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Shruthi Subramanyam   April 20, 2011

Sustainability in Higher Education: What Do Administrators Have To Do With It?

By

Shruthi Subramanyam

Karen A. Hegtvedt

Adviser

Department of Sociology

Karen A. Hegtvedt

Adviser

Cathryn Johnson

Committee Member

Andrew R. Wilson

Committee Member

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ABSTRACT

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Environmentally responsible behaviors are becoming an integral component of the average American's daily lifestyle. College campuses are also part of the movement as they go "green," increasing students' awareness about sustainability and shaping related behaviors. This study focuses on the impact of how students perceive university efforts to promote sustainability. I argue that to the extent that students perceive university efforts to be legitimate, they are more likely to engage in environmentally responsible behaviors. Responses from 300 students, half of whom lived in campus "green" housing and half in conventional residence halls at a southeastern university, confirm that student perceptions of what administrators do affect their environmentally responsible behaviors. Interestingly, whether students' peers legitimate sustainability efforts has little effect. I discuss results in terms of enhancing sustainability on college campuses.

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INTRODUCTION

Students, doctors, and communities all across the United States are recycling their plastic bottles, using reusable grocery bags, and investing in hybrid cars and solar panels. Environmentally responsible behaviors are becoming an integral component of the average American's lifestyle. College campuses are part of this movement as well, with increased recycling efforts, energy saving competitions, and greener methods of construction.

Colleges and universities in the United States formally acknowledged their commitment to environmentally responsible behaviors by signing the Talloires Declaration in 1990 and the American College & University Presidents Climate Commitment (ACUPCC) in 2007. The ten-point Talloires Declaration, sponsored by the Association of University Leaders for a Sustainable Future (USLF), consists of a commitment to the following types of activities: "create an institutional culture of sustainability," "collaborate for interdisciplinary approaches," and "educate for environmentally responsible citizenship" (USLF 2008). The ACUPCC is another action plan that specifies annual goals focused on climate neutrality. Particular objectives include to compile "a comprehensive inventory of all greenhouse gas emissions…and update the inventory thereafter," "expand research," "make climate neutrality and sustainability a part of the curriculum," and establish policies so future building construction follows at minimum the U.S. Green Building Council Leadership in Sustainability and Environmental Design (LEED) Silver regulations (Presidents' Climate Commitment 2011).

This "green" movement is intended to increase student awareness about environmentalism and shape related behaviors. An important component of these efforts are campus-housing initiatives. Buildings are considered "green" because of their

construction, operation, and programming. Research demonstrates that after educational programs and campus demonstrations, students are more likely to perform sustainable behaviors such as recycling or turning off their lights (Marcell et al. 2004; Kahler 2003). Universities use such initiatives to create and maintain a culture of sustainability.

Researchers typically frame their studies about students' environmental behaviors in terms of the relationship between attitudes and behaviors. While research shows that attitudes are statistically significant predictors of behavior, the relationship between attitudes and environmentally responsible behavior is relatively weak (Schultz et al. 1995). Scholars have also examined other psychological or positional factors that determine conservation behavior. Costanzo (1996) discusses psychological factors, including people's perceptions, evaluation, understanding, and recollection of information about energy conservation. He also comments on positional indicators, such as income, that affect one's behavior. The psychological factors are generally positively related to an individual's environmentally responsible behavior. Income also significantly affects an individual's behavior, because someone with a higher income is better able to afford the more expensive energy-conserving devices.

My study focuses on a potential antecedent to the development of students' environmentally responsible attitudes and behaviors: how do students perceive university efforts to promote sustainability? To answer this question, I draw from legitimacy theory to understand why information conveyed to students has the intended consequences. Legitimacy theory (Walker and Zelditch 1993; Zelditch and Walker 1984) takes into account the context that shapes students' environmental perceptions and actions. "Something is legitimate if it is in accord with the norms, values, beliefs, practices, and

procedures accepted by a group" (Johnson et al. 2006: 55). Two collective sources of legitimacy potentially affect students' behaviors. One source, endorsement, exists when peers, individuals of equal or lower positions, support whatever is being legitimated. The other, authorization, stems from support for the object of legitimation from people in higher positions in the organization or hierarchy, i.e., authorities.

Students' perceptions of the university are shaped by those with whom they interact on a daily basis. University staff structures the broader set of behavioral norms and beliefs that characterize the way things are expected to be done on campus. Thus, in a university context, endorsement occurs when students' peers (e.g. hallmates, classmates) support particular behaviors, and authorization occurs when professors and administrative staff, such as those in the academic and residential realms, support specific behaviors.

In order to examine the effects of students' perceptions of university sustainability efforts on their environmentally responsible behaviors, I look at the experience of a subset of students of the Class of 2012 at Emory University in Atlanta, GA. Two new green residence halls (Few Hall and Evans Hall) opened in Fall 2008, were built to LEED Gold standards, used green technologies, and implemented residential programming related to environmental issues. In contrast, most other freshman residence halls were "conventional," built sometime in the 20th century, and lack green technologies or programming. For this paper, I analyze responses to a survey questionnaire administered in Spring 2009 to residents of the green and selected conventional residence halls.

I begin with a discussion of how colleges and universities across the United States have incorporated sustainability into their campuses, including the surge in construction of green buildings and facilities. I then provide an in-depth look at sustainability efforts at

Emory University, especially the rise of green campus housing. Finally, to frame the impact of university sustainability efforts, I provide an overview of the legitimacy literature, focusing on how endorsement and authorization influence students' environmentally responsible behaviors.

UNIVERSITY GREENING EFFORTS

Sustainability or sustainable development is defined in the Brundtland Report as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations n.d.). Colleges and universities have embraced this definition and have conceptualized it as five unique focus areas to help promote sustainability at their campuses. Bartlett and Chase (2004) describe the five dimensions of university sustainability efforts in their book *Sustainability on Campus: Stories and Strategies for Change*. Considered a guidebook to university greening efforts, Bartlett and Chase emphasize the following: (1) sustainable leadership on campus; (2) building a curriculum around sustainability; (3) green building design; (4) engaging the campus population – students, faculty, staff, and the surrounding community; and (5) creating a system-wide framework to foster sustainability.

Moreover, Bartlett and Chase argue that environmental initiatives do not originate solely from occupants or positions of authority. They can come from any position – students, faculty, and administrators. For example, Christopher Uhl, Professor of Environmental Science at Penn State University, found that after researching "the biotic impoverishment of [the] Amazonian ecosystems" he saw the environment of Pennsylvania State University from a new perspective (Bartlett and Chase 2004: 29). Uhl realized that while people were still abusing the Amazonian lands, the same thing was happened in the

United States. His work provided a blueprint for Pennsylvania State University's sustainability initiatives, which included developing sustainability indicators, an ecological mission, and university policies.

Creating a discourse between the university members and its community is also vital to foster a culture of sustainability. Community members and organizations can provide outlets for students to apply their knowledge and see first-hand how education translates into action. A case study on Allegheny College in northwest Pennsylvania highlights how professors of Environmental Science, Richard Bowden and Eric Pallant, facilitated students' work with local businesses to build ecotourism (Bartlett and Chase 2004).

Bartlett and Chase (2004) also discuss the importance of building a strong curriculum focused on environmentalism to connect students and faculty from various departments. In order to modify the sustainability culture of a university, the first step is to educate the students, followed by providing opportunities to apply their knowledge. Northern Arizona University, St. Olaf College, and Oakland Community College have employed model strategies to promote the knowledge of sustainability at their respective campuses. They offer minor and major concentrations in sustainability; revise their teaching style to foster discussion, critical thinking, and evaluation; and integrate sustainability content into a variety of course work including green chemistry and the relationship between environmental initiatives and business (Herman Miller 2005).

Likewise, universities may incorporate aspects of green building designs into academic buildings, student unions, and campus housing. The conception, planning, and construction of buildings at both Oberlin College and Stanford University highlight the

transformation in green buildings within a university context. David Orr's account of the planning and execution of the Lewis Center for Environmental Studies at Oberlin College reflects how collaboration between students, faculty, and the Oberlin College community can overcome adversity or resistance from the administration in regard to green construction. Similarly, Audrey Chang provides a student perspective on green building construction at Stanford University. Part of a student task force to educate the Stanford community about various principles of environmentalism, Chang discusses her experiences working with the Stanford administration to promote green construction (Bartlett and Chase 2004).

Bartlett and Chase's discussion of green campus buildings and facilities emphasizes campus housing. A majority of underclassmen, especially freshman and sophomores, live in on-campus residence halls in college. These housing options can promote sustainability by incorporating sustainable building guidelines and educational programming into the residence halls. Universities have implemented a variety of green-housing initiatives, including green demonstration rooms, apartments, and houses, green living councils, and sustainability-themed living-learning or residential learning communities (Torres-Antonini and Dunkel 2009).

University housing sustainability initiatives have two distinct components, green education and green operations. The educational dimension is most closely related to residential programming -- events in the residential communities that focus on green topics, such as recycling, and include guest speakers, community service events, academic resources, and group outings. They are often related to broader sustainability initiatives at a university such as recycling programs, sustainable gardens, and energy contests. The

residential programming can be run or facilitated by students or sponsored by leaders in the residential community such as Sophomore Advisors (SAs), Residential Advisors (RA), and Residence Hall Directors (RHDs) (Emory University 2009).

