The effect of a Self-conducted Personal Energy Audit on Students' Consumption Patterns

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ABSTRACT

Our carbon footprint is increasing due to the growing global consumption rate, presenting the problem of how we can lower our current energy intake. Interventions have traditionally been used to elicit a behavioral change, with this particular study examining the effects of calculating personal carbon footprints on students' consumption patterns. Through administering a pre-intervention survey, I determined students' current knowledge level regarding environmental issues, behavior associated with energy consumption, and values involving the prioritization of the environment. At the end of the survey, students interacted with the Cool Climate Calculator and recorded personal energy consumption and low-carbon behavior changes that they would be willing to make. After about two weeks, a post intervention survey was distributed to determine if the intervention had any effect on their personal consumption patterns. I found that 77% of students adopted as least one behavioral change, accrediting the intervention's success to the high values scores of the participants and the multiple options for the low-carbon behaviors. Though no relationship was found between knowledge, behavior, and values, and the number of behavior changes made, it was determined that values is a larger determinant of behavior than knowledge. Overall, my study provides insight on how interventions can yield better success within a student demographic.

KEYWORDS

carbon footprint, Cool Climate Calculator, student behavior, values, knowledge

INTRODUCTION

Increased energy consumption that is evident in our everyday lives, whether in the form of food portions or the size of homes, is a reflection of a much broader trend in increased global energy consumption that is projected to increase 48% by 2040 (EIA 2016). This, in turn, has resulted in increased global carbon emissions from fossil fuels, which can be understood in terms of our "carbon footprint" (EPA 2017). As technological advances are not enough to mitigate increased demand, consumers must modify their energy use habits to reduce personal consumption (Steg and Vlek 2009). However, it is difficult to elicit changes in behavior and consumer choice, as people's decisions are often dictated by factors unrelated to environmental impact. Such factors include societal pressure, the amount of effort required to adopt the sustainable behavior, and a lack of incentives to motivate behavioral change (Steg 2008, Frederiks et al. 2015). These behavioral barriers present a challenge to the goal of lowering energy use through the reduction of consumer demand.

Various types of interventions have been employed as a means of addressing behavioral barriers and eliciting behavioral changes. Interventions such as informational workshops, incentive programs and goal setting, social norming, and energy audits can potentially motivate consumers to use less energy; however, outcomes associated with these interventions vary greatly (Stern 1999). Informational interventions have had limited effects on participants' behaviors, as they introduce the issue, but do not always provide participants with the tools to solve it (Steg 2008). Interventions involving incentives and goal setting have had slightly more success, as they provide participants with an objective to work towards and make the desired behavioral change clear (Stern 1999, Abrahamse et al. 2007). Social norming interventions, in which participants are encouraged to adopt a certain behavior by suggesting that it is socially approved, has been found to have a significant impact in motivation behavioral changes (Goldstein et al. 2008, Frederiks et al. 2015). Finally, energy audits have been successful in lowering energy consumption, however, very few studies have conducted an energy audit based intervention, as a review of thirty-eight studies, only included three home audits (Abrahamse et al. 2005).

Energy audits as a form of intervention can show participants from where the majority of their energy originates, how their energy usage compares to others within the audit program, and what actions they can take to lower their consumption. Often conducted by outside parties, such as utility companies or government organizations, audits aim to evaluate homes for energy efficiency and

recommend various energy-saving measures that the homeowner can implement (Anderson and Newell 2004). The common objective of a home audit program is to minimize the "energy efficiency gap," or the lack of information surrounding energy efficient renovations and the associated costs and benefits (Frondel and Vance 2013). Conservation measures suggested include the type of windows, stove, thermostat, hot water heater, and ceiling, wall, and floor insulation, all aspects that could greatly improve the energy efficiency of a house (Junk et al. 1987). With more information, homeowners or tenants are able to assess the different energy saving options, resulting in a higher likelihood of investing in energy efficient technologies. In one study, 76% of households undertook some sort of renovation following an audit, while another study found households that received an audit were far more likely to have energy efficient technologies than households that did not (Junk et al. 1987, Frondel and Vance 2013). In addition, an intervention involving manufacturing plants found that businesses adopted at least half of the recommended energy efficiency projects after the audit (Anderson and Newell 2004). Unfortunately, the traditional form of an energy audit is inapplicable for university students, as most are renters and are unable or unwilling to invest in energy saving technologies, resulting in a lack of understanding on how to encourage college students to reduce their consumption.

