2005

Analysis of the Impact of a Social Norms Campaign on the Alcohol Use of Undergraduate Students at a Public, Urban University

Amanda B. Wattenmaker
Virginia Commonwealth University

Analysis of the Impact of a Social Norms Campaign on the Alcohol Use of Undergraduate Students at a Public, Urban University

By Amanda B. Wattenmaker

Advisor: C.M.G. Buttery, MB BS, MPH

Preceptor: Linda C. Hancock, MSN, FNP, PhD

Department of Epidemiology and Community Health
Master of Public Health Program
MPH Research Project: EPID 691

Virginia Commonwealth University
Richmond, Virginia

December 2005

Master of Public Health

Research Project Agreement Form

Department of Epidemiology and Community Health

Student name: Amanda B. Wattenmaker E-mail address: wattenmakeab@vcu.edu
Street address: [redacted]
Cell phone: [redacted] Work phone: ( ) N/A Fax: N/A
Number of semester hours (3-6): 4 Semester: Fall Year: 2005

A. PROJECT TITLE: Analysis of the Impact of a Social Norms Campaign on the Alcohol Use of Undergraduate Students at a Public, Urban University

B. PURPOSE: Is a multi-faceted social norms marketing campaign successful in improving peer perceptions, reducing harm, and changing behavior associated with college drinking behaviors?

C. SPECIFIC OBJECTIVES:
-Identify whether or not peer perceptions related to alcohol use have shifted among those students who are exposed to a social norms marketing campaign. (i.e., among those students who previously believed that their peers drank more than four drinks each time they partied, do they now believe that their peers drink less?)
-Determine if there was a change in drinking behavior that resembles the perception shift (i.e., has the number of drinks consumed changed as perceptions have shifted?)

D. DESCRIPTION OF METHODS

D.1. Identify source(s) of data:

The data set that is being used for this study was collected with the National College Health Assessment measurement tool during February of each year from 2002 and 2004. The 2002 data is baseline data as there had been minimal alcohol education activities at the university prior to this point. The NCHA enables the researcher to compare trends among the local study population with the national data set. The data was collected by administering the NCHA tool in classrooms, where professors gave consent for the use of class time. Attempts were made to randomize the class selection. Classes were selected randomly from a list using systematic random sampling, and were part of a quasi-random sample as class participation was contingent upon professorial consent. Classes were comprised of a diverse group of college majors, year in school, and class times. I was not involved in the collection of the data, so this is a secondary analysis.

D.2. State the type of study design:

I used a cross-sectional design with an intervention. The study population differs each year; however, the measurement tool is used to determine a global picture of perception shift and

behavior change after being exposed to a campus-wide social norms campaign. This study will analyze perceptions and behaviors among 18-24 year olds in 2002 and 2004. Those students younger than 18 years old did not complete the survey. All undergraduate students older than 24 years old will be excluded from the study. All students who reported drinking more than 25 alcoholic drinks the last time they partied or socialized were also excluded from the study. An analysis of perceptions and behaviors among the study population of 18-24 year olds in 2004 will occur after potentially being exposed to the social norms messages for approximately 18 months. Because the surveys were completely anonymous, there is no way to match the members of each study population.

D.3. Describe the study population and sample size:

The sample for 2002 was n=662.
The sample for 2004 was n=1334.

The samples for 2002 and 2004 have been identified as mostly similar concerning population characteristics such as age group, class rank, gender, and race/ethnicity. The 2002 data was used as baseline data.

D.4. List variables to be included:

There are three classifications of variables:

*Alcohol-related behaviors

Q	Questions as they appear on NCHA	Variable labels
Q9	Within the last 30 days, on how many days did you use: (alcohol)?	alcohol use in the last 30 days
Q13	The last time you "partied"/socialized, how many alcoholic drinks did you have? State your best estimate.	number of drinks last time partied
Q17	During the last school year, if you "partied"/socialized, how often did you: (alternate non-alcoholic with alcoholic beverages, determine in advance not to exceed a set number of drinks, choose not to drink alcohol, eat before and/or during drinking, have a friend let you know when you've had enough, keep track of how many drinks you were having, pace your drinks to 1 or fewer per hour, avoid drinking games, drink an alcohol look-alike)	number of strategies used usually or always when partied in last school year to reduce negative consequences associated with alcohol use
Q18	If you drink alcohol, within the last school year, have you experienced any of the following as a consequence of your drinking? (physically injured yourself, physically injured another person, been involved in a fight, did something you later regretted, forgot where you were or what you did, had someone use force or threat of force to have sex with you, had unprotected sex)	number of harmful results as a consequence of drinking in last school year

*Alcohol-related perceptions

Q	Questions as they appear on NCHA	Variable labels

Q15	How many alcoholic drinks do you think the typical student at your school had the last time he/she "partied"/socialized?	perception of typical VCU student number of drinks last time partied
Q10	Within the last 30 days, how often do you think the typical student at your school used: (alcohol)? State your best estimate.	perception of typical VCU student alcohol use in past 30 days

*Demographics

Q	Questions as they appear on NCHA	Variable labels
Q46	What is your sex?	gender
Q51	How do you usually describe yourself? (White not Hispanic, Black not Hispanic, Hispanic or Latino, Asian or Pacific Islander, American Indian or Alaskan Native, Other)	race/ethnicity
Q45	How old are you?	age
Q50	Are you a full-time student?	school enrollment status
Q2	On which of the following health topics have you ever received information from your college or university (alcohol)?	have received information from VCU on alcohol and other drug use prevention
Q54	Where do you currently live? (campus residence hall, fraternity or sorority house, other university/college housing, off-campus housing, parent/guardian's home, other)	residential status (on- or off-campus living)
Q55	Are you a member of a social fraternity or sorority (National Interfraternity Conference, National Panhellenic Conference, or National Pan-Hellenic Council)?	Greek affiliation

D.5. Describe methods to be used for data analysis:

SPSS version 13 software will be used to conduct a secondary analysis of the data that was collected for this study. The analysis involves comparing the samples of 2002 and 2004. I used the Pearson's *r* correlation coefficient to determine if there exist correlations between variables and perception shift/behavior change. I wished to determine if there is an association between exposure to the social norms campaign and perception shift and/or behavior change via relationships between variables. I also constructed frequency tables, and performed an independent samples *t*-test to compare the difference of the means between samples.