The operations component of sustainability initiatives focuses on the construction of buildings. The US Green Building Council (USGBC) evaluates university buildings based on their compliance with LEED standards. This certification program acknowledges performance in the following nine areas: sustainability sites, water efficiency, energy, natural resources, indoor environmental quality, locations and linkages, awareness and education, innovation in design, and regional priority. The breakdown and certification system for New Construction is out of 110 points. The levels for certification are as follows: 40+ for basic certification, 50+ for Silver Certification, 60+ for Gold, and 80+ for Platinum (USGBC 2011).

Torres-Antonini and Dunkel (2009) have defined two types of green campus housing relevant to Emory's green initiatives: (a) green-certified student housing and (b) sustainability-themed living-learning communities. Green student housing, such as Few Hall and Evans Hall at Emory University, are "those that maximize energy, water, and materials use and that minimize and ultimately eliminate negative impacts on human health and the environment" (Torres-Antonini and Dunkel 2009: 14).

Few and Evans Residence Halls are also considered a living-learning community. Sustainable living-learning communities "integrate academic learning, and community living" focused on environmental issues (Torres-Antonini and Dunkel 2009: 6). Common characteristics of all living-learning communities include: (a) provide a platform to integrate coursework in an interdisciplinary manner, (b) help students create and maintain

social networks among their peers, (c) increase student involvement, (d) improve student performance, and (e) becoming a lens through which students' experiences at a particular college can be understood (Love 1999). Few and Evans staff incorporate these aspects of a living-learning community into their programs and utilization of the space and available resources during the year. Emory University is unique in that the living-learning communities of Few and Evans Residence Halls are much bigger, with about 300 students, and have a large staff of about 25, dedicated to the residential experience of these students (Emory University Residence Life and Housing 2009). Also, the living-learning community experience at Few and Evans is voluntary. All of these components enhance the student residential experience and educate them about sustainable issues.

A second sustainable living-learning community at Emory University is the Asbury House, which hosts the Student Experiment in Ecological Design (SEED) Program. Residents go through an application process to live in the Asbury House. This living-learning community is much smaller than Few and Evans Residence Halls, but also aims to educate and excite people about the environment and incorporate sustainable living techniques into the students' lifestyles.[1]

GREEN EFFORTS AT EMORY UNIVERSITY

The initiatives Bartlett and Chase (2004) discuss, as well as the types of green campus housing presented by Torres-Antonini and Dunkel (2009), have been incorporated into Emory University's sustainability mission. Emory has become a pioneer in the green movement, especially among universities in the southeast region of the United States.

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[1] More details about the Asbury House including building floor plans, list of amenities, and a history can be found on Emory Residence Life & Housing website at http://www.emory.edu/HOUSING/UNDERGRAD/asbury.html.

Beginning about 20 years ago, Emory has engaged faculty, students, and other members of Emory's community to make sustainability a part of the university's mission. This work has brought about changes in three main spheres: leadership, curriculum, and buildings.

The Senate Committee on the Environment (COE) was established in the 1990's to "review capital projects and policy recommendations related to planning, development, and the use of the Emory environment" (Emory Office of Sustainability Initiatives 2008c). The university also created alternative transportation programs in response to the high costs of parking decks and increased local congestion. The program has grown to encompass carpools, vanpools, mass transit programs, and bicycles. In addition, vehicles in the university fleet of buses are fueled by a combination of natural gas, electricity, and biodiesel (Emory University Office of Sustainability Initiatives 2008c).

In 1999, Emory College opened the Environmental Studies Department. This department joined the existing Environmental and Occupational Health Program at the Rollins School of Public Health, and the Environmental and Natural Resources Law Program and Turner Environmental Law Clinic at the law school, as leaders in academic programming related to sustainability. In the same year, the Ad Hoc Committee on Environmental Stewardship was formed. By 2006, the university established the Office of Sustainability Initiatives and appointed Ciannat Howett as director. Her efforts, combined with those of faculty and students, ultimately led to the opportunity to take classes that count toward the Sustainability Minor and Masters in Sustainable Development Practices (Emory University Office of Sustainability Initiatives 2008c).

Leadership

Dr. Peggy Bartlett, Professor of Anthropology at Emory University, formed the Ad Hoc Committee on Environmental Stewardship in 1999. Since then, it has become the core of Emory's green efforts. It has fostered work in the five areas of sustainability discussed above –- leadership, curriculum, green buildings, working with the community, and building a framework to address sustainability. The committee facilitated communication between faculty, staff, administrators, and community officials. The Ad Hoc Committee has also spearheaded efforts to preserve the Lullwater grounds, establish an Environmental Mission Statement for Emory University, and create the Faculty Green Lunch Group. Faculty members meet monthly for the Faculty Green Lunch Group, where they present their research on a variety of environmental issues such as green chemistry, environmental poetry, and water quality in developing nations (Emory University Office of Sustainability Initiatives 2008c).

Curriculum and Community

The Piedmont Project at Emory University focuses on incorporating environmental issues into the current curriculum and developing new courses with an interdisciplinary focus on sustainability. Dr. Bartlett and Dr. Arri Eisen, a biologist, started a summer faculty development program in 2001. Modeled after the Ponderosa Project at Northern Arizona University, this week long workshop allowed professors to brainstorm about sustainability issues, relevant activities, and new courses. In the past nine years, over 167 faculty members have participated and 34 (of 43 or 79%) Emory departments have at least one sustainability-related course. In 2004, the Piedmont Project grew to incorporate a one-day

workshop for graduate students. Since then, 99 graduate students have participated in the

Piedmont Project. (Emory University Office of Sustainability Initiatives 2008c).

Buildings

Emory has 20 buildings on campus with LEED certification. The first LEED-certified

building was the Whitehead Biomedical Research Building. It was constructed in 2002 and

was also the first LEED-certified building to be constructed in the Southeast. Other LEED-

certified facilities at Emory University include Goizueta Business School, Candler Library,

Mathematics and Science Building, and of particular interest to this study -- residence halls

Few and Evans.[2] The residence halls Few and Evans have a specific structure designed to

"save energy and water, feature improved air quality…and are constructed using a

percentage of recycled, local, or rapidly renewable building materials" (Emory University

Office of Sustainability Initiatives 2008a, 2008d). These two residence halls embrace

sustainable technologies via building design, solar power, and flooring materials. The solar

power is used to pump rainwater from a cistern to dual-flush toilets, control active

dimming and day lighting, and contribute to energy efficient air conditioning systems. The

floor materials are from recycled carpet, bamboo, and recycled automobile glass. There is

also a bike room and demonstration kitchen to facilitate green programming and events.

Through these structural components and residence life programming, Few and Evans

Halls teach students about different environmental issues and their impact on the

environment (Emory University Office of Sustainability Initiatives 2008a, 2008d).

These facets of Emory's green efforts provide an overview of how Emory embraces

sustainability in a variety of ways. Clearly institutional support for sustainability has grown

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[2] A full list of LEED-certified buildings at Emory can be found in Appendix A.

both at Emory and at colleges and universities across the United States. What remains is to examine how students perceive these efforts and their impact on environmentally responsible behaviors.

BACKGROUND LITERATURE AND HYPOTHESES

University Greening Efforts and Students' Green Behavior

Although few studies examine how students' perceptions of sustainability efforts affect their environmental behaviors, research has focused on the effects of university sustainability efforts as a whole on students' behaviors. Generally, studies show that university sustainability programs and initiatives have a positive effect on students' environmentally responsible behavior. As described below, these studies focus on university initiatives such as energy competitions between residence halls, paper and online advertising, and visual feedback on energy usage. I have classified the studies based on the three types of sustainable behaviors examined in this study: recycling, conservation, and advocacy.

Research on the effects of university programs on students' recycling behaviors focuses on the effects of recycling outreach. Recycling outreach consists of interventions and education (Schultz 2002). Feedback intervention is one form of recycling outreach. During feedback intervention, members of a particular community or locale receive feedback about their recycling behavior. Research generally shows a positive relationship between feedback intervention and students' recycling behaviors (Goldenhar and Connell 1993). Katzev and Mishima (1992) also find support for the importance of feedback intervention. Their study shows that while a sign stating the number of pounds of paper collected the previous day was in the mailroom, paper recycling was 76.7% above the

baseline level. After the intervention, higher rates of paper recycling continued, with paper recycling about 48.3% above the baseline level.

The relationship between the convenience and proximity of recycling receptacles and recycling behavior has also been examined within (Ludwig et al. 1998; Pike et al. 2003) and outside the university context (Austin et al. 1993; Brothers 1994). These studies show that students are more likely to recycle when the receptacles are in more convenient locations, such as within a specific academic classroom or in the residence halls and apartments. In the workplace, the frequency of recycling also increases when the recycling receptacle is closer to one's work desk or within one's unit.

Studies focused on conservation behaviors in a university context have primarily focused on energy conservation behavior, specifically related to the effects of energy competitions. Energy competitions at the University of California Berkeley, Duke University, University of Hawaii, and the University of Colorado illustrate that after the competitions, students exhibited a higher energy literacy, frequency of energy conservation behaviors, and eagerness to learn about energy saving measures, such as power strips (Barlow 2008). At Columbia University, the Lighting Project encourages residents to exchange their halogen bulbs for compact fluorescent bulbs. The project experienced great success in two of the residence halls, with 600 bulbs being changed and a savings of $38,000 (Barlow 2008).

