# ENCOURAGING CONSERVATION

IN COMMUNAL LIVING ENVIRONMENTS



A Student-Driven Research Project
Supported by the School of Business and
the Campus Sustainability Office

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A COLLABORATIVE RESEARCH PROJECT SUPPORTED BY
PACIFIC LUTHERAN UNIVERSITY | PUGET SOUND ENERGY | INDEPENDENT COLLEGES OF WASHINGTON

# SOMETIMES SMALL CHANGES MATTER. AN EXPLORATION OF BEHAVIORAL APPROACHES TO CONSERVATION.







Independent Colleges of Washington

#### THE INSPIRATION BEHIND THIS RESEARCH

Energy conservation and resource sustainability have emerged as two of the more pressing issues of the early 21st century. Historically, these issues have been addressed through policy green to be seen; Griskevicius, -making based on economic models suggesting that relative prices are the primary drivers of conservation efforts and consumer behavior. For instance, economic theories of resource conservation posit that increasing the price of energy will result in lower energy consumption. Although these models have helped promote energy conservation, they are expensive to implement and often disproportionately affect those at the lower end of income distribution (see Gillingham et al. 2006; Bertrand et al. 2010). Perhaps spurred by the increased burden placed on lower-income individuals and families, more recent efforts to motivate energy conservation have applied theories of behavioral economics and consumer behavior to design non-price interventions that "nudge" consumers to conserve energy.

Non-price interventions are typically inexpensive to implement and often have proved to be as effective, if not more effective, than price-based interventions (e.g., Bertrand et al. 2010). Conservationbased consumer research often considers carefully planned psychological interventions that influence individual conservation behaviors. Previous research in marketing and consumer behavior has considered individual-based motivations for conservation, such

as hotel guests choosing to participate in hotel conservation programs (Goldstein et al, 2008), consumers choosing to conserve in order to signal to others (c.f., going 2010) and recycling behaviors (Schultz, 1999).

While this research offers insights into individual consumer decisions related to temporary hotel stays, transportation or recycling, research has not explored



how to motivate consumers to conserve energy in collaborative living environments. With apartment occupancy rates at an all -time high, growing interest in condominium/community style living among an aging population, and the large numbers of university students who live in campus-based residence halls or apartment units, opportunity exists to research and experiment with a variety of potential triggers that encourage participation in conservation programs.

To answer these questions, our research team conducted a variety of behavioral-based experiments. This research drew upon the theoretical foundations and findings of past research to develop different hypotheses and experimental approaches within a field study setting.

First, previous research has shown social normative influence to affect what individuals may say, what they may believe and ultimately how they may behave. In essence, social normative influence suggests that individuals have a strong desire to adhere to social norms as a way of gaining public acceptance. Thus, individuals are driven to engage in behaviors that conform to what they believe "everybody else is doing."

Regulatory focus theory suggests consumers are motivated by either a promotion (achieving the good) or a prevention (avoiding the negative) message frame (Higgins 2000). Previous research suggests that when a message frame fits (i.e., regulatory fit) with the orientation of the consumer (i.e., a promotionframed preference), motivation to act in congruence with the message may be significantly improved.

The researchers developed unique interventions that were tested in a variety of living communities, all of which are on the campus of Pacific Lutheran University. This research sought to extend our understanding of motivations to conserve energy, and to understand the potential impact of such interventions in a comprehensive experimental study and conservation campaign.









# SAY YES TO THE SWAP

### TURN UP A NEW WARDROBE; TURN DOWN THE THERMOSTAT

The event "Keep it at 68°: Sweater Swap" was open to the entire PLU community (students, staff and faculty) and the intended message to the audience was that it is easy to keep heat sources at a lower temperature to save energy, particularly when a sweater is worn. This event used the theory of social proof, which suggests that an individual is more likely conform to what others are doing around him, because individuals assume that what the group is doing is the

posters and tabling in a popular area to generate word of mouth.

Second, the chosen location also helped generate attention for the event, as it took place in a very heavily trafficked area. The building is the most frequently used building on the campus.

