

**Understanding Proenvironmental Intentions and Behaviors: The Importance of  
Considering Both the Behavior Setting and the Type of Behavior**

Alexander Maki

Vanderbilt University

Alexander Rothman

University of Minnesota

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Correspondence concerning this article may be addressed to Alexander Maki, Vanderbilt Institute of Energy and Environment, Vanderbilt University, 159 Buttrick Hall, PMB 407702, 2301 Vanderbilt Place, Nashville, TN 37240. E-mail: [alexander.maki@vanderbilt.edu](mailto:alexander.maki@vanderbilt.edu)

**Abstract**

To better understand the consistency of people's proenvironmental intentions and behaviors, we set out to examine two sets of research questions. First, do people perform (1) different types of proenvironmental behaviors consistently and (2) the same proenvironmental behavior consistently across settings? Second, are there consistent predictors of proenvironmental behavioral intentions across behavior and setting type? Participants reported four recycling and conservation behaviors across three settings, revealing significant variability in rates of behaviors across settings. Prior behavior, attitudes toward the behavior, and importance of the behavior consistently predicted proenvironmental intentions. However, perceived behavioral control tended to predict intentions to perform proenvironmental behavior outside the home. Future research aimed at understanding and influencing different proenvironmental behaviors should carefully consider how settings affect intentions and behavior.

*Keywords:* proenvironmental behavior; intentions; behavior consistency; behavior setting; theory of planned behavior

### **Understanding Proenvironmental Intentions and Behaviors: The Importance of Considering Both the Behavior Setting and the Type of Behavior**

Given that many environmental problems (e.g., climate change, water degradation) are due to people engaging in numerous, distinct behaviors that are harmful to the natural environment (Gifford, 2014; Kazdin, 2009), research needs to shift from an analysis of why a *specific* proenvironmental behavior is performed to an analysis of why and where individuals consistently engage in a *range* of proenvironmental behaviors – behaviors engaged in by an individual that affect environmental sustainability (Mesmer-Magnus, Viswesvaran, & Wiernik, 2012; Ones & Dilchert, 2012). For example, do people who consistently recycle paper and plastic make similar efforts to conserve electricity and water? Furthermore, is there variability across the specific *settings* in which proenvironmental behaviors are performed? Do students who recycle paper at school engage in the same behavior at a similar rate at home?

To the extent that proenvironmental behaviors are tied to the settings in which they are enacted, research aimed at understanding proenvironmental behavior must simultaneously consider how consistently individuals perform different types of proenvironmental behaviors and whether they consistently engage in these types of proenvironmental behaviors across different settings. This paper examines the consistency with which people report engaging in two recycling and two conservation behaviors, and the extent to which the frequency of these behaviors varies across three settings, including a private setting (the home), a public setting (school), and a semi-public setting (friends' homes). In addition, guided by the theory of planned behavior (Ajzen, 1985), we examine whether the factors associated with intentions to engage in different behaviors are consistent, or whether these factors instead vary across distinct settings.

#### **Do People Consistently Engage in Different Types of Behaviors?**

The field of environmental psychology has concerned itself with the consistency with which people perform different proenvironmental behaviors. For example, past research has revealed a strong, positive correlation within types of recycling behaviors (e.g., recycling paper and glass, recycling hazardous materials, and recycling textiles; Daneshvary, Daneshvary, & Schwer, 1998) as well as similar trends within types of green consumption behaviors (e.g., purchasing organic foods) and within types of public transportation behaviors (e.g., to and from work and shopping), but the correlations across these different types of behavior tend to be much more modest (Thøgersen & Ölander, 2006). An earlier study (Bratt, 1999) assessed rates of recycling, conservation, and car use behaviors and found that overall rates of recycling had a modest, positive correlation with rates of conservation, but neither recycling behavior nor conservation behavior correlated with car use behaviors. These studies demonstrate that meaningful correlations between different proenvironmental behaviors do exist, but that the strength of these correlations can vary considerably (see also Barr, 2007; Barr, Gilg, & Ford, 2005; Bratt, Stern, Matthies, & Nenseth, 2015; Harland, Staats, & Wilke, 1999; Kaiser & Wilson, 2004; Thøgersen & Noblet, 2012).

However, the consistency with which people engage in some of the most frequent and common proenvironmental behaviors (i.e., recycling paper, recycling plastic, glass, and aluminum, conserving water, and conserving electricity) has rarely been examined in the same study. Knowing the consistency with which people engage in these common behaviors would also help us hypothesize about when we should expect the benefits of an intervention designed to promote a proenvironmental behavior to “spillover” and influence another proenvironmental behavior (Thøgersen, 1999; Truelove, Carrico, Weber, Raimi, Vandenberg, 2014).

### **Do People Consistently Engage in the Same Behavior across Settings?**

Despite the long-standing observation that context shapes people's behavior (e.g., Gibson, 1977; Lewin, 1951; Snyder & Ickes, 1985), less empirical or theoretical work has considered the frequency and consistency with which people engage in different types of proenvironmental behaviors across *settings*. Investigators have tended to study proenvironmental behaviors in a specific, single physical space or setting such as at home (e.g., Abrahamse Steg, Vlek, & Rothengatter, 2005), at work (e.g., Holland, Aarts, & Langendam, 2006), at school (e.g., Werner, Stoll, Birch, & White, 2002), or in other public places such as parks or hotels (e.g., Cialdini, 2003). Yet, the environmental benefits afforded by behaviors such as recycling or conservation depend upon the consistency with which people perform these behaviors across settings. Proenvironmental behaviors are embedded within a given setting, and features of that setting may make it easier or harder to perform the behavior (Scheuthle, Carabias-Hütter, & Kaiser, 2005). For example, at home there is a clear set of actions students can take to conserve electricity, such as adjusting thermostats or unplugging electronic devices, whereas at school those same students might have to rely on a different, perhaps more limited, set of actions to conserve energy (e.g., turning off computer monitors). Recycling can also involve different behaviors across settings. At school, recycling paper can be as simple as putting the paper into a recycling bin, whereas at home recycling paper is a multi-step process; it requires collecting paper over time and eventually bringing it out to a pick-up site (e.g., the curb).

