

## The Relationship between University Students' Environmental Identity, Decision-Making Process, and Behavior

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**Abstract:** Environmental education scholars have argued for the need to focus on identity as a more predictive factor than attitude of individuals' environmental behavior. We examine individuals' decision-making as a mediating process between identity and behavior. University undergraduates (n=299) were surveyed, with a select sub-sample interviewed. As expected, environmental identity was correlated with pro-environment behavior (recycling). However, students with lower pro-environmental identity also recycled regularly. Similarly, analysis of decision-making revealed most students, regardless of their environmental identity, do not think much when recycling. Environmental structures such as presence of recycling bins surfaced as a powerful influence on pro-environment behavior.

**Keywords:** environmental identity, pro-environmental behaviors, decision-making, mixed-methods, undergraduates

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## **Introduction**

The overarching goal of this research is to understand how to foster students' pro-environmental behavior. Past research in environmental education research has given attention to individuals' environmental attitudes and its effect on environmental behaviors. However, the relationship between environmental attitudes and behaviors has proven complex and inconsistent (Kollmuss & Agyeman, 2002; Heberlein, 2012). In this study, we focus on another individual characteristic: environmental identity. Scholars have argued for the need to focus on identity (Payne, 2001; Clayton, 2003; Blatt, 2014; Stapleton, 2015) and a growing body of research suggests identity is more predictive than attitude of individuals' environmental behaviors (Clayton, 2003; Kempton & Holland, 2003).

In addition, prior research clearly indicates that individual characteristics, e.g., attitude and identity, do not exert a direct influence on pro-environmental behavior. Instead, mediating factors must be considered. Consequently, our conceptual framework includes decision-making as a factor mediating between identity and behavior. We use Kahneman's decision-making model which posits that consideration about how to act can occur be characterized on a continuum from faster, automatic thinking to slower, deliberating thinking.

This research has implications for environmental education research community because understanding the mechanisms behind the daily decisions people make and why they make them can illuminate on how educators can prepare, influence, and educate people to act in more positive ways toward the natural world.

## **Literature Review**

### **Fostering Pro-Environmental Behavior by Changing Attitudes**

One approach to fostering students' pro-environmental behavior emerges from the assumption that changes in students' attitudes are pre-requisite to behavior changes. Gardner and Stern's (1996) review noted that instructional interventions to changing students' attitudes focus on morals (it's the right thing to do), education (it's the informed thing to do), incentive (doing it leads to rewards), or community (it's what's others are doing). Gardner and Stern found that each of these intervention types, if carefully executed, could change behavior. However, moral and educational approaches have generally disappointing track records, and even incentive and community approaches rarely produce much change on their own. By far, the most effective behavior change programs involve combinations of intervention types.

Social scientists have continued to study why people act in certain ways. In a research project studying the effect of environmental attitudes on behavior, Heberlein and Black (1974, 1976) measured attitudes of people who were observed purchasing lead-free gasoline (before lead-free gasoline was the norm). They found lead-free buyers had a greater sense of personal obligation and were more likely to anticipate long-term savings than those who purchased regular gasoline. Heberlein and Black found that more specific attitudes linked more closely to the specific act of purchasing lead free gas. The specific

attitudes of having personal obligation and knowing the amount of economic savings were two variables necessary to behave in a pro-environmental way.

The New Environmental Paradigm (NEP) was created to explore and interpret broad, overarching environmental attitudes. The NEP is a broad worldview that takes into consideration environmental problems and how humans impact the Earth. People adopting the NEP have eco-centric attitudes meaning they value the natural environment for its intrinsic value (Dunlap, 2008; Dunlap et al., 2000). A number of authors (e.g., Dalton, Gontmacher, Lovrich, & Pierce, 1999; Edgell & Nowell, 1989; Gooch, 1995) believe the NEP represents a set of beliefs toward the environment and it influences behavior and attitudes (Ewert, Place, & Sibthorp, 2005). However, the NEP scale has done a poor job of predicting participation in specific environmental behaviors (Heberlein, 2012).

### **Critique of Attitude Studies**

Much attention has been given to environmental attitudes and their effect on participating in environmental behaviors. But, the relationship between environmental attitudes and behaviors is complex and it has proven difficult to foster or predict behaviors using attitudes alone. In their review of the literature, Heimlich and Ardoin (2008) concluded “many findings are inconclusive, while others are contradictory. Little consensus exists on how, and to what extent, attitudes affect and can predict environmental behavior.” (p. 221). Why is the relationship between attitude and behavior so weak and inconsistent?

