with the Public Policy Research Institute (PPRI), has conducted numerous studies in an effort to establish treatment needs and measure addictive behaviors. While many of the studies have focused on the general adult population or on children under eighteen, little attention has been paid to the adults bridging that gap. To remedy this situation and to allow for drug abuse prevention programs to be targeted as needed, DSHS sponsored a recent survey of college students. This survey is a follow-up to a 1997 survey of college students.

Designing a study of the college-aged population in the state presents many challenges. Traditional methods of survey research have various limitations. For example, students are not often in households reached with normal random-digit dialing telephone surveys. Student phone numbers change frequently. Contacts at dormitories, fraternities, and sororities are often excluded from common directory listings. Even in those cases in which good contact numbers are established, surveys are difficult to complete due to the highly variable schedules among students. The recent growth in the use of cellular phones has also made contacting students difficult. Among young adults cellular service is more likely to have replaced traditional phone service (Blumberg, Luke, and Cynamon; 2005). Moreover, federal legislation restricting unsolicited calls to cellular numbers further complicates the study of the population.

The nature of college education has also changed in recent years. Statewide students are no longer attending four-year institutions during the first years of higher education. A high proportion first enrolls in a community college, and then transfers to a four-year institution to complete a degree. In 2003 nearly 88% of the freshmen at public institutions across the state were enrolled at community colleges. This has been a growing trend for many years. Since 1997, the percentage of students enrolled in academic programs at two-year colleges in the state has grown 23.5%. Thus survey methods of the population that do not include students at two-year institutions, exclude a large proportion of younger college students in Texas.

With these methodological issues in mind, substantial changes were made to the study design previously developed in 1997. Similar to 1997 the study population was comprised of full-time undergraduate students between the ages of 18 and 26. However, the sampling frame was broadened to include students at all public and private universities, colleges, and community colleges across the state. The current study also utilized a mixed mode approach in survey administration. Survey data were collected via telephone interviews and online survey forms.

Collecting data using online interviewing is seen as a way to overcome limitations of telephone surveys. At the same time, it required that we undertake analysis of the difference between collection in the different modes and find ways of dealing with some of these differences. A pilot involving three different modes of recruitment was conducted. The three approaches were to conduct a complete telephone interview, recruit respondents for an online questionnaire using the telephone, and using e-mail recruitment for an online questionnaire.

In addition to the pilot an additional comparison in methodologies was designed into the data collection. For a subset of institutions, data for separate samples of students were collected using telephone surveys and online surveys. This provided data capable of comparing responses using the different methodologies. It provided us with a basis for adjusting the online collected data for at least some of the differences in response between the methods.

PPRI collected data from March 8, 2005 to May 30, 2005. Data was collected from four thousand six hundred and thirty-five students during the study. Data was collected by telephone interviews in the schools

that were part of the comparison analysis, where both methods were used, and for institutions where e-mail addresses for students were not available. A total of 761 telephone interviews were conducted and 3874 questionnaires were completed on line. Weights were computed to adjust the analysis for the sample design and for differences in mode of collection.

The following sections of the report present the survey's development and content, the sampling design, survey administration methods, survey response rates, a discussion of the findings from the pilot and comparisons of methodologies, the development of analysis weights, and recommendations for future college surveys.

The Survey Instrument

The college questionnaire was developed to measure drug and alcohol attitudes and usage as well as other addictive behaviors. Much of the focus was on alcohol use and abuse. The 2005 instrument followed the one developed in 1997 by state staff at the Texas Commission on Alcohol and Drug Abuse (now the Substance Abuse Division of DSHS). The original survey was developed from questions from Wechsler's (1993) mail survey among college students. Some questions were also loosely drawn from other instruments such as the Core Alcohol and Drug Survey (Core Institute, 1994). New mental health related items were based upon Kessler and Mroczek (1994) K10+ Self-Administered mental health scales.