The distinct opportunities to engage in conservation and recycling behaviors in the settings of home and school may also be shaped by the social dynamics associated with each setting. In public settings such as a school, people may not feel personally responsible for managing electricity use (e.g., master-metered buildings; Steg, 2008). If a student is the last person to leave a classroom, she or he may not infer that managing the lights is her or his

responsibility; not only is it unlikely that the student turned on the light, but also it is unclear when someone will use the room next (e.g., Dwyer, Maki, & Rothman, 2015). At the same time, the visible acts of other people in public spaces can facilitate proenvironmental behaviors, such as a friend who communicates or models the expectation that guests should recycle empty bottles in the friend's home (e.g., Aronson & O'Leary, 1983; Burn, 1991), or the social norms created and perpetuated in public spaces (Nye & Hargreaves, 2009). Finally, the outcomes afforded by an individual's conservation or recycling behaviors can differ across settings. For example, efforts to conserve energy and water at home can lead to reductions in the next utility bill, whereas the same actions undertaken at school produce savings that only indirectly affect the financial situation of students, faculty members, and staff (Siero, Bakker, Dekker, & Van Den Burg, 1996).

A few studies have considered the consistency of proenvironmental behaviors across settings. For example, people who recycle at home are more likely to recycle at work (Lee, De Young, & Marans, 1995; Tudor, Barr, & Gilg, 2007). At the same time, people engage in proenvironmental behaviors on vacation less frequently than they do at home (Barr, Shaw, Coles, & Prillwitz, 2010), demonstrating that people are not necessarily consistent across some types of settings. Recent evidence suggests that there may be relative consistency in children's proenvironmental behavior across urban, rural mountain, and rural agricultural areas (Collado, Corraliza, Staats, & Ruiz, 2015). And Littleford, Ryley, and Firth (2014) observed that people engage in some, but not all, energy conservation behaviors consistently at home and work, such as consistently turning off their computer monitor when they know that they will be away from it for an extended amount of time.

The current research extends prior theorizing and research to consider how distinct types of proenvironmental behaviors may vary across a range of settings, and provides, to our knowledge, the first examination of behavior across the public setting of school and semi-public setting of friends' homes. Schools are distinct from home and work settings in important ways, because students rarely have their own physical spaces that they have control over, unlike their home or a worker's office or cubicle. In addition, the setting of friends' homes contains an interesting blend of being public, because the visitor does not live in that home and is interacting with others, but it also retains elements of privacy, given that a close other does have control over the physical space. By considering different types of behaviors across distinct settings, we can shed light on which is more likely, the spillover from engaging in one behavior leading to a second behavior, or the spillover from engaging in a behavior in one setting to engaging in that same behavior in a different setting.

### **Are There Consistent Predictors of Intentions across Types of Behaviors and Settings?**

Just as there may be consistency or inconsistency in the rates in which people engage in different types of proenvironmental behaviors across distinct settings, there may be consistency or inconsistency in the predictors of intentions to engage in these different types of behaviors across settings. Collapsing across different types of behaviors, recent meta-analytic work has found that perceived behavioral control, attitudes, and moral norms are the strongest predictors of proenvironmental intentions and behaviors (Bamberg & Möser, 2007). However, less is known as to whether the relationship between predictors and proenvironmental intentions and behavior vary across types of proenvironmental behaviors and across different settings. For example, social norms might be a key determinant of intentions to engage in proenvironmental behaviors in public settings (e.g., school), whereas attitudes may be a more important

determinant of intentions to perform proenvironmental behaviors in private settings (e.g., home). Although past research has considered how certain demographic characteristics, identity, and beliefs might predict more than one type of proenvironmental intention or behavior (e.g., Black, Stern, & Elworth, 1985; Bratt, 1999; Dietz, Stern, & Guagnano, 1998; Oreg & Katz-Gerro, 2006; Thøgersen & Ölander, 2006; Whitmarsh & O'Neill, 2010), the field would benefit from a theoretically-grounded analysis of how the predictors of proenvironmental intentions vary across types of behavior and settings.

The theory of planned behavior (TPB; Ajzen, 1985) provides a useful framework within which to determine whether predictors of people's behavioral intentions vary across both types of proenvironmental behavior and settings. According to the TPB, intentions are the strongest predictor of a given behavior, and attitudes, social norms, and perceived behavioral control (PBC) are the primary determinants of intentions. The TPB also assumes that attitudes, norms, and PBC best predict intentions when specified at the level of the type of behavior, and possibly also the exact setting in which it is enacted, making it a good framework within which to examine our research questions. In fact, past research (Harland et al., 1999) has used the TPB to examine whether the predictors of intentions to engage in proenvironmental behaviors varied across four behaviors (i.e., using unbleached paper, reducing meat consumption, not using a car, and using energy-efficient light bulbs). This research found that whereas attitudes predicted intentions across all four behaviors, PBC predicted intentions for three (i.e., all but reducing meat consumption), and subjective norms for only one (i.e., not using a car). These findings illustrate the value of examining whether the predictors of intentions vary across different types of proenvironmental behavior, particularly the two common behavioral domains of recycling and conservation, as well as potentially across settings.