First, research has often shown a discrepancy between attitude and behavior (Kollmuss & Agyeman, 2002). Diekmann and Preisendoerfer (1992) used a cost analysis model to suggest people choose pro-environmental behaviors that require the least economic and psychological (i.e. time, effort, motivation) cost. They found that environmental attitude and pro-environmental behaviors such as recycling were significantly correlated but other pro-environmental behaviors like driving less did not correlate with environmental attitudes. Similarly, Heberlein (2012) found that the strength of the behavior barrier mattered when understanding the relationship between attitude and behavior. Economic concerns would be considered a strong behavior barrier. If it will cost money to act environmental an individual may not participate in the behavior consistently.

Second, competition or prioritization among different values is another complicating factor. People may hold values or worldviews consistent with concern for the environment, but those values may not be as salient as other social comparison values like showing up the neighbor with a large SUV. Kempton and Holland (2003) suggest that upholding one’s social status is often judged more important than dedicating time and energy to being environmentally friendly. Thus, one of primary reasons why the relationship between attitudes and behavior is so complex is that the relationship seems to be typically mediated by other factors. The connection between one’s attitude about the environment is considered against other priorities or in terms of its relative cost (Diekmann & Preisendoerfer, 1992; Kempton & Holland, 2003). Based on a study examining undergraduate and graduate students’ understanding of sustainable practices and their personal accountability for taking those actions, students at a large Midwestern University did not accept their personal responsibility for maintaining a sustainable campus (Rosentrater & Burke, 2018).

Third, evidence of the questionable relationship between individual's environmental attitudes and behaviors can be found in intervention studies – studies built on the assumption that changing individuals' attitudes should lead to corresponding changes in their behavior. McKenzie-Mohr (2000) concluded after reviewing a variety of intervention studies that enhancing knowledge and creating supportive attitudes often has little or no impact upon behavior. For instance, Geller (1981) reports a study where members of households who were interested in enhancing the energy efficiency of their homes participated in a workshop on energy conservation. There were significant changes in knowledge and attitudes about energy conservation, but their behavior did not change. Similarly, efforts to change people's water consumption met with similarly disappointing results (Geller, Erickson & Buttram, 1983). Members of households volunteered to be a part of a 10-week study of water conservation and received a booklet outlining the relationship between water use and energy use and certain methods for conserving water. No impact on water consumption was found. Similarly, according to Finger (1994), the results of two surveys conducted in Switzerland showed that environmental attitudes and knowledge were poorly associated with environmental behavior. Also, Bickman (1972) reported that when five hundred people were interviewed asking about their personal responsibility for picking up litter, 94% acknowledged their responsibility, yet only 2% picked up litter.

### **Identity as a Factor**

Although the relationship between pro-environmental attitudes and behavior may seem inherent, research clearly suggests environmental attitude is a complex and difficult construct to work with (Heberlein, 2012). Attitudes may be the least important factor affecting human behavior (Heberlein, 2012). What are alternatives? In this study, we examine the potential of another budding construct in environmental education for examining environmental behaviors (Payne, 2001; Clayton, 2003; Blatt, 2014; Stapleton, 2015): individual's environmental identity.

Generally, identity can be defined as distinctive characteristics associated with an individual or group. One's identity is linked with one's self-concept, values and beliefs about who one is, and what one wants others to know about oneself (Clayton & Opatow, 2003). According to Clayton and Opatow (2003), environmental identity is the way we define the environment, the amount of connection and similarity we feel with the natural world and whether we believe the natural world is a valued component of our social and moral community. In addition, Payne (2001) reiterated that identity includes how one presents oneself in a variety of contexts, how one makes sense of oneself and how others relate to how one presents oneself.

Unlike attitudes, environmental identity has both social and environmental influences and can have behavioral implications across situations and contexts (Stets & Biga, 2003). For example, a stronger environmental identity can predict pro-environmental attitudes and behaviors and is also associated with a desire to be active in more specific issues like animal rights (Clayton, Fraser & Burgess, 2011). Environmental identities are inherently social. Environmental identity depends on a common social meaning and

understanding of what nature is and how it is to be “utilized” (Clayton, 2003, p. 10). Environmental identity is also influenced by social interactions. For instance, Clayton and Opatow (2003) mention that environmental identities are influenced by group membership such as political party.