The survey began with questions designed to establish study eligibility. Screening questions determined if a respondent was: an undergraduate, registered in more than four hours, and between the ages of 18-26. Individuals that did not fall within the eligibility requirements were excluded from participation. Subsequent questions fell into sections related to: student life (including housing, major, GPA, and student activities); knowledge of the school's alcohol policies and programs; personal alcohol use (including frequency and type of drinking); use of drugs other than alcohol; other personal behaviors (gambling, drinking and driving as well as sexual experience); mental health; and basic demographic information.

The instrument changed from 1997 to 2005. Minor changes were made in survey wording and question order. Additionally several question sets were deleted and new sections were added. The major changes made in 2005 are as follows:

- Detailed questions related to home brewed alcohol use among underage respondents were deleted;
- The list of drugs potentially used was updated and categories from 1997 were collapsed to shorten the list;
- Questions were added related to the use of internet for drug information and acquisition;
- Questions were added related to the recreational use of prescription drugs;
- A set of questions assessing perceptions of drug use danger was added;
- A large section related to gambling behavior was substantially shortened; and
- A section on mental health status was added.

A copy of the final instrument is available in Appendix A. A detail of the survey changes in 2005 is found in Appendix B.

Survey Development

PPRI staff developed an online version of the instrument to be used the self-administrated interviews. The online survey was created using Microsoft Internet Information Server ASP pages. The survey's underlying

databases were developed in Microsoft SQL Server. A website was dedicated to the survey, www.texascollegesurvey.org. This domain name was selected due to a concern that an online address too closely associated with Texas A&M University and/or the Department of State Health Services might bias participation. The study's sponsorship and research affiliation were clearly outlined, however, in all recruitment scripts and in the online consent form.

In order to control access to the survey to those sampled, each sampled student in the sample was assigned a unique alphabetic password. This password was required for survey login and entry. Each password could only be used once so that an individual could submit one completed survey.

A password and its resultant survey record were active for 48 hours. Therefore, a respondent could leave the survey and return within two days to complete the record. Self-administered participants were notified of the two-day window via a pop-up message that appeared if (1) they moved to a different website or (2) the survey window was closed prior to completion. Respondents surveyed by phone were not offered their passwords, nor given the option to return to the survey online.

The survey also automatically excluded those participants that did not fit the eligibility requirements. Validation rules also prevented errors related to skip patterns within the survey. Participants that did not qualify to continue past a skip were automatically taken to the next question section. For example, those students that indicated no drug use were not asked questions detailing drug abuse.

In telephone interviews the calling was controlled by a computer assisted telephone interview (CATI) system. Once a student agreed to be interviewed, the interviewer used the same online survey form used by online respondents.

Survey Pre-testing

Prior to the pilot using actual respondents, survey staff conducted mock online interviews. This provided preliminary checks of survey readability, flow, logic, and timing. The survey was also tested for performance across platforms and web applications. At each stage, modifications were made in the draft to respond to problems. This process was repeated several times during the development of the questionnaire with the assistance of the project officer at DSHS. The pre-test indicated that the survey would be completed in 35 to 45 minutes depending upon respondent answers and skip patterns.

Survey Revisions

Two substantial revisions were made to the instrument after data collection had begun. Each was made to address methodological concerns that arose during the study. The first included alterations to the study eligibility requirements and screening questions. Early in the pilot study, community college staff expressed concern that by excluding part-time students from the study, the majority of community college students would be excluded. To address this concern and to provide for adequate participation levels from community college respondents, the requirement for full-time enrollment was dropped. An additional question was added requesting the actual number of hours enrolled. Those enrolled in fewer than five hours were excluded from participation. Under the new requirements students enrolled in only one course (three to four credit hours) were excluded from the study. Given that this change was made very early in the data collection process and prior to the solicitation of community college students, the impact of screening changes on the sample was negligible.

The second change was made later in the data collection process and involved changes to a question related to sexual activity. The question originally asked respondents to indicate the age of first sexual intercourse. Telephone interviewers were instructed to record when a respondent reported no sexual intercourse with a distinguishable code of "0". However, online respondents were offered no such prompt. Early data analyses indicated high rates of missing data on that question from online respondents. This suggested that those with no first age of sexual intercourse skipped the question. As a result "no sexual intercourse" was indistinguishable from question refusals. To address the problem, a textual prompt was added to the question online that instructed respondents to "enter 0 if never". This change occurred on April 20th. At that time 2,494 eligible responses had been received.

