Knowledge Of Factual Aspects Of Arctic National Wildlife Refuge As Pertaining To Political Stance Among College Students.

Paul Levers

Abstract The proposed drilling in the Arctic National Wildlife Refuge (ANWR) is an important environmental issue which provokes strong feelings both for and against. However the reasons behind these opinions are not always clear. My project sets forth to ascertain whether there is a relationship between college students' stance on drilling in ANWR and their knowledge of the facts regarding the oil that will be pumped out, using the U.S. Geological Survey's data as a baseline. By using a survey around campus, I will obtain a sample of the college populations opinion on ANWR drilling and test both the accuracy of their knowledge and their tendency to over or underestimate the benefits or drilling. If my hypothesis is correct, those students who support drilling will significantly overestimate the economic benefits from drilling compared to those who do not support drilling. If this is proven correct, it has implications for campus educational programs regarding this issue, as well as for groups attempting to sway people to their side. For if many people support drilling based on inaccurate information, particularly if they overestimate, correcting their misconceptions could be a powerful tool in order to shift opinions.

Introduction

The Alaskan National Wildlife Refuge(ANWR) is a federally protected area of land covering 19 million acres in Alaska, or roughly the area of South Dakota(Ruskin 2001). Many groups such as the Sierra Club consider the protection of this area vital, as it is one of the few pristine areas of wilderness remaining in the United States (www.sierraclub.com, Woods 2000). However, the presence of oil underneath parts of the refuge has created opposition to conservation efforts.. Major oil concerns have made a concerted effort over the years to allow drilling in ANWR, but have been consistently blocked (Woods 2000). For example, in 1995 the Republican controlled Congress passed the Budget Reconciliation Act, which included provisions for drilling in ANWR. President Clinton however threatened a veto, saying "I will veto any reconciliation bill that opens the Arctic National Wildlife Refuge to oil drilling", and then carried out that threat by vetoing the entire act (U.S. Govt. 1995). With a change in national leadership, interest in drilling in ANWR has been rekindled (Sandalow 2001). President George W. Bush has made a drilling in ANWR one of the centerpieces of his energy plan, citing his belief that the oil contained there is vital for the U.S.(U.S. Govt 2001).

Since drilling in ANWR is receiving attention at the highest levels of government, there have been many polls to help ascertain public opinion. A telephone poll conducted in January of 2003 among 1013 adults showed 61% opposing drilling and 30% supporting it(LA Times 2003). In 2002 one poll of 999 adults showed 61% opposed to drilling with 31% in favor, with another that same year of 812 adults showing 55% opposed and 41% in favor of drilling(SF Chronicle 2002, Chicago Tribune 2002). In 2001 polls by CBS and the New York Times showed 57% and 54% opposed to drilling,

respectively, with 36% and 37% in favor of it, each with over 900 participants (CBS 2001, New York Times 2001). Even a poll by the League of Conservative Voters showed 62% opposed to drilling and 34% opposed(Greenberg 2001). The results from more polls can be seen in Figure 1.