Students at UC Berkeley often rent apartments or houses, and are unable to control the energy efficiency of their household appliances or insulation. As technological improvements are not an option, students must alter their own behavior if they wish to reduce their energy consumption. In addition, students in dormitories don't pay directly for their energy use, providing even less of an incentive to reduce their consumption. Consistent feedback on energy and water use, as well as a competition setting, has been employed as a means of encouraging students in dormitories to reduce their overall consumption through behavioral changes. One study found that their intervention resulted in a 32% decrease in electricity usage (John E. Petersen et al. 2007). An alternative form of energy audits that is used less frequently involves a carbon footprint calculator, where participants learn where their energy is coming from not only within the home, but from travel, food, goods, and services. The calculator shows participants their total consumption, as well as where they are in relation to their community (West et al. 2016). Though a tool with theoretical potential, the impact of carbon calculators as a form of interventions is relatively unknown.

My central research question is: How does a self-conducted personal energy audit affect student consumption patterns? To help answer this question, I pose the following sub-questions: How does knowledge compare to values as a determinate of pro-environmental behavior? How does prior

knowledge regarding energy consumption impact their energy use after the intervention? How do existing pro-environmental practices effect the students' willingness to adopt behavioral changes? How do personal values influence students' resource consumption patterns? What are the main reasons students do and do not make behavioral changes?

METHODS

Study system description

I conducted an intervention study of students enrolled in Environmental Science, Policy and Management (ESPM) 50 AC, Introduction to Culture and Natural Resource Management at UC Berkeley, with my sample population as the students who wished to receive extra credit for the class. The course population was meant to represent the UC Berkeley undergraduate population.

Data collection methods

The sample size of my study was determined by the number of willing participants, as involvement was optional and incentivized through extra credit in ESPM 50AC during the fall 2016 and spring 2017 semesters. I conducted a preliminary survey, within which the intervention was embedded, and distributed a follow-up survey two weeks later. The first survey documented students' prior knowledge regarding different environmental issues, established if they were already practicing carbon-saving behaviors, identified specific values that might influence their actions, and basic demographics (Figure 1, Figure 3). I then introduced an intervention in the survey, where students calculated their personal carbon footprints using the CoolClimate Calculator (http://www.coolcalifornia.org/calculator-households-individuals, Figure 2). Students learned how much carbon they expel each year due to travel, housing, food, and shopping, while exploring different behavioral choices they could adopt to lower and offset their carbon footprints. Two weeks later, a brief second survey was distributed to determine if students implemented any of the lowcarbon alternatives, and, if they did not, to identify the main barriers preventing them from doing so (Figure 4). This last question was the most important aspect of the intervention, as it provided students with the opportunity modify behavior to reduce their carbon footprint, if they chose to do so.

Data analysis methods

The first survey included questions regarding knowledge, behavior, and values, with students receiving a relative pro-environmental profile score for each category. Using these scores I calculated the R^2 values to determine whether students who ranked highly on the knowledge and value sections also demonstrated environmentally conscientious behaviors. The second survey established whether the intervention encouraged participants to lower or offset their carbon emissions by adopting a behavioral change, ultimately determining the success of the intervention. In addition, I ran regressions on students' knowledge, behavior, and values scores compared with the number of lifestyle changes they adopted to determine if the intervention was more successful for different groups of students. Regardless of the effect of the carbon calculator, my surveys determined consumption patterns of students, the sources of most their carbon emissions, and respondents' reasoning behind why they did or did not adopt a behavioral change.

RESULTS

Study Sample

My study sample was representative of UC Berkeley's undergraduate student body. The sample size was 327 out of 923 students in ESPM 50AC both semesters and 27,496 students in all of UC Berkeley, 35% of the class population and 1.25% of the student population. While 53% of undergraduates at Berkeley are women and 47% are men, my sample contained 50% women and 47% men (Diversity Snapchat, Table 1). Based on the participants' majors, the sample did not include more environmentally-oriented students, despite the course's focus on environmental issues (Table 2).

Table 1. Study Sample vs. UC Berkeley Undergraduate Population

	Study Sample	UC Berkeley Undergraduate Population
Male	47%	47%
Female	50%	53%
Non-binary	3%	Not accounted for
Caucasian	37%	29%
African American	2%	3%
Asian	58%	40%
Native Hawaiian	2%	.2%
Native American	.3%	1%
Spanish, Hispanic or Latino Decent	10%	14%

Table 2. Study Sample Majors

	Undeclared	Social Sciences	Biological Sciences	Physical Sciences	Natural Sciences	Humanities	Arts	Business/ Economics	Engineering/ CS
% of Sample	10%	8%	25%	7%	11%	4%	2%	17%	17%

Pre Intervention Survey

High environmental knowledge and values did not correlate with conservation-oriented energy and resource behaviors (Figure 5, Figure 6). However, the R^2 value and the slope for the relationship between values and behavior is double that for knowledge and behavior, suggesting that values are a larger determinate of behavior than knowledge.