Third, a group of people was invited to show up at the beginning of the event to suggest this was already a popular event. Those who showed up early decided they too could not leave without a new

was raised from this event and donated to a local food bank). (3) A participant simply could donate a sweater to the event (some participants donated and did not pick up a sweater in return).

From a logistical standpoint, this event could not have happened without the assistance of Goodwill or PLU's Department of Marketing and Communications. Goodwill generously loaned clothing racks for use during the Sweater Swap, while PLU Marketing and Communications



correct course of action.

Our research attempted to create social proof influence regarding conservation behavior through three different methods. First, social proof was created through an advertising campaign. For this campaign, the following forms of advertisements were used: posters with "celebrities" on them (i.e. popular PLU professors and staff), large butcher-paper

sweater from the Sweater Swap. Over 80 people participated in the Sweater Swap.

Participation in the Sweater Swap meant participants did one of three things: (1) A participant brought her own sweater and traded it in for a different sweater at the event. (2) A participant donated money for a sweater, with donations ranging from 50 cents to \$10 (a total of \$99



assisted with the creation of appealing advertisements and flyers for the event.

The event attracted a lot of attention and easily could be replicated in other communities. Local thrift stores may help sponsor the event, or sweaters simply could be purchased from a variety of local thrift stores.

# **SOCIAL PROOF**

### EVERYBODY'S DOING IT... EVEN MY PROF

#### THE THEORY

The celebrity effect is an example of the "transfer of meaning" model. When a celebrity endorses a product or service, some of his personality traits ("meaning") are transferred onto that product or service. By advertising with images of respected people, that advertisement becomes more compelling to people whose attitudes and values coincide with the image of that person, thus becoming more effective. This project also utilized two sources of influence, via social proof and liking. Social psychologist and marketer Robert Cialdini

found that what other people are doing (social proof) can have great influence on the likelihood of others joining the behavior. Further, if we tend to like the person (i.e., a well-liked professor or a celebrity), then that too can have an influence on the likelihood of others participating.

the professors in high regard or have a personal relationship with the professor. This would create more attraction and participation for the event.

#### **RESULTS**

The "Keep it at 68°" advertising campaign was a success. The campaign and swap were featured in PLU's student newspaper, *The Mooring Mast.* The associated sweater swap was well-attended, and students were eager to trade in old sweaters for new ones. Combined with the other interventions and infrastructure changes, the Keep It at 68°

campaign correlated with a drop in energy usage from 2013 to 2014. The effect may have been limited in that the campaign was limited to print media on campus. Students easily could have ignored the campaign, particularly if they



#### **APPLICATION**

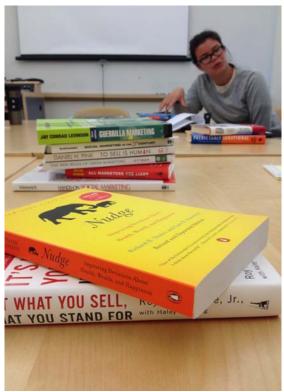
We created the "Keep it at 68°: Sweater Swap" event to encourage students to wear warmer clothing instead of turning on their heaters and using more energy. To advertise this event, we decided to utilize the celebrity effect. We took pictures of popular staff and faculty members around campus wearing sweaters to be used in our poster advertisements. These pictures would gather the attention of students who held one or more of

didn't frequently walk through common areas or look through the Daily Flyer. Qualitatively, we believe that the Keep it at 68° campaign was very successful in promoting the idea of energy conservation. Students around campus informed us that the use of a specific temperature helped them understand a recommended setting when they were entirely unsure at what temperature to set their thermostat. We believe campaigns similar to this could be quite successful in communal living facilities where residents do not pay energy bills directly.











# MAKE THE LINK

### LEFT HAND HERE, RIGHT HAND THERE, AND PULL

#### THE THEORY

Association is the creation of a connection between a stimulus and a desired response. If the connection is successfully created, then a desirable habit can be formed and maintained through that association. Triggers are associations created between two or more objects. When a person observes a trigger, a response or behavior can be initiated. For example, when someone views peanut butter, it is likely she will think of jelly as well. This effect can be used as a simple nudge to encourage people to perform desired sustainable behaviors.

make the connection on their own (without the tape) and perhaps continue with the desired behavior. Thus, the tape could be removed in the future and the behavior could continue.

