

Evaluating Sustainability on the Cal Poly Campus: Attitudes, Behaviors, Knowledge, Social
Norms, and Social Desirability

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Abstract

Previous research has shown that attitudes and behavior towards sustainability are not correlated. Social factors including norms and desirability have been found to explain these results. One hundred and six students from California Polytechnic State University participated in this study. The survey used was composed of several sections: attitudes, behaviors, knowledge, social norms, social desirability, and a demographic section. Attitudes and behaviors were found to be correlated in this study. Knowledge and behavior towards sustainability was not found to be correlated as expected. Participants' attitudes were correlated with friends' and families' but not professors' and peers' attitudes. Participants' behaviors were correlated only with friends' attitudes. This study is particularly relevant for colleges who are moving towards a sustainable future and wish to measure the effectiveness of the movement.

Keywords: sustainability, college campuses, attitudes, behavior, social norms

In 1987, the United Nations defined sustainability as “[meeting] the needs of the present without compromising the ability of future generations to meet their own needs” (United Nation General Assembly, 1987). Twenty-five years later, most businesses, individuals, and college campuses still use this definition. In particular, sustainability on college campuses is receiving much attention from researchers in all fields. Psychology researchers are measuring students’ behaviors and attitudes toward, as well as knowledge about sustainability, and seeing how they relate. This paper and research study looks at how these three psychology factors relate and how social norms and desirability explain the relationships.

A common misconception most people hold is that if an individual has strong attitudes and behaviors towards a cause, they must be knowledgeable about that cause. Most studies that have examined this concept have found that providing information and knowledge does not necessarily increase attitudes or behaviors, but rather can help shape or improve existing behaviors and reinforce attitudes (Barr, 2003; Gardner & Stern, 1996). It has also been found that when implementing programs, providing knowledge is best used in accordance with other intervention strategies. For instance, in one study, it was found that recycling behaviors were increased when convenience was decreased and effort required minimized; providing instructions on what to recycle was only helpful if the individual already recycled (Barr, 2003). Increasing information about the desired behavior did not directly increase the behavior.

The level of knowledge that college students have about sustainability generally varies based on how sustainable the campus is. A study done by Emanuel and Adams found that students from Alabama campuses with a low sustainability rating knew less about sustainability than did students from Hawaii campuses with a high sustainability rating (2010). Numerous factors could have contributed to this difference such as different social norms on campus, norms

in the community, and level of knowledge taught about sustainability on the campuses. At a study done on a college campus in Missouri, researchers found that there was minimal knowledge on students' carbon footprint and lack of awareness of environmental problems (Schuetz, et. al., 2011). Not only did these students not know about sustainability and its importance, they didn't care about the issue either.

The vast majority of research on attitudes towards pro environmental behavior has found that there is a substantial gap between an individual's attitudes and their behavior (Gifford, 2011; Kollmuss & Agyeman, 2002; Gardner & Stern, 1996). We generally see these gaps when an individual has highly positive attitudes but their frequency of behavior is low. There have been several theories as to why this is the case. Early models from the 1970's assumed that increasing knowledge would lead to an increase in one's positive attitudes towards sustainability and this would then lead to an increase in the individual's pro environmental behavior. Although these were proved incorrect, it is mentioned here because most pro-environmental advertisements and programs still use this model in order to increase behavior (Kollmuss & Agyeman, 2002). More recent models have incorporated psychological factors such as social comparison, a person's ranking of their values, and perceived risks of behavior change. Robert Gifford's (2011) model categorizes 29 obstacles into seven psychological barrier categories: limited cognition, ideologies, comparisons with others, sunk costs, discredence, perceived risks, and limited behavior. These ideas have not yet been looked at as a group, but individual obstacles have been researched. Another model includes individual barriers as well as unchangeable individual barriers and errors in collecting data on attitudes and behaviors (Rajecki, 1990). The four components to the model include an individual's direct versus indirect experience with environmental problems, normative influence on the individual by others, attitude change over

time, and scientific methods of measuring attitudes and behaviors. On college campuses it is reasonable to assume that social influences, and in particular social norms, have a large impact on an individual's attitudes and behaviors towards sustainability.

