Abstract

Despite concern about environmental issues, many people engage in environmentally-unfriendly behavior. To address this problem, the present research introduces a novel predictor of environmentally-friendly behavior: attitudes toward the prototypical environmentalist, or the favorability of a mental image someone has of the typical, representative environmentalist. Based on previous findings linking prototype attitudes to relevant behavior, we expected positive attitudes toward environmentalist prototypes to predict greater environmentally-friendly behavior. In addition, the current studies used not just explicit, direct self-reports of attitudes, but also indirect measures of implicit attitudes, which are less intentional, less controllable, and less deliberate. As expected, Studies 1 and 2 showed that positive implicit and explicit attitudes toward the prototypical environmentalist predict greater self-reported engagement in environmentally-friendly behaviors. In Study 2, positive implicit and explicit prototype attitudes also predicted greater likelihood of donating to an environmental charity. The current findings provide the first demonstration of the utility of prototype models in environmentalism, and unite environmental scholarship with prototype models and implicit social cognition.

Attitudes toward the Prototypical Environmentalist Predict Environmentally-Friendly Behavior

1. Introduction

Environmentally-friendly human behavior is critical for the health of the planet (Dietz et al., 2009; Vlek & Steg, 2007). Most people accept this view and report high levels of concern about environmental issues (Yeager, Larson, Krosnick, & Tompson, 2011; Pew, 2011). But these pro-environment attitudes do not necessarily translate to actual behavior (Knussen & Yule, 2008; Rabinovich, Morton, & Postmes, 2010). Worldwide, less than 25% of recyclable waste is recycled (Worldwatch, 2004), few people use energy efficient lightbulbs (IEA, 2006), household energy consumption continues to climb (IEA, 2008), and only 1-2% of food product sales qualify as sustainable (Radman, 2005). In the United States, 76% of employed adults drive to work alone rather than carpooling or taking public transit (American Community Survey, 2014), bottled water consumption is rising steadily (Rodwan, 2012), recycling rates have flattened or slightly declined (EPA, 2013), and, despite meat consumption's potential to harm the environment (Marlow et al., 2009), only about 3% of people follow a vegetarian diet (Vegetarian Times, n.d.).

Behavioral scientists have identified a wide variety of psychosocial factors that predict environmentally-friendly behavior (see Steg & Vlek, 2009, for a review) including values and moral concerns (Bolderdijk, Gorsira, Keizer, & Steg, 2013; Dunlap, de Groot & Steg, 2007; van Liere, Mertig, & Jones, 2000; Perlaviciute & Steg, 2015), social norms (Bator, Tabanico, Walton, & Schultz, 2014; Cialdini et al., 1990), affect (Steg, 2005), environmental knowledge (Cheng & Wu, 2015), habit development (Aarts & Dijksterhuis, 2000), and temporal focus (Baldwin & Lammers, 2017). The present research examines an additional factor that might influence people's environmentally-friendly behavior: how one feels about environmentalists. More specifically, we hypothesize that people will engage in environmentally-friendly behavior to the extent that they have positive attitudes toward the

most central, representative – i.e., prototypical – environmentalist. To support this hypothesis, we turn to the growing literature on prototypes and prototype-behavior relations.

1.1 Prototypes and Behavior

A prototype is an exemplar of a category that comes most easily to mind (Rosch, 1973). For example, when one thinks of the category "pets" it is likely that a dog or a cat comes to mind, rather than an orangutan or a flying squirrel, even though the latter two could fit into the category. Consistently, when asked "do you like pets?" a person's response is likely to be the same as if they were asked "do you like cats and dogs?" because cats and dogs represent prototypical members of the category (Rosch, 1973).

People also have prototypes of *social* categories (e.g., professors, bank tellers, smokers). This is a mental image of the representative person whom they think of when think of the category. Social prototypes can differ widely; one person's prototypical smoker may be fun and cool, and another person's may be boring and uncool (Gerrard et al., 2005). The Prototype-Willingness Model of behavior (PWM; Gerrard et al., 2008) suggests that differences in evaluations of these prototypes predict differences in willingness and likelihood of engaging in relevant behaviors. For example, in one study of teenagers, positive prototypes of smokers (e.g., as cool, fun) predicted teens' willingness to smoke cigarettes and, subsequently, their actual smoking behavior (Gerrard et al., 2005). Researchers have observed a similar influence of prototypes on behaviors ranging from alcohol use (Spijkerman, Larsen, Gibbons, & Engels, 2010) to exercise (Ouellette, Hessling, Gibbons, Reis-Bergen, & Gerrard, 2005).

The present studies use the Prototype-Willingness Model (PWM) to understand how attitudes toward the prototypical environmentalist relate to environmental behavior. We expect that positive attitudes toward the prototypical environmentalist will be associated with greater self-reported engagement in environmentally-friendly behaviors (Studies 1 and 2) and greater likelihood of donating

money to an environmental charity (compared to other charities; Study 2). The PWM has largely been

used to measure health behaviors. Thus, one important contribution of the present work is to extend its

applicability to environmental behavior.

There is a small, but important, distinction between stereotypes, which are beliefs about the

nature of all members of a group (Hamilton, Dugan, & Trolier, 1986; Hilton & von Hippel, 1996;

Stangor & Schaller, 1996; van Knippenberg & Dijksterhuis, 2000) and prototypes, which are beliefs

about the typical member who represents a group (Gerrard et al., 2005; Rosch, 1973). Nevertheless, the

stereotyping literature supports the general idea that attitudes toward, and beliefs about, the prototypical

environmentalist will influence behavior. Most related to the present work, Bashir et al. (2013) found

that negative stereotypes of environmental activists lead people to avoid affiliating with them.

Subsequently, these participants were also less motivated to adopt pro-environmental behaviors when

such behaviors were advocated by "a typical environmentalist". The present work builds on this initial

finding in two important ways. First, we measure participants' actual behavior rather than intended or

hypothetical behavior. Second, we include implicit measures of attitudes toward environmentalist

prototypes, a point we turn to next.