#### RESULTS

The tape intervention generated a lot of discussion and conversation as the intervention was carried out in the buildings. Residents were interested in the project and were quick to allow the teams to help set up their rooms with the intervention. Interestingly, when the energy use was compared (for the entire building) to



#### **APPLICATION**

In this case, living spaces were fitted with blue painters' tape. The tape was placed in two locations, including the door handles and light switches. The goal was simple—residents could see the two taped areas—and this could serve as a trigger to make the association between leaving the room and turning off the light.

The project included an educational campaign for residents as well. Members from sustainability teams and the research team went door to door to help place the tape and explain the project to the residents, and the purpose of the tape (and related desired behavior) was explained to those who were present at the time.

Additionally, flyers with energy-conservation tips were left with those who agreed to participate, and flyers also were placed on some of the doors of those who were not home at the time. Associations can be learned through repetition, and as residents practiced the learned behaviors, they would be more likely to

usage in previous years, the intervention showed no significant change in energy usage when compared to the other interventions and the control (compared to flyers, p = .059; to pledges, p = .605; to control, p = .605).

Some possible reasons for the lack of significance with this intervention could be a low number of participants or the timing of the intervention.

Although significant effects for this intervention were not present, we maintain that this could be something PSE evaluates further for possible future use. The intervention could be easy to develop and reinforce PSE as a partner in conservation. For example, a simple light switch (a different color or glow-in-the-dark with a PSE logo) that looks different than a normal light switch may cause residents to pay attention to this stimulus. If this stimulus becomes associated with energy conservation, this could make residents think about turning off the lights before leaving a room.

# LET'S PLEDGE

### TO MAKE A CHANGE—TO unPLUg

#### THE THEORY

Cognitive dissonance occurs when there is a difference between a person's words and his actions. It works similarly to guilt and motivates a person to act in line with what he promised. This is often linked with research on the self-prophecy effect, and also with the source of influence known as commitment and consistency from the work of social psychologist and marketer Robert Cialdini. In

short, if someone says he will do something, he is more likely to continue with the behavior.

#### **APPLICATION**

Framed as part of the

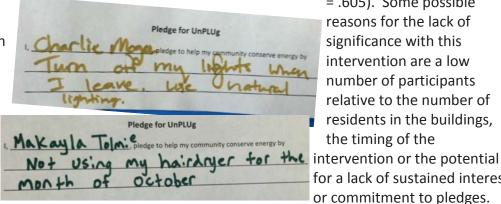
annual unPLUg energyconservation campaign, sustainability advocates asked residents to pledge to conserve energy by using a specific behavior chosen by the resident. Residents were given suggestions that included unplugging electronics not in use and using daylight as the primary source of illumination when possible. Pledges were completed by the resident, and the pledges then were hung in a visible location near the entrance to remind residents of their pledges as they entered the building. If the resident hadn't been holding true to his or her pledges, he or she theoretically would experience cognitive dissonance, and seek to change the behavior to what was pledged.