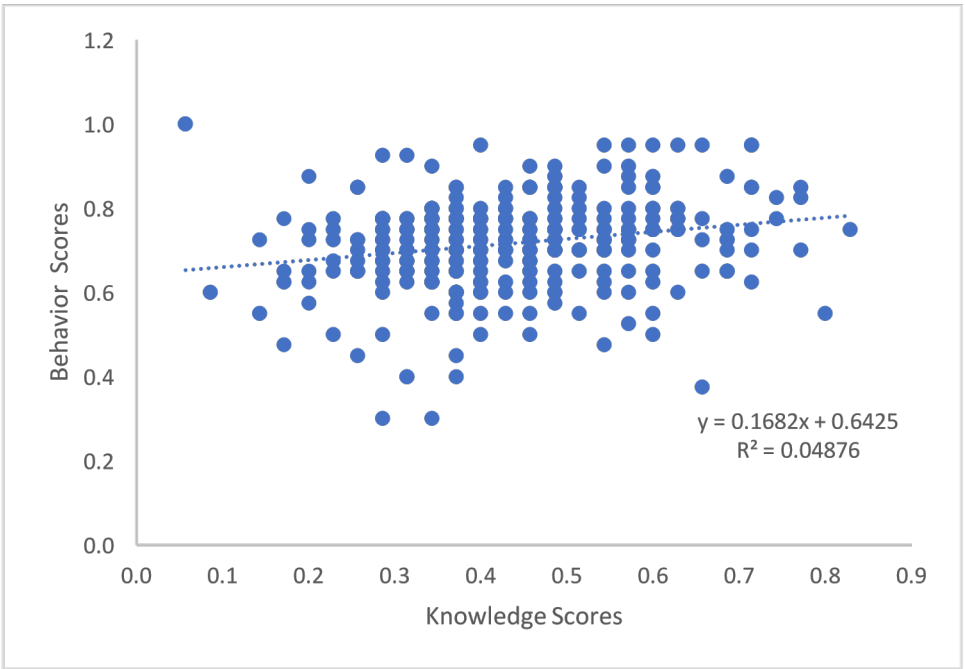

Figure 5. Knowledge scores correlation with behavior scores.

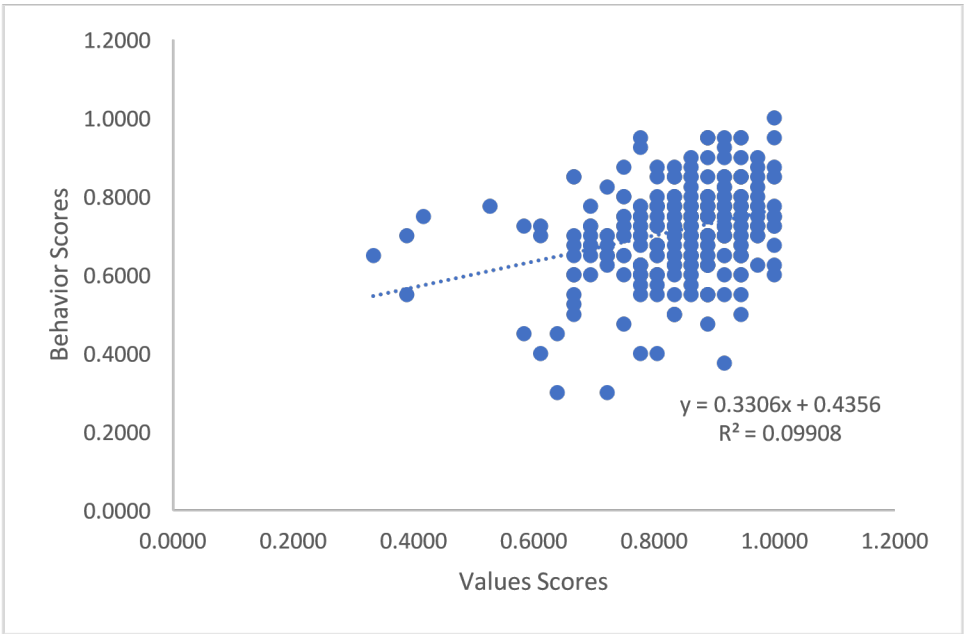

Figure 6. Value scores correlation with behavior scores

Intervention

Based on the responses to the intervention, I found that most of students' emissions originate from food, travel, and home (Figure 7).