1.2 Implicit and Explicit Measures of Prototypes

The current research investigates the predictive power of both implicit and explicit measures of

attitudes toward prototypes. We define explicit measures of attitudes as those where participants'

responses are largely intentional, controllable, and subject to deliberate introspection. Implicit measures

of attitudes, on the other hand, are those where participants' responses are largely unintentional,

uncontrollable, or outside of conscious awareness (Gawronski & De Houwer, 2013; De Houwer &

Moors, 2012). Because implicit measures of attitudes typically do not alert the respondent to what is

being measured, or do not allow the respondent time to control their automatic response, they are ideal

for detecting attitudes that people are otherwise unwilling or unable to report (Greenwald & Banaji, 1995). For simplicity, in this manuscript we will refer to the outcomes of explicit measures as "explicit attitudes" and the outcomes of implicit measures as "implicit attitudes" (see De Houwer, 2003, 2006, for further discussion of this distinction). It is important to note that both implicit and explicit attitudes often inform behavior (see below), and neither is a definite reflection of a "truer" or "real" attitude.

Researchers rarely use implicit measures when assessing prototypes or environmental attitudes, and have never measured implicit attitudes of environmentalist prototypes. Measuring attitudes toward implicit prototypes should expand explanatory power beyond more traditional explicit measures. Evidence suggests that implicit and explicit attitudes have distinct predictive validity (see Greenwald et al., 2009, for a meta-analysis). Implicit attitudes predict a wide-variety of important, real-world behaviors including White Americans' behavior in interracial interactions (Dovidio, Kawakami, & Gaertner, 2002), race-based disparities in physicians treatment of patients (Green et al., 2007), the longevity of romantic relationships (LeBel & Campbell, 2009), suicidal behavior (Nock et al., 2010), voting behavior (Galdi, Arcuri, & Gawronski, 2008), consumer decision making (Maison, Greenwald, & Bruin, 2004), and eating behavior (Friese, Hofmann, & Wanke, 2010).

Only a handful of papers that we know of have used implicit attitudes toward prototypes to predict behavior, but both provide strong evidence that it is useful to do so. First, Ratliff and Howell (2014) demonstrated that implicit attitudes toward the prototypical woman with tan skin predicted more variance in women's reported sun behavior, planned sun behavior, willingness to engage and risky sun behavior, and tanning frequency than did explicit attitudes toward prototypes (see also Howell & Ratliff, 2016). Then, Redford, Howell, Meijs, and Ratliff (2016) found that implicit attitudes toward the prototypical feminist explained variance in feminist behavior (public identification, donating to a feminist organization) above and beyond explicit attitudes alone (see also Weis, Zucker, Redford, &

Ratliff, 2017). Both of these findings suggest that measuring implicit prototype-attitudes can maximize prediction of real-world behavior.

While there has been relatively little study of the role of implicit attitudes in environmental behavior, and none specifically regarding implicit prototypes, the work that does exist suggests the utility of implicit attitude measures in predicting environmentally-friendly behavior. For example, Panzone, Hilston, Sale, and Cohen (2016) found that explicit attitudes (a measure of environmental concern) predicted overall sustainable food shopping behavior, but decisions in single categories (e.g., bottled water) were better predicted by more specific implicit attitudes. More generally, the research suggests that implicit attitude measures are particularly useful in situations where self-presentation concerns might contribute to self-report (Nosek, 2005). Consistently, there is evidence that individuals often inflate explicit pro-environment attitudes relative to their implicit attitudes (Schlegelmilch, Bohlen, & Diamantopouls, 1996). For example, Siegrist, Keller and Cousin (2006) showed that while people did not self-report negative attitudes towards nuclear energy, measures of implicit attitudes suggested that they were opposed to nuclear energy. Similarly, Beattie and Sale (2009) found that most participants' self-reported attitudes toward low carbon-footprint products were more favorable than their implicit attitudes.

Similarly,, we suspect that people might be unwilling to report or unable to access unfavorable attitudes toward the prototypical environmentalist. As such, implicit measures should prove particularly useful in this context.

1.3 The Present Research

Based on previous work showing that implicit prototype-favorability is associated with relevant behavior (Ratliff & Howell, 2014; Redford et al., 2016), we hypothesized that positive implicit attitudes toward the prototypical environmentalist will be associated with greater self-reported engagement in

environmentally-friendly behaviors (Studies 1 and 2) and greater likelihood of donating to an

environmental charity (Study 2). Although we expect positive explicit attitudes to be related to

environmental behavior in isolation, we do not know whether they will add explanatory power in the

context of implicit attitudes. Indeed, Ratliff and Howell (2014) found that only implicit attitudes toward

prototypes were related to behavioral intention, while Redford et al. (2016) demonstrated the importance

of both implicit and explicit attitudes toward prototypes.

2. Study 1 Method

Study 1 was designed as an initial test of the hypothesis that implicit prototypes would predict

environmental behavior.

2.1 Study 1 Participants

Participants were 1346 volunteers at the Project Implicit research website

(https://implicit.harvard.edu; M_{age} = 32.2 years, SD = 13.3, 65.8% women, 71.1% U.S. citizens, 81.0%

White) who completed all study materials. Project Implicit is a website researchers designed to conduct

research and to promote education in the social and behavioral sciences. Participants typically find the

site through suggestion of friends, school or work assignment, or through links in news sources.

Participants complete demographic information upon registration, and are then randomly assigned to a

study from a pool of studies.