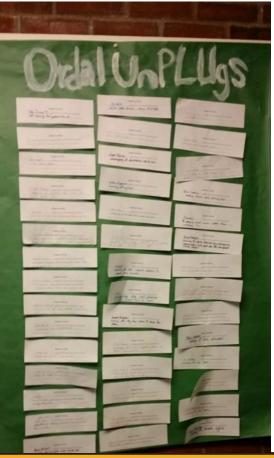
#### **RESULTS**

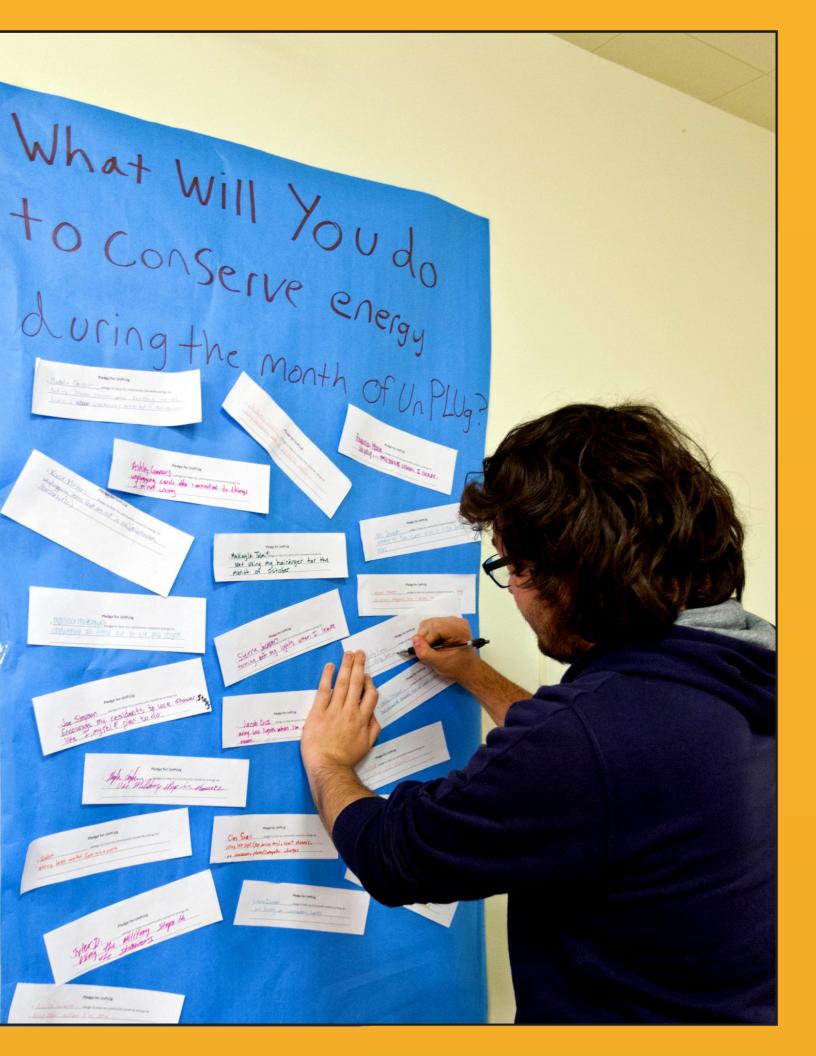
The pledges succeeded in getting residents to participate, and many residents were observed reviewing the pledges of other residents. However, the data did not show a significant change in energy usage for the two residence halls when compared to other interventions or the controls, except for the flyer condition used in another hall (compared to flyers, p = .010; to control, p = .709; to tape, p

> = .605). Some possible reasons for the lack of significance with this intervention are a low number of participants relative to the number of residents in the buildings, the timing of the for a lack of sustained interest or commitment to pledges.

Pledges are often the standard for trying to get participants to buy in to programs, and future projects might reinforce the pledge via contact with the resident (i.e., checking in every few days to remind the resident of the pledge and encourage continued behavior). Another option for future interventions might be a two-stage approach, where an initial pledge is followed up by another pledge, building on the success of the first (and offering another touch point). This step approach may help keep the pledge on the top of the mind for the consumer, and improve pledge efficacy.









# **SOCIAL NORMS**

### WHAT OTHER PEOPLE ARE DOING MATTERS

#### THE THEORY

Social norms influence everyday behaviors and habits. We look to the behavior of others particularly our communities—to determine what type of behavior is encouraged or acceptable. If one thinks a behavior is "normal," however that is defined, then a person is more likely to engage in that behavior. Anchoring someone to a certain norm often will lead the person to behave according RESULTS to the norm. Norms can be either positive (i.e., recycling behaviors) or negative (i.e., littering). Research on consumer behavior suggests that highlighting the behavior of others can help create

the norm. A popular conservation study was conducted by consumer behavior researcher Noah Goldstein and colleagues. In this study, hotel guests were told that a certain percentage of guests at the hotel participated in green programs, such as reusing towels for more than a day. In this study, the best approach found that when people were told how many participated in that particular room (i.e.,

70% of guests in room 318 participate), the participation rates increased significantly.