Energy conservation behavior is also shaped by educational programming in university residence halls (Marcell et al. 2004). Recent research also shows how feedback on students' electricity consumption and energy competitions increase students' awareness in regard to their energy expenditure (Peterson et al. 2007). Similarly, tours of

an energy-efficient residence hall open to the campus community informed the student population about the university's general sustainability efforts and provided insight on how they could improve their energy conservation habits (Kahler 2003).

Research studies have focused on other conservation behaviors, such as the use of reusable grocery bags instead of single-use plastic bags and reusable mugs as opposed to disposable drink containers (Barlow 2008). Both sets of studies demonstrate that once the environmentally friendly product was available, students found them very convenient to use and felt the item helped them reduce their waste. At the University of Colorado Boulder, Barlow (2008) found that students claimed that: it was very easy to use reusable bags at their campus dining Grab-N-Go Venues; it was somewhat easy to remember to bring the bag; and the bags were easy to clean. Importantly, 88% of respondents indicated they felt the bags helped reduce their waste, indicating that the reusable bags help promote sustainable behavior.

Although studies clearly show the impact of university efforts on recycling and conservation, little research really examines the independent effect of university efforts on advocacy behaviors. Advocacy behaviors have often been grouped with conservation or recycling behaviors to create a joint scale (Korfiatis 2004) or a specific advocacy behavior has been measured (Harland et al. 1999). However, advocacy behaviors are important in demonstrating that students are moving beyond individual behaviors to focus on larger issues of sustainability in the community and getting other individuals to change their behavior. In this study, I analyze recycling, conservation, and advocacy behaviors separately.

These aspects of university greening efforts at colleges across the United States provide an overview as to how the initiatives affect students' environmentally responsible behavior. It is clearly evident that students' experiences in college do affect their personal behavior. What remains to be examined, however, is why university efforts work. To begin to explain the impact of university efforts, I focus on student perceptions.

Theoretical frameworks

Consideration of students' development at college and their perceptions of college activities and initiatives is important to understand "why" students' perceptions of university sustainability efforts affect their environmentally responsible behaviors. Thus, this section considers two types of theories: student development and the social psychology processes of legitimacy.

Student development theories examine students' prioritization of attitudes, behaviors, and values over the course of their college career. They explain how the college environment affects students' attitudes, beliefs, and values. The work of Pascarella and Terenzini (2005), focused on students' change in sociopolitical attitudes and values during college, suggests that students' college experience do affect their attitudes and values. Students graduating from college in 1989 considered themselves more like "social activists" at the end of their senior year than when they started college in fall 1985. Studies from the 1990s illustrate smaller shifts in attitudes over time in college, but the trend remains the same. This research on student development during college thus demonstrates that students' attitudes and beliefs about civic engagement, discourse, and sociopolitical issues do change during their college years. These attitudes tend to be more liberal after college and are often linked with greater environmental concern or a higher frequency of

environmentally responsible behaviors. This means students' college experiences do shape their views on the environment and other sociopolitical issues.

The student development literature also expands upon the relationship between student attitudes and behavior and the educational component of residential housing. In particular, students who live on-campus are more likely to be satisfied with their college experience and experience greater changes in their specific values and attitudes during college than students who live off-campus (Pascarella and Terenzini 2005). Students who live in an environment with a particular purpose experience greater change in ideals as well because of the "purposeful, programmatic efforts" (Pascarella and Terenzini 1991: 178).

The residence halls of Few and Evans are prime examples of these goal-oriented environments -- they serve to educate students about living green, how to serve as leaders in the community, and incorporate a "living green" lifestyle into their daily routine. Few and Evans also incorporate a variety of facilities that promote environmentally responsible behavior. Each building features an Energy Monitor, recycling rooms, dual-flush functioning toilets, and automatic lights in the halls and study rooms (Emory Residence Life & Housing 2008). Past research shows that when students are in an environment with targeted sustainable programming, supplemented by green facilities, they are more likely to engage in environmentally responsible behaviors (Barlow 2008; Kahler 2003; Marcell et al. 2004). Thus, I propose the following:

Hypothesis 1: The frequency of environmentally responsible behaviors will be

higher for those living in green residence halls than in conventional residence halls.

The student development framework is useful because it suggests individuals'
experiences in college matter and reflects how they change over time. More generally,
however, social psychological frameworks emphasize how what people perceive impacts
what they do. Here, my use of legitimacy theory as the theoretical basis for this study
allows me to focus on how students' perceptions of social support, from peers and
administrators, of a particular norm, belief, attitude, or procedure affect what they do.[3]

In sociology, the work of Max Weber (1918) provides the foundation for discussions
of legitimacy. Weber stated that legitimation occurs when a social order is in accordance
with the norms and beliefs that individuals see as widely shared. Dornbush and Scott
(1975) applied Weber's ideas to the realm of organizations in the 1970's. Through this
research, they defined two aspects of legitimacy – propriety and validity. Propriety refers
to approval of a specific social norm at the individual level. An individual believes that the
specific social norms "are desirable and appropriate patterns of action" (Johnson et al.
2006: 55). On the other hand, validity is related to approval of the social norm at the group
level. Validity is defined as the individual's belief that he/she is obliged to obey these
norms regardless of personal approval (Johnson et al. 2006; Walker and Zelditch 1993).
Individuals might have personal beliefs that differ, but they recognize that the larger
community supports a particular norm that nonetheless governs their behavior. Thus,

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[3] A parallel theoretical framework in the realm of social psychology is the Theory of
Planned Behavior (TPB) (Ajzen 1985, 1991). It examines the relation between attitudes
and behaviors and considers subjective norms as an inhibiting or facilitating factor in this
relationship. The notion of subjective norms, perceived social pressure to perform or not to
perform the behavior, could be capture by perceived peer and administrative sanctions in
the context of legitimacy. However, I do not use TPB as the theoretical framework for my
study, because in TPB the subjective norms mediate the relationship between beliefs and
behavior. Here, I follow legitimacy theory, and argue instead that students' perceptions are
a direct antecedent of behavior, not a mediating factor.

though individuals may hold different personal beliefs, because of the validity of norms, they nonetheless comply with them (Johnson et al. 2006).

Zelditch and Walker (1984, 2003; Walker & Zelditch 1993) augment the notion of validity by focusing on collective sources of legitimacy, detailing how collective support can maintain the legitimation of an object, rule, or action. Legitimacy is accomplished through endorsement and authorization. Endorsement occurs when one's peers, or those at a similar or lower position in a hierarchy, support a particular object, behavior, rule, or procedure. Authorization occurs when one's superiors, those at higher positions in a hierarchy, support the same. Endorsement and authorization of an object, behavior, rule, or procedure typically produce compliance of a related behavior.

Zelditch (2006) also argues that a norm, belief, procedure, or action is considered valid if it is thought to be normative and incorporated into everyday practice. With, for example, a valid norm or behavior, individuals observe that others act in accordance with it and come to likewise support it. With a valid norm, individuals are more likely to participate in the behavior because they (a) consider it a duty to do so, (b) expect that others will do so as well, and (c) believe that they will receive negative sanctions for noncompliance. Individuals' compliance with a social norm is indicated by their enactment of the appropriate behavior.

It is also important to note that individuals' compliance with a particular norm, belief, procedure, or action also depends on certain factors associated with propriety. Propriety is shaped by a variety of factors, including identity, attitudes, and other social categories, such as gender, race, and income. In this study, I control for propriety indirectly

by including these background factors to focus on the relationship between student behavior and sources of legitimacy.

Research shows that authorization and endorsement enhance the validity of a norm, belief, procedure, or action. In a series of studies, Zelditch and colleagues (Dornbush and Scott 1975; Walker and Zelditch 1993; Zelditch and Walker 1984) demonstrate that individuals are more likely to comply with a particular structure – even if it does not benefit them directly – if authorities support the structure. By doing so, individuals avoid formal sanctions from authorities for noncompliance. Similarly, people are more likely to comply with a particular norm, belief, procedure, or action if their peers support the structure. In this way they avoid informal sanctions from their peers (Johnson et al. 2000; Walker et al. 1986; Zelditch and Walker 1984).

Therefore, I propose the following regarding the basic relationship between authorization, endorsement, and student behavior.

Hypothesis 2: Perceived authorization of environmentally responsible behavior will have a positive effect on the frequency of students' environmentally responsible behavior, while controlling for all other variables.

Hypothesis 3: Perceived endorsement of environmentally responsible behavior will have a positive effect on the frequency of students' environmentally responsible behavior, while controlling for all other variables.

Some legitimacy studies that focused on the comparative effects of endorsement and authorization have found endorsement is more salient for individual behavior. Johnson and colleagues (Johnson et al. 2000) examine how likely a sample of college students are to express their emotions toward their manager when placed in a scenario where they occupy

a subordinate position. A possible explanation as to why perceived support from one's

coworkers, endorsement, has a greater effect on the likelihood of expressing emotions than

perceived authorization stems from the subordinates' interactions with their coworkers

versus authority figures. It may be that subordinates have more opportunities to express

their feelings in the presence of coworkers than when surrounded by authority figures. In

the same manner, if a subordinate's coworkers support the authority figures, the individual

is less likely to express their feelings because they fear informal sanctions from their

coworkers.