When it comes to environmental decisions and behaviors, individuals use their actions as a way to “make statements about their personal and collective values or to define who they are through the causes they support” (Rivot & Kahneman, 1997; Clayton & Opatow, 2003, p. 4). Unlike the complexity of attitudes, individuals usually act in accordance to their identity (Kempton & Holland, 2003). Studies have found environmental identity to have a higher correlation and to be more predictive of environmental behavior than attitudes (Clayton, 2003; Stets & Biga, 2003; Kempton & Holland, 2003; Zavestoski, 2003; Blatt, 2013; Stapleton, 2015).

How one acts, interacts, and communicates are all part of one’s identity (Payne, 2001). According to Stapleton (2015), based on the social perspectives of identity development, one’s identity can influence how people are recognized and how they act. Participants with strong environmental identities also perceived their decisions on environmental crises as easier than participants with weak environmental identities (Clayton, 2003). Participants with strong environmental identities were also more confident in their decisions (Clayton, 2003). Identifying with the natural world would make one more likely to make environmental decisions quickly and confidently.

### **Decision-Making as a Mediating Factor**

As we prepared to investigate how individuals’ pro-environment identity influences their behavior, we kept in mind lessons from prior research – that it would be difficult to find a clear relationship between individual characteristics (e.g., identity, attitude, knowledge) and behavior (Heimlich & Ardoin, 2008). Consequently, we decided to include a mediating factor between identity and behavior as part of our conceptual framework. We chose decision making as the mediating factor because it is frequently identified as a central component of environmental literacy. In addition, the process of environmental decision-making is the kind of student characteristic that lends itself logically to being developed through education. (See Figure 1).

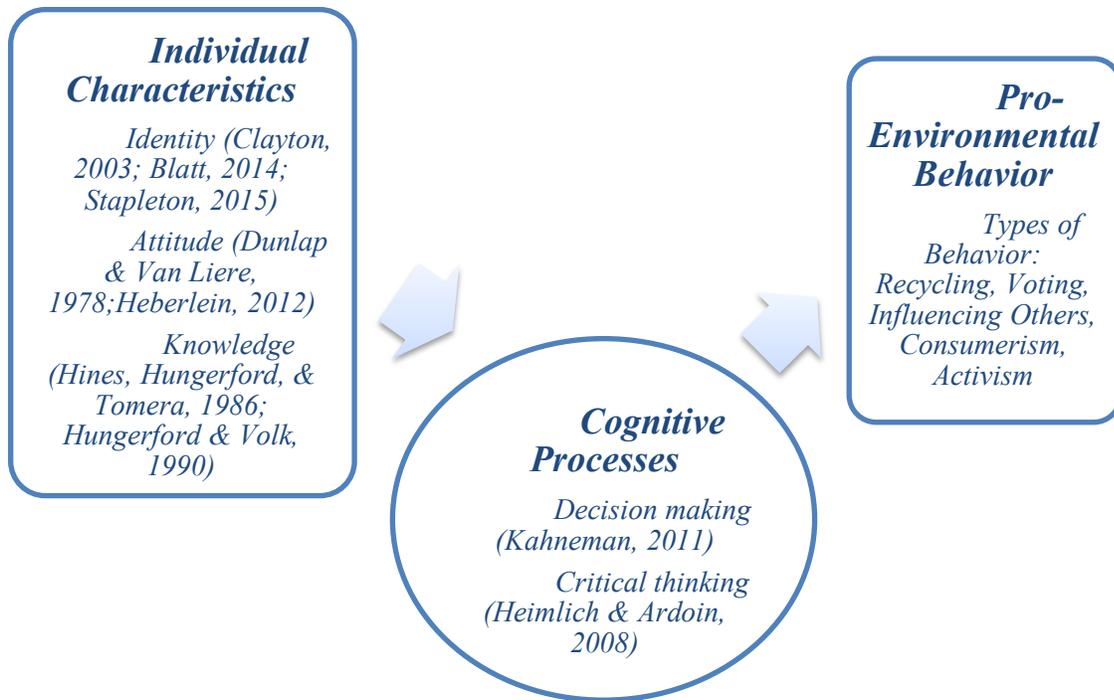


Figure 1. Cognitive Processes as Mediating Factors for Pro-Environmental Behaviors.