### Current Research

The current research examines how rates of reported proenvironmental behavior vary across both types of behavior and setting, as well as whether predictors of proenvironmental intentions vary across types of behavior and setting. Three distinct settings in which people have the capability to engage in proenvironmental behaviors were examined: at home, at school, and in the homes of friends. We wished to focus more on physical settings or environments, and less on general contexts such as rural versus urban environments (Kaiser & Keller, 2001) or different cultures (Kaiser, Schultz, Berenguer, Corral-Verdugo, & Tankha, 2008). Four common proenvironmental behaviors that can be performed across distinct settings were considered: two recycling behaviors (recycling paper and recycling plastic, glass, and aluminum; recycling PGA) and two conservation behaviors (conserving water and conserving electricity). We chose these behaviors because they are frequent behaviors and are commonly engaged in across a range of settings. To test whether people consistently engage in types of proenvironmental behaviors across the three settings, we asked participants to report past behavior in regards to the four types of behaviors across the three settings. Given our research aims, we focused on a sample of students, given that they often spend ample amounts of times in the three distinct settings of home, school, and friends' homes.

Our first hypothesis was that the frequency with which people report having engaged in proenvironmental behavior would vary across both the *type of behavior* and across the *setting* in which the behavior is performed. Our second hypothesis was that there would be positive correlations between each specific reported behavior across the three settings (e.g., paper recycling at home would correlate with paper recycling at school and paper recycling in friends' homes) and that there would be stronger correlations between the same reported behaviors across

settings than between different reported behaviors within a settings. Our third hypothesis was that stronger correlations would be observed for related behaviors, such that recycling paper would correlate higher with recycling PGA than with the two conservation behaviors, and that water conservation would correlate higher with electricity conservation than with the two recycling behaviors.

Our fourth hypothesis was that reported past behavior, attitudes, and importance would be significant predictors regardless of type of behavior or setting, but that perceived social norms and perceived behavioral control would be significant predictors of intentions in settings that are more public (i.e., at school and in friends' homes), but not of intentions in settings that are more private (i.e., at home). We did not have any *a priori* predictions for how the predictors might vary across type of behavior.

## Method<sup>1</sup>

### Participants

Participants were 191 students (134 females, 56 males, 1 unspecified;  $M$  age = 20.33,  $SD$  = 3.52) recruited from a public Midwestern University who completed the survey for partial course credit. Participants could identify as a member of more than one race or ethnicity, and most participants identified themselves as white (81%); fewer as African American (4%), Asian American (14%), Latino (1%), Native American (1%) or other (3%).

### Procedure

After providing consent, participants completed a series of questions regarding the four types of proenvironmental behaviors (i.e., recycling paper; recycling plastic, glass and aluminum; conserving water; and conserving electricity) performed in three settings (at home, at

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<sup>1</sup> Open materials for this article can be accessed at <https://osf.io/njaxk/>

school, and in friends' homes) as well as their age, gender, race, and the location of their home and friends' homes.<sup>2</sup>

### **Materials**

Measures of self-reported behavior, perceived social norms, perceived behavioral control, perceived importance, attitude, and intentions were collected for each of four behaviors (i.e., recycling paper, recycling PGA, conserving water, and conserving electricity) performed in each of the three settings (i.e., at home, at school, and in friends' homes). All participants completed the measures in the same order. For all measures, participants were allowed to select "N/A" as a response option if the behavior was not applicable to them in that setting.

***Self-reported behavior.*** Each behavior in each setting was measured using a format adapted from Bamberg (2002). Participants reported the extent to which they engaged in each behavior in each setting during the past month (e.g., "In the past month, when I am at home I recycle paper") using a scale that ranged from 0 ("never") to 6 ("always").

***Perceived social norms.*** Participants reported their social norm beliefs using a format adapted from Bamberg (2002). Participants reported perceptions of injunctive norms using a scale that ranged from -4 ("strongly disagree") to +4 ("strongly agree") to indicate their agreement with a statement about the performance of each behavior in each setting (e.g., "Most people who are important to me think that I should recycle paper at home."). The referent for this question was always "most people who are important to me."

***Perceived behavioral control.*** Participants reported their perceived behavioral control for each behavior in each setting using a format adapted from Rise, Thompson, and Verplanken

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<sup>2</sup> A majority of participants reported living in on-campus housing (53%). Participants reported that when thinking of friends' homes, 43% thought of off-campus houses, 33% thought of off-campus apartments, and 24% thought of on-campus dormitory rooms.

(2003). Participants indicated their agreement with a statement about the control they have over each behavior (e.g., “I have complete control over recycling paper at home”) on a scale that ranged from -4 (“strongly disagree”) to +4 (“strongly agree”).

***Perceived importance.*** Participants reported how personally important it is to engage in each behavior in each setting using a format adapted from Haugtvedt and Wegener (1994). Participants indicated their agreement with a statement about the personal importance of each behavior (e.g., “Recycling paper at home is very important to me personally”) on a scale that ranged from -4 (“strongly disagree”) to +4 (“strongly agree”).

***Attitude.*** Participants reported their attitudes toward each behavior in each setting using a format adapted from Bamberg (2002). Participants indicated their evaluation of a statement about each behavior (e.g., “For me, recycling paper at home is”) on a scale that ranged from -4 (“very bad”) to +4 (“very good”).

***Intentions.*** Participants reported their intentions to engage in each behavior in each setting over the course of the next month using a format adapted from Rise et al. (2003). Participants indicated their evaluation of statements about expectations to engage in each behavior (e.g., “During the next month, when I am at home I expect to recycle at home”) on a scale that ranged from 0 (“never”) to 6 (“always”).