Given that the context of this research study is at a university, students interact on

average more often with students than with the administration. They live together with

their peers, participate in student organizations, and attend social events outside of the

classroom. So it may be that peer support is more salient for students and thus has a strong

impact because of the intimate and frequent relationships they form with other peers. Thus

I propose the following:

Hypothesis 4: Perceived endorsement of environmentally responsible behaviors will

have a stronger effect on the frequency of environmentally responsible behaviors

than perceived authorization of such behavior, controlling for all other variables.

The effects of the sources of legitimacy on behavior and/or compliance may stem

from the proposed underlying mechanism: the possibility of sanctions from peers and

authorities. When a particular behavior is strongly authorized and endorsed, individuals

comply with the "legitimized" behaviors because they fear sanctions from both their peers

and superiors (Johnson et al. 2006). Perceived support by peers and authorities for a

behavior raises concerns with potential informal or formal sanctions. Michener and Burt

(1975) have demonstrated that perceived sanctions are an indirect mechanism for compliance. The greater the intensity of the expected punishment, the more likely the individual will comply. Thus, I propose the following hypotheses:

Hypothesis 5: Perceived sanctions from peers for not performing environmentally responsible behaviors will have a positive effect on the frequency of environmentally responsible behaviors, when controlling for all other variables.

Hypothesis 6: Perceived sanctions from the administration for not performing environmentally responsible behaviors will have a positive effect on the frequency of environmentally responsible behaviors, when controlling for all other variables.

METHODS

Sample

In Fall 2008, Emory University opened two new "green" residence halls for freshman. My set of respondents is drawn from the population of first year students inhabiting these green residence halls, as well as two conventional or non-green residence halls. Freshman wishing to live in one of the green residence halls were required to go through an application process, which included an admissions essay on why they wanted to live in the green residence halls. Not all students who applied to live in the green residence halls were accepted, however. Many students who ultimately lived in conventional residence halls applied for the green residence halls.

My data consist of survey responses from freshman students in Spring 2009.[4] The

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[4] This analysis is part of a longitudinal study to examine the environmental attitudes, identities, and behaviors of first year students at Emory University, who are part of the Class of 2012. The survey was administered at two points – prior to the students' arrival to college and at the culmination of their first year at college. In my analysis, I use the data collected at the second time point.

residents in the "green" residence halls and two conventional residence halls were sent an email with a link to the survey. The survey took approximately 15 to 20 minutes to complete. All residents who participated received $10 on their student card, which may be used to pay for campus dining, printing, and similar transactions.

The survey includes questions about environmental attitudes, environmental identity, perceptions of university staff and university sustainability efforts, environmentally responsible behaviors, perceived environmentally responsible behaviors performed by peers, and demographics. Three hundred students participated in the survey, for a response rate of about 50%. The demographics and type of residence hall of our respondents accurately reflects the incoming Class of 2012 at Emory University. In the sample, 55% of the respondents are female and 45% are male. In terms of racial and ethnic background, 61% of the sample is Caucasian, 27% Asian/Asian American/Pacific Islander, 5% Multiracial, 4% African American/Black, and 3% Hispanic/Latino/Chicano. The Class of 2012 is 52% female, 48% male, 45% Caucasian, 31% Asian, 9% African American, 4% Hispanic, and 1% Native American (Loftus 2009). In addition, 140 respondents applied to and were assigned to live in one of the two green residence halls and 160 were assigned to conventional residence halls on campus.

Measures

Multiple indicators constitute the dependent and independent variables in my analysis. Thus, I created scales for each variable, fusing principal component factor analysis with a varimax rotation and theoretical considerations. Each of these scales is additive, standardized by the number of items. I first discuss the indicators used to measure each variable and the coding scheme. I then report factor analysis and scale reliabilities.

Dependent Variables

To capture students' environmental behavior during the school year, the survey asks whether respondents had engaged in 15 specific environmentally responsible behaviors during the school year. All responses were measured on a 7-point Likert scale ranging from 1 (Never) to 7 (Always). I used principle component factor analysis to determine whether they loaded on similar components. Three mutually exclusive sets of behaviors emerged from this analysis: recycle, conserve, and advocacy.

The *recycling* scale includes items related to the respondents' recycling behavior. The five-item scale includes the following: "During this school year, how often did you…" (1) recycle paper; (2) recycle containers (e.g., plastic, glass, aluminum); (3) encourage family members to recycle; (4) encourage friends to recycle; and (5) purchase products in reusable or recyclable containers. The items stem from previous studies on environmental concerns (Milfont and Duckitt 2004; Pendarvis 2002). The reliability analysis for this scale is quite high, with a Cronbach's alpha of .903. Each of these indicators loaded on the same component in the factor analysis (Eigen values: recycle paper = .855; recycle containers = .845; encourage family members to recycle = .856; encourage friends to recycle = .905; and purchase products in reusable containers = .781).

The *conservation scale* includes items pertaining to reducing the amount of materials used and reusing the materials students do use. The term "materials" refers to anything from drinking containers and water consumption to energy and transportation. The five-item scale includes the following: "During this school year, how often did you…" (1) turn off the faucet while brushing your teeth; (2) turn off lights when exiting a room; (3) walk, ride a bike, or take public transportation instead of driving or riding in a car; (4)

unplug "chargers" for phones, iPods, etc. when not in use; and (5) carpool to a destination. I

drew upon previous studies on sustainable behavior for these measures as well (Harland et

al. 1999; Pendarvis 2002). The reliability analysis for this scale is acceptable, with a

Cronbach's alpha of .716. Each of these indicators loaded on the same component in the

factor analysis (Eigen values: turn of faucet = .720; turn off lights = .774; public

transportation = .692; unplug "chargers" = .494; and carpool = .730).

The *advocacy* scale includes respondents' activities that limit their use of

environmentally unfriendly items and by implication, advocate for more environmentally

responsible behaviors, and group activities related to environmentalism. The four-item

scale includes the following: "During this school year how often did you…" (1) limit your

consumption of meat for environmental reasons; (2) advocate for solutions to

environmental problems; (3) avoid using products harmful for the environment; and (4)

attend a meeting or event sponsored by an environmental group. These measures stemmed

from previous studies on environmental behavior (Biga 2006; Harland et al. 1999; Korfiatis

2004). The reliability analysis for this scale is quite acceptable, with a Cronbach's alpha of

.753. Each of these indicators loaded on the same component in the factor analysis (Eigen

values: limit your consumption of meat = .679; advocate for solutions to environmental

problems = .817; avoid using products harmful for the environment = .736; and attend a

meeting sponsored by an environmental group = .797).

Independent Variables

Endorsement: Peer support of sustainability initiatives at Emory. This two-item scale

includes the following: "How much do each of the following groups support the

sustainability initiatives at Emory?" (1) floormates and (2) other students. All responses

were measured on a 7-point Likert scale ranging from 1 (Not at all) to 7 (A great deal). The bivariate correlation for these two factors is .715.

     Authorization: Authorities' support of specific environmentally responsible behaviors. This 10-item scale includes the following: "How much does Emory encourage students to…" (1) advocate for environmental solutions (e.g., writing letters, protesting, signing petitions); (2) belong to environmental groups; (3) recycle paper; (4) recycle containers (e.g., plastic, glass, aluminum); (5) conserve water; (6) conserve energy; (7) talk about environmental issues/problems; (8) turn off lights when exiting a room; (9) use alternative forms of transportation (e.g., bicycling, Cliff shuttles); and (10) eat locally produced foods. All responses were measured on a 7-point Likert scale ranging from 1 (Not at All) to 7 (A Great Deal) with an additional option of 0 (Don't Know). The reliability for this scale is extremely high, with a Cronbach's alpha of .957. Each of these indicators loaded on the same component in the factor analysis (Eigen values: advocate for environmental solutions = .693; belong to environmental groups = .750; recycle paper = .913; recycle containers = .911; conserve water = .919; conserve energy = .894; talk about environmental issues = .852; turn off lights = .881; use alternative forms of transportation = .874; and eat locally produced foods = .811).

     Peer sanctions. This two-item scale includes the following: "How likely would members of the following groups be to frown upon you if you failed to act in an environmentally friendly way?" (1) floormates and (2) other students. All responses were measured on a 7-point Likert scale ranging from 1 (Very Unlikely) to 7 (Very Likely). The bivariate correlation for these two factors is .806.

Administrative sanctions. This three-item scale includes the following: "How likely would members of the following groups be to frown upon you if you failed to act in an environmentally friendly way?" (1) Residence Life administration, (2) professors, and (3) Emory administration. All responses were measured on a 7-point Likert scale ranging from 1 (Very Unlikely) to 7 (Very Likely). The reliability of this scale is high, with a Cronbach's alpha of .915. Each of these indicators loaded on the same component in the factor analysis (Eigen values: Residence Life administration = .928; professors = .923; and Emory administration = .921).