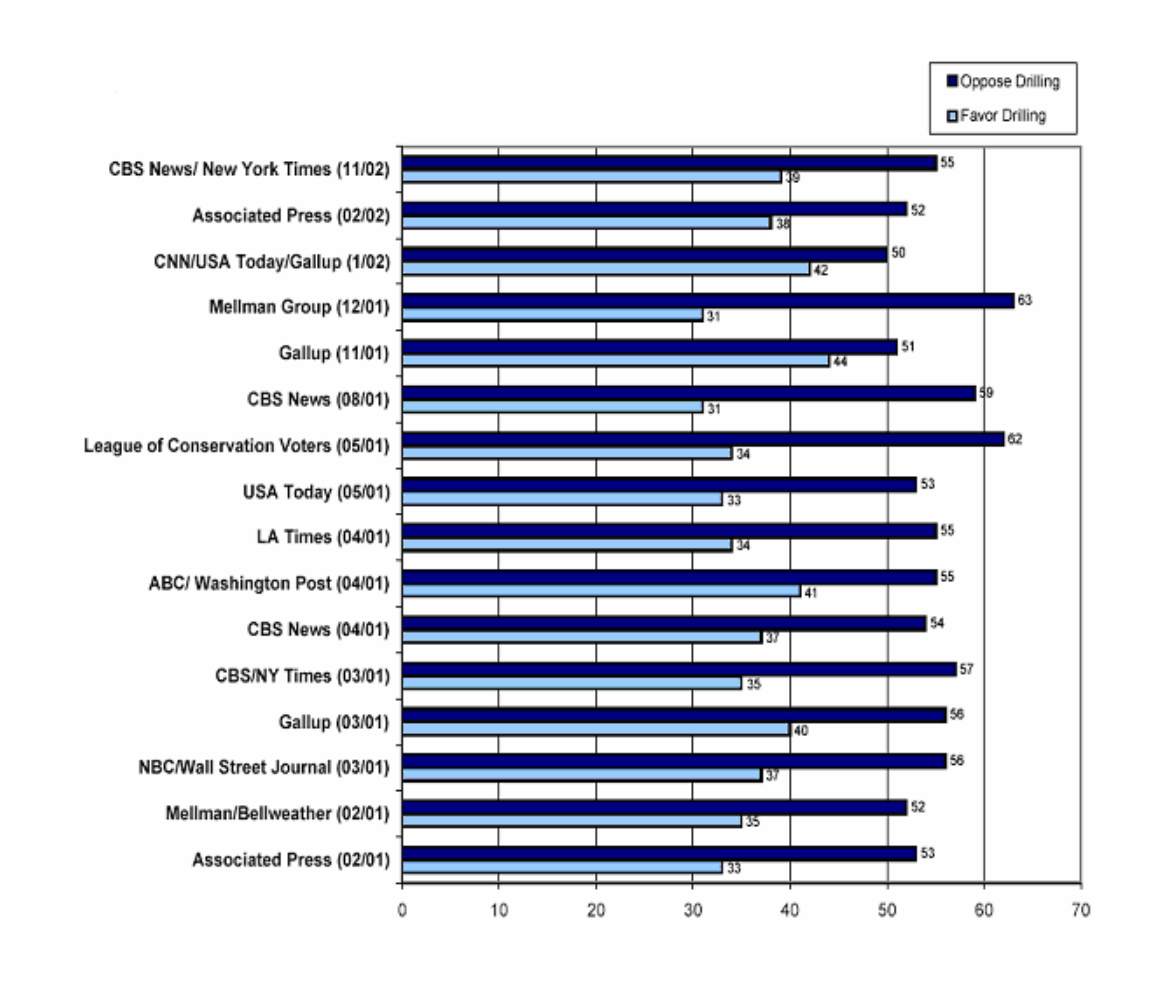

Figure 1 (Results of National Polls on drilling in ANWR, www.defenders.org)

In every case the people opposing drilling have an advantage of at least 7 points, and in only 2 of 17 is the difference under 10 points. These polls are all telephone polls of adults of voting age in the U.S., with at least 750 people per poll (www.defenders.org)

These surveys indicate that the majority of United States adults who respond to polls oppose drilling in ANWR. However these surveys all focused on peoples opinions about drilling, not on what they based that opinion on. Only a very few polls have looked at the information people possess about ANWR, not just their stance on it. One poll of 1001 adults in 2001 asked people how much information they possessed on President Bush's proposal to open ANWR to drilling. 41% responded that they knew "nothing" about it, 13% that they "didn't know much", 28% replied that they knew "something", and only 16% said they knew "a considerable amount", with 2% unsure (LA Times 2001). Another survey of 989 adults asked people how closely they were following the news regarding ANWR drilling, 20% said "very closely", 33% said "somewhat", 25% said "not very" and 21% said "not at all" (Chicago Tribune 2000). So according to these polls over half of the people surveyed said they knew either "nothing" or "not much" about President Bush's latest proposal and 46% don't follow the news "much or at all". These numbers suggest that a significant percentage of people do not consider themselves well informed about ANWR drilling and current information on it. This has been seen in other areas of strong public opinion as well. In a multi-national study on peoples knowledge of whales and their opinion on killing of whales, the average correct score for a set of multiple choice and true or false questions was only 31% more accurate than a statistically random response selection (Freeman 1994). These questions dealt with issues of social and economic relevance, such as what was done with the whale meat, how many were killed annually, and which groups were allowed to hunt them. The study also compared peoples opinions regarding whaling against their answers to the questions. It in found that people who did support limited whaling were significantly more accurate