## Results<sup>3</sup>

### **Do People Report Behaving Consistently across Settings and Types of Behavior?**

We set out to examine whether people engage in some, but not all, reported proenvironmental behaviors consistently across types of behavior, and to also test whether the

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<sup>3</sup> Open data for this article, and a corresponding codebook, can be accessed at <https://osf.io/h6dwg/>

setting in which the behaviors take place also affects people's behavioral consistency. Consistent with our first hypothesis that the frequency with which people report having engaged in proenvironmental behavior would vary across both the *type of behavior* and across the *setting* in which the behavior is performed, a 3 (setting) x 4 (type of behavior) within-subject repeated-measures ANOVA revealed a significant setting x type of behavior interaction,  $F(6,147) = 27.77$ ,  $p < .001$ ,  $\eta^2_{partial} = .53$ . Figure 1 displays the means of reported behavior for each setting and type of behavior combination.

Follow-up repeated-measures ANOVAs revealed that the frequency with which people performed each type of proenvironmental behavior varied significantly within each setting, (at home:  $F(3, 185) = 26.24$ ,  $p < .001$ ,  $\eta^2_{partial} = .30$ ; at school:  $F(3, 168) = 35.40$ ,  $p < .001$ ,  $\eta^2_{partial} = .39$ ; in friends' homes:  $F(3, 163) = 27.72$ ,  $p < .001$ ,  $\eta^2_{partial} = .33$ ). Follow-up repeated-measures ANOVAs were also conducted to determine if the frequency of each individual behavior varied significantly by setting. The frequency of recycling paper  $F(2,166) = 90.51$ ,  $p < .001$ ,  $\eta^2_{partial} = .52$ , recycling PGA  $F(2,178) = 53.63$ ,  $p < .001$ ,  $\eta^2_{partial} = .38$ , and electricity conservation  $F(2,166) = 5.25$ ,  $p < .01$ ,  $\eta^2_{partial} = .06$  varied across the three settings, but rates of water conservation did not,  $F(2,176) = .49$ ,  $p > .05$ ,  $\eta^2_{partial} = .01$ .

Table 1 provides a summary of the correlations between the reported behaviors for each setting and behavior type. Our second hypothesis was that the rates of each specific behavior (e.g., paper recycling) would be positively correlated across the three settings. Overall, there was a strong positive correlation between the frequencies with which people reported engaging in each specific behavior across the three settings ( $r$ 's ranging from .30 to .78; median  $r = .53$ ), and the correlations between the same behaviors across settings tended to be significantly stronger

than those correlations between different behaviors within a setting ( $r$ 's ranging from .11 to .59; median  $r = .31$ ;  $z = 2.79$ ,  $p < .01$ ).

Finally, our third hypothesis was that recycling paper would correlate more strongly with recycling PGA than with the two conservation behaviors, and that water conservation would correlate more strongly with electricity conservation than with the two recycling behaviors. Consistent with this hypothesis, reported recycling behaviors within each setting tended to be strongly correlated ( $r$ 's ranging from .53 to .59; median  $r = .59$ ), as did reported conservation behaviors within each setting ( $r$ 's ranging from .31 to .48; median  $r = .48$ ), whereas correlations between a given reported recycling behavior and given reported conservation behavior in each setting tended to be weaker ( $r$ 's ranging from .11 to .41; median  $r = .28$ ). Follow-up analyses revealed that people were somewhat more consistent in the pair of recycling behaviors as compared to the pair of conservation behaviors ( $z = 1.61$ ,  $p = .11$ ), but also that people were more consistent in their engagement in recycling behaviors or conservation behaviors as compared to pairings of a recycling behavior and a conservation behavior ( $z = 4.85$ ,  $p < .001$  and  $z = 3.35$ ,  $p < .001$ , respectively).

### **Do the Predictors of Proenvironmental Intentions Vary across Setting and Type of Behavior?**

In order to establish which predictors best explain variance in intentions, separate regression models were run for each behavior in each setting. In each model, the predictors (i.e., reported behavior, social norms, perceived behavioral control, importance, and attitude) referred to the specific behavior by setting combination (e.g., recycling paper at home). We relied upon regression models as they allowed us to test the focal questions in a manner consistent with past research in the area (e.g., Black et al., 1985; Dietz et al., 1998; Harland et al., 1999; Littleford et

al., 2014). Given our interest in comparisons across setting and type of behavior, we determined that data analytic approaches such as structural equation modeling, which would have estimated latent constructs collapsed across measures of behaviors or settings, were not appropriate.

Our fourth hypothesis was that reported past behavior, attitudes, and importance would be significantly related to intentions regardless of type of behavior or setting, but that perceived social norms and perceived behavioral control would be significantly related to intentions in settings that are more public (i.e., at school and in friends' homes), but not of intentions in settings that are more private (i.e., at home). Statistics for the regression models are reported in three tables, each one containing the results for the intentions to perform the four behaviors within a given setting (see Tables 2 – 4).

*What explains intentions to engage in proenvironmental behaviors at home?* Across all four behaviors, the models accounted for a large portion of the variability in intentions, ranging from seventy-one percent for intentions to recycle PGA to forty-five percent for intentions to conserve electricity (see Table 2). When considering intentions to recycle paper at home, people reported stronger intentions to recycle the more frequently they reported recycling paper at home in the past, the more positive their attitude toward recycling paper, and the stronger their belief that it was personally important. When considering intentions to recycle PGA at home, people reported stronger intentions to recycle the more frequently they had reported recycling PGA at home in the past, the stronger their perceptions that there were social norms that support the behavior, and the more positive their attitudes toward recycling PGA.

When considering intentions to conserve water at home, people reported stronger intentions to conserve water the more frequently they had reported conserving at home in the past, the more positive their attitude toward conserving water, and the stronger their belief that it

was personally important. Finally, when considering intentions to conserve electricity at home, people again reported stronger intentions to conserve electricity the more frequently they reported conserving at home in the past, the more positive their attitude toward conserving electricity, and the stronger their belief that it was personally important.