#### **APPLICATION**

Using this approach, flyers were created for three buildings (two experimental and one control building). The flyers were taped on the doors of all the units and were placed at eye level. The flyers contained some basic tips on saving energy, in addition to information about how normal it was to save energy. A high norm (79%) of participation was established in one building, while another building was told that fewer people in that building (19%) conserved energy. The third building served as a control condition. In this building, residents were provided with tips, but the flyers included no information regarding social norms.

Posting the flyers on residents' doors resulted in a significant drop in energy usage compared to the control group (p = .008). Further, when compared to other interventions used in this research, the results

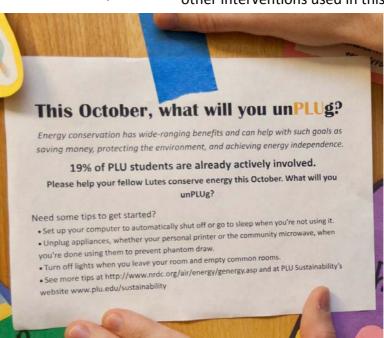
> showed that this approach worked best (compared to pledges, p = .010and to tape, p = .059).

The researchers hypothesized that the reason for the success was due to people who were affected by this intervention (n=473), and potentially the

the total number of repetition of seeing

the ways to conserve energy. Overall, these results suggest that simple interventions matter when it comes to energy-conservation behaviors.

To apply this finding, PSE could consider providing clients with information about the degree to which PSE customers in the building already are involved in reducing their energy consumption. In addition, PSE could consider sharing participation rates with smaller groups of residents (i.e., 92% of residents on the 11th floor are taking steps to conserve energy).



# HARDWIRED

### PERSONALITY TRAITS — SEEKING FOCUS

#### THE THEORY

Regulatory focus is a way of introducing a goal and then the general framework of how it should be accomplished. The way people focus on these goals is broadly broken into two categories, promotion focus and prevention focus. People tend to approach most goals in their lives through one of these focus lenses. Some topics also tend to attract the same focus from multiple people; however, the majority of individuals view their lives through either the promotion of ideals or prevention of errors.

#### **APPLICATION**

A survey was emailed to all students who are currently enrolled in a First-Year Experience class, and filled out by the request of the students' professors. This survey contained several elements. The first was a stimulus in the form of an image. Half of the students viewed a

behaviors. First, we found that females were more likely than males (p = .024) to report past conservation behaviors and are more willing to alter future behavior to conserve energy (p = .001). We found no significant results for other demographic variables, including age, grade-point average, class standing (e.g., freshman) or whether they lived on or off campus.

Second, we asked participants whether they engage in energy-conservation behaviors because: (1) it saves money, (2) it protects the environment, (3) it benefits society or (4) others are doing it. Here our findings suggest that people are more likely to change future conservation behavior when they believe it protects the environment (p = .025) or it benefits society (p = .048); saving money (p = .233) and social influence (p = .424) had no influence on intended future conservation behavior.

Third, with respect to regulatory focus, we found that the image viewed (prevention or promotion) had



lush image (promotion) of hands holding a globe with a tree sprouting from it. The second was a picture of a barren landscape (prevention). Respondents were then asked to answer questions about their environmental behaviors. Several other short questionnaires were given to assess different behavior and attitude types. The goal was to find consistencies between the stimuli given, the way questions were answered, and the various types of behavior and attitude types.

#### **RESULTS**

Our survey yielded several interesting results about how some people are hardwired toward conservation

no effect on either past or anticipated future conservation behavior. This finding was consistent with our expectations, as we did not reason that simply viewing an image would alter reporting on past behavior, or change future behavior. Instead, we reasoned that when promotion-focused individuals viewed a promotion-focused stimulus (and vice-versa), they would be more likely to change their future behavior. Our results support a consistency argument with a *p*-value of .039, indicating that when there is consistency between messaging and personal characteristics, participants were more likely to report intended changes in future conservation behavior.