E. ANTICIPATED RESULTS: I anticipated that there would be a perception shift, behavior change, and thus, reduction of harm after the intervention.

F. SIGNIFICANCE OF PROJECT TO PUBLIC HEALTH: Alcohol use and abuse are significant concerns among the college student population. Thousands of dollars in funds are disbursed for health campaigns for use with the college health population concerning alcohol and other drug use (AOD). An analysis of the effectiveness of these campaigns is imperative to the improved health and effective use of behavior change strategies.

G. IRB Status:

1) Do you plan to collect data through direct intervention or interaction with human subjects? _X_ yes ____no

2) Will you have access to any existing identifiable private information? __ yes __X_no

Please indicate your IRB status:
___ to be submitted (targeted date_____)
_X_ submitted (date of submission ___10/19/01___; VCU IRB # __2214_)
Approved for continuation yearly 2002-2005. Approval expires 5/31/06
___ IRB exempt review approved (date_____)
___ IRB expedited review approved (date_____)
___ IRB approval not required

H. PROPOSED SCHEDULE: Start Date: __7/05__Anticipated End Date:__12/05___

I. INDICATE WHICH OF THE FOLLOWING AREAS OF PUBLIC HEALTH KNOWLEDGE WILL BE DEMONSTRATED:

1. Social/Behavioral Sciences – concepts and methods of social and behavioral sciences relevant to the identification and the solution of public health problems. _X_ yes ___no (if yes, briefly describe):

The Social Norms Approach motivates behavior change by correcting misperceptions and telling the truth about normative healthy behavior. It has been utilized across the country as a campaign strategy for tobacco cessation, alcohol use, sexual assault, domestic violence, and other topics pertinent to college and university health.

Dedication

I dedicate this paper to my Mom and Dad, Paul and Susan Wattenmaker, and to my brother, David Wattenmaker. Thank you for always being my biggest fans, for your unconditional love and support, for teaching me that I can make a difference in the world, and for showing me that I can do anything I set my mind to.

Epigraph

"To laugh often and much; to win the respect of intelligent people and the affection of children; to earn the appreciation of honest critics and endure the betrayal of false friends; to appreciate beauty; to find the best in others; to leave the world a bit better, whether by a healthy child, a garden patch or a redeemed social condition; to know even one life has breathed easier because you have lived. This is to have succeeded."

-Ralph Waldo Emerson

Table of Contents

Acknowledgements

I could not have completed this project without many people who have touched my life over the past few years. I would like to thank my Mom, Dad, and brother, David, for your unending encouragement, support and love throughout my life and especially as I worked toward my Master's degree. God has truly blessed me in so many ways, and for all of the blessings He has granted to me, I am most grateful. Special thanks to Patrick S. McGann for your continuous love, support, and encouragement throughout the years and for being my best pep-talker.

Thank you to Dr. C.M.G. Buttery for your support throughout the MPH program. Your guidance and expertise have been most invaluable. Thank you also to Dr. Tilahun Adera and Dr. Saba Masho for instilling the problem solving skills and planting the seeds of epidemiology that I will use throughout my career. I would also like to thank all of the MPH program faculty for your time, energy, and expertise in the field of public health. Karen Bryant and Kate Young deserve my sincere appreciation for everything you have done throughout the course of the program. You Ladies are who keep us on our toes and we could not have been successful without both of you.

My deep appreciation goes to my preceptor, Dr. Linda C. Hancock, for her mentorship and friendship throughout this semester. You have inspired me to choose college and university health as my career because of the many differences that you have made throughout yours. Thank you for introducing me to the Social Norms Approach and many of your colleagues in the field. Your passion for making a difference with college students is incredibly contagious. You have been the most amazing person to work with, I owe you many thanks, and I look forward to continuing to work with you and the Office of Health Promotion staff at VCU.

I owe many thanks to Dr. Gregory Barker of Northern Illinois University for his statistical support throughout my project. Thank you for teaching me to be a practical statistician, and for sharing all of your expertise. Also, thank you to Dr. Neil Henry for your assistance with the cleaning and interpretation of the data set.

And last, but certainly not least, thank you to my classmates and public health colleagues, who I hope to work with again one day. Special thanks to Rachel M. Barker, Marilyn C. Batan, Anike N. Clark, and Thuy Quynh N. Do for your continued support, mutual motivation, and friendship. It has been a magnificent journey with you ladies.

Abstract

Purpose:
To conduct a secondary analysis of survey data collected at a large, urban university assessing for change in students' alcohol use perceptions and behaviors between 2002 and 2004. After the baseline data collection in 2002, the campus launched an intensive media intervention to normalize low-risk drinking. Simultaneously, the campus shifted from being a primarily commuter to primarily residential.
Methods:
This cross-sectional analysis used data collected from students in randomly selected undergraduate classes in February 2002 (n= 662) and 2004 (n=1334). The survey instrument used was the National College Health Assessment. Variables were categorized as demographic, alcohol perception, and alcohol related behavior. Because the media intervention targeted undergraduate students, decisions were made to limit analysis to traditional undergraduate students and to eliminate extreme self-reported drinking outliers by only including 18-24 year old undergraduates and those who reported drinking 25 or fewer drinks per sitting. Frequency tables were used to assess patterns. Independent samples *t*-tests and Pearson correlation coefficients were also calculated.
Results:
Consistent with the literature review, this study confirmed the existence of alcohol use misperceptions. The percent of the sample reporting accurate low-risk use perceptions increased. Despite correcting misperceptions, this study failed to document a decrease in high risk alcohol use and harm. Independent samples *t*-tests calculations revealed a statistically significant change in perception (t=6.49; p<.001) but not in consumption. A Pearson correlation coefficient calculated on number of drinks and perception of drinking confirmed what has been found in other studies. Calculations reveal that drinking is positively correlated with perception of drinking (2002 r=.428, p=.001; 2004 r=.335, p=.001).
Conclusions:
This study adds to the body of literature that documents misperceptions are positively correlated with heavy drinking. The review of the literature also suggests that residential campuses have higher consumption rates than commuter campuses. In light of the 25% increase in residence hall space that occurred at this campus, one might have predicted that alcohol consumption should have increased. It is possible that no change was beneficial change. The planning and implementation phases of social norms campaigns on college and university campuses must take into account changes to the campus environment and changes in the student population demographics.