Across the four behaviors, reported past behavior and attitudes were both significant predictors of all intentions at home. Social norms were only significant for predicting intentions to recycle PGA at home, importance predicted intentions toward all behaviors except for recycling PGA, and PBC was not a significant predictor of intentions to engage in any of the four behaviors at home.

*What explains intentions to engage in proenvironmental behaviors at school?* Across all four behaviors, the models accounted for a large portion of the variability in intentions, ranging from fifty-nine percent for intentions to conserve water to forty-four percent for intentions to conserve electricity (see Table 3). When considering intentions to recycle paper at school, people reported stronger intentions to recycle paper the more frequently they had reported recycling paper at school in the past, the more positive their attitude toward recycling paper, and the stronger their belief that it was personally important. When considering intentions to recycle PGA at school, people reported stronger intentions to recycle the more frequently they had reported recycling PGA at school in the past, the more positive their attitude toward recycling PGA, and the stronger their belief that it was personally important.

When considering intentions to conserve water at school, people reported stronger intentions to conserve the more frequently they had reported conserving water at school in the past, the more positive their attitude toward conserving water, and the stronger their belief that it was personally important. Finally, when considering intentions to conserve electricity at school,



people reported stronger intentions to conserve the more frequently they had reported conserving electricity at school in the past, the more positive their attitude toward conserving electricity, the greater the control they felt over conserving electricity, and the stronger their belief that it was personally important.

Across the four behaviors, reported past behavior, attitudes, and importance were significant predictors of all intentions at school. Social norms did not significantly predict intentions for any behavior at school, and PBC only predicted intentions toward conserving electricity at school

*What explains intentions to engage in proenvironmental behaviors in friends' homes?*

Across all four behaviors, the models accounted for a large portion of the variability in intentions, ranging from fifty-five percent for intentions to conserve water to thirty-nine percent for intentions to conserve electricity (see Table 4). When considering intentions to recycle paper in friends' homes, people reported stronger intentions to recycle paper the more frequently they reported recycling paper in friends' homes in the past, the more positive their attitude toward recycling paper, and the greater the control they felt over recycling paper. When considering intentions to recycle PGA in friends' homes, people reported stronger intentions to recycle the more frequently they reported recycling PGA in friends' homes in the past, the more positive their attitude toward recycling PGA, the stronger their perceptions that there were social norms that support the behavior, and the greater the control they felt over recycling PGA.

When considering intentions to conserve water in friends' homes, people reported stronger intentions to conserve the more frequently they reported conserving water in friends' homes in the past, the more positive their attitude toward conserving water, and the stronger their belief that it was personally important. Finally, when considering intentions to conserve

electricity in friends' homes, people reported stronger intentions to conserve the more frequently they reported conserving electricity in friends' homes in the past, the more positive their attitude toward conserving electricity, and the greater the control they felt over conserving electricity.

Across the four behaviors, reported past behavior and attitudes were both significant predictors of all intentions in friends' homes. Social norms significantly predicted intentions to recycle PGA only, importance predicted conserving water only, and PBC significantly predicted intentions to recycle paper, recycle PGA, and conserve electricity in friends' homes.

### **Discussion**

The current research examines three questions regarding common proenvironmental behaviors. First, how consistently do individuals report performing different *types* of proenvironmental behaviors? Second, how consistently do individuals report performing different types of proenvironmental behaviors across different *settings*? And third, what are the common and unique cognitions that predict intentions to perform different types of proenvironmental behaviors in different settings? Overall, all four behaviors were positively correlated. However, consistent with our first hypothesis, rates of reported proenvironmental behaviors varied across both types of behavior and by setting, revealing that within all three of the settings (at home, at school, and in friends' homes) there was meaningful variability in the rates with which people reported performing the four types of behavior (i.e., recycling paper, recycling PGA, conserving water, and conserving electricity). Furthermore, for three of the four behaviors – recycling paper, recycling PGA, and conserving electricity – rates of reported behavior varied significantly across the three settings. These results reveal that people report not consistently engaging in different types of proenvironmental behaviors within a given setting, nor do they consistently engage in a given type of proenvironmental behavior across settings.

However, in line with our second and third hypotheses, there were some predictable patterns of consistency in people's self-reported behavior. People reported engaging in the same behavior across settings more consistently than engaging in all four proenvironmental behaviors within any one given setting. Furthermore, people reported greater consistency in their behavior within a proenvironmental domain (i.e., recycling, conservation) than between behaviors across the two domains. These results can guide predictions regarding when a person's behavior might spillover. Influencing someone to engage in a given recycling or conservation behavior should be more likely to spillover to another setting than to another behavior. But, when we do see spillover across behaviors, it should be more likely to be from one recycling behavior to another recycling behavior, or from one conservation behavior to another conservation behavior, rather than from, for example, one recycling behavior to a conservation behavior. These are important points, because the literature to-date has largely ignored what factors may make spillover more or less likely across behaviors or settings (Truelove et al., 2014).