Sample Design

Compared to 1997, the 2005 sample included students from a greater variety of campuses across the state. In 1997, the sample design was a simple random sample of students from readily available campus directories through Survey Sampling, Inc. It included only full-time undergraduates in four-year colleges and universities in Texas. The student body at two-year institutions was excluded due to the desire to capture the attitudes and drug use behaviors of resident (i.e. non-commuter) students. Given the limited availability of campus lists at that time, the 1997 sample design included only the largest universities in the state and was comprised of seven public and three private universities. The colleges sampled in 1997 represented 49% of all Texas college students, 54% of all students at public colleges and universities, and 28% of all students at private colleges.

In 2005 there was a strong desire to expand the survey to include students from community colleges and small campuses. So in contrast to 1997's simple random sample, a multi-stage cluster design was utilized. Since no community college directories were available for purchase in 1997, the 2005 design was developed with the assumption that PPRI staff would recruit colleges and universities to the study and solicit student contact information directly from campus contacts.

Campuses were assigned to one of six strata based on the size of student enrollment and type of institutions. Strata A1-3 included all of public and private community colleges in the state. Strata B1-3 included public and private four-year institutions. Campuses were further stratified by size with *small* campuses defined as those with fewer than 5,000 students; *medium* campuses with greater than 5,000 but fewer than 10,000 students; and *large* campuses as those with more than 10,000 students (see Table 2). Campuses in strata A-3 and B-3 were sampled with a probability of one. This means that the largest campuses in the state were automatically selected for recruitment. This was to ensure that the majority of the state's students were included in the sample. Other campuses were randomly selected from within each of stratum.

TABLE 1. Distribution of Selected Districts by Enrollment Size

Strata	Group
A-1	Small Community Colleges - 5,000 > enrollment
A-2	Medium Community Colleges - 5,000 <= enrollment < 10,000
A-3	Large Community Colleges - 10,000 <= enrollment
B-1	Small Colleges and Universities - 5,000 > enrollment
B-2	Medium Colleges and Universities - 5,000<= enrollment < 10,000
B-3	Large Colleges and Universities - 10,000 <= enrollment

TABLE 2. Sample by Strata

Original Sample with Alternates (n=64)	Actual Sample (n=40)
Stratum A-1: Institutions (n=9)	**Stratum A-1: Institutions (n=5)**
Cisco Junior College	Cisco Junior College
Clarendon College	Clarendon College
College of the Mainland	College of the Mainland
Frank Phillips College	Texas State Technical College-Harlingen
Southwest Texas Junior College	Western Texas College
Temple College	
Texas State Technical College-Harlingen	
Vernon College	
Western Texas College	
Stratum A-2: Institutions (n=13)	**Stratum A-2: Institutions (n=7)**
ACCD - St. Philip's College	Amarillo College
Amarillo College	Lee College
Angelina College	Navarro College
Laredo Community College	North Central Texas College
Lee College	South Plains College
Navarro College	Texas Southmost College/UT Brownsville
North Central Texas College	Tyler Junior College
San Jacinto College District - South Campus	
South Plains College	
Tarrant County College - South Campus	
Texas Southmost College/UT Brownsville	
Trinity Valley Community College	
Tyler Junior College	

TABLE 2. Sample by Strata, cont.