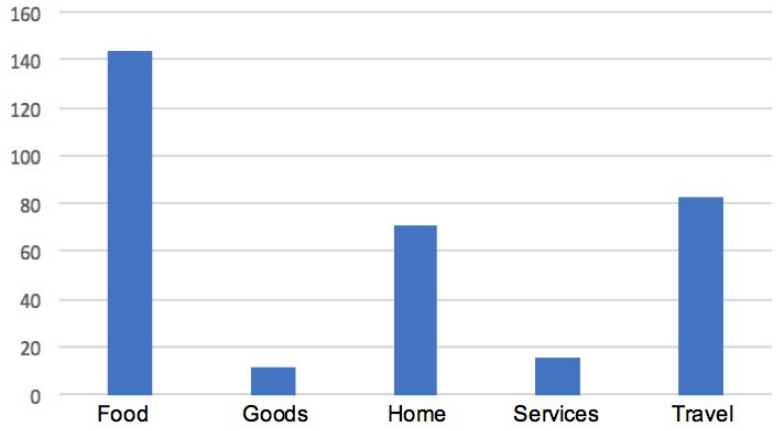

Figure 7. Main sources of carbon emissions

Post Intervention Survey

Of those who completed the first survey and intervention, 73% also completed the second survey. From the post-intervention survey, I determined that while only 21% of students adopted all three alternative lifestyle choices, 77% of students adopted as least one (Figure 8). In addition, I examined the knowledge, behavior, and values scores of students who made behavioral changes to determine if there was any relationship between the three variables and the number of lifestyle choices adopted. I found that having higher knowledge, behavior, and values scores had no correlation with the number of behavioral changes made (Figure 9, 10, and 11).

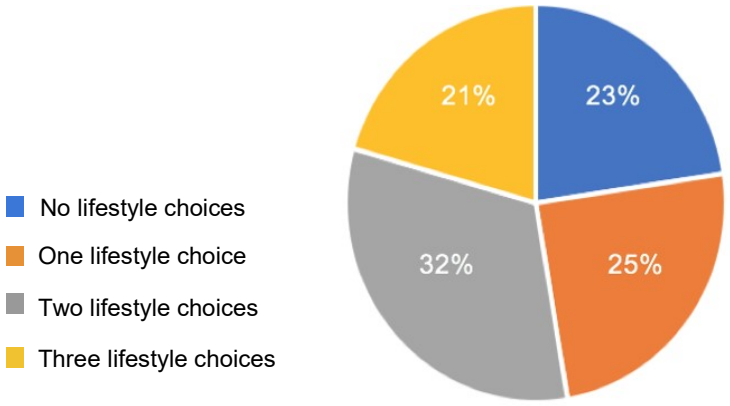

Figure 8. Number of alternative lifestyle changes adopted by the students.

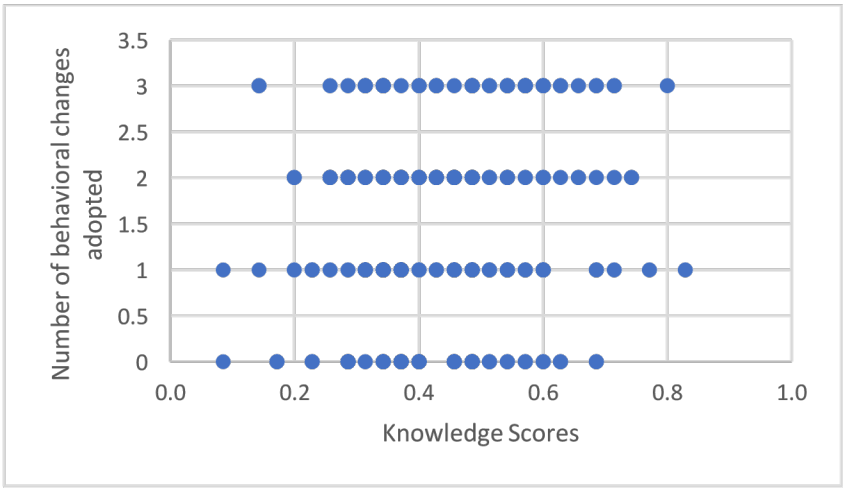

Figure 9. Knowledge scores correlation with number of behavioral changes adopted

Figure 10. Behavior scores correlation with number of behavioral changes adopted

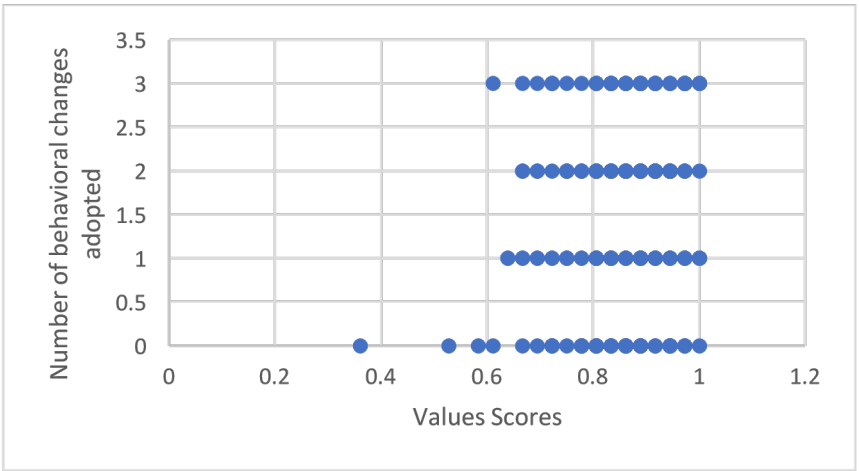

Figure 11. Values scores correlation with number of behavioral changes adopted

The final survey also provided information on the main reasons why students did and did not make behavioral changes (Figure 14). I found that students adopted alternative behaviors primarily because they felt it benefited the environment or because it was convenient. On the other hand, students who did not make behavioral changes attributed it to them not thinking about it or because it was too inconvenient.