Why might people more consistently engage in recycling behaviors or conservation behaviors, but not both types of behaviors? Research and theorizing suggest that recycling behaviors are easier to engage in, and thus some people who only wish to engage in easier proenvironmental behaviors may choose to only recycle, instead of engaging in other proenvironmental behaviors, such as conservation behaviors (e.g., Kaiser, 1998; Truelove et al., 2014). Physical affordances also matter (Barker, 1968). Settings that provide people the opportunity to recycle one product typically provide the opportunity to recycle numerous products, but may not necessarily facilitate conservation behavior. Likewise, some people may have the ability to conserve both energy and water at home, for example, but may not have a recycling collection service that visits their home or apartment, making it difficult to engage in

both conversation and recycling behaviors at home. Finally, how people construe proenvironmental behaviors may determine patterns of spillover. Thøgersen (2004) observed that the people were more likely to consistently perform behaviors they perceived to be similar. These perceptions of similarity may lead people to infer that engaging in one behavior indicates that they ought to engage in another, similar behavior, or risk being perceived as or feeling inconsistent (Thøgersen, 2004). These perceptions of similarity may be less common between types recycling and conservation behavior.

How might features of settings affect the consistency of proenvironmental behavior? Theorizing in social psychology suggests that situations can vary along a number of dimensions, including how much they elicit a sense of duty or how much they are inherently social (Rauthmann et al., 2014). For example, people may have more of a sense of duty to engage in proenvironmental behaviors when at home, thus possibly leading to greater consistency at home. Alternatively, people may be more influenced by social dynamics when at school or when visiting friends, including others' behavioral expectations, such that people may believe that their friends expect them to engage in proenvironmental behaviors in their friends' homes (Snyder & Stukas, 2007). This variability in social dynamics could lead to variability in rates of behavior across settings. Physical or social settings have also been found to elicit schemas or scripts that can subsequently influence behavior (Aarts & Dijksterhuis, 2003; Higgins & Stangor, 1988), and thus could potentially account for why rates of behaviors vary across settings. Additionally, certain individuals may seek out certain physical or social settings that allow them to engage in the behaviors that they desire to perform (Barker & Wright, 1955; Ickes, Snyder, & Garcia, 1997). Thus, environmentalists may choose to spend time with other environmentalists, and may be more likely to have friends who also have homes where it is possible to recycle or conserve.

Accordingly, certain types of individuals may have an easier time being consistent across settings, and future research should explore this possibility, as well as why that may be true.

We also examined the extent to which psychological predictors of proenvironmental intentions vary across type of behavior and setting, finding partial support for our fourth hypothesis. Consistent with our prediction, reports of past behavior, attitudes toward the behavior, and importance of the behavior predicted behavioral intentions consistently across all types of behavior and across most settings (although importance did not have much success predicting intentions in friends' homes). However, social norms and perceived behavioral control (PBC) predicted intentions in limited circumstances, lending inconsistent support for our prediction that social norms and PBC would only predict intentions in public settings. Social norms predicted intentions for only one type of proenvironmental behavior, recycling PGA, within two of the settings, at home (a private setting) and in friends' homes (a hybrid public/private setting). But, PBC predicted intentions toward one behavior at school and three of the four behaviors in friends' homes (both settings with public components), and no behaviors at home, providing some support for our prediction that PBC would only matter in public settings. As a whole, though, the results suggest that targeting some specific cognitions (e.g., norms, PBC, and perhaps importance) may not lead to an increase in intentions to engage in all recycling and conservation behaviors across settings.

Given the inconsistent support for our fourth hypothesis, why did social norms and PBC predict only a subset of intentions to engage in proenvironmental behavior? Recycling PGA in home settings (i.e., in participants' own homes and in the homes of their friends) is perhaps the most stereotypical of all proenvironmental behaviors, and it is possible that individuals draw upon this normative information when considering intentions to engage in this behavior in these

settings. We did find that the means of perceived social norms for the types of behaviors across settings largely support this contention, as the highest means for reported perceived norms tended to be for recycling PGA across the settings. Additionally, it has been suggested that PBC represents not only perceived physical control, but also perceived difficulty or even social appropriateness (Sparks, Guthrie, & Shepherd, 1997). Given that the settings of school and friends' homes, as compared to participants' homes, tend to allow for less control of the physical and social environment, PBC should be more of a concern to students when at school or the homes of friends. For example, physical constraints such as a lack of recycling options in a friend's home might limit a person's ability to recycle in that setting, or perceptions of social appropriateness may limit a student's ability or desire to turn off lights potentially used by other individuals at school. Both of these possibilities may explain why PBC is a particularly important construct to consider when predicting people's intentions to recycle and conserve in public settings. Prior research does suggest that control is more important in office settings, and is perhaps less relevant in one's own home (i.e., Littleford et al., 2014); this research extends support for this idea to other settings outside of the home, specifically school and friends' homes.

### **Limitations and Implications**

There are some limitations to the current study that should be considered. Prospective data would provide a valuable addition to the findings reported in this study, as it would reveal how consistently people engage in types of proenvironmental behaviors across settings over time. It is also important to acknowledge that some differences exist between self-reported and objectively reported behavioral data (e.g., Chao & Lam, 2011; Kormos & Gifford, 2014), such that people tend to self-report more frequently engaging in proenvironmental behavior than their actual engagement in the behavior. One may similarly expect that people self-report more

consistency in their behavior than actually exists, but there are no data available to address this question. Uncertainty also exists as to the extent to which social desirability concerns may inflate frequency or consistency of proenvironmental behavior. However, some evidence suggests that this social desirability effect on self-reported proenvironmental behavior may be less than feared (Milfont, 2009).

Also, given that our data allow us to predict intentions only, future work should focus on predicting behavior, as the constructs that predict intentions to engage in different types of behaviors across settings may not be identical to the constructs that predict performance of different types of behavior across settings. Future research should also consider asking participants whether they had the opportunity to engage in each behavior in each setting, as some participants in the present study may have failed to select the “N/A” option if they did not have the opportunity to engage in the behavior. Finally, the use of an undergraduate student sample may limit our ability to generalize to a wider population. However, given that we were interested in how consistent both reported behaviors and predictors of intentions were across the settings of home, school, and friends’ homes, this sample proved an optimal fit for our present purposes. It is also worth noting that social norms were not significantly related to many of the behavioral intentions across settings. Though this may appear to contradict the numerous experimental studies linking norms to proenvironmental intentions and behavior (e.g., Cialdini, 2003; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007), it is important to note that self-reported social norms are distinct from manipulated norms, and have often been found to not exert a particularly strong influence on intentions or behaviors across a number of domains (e.g., health behaviors; Armitage & Conner, 2001).