in their responses than people who totally disagreed with whaling (Freeman 1994). Those who were opposed to all forms of whaling had a much higher percentage of incorrect answers. It concluded that there was a strong association between peoples correct knowledge about whaling and their opinions regarding it (Freeman 1994). A strong association between a persons correct knowledge and their opinion on an issue is therefore not unheard of.

All of these studies focused on a random sampling of the adult population, none of them focused on college students as a target sampling population. This is probably due to the low voter turnout of college age citizens. In the 1996 presidential election, only 31% of the eligible voters, in the 18-20 years old age bracket, voted as compared to 49.8% of the eligible voters in the total population voting(FEC 1996). This pattern repeated itself in 2000, with 51.3% of the total eligible population voting and only 31.4% of the 18-20 year old group voting(FEC 2000). However despite low voting turnout college students will eventually make up the segments of society most likely to vote (McClintock 1962). As such, ascertaining their opinions and knowledge about important issues such as ANWR does have significant value. Especially as some studies have shown that time spent in college does not drastically alter students political views in most cases, statistically it has at most a minimal influence on political stance, shifting them slightly towards more liberal views, but not otherwise affecting political views (Jacobsen 2001, Goldstein 1989). Another study showed that college students on average were not more aware or knowledgeable about political issues than the average adult not currently attending college (Harvey 1976). As college students are not better informed than other adults, this supports the findings that their current political stance is not likely to be

significantly altered by their time in school. This helps support the value of surveying targeted at college students, as their views do not significantly change after graduation, and they will eventually be among those citizens most likely to vote.

My primary hypothesis is that there will be an association between UC Berkeley students stance on ANWR drilling and the number of correct answers they choose on the survey. My secondary hypothesis is that there will be an association between UC Berkeley students stance on ANWR drilling and their under or overestimation of the benefits of oil drilling, on questions which they get incorrect. Answers to these questions could help shape educational efforts regarding drilling in ANWR. For example Calpirg, a campus environmental organization, s currently engaged in a Clean Energy Campaign in which educating people about clean energy sources was deemed an effective tactic(www.calpirg.com). Their stance is that much of the opposition to clean energy efforts is based on misinformation. If this study shows that people supporting ANWR drilling are more likely to get false answers, such educational efforts could prove to be an effective tool in swaying opinions on campus. This would also work for group supporting drilling if there is an association such that students supporting drilling are more likely to get correct answers than those who oppose drilling. An association between students' stance on ANWR drilling and over or underestimation would have a similar impact, as educational efforts could be shifted towards correcting specific misconceptions in order to gain support.

Methods

The target population for this study was the UC Berkeley student body, the population consists of 32,128 students, of which 23,269 are undergraduates (UCB 2003). The sample size was 124 individuals. Sampling consisted of cluster sampling at Sproul Plaza, using self administered questionnaires. Sproul Plaza was chosen as it is by far the most heavily traveled gateway to campus. To help induce participation, candy was offered as a reward for survey completion. I also had a sign, reading "Take a quick survey and get some candy". The sign displayed no information about the type of survey, in order to help prevent sampling bias. This survey depended on people showing interest in taking the survey initially, without being approached. This was in to avoid selection bias on the part of the surveyor, in the selection of who is offered the survey. Surveying was conducted from 12P.M. to 4P.M on 4/15/03, 4/17/03, 4/18/03, as well as from 12P.M. to 2P.M. on 4/21 and 4/22.