Controls

Demographics. Other variables, in addition to the focal legitimacy factors may affect environmental behaviors. I control for many demographic factors including gender (0 = male), race (0 = nonwhite), income, parental education levels, environmental identity, and attitudes. (Appendix B provides detailed coding information.) These variables are included as controls, because previous research on environmental concerns shows that demographic variables as well as environmental identity and attitudes may affect environmentally responsible behavior (Biga 2006; Clayton 2003; Sparks and Shepherd 1992; Stets and Biga 2003).

Environmental identity. Environmental identity was measured by a 10-item scale, derived from Clayton's (2003) environmental identity scale, designed to assess the degree the environment affects a person's self-definition. The original scale consists of 22 statements but I use ten items specifically focused on the importance of environmental behaviors and individuals' connection with the environment, which were shown in a pretest on a similar subgroup to capture environmental identity. Responses were scored on

a 7-point Likert scale ranging from 1 ("Not at all true of me") to 7 ("Completely true of me"). The scales includes items such as "Being a part of the ecosystem is an important part of who I am;" "I spend a lot of time in natural settings (woods, mountains, desert, lake, ocean);" and "I think of myself as a part of nature, not separate from it." A full list of the 10 items used in the scale can be found in Appendix B. The environmental identity scale has a Cronbach's alpha of .931.

Environmental attitudes. Environmental attitudes were captured in two scales: one measuring attitudes toward government activities and laws (*government attitude scale)* and one measuring attitudes toward issues suggesting environmental crises (*crisis attitude scale)*. These scales derive from work done by Milfont and Duckitt (2004, 2010). The responses were measured on a 7-point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). Thus, higher numbers represent more environmentally friendly attitudes.

The *government attitudes scale* consists of the following: "How much do you disagree or agree with the following statements?" (1) The government should tax companies who pollute the natural environment; (2) People should pay higher taxes in order to protect the environment; (3) Laws to protect the environment limit my choices and personal freedoms (reverse coded); and (4) There should be laws that require companies to make their products more energy efficient. The reliability for this scale of four items is .681.

The *crisis attitudes scale* consists of the following: "How much do you disagree or agree with the following statements?" (1) Funding for environmental protection is a bigger priority than funding for the creation of new jobs; (2) Environmental protection benefits everyone; (3) The environmental crisis has been greatly exaggerated (reverse coded); and

(4) There are other problems more pressing than the environmental crisis (reverse coded).

The reliability for this scale for these four items is .525.

Analysis

I used ordinary least squares (OLS) regression to test the effect of direct and

indirect measures of legitimacy on the three types of environmentally responsible

behaviors. I ran three separate models to analyze the direct effects of my independent

variables on recycling, conservation, and advocacy. Model 1 includes controls, type of

residence hall, and the three environmental behavior categories. Model 2 involves the

control variables, type of residence hall, endorsement, and authorization. The authorization

variable measures Emory's encouragement of specific environmental behaviors, while the

endorsement variable measures general support by floormates and other students of

Emory's sustainability initiatives. Finally, my full model (Model 3) includes controls, type of

residence hall, endorsement, authorization, peer sanctions, and administrative sanctions.

Peer and administrative sanctions parallel the indicator for endorsement, in that they focus

on Emory's sustainability efforts in general, not specific behaviors. The "sanctions"

indicators measure general disapproval if students fail to act in an environmentally friendly

way.

RESULTS

Descriptives and Residence Hall Effects

Tables 1A and 1B provide the descriptive statistics for each of the dependent,

independent, and control variables. As shown in Table 1B, several patterns are noteworthy.

Among green behaviors, conservation behaviors are the most common (mean=4.91),

followed closely by recycling behaviors (mean=4.43). Advocacy behaviors are, however,

the least common (mean=3.02). This is possibly because the conservation and recycling behaviors are incorporated into the specific residence hall and campus-wide programming, require less time, and are easier to incorporate into one's daily lifestyle than the advocacy behaviors. Overall, the means for most of my variables are above the midpoint on the 7-point scales, indicating high levels of environmental identity, government and crisis attitudes, authorization, perceptions of administrative sanctions, recycling, and conservation behaviors. The only variables with a below-midpoint mean are perceived endorsement, peer sanctions, and advocacy behaviors.

[Tables 1A and 1B about here]

Many of the variables are correlated as expected (Table 2). The type of residence hall is significantly correlated with students' recycling behaviors (r = .352, p < .01), conservation behaviors (r = .154, p < .05), and advocacy behaviors (r = .262, p < .01). Environmental identity is also significantly correlated with students' recycling behaviors (r = .643, p < .01), conservation behaviors (r = .535, p < .01), and advocacy behaviors (r = .695, p < .01). Finally, gender is significantly correlated to students' recycling behaviors (r = .183, p < .01) and conservation behaviors (r = .314, p < .01). It is not, however, significantly related to advocacy behaviors.

[Table 2 about here]

Hypothesis 1 states that students living in green residence halls will exhibit strong green behaviors than students living in conventional residence halls. As shown in Table 3 (all models), the type of residence hall has a significant effect on students' recycling behavior (b= .682, p < .001) and students' advocacy behaviors (b = .353, p < .001), indicating students in green residence halls are more likely to partake in these behaviors.

The type of residence hall, however, does not have a significant effect on students' conservation behavior. Thus, Hypothesis 1 is supported for recycling and advocacy behaviors, but not for conservation behaviors.

[Table 3 about here]

Legitimacy effects

Hypothesis 2 states that perceived authorization and students' environmentally responsible behaviors have a positive relationship. Results in Table 3 provide some support for this hypothesis. Concerning recycling behaviors, perceived authorization has a positive relationship with students' behavior (b=.121, p < .01). The effects remain the same in Model 3, when factoring in peer and administration sanctions (b=.111, p < .05). Perceived authorization also has a positive and significant relationship with students' conservation behavior (b=.133, p < .001). The effects remain the same in Model 3 (b=.107, p < .01). The effect of authorization on advocacy behaviors, however, approaches significance and is not in the predicted direction (b=-.067). In Model 3, the effect of authorization on advocacy behaviors also approaches significance and is not in the predicted direction (b= -.071). Thus, Hypothesis 2 is supported for recycling and conservation behaviors, but is not supported for advocacy behaviors.

Hypothesis 3 predicts a positive relationship between perceived endorsement, measured by how peers support environmental initiatives at Emory, and student environmentally responsible behavior. Concerning recycling and conservation behaviors, the relationship between endorsement and student green behavior is not statistically significant. However, endorsement has a significant effect on students' self-reported advocacy behaviors (b = .114, p < .05) and is in the predicted direction. Endorsement

continues to have a significant effect on students' advocacy behaviors when taking into account peer and administrative sanctions (b=.125, p < .01). Thus, Hypothesis 3 is supported for advocacy, but is not supported for recycling and conservation.

Hypothesis 4 compares the effects of endorsement and authorization on students' green behavior, suggesting that endorsement will have greater effects. As the results described above indicate, however, Hypothesis 4 is confirmed only with regard to advocacy behaviors. For recycling and conservation behaviors, authorization, not endorsement, has significant positive effects on the behaviors. Thus, Hypothesis 4 is not supported in regard to recycling and conservation behaviors.

Effects of sanctions

The literature states that students comply with the "legitimized" behaviors in order to avoid sanctions from their peers and/or the administration. Model 3 in Table 3 provides results relevant to the impact of sanctions, controlling for all other variables. Hypothesis 5 suggests peer sanctions will have a positive effect on students' green behavior. Concerning recycling and advocacy behaviors, the relationships between perceived peer sanctions and students' green behavior are not statistically significant. Perceived peer sanctions do have a significant effect on students' self-reported conservation behaviors (b= -.114, p < .05), but it is not in the predicted direction. Thus, Hypothesis 5 is not supported for recycling, conservation, or advocacy.

Hypothesis 6 also suggests administrative sanctions will have a positive effect on students' green behavior. Findings show that the relationships between recycling and advocacy behaviors and perceived administrative sanctions are not statistically significant. Perceived administrative sanctions do, however, have a significant positive effect on

students' conservation behavior (b=.128, p < .01). Thus, Hypothesis 6 is supported for conservation, but is not supported for recycling and advocacy.

Effects of control variables

Gender has a significant effect on students' recycling behavior (b= .308, p < .05) and students' conservation behaviors (b=.414, p < .001), indicating women are more likely to partake in these environmentally responsible behaviors. The relationship between gender and students' advocacy behaviors is not statistically significant. Race and income do not have a significant effect on recycling or advocacy behaviors. The effect of race on students' conservation behaviors approaches significance (b= -.058), meaning nonwhites are more likely to partake in conservation behavior than whites. The effect of income on students' conservation behaviors also approaches significance (b = -.058), indicating that students whose parents have a lower income are more likely to partake in conservation behavior than students whose parents have a higher income. Parental education and environmental attitudes do not have a significant effect on students' environmentally responsible behaviors in any of the models. Finally, environmental identity has a positive effect on self-reported recycling (b= .596, p <.001), conservation (b=.372, p < .001), and advocacy (b=.626, p <.001). These findings are consistent with previous literature that states environmental identity has a positive effect on environmentally responsible behavior (Stets and Biga 2003).