### Imagine the Earth

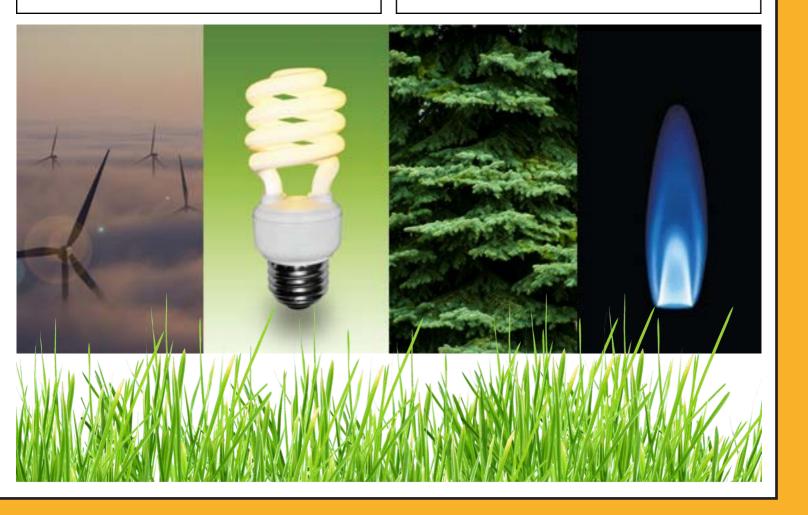


unPLUg and Protect the Climate

## Imagine the Earth



unPLUg and Protect the Climate





# DATA. DATA. DATA.

### DESIGN. EXECUTE. MEASURE. REPEAT. REPORT.

#### TIMING OF AN EFFECT

There is a variety of ways to consider the efficacy of an intervention. Certainly the researchers looked at hard numbers, which will be explained in more detail. Yet, there's more than simply the energy usage, and research suggests that there can be a delayed effect (i.e., a "sleeper" effect) from the time when awareness is gained and when a behavior takes place.

#### MEASURING PARTICIPATION

The experiment that drew the most awareness from a campus and word-of-mouth perspective was the sweater campaign. Students spoke to their professors and shared they had seen the image of the faculty member as part of the campaign. The Sweater Swap was placed in the highest traffic area, and generated a lot of attention from the community. The student newspaper shared the story, and it was featured on the PLU website and social-media outlets.

Other experimental interventions also generated participation through pledges, during the taping of doors and light switches and as flyers were being placed on residents' doors. Clearly, if participation is one measure of success, interventions generated conversation and active participation.

#### MEASURING ENERGY USAGE

Data were collected 3-5 times a week from the meters for the month of October; the variations of collection time per week were caused by holidays and researcher availability. Approximately half of the buildings have energy meters placed within the individual buildings, while the other half are combined in two locations that are home to multiple buildings' energy meters. At locations where buildings are housed on the same meter, we extracted individual KWh used for that day.

A few averages were utilized in the research. For example, for three buildings, instead of three individual meter readings, the historical utility data would reflect one reading for all three buildings. This was problematic when the researchers started comparing data from

2014 to that from 2008, in order to assess the cumulative effects of the campaign.

Thus, the energy usage for the buildings in past years was converted into a per-capita value in order to control for the number of residents in each building over the years, as different numbers of residents would impact the energy usage of a building. The conversion of historical utility data into a more usable form was done by finding the per-person KWh usage per day, then multiplying that number by the total number of residents for each individual building.

After organizing the data from the prior year, the researchers ran a Multiple Factor ANOVA, which compared all of the interventions (i.e. Flyers, Tape, Pledges) to uncover which resulted in a significant change in energy usage. As described, the flyer intervention offered the most significant reduction.

In all, we believe our results provide support for non-price-based energy-conservation interventions. While not all interventions showed a change in energy usage, we believe that the overall campaign was effective particularly when considering involvement of the campus and the benefit of other people telling our story (arguably the most effective and least expensive form of marketing available). Interventions, personality traits and experiments offered insights for Puget Sound Energy. Interestingly, beyond the awareness, the project did achieve lower energy consumption university-wide during the event.

We believe that these results are even more impressive given that this project is a great example of student, faculty and community partners involved in collaborative research. We very much appreciate the financial support for the research from Puget Sound Energy and the partnership with the Independent Colleges of Washington. Further, we could not have completed this work without the many supporters at PLU, a great and supportive community that celebrates and supports student research. We are grateful for the opportunity, and we offer a heartfelt thank you to all of our partners, advisors and supporters.