The key finding from the present research is that both types of behavior and the settings in which they take place *matter*. This knowledge can inform future intervention work that aims to increase consistency across types of behaviors and settings, particularly the spillover of behavior to different behaviors and different settings. Prior research (Thøgersen, 2004) and meta-analytic work (Osbaldiston & Schott, 2012) suggests that one of the most effective intervention strategies in the proenvironmental behavior change area is eliciting cognitive dissonance, or making people feel inconsistent when comparing their past behavior to their current behavior. To the extent that interventions influence individuals to perceive that different types of proenvironmental behaviors across settings are all instances of the general category of proenvironmental behavior (e.g., Thøgersen, 1999), cognitive dissonance interventions might be better able to leverage these perceptions of similarity to elicit feelings of cognitive dissonance, leading to greater consistency of future behavior across types of behavior and settings.

Future research should also continue to document not only the types of behavior that people do and do not consistently engage in, but also the settings in which these types of behavior take place. The current study focused on a set of frequent recycling and conservation behaviors across three distinct settings. Research should build on this foundation and work to systematically map a more comprehensive set of proenvironmental behaviors, including other types of recycling and conservation behaviors (e.g., composting or gasoline conservation), as well as other forms of proenvironmental behaviors (e.g., taking public transportation and purchasing green products). Finally, the field needs new models and theories that classify and attempt to explain differences in types of behavior (such as conservation behaviors; Karlin et al., 2014; Urban & Ščasný, 2014) and types of settings. We need to be able to better predict when we should expect people to consistently or not consistently engage in different types of



proenvironmental behaviors, and when we should expect people to engage in types of proenvironmental behaviors consistently across settings.

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Table 1  
*Correlations of reported behaviors by setting and type of behavior*

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. RP at home	3.67	1.97	--											
2. RP at school	4.63	1.40	.35**	--										
3. RP in friends' homes	2.78	1.89	.70**	.46**	--									
4. RPGA at home	4.72	1.76	.59**	.21**	.41**	--								
5. RPGA at school	5.06	1.24	.14	.59**	.17*	.30**	--							
6. RPGA in friends' homes	3.87	1.66	.40**	.24**	.53**	.55**	.42**	--						
7. CW at home	3.91	1.31	.18*	.24**	.33**	.11	.21**	.23**	--					
8. CW at school	3.96	1.45	.09	.18*	.24**	.13	.21**	.17*	.64**	--				
9. CW in friends' homes	3.99	1.38	.14	.15*	.28**	.15	.16*	.28**	.71**	.78**	--			
10. CE at home	4.25	1.36	.32**	.19**	.31**	.25**	.24**	.22**	.31**	.06	.20**	--		
11. CE at school	3.86	1.63	.19*	.26**	.26**	.23**	.30**	.40**	.31**	.48**	.39**	.36**	--	
12. CE in friends' homes	4.03	1.30	.31**	.18*	.34**	.20**	.14	.41**	.35**	.22**	.48**	.55**	.51**	--

*Note.* \* $p < .05$ . \*\* $p < .01$ . RP = recycle paper, RPGA = recycle plastic, glass, and aluminum, CW = conserve water, and CE = conserve electricity.

Table 2

*Regression models for proenvironmental intentions at home, using respective reported behavior, social norms, perceived behavioral control (PBC), importance of behavior, and attitude to predict intentions to engage in proenvironmental behavior*

Variable	Recycle Paper			Recycle PGA			Conserve Water			Conserve Electricity		
	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$
Behavior	.52	.05	.58**	.56	.05	.66**	.40	.06	.39**	.24	.06	.26**
Norms	.05	.05	.05	.12	.04	.12**	.09	.05	.10	.08	.05	.09
PBC	.07	.04	.09	.06	.04	.06	-.02	.04	-.02	.09	.05	.11
Importance	.12	.05	.14*	.04	.04	.04	.23	.04	.33**	.23	.05	.30**
Attitude	.19	.06	.16**	.15	.06	.13*	.14	.05	.17**	.19	.05	.24**
<i>F</i> ( <i>df</i> )		70.03 (5,180)			88.86 (5,176)			51.07 (5,177)			31.88 (5, 181)	
<i>Adjusted R</i> <sup>2</sup>		.65**			.71**			.58**			.45**	

*Note.* \* $p < .05$ . \*\* $p < .01$ . Recycle PGA = recycle plastic, glass, and aluminum.

Table 3

*Regression models for proenvironmental intentions at school, using respective reported behavior, social norms, perceived behavioral control (PBC), importance of behavior, and attitude to predict intentions to engage in proenvironmental behavior*

Variable	Recycle Paper			Recycle PGA			Conserve Water			Conserve Electricity		
	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$
Behavior	.47	.06	.46**	.37	.06	.37**	.32	.06	.32**	.21	.07	.22**
Norms	.04	.05	.05	.08	.05	.10	.03	.05	.03	.05	.06	.05
PBC	.07	.04	.10	.05	.04	.06	.07	.04	.10	.09	.04	.14*
Importance	.16	.05	.21**	.12	.05	.18**	.24	.05	.33**	.22	.06	.28**
Attitude	.17	.07	.15*	.25	.06	.26**	.28	.05	.30**	.25	.06	.28**
<i>F</i> ( <i>df</i> )		40.06 (5,176)			40.66 (5,178)			52.39 (5,171)			27.34 (5,162)	
<i>Adjusted R</i> <sup>2</sup>		.52**			.52**			.59**			.44**	

*Note.* \* $p < .05$ . \*\* $p < .01$ . Recycle PGA = recycle plastic, glass, and aluminum.