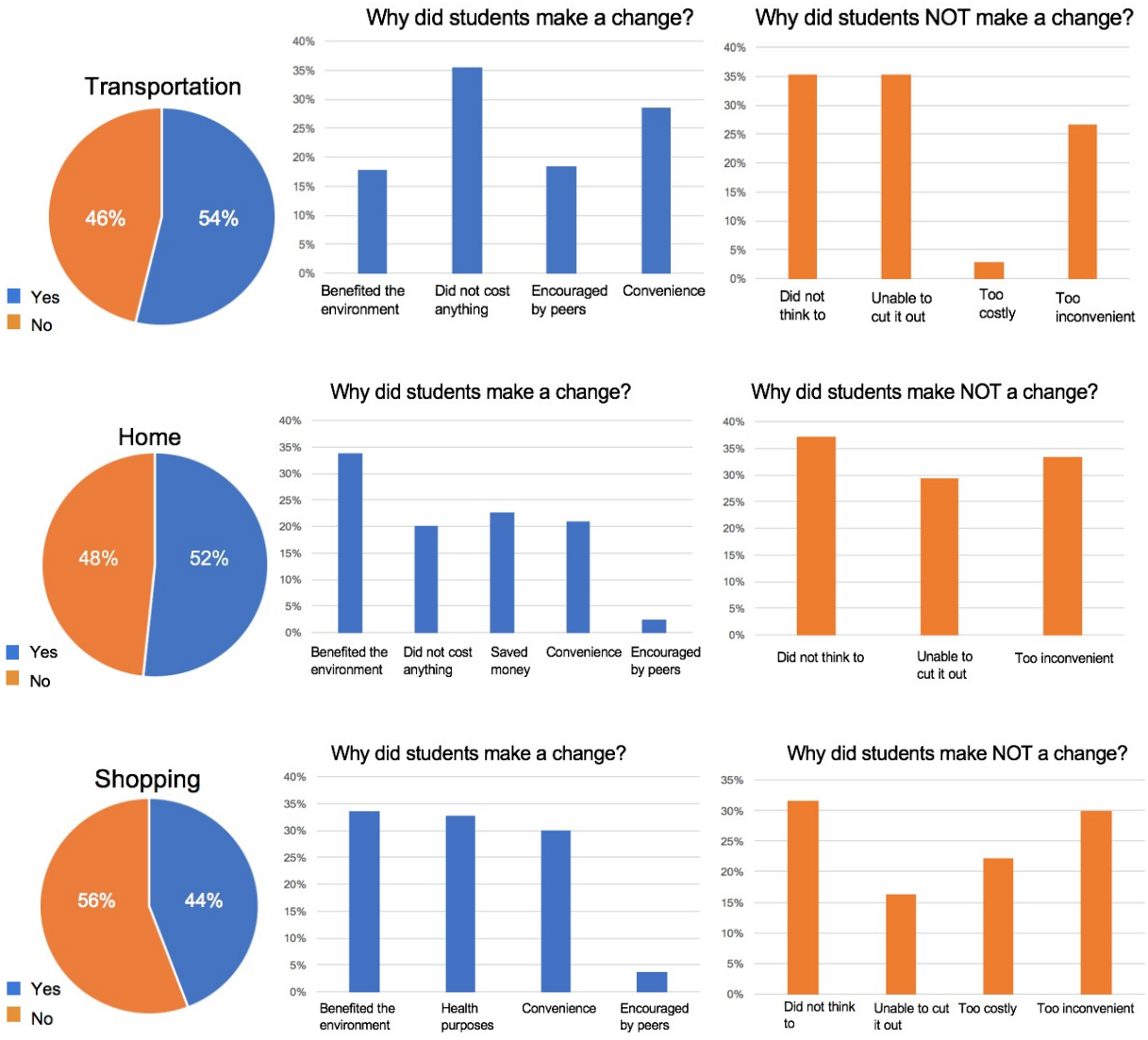

Figure 14. Why students did or did not make a behavioral change for transportation, home, and shopping

DISCUSSION

Calculating personal carbon footprints addresses misconceptions surrounding energy use, successfully motivating participates to make low-carbon behavioral changes. In addition, the reasoning behind why students did or did not adopt alternatives sheds light on what current barriers exist to drive change. My study confirms that personal values and experiences are the main motivators of change, while knowledge is not enough to encourage students to take action, suggesting what the focus of future interventions should be. The CoolClimate Calculator was a successful motivator of

change, due to its behavioral suggestions for respondents, as well as the high value scores of most participants, demonstrating care and consideration for the environment.