# **TEAMWORK**

### STUDENT RESEARCH TEAM



Aiko Nakagawa is a senior graduating in the spring of 2015. Her majors are Psychology and Women's and Gender Studies. She is the current Residence Hall Association (RHA) Sustainability Director and works in the Sustainability Office. While serving as a member of RHA, she has helped host events related to UnPLUg, such as "Hour of NO Power", and helps hall Sustainability directors put on events related to unPLUg. She is excited to apply her growing knowledge to this and future projects.



Neil Wagner is a senior graduating in the spring of 2015. He studies Economics with minors in German and Math. He has worked in the PLU Sustainability Office for over two years. Outside of general recycling, he has done work collecting data on utilities for the university and worked for previous unPLUg and RecycleMania events. He is very interested in applying behavioral economics to motivate positive environmental change.



Ashley Connors is a sophomore double-majoring in Chemistry with an emphasis in Biochemistry and Biology, and a minor in Environmental Studies. She has worked in the Sustainability Office since October 2013. Outside of general recycling, she is interested in advertising to further the goals of sustainability. She hopes to use the information provided by this study to create more effective advertising that educates and persuades students to live sustainably.

### A TEAM OF DEDICATED RESEARCH ADVISORS



Dr. Mark Mulder is an Assistant
Professor of Business at PLU and
teaches Marketing courses in the
undergraduate and MBA programs. He
built an Energy Star rated home,
recognized as being in the top 2%
nationally. Recently, Dr. Mulder has
helped coordinate the funding and
installation of wells to bring clean water
to remote villages in Nicaragua.



**Dr. Matt Luth** is an Assistant Professor of Management at PLU and teaches Introduction to Business in the Global Environment. Prior to his career in academia, he worked for seven years as an environmental engineer, where he studied, designed and built wetlands for an international consulting firm. Dr. Luth appreciates the role of student research.



Nicholas Lorax is the Sustainability Lead at PLU. He graduated from PLU in 2011 with a major in Environmental Studies and a minor in Biology. Nick oversees all aspects of waste diversion and energy conservation at PLU and is an instrumental leader in PLU's commitment to carbon neutrality.

The research team also would like to recognize and thank **Chrissy Cooley**, Sustainable Tacoma Commissioner, for her valuable ideas, work and coordination during this research project.

#### CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

inexpensive interventions can be very effective. Though information about social norms created a weak effect, the flyers detailing energy-saving tips correlated with the highest energy drop of all of the interventions. The other interventions (pledges, visual cues and the sweater-wearing celebrity campaign) hold promise and generated word of mouth, though did not show a significant reduction in energy usage. It is very possible that energy reduction did occur, though the number of participants may have been too small to show a significant statistical effect.

Still, the research found some interesting insights beyond energy use. The survey revealed that women were more likely to report energy conservation behaviors, both past and intended, than men. Additionally, when respondents intended to change their behavior, it was in the interest of protecting the environment or bettering society, rather than to save money or because others were doing it. This validates the desire to avoid the financial incentives, and focus

The results of this study demonstrated that simple, on behavioral interventions. Finally, we found that participants were most likely to conserve energy when the content of the message corresponded to their world view. Specifically, those with a prevention orientation responded positively to prevention messaging, whereas those with a promotion orientation responded positively to the promotion messaging. Thus, this "fit" is important to consider.

> One interesting extension of this research would be to determine the spill-over effect, if any, the drop in energy conservation had on other aspects of sustainability, such as recycling. One way this could potentially happen is through labeling. If a person views himself as sustainable because he is conserving energy, then he may act in other ways consistent with that label. Another potential area for further research would be to determine the effect of similar interventions on the tendency of participants to recycle or to purchase sustainable products, to see if there is a difference when the behavior revolves around the disposal or purchase of items.

#### STUDENT RESEARCH MATTERS. THANK YOU, PUGET SOUND ENERGY, FOR INVESTING IN STUDENT RESEARCH.



### TEAP **NORK**







Independent Colleges of Washington

PLU SEEKS TO EDUCATE STUDENTS FOR LIVES OF THOUGHTFUL INQUIRY, SERVICE, LEADERSHIP AND CARE—FOR OTHER PEOPLE, FOR THEIR COMMUNITIES AND FOR THE EARTH.