Stratum A-3: Institutions (n=9)	Stratum A-3: Institutions (n=5)
ACCD - San Antonio College	Austin Community College
Austin Community College	Blinn College
Blinn College	Dallas County Community College District
Dallas County Community College District	Del Mar College
Del Mar College	North Harris Montgomery Community College District
North Harris Montgomery Community College District	
San Jacinto College District - Central Campus	
South Texas Community College	
Tarrant County College - Northeast Campus	

Stratum B-1: Institutions (n=10)	Stratum B-1: Institutions (n=5)
Abilene Christian University	East Texas Baptist University
Dallas Baptist University	Howard Payne University
East Texas Baptist University	Texas A&M University-Kingsville
Howard Payne University	The University of Texas of the Permian Basin
Lamar State College at Orange	Sul Ross State (alternate)
Lubbock Christian University	
Rice University	
Texas A&M University-Kingsville	
University of Houston-Clear Lake	
The University of Texas of the Permian Basin	
Austin College (alternate)	
Concordia University (alternate)	
Houston Baptist University (alternate)	
LeTourneau University (alternate)	
St. Edward's University (alternate)	
St. Mary's of San Antonio (alternate)	
Sul Ross State University (alternate)	
Texarkana College (alternate)	
Texas A&M International (alternate)	
Texas A&M University-Texarkana (alternate)	
The University of Texas at Tyler (alternate)	
Trinity University (alternate)	
University of the Incarnate Word (alternate)	
Wiley College (alternate)	

TABLE 2. Sample by Strata, cont.

Stratum B-2: Institutions (n=11)	Stratum B-2: Institutions (n=9)
Angelo State University	Lamar University
Lamar University	Midwestern State University
Midwestern State University	Prairie View A&M University
Prairie View A&M University	Southern Methodist University
Southern Methodist University	Stephen F. Austin State University
Stephen F. Austin State University	Tarleton State University
Tarleton State University	Texas A&M University at Galveston
Texas A&M University at Galveston	Texas Woman's University
Texas Southern University	West Texas A&M University
Texas Woman's University	
West Texas A&M University	

Stratum B-3: Institutions (n=12)	Stratum B-3: Institutions (n=9)
Baylor University	Sam Houston State University
Sam Houston State University	Texas A&M University - College Station
Texas A&M University - College Station	Texas A&M University-Commerce
Texas A&M University -Commerce	Texas State University - San Marcos
Texas State University - San Marcos	Texas Tech University
Texas Tech University	The University of Texas at Austin
The University of Texas at Arlington	The University of Texas at El Paso
The University of Texas at Austin	University of Houston
The University of Texas at El Paso	University of North Texas
The University of Texas at San Antonio	
University of Houston	
University of North Texas	

Campus Participation

Sixty-four campuses were originally selected for recruitment. An additional 14 were added as substitutes. Campuses were contacted and asked to provide the phone numbers and email addresses of all unduplicated undergraduate students enrolled in the 2004-2005 academic year. Contacts were made by phone and email to campus administrators. Initial phone calls were placed to the registrar's office. However, some colleges routed student directory requests through measurement and institutional research offices, and Provosts' or Deans' offices. Phone calls and messages that resulted in contact were followed-up with an email or fax containing a formal written request, a study brief, a copy of the study's IRB approval, and contact information for the study's sponsor, DSHS. Other documentation such as the questionnaire and additional confidentiality statements were provided upon request. A minimum of three contacts were made to each campus.

Of the original 64 campuses selected, 39 participated and provided student contact information from which the final sample was obtained. With a cooperation rate of 61 percent, campus recruitment was successful.

However, cooperation rates fluctuated across strata. As Table 3 indicates, cooperation was highest among medium and large-sized four-year institutions. It was lowest among small four-year institutions (B1). Additional campuses were selected for recruitment within that stratum and 14 alternates were added to the sample. One of the alternate campuses participated.

In addition to the 40 participating campuses, three colleges provided directory data that was not included in the sample: Lamar College at Orange, University of Texas at Tyler, and the University of Texas at San Antonio. The datasets were excluded from the sample due to time and resource constraints.

TABLE 3. Cooperation Rate of Campuses by Strata*

	Strata A1	**Strata A2**	**Strata A3**	**Strata B1**	**Strata B2**	**Strata B3**
Total Cooperation Rate (61%)	55%	54%	55%	40%	82%	75%

* Alternates excluded.

Cooperating campuses provided phone numbers, emails, or a combination of both. Several campuses did not offer students institutional email accounts or collect private email addresses. Therefore, they only provided phone numbers. Phone and email addresses were supplied by 27 (68%) of campuses. Eleven campuses (28%) supplied only phone numbers and two campuses provided only email addresses. Many campuses provided multiple phone and email contacts, such as permanent and local phone numbers and multiple emails addresses.