Determinants of Behavior

Respondents' pro-environmental behavior prior to the intervention is more closely related to their personal values than their knowledge regarding environmental issues. While my data demonstrates little correlation between the respondents' values and behavior scores, it exhibits even less between their knowledge and behavior scores. Therefore, values are a stronger determinant of proenvironmental behavior than knowledge due to the persuasiveness of personal experience (Semenza et al. 2008). People are more likely to act on an issue they care about, rather than a problem they read in the news or took a course on (Finger 1994). While knowledge is still important for developing an awareness of the various consumption issues, it is only useful if people feel personally inclined to act on that information and is ultimately not enough to encourage individuals to take action (Schmidt 2007). Therefore, when designing future interventions, it is important to first build upon participants' values, and then display information on how they can help, establishing their knowledge on sustainability issues.

Effects of the carbon calculator

The intervention was successful due to the high values scores of the majority of the participants, as well as the removal of misconceptions regarding personal energy consumption. By calculating their carbon footprints, students were made aware of their environmental impact and saw from where the majority of their emissions were coming. Often people mistake their ideal behavior for their actual, resulting in a lack of awareness for the need to improve their behaviors (Mckenzie-Mohr 2000). In addition, the carbon calculator directly provided behavioral changes for the participants to adopt, making it easy on the students to alter their behavior. Interventions often establish the need for participants to alter their behavior, but do not tell them how to do so, making it difficult for them to taking action (Whitmarsh and O'Neill 2010). The interactive portion of the carbon calculator, students' high value scores regarding the environment, and the calculators suggested behavior changes determined the success of this intervention.

Effectiveness of the intervention for different groups

There was a weak relationship between the participants' knowledge, behavior, and values scores and the number of behavioral changes made, suggesting that none of the factors influenced participants' post-intervention behavior. However, it was difficult to evaluate how the various factors corresponded with each other, as the majority of students had high behavior and values scores. I believe a larger spread of data would be needed to accurately determine if there is a relationship between knowledge, behavior, and values, and post-intervention behavior, such as seeing the correlation between low behavior and values scores.

In conclusion, when designing future interventions, it is important to engage personal values and experiences, before building upon the participants' knowledge. In addition, the desired behavioral changes should be clear and easy to adopt, ensuring the success of the intervention.

Limitations

Although my sample population was representative of the UC Berkeley student body, it may not be able to represent all university populations, due in part to the particularly liberal nature of the campus. The majority of the participants exhibited high values scores, which dictated the success of the intervention. Other university populations with comparable values might respond similarly to the intervention, however, universities with a wider spread of values scores could exhibit a different reaction.

Because my study relied on self-reported data, my findings might be slightly skewed, as there is no way to confirm the validity of the responses or if students actually completed the intervention. In addition, people often over-state their understanding or commitments, therefore future interventions should incorporate a way to monitor the participants (Costanzo et al. 1986).

Future Directions and Broader Implications

Very few studies have examined the effect of an intervention on university students and even fewer have explored calculating carbon emissions as a form of intervention. Due to the lack of research conducted, the scientific community could benefit from the replication of this study, or

something similar. That said, it is important to keep a few points in mind when designing future interventions and targeting populations. Future studies should work to incorporate values and personal experiences within the activity, with integrating knowledge after, to emotionally invest the participates and then provide them with the information to act on it. As the majority of students adopted a low-carbon alternative due to perceived environmental benefit and convenience, it is important to make the desired change of behavior clear and easily attained. In addition, as most students who did not make a behavioral change accredited it to absentmindedness, future interventions should work to incorporate a reminder system or the ability to track personal progress to keep the participants engaged. Overall, barriers to sustainable action and solutions to overcome them need to be further explored. I believe the insight gained from my study can help improve future interventions so that they can better encourage people to take initiative and play an active role in the future of their planet.

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APPENDIX

Figure 1. Survey 1 - Background

* 24. Other than ESPM 50AC, how many environmental science/studies related classes have you taken at Berkeley(including EEP, ERG, ESPM, etc.)?

- None
- 1-3
- 4-6
- 7-9
- 10+

* 25. Have you heard of the Dakota Access Pipeline Issue?

- Yes
- No

* 26. Have you heard of Diablo Canyon Power Plant in California?