The survey consists of a single sheet of paper, starting with a paragraph on informed consent. They are first informed of the projects goals and potential value of the information obtained, and are then invited to participate. The first 3 questions consist of background information, specifically asking the participants, major, age, and year in school. The first two rely on the participant to fill in the answer, while the has five options: freshman, sophomore, junior, senior and graduate student. Major will be a nominal variable, age is a ratio variable and year in school is considered an ordinal variable(Bernard 1999) Following that was the question regarding the participants stance on ANWR drilling, which is answerable in a range of 1-5. These options are ranked

from ”strongly supporting” at 1 to “strongly opposed ” at 5, with 3 being neutral. The last four questions are designed to give a knowledge score and a deviation score for the participant regarding some factual aspects of ANWR drilling. Each of these questions has 4 choices, each covering a range, and no option to put down “I don’t know”. The questions ask for estimations if they are not sure, and as such there is no need for putting in they don’t know. In each case the correct answer is one of the middle two options. Making use of parallel structure, for two of the questions there are two answers which are considered overestimations and one which is an underestimation. For the other two questions there is only one option each which is an overestimation and one which is an underestimation. This is to keep the pattern of correct answers from becoming obvious to a discerning participant which might occur if five options were offered with the correct answer being in the exact middle every time. The correct answer score will be assigned as 1 point for each correct answer and 0 pts for each wrong answer, giving a range of 0-4 for the knowledge score. The deviation score was be assigned by giving 1 pt for each overestimation, -1 pt for each underestimation, and 0 points for a correct answer. This gives a range of -4 to 4 for the deviation score.

In order to test the association between student’s stance on ANWR drilling and the knowledge score, simple regression and the ANOVA test were used to analyze the variables. ANWR support was classified as the dependent variable with correct answer score as the independent.. These same tests were used on the association between ANWR drilling support and the deviation score. ANWR was once again classified as the dependent variable, with the deviation score as the independent variable.

Results

There was no association between ANWR drilling support and the correct answer score. ($R^2 = 2.25*10^{-4}$, F = .03 , P = .87) The average number of correct answer scores as relating to students stance on ANWR drilling can be seen in Figure 2, along with the simple regression trend line.