Once they were assigned to this study, participants were again randomly assigned to respond to

one of five prototype conditions, which we treat separately for data analysis. In other words, each

participant completed measures of only one potential characteristic of the prototypical environmentalist:

attractiveness (final N = 243), coolness (final N = 260), fun (final N = 243), intelligence (final N = 228),

or judgmentalness (final N = 216). We chose the first four traits based on previous work utilizing the

Prototype Willingness Model (PWM; e.g., Ratliff & Howell, 2014; Redford et al., 2016) and the latter,

judgmental, because it is a common stereotype of environmentalists (Bashir et al., 2013). We chose a

sample size of at least 200 participants per prototype condition a priori and ended data collection as soon

as possible after reaching this target number (because studies at Project Implicit are not removed from

the website immediately upon request, the total sample size is a bit larger). Our sample size allowed us

to detect a small-to-medium effect size of $r_{partial}$ = .20 at .80 power in each prototype condition (sample

size needed 189; Faul, Erdfelder, Lang & Buchner, 2007), and a small meta-analytic effect size at .80

power across conditions (sample size needed 1221, Faul et al., 2007). This research was approved by the

University of Florida Institutional Review Board.

2.2 Study 1 Materials and Measures

   Implicit Measure of Environmentalist Prototype (Speeded Self-report; Ranganath et al., 2008).

Prior to each trial, a brief orienting stimulus (a series of X's: 'XXXXX') appeared for 500ms. Then, as a

stimulus item appeared on the screen. Participants responded to this stimulus using a 4-point scale

corresponding to the 1, 2, 3, and 4 keys on the computer keyboard. If participants failed to respond to

the stimulus within a 1000ms response deadline, a red X appeared and the next trial began

automatically.

   Prior research has fruitfully employed speeded self-report tasks as measures of implicit attitudes

using similar response windows (Bar-Anan & Nosek, 2014; Ho, Sidanius, Levin, & Banaji, 2011;

Howell, Ratliff, & Shepperd, 2016; Nosek, Bar-Anan, Sriram, Axt, & Greenwald, 2014). Although

people are aware of their responses on speeded self-reports, they also appear to be unable to control their

responses. Indeed, speeded self-reports are distinct from more controlled measures (e.g., the same

reports without time pressure) and consistently relate to other measures of implicit attitudes (e.g., the

Implicit Association Test; Ranganath et al., 2008).

Participants were assigned to rate environmentalist stimuli on one of five response scales corresponding to the five prototypes: Attractive (1 = Very unattractive, 2 = Unattractive, 3 = Attractive, 4 = Very attractive; Cool (1 = Very uncool, 2 = Uncool, 3 = Cool, 4 = Very cool); Fun (1 = Very boring, 2 = Boring, 3 = Fun, 4 = Very fun), Intelligent (1 = Very unintelligent, 2 = Unintelligent, 3 = Intelligent, 4 = Very intelligent), Judgmental (1 = Very tolerant, 2 = Tolerant, 3 = Judgmental, 4 = Very judgmental). Participants responded to the target word ("Environmentalists") in 8-10 trials out of 60 total trials. They also responded to eight distractor stimuli: bicyclists, politicians, Republicans, Democrats, vegetarians, lobbyists, feminists, and professors. See Appendix A for screen shot of the measure. The instructions given to participants prior to the task were as follows:

> *In this next part of the study you will judge words or pictures very quickly. First, you will see "XXXXXXX" in the middle of the screen. Then there will be picture or word. You will indicate how you feel about the picture or word using the 1, 2, 3, and 4 keys on your keyboard, as shown. You simply press the key that corresponds to how you feel about that item. As soon as you respond to one item, the next will appear. You will have one ONE SECOND to respond to each item, so just go with your gut reaction and don't be worried if you hit the wrong key from time to time. If it takes you longer than one second to respond, a prompt will indicate that you need to go faster and then the next item will appear. Remember this task goes very fast so stay alert. We recommend that you use your left-hand fingers to press the "1" and "2" keys and your right hand fingers for the "3" and "4" keys (take a second to try it now). Please press the button below to begin.*

We did not analyze data from participants who pressed the same number for every trial (N = 124). It was considered an error if participants did not respond to the stimulus item within the response window. Of the remaining 1222 participants, the overall error rate was 21.1% (*SD* = 16.7), and the error rate on the target trials was 17.3% (*SD* = 24.0). We then discarded data from 32 participants whose error rates were more than two standard deviations from the mean error rate on target trials, resulting in a total of 1190 participants.

Self-Reported Environmentalist Prototype. The self-report measure of prototypes was identical to the speeded report task except that: (a) there was no time pressure, and (b) participants responded to each stimulus only once.

Self-Reported Environmentally-Friendly Behavior. Participants reported the frequency with which they engage in sixteen different environmentally-friendly behaviors (e.g., I put my food scraps in a compost bin; I use recycled printer paper; see Appendix B for full scale. Participants responded to each item on a 6-point scale with the following response choices: 1 = Never, 2 = Rarely (about 25% of the time), 3 = Sometimes (about 50% of the time), 4 = Usually (about 75% of the time), 5 = Always, 6 = Not applicable. We combined participants responses to the items into a single numerical index (coding 6= Not Applicable as missing) of environmentally-friendly behavior ($\alpha = .84$; $M = 3.16$, $SD = 0.84$).

2.3 Study 1 Procedure

Participants were randomly assigned to this study from a pool of studies at the Project Implicit research site. Participants read a consent form on screen that assured them of the anonymity of their data and that they could leave the study at any time by closing their internet browser. Then, participants generated a mental image of a single person representing the prototypical environmentalist. Participants then completed the explicit measure of environmentalist-prototypes, followed by the implicit measure of environmentalist-prototypes. This order was fixed because we reasoned that seeing how the task was set up would reduce error on the speeded version. Finally, participants completed the measure of their self-reported environmentally-friendly behavior[1]. Once a participant initiated the study session, they were no longer eligible to be assigned to this study again on subsequent visits to the website.

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[1]At the end of this study we pilot-tested a new version of an environmentalist-prototype Implicit Association Test (IAT; Greenwald, McGhee, & Schwarz, 1998) for use in another study.