Introduction

Alcohol use among college students

When it comes time for college freshmen to pack up their parents' minivans full of their most prized possessions, anticipation floods their minds about the new people and places they will encounter. They think about how they will like their roommate, if they will fit in with the other freshmen, and the idea of latching on to a group of upperclassmen to avoid the initial awkwardness that is so familiar to freshmen. Experimentation is at the center of student life, as each individual, having reached a milestone in his or her life, is ready to encounter new experiences. "Using alcohol frequently facilitates the adoption of a new college student identity and serves as a landmark of independence from parental control (Maggs, 1997)." According to Johnston, O'Malley & Bachman, "individuals entering college show marked increases in alcohol and drug use, compared to those that live at home or get jobs following graduation from high school (Borsari, 2001)."

Those who are returning from summer break, too, look forward to what the new school year has to offer at their already familiar place. They have thoughts of a new love, better grades, and exploration of a new hotspot for those evenings when the most impossible midterm is finally over. Certain factors may lead to heavy drinking, such as distance from parents, close association with peers, type of residence, affiliation with fraternities and sororities (also noted as Greek affiliation), large social events, and athletic participation (Baer, 2001). It has been well documented that four out of five college students drink alcohol (Wechsler, 1990). Socializing with a familiar group of peers (Klein, 1992), and year in school are positively correlated with refusing an offered drink, suggesting that maturity and confidence may make students more

comfortable resisting offers of alcohol from their peers (Borsari, 2001). As noted by Perkins in 1997, "peers are the most salient social referents in the college environment (Borsari, 2001)."

Misperceptions of alcohol use

Peers become more influential and increasingly independent of parental oversight (Brown, 1997). In fact, "peer influence is even stronger than parents' beliefs and guidance or religious affiliation (Perkins, 1985)." Consequently, individuals are constantly evaluating their own beliefs and behaviors in relation to their peers.

Students often assume that their own attitudes are more conservative than are those of other students, even though their public behavior is similar (Schroeder, 1998). It is uncommon for personal alcohol use to be reported as higher than the perception of peer alcohol use (Corcoran, 1995). "Although the perceived hierarchy of drinkers may change, students consistently rate others as drinking more than themselves (Borsari, 2001)." Most students overestimate the use and approval of alcohol by campus peers. Students with these misperceptions are less likely to believe that their own alcohol use is problematic. Findings from a study conducted by Borsari in 2003 confirm that most students believe that they drink less and are not as favorable of alcohol use as their peers.

It is also common for students to have limited knowledge about the actual behaviors and attitudes of other students. As students observe others drinking alcohol heavily, they assume that extreme use is typical, which perpetuates elevated norms (Perkins, 1997). According to the normative social influence model, as stated by Perkins in 1985, students use their perceptions of "heavy alcohol and other drug use" to guide their attitudes and behaviors about alcohol and other drug use, even if it is not the norm at the university (Perkins, 1985). "Students perceiving others

as drinking heavily may drink in a similar manner. This behavior is then observed by other students, perpetuating the perception that heavy drinking is the norm. Students may then feel pressured to conform to these elevated behavioral and attitudinal norms, perpetuating heavy alcohol use (Perkins, 1997)."

Social Norms Campaigns

The intention of the social norms approach is to convey that the actual levels of alcohol use and attitudes toward drinking on campus are more moderate than most students suppose. This information challenges students' personal beliefs that heavy drinking is prevalent and acceptable. According to Perkins (2002), "as student perceptions become more accurate, actual norms become even more moderate as the process of misperception leading to misuse is reversed (Borsari, 2003)." Addressing the inconsistency between one's perceptions of peer behaviors and actual peer behaviors is paramount in social norms campaigns (Borsari, 2003).

In a landmark study by Michael Haines in 1996, the social norms approach addressed alcohol misperceptions. In this longitudinal study, "a traditional intervention proved unsuccessful, but a media campaign designed to change student perceptions of the amount of binge drinking showed an 18.5% drop in the number of students who perceived binge drinking as the norm (from 69.7% to 51.2%) and a corresponding reduction in self-reported binge drinking of 8.8% (from 43.0% to 34.2%)." There have been numerous campus-wide campaigns across the country that utilize the social norms approach for college alcohol interventions, including comprehensive campaigns at Northern Illinois University, Hobart and Williams Smith Colleges, and University of Arizona.

Over twenty-five studies conducted on multiple campuses and with a variety of measures have addressed the misperception of drinking norms among college students (Haines, 2005). In a critique by DeJong in 2003 of a study that has argued that college students do not misperceive alcohol consumption of their peers (Wechsler, 2000) DeJong showed that its conflicting finding was due to inconsistent measurement tools to evaluate perceptions and actual drinking behaviors. Increased attention to social norms, particularly in the university environment, has resulted in several studies evaluating whether social norm education can bring about a perception shift of peer norms as well as a change in the amount of alcohol that is consumed by students. Social norms education, using various approaches, appears to be an effective method of changing student perceptions of peer drinking behaviors (Borsari, 2001).

Gender and norms

Gender differences are present in regard to peer alcohol perceptions, with men perceiving more permissive alcohol norms than females do (Adams, 1999). Drinking behaviors are also evident, with women consistently reporting drinking behavior that is not as heavy as male drinking behavior (Johnston, 2000). Most women drink in mixed groups (Orcutt, 1991; Rosenbluth, 1978), implying that there are different social implications for each gender. A greater proportion of female students reported relying on self-protective behaviors (Delva, 2004), reducing negative consequences associated with alcohol use.