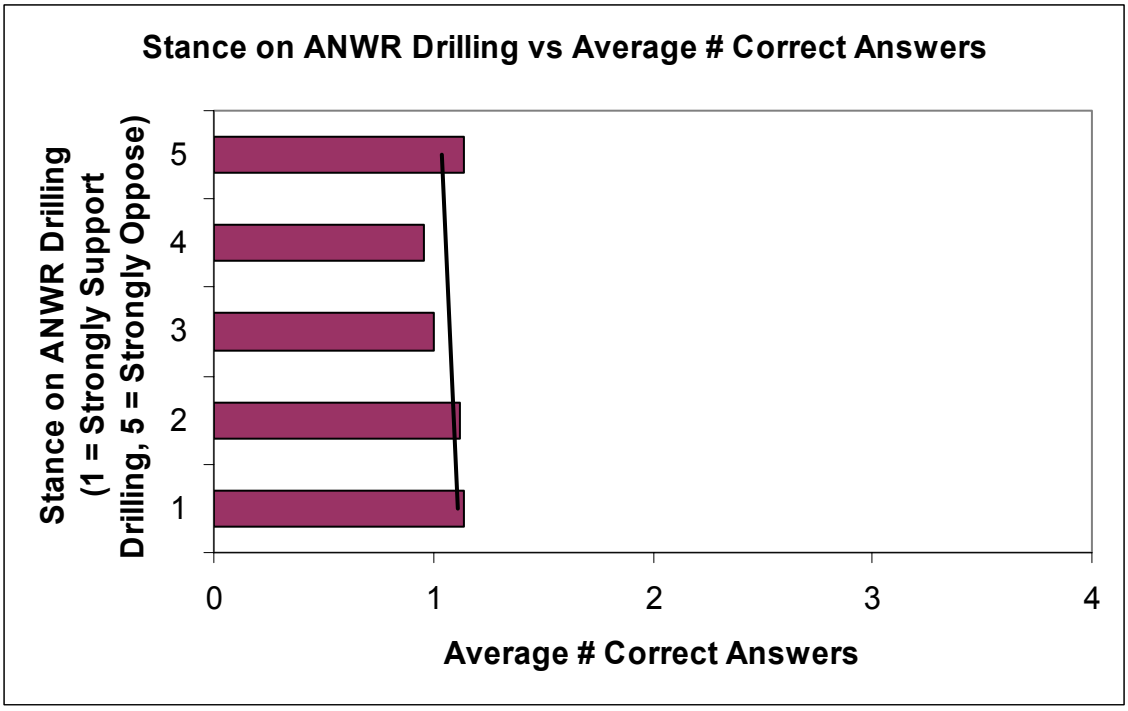

Figure 2

There was an association between ANWR drilling support and the deviation score however. ($R^2 = .07$, F = 9.02 , P = .003) Figure 3 shows comparison between these two variables as well as the trend line.

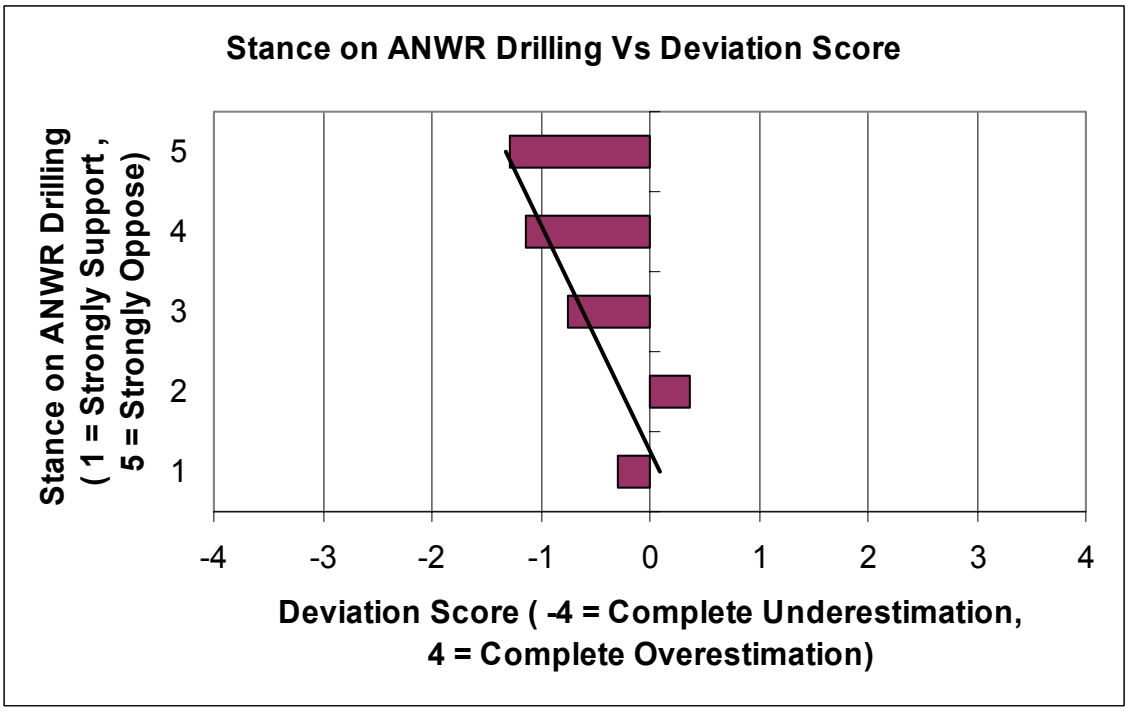

Figure 3

The sample composition was composed of 98% undergraduates, despite graduate students being 30% of the Berkeley student population. With the exception of this, other segments of the student population were well represented, as can be seen in Figure 4. Figure 5 shows the actual makeup of the UC Berkeley student population in comparison.