3. Study 1 Results and Discussion

We predicted self-reported environmentally-friendly behavior from implicit prototypes (centered), explicit prototypes (centered), and the interaction between implicit and explicit prototypes.

Table 1. **Descriptive Statistics for Studies 1**

	Mean	SD
Unattractive/Attractive		
Implicit Prototype	2.86	0.73
Explicit Prototype	3.14	0.72
Uncool/Cool		
Implicit Prototype	3.02	0.76
Explicit Prototype	3.17	0.70
Boring/Fun		
Implicit Prototype	2.45	0.78
Explicit Prototype	2.56	0.78
Unintelligent/Intelligent		
Implicit Prototype	3.02	0.67
Explicit Prototype	3.13	0.69
Judgmental/Tolerant		
Implicit Prototype	2.20	0.85
Explicit Prototype	2.25	0.98

3.1 Environmentalist-Attractive Prototypes

Participants' implicit environmentalist + attractive prototypes ($M = 2.86$, $SD = 0.73$) were less favorable than their explicit environmentalist + attractive prototypes ($M = 3.14$, $SD = 0.72$), $t(226) = -5.75$, $p < .0001$, 95% CI around the difference [-0.36, -0.18], Cohen's $d = -0.39$. The correlation between the two measures was $r(227) = .52$. Participants' self-reported frequency of engagement in environmentally-friendly behavior was positively related to the implicit measure of environmentalist-attractive prototype, $b = 0.20$, $\beta = 0.22$, $SE = .07$, $p = .004$, but was unrelated to the explicit measure of environmentalist-attractive prototype, $b = 0.11$, $\beta = 0.11$, $SE = .08$, $p = .15$. There was no interaction

between implicit and explicit measures in predicting behavior, $b = 0.05$, $\beta = 0.06$, $SE = .06$, $p = .43$.

3.2 Environmentalist-Cool Prototypes

Participants' implicit environmentalist + cool prototypes ($M = 3.02$, $SD = 0.76$) were less favorable than their explicit environmentalist + cool prototypes ($M = 3.17$, $SD = 0.70$), $t(242) = -3.84$, $p < .0001$, 95% CI [-0.22, -0.07], Cohen's $d = -0.26$. The correlation between the two measures was $r(244) = .68$, $p < .0001$. Participants' self-reported frequency of engagement in environmentally-friendly behavior was positively related to the implicit measure of environmentalist-cool prototype, $b = 0.20$, $\beta = 0.23$, $SE = .07$, $p = .006$, but was unrelated to the explicit measure of environmentalist-cool prototype, $b = 0.15$, $\beta = 0.16$, $SE = .08$, $p = .06$. These results were qualified by a significant interaction between implicit and explicit measures in predicting behavior, $b = 0.13$, $\beta = 0.14$, $SE = .06$, $p = .03$. For those participants who had a stronger explicit (+1 SD) environmentalist + cool prototype, there was a significant positive relationship between implicit prototype and behavior, $b = 0.28$, $\beta = 0.31$, SE = .11, $p = .01$. By contrast, there was no significant relationship between implicit prototype and behavior among those with a weaker (-1 SD) explicit environmentalist + cool prototype, $b = 0.01$, $\beta = 0.02$, SE = .09, $p = .88$.

3.3 Environmentalist-Fun Prototypes

Participants' implicit environmentalist + fun prototypes ($M = 2.45$, $SD = 0.78$) were less favorable than their explicit environmentalist + fun prototypes ($M = 2.56$, $SD = 0.78$), $t(220) = -2.27$, $p = .02$, 95% CI around the difference [-0.21, -0.02], Cohen's $d = -0.15$. The correlation between the two measures was $r(221) = .53$, $p < .0001$. Participants' self-reported frequency of engagement in environmentally-friendly behavior was positively related to the implicit measure of environmentalist-fun prototype, $b = 0.34$, $\beta = .37$, $SE = .09$, $p < .0001$, but was unrelated to the explicit measure of environmentalist-fun prototype, $b = 0.08$, $\beta = .10$, $SE = .08$, $p = .30$. There was no interaction between

implicit and explicit measures in predicting behavior, b = -0.02, β = -.02, SE = .08, p = .83.

3.4 Environmentalist-Intelligent Prototypes

Participants' implicit environmentalist + intelligent prototypes (M = 3.02, SD = 0.67) were less favorable than their explicit environmentalist + intelligent prototypes (M = 3.13, SD = 0.69), t(212) = -2.56, p = .01, 95% CI around the difference [-0.20, -0.03], Cohen's d = -0.17. The correlation between the two measures was r(213) = .57, p < .0001. Participants' self-reported frequency of engagement in environmentally-friendly behavior was positively related to the implicit measure of environmentalist-intelligent prototype, b = 0.22, β = 0.26, SE = .06, p = .001, and also to the explicit measure of environmentalist-intelligent prototype, b = 0.16, β = 0.19, SE = .06, p = .01. There was no interaction between implicit and explicit measures in predicting behavior, b = -0.01, β = -0.01, SE = .06, p = .85.

3.5 Environmentalist-Judgmental Prototypes

Participants' implicit environmentalist + judgmental prototypes (M = 2.20, SD = 0.85) were equivalent in favorability to their explicit environmentalist + judgmental prototypes (M = 2.25, SD = 0.98), t(198) = -0.60, p = .55, 95% CI [-0.14, 0.08], Cohen's d = -0.06. The correlation between the two measures was r(199) = .63, p < .0001. Participants' self-reported frequency of engagement in environmentally-friendly behavior was not related to the implicit measure of environmentalist-judgmental prototype, b = -0.10, β = -0.14, SE = .07, p = .14, or to the explicit measure of environmentalist-judgmental prototype, b = -0.04, β = -0.06, SE = .07, p = .53. These results were qualified, however, by a significant interaction between implicit and explicit measures in predicting behavior, b = 0.13, β = 0.17, SE = .06, p = .02. Among those participants who were higher (+1 SD) in explicit environmentalist + judgmental beliefs, there was no relationship between implicit prototypes and behavior, b = 0.09, β = 0.14, SE = .08, p = .25. However, among those participants who were lower (-1 SD) in environmentalist + judgmental prototype, there was a significant negative relationship

between implicit prototype and behavior, $b = -0.17$, $\beta = -0.26$, SE $= .08$, $p = .04$.