Race/ethnicity and norms

Drinking behavior also differs with regard to race/ethnicity. Female African- American students are more likely to abstain from alcohol than are their White and Hispanic female

counterparts. Drinking patterns are similar between Hispanic and White non-Hispanic women (Delva, 2004).

Greek affiliation

Students who are affiliated with a fraternity or sorority tend to perceive their drinking as heavier than that of non-Greek members' drinking behavior (Borsari, 2003), further providing a misperception for college students to attempt to adhere to.

Protective behaviors/strategies

Student drinkers experiences fewer negative consequences as a result of their drinking when they employed more types of protective behaviors more frequently (Delva, 2004). Campus-wide social norms campaigns are beginning to incorporate protective behaviors and safe party strategies such as designating a driver; alternating alcoholic drinks with water; pacing drinks to one per hour; deciding in advance how many drinks to have prior to going out; choosing not to drink alcohol; eating before or during drinking; having a friend let them know when they have reached their limit; avoiding drinking games; or drinking an alcohol look-alike.

According to a 2005 study conducted at a university in the mid-west United States, nearly three-quarters (73%) of student drinkers in the sample regularly employ at least one protective behavior, and well over half (64%) of the students who use protective behaviors routinely employ two or more. The conclusions from this study, conducted by Haines in 2005 provide implication for an alternative to abstinence-only approaches.

Alcohol related consequences

"College students, on average, drink more than their non-college peers of the same age (Schulenberg, 2001)", and commonly report negative consequences as a result of their drinking or peer drinking (Wechsler, 1994). Alcohol-related consequences include physically injuring one's self or being physically injured by another person; being involved in a fight; doing something that they later regretted or forgot what they did; had someone use force or threat of force to have sex; or had unprotected sex.

Objectives

There are gaps in the current literature on social norms campaigns and interventions that address college and university alcohol use. First, no previous research has evaluated a social norms campaign at a college or university that is shifting from a largely commuter student population to a more residential student population. Exposure to a communal campus environment is associated with increased alcohol use. On the average, students residing in places where heavy drinking is approved, and away from parental supervision and where alcoholic beverages and the places to consume them are readily available will drink more (Schall, 1992). This study examines the impact of a multi-faceted social norms campaign on the alcohol use and alcohol use perceptions of students at a public, urban, east coast university during a time of transition from a primarily commuter student population to a primarily residential student population. Second, the student population is racially and ethnically diverse, unlike many previous studies in which the student population was mostly comprised of Caucasian students.

Methods

Purpose of study

The purpose of the study was to conduct a secondary analysis of survey data collected during February of 2002 and 2004 at Virginia Commonwealth University (VCU). While traditional alcohol education had occurred prior to 2002, there had been very minimal norms education activities at the university. The 2002 data is considered baseline data. Surveys were collected in randomly selected undergraduate classrooms. Classes were randomly selected from a list of all undergraduate classes. In reality, the sampling was quasi-random, as class participation was contingent upon professor consent. Classes were comprised of a diverse group of college majors, year in school, and class times. This study will provide a secondary analysis of data collected over a time period of two years, and will examine the impact of the social norms campaign in improving peer perceptions, reducing high-risk drinking, and reducing harm associated with college drinking behaviors.

Instrument

The instrument used in this study is called the American College Health Association-National College Health Assessment (ACHA-NCHA). It contains 58 multiple choice questions on seven content areas: Health, Health Education and Safety; Alcohol, Tobacco, and Other Drugs; Sexual Health; Weight, Nutrition, and Exercise; Mental and Physical Health; Impediments to Academic Performance; and Demographics. The survey includes questions on alcohol use perceptions as well as behavioral indicators. The ACHA-NCHA was pilot tested in 1998-1999, and was first implemented in spring of 2000. Data collection continues to occur on college campuses each semester. The ACHA-NCHA was developed by an interdisciplinary team

of college health professionals, who systematically evaluated with reliability and validity analyses comparing common survey items with national studies such as the National College Health Risk Behavior Survey (CDC) and the Harvard School of Public Health 1999 College Alcohol Study (CAS). Only schools that randomly selected students, or surveyed students in randomly selected classrooms, are part of the national databases. Because the schools are self-selecting, the ACHA-NCHA databases are not generalizable to all schools and students in the United States. Since the data collection began in 2000, over 324 schools have participated and over 190,092 students have been surveyed.

Selection of Cases

This study used a cross-sectional design to evaluate a social norms intervention, and analyzed perceptions and behaviors among 18-24 year olds in 2002 and 2004 at VCU. Those students younger than 18 years old did not complete the survey. Because the purpose of this secondary analysis is to analyze the impact of a social norms campaign as a traditional undergraduate study, all undergraduate students older than 24 years old were excluded from this study. The analysis was conducted on the perception of peer behaviors and actual behaviors in regards to alcohol use among the sample in 2004 after having been exposed to the social norms messages for approximately 18 months. Because the surveys were completely anonymous, there was no way to match the members of each sample or identify the students that were surveyed.

The sample for 2002 was n=662. The sample for 2004 was n=1334. The difference in sample size may be explained by several factors. First, in 2002, there was a snowstorm that caused classes to be cancelled on survey dates. Second, there was a better rate of faculty consent in 2004.

Description of Social Norms Intervention (Spring 2002-Spring 2004)

VCU's social norms intervention began in 2002 with the collection of baseline data in February, which was made possible by a four-year grant from the National Social Norms Resource Center. During the spring of 2002, the media components were designed and included posters, websites, and other campaign media.

Media habits surveys determined where students obtained their information. Focus group research was used to guide strategic planning for media creation. Print ads were pilot tested in the summer of 2002 and the campus-wide mass media campaign was launched in the fall of 2002. The campaign consisted primarily of posters and table tents, but included other promotional items. Each semester between fall of 2002 and spring of 2004, several different campaigns were created, pilot tested and distributed. The "VCU Students Are Healthier Than You Think!" campaign series, the "Skeptical Bubble" campaign series, and the "Urban Legends" campaign series were all implemented between fall 2002 and spring 2003. The "Students Care About Their Health" campaign series and the "Stall Seat Journal" were implemented in fall 2003. One of the Stall Seat Journals featured an article about a class of VCU skeptics who decided to test the 0-4 drinks campus norm and discovered that it was true, even with their small sample size. The "Amazing But True" campaign was implemented in spring 2004.