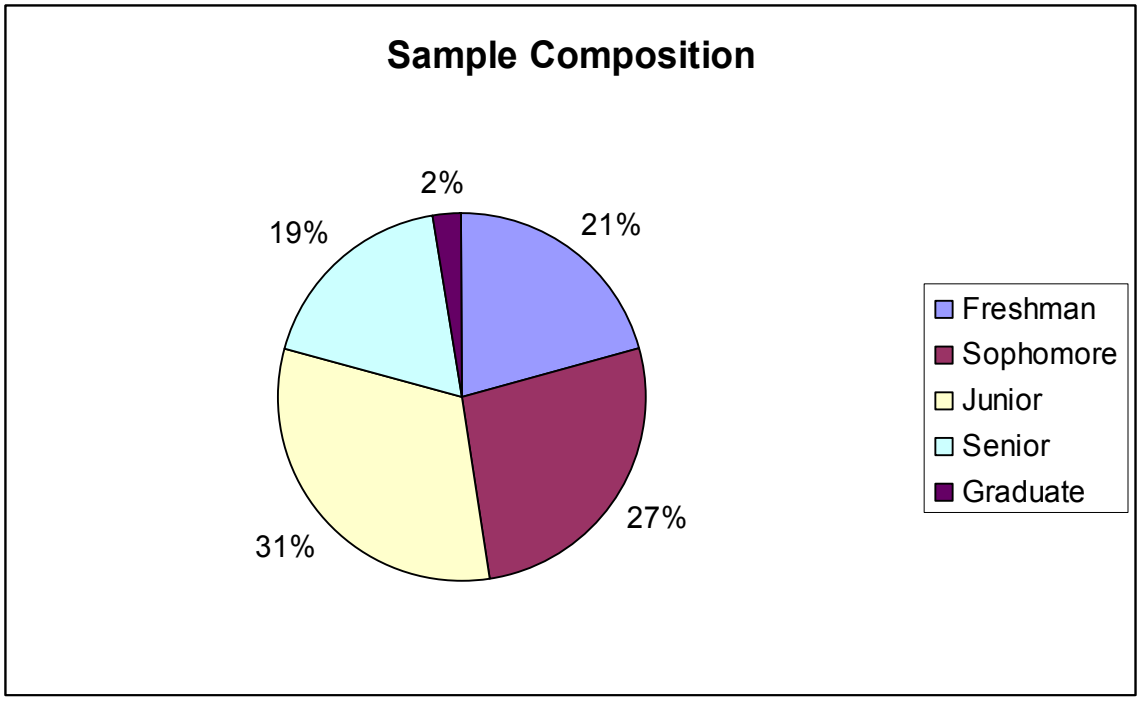

Figure 4

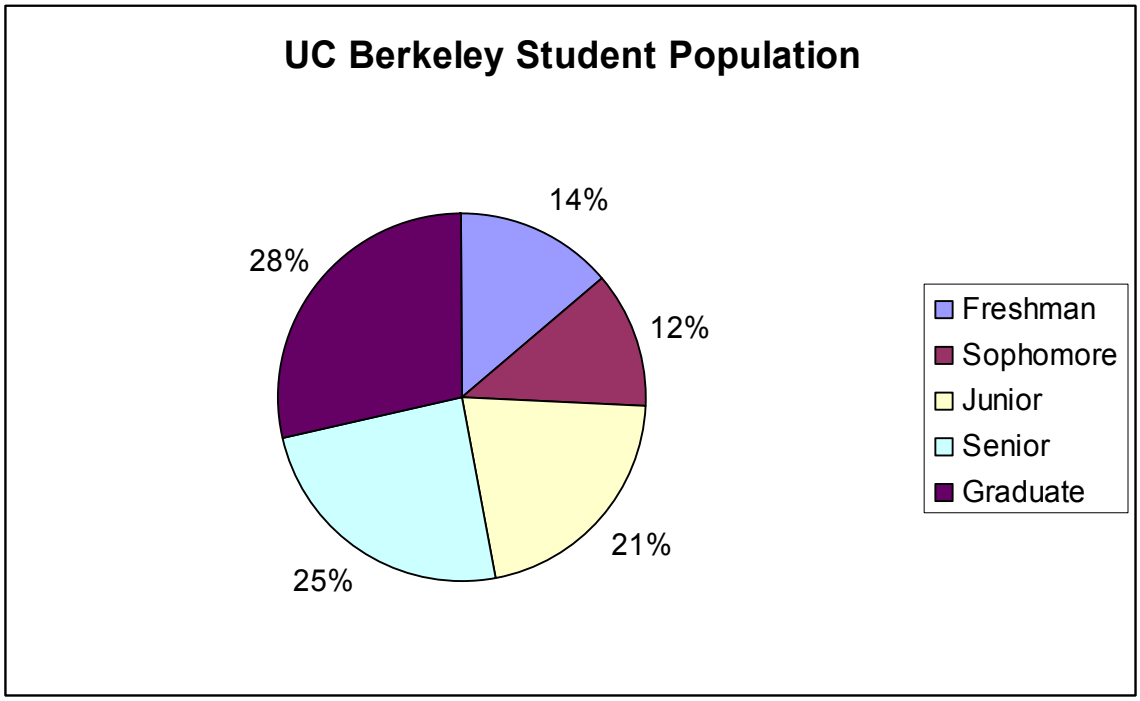

Figure 5

Discussion

The data did not support my hypothesis that is an association between the number of correct answers on the survey and the participants stance on ANWR drilling. There was a very low R^2 of $2.25 * 10^{-4}$, indicating that only .025% of the data would be fall on the linear regression line. And the P value was extremely high at .87. This means that there is virtually no chance of there being an association between correct answers and ANWR drilling support, and as such the hypothesis is not supported at all. I see three primary reasons for this data.

The first is simply that there is no association between the amount of knowledge people have regarding ANWR and their support for drilling there. This would indicate that opinions regarding ANWR are probably related to other factors, such as the priority someone places on the environment compared to economic gains. If this is true it is also probable that ANWR opinions are distributed with no relation to education level in the general public, since people with higher degrees of education are probably more likely to possess accurate knowledge about a wide range of topics including ANWR. However this is merely a potential explanation, as the target population of UC Berkeley students does not provide enough information to make such a wide ranging conclusion.

The second reason would be that lack of association is due to the makeup of the sample population. Compared to a nationwide random sample, UC Berkeley students have very similar educational backgrounds. They are all high school graduates, the vast majority at the top of their class. They have virtually all scored among the best in the nation on many standardized tests such as the SAT test. As such it is not unreasonable to assume that regardless of ANWR drilling support, they would all possess similar levels of

information due to their fairly homogenous educational background. This problem could be alleviated by conducting this survey using a completely random national sample. This would result in a sample population with a far greater educational range.

The third possibility is that the survey itself is responsible for the lack of an association. By simply randomly selecting answers the average number of correct answers would be 1. Since the average number of correct answers overall was just 1.05, it is reasonable to assume the survey may have been too difficult for an accurate calculation of the subjects knowledge. This extreme difficulty is a combination difficult subject material and close spacing of answers. The answers to choices were all within a relatively small range. There were no answers that were obviously false to someone with a modicum of knowledge about ANWR. So the survey may not have accurately differentiated between people with some knowledge about ANWR drilling and people that know virtually nothing. If this survey were to be redone, I would further differentiate between choices, so that the correct answers are much clearer to someone possessing considerable knowledge about ANWR.