While campus recruitment to the project was successful, 39 percent of the campuses in the original sample did not participate. Nine campuses were unable to be contacted due to staff changes, errors in staff directory information, or unreturned messages. Administrators at another 16 campuses actively declined participation. The reasons for non-participation varied. Several campuses were interested in participating, however, did not have the staff or time to fulfill the request prior to the study's completion. This was true of alternate campuses in particular. Other administrators had concerns about the survey's topic. However, most that declined expressed student privacy concerns. This generally stemmed from current legislation related to the disclosure of student contact information. Under the Family Educational Rights and Privacy Act (FERPA) a campus may disclose directory information for students that have consented to release. However, the definition of directory information differed across campuses. Many excluded email addresses from their published directories, and made other efforts to conform to FERPA and protect student information. Such campuses generally declined to participate.

Three campuses asked that we submit the request through the Institutional Review Board (IRB). One review board was not able to meet prior to the study's conclusion and thus did not participate. Another IRB declined our request citing student privacy concerns. A third resulted in approval and campus participation.

Mixed-Mode Pilot Test

The survey was piloted among randomly selected students from seven campuses in an effort to test various survey administration and recruitment modes. The pilot was conducted from March 8, 2005 to March 30, 2005. Samples from the seven schools were divided into three pilot groups: (1) participants targeted for an email invitation to the survey, (2) those provided survey information over the phone and guided to the online survey for self-administration (i.e., telephone recruitment), and (3) those surveyed directly by phone. The schools were not randomly selected for the pilot; rather, the pilot was conducted among those campuses for which data were available. Email and telephone contact information was available for all seven campuses.

Two of the recruitment methods utilized telephone interviewers: (1) telephone recruitment, and (2) telephone survey administration. The telephone components of the pilot (and subsequent surveys) were managed by a CATI system. This system managed the sample and automated random-digit dialing procedures. Telephone interviewers were trained on all survey and recruitment scripts. Those that administered the survey by phone were also trained to use the online survey site correctly. Survey supervisors oversaw all aspects of the telephone interviewing and recruitment. They ensured the timeliness and quality of all calls and validated contacts and/or data as necessary.

Telephone Recruitment

The pilot was designed to test the effectiveness of telephone recruitment against the other two administration modes. This mode of recruitment was hypothesized to reduce the costs associated with long telephone surveys. In theory a reduction in the time required to complete a call would allow for more student contacts and require fewer survey resources. At each call interviewers offered a brief description of the survey; confirmed students' enrollment at the college of record; and asked about internet access. Subsequently they provided the survey's web address and a unique password to willing participants. Students without access to the internet were excluded, as were students that indicated that they were not enrolled at the school on file. The telephone recruitment script can be found in Appendix C.

Out of 779 calls, 254 students accepted the website information. Of those 35 accessed the website and 25 completed the survey for an overall completion rate of 3 percent. Each successful informational call required an average of 22 minutes active call time, and 25 minutes of total survey lab time. Reflecting the rate of non-completion of those agreeing to the survey, each completed survey required an average of 3.6 hours of active call time and an average of 4.2 hours of total lab time.1 Each completed survey cost $63.00.

This mode of administration proved to be the most expensive and time consuming mode given the number of resultant completes (see Table 4). For this reason the method was not utilized in subsequent survey and recruitment efforts.

Telephone Survey

During the pilot, students were also recruited and surveyed by traditional telephone survey methods. As students were contacted by phone, interviewers offered a description of the survey and confirmed enrollment in the school on file. They subsequently read the survey to participants and recorded responses

[1] Survey lab hours include supervisory hours, active call time, administrative time, and training hours.

via the online system. This method proved to be very effective but costly compared to email recruitment.

During the pilot phase of the study 779 students were randomly selected and contacted for participation. Seventy-five eligible students completed the survey. This method yielded the highest completion rate of the three modes at nearly 10 percent. A complete survey required 1.5 hours of active call time and 1.8 hours of total lab time. Each completed survey cost $27.00.