Market saturation intercept surveys at the end of each semester showed that 90% of the population had seen the campaign and that most students felt favorably about the campaigns. The overarching theme of the intervention was "VCU students are healthier than you think." Posters contained specific behavioral norms information such as "Most students (67%) have 0-4 drinks when they go out" and "Most students drink alcohol on 5 or fewer days per month." Information

about what "1 drink equals" was included on most posters. Print media included statements about how statistics were collected and the sample size for that year.

Selection of Variables

Variables were divided into three separate classifications: demographics, alcohol-related perceptions, and alcohol-related behaviors. The demographics that were selected as variables were gender, race/ethnicity, age, school enrollment status, whether or not the student has received information from VCU on alcohol and other drug use prevention, residential status (on- or off-campus living), and Greek affiliation *(See Appendix Tables A, B, C).*

Alcohol-related perceptions that were selected as variables were the perception of the number of drinks of a typical VCU student the last time he/she partied, and the perception of alcohol use in the last 30 days by a typical VCU student.

Alcohol-related behaviors that were selected as variables were drinking alcohol in the last 30 days, the number of alcoholic drinks the last time he/she partied, the number of strategies/protective behaviors used usually or always when they partied in the last school year, and the number of harmful consequences as a result of drinking alcohol in the last school year.

SPSS software version 13 was used for the analysis. Frequency tables were constructed, the Pearson's *r* was calculated, and the independent samples *t*-test was conducted. The Pearson's r (correlation coefficient) was used to determine if there was a correlation between variables that would result in a perception shift and/or behavior change in regard to alcohol consumption. The Pearson's *r* was used to determine if there was a correlation between receiving alcohol information from VCU and alcohol use behavior change. It was also used to examine a possible

correlation between the perception of typical VCU student drinks and self-reported number of drinks the last time the students partied. The independent samples t-test

Results

All of the variables that were considered in the analysis were included because of a potential relationship with perception of peer alcohol use or self-reported alcohol use within the sample.

Demographics

Table 1 displays characteristics of the sample. There was an increase in the number of students who lived on-campus or off-campus without parental supervision between the two years. There was also an increase in the percent of students who received information from VCU about alcohol and other drugs. African American students, who generally drink less than their counterparts, were under-represented in the 2004 sample. Women were over-represented in the 2004 sample. Previous findings indicate that women tend to respond more to surveys and drink less than men. These two demographic misrepresentations could have possibly skewed the 2004 reported alcohol use data.

Table 2 compares the VCU student population and the student samples. VCU is undergoing transition. The university's student population is growing, and is transitioning from being a primarily commuter campus to becoming a more residential campus. This demographic change has the potential to greatly impact alcohol use patterns at VCU. The institutional changes have coincided in time with the intervention, making data analysis more complex. The number of

residence hall beds has increased by 25% since baseline data was collected in 2002 (*see Appendix Table D*).

Perception

Table 3 confirms the correlation between the perception of typical VCU student drinks during the last time they partied, and self-reported alcohol use the last time they partied. Consistent with previous research, there is a positive correlation between the two variables (2002 r=0.428, 2004 r=0.335; p=0.001). These positive correlations indicate that students who tended to perceive high levels of drinking also drank heavily themselves. Further, students in the sample who perceived low levels of drinking were light drinkers. In other words, perceptions of peer drinking behaviors were consistent with self-reported drinking behaviors.

Figure 1 shows perception and consumption mean comparisons between 2002 and 2004. The perception of the mean number of drinks decreased by one drink. The difference in these means was statistically significant as calculated by an independent samples t-test, as calculated by an independent t-test (t=6.49, p<.001). The change in the mean number of self-reported drinks were not statistically significant between 2002 and 2004.

Behavior

Table 4 displays the correlation between receiving information from VCU about alcohol or drugs, and the number of self-reported drinks the last time the students partied. In 2002, there appeared to be a positive correlation between receiving information and number of drinks (R=0.056), however, the statistic was not statistically significant. In 2004, there was a positive correlation between receiving information from the university about alcohol or other drugs and

number of drinks the last time they partied (R=0.068), with a significance level of 0.008. This is a very weak correlation, and receiving information from VCU about alcohol can not be equated to being exposed to the campaign.

Table 5 displays the number of protective behaviors that students in the sample utilized when partying or socializing. It was hypothesized that an increase in protective behaviors would reduce alcohol-related harm. There was no substantial change in the percent of students who use protective behaviors.

Table 6 shows the number of negative consequences that students have experienced that are associated with alcohol. There was no evident trend in the reduction of the percent of students who experienced consequences.

Table 7 describes the number of drinks the last time the students partied by residential status (on-campus, off-campus, with parents). The trend among heavy drinkers (five to nine drinks, or ten or more drinks) was most apparent among students who lived on–campus. This supports the findings from previous studies that on-campus residential status is a factor in determining alcohol use.

Discussion

This study was unlike previous social norms studies because it was conducted at a university that is undergoing change in the residential status of the student population. It considered multiple variables that may or may not have a relationship with the correcting of misperceptions and change of behavior in regard to alcohol use among students at VCU. Students consistently believe that peer drinking behaviors are more extreme than their own, as confirmed in this study. Men perceive more permissive alcohol norms than females do and

women consistently report drinking less than do men. More students perceived that one to four drinks as typical for a VCU student. However, according to this analysis the perception shift has not been transferred to personal use at this point in time. Behavior remained relatively stable. The number of drinks that the surveyed students consumed did not change, nor did protective behaviors.