The data did however support my hypothesis that there was an association between participants tendency to over or underestimate, their deviation score, and their stance on ANWR drilling. The R value was fairly high at .069, meaning 6.9% of the data corresponds correctly to the linear regression line. And the P value was only .003, which indicates that the data pattern has only a .3% chance of occurring randomly. This indicates that there is a very strong association between ANWR drilling support and misconceptions about some economic impacts of ANWR drilling, at least among UC Berkeley students. However this merely shows that there is a strong association, it does

not address causation. While it is possible, and in my mind probable, that this trend in estimation is part of the reason for people's opinions on ANWR drilling, it is not directly addressed by this study. It is also possible that people with previously established opinions on ANWR drilling over or underestimated to suit their opinions. I do not believe this is as likely, but it is certainly possible. Also, there was an interesting spike in the deviation score for people selecting 2 as their ANWR drilling support option, halfway between "strongly supporting drilling" and neutral. While the neutral option of 3 had an average deviation score of -.75, and the strongly supporting option of 5 had a deviation score of -.286, the deviation score for 2 was +.375. People choosing 2 were on average the most likely to overestimate of any group. This was probably a statistical anomaly, due to the low number of people choosing the option of 2 for ANWR drilling support, only 8. So only a couple people whose responses had a very high deviation score could easily skew the results. Also, this spike was still largely in line with the regression trend line calculated for the graph.

One of the biggest weaknesses of this survey was the sample size. At only 124, a larger number would have been preferable in order minimize such potential statistical anomalies such as the previously discussed spike in deviation score for the ANWR drilling support option of 2. A larger sample would provide a larger selection in both the 1 and 2 categories, which had only 7 and 8 respondents respectively. This left the 1 and 2 categories very open for skewing due to their minimal size. Another problem with this project was the survey design. Were I to redo it, I would design some of the questions to easily answered by people with a minimum amount of knowledge regarding ANWR, in order to better differentiate between people who know nothing and those who are fairly

well informed. This problem may be one reason why there was no association between the number of correct answers and ANWR drilling support. There is also the problem of sample randomization. Only 3 out of 124 respondents were graduate students, despite graduate students making up 28% of the target population. After doing this survey, I discovered that most graduate students don't take classes after the first couple years, and rarely walk through Sproul Plaza. This largely explains their minimal survey presence. In a future survey, this problem could be addressed by stratifying the population for graduate students, surveying in areas where graduate students are heavily represented. Or the target population could be adjusted to include only undergraduate students.

The information obtained in this project has interesting implications. The data did not show any association between the number of correct answers and ANWR drilling support among UC Berkeley students. This does not support the effectiveness of educational efforts as a means to sway opinion regarding ANWR, at least among UC Berkeley students. If both student supporters and opponents of drilling are equally informed then simply educating them is unlikely to change their minds. It would suggest that propaganda attempts focusing on the value of the environment or the importance of oil would be more likely to succeed. However, My secondary hypothesis was strongly supported by the data however. There was a strong association between the deviation score and stance on ANWR drilling. The data showed that people supporting drilling were considerably less likely to underestimate the benefits of drilling in the questions than those who opposed drilling, while the opposite was true for those opposing drilling. This in turn suggests that there are a great deal of misconceptions on the both sides of the

issue. So targeted educational efforts to correct misconceptions would probably have value.

The major complication however is that the data does not support a general education effort in pursuit of changing opinions on either side of the issue, since there was no association between the number of correct answers and ANWR stance. However, this does have strong implications towards general education with no political goal in mind. Since the data does not show overall knowledge as shifting someone's opinion, a general education effort would not be likely to cause a major shift in opinion. But it would very likely correct many of the misconceptions shared by both sides, to bring their over and underestimations in line with each other. And with both sides better informed about the issue, there is a great deal of potential for reducing the conflict between the two sides. In fact there is a strong possibility of people on both sides of the issue changing their opinions once these misconceptions are removed, or at least moderating their opinions. This could quite probably result in a reduction of some of the extreme elements on both sides of the issue, with a greater shift toward moderate positions. However, all of this relies on the belief that these misconceptions are in some part a cause of stance on ANWR, instead of being caused by their stance. While causation can not be established to a certainty, it is reasonable to assume that the misconceptions held by students regarding ANWR plays some role in the stance ANWR drilling.

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