Telephone surveys were used along with email solicitation to the online questionnaire for survey data collection. Telephone surveys were used to collect data for the comparison with e-mail/online data collection and for colleges for which e-mail addresses were not available. Colleges that did not have e-mails for students were generally smaller colleges and community colleges.

Email Recruitment and Online Survey Administration

The third method of recruitment to the survey was by email solicitation. This method was tested due to its ability to contact a large sample for little cost. Follow-up contacts could also be made inexpensively. Email solicitations were mailed to a random sample of students with email addresses. The email provided a brief description of the survey, and link with an embedded password to the survey, and instructions for login and self-administration (See Appendix C).

In the event that more than one email was on file, solicitations were sent to at least two addresses. Some emails were not successfully delivered. Sixteen percent of the addresses used in the pilot were rejected due to inaccurate addresses, account terminations, or full accounts. Spam blockers also prohibited the receipt of some solicitations. However, most spam blocker programs asked for sender confirmation prior to email delivery. When this occurred, staff confirmed the source of the email and provided other information as necessary. This process hindered but did not prevent emails to only a few students in the pilot. It also delayed the receipt of approximately 1,300 students in the final survey.[2]

Each email solicitation was followed by a survey reminder a week later. Fifteen percent of the reminder notices were not delivered. If a student did not wish to receive additional emails, his or her email address was removed from our contact list.

This mode of recruitment proved effective and inexpensive. With a completion rate of 5.4 percent, it was more successful at recruiting survey participants than telephone recruitment. It also required only 5 staff hours to send and confirm emails. The final cost per complete was small at $1.80. Ultimately, students from schools with email directory lists were recruited to the final survey by email.

[2] All email accounts at East Texas Baptist University required a reply confirming the source of the email. This accounted for over 1,100 solicitations that were blocked by anti-spam filters. Other accounts requiring sender confirmations were with private email providers (e.g., Earthlink, etc.).

TABLE 4. Comparison of Survey Modes by Completion Rate and Cost

	Total Attempts	Ineligible	Completes	Completion Rate	Cost per Complete
Telephone recruitment to survey	779	10	25	3.2%	$63.00
Telephone survey administration	779	51	75	9.6%	$27.00
Email recruitment to survey (includes two email contacts)	779	10	42	5.4%	$1.80

Student Participation

Students were randomly selected for participation from each institution in numbers proportionate to the school's enrollment. This provided a sample of nearly 85,000 students statewide. The completion rate is defined by the proportion of surveys completed to the number of students successfully contacted. Rates are presented for the overall survey and for each mode of solicitation/administration in Table 5. The following completion rates are conservative in that all emails and phone numbers, including bad numbers and incorrect email addresses, were included in the calculations.

TABLE 5. Completion Rates by Mode

	Overall	Telephone	Email
Completion Rate	5.5%	5.1%	5.5%

Completion rates varied across strata. In general rates were higher among students at four-year institutions than at community colleges. Rates were higher regardless of the size of the institution or the mode of survey administration. Community college completion rates varied from less than 1 percent to 3.5 percent for email solicitations and 2.1 percent to 5.1 percent for telephone. Completion rates ranged from 4.1 percent to 9.1 percent at colleges and universities. Lower rates among community colleges could be due to several factors. Student information may be updated less frequently due to the high turnover of students each semester; and thus more likely to be incorrect. Low email completion rates may also indicate that email use is more prevalent at larger four-year institutions; or that formally assigned institutional accounts are offered less frequently at community colleges.

TABLE 5. Completion Rates by Strata

	Strata A1	Strata A2	Strata A3	Strata B1	Strata B2	Strata B3
Telephone Administration	3.3%	2.1%	5.1%	9.1%	4.4%	6.9%
Online Self-Administration	3.5%	2.7%	0.7%	4.1%	6.9%	8.3%

Participant Confidentiality

To insure confidentiality of the respondent, the student's name was only accessible to research staff. There are a variety of procedures that ensure confidentiality in the interviewing process. PPRI is required to maintain confidentiality of records on a variety of projects, including ones in which records are maintained on identified individuals. The approaches include maintaining security, following specified procedures, and training and supervising employees.