A social norm is a standard for a group that describes the group and also tells the group how to behave (Miller & Prentice, 1996). There are two main types of social norms; injunctive and descriptive. Injunctive norms guide an individual's behavior based on whether or not their actions would be perceived positively or negatively by others. Descriptive social norms guide one's behavior based off of what most people do (Cialdini, 1991). Injunctive norms can be manipulated in order to make a group of people increase their positive behavior, such as recycling and adopting more sustainable behaviors. The more salient a norm is, the more it calls for the individual to make social comparisons between themselves and actual or perceived norms. For example, in a study conducted by Cialdini, Kallgren, and Reno (1991), littering was made either more or less salient and then participant responses were recorded. When participants walked into a littered area and saw a confederate littering, they littered significantly more than if there was no litter and no confederate present. Although social norms cannot directly and immediately change or influence an individual's attitudes on sustainability, they can be used to influence and explain the individual's behavior. In particular, an individual's friends and family's behavior will heavily influence the person's own behavior (Nickerson, 2002). On college campuses where injunctive and descriptive social norms are readily noticeable, we expect social norms to be a significant link between a student's attitudes and their behaviors. We also expect behaviors to be similar to those of their friends and family's perceived behavior and attitudes.

This study examines several hypotheses about sustainability. Hypothesis one: we do not expect attitude scores and behavior scores to be correlated. Hypothesis two: we will see no correlation between behavior and knowledge of sustainability. Hypothesis three: we expect to see positive correlations between attitude scores and perceptions of attitudes in a person's social circle. We expect the same thing to occur for behavior, although the correlations may not be as high as in the attitude section. For example, if an individual reports their sustainable behavior as low, we would expect them to perceive their friend's and family's behavior as low. We expect less of a correlation, or no correlation at all, with the individual's peers and professors. Thus the purpose of this study is to (1) determine students' attitudes, behaviors, and knowledge of sustainability on the California Polytechnic State University campus and correlations between them and (2) see if social norms and desirability play a role in explaining any differences found and to what degree.

Method

Participants

College aged students from California Polytechnic State University (106 total; 51 male, 55 female, $M_{\text{age}} = 20.14$ years, age range: 18-38 years) were either offered extra credit for their intro psychology class or were asked to take the survey in an environmental psychology class. Participants were asked to meet in a designated classroom where the study was carried out. All participants read an informed consent paper and were treated ethically through the guidelines set down by Institutional Review Board on the college campus.

Materials

The survey used in this experiment is composed of several different parts (See Appendix). The first part evaluates attitudes on sustainability by asking how the participant

perceives sustainable movements will affect different aspects of their lives. The following section evaluates behaviors in regards to sustainability. Participants mark how often they engage in specific sustainable behaviors such as recycling on campus or using a reusable bottle. The next section determines the participant's knowledge of sustainability by asking multiple choice questions. The knowledge section is composed of questions that students should know such as what can and cannot be recycled and what types of energy are renewable. One of the last sections measures social norms and the individual's perception of how groups in their social circle match their own attitudes and behaviors in regards to sustainability. The survey concludes with a short social desirability survey and a demographic section. In the social desirability section, we are concerned about scores above five out of ten since this may show that the participant was trying to appear more desirable by distorting their answers. This section was provided by D. L. Paulhus (1988).

Procedure

The study was held for six consecutive weeks in the same classroom from 12:10 until 1:00pm on Wednesdays starting April 18th. The number of participants ranged from one to twenty-two. Since the participants had their intro to psychology class until 12:30 on Wednesdays and the study only took about 15 minutes, participants came in at different times throughout the hour. Although we did not have an established script to use, essentially the same thing was said to each group. Participants were told this survey was part of a senior project, and instructions were given to read the consent form, and then fill out and return the survey. For the environmental psychology group, the survey was given out by Dr. Dan Levi to his students during one of his lectures. Forty-four students in the class participated in the study.