3.6 Meta Analytic Results

We computed sample-size-weighted average effect sizes for implicit prototypes, explicit

prototypes, and their interaction. The results of this meta-analytic procedure suggested that there was an

overall significant main-effect of both implicit, $r_{partial} = .18$ [.12, .24], and explicit, $r_{partial} = .11$ [.05, .17],

prototypes, suggesting that more positive attitudes toward the prototypical environmentalist were

associated with greater environmentally-friendly behavior. These main effects were not qualified by an

interaction $r_{partial} = .01$ [-.05, .07]

Table 2. **Study 1 regression results**

	Partial Correlations with Behavior [95% CI]
Unattractive/Attractive	
Implicit Prototype	.19 [.06, .31]**
Explicit Prototype	.10 [-.03, .23]
Explicit x Implicit	.05 [-.08, .18]
Uncool/Cool	
Implicit Prototype	.18 [.05, .03]**
Explicit Prototype	.12 [-.01, .24]
Explicit x Implicit	.14 [.01, .26]*
Boring/Fun	
Implicit Prototype	.23 [.10, .35]**
Explicit Prototype	.17 [.04, .30]*
Explicit x Implicit	-.01 [-.14, .12]
Unintelligent/Intelligent	
Implicit Prototype	.18 [.05, .31]**
Explicit Prototype	.09 [-.05, .22]
Explicit x Implicit	-.02 [-.16, .12]
Judgmental/Tolerant	
Implicit Prototype	-.11 [-.03, .25]
Explicit Prototype	-.05 [-.09, .19]
Explicit x Implicit	.16 [-.29, -.02]*

Average r_p^a [95% CI]

Implicit Prototype	.18 [.12, .24]
Explicit Prototype	.11 [.05, .17]
Explicit x Implicit	.01 [-.05, .07]

$*p < .05$, $**p < .01$; $r_p{}^a$ = partial correlation weighted by sample size.

3.7 Study 1 Discussion

Study 1 showed that people with more positive implicit attitudes toward environmentalist prototypes – on four of five traits – were more likely to engage in environmentally friendly behavior. Nevertheless, Study 1 was limited in two important ways. First, the study examined prototypes between subjects. Prototype studies often use measures of multiple prototypes to examine the extent to the positivity of participants' average prototype. Second, the study examined self-reported behavior. It is possible that participants with positive implicit prototypes of environmentalists are simply more likely to report that they engage in environmental behavior. Study 2 was designed both to circumvent these limitations as well as to replicate the findings from Study 1.

4. Study 2 Method

4.1 Study 2 Participants

We initially began this study as a laboratory study. A small portion of participants (n = 26) received credit toward a research requirement. Early on, we recognized that we would not be able to collect enough data during the course of the semester so we recruited an additional 127 adults in public spaces on the university campus. These participants received $1 payment for their participation. No study variable differed significantly between paid and non-paid participants. We collected data from as many participants as we could before the end of the semester. This provided enough power to detect a small-to-medium effect size of $r_{partial}$ = .25 at .80 power (sample size needed 129; Faul et al., 2007). This research was approved by the University of Florida Institutional Review Board.

4.2 Study 2 Materials and Measures

Implicit Measure of Environmentalist Prototype (Speeded Self-report). The measure of implicit

attitudes was identical to Study 1 with two exceptions. First, all participants completed four prototype

measures (cool, fun, intelligent, attractive). We dropped judgemental from the method because it failed

to predict Second, there were 20 total trials for each prototype (80 trials total), and participants

responded to the target word ("Environmentalists") between 4-12 times (1 to 3 times for each

prototype). Thirty-four participants made more than one error or entered the same response to every trial

or on one of the prototypes. Thus, we coded their data for that prototype as missing. However, none of

the participants made errors or entered the same response for every trial on all prototypes, so we retained

and analyzed all participants data[2]. We aggregated participant responses to the cool, fun, attractive, and

intelligent prototypes into a single measure of positive prototypes (α = .80).

Self-Reported Environmentally-Friendly Behavior. Participants self-reported the frequency of

their environmentally-friendly behavior using the scale described in Study 1. We combined the items

into a single numerical index of environmentally-friendly behavior (α = .74). The mean score on the

self-reported behavioral measure was M = 3.06 (SD = 0.55).

Environmental Donation Behavior. Participants completed a donation task designed to measure

spontaneous environmental behavior. After completing the computerized portion of the task, participants

received their $1 payment along with $1.25 to donate to charity. All payments were made in quarters.

They donated the money to one of four charities: one supporting cancer research (M = 1.72 quarters, SD

= 1.78), one supporting children and childhood education (M = 1.70 quarters, SD = 1.42), one

supporting homeless animals and animal rights (M = 1.25 quarters, SD = 1.41), and one supporting

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[2] The pattern of results presented here does not change when eliminating those who made an error in one
of the prototypes.

environmental research and preservation ($M = 0.68$ quarters, SD = 0.92).[3] Donation to the environmental

charity was the primary outcome of interest.

4.3 Study 2 Procedure

Researchers approached participants in public places and asked them to participate in a

psychology study in exchange for $1. Researchers then escorted willing participants to a bank of laptop

computers to complete the study[4]. Participants read a consent form on screen that assured them of the

confidentiality (for lab participants) or anonymity (for public participants) of their data, and that they

could leave the study at any time without penalty. Participants were then asked to generate a mental

image of a single person representing the prototypical environmentalist. Participants completed the

implicit prototype measures and the measure of their self-reported behavior in a counterbalanced order.