The CATI system enables control to be maintained over all files and records. The computer handles all sample management and data collection and there is no printed material that could compromise confidentiality. The computer system is secure and all areas where confidential material is stored is password protected and accessible only to a select group of staff. Additionally, the premises and physical storage areas are secured.

The most important procedural consideration in maintaining security is to make sure that the anonymity of the interviews and surveys is not compromised. All identifying information (e.g., telephone number, name and email) are in a file separate from the collected data. These files can be linked, but they are not maintained in a linked form. As soon as the results have been processed, there is no further need for access to telephone numbers and other identifying information. Identifying data are then destroyed.

Weights

The weighting for the sample is comprised of three components: a weight based on the sampling design and sizes of the strata population and strata sample sizes, an adjustment based on an estimated "propensity" factor in response to the e-mail solicitation, and an adjustment based on the proportion of the population who are male and female.

The sample design involved sampling schools from within each stratum and then sampling students from each sampled schools. The weight derived for this design is

$$design\_weight_{ij} = (NSchools_i/nSchools_i)(NSchoolEnroll_{ij}/nSchoolSamp_{ij};$$

where

i=strata
j=school
$NSchools_i$ Number of schools in the i^{th} strata
$nSchools_i$ Number of schools sampled in the i^{th} strata

$NSchoolEnroll_{ij}$ Number of students enrolled in the j^{th} school
$nSchoolSamp_{ij}$ Number of students sampled in the j^{th} school.

The propensity adjustment to the weight is based in analysis of the difference between the cases collected using a telephone survey methodology and the e-mail solicitation. The approach used here is a variant of approaches suggested in (Shonlau, et. al., 2004). The argument is that the telephone survey provides better representation of the population than the e-mail solicitation. As noted elsewhere, the differences between coverage of telephones and e-mails are not as great for college students as for other populations and, with few exceptions, e-mail addresses were generally available for the students in the sampled schools. However, there were very different responses to some questions on the telephone and e-mail solicited web based surveys.

The telephone/e-mail comparison was based on samples from six schools. Separate samples of students were sampled from for the telephone and e-mail surveys. A total of 388 telephone surveys and 1,937 e-mail surveys were completed from the six schools. One area of difference in responses was that e-mail solicited students were less likely to be involved with others on a number of dimensions. It is reasonable that those more involved may be less likely to spend time on the internet and less likely to respond to the internet survey. We created an index of involvement using responses to the following questions. For each student, the average responses from the nine questions were computed. The average was computed across all questions not omitted or something other than "Don't know/refused" was given as a response. The involvement index was rounded so that the values were integers between 1 and 5. The categories of 1 and 2 were collapsed due to the small number with a code of 1.

	During a typical semester, how often do you:	Daily	Weekly	Every other week	Monthly	Once or twice a semester	Don't know/ Refused
SL8a.	Attend religious services/classes	1	2	3	4	5	88/99
SL8b.	Attend sporting events	1	2	3	4	5	88/99
SL8c.	Go to parties or clubs	1	2	3	4	5	88/99
SL8d.	Attend plays, concerts, or art shows on campus	1	2	3	4	5	88/99
SL8e.	Attend academic lectures or presentations on campus	1	2	3	4	5	88/99
SL8f.	Participate in community service projects	1	2	3	4	5	88/99
SL8g.	Participate in fraternity or sorority activities	1	2	3	4	5	88/99
SL8h.	Participate in a student activities organization	1	2	3	4	5	88/99
SL8i.	Play sports or exercise	1	2	3	4	5	88/99

The proportion of respondents in each category of the involvement was computed for the telephone and e-mail samples and a weight adjustment calculated by dividing the proportion in the category in the telephone sample by that in the e-mail sample. The weight calculated from the sample design was multiplied by this adjustment. This weight adjustment was applied only to the cases in the sample using the e-mail solicitation.