Results

Data were analyzed using SPSS and JMP statistical software packages. Participants came from all colleges on campus (25% from the college of liberal arts was the most represented and 11% from the college of business was the least represented). Most of the participants live off campus (55%), and about half of the students were second or first years while the other half were of at least third year standing.

Correlations between variables were assessed using a Pearson's correlation with a significance level of 0.05. Since question three on the attitude section (part 1; see Appendix) asks the participant's overall attitude towards sustainability, we needed to see if this question was correlated with the previous questions in the attitude section. After looking at SPSS correlations, we can see that this question is significantly correlated with the other questions in the section. In order to see if attitudes and behaviors are correlated, we can use this third question and the total behavior score from the behavior section. Behavior and attitudes are significantly correlated with a correlation coefficient of 0.45. We also looked at these correlations while controlling for social desirability effects, and it had little effect on the overall correlation (adjusted coefficient is 0.42). This was checked in order to see if social desirability plays a role in the correlation between these two variables.

Next, we looked at the total knowledge scores compared to the total behavior scores to see if the data supports our second hypothesis. The total knowledge scores (range 2-7; mean 4.17) and total behavior scores (range 22-44; mean 32.88) are not significantly correlated with a correlation coefficient of 0.026.

Lastly, we looked at associations between attitude and behavior scores and their corresponding sections for the social norm data. The participants' attitudes are significantly

correlated with the participants' perceptions of their friends and families' attitudes (0.361 and 0.389 respectively). However, they are not correlated with their perceptions of peer and professors attitudes (0.185 and 0.034 respectively). Comparing behaviors with participants' perceptions of behaviors of the members in their social circle, we find that only friends' behaviors are correlated (0.361).

Discussion

The results found in the study allow us to make several conclusions. For the first hypothesis, we expected to find no correlation between behaviors and attitudes. However, when the data was analyzed, we did find a statistically significant correlation. The most probable reason for this is the method used to measure sustainable behaviors and attitudes. Self reported positive behavior is generally higher than actual observable behavior (Manfredo & Shelby, 1988). If we had observed behavior rather than ask participants to report behavior, we may have seen different results. We also looked at these results while taking the social desirability results into account. Since the correlation between attitudes and behaviors did not significantly change with this factor included, we can conclude that social desirability was not the reason for the correlation.

Our second hypothesis (knowledge and behavior scores will not be correlated) was supported. We expected these results, since knowledge about sustainability is not always needed to carry about sustainable behaviors (Barr, 2003; Gardner & Stern, 1996). For instance, question 1 on the behavior section asks how often do you "recycle newspaper, glass, or plastic bottles on campus?" Questions 1 and 6 on the knowledge section ask if the following items can or cannot be recycled. When we look at the correlations between the knowledge questions and the

behavior question, we see that neither knowledge question is correlated with behavior (0.2 for question 1 and 0.05 for question 6).

For our final hypothesis, we compared measures of self reported attitudes and behaviors to participants' perceptions of attitudes and behaviors of the members in their social circle. Comparing behaviors to perceived social norm behaviors, we found that our hypothesis was only half supported. Although there was no significant correlation between behaviors and professors' and peers' perceived behavior like we expected there was also no significant correlation with families' behavior. There was, however, a significant correlation with friends' behaviors. We would expect to see this since an individual's friends play a larger role in social influence than peers or professors do. While analyzing attitudes compared with the perceived attitudes of the participants' social circle's attitudes, we found that our hypothesis was completely supported. The individual's attitudes significantly correlated with friends' and families' attitudes but not with peers' or professors' attitudes. While analyzing the data, we also found one other correlation that we did not expect to find. We found that the participants' attitudes were significantly correlated with the perceived behaviors of their friends (0.301). Intuitively this makes sense. If we see our friends exhibiting positive sustainable behavior, we are more likely to think of sustainability in a positive manner. Although we cannot say this association is causal, the next step would be to follow up with an experiment testing these relationships.