To disguise the true nature of the study, participants also completed a variety of items about topics like

feminism, philanthropy, and volunteering (related to the filler items in the speeded report task). After

participants completed the study, the researcher escorted them to a table with four jars on it, each labeled

for a charity and full of $20 in quarters (about ¼ of the jar). In front of the jars were one-page print-outs

about each of the charities and their goals.

The researcher told participants that an anonymous donor was going to donate money to each of

the charities at the end of the study, and that participants got to decide where the money would go. The

researcher also indicated that all charities received highly positive reviews on

http://www.charitynavigator.org. Next, the researcher gave participants five quarters and instructed that

they could donate them in any way they desired. The researcher then stepped away and unobtrusively

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[3] Some participants chose also to donate the dollar they received in payment to charity. Analyzing the data with and without this extra donation produces the same pattern of results, so we have retained this additional donation behavior here.

[4] Participants receiving participation credit for a research requirement scheduled an appointment to come to a room in a campus building and completed the study on a bank of desktop computers.

observed and recorded how many quarters participants donated in each jar. Between participants, researchers took out donated quarters to equalize the number of quarters were in each jar and randomly shuffled the jars so that they did not have the same left-to-right configuration.

5. Study 2 Results

Self-Reported Environmentally-Friendly Behavior. As in Study 1, participants with more positive implicit prototypes of environmentalists were also more likely to report engaging in environmentally-friendly behavior, $r(144) = .31, p < .001$.

Environmental Donation Behavior. Like most count-type behavior, quarter donation was both positively skewed, skewness = 3.54, SE = .19, and leptokurtic, kurtosis = 20.32, SE = .39. As such, we used the non-parametric Spearman's rho to assess correlation between prototype-favorability and donation behavior. As expected, participants with more positive implicit prototypes of environmentalists were also more likely to donate quarters to the environmental charity, $\rho(140) = .29, p < .001$. Self-reported environmental behavior was also positively related to participants' donation behavior, $\rho(140) = .23, p = .009$, and implicit prototypes continued to predict donation behavior even when controlling for self-reported behavior $\rho(132) = .24, p = .005$. Establishing discriminant validity, positive implicit environmentalist prototypes did not significantly predict donation behaviors to the animal-, $\rho(140) = .14$, $p = .11$, children-, $\rho(140) = -.15, p = .07$, or cancer-related charities, $\rho(140) = -.08, p = .37$, suggesting that implicit prototypes specifically predicted environment-related behavior.

Table 3. **Descriptive Statistics for Study 2**

	Mean	SD
Unattractive/Attractive Implicit Prototype	2.87	0.76
Uncool/Cool Implicit Prototype	2.92	0.82

Boring/Fun
    Implicit Prototype   2.73   0.90

Unintelligent/Intelligent
    Implicit Prototype   2.96   0.71

6. General Discussion

In two studies, implicit and explicit attitudes toward environmentalist prototypes predicted two types of relevant outcomes: (1) self-reported engagement in environmentally-friendly behaviors (Studies 1 and 2), (2) the amount participants donated to an environmental charity (Study 2). These findings provide the first demonstration of the utility of prototype models in understanding environmental behavior. They also advance an emerging literature on how attitudes toward implicit prototypes predict behavior (e.g., Ratliff & Howell, 2015; Redford et al., 2016). Thus far, implicit prototypes have been shown to predict only UV behavior (e.g., tanning; Ratliff & Howell, 2015) and feminist identification (Redford et al., 2016). As the first to link implicit prototypes to environmental behavior, the present work suggests the generality of implicit prototypes in predicting behavior and offers further evidence for the utility of measuring implicit prototypes.

The present work also suggests several possible future lines of inquiry. First, future research should investigate whether attitudes toward prototypes moderate typical predictors of environmental behavior. Prototypes may increase or decrease the effects of more structural or contextual predictors of environmental behavior. For instance, research suggests that people are more likely to engage in environmentally-friendly behaviors to the extent that they feel the behaviors are easy to implement (e.g Fujii, 2006). If attitudes toward environmentalist prototypes are negative, even those who report that they want to engage in environmentally-friendly behaviors (e.g., recycling) may acquiesce to difficult circumstances. By contrast, if attitudes toward environmentalist prototypes are very positive, a person may recycle even if it is difficult, shielding them from the negative effects of difficulty.

Future research should also determine the conditions under which implicit and explicit attitudes each predict environmentally-friendly behavior. For example, implicit attitudes generally outperform explicit attitudes in predicting socially sensitive behaviors (Greenwald et al., 2009). So, to the extent that people are motivated to report favorable attitudes toward environmentalists, implicit measures should predict behavior more strongly than explicit attitudes. Implicit and explicit attitudes may also predict different aspects of behavior. Implicit attitudes tend to be better predictors of nonverbal, spontaneous behavior (e.g., friendliness; Dovidio, Kawakami, & Gaertner, 2002) than explicit attitudes, which perform better at predicting controllable behaviors (e.g., brand-related choices and voting, Brunel, Collins, Tietje, & Greenwald, 1999; for a meta-analysis, see Greenwald et al., 2009). Thus, it might be that implicit and explicit a toward prototypes have different effects on environmentally-friendly behaviors that differ in automaticity or controllability.

6.1 Research Limitations

Although the present study suggests unique predictive power of implicit prototypes in behavior, it remains to be seen whether the present effects would generalize in the context of other predictors. In addition to prototypes and behaviors, the full Prototype-Willingness Model (PWM) includes attitudes and subjective norms as predictors of intentions, willingness, and behaviors. Given that our focus here was on the contribution of prototypes to environmental behavior, with a specific focus on including implicit and explicit prototypes, we did not examine the full PWM. Moreover, evidence consistently suggests that prototypes predict in addition to, and often more than, attitudes and subjective norms (Gerrard et al., 2008). Nevertheless, future studies should examine whether prototypes (both implicit and explicit) continue to predict behavior in the context of other measures (e.g., attitudes, subjective norms).