**Kahneman's model for decision-making.** We use Kahneman's System 1 and 2 decision-making model as a conceptual framework for studying students' decision making about their environmental behaviors. Daniel Kahneman, a Nobel Prize winner in Economics, work has focused on judgment, decision-making, and behavior. Of particular interest, were intuitive judgments, or "thoughts and preferences that come to mind quickly and without much reflection" (Kahneman, 2003, p. 697). According to Kahneman (2003), intuitive judgments lie somewhere between automatic operations of perceptions and deliberate operations of reasoning (Kahneman & Frederick, 2002; Sloman, 2002; Stanovich, 1999; Stanovich & West, 2000). According to Kahneman (2003, 2011) and others, the way individuals make decisions and judgments can be divided into two distinct cognitive processing groups: System 1 and System 2 (Stanovich, 1999; Evans, 2008). System 1 decisions are fast, automatic, effortless, associative, implicit, and emotionally charged (Kahneman, 2003, 2011). Decisions made in System 2 are more conscious, effortful, deliberately controlled, easily flexible, and rule driven (Kahneman, 2003, 2011).

Our rationale to use Kahneman's framework emerged from our concern for the educational implications of this research. System 1 and System 2 thinking are distinguished by the degree to which knowledge and thinking are brought to bear on decision-making. As thinking and decisions become more deliberate, it is influenced more by the individuals' understanding of the issue and their thinking strategies. Development of students' understanding of issues and strategies for thinking are the realm and responsibility of education. According to Arvai, Campbell, Baird, & Rivers, (2004), the most effective way to

help students become better environmental decision makers and overcome the many biases they encounter is to help students become aware of the traps they may encounter and to develop the strategies for making sensible, structured decisions.

## Research Questions

1. What is the association between university students' environmental identity and pro-environmental behavior?
2. What is the relationship between university students' environmental identity, decision-making, and pro-environmental behavior?

## Method

### Participants

In the fall of 2014, 299 undergraduate students completed a three-part survey at a large Midwestern University. A majority of the participants (n=237) were enrolled in an introductory educational psychology course called *Reflections on Learning*. The other 62 participants were enrolled in an *Introduction to Sustainability* course. These groups were selected because of their potential for providing the desired variability for the overall sample. Undergraduate students were selected for their potential future contributions to important environmental decisions. These students represent the future leaders and opinion makers in society and will make important environmental decisions (Smith-Sebasto & D'Acosta, 1995; Ewert et al., 2005).

### Instruments

**Environmental Identity Scale.** The scale was constructed to assess the extent to which the natural environment plays an important role in a person's self-definition (Olivos & Aragonés, 2011; Clayton, 2003). The scale was composed of 24 5-point Likert scale items that measure six constructs. These constructs included: interactions with nature, group membership, ideology, values and priorities, positive emotions and experiences in nature and self-concept.

**Environmentally Responsible Behaviors Index (ERBI).** The ERBI was developed by Smith-Sebasto and D'Acosta (1995) to predict environmentally responsible behavior among undergraduate students. The index contained twenty-five 5-point Likert-scale items presented as examples of pro-environment behaviors with a response format scale (from 1 = rarely to 5 = usually). As a guideline, rarely is "in less than 10% of the chances when I could have"; occasionally is in 30% of the chance; sometimes is 50% of the chances; frequently is 70%; and usually is 90% (Smith-Sebasto & D'Acosta, 1995; Thapa, 1999). The index was designed to reference the categories of environmentally responsible behaviors including: civic action (three items), education action (five items), financial action (seven items), legal action (two items), persuasion action (one item), and physical action (six items).

**Decision-Making Questionnaire.** Kahneman's framework was used to develop the decision-making questionnaire. The goal of the questionnaire was to examine the type of

thinking that participants used to make the environmental decision to recycle. The questionnaire consisted of 6, 5-point Likert scale statements based on the characteristics of System 1 and 2 thinking. These characteristics included: slow/fast, effortful/effortless, affecting thinking capacity/not affecting thinking capacity, neutral/emotional, conscious/automatic, and skeptical/certain. A response of a 1 was considered slow thinking and a response of 5 was considered fast thinking. Each item asked participants about a different component/characteristic of System 1 and 2 thinking.