If this study was carried out again, it would be best to acquire behavior information through observation and social norm information through an experiment. For the knowledge section, we would tailor the questions more towards what college students should know before they graduate; questions such as those found in a typical sustainability focused class. Since this study was focused specifically on the Cal Poly campus, the results from this study are of

particular use to the faculty, students, and members of the sustainability committee at this university.

Cal Poly at San Luis Obispo currently does not have a sustainability requirement for its students. Although some professors teach classes with sustainable topics incorporated into them, it is possible for a Cal Poly student to graduate without ever having taken a sustainability focused class. Since Cal Poly is in the midst of debating whether or not to add the requirement, this survey could be used to collect data before and after to see if it was effective in teaching students about sustainability, and if it changed students' behaviors and attitudes towards sustainability. Many universities around the United States have started to make the move towards incorporating sustainability on its' campuses. It is important to know if these shifts are affecting students in a desired way. Although social norms and desirability were used in this study to clarify differences found in attitudes, behavior, and knowledge, many other potential factors can be looked at to explain found correlations and differences.

References

- Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: a theoretical refinement and reevaluation of the role of norms in human behavior. *Advances in Experimental Social Psychology*, 24, 201-234.
- Emanuel, R. & Adams, J.N. (2010). College students' perceptions of campus sustainability. *International Journal of Sustainability in Higher Education*, 12(1), 79-92. doi: 10.1108/14676371111098320
- Gardner, G. T. & Stern, P. C. (1996). *Environmental problems and human behavior*. Boston: Allyn & Bacon.
- Gifford, R. (2011). The dragons of inaction: Psychological barriers that limit climate change mitigation and adaptation, *American Psychologist*, 66(4), 290-302. doi: 10.1037/a0023566
- Kollmuss, A. & Agyeman, J. (2002): Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8(3), 239-260. doi: 10.1080/13504620220145401
- Levi, D. (2012). *University sustainability survey*. Unpublished manuscript, Department of Psychology, California Polytechnic State University, San Luis Obispo, United States.
- Manfredo, M. J., & Shelby, B. (1988). The effect of using self-report measures in tests of attitude-behavior relationships. *Journal of Social Psychology*, 128(6), 731-743.
- Miller, D. T. & Prentice, D. A. (1996). The construction of social norms and standards. In Higgins E. T. & Kruglanski A. W. (Eds.), *Social psychology: Handbook of basic principles* (799-829). New York: The Guilford Press.
- Nickerson, R.S. (2002). *Psychology and environmental change*. Mahwah, New Jersey: Lawrence

Erlbaum associates, Inc.

Paulhus, D. L. (1988). Assessing self deception and impression management in self-reports: the

Balanced Inventory of Desirable Responding.

Rajecki, D. W. (1990). *Attitudes* (2nd ed.). Boston: Sinauer Associates, Inc.

Schuetz, S. et. al. (2011). What? The earth is sick? Undergraduate students awareness of

environmental problems: a qualitative study. *Ecopsychology*, 3(4), 269-276.

doi: 10.1089/eco.2011.0033

United Nations General Assembly (1987) *Report of the world commission on environment and*

development: our common future. Transmitted to the General Assembly as an Annex to

document A/42/427 - Development and International Co-operation: Environment.

Retrieved on: 2009-02-15.