Anotherlimitation of the present work is that it was primarily correlational in nature. Despite the clear relationship between environmentalist prototypes and behavior, it is impossible to infer that

prototypes cause behavior. Indeed, positive prototypes of environmentalists might cause people to engage in more environmentally-friendly behaviors. This pattern is supported best by other work on the PWM, which implicates prototypes as causing behavior. Nevertheless, in the present study we cannot rule out the possibility that engaging in environmentally-friendly behavior promotes pro-environmentalist attitudes. Our second study offers at least some temporal precedent of measured environmentalist prototype attitudes in predicting a novel environmentally-friendly behavior, consistent with the PWM. Nevertheless, because we cannot conclude causality, future studies should directly test the causal influence of prototype attitudes on environmentally-friendly behavior.

Such causal evidence could come from studies using prototype-based interventions to increase environmentally-friendly behavior. The relationship between positive prototype attitudes and positive behaviors suggests that interventionists wishing to increase environmentally-friendly behavior should consider how to promote positive implicit attitudes toward environmentalists. Changing implicit attitudes often requires different means than changing explicit attitudes (c.f. Smith, De Houwer, & Nosek, 2013). For example, implicit attitudes change particularly well in response to associative retraining (e.g., Baccus, Baldwin, & Packer, 2004; Dijksterhuis, 2004). In the context of environmental behavior, associative retraining might consist of repeatedly pairing pictures of environmentalists with positive stimuli. Doing so should lead to more positive implicit attitudes toward environmentalist prototypes and, subsequently, more environmentally-friendly behavior.

One final limitation of the present results was that the order of presentation of implicit and explicit attitudes was fixed. We chose to present explicit attitudes first followed by implicit attitudes so that participants could understand the task at hand prior to having to speed it. Moreover, fixing the task order reduces error variance and makes it easier to find true relationships between variables.

Nevertheless, future studies should examine whether the order of presentation of implicit and explicit attitudes influences the extent to which they relate to environmental behavior.

6.2 Conclusion

At the outset of this inquiry, we noted that despite the fact that most people are concerned about environmental issues (Yeager et al., 2011), many do not engage in environmentally-friendly behavior (Knussen & Yule, 2008; Rabinovich et al., 2010). The present work offers a novel way of understanding environmentally unfriendly behavior. Specifically, it suggests that positive attitudes toward the prototypical environmentalist relate positively to environmentally-friendly behaviors. Importantly, it implicates both implicit and explicit processes in predicting this behavior, suggesting that environmentally-friendly behavior may derive both from controlled, thoughtful processes, but also from automatic, affective reactions to the types of people who actively engage in environmentally-friendly behavior. The present studies represent the first attempt to unite inquires about environmentalism with knowledge about prototypes and prototype models and implicit social cognition. In so doing, it plants the seed for several potential future studies and offers potential targets for future interventions to predict and promote behavior that is crucial to the health of the planet.

References

Aarts, H., & Dijksterhuis, A. (2000). Habits as knowledge structures: automaticity in goal-directed behavior. *Journal of Personality and Social Psychology*, *78*(1), 53.

Baccus, J. R., Baldwin, M. W., & Packer, D. J. (2004). Increasing implicit self-esteem through classical conditioning. *Psychological Science, 15*, 498-502.

Baldwin, M., & Lammers, J. (2017). Past-focused environmental comparisons promote pro environmental outcomes for Conservatives. In press at *Proceedings of the National Academy of Sciences*.

Bar-Anan, Y., & Nosek, B. A. (2014). A comparative investigation of seven indirect attitude measures. *Behavior Research Methods*, *46*(3), 668-688.

Bashir, N. Y., Lockwood, P., Chasteen, A. L., Nadolny, D., & Noyes, I. (2013). The ironic impact of activists: Negative stereotypes reduce social change influence. *European Journal of Social Psychology*, *43*(7), 614-626.

Bator, R. J., Tabanico, J. J., Walton, M. L., & Schultz, P. W. (2014). Promoting energy conservation with implied norms and explicit messages. *Social Influence*, *9*(1), 69-82.

Beattie, G., & Sale, L. (2009). Explicit and implicit attitudes to low and high carbon footprint products. *International Journal of Environmental, Cultural, Economic and Social Sustainability*, *5*, 191-206.

Bolderdijk, J. W., Gorsira, M., Keizer, K., & Steg, L. (2013). Values determine the (in)effectiveness of informational interventions in promoting pro-environmental behavior. *PloS one*, *8*(12), e83911.

Brunel, F. F., Collins, C. M., Greenwald, A. G., & Tietje, B. C. (1999). Making the public private, accessing the inaccessible: Marketing applications of the Implicit Association Test. *Polish Psychological Bulletin, 32,* 1-9.

Cheng, T. M., & Wu, H. C. (2015). How do environmental knowledge, environmental sensitivity, and place attachment affect environmentally responsible behavior? An integrated approach for sustainable island tourism. *Journal of Sustainable Tourism*, *23*(4), 557-576.

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, *58*(6), 1015.

Dietz, T., Gardner, G. T., Gilligan, J., Stern, P. C., & Vandenbergh, M. P. (2009). Household actions can provide a behavioral wedge to rapidly reduce US carbon emissions. *Proceedings of the National Academy of Sciences*, *106*(44), 18452-18456.

De Houwer, J. (2006). What are implicit measures and why are we using them. In R. W. Wiers & A. W. Stacy (Eds.), *The handbook of implicit cognition and addiction* (pp. 11-28). Thousand Oaks, CA: Sage Publishers.

De Houwer, J., & Moors, A. (2012). How to define and examine implicit processes? In R. Proctor & J. Capaldi (Eds.), Implicit and explicit processes in the psychology of science (pp. 183-198). New York: Oxford University Press.