**Interview.** The 45-60 minute interviews consisted of a variety of open-ended questions and card sort activities (Arthur & Nazroo, 2013) with the goal of acquiring additional information and details about students' thinking while making the decisions to recycle and participate in other everyday environmental behaviors. The interviews provided other information about students' environmental identities including examples of outdoor experiences and how social interactions affected their participation in environmental behaviors. Coding began with using categories that included the key constructs of environmental identity (Clayton, 2003), environmental responsible behaviors (Smith-Sebasto & D'Acosta, 1995) and fast and slow decision-making (Kahneman, 2011). After the initial round of coding, a set of themes was established that led to the final coding themes of group membership/collective identity, physical environment, System1 and System 2, values, and social influences on learning. The themes used for this paper include: group membership/collective identity, physical environment and System 1 and 2 thinking.

## **Procedure**

This study had a mixed methods sequential explanatory design (Lodico, Spaulding, & Voegtle, 2006; Creswell, 2006). The previous research exploring environmental identity has been solely quantitative or qualitative, so a new methodological approach was explored to enhance understandings of the relationships between identity, pro-environmental behavior participation and making decisions to recycle.

The quantitative phase began in the fall of 2014. With permission from the course instructors, the study was described, consent was given, and the survey was administered. The survey responses were analyzed using a variety of statistical analyses. Following analysis, a sample of participants was selected for an interview. In the qualitative phase, the interviews were conducted with eight participants. Table 1 shows the interview participants' survey scores.

Table 1. Interview participants' survey scores.

<i>ERBI score range: 25-125; Environmental Identity Scale score range: 24-120; Decision Making Questionnaire score range: 6-30</i> <i>A=above average</i> <i>B=below average</i>			
<b>Participant</b>	<b>Behavior Mean=66.2</b>	<b>Identity Mean=82.1</b>	<b>Decision Making Mean=21.1</b>
Molly	125 A	117 A	30 A
Olivia	116 A	118 A	26 A
Ryan	111 A	115 A	28 A
Savannah	97 A	96 A	30 A
Ansel	80 A	56 B	22 A
Renee	74 A	113 A	30 A
Kim	36 B	32 B	15 B
Katie	36 B	86 A	22 A

## Results & Discussion

### Environmental Identity is Correlated With Pro-Environmental Behavior

Quantitative analysis indicates a positive correlation ( $r = 0.685$ ,  $p < .01$ ) between environmental identity score and pro environmental behavior for the entire sample of participants ( $N= 299$ ). This means that individuals who had strong environmental identities as evidenced by statements - such as when asked how the natural environment fit into her identity Molly said,

*"I think I care a little bit more. When people laugh that I recycle everything, I've recycled everything since I was young. Like I've never really lived in an environment where we didn't reuse or we didn't recycle."*

Olivia said the natural environment is part of her identity because,

*"The natural environment has kind of always been there. Like I said when we were younger we would be outside all the time. We would pass through to a forest, which used to be a cranberry bog so it's a wetland so we would go back there and play in the trees. And so I think just growing up in that area really helped mold me."*

The positive correlation between identity and behavior is not unexpected: Individuals who think of themselves, as environmentalists should behave like environmentalists. Things become more interesting when we take a closer look at this correlation in light of the qualitative data. In the interviews with our subsample of students, we found the frequency of their recycling seemed unrelated to their environmental identity. Figure 2 shows the results of the recycling questions on the Pro-Environmental Behavior Scale.

Table 2. Subsample environmental identity scores and their reported frequency of recycling.

Subsample environmental identity scores and their reported frequency of recycling. 1=infrequently and 5= frequently.					
Participant	Environmental Identity Score	Recycled glass bottles or jars or aluminum cans	Sorted your trash to separate non-recyclables from recyclable materials	Avoided buying products with excessive packaging	
Olivia	118	5	5	4	
Molly	117	5	5	5	
Ryan	115	5	5	4	
Renee	113	5	5	4	
Savannah	96	5	5	4	
Katie	86	5	5	1	
Ansel	56	5	5	1	
Kim	32	5	3	1	
Mean	91.6	5	4.75	3	
Standard Deviation	41.7	0	0.71	1.7	

When asked how frequently she recycled, Kim a participant with a weak environmental identity stated she recycled glass bottles or jars or aluminum cans frequently. She said,

*"I do that [recycle cans and bottles] all the time. And I've done that since I was little. We [her family] always had a separate trashcan that was just for recyclables [glass bottles and aluminum cans]"*.

Kim also mentioned sorting trash to separate non-recyclable from recyclable material more frequently as a college student than with her parents.