Strengths of the study

Several comprehensive studies conducted prior to this study have demonstrated the effectiveness of a social norms approach to correcting misperceptions of peer alcohol use and decrease alcohol consumption within the college community. This study confirmed the existence of misperceptions in VCU students and demonstrated that the social norms campaign was associated with a dramatic 18% change in 0-4 drink perceptions. This study confirmed the positive correlation between perception of peer alcohol use and self-reported alcohol use. Despite reducing misperceptions, this study failed to document a decrease in alcohol consumption and harm. The review of the literature suggests that residential campuses have higher consumption rates than commuter students. In light of VCU's 25% increase in residence hall space, one might have predicted that alcohol consumption should have increased at VCU. It is possible that no change was beneficial because of the assumption that self-reported alcohol use should have worsened. This study suggests that when evaluating the impact of campaigns, researchers must consider any demographic shifts in the campus population.

Limitations of the study

There are limitations worthy of note. Because this was a cross-sectional study, we were not able to determine the direction of the associations or causality. The study only provided a snapshot of the student population at two points in time, one in February 2002 and one in February 2004. The students who were surveyed in 2002 were not followed up in 2004, therefore, determinations of perception shift and behavior change are noted in terms of the VCU population as an entity rather than individuals who possess certain characteristics and exhibit particular behaviors. In regard to sampling, attempts were made to obtain a random sample, however, a quasi random sample was obtained due to the requirement of professorial consent prior to administering the survey. Some sample sociodemographic characteristics of the sample were not consistent with those of the VCU population. Thus, it may be difficult to generalize the findings of this study to the entire VCU population, or to any other university student population. Furthermore, the variable that was used to identify whether or not students were exposed to the social norms campaign was stated as "On which of the following health topics have you ever received information from your college or university (alcohol and other drug use prevention)?" It is feasible that students will not consider the social norms campaign media to be information provided by the university on alcohol use prevention. Last, the nature of surveying as a method of data collection has flaws, namely reporting bias and recall bias because it relies on the student to self-report information about health behaviors often over the length of time such as an entire school year.

Future research to be conducted

This study confirmed that misperceptions have been reduced at VCU between 2002 and 2004. It also proved that alcohol-related behaviors have remained stable with little or no change in the use of protective behaviors, consequences experienced, and the reduction of harm. Future research should be conducted in the field of social norms media campaigns as a method of public health behavior change. Within the college and university context, future studies should include more specific questions about the media exposures, and high-risk student groups such as athletes, freshmen, and members of fraternities/sororities should be targeted in an additional social norms campaign that employs attitudinal norms. Environmental and campus culture need to be taken into account when evaluating future campaigns.

Appendix

Table A. Alcohol-related behavior variables.

Q	Questions as appear on NCHA	Variable labels
Q9	Within the last 30 days, on how many days did you use: (alcohol)?	alcohol use in the last 30 days
Q13	The last time you "partied"/socialized, how many alcoholic drinks did you have? State your best estimate.	number of drinks last time partied
Q17	During the last school year, if you "partied"/socialized, how often did you: (alternate non-alcoholic with alcoholic beverages, determine in advance not to exceed a set number of drinks, choose not to drink alcohol, eat before and/or during drinking, have a friend let you know when you've had enough, keep track of how many drinks you were having, pace your drinks to 1 or fewer per hour, avoid drinking games, drink an alcohol look-alike)	number of strategies used usually or always when partied in last school year
Q18	If you drink alcohol, within the last school year, have you experienced any of the following as a consequence of your drinking? (physically injured yourself, physically injured another person, been involved in a fight, did something you later regretted, forgot where you were or what you did, had someone use force or threat of force to have sex with you, had unprotected sex)	number of harmful results as a consequence of drinking in last school year

Table B. Alcohol-related perception variables.

Q	Questions as appear on NCHA	Variable labels
Q15	How many alcoholic drinks do you think the typical student at your school had the last time he/she "partied"/socialized?	perception of typical VCU student number of drinks last time partied
Q10	Within the last 30 days, how often do you think the typical student at your school used: (alcohol)? State your best estimate.	perception of typical VCU student alcohol use in past 30 days

Table C. Demographic variables.

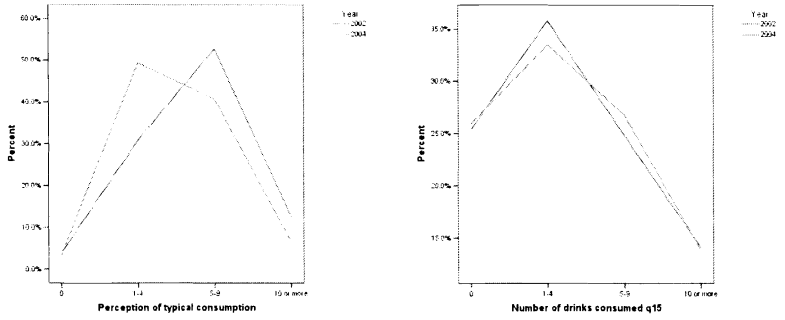
Q	Questions as appear on NCHA	Variable labels
Q46	What is your sex?	gender
Q51	How do you usually describe yourself? (White not Hispanic, Black not Hispanic, Hispanic or Latino, Asian or Pacific Islander, American Indian or Alaskan Native, Other)	race/ethnicity
Q45	How old are you?	age
Q50	Are you a full-time student?	school enrollment status
Q2	On which of the following health topics have you ever received information from your college or university (alcohol)?	have received information from VCU on alcohol and other drug use prevention
Q54	Where do you currently live? (campus residence hall, fraternity or sorority house, other university/college housing, off-campus housing, parent/guardian's home, other)	residential status (on- or off-campus living)
Q55	Are you a member of a social fraternity or sorority (National Interfraternity Conference, National Panhellenic Conference, or National Pan-Hellenic Council)?	Greek affiliation

Table D. Residence Hall Occupancy

Year	2001	2002	2003	2004	2005
Bed spaces	3306	3346	4010	4157	4705
Bed space increase	baseline	40	704	851*	1339

*25% increase in on-campus housing space since baseline data collected
**42.3% increase in on-campus housing space expected by 2005

Figure 1. Alcohol use perception and consumption.