[Table 3 about here]

Additional Findings

I also ran the OLS regression models with subsamples of those students living in (a) green and (b) conventional residence halls (Tables 4 and 5). While the findings discussed

above illustrate that the type of residence hall has a significant effect on recycling, conservation, and advocacy behaviors, this additional analysis shows whether effects of perceived legitimacy and sanctions vary between green and conventional residence halls. Table 6 compares my findings between the full sample and subsamples of students in the green and conventional residence halls. It shows whether Hypotheses 2-6 are supported or not supported across the three samples.

[Tables 4, 5, and 6 about here]

With residence hall a factor in the models, authorization has significant relationships with students' recycling and conservation behaviors, but not with advocacy behaviors. Based on the responses of students living in the green residence halls, the effect of authorization on recycling (b = .114) approaches significance. Authorization has a significant effect on students' conservation behavior (b = .092, p < .05). However, it does not a have a significant effect on advocacy behaviors. For students living in the conventional residential halls, the effect of authorization on conservation (b = .116) approaches significance. Authorization does not have a significant effect on recycling and advocacy behaviors.

Endorsement does not have a significant effect on recycling or conservation in the full sample. Likewise, for students living in both conventional and green residence halls, endorsement does not have significant relationships with students' recycling and conservation behaviors. For students living in the green residence halls, the relationship between endorsement and advocacy behaviors is not statistically significant, unlike the results for the full sample. However, the effect of endorsement on advocacy behaviors for students living in the conventional residential halls approaches significance (b=.139).

When the effects of authorization and endorsement on students' environmentally responsible behavior are compared, authorization has a greater effect on students' recycling and conservation behaviors amongst the entire sample. Likewise, for students living in both conventional and green residence halls, authorization has a greater effect on students' conservation behavior. The effect of authorization is also greater for recycling behaviors for students living in green residence halls. However, the relationships between endorsement and authorization and recycling behaviors are not statistically significant for students living in the conventional residence halls. Interestingly, administrative support of environmentally responsible behaviors matters for recycling behaviors of those students in the green residence halls, but not for those in the conventional residence halls.

In addition, endorsement has a greater effect on students' advocacy behaviors in the full sample. Similarly, for students living in the conventional residence halls, the effect of endorsement is greater for advocacy behaviors. On the other hand, the relationships between endorsement and authorization and advocacy behaviors are not statistically significant for students living in the green residence halls, unlike the results for the full sample. Thus, the findings show that peer support significantly impacts advocacy behaviors of those students in the conventional residence halls, but not for those in the green residence halls.

According to the model with the full sample, peer sanctions do not affect students' recycling and conservation behaviors and are positively related to students' advocacy behaviors. For students living in the green and conventional residence halls, peer sanctions do not have a significant effect on recycling, conservation, or advocacy behaviors.

In the model with the full sample, administrative sanctions have significant effects on students' recycling and conservation behaviors. The relationship between administrative sanctions and students' advocacy behaviors in the full sample is not statistically significant. For students living in the green residence halls, the relationships between administrative sanctions and recycling and advocacy behaviors are not statistically significant. The effect of administrative sanctions on conservation behaviors approaches significance (b=.100). For the students living in conventional residence halls, the relationships between administrative sanctions and recycling and advocacy behaviors are not significant. The effect of administrative sanctions on conservation behavior also approaches significance for students living in conventional residence halls (b=.146).

These finding illustrate that the pattern of effects of legitimacy factors across residence halls is generally the same in comparison to the full sample. A key distinction, however, is the importance of peer support of advocacy behaviors, which is stronger for students in conventional residence halls than those in the green residence halls.

DISCUSSION

My goal in this research study is to determine how students' perceptions of university efforts directly and indirectly affect students' green behaviors. Several key findings emerge that have further implications for research on factors that shape environmentally responsible behaviors as well as residence hall programming and sustainability efforts at university campuses.

First, my findings show that support from peers or authorities has a significant effect on students' recycling, conservation, and advocacy behaviors. Such patterns are consistent with previous legitimacy studies that show individuals are more likely to comply

with a behavior if their peers and authorities support the structure, in order to avoid sanctions from these individuals. Endorsement and authorization, however, have differing effects on recycling, conservation, and advocacy.

Endorsement, or support from one's peers, has a significant, positive effect on students' advocacy behaviors. However, contrary to my hypothesis, the relationships between students' recycling and conservation behaviors are not significant. A possible explanation is advocacy behaviors are seen as more group activities so peer support is represented by students attending meetings with each other. Recycling and conservation may, however, be considered more individual behaviors and not contingent on simultaneously engaging in the activity with one's peers.

Support from the administration has a significant effect on students' recycling and conservation behaviors, but not advocacy behaviors. The effect of authorization on advocacy is negative and approaches significance, contrary to my hypothesis. This could be because students often do not directly interact with the administration when they decide to partake in advocacy behaviors, such as limiting their consumption of meat or attending an event sponsored by environmental group. As a result, students see their advocacy behaviors as independent of the administration.

The university could strengthen perceptions of advocacy behaviors by implementing more initiatives, such as facilitating public discussion on these topics and heavily advertising these opportunities to students. Emory's efforts regarding recycling and conservation are extremely visible, well advertised, and incorporated into residential programming. Emory has an annual energy competition, Recyclemania (university-wide recycling competition), and recycling receptacles in all residence halls. These university

initiatives aimed at interventions clearly demonstrate that the administration supports

recycling and conservation behaviors. By adapting these initiatives to focus on advocacy,

the university could create a needed structure and, over time, generate support for such

behaviors.

In addition to leveraging advocacy-based initiatives, the university could capitalize

on the importance of peers' support in the frequency of students' advocacy behaviors,

thereby affecting students' perceptions regarding university's advocacy efforts. In the

context of the university, student environmental groups could lead campus-wide activities.

In the context of Residence Life and Housing and the specific residence halls, the Resident

Advisors and Sophomore Advisors could facilitate discussion and activities among the

students.

Previous literature also shows that perceptions of sanctions from peers and

authority figures are positively related to students' environmentally responsible behaviors

(Walker and Zelditch 1993). The more students perceive sanctions from peers and their

authority figures, the more likely they are to comply with the behavior to avoid such

consequences. My findings, contrary to my hypothesis, show that sanctions from peers do

not positively affect recycling, conservation, or advocacy behaviors. This could be because

peer sanctions are more implicit and are not clearly visible in student interaction or

conversation. Even though students have numerous conversations with each other on a

variety of topics, peer responses to environmentally irresponsible behaviors may be hard

to detect because they are communicated non-verbally. Thus, peer sanctions are not as

salient in the university context as expected.

According to my findings, administrative sanctions only significantly affect students' conservation behaviors. A possible explanation could be that conservation is already present or "built in" in many aspects of the university. The university invests a lot of money into sustainable building materials, automatic lighting, and other ways to conserve energy on campus. As a result, students feel a support structure for conservation behaviors is in place and they should respect that. Students also fear sanctions from the administration for failing to adhere to this behavior.

In addition, because the university controls the lights and energy in the residence halls, they may be able to impose sanctions by limiting the energy and thus affect students' conservation behaviors. However, what exactly can the university do when students do not recycle or participate in advocacy behaviors? Since the administration does not directly interact with students when they are about to recycle a plastic bottle or decide to attend a meeting sponsored by an environmental group, they have less control over these behaviors. As a result, perceived administrative sanctions related to recycling and advocacy behaviors are not as pronounced in the university setting.

A third finding is that generally the effects of direct and indirect measures of legitimacy are consistent between the full sample and the sub samples of students living in the green and conventional residential halls. Differences arise, however, when examining the effects of endorsement on students' advocacy behaviors and the effects of authorization on students' recycling behaviors. For students in the conventional residence halls, endorsement does have a significant effect on students' advocacy behaviors, while for students in the green residence halls it does not. A possible explanation is that students in the green residence halls had to write an essay to live in the green residence halls, meaning

they all have a similar, high interest in environmental issues. As a result, they believe that their hallmates engage in advocacy behaviors and are aware about environmental issues, so peer support has no additional effect on their behavior. This is in comparison to students in the conventional residence halls, where students' environmental concerns and behavior vary, so peer support could potentially affect the frequency of students' environmentally responsible behavior.

It is also interesting in that authorization has a significant effect on students' recycling behavior for students in the green residence halls but not for students in the conventional residence halls. This could be explained by the difference in recycling-based initiatives and programs in each residence hall. While both residence halls are equipped with recycling receptacles, the green residence halls have a large recycling room on each floor and the university gives each student his/her personal recycling receptacle. The use of the individual recycling bins makes it more convenient for the students to transport their recyclables from their room to the larger recycling room. Since the university is investing time and effort to distribute these receptacles, the students could see this as enhancing university's support and concern for recycling issues, thereby bolstering the structure and social norm of recycling that is currently in place.

Limitations and Directions for Future Research

There are limitations to this study that are important to consider. First, the measures for endorsement focus on peers' general support of Emory's sustainability initiatives, while measures for authorization focus on authorities' support of specific sustainable behaviors. The measures of endorsement should change to focus on specific environmentally responsible behaviors. As a result, indicators of endorsement would

parallel those of authorization and serve as a more comprehensive measure of peer support of students' environmentally responsible behaviors.