*"I didn't do that [separate non-recyclables from recyclable materials] really except for the cans and everything until this year. And now I do it this year and my roommates had me do it this year. We have anything from like any type of wine bottle, water bottle, milk jugs like everything separated.*

Katie, another student with a reported weak environmental identity also explained that she recycled glass, bottled jars or aluminum cans frequently. She said, *"Yeah, we have a spot at our house for cans and everything."*

It also seemed the frequency of students' recycling behavior seemed unrelated to the frequency in which they engage in other environmentally responsible behaviors. For instance, all interview participants reported frequently recycling glass bottles and aluminum cans while also reporting to infrequently paying for memberships to environmental organizations. Participants such as Kim and Katie reported frequently recycling, but rarely talking to others about environmental issues and never avoiding products with excessive packaging. Participants with strong environmental identities were less likely to write to their elected officials about environmental problems. These individuals were more likely to be political in other ways. For instance, Molly an environmentalist reported that she was more likely to attend an activist march or a State Department meeting about environmental issues before writing to her political officials. Other participants such as Olivia mentioned that most of her political activism involved Twitter or Facebook. Olivia said, *"...if I see something that looks really cool I'm going to like re-tweet it just because social media is fast."*

Why do some students recycle so willingly and frequently despite their low environmental identity score, and despite their low participation in other environmentally responsible behaviors? How could students who don't see themselves as environmental people nonetheless engaging in the environmentally responsible behavior of recycling frequently? The interview data sheds some light.

Katie was a freshman history education student with an above average environmental identity score and a below average environmental behaviors score meaning she identifies with the environment, but she rarely participates in pro-environmental behaviors. However, when asked about her recycling behavior,

*"I do a lot more recycling now that I live [on campus] because like at home I just do cans. We don't have recycling bins around us. It's like now I live here I recycle all the time."*

Kim was a senior psychology major with a low environmental identity and a low behavior score.

*"...if your teachers give you a bunch of paper back that you know you don't need for the future, they have tons of recycling bins for even paper or a bunch of*

*random stuff around and they are seriously everywhere on campus. So the university does pretty good as far as like really random stuff that you don't even think about recycling."*

Five out of the eight students interviewed made reference to the abundant recycling bins on campus when describing their recycling behavior. This association points to the powerful influence the physical environment has on their behavior. On this particular campus, recycling bins are everywhere in the residence halls, classroom buildings, and cafeterias. Students do not have to walk more than a short distance to clearly marked recycling bins. There was a significantly positive correlation (.519\*\*) between the decision making score and recycling behavior score.

Thus, we might speculate that because recycling on campus is so convenient, students' behavior is influenced more by characteristics of their physical surroundings than characteristics of their environmental identity. Other kinds of environmentally responsible behavior - reducing carbon footprint or water consumption, for example - are not made as convenient by physical features of the campus. Therefore, unlike recycling behavior, these environmental behaviors may be more strongly correlated with environmental identity.

As Table 3 indicates, the qualitative data shows the students with the strongest environmental identities more frequently talked with others about environmental issues ( $n= 6$ ;  $M= 3.5$ ) compared to the participants with a weaker environmental identity ( $n= 2$ ;  $M= 2.5$ ). Participants with a strong environmental identity ( $M= 3.67$ ) also more frequently reported not buying products with excessive packaging compared to the weak environmental identity participants ( $M= 1$ ).

Table 3. Subsample environmental identity scores and their reported frequency of recycling and being environmental activists.

<b>Subsample environmental identity scores and their reported frequency of recycling and being environmental activists. 1=infrequently; 5=frequently</b>					
<b>Participant</b>	<b>Environmental Identity Score</b>	<b>Written to your elected officials expressing your opinions on environmental problems</b>	<b>Donated money or paid membership dues to a conservation organization</b>	<b>Voted for a politician due to his or her record on protecting the environment</b>	<b>Talk to others about environmental issues</b>
Olivia	118	1	1	2	5
Molly	117	2	2	5	5
Ryan	115	1	5	1	5
Renee	113	1	1	1	4
Savannah	96	1	1	4	1
Katie	86	1	1	1	1
Ansel	56	1	1	1	4
Kim	32	1	2	1	1
Mean	91.63	1.13	1.75	2	3.25
Standard Deviation	41.7	0.35	1.4	1.6	1.9

### **Decision-Making, Behavior, and Identity**

Data from students' decision-making process provides further evidence that recycling behavior is prompted by cues in the situation rather than students' sense of environmental identity. All students reported using System 1's fast and automatic decision-making when recycling. The reflexive, non-deliberative nature of their recycling behavior is the kind of decision-making process we would expect if students were responding to visual cues, such as recycling bins.