Mean # drinks perception 2002: 5.67 Mean # drinks consumed 2002: 4.31
2004: 4.69 2004: 4.32

Table 1.
Sociodemographic characteristics of the sample:
Virginia Commonwealth University students surveyed with NCHA, 2002 and 2004

Variable	2002 N	2002 %	2004 N	2004 %
Race	**646**	**100.0%**	**1322**	**100.0%**
White	402	62.2%	859	65.0%
Black	169	26.2%	265	20.0%
Hispanic	18	2.8%	57	4.3%
Asian	56	8.7%	130	9.8%
American Indian	10	1.5%	14	1.1%
Other	20	3.1%	59	4.5%
Age	**662**	**100.0%**	**1334**	**100.0%**
18	136	20.5%	280	21.0%
19	190	28.7%	375	28.1%
20	134	20.2%	251	18.8%
21	87	13.1%	187	14.0%
22	61	9.2%	121	9.1%
23	31	4.7%	73	5.5%
24	23	3.5%	47	3.5%
Gender	**662**	**100.0%**	**1330**	**100.0%**
Male	209	31.6%	419	31.5%
Female	453	68.4%	911	68.5%
School enrollment status	**639**	**100.0%**	**1315**	**100.0%**
Full-time	608	95.1%	1265	96.2%
Not full-time	31	4.9%	50	3.8%

Table 1. (cont.)
Sociodemographic characteristics of the sample:
Virginia Commonwealth University students surveyed with NCHA, 2002 and 2004

Variable	2002 N	%	2004 N	%
Received information from VCU	**662**	**100.0%**	**1334**	**100.0%**
No	353	53.3%	677	50.7%
Yes	309	46.7%	657	49.3%
Residential status	**641**	**100.0%**	**1325**	**100.0%**
Campus residence hall	177	27.6%	431	32.5%
Fraternity or sorority house	1	0.2%	4	0.3%
Other university/college housing	10	1.6%	34	2.6%
Off-campus housing	229	35.7%	491	37.1%
Parent/guardian's home	197	30.7%	325	24.5%
Other	27	4.2%	40	3.0%
Greek affiliation	**638**	**100.0%**	**1325**	**100.0%**
No	597	93.6%	1251	94.4%
Yes	41	6.4%	74	5.6%
Alcohol use, last 30 days	**658**	**100.0%**	**1318**	**100.0%**
never used	133	20.2%	267	20.3%
have, but not in last 30 days	131	19.9%	197	14.9%
1-2 days	106	16.1%	240	18.2%
3-5 days	89	13.5%	214	16.2%
6-9 days	82	12.5%	170	12.9%
10-19 days	86	13.1%	161	12.2%
20-29 days	23	3.5%	57	4.3%
all 30 days	8	1.2%	12	0.9%

Table 1. (cont.)
Sociodemographic characteristics of the sample:
Virginia Commonwealth University students surveyed with NCHA, 2002 and 2004

Variable	2002 N	%	2004 N	%
Alcohol use, last 30 days	**658**	**100.0%**	**1318**	**100.0%**
never used, or not in last 30 days	264	40.1%	464	35.2%
one or more days	386	58.7%	842	63.9%
used daily	8	1.2%	12	0.9%
Perception of VCU student alcohol use in last 30 days	**662**	**100.0%**	**1321**	**100.0%**
never	8	1.2%	29	2.2%
1 or more days	382	57.7%	860	65.1%
used daily	272	41.1%	432	32.7%
Drinks last time partied	**662**	**100.0%**	**1334**	**100.0%**
0	168	25.4%	346	25.9%
1-4	237	35.8%	447	33.5%
5-9	164	24.8%	357	26.8%
10 or more	93	14.0%	184	13.8%
Perception of VCU student number of drinks last time partied	**656**	**100.0%**	**1312**	**100.0%**
0	26	4.0%	45	3.4%
1-4	202	30.8%	648	49.4%
5-9	346	52.7%	534	40.7%
10 or more	82	12.5%	85	6.5%

Table 2. Summary of ROUNDED PERCENTS - Demographic Profile for VCU Undergraduate Population and NCHA Sample from undergraduate classrooms Spring 2002 and 2004

	Spring 2002		Spring 2004	
	VCU population	sample	VCU population	sample
(Pop) Sample	(N=15,788)	N=810	(N=17,053)	N=1558
Gender				
Female	58%	66%	58%	67%
Male	40%	33%	40%	32%
Class				
Freshman	19%	27%	19%	31%
Sophomore	21%	25%	22%	24%
Junior	22%	17%	22%	18%
Senior	24%	17%	27%	13%
Post Bacc	2%		1%	
Special	12%	1%	8%	0.4%
Ethnicity				
White	61%	58%	60%	63%
Black	21%	25%	20%	20%
Hispanic	3%	3%	3%	4%
Asian/Pac Isl	8%	8%	9%	9%
Amer Indian	0.5%	1%	0.7%	1%
Missing	2%		4%	
Age				
18-24	72%	84%	78%	87%
25+	23%	10%	19%	9%

Table 3. Correlation of perceived typical student drinks and number of self-reported drinks last time they partied

			How many drinks last time partied	Perception of typical student drinks
2002	How many drinks last time partied	Pearson Correlation	1	.428**
		Sig. (2-tailed)		0.001
		N	662	656
	Perception of typical student drinks	Pearson Correlation	.428**	1
		Sig. (2-tailed)	0.001	
		N	656	656
2004	How many drinks last time partied	Pearson Correlation	1	.335**
		Sig. (2-tailed)		0.001
		N	1334	1312
	Perception of typical student drinks	Pearson Correlation	.335**	1
		Sig. (2-tailed)	0.001	
		N	1312	1312

** Correlation is significant at the .001 level (2 tailed)

Table 4. Correlation of self-reported number of drinks and receiving alcohol information from VCU

Year			Info drugs and alcohol	Number of drinks last time partied
2002	Info drugs and alcohol	Pearson Correlation	1	0.056
		Sig. (2-tailed)		0.111
		N	809	797
	Number of drinks last time partied	Pearson Correlation	0.056	1
		Sig. (2-tailed)	0.111	
		N	797	797
2004	Info drugs and alcohol	Pearson Correlation	1	.068**
		Sig. (2-tailed)		0.008
		N	1558	1530
	Number of drinks last time partied	Pearson Correlation	.068**	1
		Sig. (2-tailed)	0.008	
		N	1530	1530