TABLE 6. Computation of Involvement Adjustment

Involvement Score	Phone	E-mail	Weight Adust (Phone/Email)
1-2	5.4%	2.0%	2.7
3	22.7%	16.8%	1.3
4	20.7%	25.8%	0.8
5	1.6%	5.1%	0.3

Finally, an additional post hoc adjustment was applied to adjust the gender distribution. No additional adjustment was needed for the community college sample as the gender distribution in the weighted sample and the population was quite close (40% male in the sample, 41 percent in the population. The adjustment for the university sample was computed dividing the proportion in the population by the proportion in the population. The distributions in the population were males 45 percent, females 55 percent; and the distribution in the sample were males 38 percent, and females 62 percent.

The variable "weight" is the final weight used by SUDAAN or SAS. It incorporates the above weights and adjustments.

The SAS dataset "inst_pops_strata" contains the following variables and data. This data can be used in SAS and SUDAAN procedures appropriate for the stratified cluster design of the sample.

*_total_* is the number of institutions in the population of the strata from which the sample was selected.

Enroll is the total student enrollment in the strata.

Strata is the strata number

Obs	type	size	_total_	enroll	strata
1	Ccollege	1	31	88295	1
2	Ccollege	2	17	126046	2
3	Ccollege	3	9	255859	3
4	University	1	51	92709	4
5	University	2	16	115584	5
6	University	3	12	267659	6

Conclusions

The 2004 Texas College Survey underwent several changes in an effort to ensure that results reflected the experiences of students statewide. Compared to the past college survey, the sampling frame was greatly expanded to include all two and four-year institution statewide. With the addition of community colleges and small institutions, sampling bias toward large four-year institutions was significantly reduced.

The survey also utilized online methods of data collection. Email contacts and online surveys make it possible to survey large numbers of respondents at relatively low cost. This method is also uniquely well suited to the population. Most institutions provide standardized email accounts to students and email use is high among young adults. As telephone surveys become more difficult to conduct among the population, online methods can effectively reach students.

Such methods may also contribute to more accurate data. Our data showed some response difference by survey mode. Online respondents were generally more likely to select responses at either end of a Likert scales, or the more extreme response options. They also reported higher instances of drug use. This may suggest that privacy improves the accuracy of responses.

Unfortunately comparisons between the 2004 survey and prior college surveys are limited. Given the substantial modifications to the sampling design and the mode of administration, 2004 findings may significantly vary from those in 1997. Such differences should be interpreted cautiously as they may reflect the methodological differences between surveys, rather than changes in response patterns.

Recommendations

We are pleased with the improvements made to the survey in 2004. However, more can be done to improve it in the future. Primarily, the project period should be extended to allow more time to solicit campus involvement. The current project period spanned eight months, December to August. The end of survey administration coincided with the end of the academic year in late May – limiting recruitment time to approximately 3 months. Several campuses required formal and lengthy processes to obtain data. Others required IRB review.

Additional recruitment time would allow for the development of good working relationships with campus administrators, drug and alcohol program coordinators, and database administrators. It would give campuses more time to fulfill to the request for data; and allow research staff to thoroughly respond to concerns and IRB requests. We believe this would result in an improvement in the campus participation rate and consequently a better sample.

There are also changes in the survey itself that could improve the completion rate among students. The length of the survey is a concern. The survey had 287 items and required an average of 25 minutes to complete online and 29 minutes by phone. However, respondents that were not excluded in skip patterns required nearly 20 minutes longer. We believe that the student response rate would improve if the time required to complete the survey fell between 20 to 30 minutes. With that said early data analyses of partially completed surveys showed significant patterns of drop off early in the survey. This could suggest that respondents become invested (or disinterested) in the survey process during the first sections. In lieu of reducing the survey's length, a reordering of items should be considered.

Lastly, the current survey lacks items that could improve our propensity measures. In particular, little data

is collected on internet and email usage. Without data related to the amount of internet use, it is difficult to identify the impact of online self-selection on the final dataset. More study on measurement and response differences by the types of survey methods is also necessary. This will highlight innovations in techniques to obtain representative online samples.

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