The participants in this study also used system 2 thinking. According to the interview data and Table 4, environmental identity did not have an impact on making the decisions to write to elected officials expressing opinions on environmental problems ( $N=8$ ;  $M= 2$ ), donating money or paying for memberships to conservation organizations ( $N=8$ ;  $M= 2$ ), and voting for a politician due to his or her record on protecting the environment ( $N=8$ ;  $M= 1.88$ ). All participants despite their environmental identity scores reported using System 2 deliberate and logical thinking when making these decisions.

What kind of decision-making process do students use for other kinds of environmentally responsible behavior? How is the decision making process related to students' environmental identity? Environmental identity was positively correlated with System 1 decision-making ( $r = 0.476, p < .01$ ). In other words, students with a strong environmental identity were more likely to make decisions to recycle in a fast, automatic way. This leads us to the curious conclusion that pro environmental behavior is often not the result of careful, deliberate thought processes. Instead, it is often a reflexive decision, if one can even call it a decision.

When do students engage in System 2 thinking? Our survey of the subsample summarized in Table 4 indicates that the deliberate, drawn out thinking process characterizing System 2 decision making is more likely to be associated with situations where the appropriate behavior is not obvious, not so convenient, or creates some kind of conflict between convenience and students' values and beliefs.

*Table 4.* Decision-making process for pro-environmental behaviors

<b>Decision-making process for pro-environmental behaviors</b>	
<b>Behavior</b>	<b>Decision Making Process (1=fast, 2=slow), N=8</b>
Recycled glass bottles or jars or aluminum cans	1.00
Sorted your trash to separate non-recyclables from recyclable materials	1.00
Talked to others about environmental issues	1.13
Cut down on the use of your car by using public transportation, carpooling, etc.	1.14
Avoided buying products with excessive packaging	1.38
Voted for a politician due to his or her record on protecting the environment.	1.88
Written to your elected officials expressing your opinions on environmental problems	2.00
Donated money or paid membership dues to a conservation organization	2.00

## **Implications**

### **Identity: Not as Useful as Anticipated**

Is recycling behavior the result individuals having pro-environment identity? Looking only at the quantitative data, one finds a general correlation between environmental identity and environmental behavior. However, looking deeper through the qualitative data, one realizes the connection between individual environmental identity and behavior is not so clear. Thus, the construct of identity was rendered less useful than we had initially believed.

In addition to being problematic as a research construct, identity may also prove to be difficult as an educational construct. As educators, we must consider how change can be brought about within the context of school. Changing a person's identity is difficult and the method is uncertain. According to environmental identity researchers, in order for students to develop their environmental identity they must find a personal connection to nature (Blatt, 2014), experience the natural world multiple times (Clayton et al., 2011) and be recognized as an environmental activist (Stapleton, 2015). These strategies for developing environmental identity are focused on the individual. Environmental identity is also influenced by social interactions (Clayton, 2003).

According to our study, a social norm of recycling on campus has led to a collective recycling identity for the students who attend the university. Recycling is what students do on and around campus, so if you go to this university you also recycle. The recycling norm shared by students was the catalyst for students' recycling behavior. Based on this, when looking at pro-environmental behaviors we must consider the context in which the behaviors are occurring not just individual identity and attitudes. Social norms and a collective identity make stronger influences on behavior than an individual environmental identity. Students know it's important to participate in sustainable practices, but not all students commit to acting in sustainable, environmentally friendly ways (Emanuel & Adams, 2011). For example, in a sustainability study conducted with undergraduate students from Alabama and Hawaii researchers found students from both states showed a concern and understanding of the importance for sustainable action, however the students from Hawaii, a "green" state responded with a commitment to maintain sustainable habits, while the students from Alabama were less likely to commit to such practices (Emanuel & Adams, 2011). These findings have implications for how we study identity and participation in pro-environmental behaviors.

### **Decision-Making: People Think Less Than We Expected**

The quantitative data showed that environmental identity is related to making the decision to recycle in a fast way. However our study showed recycling was a fast decision for all students in the interview even students with a weak environmental identity. The quantitative data showed a moderate correlation between environmental identity and making the decision to recycle in a fast, System 1 way.