** Correlation is significant at the .001 level (2 tailed)

Table 5. Number of protective behaviors used when partying/socializing

	2002		2004	
	N	%	N	%
Protective behaviors	**567**	**100.0%**	**1132**	**100.0%**
0 behaviors	26	4.6%	79	7.0%
1 behavior	90	15.9%	176	15.5%
2 behaviors	89	15.7%	194	17.1%
3 behaviors	80	14.1%	168	14.8%
4 behaviors	82	14.5%	140	12.4%
5 behaviors	73	12.9%	134	11.8%
6 behaviors	45	7.9%	86	7.6%
7 behaviors	31	5.5%	78	6.9%
8 behaviors	30	5.3%	46	4.1%
9 behaviors	15	2.6%	21	1.9%
10 behaviors	6	1.1%	10	0.9%

Table 6. Number of consequences as a result of drinking alcohol in the last school year

	2002		2004	
	N	%	N	%
Alcohol-related consequences	**526**	**100.0%**	**1028**	**100.0%**
0 consequences	241	45.8%	416	40.5%
1 consequence	102	19.4%	206	20.0%
2 consequences	74	14.1%	169	16.4%
3 consequences	52	9.9%	101	9.8%
4 consequences	29	5.5%	81	7.9%
5 consequences	21	4.0%	36	3.5%
6 consequences	7	1.3%	14	1.4%
7 consequences	0	0.0%	5	0.5%

Table 7. Self-reported number of drinks and residential status

Residential status		Number of drinks			
		0	**1 to 4**	**5 to 9**	**10 or more**
2002	on campus	36.5%	34.4%	24.0%	21.4%
	off campus	25.8%	38.0%	42.7%	47.6%
	with parents	37.7%	27.6%	33.3%	31.0%
		100.0%	**100.0%**	**100.0%**	**100.0%**
2004	on campus	39.9%	34.5%	35.0%	37.9%
	off campus	24.2%	43.8%	42.6%	42.3%
	with parents	36.0%	21.7%	22.4%	19.8%
		100%	**100%**	**100%**	**100%**

References

Adams, C., & Nagoshi, C. (1999). Changes over one semester in drinking game playing and alcohol use and problems in a college sample. *Substance Abuse*, *20*, 97-106.

Baer, J., Kivlahan D., Blume A., & McKnight, P. (2001). Brief intervention for heavy-drinking college students: 4-year follow-up and natural history. *American Journal of Public Health*, *91*(8), 1310-1316.

Borsari, B. & Carey, K. B. (2001). Peer influences on college drinking: A review of the research. *Journal of Substance Abuse*, *13*, 391-424.

Borsari, B., & Carey, K. B. (2003). Descriptive and injunctive norms in college drinking: a meta-analytic integration. *Journal of Studies on Alcohol*, *64*, 331-341.

Brown, B. , Dolcini, M. , and Leventhal, A. (1997). Transformations in peer relationships at adolescence: implications for health-related behavior. In J. Schulenberg, J.L. Maggs, & K. Hurrelman (Eds.), *Health risks and developmental transitions during adolescence*. New York: Cambridge University Press.

Corcoran, K. (1995). Cognitive and situational factors predict alcoholic beverage selection. *Addictive behaviors*, *20*, 525-532.

Delva, J., Smith M., Howell R., Harrison, D., et al. (2004). A study of the relationship between protective behaviors and drinking consequences among undergraduate college students. *Journal of American College Health*, *53*(1), 19-26.

Haines, M., Barker, G. & Rice, R. (2005). The personal protective behaviors of college student drinkers: Evidence of indigenous protective norms. Journal of American College Health Association.

Johnston, L., O'Malley, P., & Bachman J. (2000). Monitoring the future national survey results on drug use. 1975-1999, 2. Bethesda, MD: National Institute on Drug Abuse.

Klein, H. (1992). College student's attitudes toward the use of alcoholic beverages. *Journal of alcohol and drug education*, *37*, 35-52.

Maggs, J. L. (1997). Alcohol use and binge drinking as goal-directed action during the transition to post-secondary education. In J. Schulenberg, J.L. Maggs, & K. Hurrelman (Eds.), *Health risks and developmental transitions during adolescence*. New York: Cambridge University Press.

Orcutt, J. (1991). The social integration of beers and peers: situational contingencies in drinking and intoxication. In D.J. Pittman & H.R. White (Eds.), *Societyculture, and drinking re-examined.* New Brunswick: Alcohol Research Documentation

Perkins, H. (1985). Religious traditions, parents and peers as social determinants of alcohol and drug use among college students. *Review of religious research*, *27*, 15-31.

Perkins, H. (1997). College student misperceptions of alcohol and other drug norms among peers: explaining causes, consequences and implications for prevention programs. *The Higher Education Center for Alcohol and Other Drug Prevention*, U.S. Department of Education.

Rosenbluth, J., Nathan, P., & Lawson D. (1978). Environmental influences on drinking by college students in a college pub: behavioral observations in the natural environment. *Addictive behaviors*, *3*, 117-121.

Schall, M., Kemeny, A., & Maltzman I. (1992). Factors associated with alcohol use in university students. *Journal of Studies on Alcohol*, *53*, 122-136.

Schroeder, C., & Prentice, D. (1998). Exposing pluralistic ignorance to reduce alcohol use among college students. *Journal of Applied Social Psychology*, *28*, 2150-2180.

Schulenberg, J., Maggs, J., Long S., et al. (2001). The problem of college drinking: insights from a developmental perspective. *Alcohol Clinical and Experimental Research*, *25*, 473-477.

Wechsler, H., Lee J., Kuo M., and Lee, H. (1990). College binge drinking in the 1990s: a continuing problem. *Journal of American College Health*, *48*, 199-210.

Wechsler, H., Davenport A., Dowdall G., Moeykens, B., et al. (1994). Health and behavioral consequences of binge drinking in college, a national survey of students at 140 campuses. *Journal of American Medical Association*, *272*, 1672-1677.