In addition, the sample primarily includes first-year students. Focusing on the responses of first-year students then suggests a conservative effect of perceived authorization. Even though first-year students are still learning about the university, the university's efforts still had an effect on students' environmentally responsible behaviors. So perhaps a limitation is that the study doesn't involve upper class students who live off-campus, who have established themselves at the university and have had a different residential experience.

Future research can address these issues in several ways. First, longitudinal research would track changes in the development of student perceptions and the effect of university efforts on students' environmentally responsible behaviors over time. It would also provide an opportunity to track changes in residential programming and their differing impacts on students' behaviors. Qualitative research would also provide in-depth information about students' perceptions of university sustainability efforts and their involvement in campus-wide and residence hall sustainability initiatives. In addition, modifying the sample to include upper class students who live off-campus would indicate whether what the university supports affects these students' behaviors as well.

To further explore the interaction between students' perceptions and environmentally responsible behaviors, future studies could delve into what factors shape students' perceptions of university efforts. This includes the types of sanctions students fear or do not fear from their peers and authorities and the direct relationship between perceived sanctions and perceived support of environmentally responsible behaviors.

Policy Implications

These findings have contributed to understanding how students' perceptions of university sustainability efforts shape their behaviors. The environmentally responsible behaviors of this age group may signal their priorities as they assume leadership roles in the future. In addition, the results have implications for modifications of sustainability policies and residence life programming efforts at colleges and universities across the nation, and in particular at Emory University. Colleges and universities can use this information to decide how to engage their students in environmentally responsible behaviors. The findings suggest that peer and administrative support and sanctions operate distinctly in regard to recycling, conservation, and advocacy behaviors. The behaviors may require different programs or initiatives in order for universities to achieve their goals.

Specific to Emory University, these findings demonstrate that the university's greening efforts and initiatives are having an effect on students' environmentally responsible behaviors. They should continue their efforts, keeping in mind that there should be a goal to establish a structure of support from peers and administration for environmentally responsible behaviors. This is crucial, because it shows the students that the university is passionate about these issues. Emory University is unique from other colleges and universities in that the faculty initiated sustainability issues at Emory, as opposed to student groups or the university community. These findings suggest that according to the students, peer and administrative support exists for environmentally responsible behaviors.

In order for Emory to expand its sustainable efforts, it must continue to build this support, targeted on the types of environmentally responsible behavior. So far, they have made tremendous changes that will only continue to improve. Most importantly, however, Emory is at a point in its environmental history where to continue to see growth in size and support of their greening efforts, they must pursue grassroots efforts focused on student involvement and determine student's perspectives on their efforts. These steps will help the university assess which aspects of their sustainability mission have succeeded and which areas need improvement. They will also unify administrative and student sustainability efforts to create and maintain a culture of environmentalism at Emory.

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APPENDIX A: LEED-CERTIFIED BUILDINGS AT EMORY

Emory University Office of Sustainability Initiatives. 2008. "Green Building List." Retrieved
April 3, 2011 (http://sustainability.emory.edu/html/dashboard/buildings-list.html).

1. Goizueta Business School (LEED Gold)
2. Psychology and Interdisciplinary Sciences Building (LEED Gold)
3. Whitehead Biomedical Building (LEED Silver)
4. Candler Library (LEED Silver)
5. Turman Residence Hall (LEED Silver)
6. Yerkes Neuroscience (LEED Silver)
7. Mathematics & Science Center (LEED Certified)
8. Winship Cancer Institute (LEED Certified)
9. Emory Children's Pediatric Center (LEED Certified)
10. Few & Evans Residence Halls (LEED Gold)
11. Goizueta Foundation Center (LEED Gold)
12. Emory School of Medicine (LEED Silver, Pending)
13. Candler School of Theology (LEED Silver)
14. Emory Conference Center Hotel Expansion (LEED Silver)
15. Oxford Road Building (LEED Silver, Pending)
16. Rollins School of Public Health Addition (LEED Silver, Pending)
17. Longstreet-Means Freshman Residence Halls (LEED Silver, Pending)
18. East Village Residence Halls at Oxford College (LEED Gold)
19. Yerkes Field Station – Lawrenceville, GA (LEED Gold)

APPENDIX B: VARIABLE CODING & SCALES

CONTROLS

Gender: Male=0, Female=1

Race: Nonwhite=0, White=1

Income: "What is your parents' estimated annual combined income?"
1. Less than $25,000
2. $25,001-$50,000
3. $50,001-$75,000
4. $75,001-$100,000
5. $100,001-$150,000
6. $150,001-$200,000
7. $200,001-$250,000
8. More than $250,000

Mother's Education: "What is the highest level of school that your mother or female guardian has completed?"
0. N/A
1. High school graduate/GED/Less than high school
2. Technical/Vocational
3. Some college or Associate's degree
4. Bachelor's degree
5. Master's degree (e.g. MA, MBA, MPH, MSW)
6. Professional school degree (e.g. MD, JD, DVM, DDS)
7. Doctorate degree (e.g. PhD, EdD)

Father's Education: "What is the highest level of school that your father or male guardian has completed?"
0. N/A
1. High school graduate/GED/Less than high school
2. Technical/Vocational
3. Some college or Associate's degree
4. Bachelor's degree
5. Master's degree (e.g. MA, MBA, MPH, MSW)
6. Professional school degree (e.g. MD, JD, DVM, DDS)
7. Doctorate degree (e.g. PhD, EdD)

Environmental Identity Scale Items (Eigen value):
"How "true" of you are each of the following statements?" (1=not at all true, 7=complete true of me)
1. I spend a lot of time in natural settings (woods, mountains, desert, lake, ocean) (.686)
2. Engaging in environmental behaviors is important to me. (.806)
3. I think of myself as a part of nature, not separate from it. (.832)
4. If I had enough time or money, I would certainly devote some of it to working for environmental causes. (.798)
5. Being a part of the ecosystem is an important part of who I am. (.895)
6. I feel that I have roots to a particular geographic location that had a significant impact on my development. (.631)
7. Behaving responsibly toward the Earth – living in a sustainable lifestyle – is part of my moral code. (.855)
8. I believe that learning about the natural world should be an important part of every child's upbringing. (.749)
9. In general, being part of the natural world is an important part of my self-image. (.838)
10. My own interests usually seem to coincide with the position advocated by environmentalists. (.770)

Environmental Attitudes Scale: "How much do you disagree or agree with each of the following statements?" (1 = Strongly Disagree, 7 = Strongly Agree)

Government Attitudes
1. The government should tax companies who pollute the natural environment.
2. People should pay higher taxes in order to protect the environment.
3. Laws to protect the environment limit my choices and personal freedoms (Reverse Coded).
4. There should be laws that require companies to make their products more energy efficient.

Crisis Attitudes
1. Funding for environmental protection is a bigger priority than funding for the creation of new jobs.
2. Environmental protection benefits everyone.
3. The environmental crisis has been greatly exaggerated (Reverse Coded).
4. There are other problems more pressing than the environmental crisis (Reverse Coded).

INDEPENDENT VARIABLES

Type of Residence Hall: "What dorm do you live in?"
Conventional Dorm=0, Green Dorm =1

Direct Measures of Legitimacy

Endorsement (Perceptions of Peer Support): "How much do each of the following groups support the sustainability initiatives at Emory?" (1=Not at All, 7=A Great Deal)
    1. Floormates
    2. Other Students

Authorization: "How much does Emory encourage students to…" (1= Not at All, 7 = A Great Deal)
    1. Advocate for environmental solutions
    2. Belong to environmental groups
    3. Recycle paper
    4. Recycle containers
    5. Conserve water
    6. Conserve energy
    7. Talk about environmental issues and problems
    8. Turn off lights when exiting a room
    9. Use alternative form of transportation
    10. Eat locally produced foods

Indirect Measures of Legitimacy

Peer Sanctions: "How likely would members of the following groups be to frown upon you if you failed to act in an environmentally friendly way?" (1=Not at All, 7=A Great Deal)
    1. Floormates
    2. Other Students

Administrative Sanctions: "How likely would members of the following groups be to frown upon you if you failed to act in an environmentally friendly way?" (1=Not at All, 7=A Great Deal)
    1. Residence Life administration
    2. Professors
    3. Emory administration

DEPENDENT VARIABLES
Environmental Behaviors
"During this school year, how often did you…?" (1=Never, 7=Always)

Recycling
1. Recycle paper
2. Recycle containers (e.g. plastic, glass, aluminum)
3. Encourage family members to recycle
4. Encourage friends to recycle
5. Purchase products in reusable or recyclable containers

Conservation
1. Turn off the faucet while brushing your teeth
2. Turn off lights when exiting a room
3. Walk, ride a bike, or take public transportation instead of driving or riding in a car
4. Unplug "chargers" for phones, iPods, etc. when not in use
5. Carpool to a destination

Advocacy
1. Limit your consumption of meat for environmental reasons
2. Advocate for solutions to environmental problems
3. Avoid using products harmful for the environment
4. Attend a meeting or event sponsored by an environmental group