Are pro-environmental behaviors the result of careful, informed decisions: Our results do not provide convincing support. Instead, our data show evidence that many pro-environmental behaviors, such as recycling, are more unconscious responses than conscious decisions. These findings bear a striking similarity to consumer behavior research on how partitioning shopping baskets can lead to healthier food choices (Wansink, Soman, Herbst, & Payne, 2014). Explanation, “In ambiguous allocation contexts, perceived norms can powerfully influence a wide range of consumer behaviors (Shultz et al., 2007)” (Wansink et al., 2014). In ambiguous situations, the appropriate behavior is “variable, subjective, and situation specific.” In these situations, any implied suggestion of the social norm – such as a visual cue - can have an effect on the individuals’ behavior. In Wansink’s research, the size of the effect was surprisingly strong considering the size of the intervention. Thus, in situations where individuals may be unsure of the correct behavior, visual cues – especially cues pointing to the social norm – can have powerful effects on behavior. The influence of social norms is well established (Burn, 1991; Heberlein, 2012).

### **Informed Decisions: What Knowledge Matters?**

So far, we have examined how environmental behavior is influenced by the students’ identity. Another factor often studied is the role of knowledge: To what degree does being informed change behavior? As educators, we assume that knowledge plays a central role in decision-making, especially in situations where the more deliberate System 2 process is invoked. However, as the attitude studies described earlier have shown, providing additional information often has little effect on behavior.

Kollmuss and Agyeman (2002) note, “These rationalist models assumed that educating people about environmental issues would automatically result in more pro-environmental behavior, and have been termed (information) ‘deficit’ models of public understanding and action by Burgess et al. (1998. p. 1447).” (p. 241). In other words, the prevailing assumption underlying many intervention studies is that people fail to act in pro-environmental ways because they lack certain information. Kollmuss and Agyeman (2002) continue, “These models from the early 1970’s were soon proven to be wrong. Research showed that in most cases, increases in knowledge and awareness did not lead to pro-environmental behavior” (p. 241).

From this argument, we might conclude that knowledge does not matter. However, it is more likely that certain knowledge matters more than others. According to Vining and Ebreo (1990) the biggest difference between recyclers and non-recyclers is their knowledge of collectable materials. In a study of 197 Illinois households, (Schultz, Oskamp, & Mainieri (1995) found recyclers have significantly more knowledge about recycling than non-recyclers. Oskamp et al. (1991) suggested that recycling behaviors may be less related to knowledge about global environmental issues than to knowledge about specifics of recycling” (Schultz et al., 1995, p. 107). In brief, practical knowledge of how to recycle this particular thing is more important than understanding broad conceptual ecological issues.

## **Physical Structures: When Can Small Changes Have Big Effects?**

Our interview data also pointed to the importance of specific practical knowledge. Students knew they could recycle certain materials and they knew how to do it. We might push our interpretation even further: students' recycling behavior was influenced simply by seeing recycling bins and seeing other students recycle. The phenomenon is a process of perception, rather than a process of applying knowledge, practical or otherwise. The fact that all students' recycling behavior was associated with the fast, automatic System 1 decision-making certainly supports the argument that recycling is a perceptual, reflexive, or imitative behavior. Students reported campus as making recycling easy and automatic. Furthermore, physical structures such as recycling bins were effective because they were "consistent with dominant public attitudes and values" (Heberlein, 2012, p. 9). Giving out recycling bins and making recycling easy increases the social desirability to recycle and acts to "signal a social norm for recycling" (Guagnano et al., 1995, p. 714).

Thus, the powerful effect of physical structures on campus leads us to pose this research question for future research: What small changes to students' physical environment result in large changes in their pro-environmental behavior? Wansink's work suggests a couple prerequisite conditions: an element of ambiguity in the situation (Tangwanichagapong, Nitivattananon, Mohanty, Visvanathan, 2017) about what to do and a physical cue that connotes a social norm for the appropriate behavior. This research could focus on the effects of these physical cues on behavior and whether these cues are evoking consciousness about social norms. For example, our campus office wastebaskets have been replaced with much smaller baskets that are clearly labeled "Landfill only". The physical size of the basket itself may be sufficient to suggest you should not throw out all your trash. Also, we would like to look beyond the recycling behavior to ask how might similar cues be applied to other kinds of pro-environment behavior such as water conservation, home energy use, or fuel consumption

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