- Yes
- No

* 27. How much do you know about the following topics? (1 being nothing, 3 being somewhat, and 5 being a lot)

	0	1	2	3	4
Pollution					
Climate Change					
Renewable Energy Sources					
Waste Disposal					
Environmental Politics					
Ocean Acidification					

* 28. Where would you place your individual energy consumption at UC Berkeley?

- Below average
- Average
- Above average

*

* 29. What is your primary method of transportation in college?

- ◯ Walk
- ◯ Bike
- ◯ Public Transit
- ◯ Car
- ◯ Carpool
- ◯ Other (please specify)

* 30. How would you classify your food consumption?

- ◯ Vegan
- ◯ Vegetarian
- ◯ Pescatarian
- ◯ No restrictions
- ◯ Other (please specify)

* 31. How often do you turn off the lights when you leave the room?

- ◯ Always
- ◯ Most of the time
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

* 32. How often do you turn off the faucet when you brush your teeth?

- ◯ Always
- ◯ Most of the time
- ◯ Sometimes
- ◯ Rarely
- ◯ Never

33. How often do you compost at home?

- ◯ Always
- ◯ Most of the time
- ◯ Sometimes
- ◯ Rarely
- ◯ N/A (Cannot where you live i.e. Landlord doesn't offer it, live in dorms, etc.)

* 34. How strongly do you agree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Climate change is real	◯	◯	◯	◯	◯
Human induced climate change is real	◯	◯	◯	◯	◯
I have a personal responsibility to combat climate change	◯	◯	◯	◯	◯
Reducing my personal energy consumption will contribute to mitigating climate change	◯	◯	◯	◯	◯
I grew up in a household that encouraged environmental awareness	◯	◯	◯	◯	◯
I attempt to purchase local and sustainably-grown groceries	◯	◯	◯	◯	◯

*

Figure 2. Survey 1 - Consumption Calculator

Now you will calculate your own carbon footprint in **college**. Please follow the steps below:

Step 1: In a separate window, visit: http://www.coolcalifornia.org/calculator-households-individuals

Step 2: On the first tab, "Intro," fill out where you live in college (Ex: Berkeley, Oakland, etc.), how many people live with you, and your estimated annual household income.

Step 3: Make your way through the rest of the tabs, adjusting the details for **each** one of the sections (travel, housing, food, and shopping). End at the "Take Action" tab.

* 35. What are your top three carbon-emitting activities? (From the "Take Action" tab) Example: Car fuel, natural gas, meat

First

Second

Third

* 36. Which category is **highest** for you?

- Travel
- Home
- Food
- Goods
- Services

* 37. Which category is **lowest** for you?

- Travel
- Home
- Food
- Goods
- Services

* 38. What is your **total** emitted tons of carbon per year? (From the "Take Action" tab)

*

39. Are you better or worse than the average? (Happy or sad

- ○
- ○

Transportation	
Home	
Shopping	

- ○
- ○

face)

Better

Worse

* 40. Out of the listed suggestions, which lifestyle changes are you most likely to make for each of the categories? Be as realistic as possible. (Example: Transportation-Ride my Bike, etc.)

* 41. Have you ever used this website before?

Yes

No

*

Figure 3. Survey 1 - Demographics

* 73. What year are you at UC Berkeley?

- ◯ Freshman
- ◯ Sophomore
- ◯ Junior
- ◯ Junior Transfer
- ◯ Senior
- ◯ Senior+

* 74. What is your major/minor? If you are not sure or do not have one write N/A.

Major	
Major 2	
Minor	
Minor 2	

* 75. In which category would you place your major?

- ◯ Undeclared
- ◯ Social Sciences
- ◯ Biological Sciences
- ◯ Physical Sciences
- ◯ Humanities
- ◯ Arts
- ◯ Business and/or Economics
- ◯ Engineering and/or Computer Sciences
- ◯ Other (please specify)

[ ]

*

76. What is your ethnic or racial background? (Mark all that apply)

- [ ] Caucasian/ White
- [ ] Black/ African-American
- [ ] Asian
- [ ] Native Hawaiian or other Pacific Islander
- [ ] Native American
- [ ] Prefer not to say
- [ ] Other (please specify)

* 77. Are you of Spanish, Hispanic or Latino origin or descent?

- ( ) Yes
- ( ) No
- ( ) Prefer not to say

* 78. What gender do you identify with?

- ( ) Male
- ( ) Female
- ( ) Non-binary
- ( ) Prefer not to say
- ( ) Other (please specify)

* 79. What is your place of longest residence before coming to UC Berkeley? (City and State). If you are international enter your country of longest residence.

City

State

Country

*

80. Classify your hometown as one of the following.

- ◯ Rural
- ◯ Suburban
- ◯ Small urban city
- ◯ Medium-sized urban city
- ◯ Large urban city

* 81. Estimate the population of your hometown. For reference, Berkeley has a population of around 120,000. San Francisco has a population of around 840,000. Los Angeles has a population of nearly 4,000,000.