TABLE 1A: Descriptive Statistics - Demographics

	%
Live in Green Residence Hall	46.7
Female	55.0
Race	
Asian/Asian American/Pacific Islander	26.4
Hispanic/Latino/Chicano	3.1
African American/Black	4.2
Caucasian/White	60.5
Multiracial/Multiethnic	5.4
Income	
Less than $25,000	4.4
$25,001-$50,000	7.8
$50,001-$75,000	9.6
$75,001-$100,000	14.3
$100,001-$150,000	16.0
$150,001-$200,000	13.0
$200,001-$250,000	9.6
More than $250,000	25.3
Mother's Education	
High School Graduate/GED	11.5
Technical/Vocational	1.7
Some college/Associate's Degree	11.1
Bachelor's Degree	27.7
Master's Degree	25.0
Professional Degree	13.9
Doctorate Degree	8.4
Father's Education	
High School Graduate/GED	10.1
Technical/Vocational	1.7
Some college/Associate's Degree	6.0
Bachelor's Degree	20.8
Master's Degree	24.2
Professional Degree	15.8
Doctorate Degree	20.5

TABLE 1B: Descriptive Statistics – Identity, Attitudes, Legitimacy, and Behaviors

	Mean	Standard Deviation	N
Controls			
Environmental Identity (EID) Scale	4.33	1.31	291
Govt Attitudes Scale	4.82	1.06	295
Crisis Attitudes Scale	4.23	1.01	293
Independent Variables			
Direct Measures			
Endorsement	3.67	1.37	291
Authorization Scale	4.79	1.7	286
Indirect Measures			
Peer Sanctions	3.38	1.49	291
Administrative Sanctions	4.17	1.55	295
Dependent Variables			
Recycle	4.43	1.55	288
Conservation	4.91	1.12	292
Advocacy	3.02	1.27	296

TABLE 2: Bivariate Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 Gender	1															
2 Race	-.022	1														
3 Income	-.100	.339**	1													
4 Mom's Ed	-.030	.130*	.373**	1												
5 Dad's Ed	.012	.071	.375**	.577**	1											
6 EID Scale	.155*	.028	-.032	.115	.163*	1										
7 Govt Att	.193**	.100	.082	.108	.146*	.510**	1									
8 Crisis Att	.050	.001	-.039	.049	.097	.450**	.548**	1								
9 Residence Hall	-.107	.141*	.088	.055	.069	.224**	.156*	.159*	1							
10 Endorsement	.251**	.036	.060	.070	.029	.289**	.147*	.123	.119	1						
11 Authorization	.211**	-.008	.022	-.024	.028	.329**	.155*	.027	.024	.376**	1					
12 Peer Sanctions	-.039	.024	.020	-.074	-.084	.006	-.007	.044	.009	.091	-.046	1				
13 Admin Sanctions	.026	.138*	.137*	-.018	.053	.003	.019	.050	-.102	-.090	.119	.525**	1			
14 Recycling	.183**	.118	.042	.169**	.216**	.643**	.341**	.352**	.352**	.233**	.324**	.078	.126	1		
15 Conservation	.314**	.083	-.072	.054	.123	.535**	.247**	.212**	.154*	.220**	.377**	-.087	.103	.631**	1	
16 Advocacy	.106	-.022	-.062	.097	.065	.695**	.330**	.334**	.262**	.313**	.181**	.097	.012	.634**	.442**	1

* Correlation is significant at the .05 level
** Correlation is significant at the .01 level

TABLE 3: OLS Regression of Controls, Type of Residence Hall, and Legitimacy Factors on Students' Recycling, Conservation, and Advocacy Behaviors

	Behaviors								
	Recycling			Conservation			Advocacy		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Constant	.662	.263	-.193	3.023	2.646	2.587	.134	.167	-.093
Controls									
Gender	.342*	.293†	.308*	.492***	.442***	.414***	-.037	-.012	-.025
Race	.319*	.293†	.234	.205†	.272*	.232†	-.189	-.173	-.175
Income	-.008	-.019	-.027	-.026	-.052†	-.058†	-.017	-.019	-.029
Mom's Education	.002	.034	.046	-.036	-.014	-.007	.073†	.048	.054
Dad's Education	.057	.063	.060	.030	.032	.018	-.075†	-.059	-.063
EID Scale	.662***	.605***	.596***	.440***	.365***	.372***	.626***	.613***	.626***
Govt Attitudes	-.108	-.115	-.099	-.059	-.059	-.059	.015	.016	.008
Crisis Attitudes	.131	.156†	.137	.004	.031	.018	.045	.024	.010
Residence Hall	.567***	.641***	.682***	.070	.103	.146	.315**	.329**	.353***
Endorsement		-.031	-.025		-.018	.022		.114*	.125*
Authorization		.121**	.111*		.133***	.107**		-.067†	-.071†
Peer Sanctions			.046			-.114*			.037
Admin Sanctions			.091			.128**			.045
Adjusted R²	.466	.480	.482	.334	.360	.373	.481	.486	.492
N	262	243	241	267	247	246	271	251	250

Notes: Coefficients are unstandardized.

† p < .10; * p < .05; ** p < .01; *** p < .001

TABLE 4: OLS Regression of Controls and Legitimacy Factors on Students' Recycling, Conservation, and Advocacy Behaviors (Subsample of Students Living in Green Residence Halls, N=140)

	Behaviors								
	Recycling			Conservation			Advocacy		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Constant	1.456	.980	.553	3.094	2.847	2.853	.649	.691	.325
Controls									
Gender	.352†	.342	.392	.584***	.559***	.554***	-.010	.015	.024
Race	.103	.006	-.034†	.128	.162	.094	-.274	-.308	-.318
Income	.012	.043	.040	.020	.022	.020	-.051	-.037	-.038
Mom's Education	.039	.059	.047	-.007	.006	-.006	.114†	.099	.083
Dad's Education	.065	.052	.058	.031	.026	.030	-.128*	-.116†	-.107†
EID Scale	.629***	.616***	.618***	.352***	.316***	.337***	.590***	.618***	.622***
Govt Attitudes	.057	.053	.028	-.061	-.061	-.068	.084	.063	.047
Crisis Attitudes	-.114	-.055	-.054	.011	.045	.026	.027	.015	.011
Endorsement		-.112	-.074		-.081	-.057		.068	.105
Authorization		.128†	.114†		.107*	.092*		-.070	-.079
Peer Sanctions			.017			-.095			.016
Admin Sanctions			.110			.100†			.080
Adjusted R²	.402	.422	.429	.365	.372	.379	.443	.441	.442
N	128	120	120	127	119	119	129	121	121

Notes: Coefficients are unstandardized.

† p < .10; * p < .05; ** p < .01; *** p < .001

TABLE 5: OLS Regression of Controls and Legitimacy Factors on Students' Recycling, Conservation, and Advocacy Behaviors (Subsample of Students Living in Conventional Residence Halls, N=160)

	Behaviors								
	Recycling			Conservation			Advocacy		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Constant	.411	.280	-.057	3.084	2.652	2.462	-.006	.105	.108
Controls									
Gender	.278	.203	.175	.428*	.386*	.325†	-.079	-.042	-.060
Race	.480*	.443*	.397†	.197	.225	.226	-.076	-.077	-.061
Income	-.023	-.062	-.079	-.071	-.114*	-.125*	.009	.000	-.009
Mom's Education	-.028	.010	.042	-.054	-.014	.022	.032	.002	.002
Dad's Education	.068	.092	.079	.028	.033	-.003	-.019	-.001	-.001
EID Scale	.676***	.607***	.600***	.534***	.446***	.452***	.625***	.587***	.618***
Govt Attitudes	-.267*	-.291*	-.260*	-.061	-.068	-.061	-.048	-.025	-.050
Crisis Attitudes	.390***	.383***	.353**	-.017	-.004	-.009	.089	.046	.037
Endorsement		.001	-.010		.016	.065		.144*	.139†
Authorization		.106	.098		.154**	.116†		-.076	-.065
Peer Sanctions			.022			-.112			.042
Admin Sanctions			.092			.146†			-.026
Adjusted R²	.442	.417	.400	.311	.347	.355	.449	.427	.430
N	134	123	122	140	128	127	142	130	129

Notes: Coefficients are unstandardized.

† p < .10; * p < .05; ** p < .01; *** p < .001

TABLE 6: Comparison of Whether Hypotheses Are Supported or Not Supported in the Full Sample, Subsample of Students in the Green Residence Halls, and Subsample of Students in the Conventional Residence Halls

	Full Sample	Subsample of Students in the Green Residence Halls	Subsample of Students in the Conventional Residence Halls
Hypothesis 2: Endorsement has a positive effect on students' behavior			
- Recycling	NS	NS	NS
- Conservation	NS	NS	NS
- Advocacy	S	NS	S
Hypothesis 3: Authorization has a positive effect on students' behavior			
- Recycling	S	S	NS
- Conservation	S	S	S
- Advocacy	NS	NS	NS
Hypothesis 4: The effect of endorsement is greater than that of authorization on students' behavior			
- Recycling	NS	NS	NS
- Conservation	NS	NS	NS
- Advocacy	S	NS	S
Hypothesis 5: Peer sanctions have a positive effect students' behavior			
- Recycling	NS	NS	NS
- Conservation	NS	NS	NS
- Advocacy	NS	NS	NS
Hypothesis 6: Administrative sanctions have a positive effect on students' behavior			
- Recycling	NS	NS	NS
- Conservation	S	S	S
- Advocacy	NS	NS	NS

Notes:
S: Hypothesis is supported; NS: Hypothesis is not supported