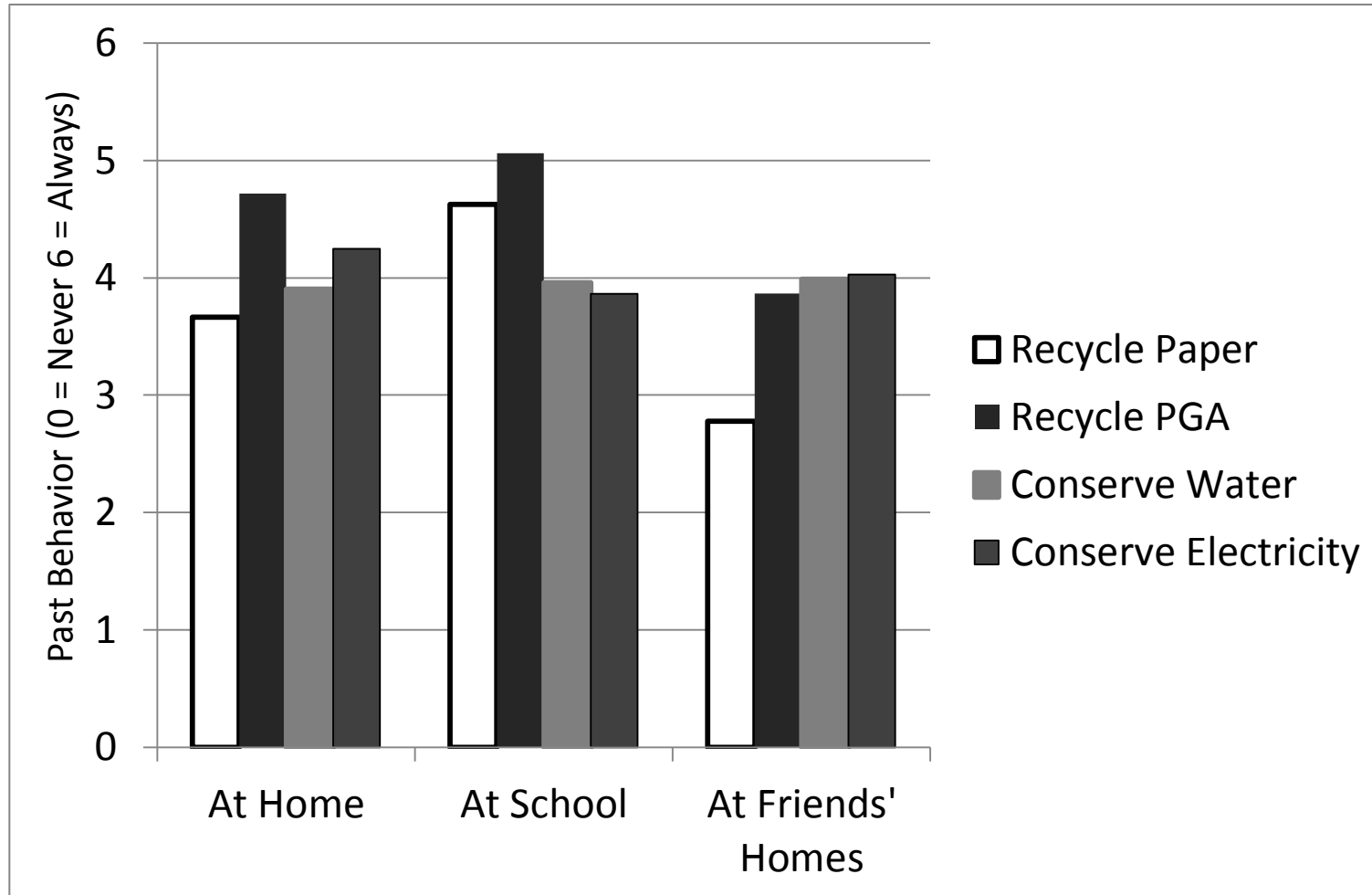
Table 4

*Regression models for proenvironmental intentions in friends' homes, using respective reported behavior, social norms, perceived behavioral control (PBC), importance of behavior, and attitude to predict intentions to engage in proenvironmental behavior*

Variable	Recycle Paper			Recycle PGA			Conserve Water			Conserve Electricity		
	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$	B	SE B	$\beta$
Behavior	.41	.06	.52**	.32	.05	.39**	.47	.06	.48**	.34	.07	.32**
Norms	-.04	.06	-.04	.13	.05	.14*	.03	.05	.04	.10	.06	.11
PBC	.13	.04	.19**	.11	.04	.18**	.03	.03	.05	.13	.04	.21*
Importance	.03	.06	.05	.08	.05	.12	.19	.04	.29**	.10	.05	.15
Attitude	.19	.06	.19**	.20	.05	.23**	.15	.05	.18**	.13	.06	.15*
<i>F (df)</i>		30.24 (5,154)			39.30 (5,164)			41.63 (5,163)			22.97 (5, 165)	
<i>Adjusted R<sup>2</sup></i>		.48**			.53**			.55**			.39**	

*Note.* \* $p < .05$ . \*\* $p < .01$ . Recycle PGA = recycle plastic, glass, and aluminum.

Figure 1  
*Rates of reported proenvironmental behavior by setting and type of behavior*



Note. PGA = plastic, glass, and aluminum.