- ◯ Less than 25,000 people
- ◯ 25,000 to 100,000 people
- ◯ 100,000 to 500,000 people
- ◯ 500,000 to 1,000,000 people
- ◯ More than 1,000,000 people

* 82. For your home residence (not college residence), please classify your household economic status to the best of your ability.

- ◯ Below the poverty line
- ◯ Between lower middle class and the poverty line
- ◯ Lower middle class
- ◯ Upper middle class
- ◯ Upper class

* 83. How old are you?

[ ]

*

84. Where do you live while at college?

- ◯ Residence hall or dormitory
- ◯ Non-university student housing (The Berk, Wesley, etc.)
- ◯ Complex (1-6 units)
- ◯ Apartment (6+ units)
- ◯ House
- ◯ Co-op
- ◯ Sorority or fraternity
- ◯ Other (please specify)

* 85. How many people do you live with?

- ◯ None
- ◯ 1 to 3
- ◯ 4 to 5
- ◯ 6 to 7
- ◯ 8 to 9
- ◯ 10+

* 86. Rate how you would consider your political beliefs on the spectrum of liberal to conservative.

- ◯ Very liberal
- ◯ Liberal
- ◯ Neither liberal nor conservative
- ◯ Conservative
- ◯ Very conservative

There will be a **follow-up survey** within the next few weeks. We would like to connect the responses from this survey to the second in order to identify any noticeable trends. For this reason, we ask you to **please remember** your answer to the question below, as it will be how we connect the two surveys. The answer will in **no way** be connected to your identity, as we wish your responses to remain anonymous. **Thank you so much for your participation!**

* 87. Please write your cell phone area code, followed by the name of your favorite Uncle.
Example: 650moe

Figure 4. Post Intervention Survey

*

* 1. Did you adopt the lifestyle change you selected for transportation?

- Yes
- No

* 2. If yes, which answer best illustrates the **main** reason why?

- Because it was convenient
- Because it didn't cost me anything
- Because it benefited the environment
- Because it encouraged me to be more active (i.e. walking)
- Because my peers encouraged me to
- N/A I did **NOT** adopt the lifestyle change
- Other (please specify)

* 3. Will you continue to practice the lifestyle change?

- Yes
- No
- N/A I never adopted it in the first place
- If no, why?

* 4. If you did **not** adopt the lifestyle change, which answer best illustrates the **main** reason why?

- ○ It was too inconvenient
- ○ It was too costly
- ○ I was unable to cut that portion out (i.e. airfare from flying home over breaks)
- ○ I didn't think to
- ○ N/A I **did** adopt the lifestyle change
- ○ Other (please specify)

  [ ]

*

5. Did you adopt the lifestyle change you selected for home?

- ◯ Yes
- ◯ No

* 6. If yes, which answer best illustrates the **main** reason why?

- ◯ Because it was convenient
- ◯ Because it didn't cost me anything
- ◯ Because it saved me money
- ◯ Because it benefited the environment
- ◯ Because my peers encouraged me to
- ◯ N/A I did **NOT** adopt the lifestyle change
- ◯ Other (please specify)

* 7. Will you continue to practice this lifestyle change?

- ◯ Yes
- ◯ No
- ◯ N/A I never adopted it in the first place
- ◯ If no, why?

* 8. If you did not adopt the lifestyle change, which answer best illustrates the main reason why?

- ◯ It was too inconvenient
- ◯ I was unable to cut that portion out (i.e. unable to buy energy efficient technologies)
- ◯ I didn't think to
- ◯ N/A I **did** adopt the lifestyle change
- ◯ Other (please specify)

* 9. Did you adopt the lifestyle change you selected for shopping?

- ◯ Yes
- ◯ No

* 10. If yes, which answer best illustrates the **main** reason why?

- ◯ Because it was convenient
- ◯ Because it benefited the environment
- ◯ Because my peers encouraged me to
- ◯ Because it is healthier
- ◯ N/A I did **NOT** adopt the lifestyle change
- ◯ Other (please specify)

* 11. Will you continue to practice the lifestyle change?

- ◯ Yes
- ◯ No
- ◯ N/A I never adopted it in the first place

If no, why?

* 12. If you did **not** adopt the lifestyle change, which answer best illustrates the **main** reason why?

- ◯ It was too inconvenient
- ◯ It was too costly
- ◯ I was unable to cut that portion out (i.e. live in a Co-op or sorority and cannot control where we buy our produce)
- ◯ I didn't think to
- ◯ N/A I **did** adopt the lifestyle change
- ◯ Other (please specify)

* 13. Please write your cell phone area code, followed by the name of your favorite Uncle. Make sure it is the

same answer from the first survey as we are using this question to connect the two. Example:

650moe