Appendix

Part 1

In the coming decades, our society will likely shift toward a greater emphasis on sustainability. How will this move toward sustainability affect your life and our society? Please circle the numbers below which best express your views

1. What impact do you expect sustainable practices to have on these aspects of your life?	Very Negative	Negative	Neutral	Positive	Very Positive
a) Your life satisfaction	1	2	3	4	5
b) Your career	1	2	3	4	5
c) Your health and well-being	1	2	3	4	5
d) Your friendships and social relations	1	2	3	4	5

2. What impact do you expect sustainable practices to have on our society and world? Specifically:	Very Negative	Negative	Neutral	Positive	Very Positive
a) The next generation	1	2	3	4	5
b) The quality of local communities	1	2	3	4	5
c) U.S. economy	1	2	3	4	5
d) Natural environments	1	2	3	4	5

3. Overall, what is your view of the shift toward sustainability?	Very Negative	Negative	Neutral	Positive	Very Positive
	1	2	3	4	5



Part 2

Using the scale below, write down a number next to each question to rate how much you engage in the following activities.

—1— ————— 2— ————— 3— ————— 4— ————— 5—
Never Rarely Sometimes Usually Always

___ 1. Recycle newspaper, glass, or plastic bottles on campus:

___ 2. Buy organic or locally grown vegetables at places such as Farmer's market, local grocery stores, or the Cal Poly campus

___ 3. Take classes that have a focus in sustainability

___ 4. Conserve water by taking shorter showers

___ 5. Consume beverages in a reusable bottle or cup

___ 6. Participate in activities on campus that promote sustainability (e.g. housing energy competitions)

___ 7. Use the stairs rather than the elevator at locations such as the library

___ 8. Use reusable bags when shopping

___ 9. Wash laundry only when you have a full load

___ 10. Use both sides of the paper when printing out notes, or bring a laptop to class

Part 3

Answer the following questions to the best of your ability. Please circle the correct answer and/or write the letter of the correct answer in the blank to the left of the question.

_____ 1. Which of the following CANNOT be recycled:

- A) Milk Cartons
- B) Aluminum foil
- C) Pizza Boxes
- D) Newspaper

_____ 2. How many gallons of water does the average Poly Canyon Village resident use per day?

- A) 7
- B) 10
- C) 35
- D) 40

_____ 3. Recycling six (6) aluminum cans can save enough energy to drive a car ____ miles:

- A) 0.5
- B) 2
- C) 5
- D) 20

_____ 4. Americans use _____ plastic bottles every hour; _____ are recycled.

- A) 850,000; 1/6
- B) 400 million; 1/4
- C) 700 million; 1/10
- D) 2.3 billion; 1/2

_____ 5. Which of the following is NOT a type of renewable energy:

- A) Fossil Fuels
- B) Hydroelectric
- C) Geothermal
- D) Solar

_____ 6. Which of the following can be recycled:

- A) Paper towels
- B) Kleenex
- C) Newspaper
- D) Phone books

_____ 7. In the 2008/2009 school year, Cal Poly's electric bill was

- A) \$900,000
- B) \$4.5 million
- C) \$12 million
- D) \$50 million

_____ 8. The majority of food used in Cal Poly's campus dining is purchased from:

- A) San Luis Obispo
- B) The central valley
- C) Mexico
- D) The east coast

_____ 9. In the U.S., the average grocery store's produce travels ____ miles between where it was grown and the store shelf

- A) 75 miles
- B) 400 miles
- C) 1500 miles
- D) 3000 miles

_____ 10. What percentage of American’s energy usage comes from wind power?

- A) 2%
- B) 10%
- C) 15%
- D) 23%

Part 4

For each group, circle the number that best corresponds with:

1. How the following groups in your social circle view sustainable practices:	Very Negative	Negative	Neutral	Positive	Very Positive
a) Friends	1	2	3	4	5
b) Family	1	2	3	4	5
c) Peers	1	2	3	4	5
d) Professors	1	2	3	4	5

2. How often the following groups in your social circle engage in sustainable practices:	Never Always	Rarely	Sometimes	Usually	
a) Friends	1	2	3	4	5
b) Family	1	2	3	4	5
c) Peers	1	2	3	4	5
d) Professors	1	2	3	4	5