Dijksterhuis, A. (2004). I like myself but I don't know why: Enhancing implicit self-esteem by subliminal evaluative conditioning. *Journal of Personality and Social Psychology, 86*, 345-355.

Dovidio, J. F., Kawakami, K., & Gaertner, S. L. (2002). Implicit and explicit prejudice and interracial interaction. *Journal of Personality and Social Psychology, 82,* 62-68.

Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). New trends in measuring environmental attitudes: measuring endorsement of the new ecological paradigm: a revised NEP scale. *Journal of Social Issues*, *56*(3), 425-442.

Environmental Protection Agency (2013). Advancing Sustainable Materials Management: Facts and

    Figures. Retrieved from https://www.epa.gov/smm/advancing-sustainable-materials

    management-facts-and-figures-report.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power

    analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*

    39(2), 175-191.

Friese, M., Hofmann, W., & Wanke, M. (2010). When impulses take over: Moderated predictive

    validity of explicit and implicit attitude measures in predicting food choice and consumption

    behavior. *British Journal of Social Psychology, 47,* 397-419.

Fujii, S. (2006). Environmental concern, attitude toward frugality, and ease of behavior as determinants

    of pro-environmental behavior intentions. *Journal of Environmental Psychology*, *26*(4), 262-268.

Galdi, S., Arcuri, L., & Gawronski, B. (2008). Automatic mental associations predict future choices of

    undecided decision-makers. *Science*, *321,* 1100-1102.

Gawronski, B., & De Houwer, J. (2013). Implicit measures in social and personality psychology. In H.

    T. Reis, & C. M. Judd (Eds.), *Handbook of research methods in social and personality*

    psychology (2nd ed.). New York, NY: Cambridge University Press.

Gerrard, M., Gibbons, F. X., Houlihan, A. E., Stock, M. L., & Pomery, E. A. (2008). A dual-process

    approach to health risk decision making: The prototype willingness model. *Developmental*

    Review, *28*(1), 29-61.

Gerrard, M., Gibbons, F. X., Stock, M.L., Vande Lune, L. S., & Cleveland, M.J. (2005). Images

    of smokers and willingness to smoke among African American pre-adolescents: An

    application of the prototype/willingness model of adolescent health risk behavior to smoking

    initiation. *Pediatric Psychology, 30,* 305-318.

Green, A. R., Carney, D. R., Pallin, D. J., Long, H., Raymond, K. A., Iezzoni, L. I., Banaji, M. R.

(2007). Implicit bias among physicians and its prediction of thrombolysis decisions for black and

white patients. *Journal of General Internal Medicine, 22,* 1231-1238.

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: attitudes, self-esteem, and

stereotypes. *Psychological Review, 102*(1), 4.

Greenwald, A. G., Poehlman, T. A., Uhlmann, E., & Banaji, M. R. (2009). Understanding and using the

Implicit Association Test: III. Meta-analysis of predictive validity. *Journal of Personality and

Social Psychology, 97*, 17–41.

de Groot, J., & Steg, L. (2007). General beliefs and the theory of planned behavior: The role of

environmental concerns in the TPB. *Journal of Applied Social Psychology*, *37*(8), 1817-1836.

Hamilton, D. L., Dugan, P. M., & Trolier, T. K. (1985). The formation of stereotypic beliefs: Further

evidence for distinctiveness-based illusory correlations. *Journal of Personality and Social

Psychology, 48,* 5-17.

Hilton, J.L., & von Hippel, W. (1996). Stereotypes. *Annual Review of Psychology, 47*, 237-271.

Ho, A. K., Sidanius, J., Levin, D. T., & Banaji, M. R. (2011). Evidence for hypodescent and racial

hierarchy in the categorization and perception of biracial individuals. *Journal of Personality and

Social Psychology*, *100*(3), 492.

Howell, J. L., Ratliff, K. A., & Shepperd, J. (2016). Automatic attitudes and health information

avoidance. In press at *Health Psychology*.

Howell, J. L., & Ratliff, K. A. (2016). Investigating the role of implicit prototypes in the Prototype

Willingness Model. In press at *Journal of Behavioral Medicine.*

IEA (2008). Worldwide trends in energy use and efficiency. Key insights from IEA indicator analysis.

Retrieved from: www.iea.org/papers/2008/indicators_2008.pdf.

van Knippenberg, A. & Dijksterhuis, A. (2000). Social categorization and stereotyping: A

    functional approach. *European Review of Social Psychology, 11,* 105-144.

Knussen, C. & Yule, F. (2008). "I'm not in the habit of recycling": The role of habitual behavior in the

    disposal of household waste. *Environmental and Behavior,* 40, 683-702.

LeBel, E. P., & Campbell, L. (2009). Implicit partner affect, relationship satisfaction, and the prediction

    of romantic breakup. *Journal of Experimental Social Psychology, 45,* 1291-1294.

Maison, D., Greenwald, A. G., & Bruin, R. H. (2004). Predictive validity of the Implicit Association

    Test in studies of brands, consumer attitudes and behavior. *Journal of consumer psychology,* 14,

    405-415.

Marlow, H. J., Hayes, W. K., Soret, S., Carter, R. L., Schwab, E. R., & Sabaté, J. (2009). Diet and the

    environment: does what you eat matter?. *The American Journal of Clinical Nutrition*, *89*(5),

    1699S-1703S.

Nock, M. K., Park, J. M., Finn, C. T., Deliberto, T. L., Dour, H. J., & Banaji, M. R. (2010). Measuring

    the suicidal mind: Implicit cognition predicts suicidal behavior. *Psychological Science, 21,* 511

    517.

Nosek, B. A., Bar-Anan, Y., Sriram, N., Axt, J., & Greenwald, A. G. (2014). Understanding and using

    the Brief Implicit Association Test: Recommended scoring procedures. *PloS One*, *9*(12),

    e110938.

Nosek, B. A. (2005). Moderators of the relationship between implicit and explicit evaluation. *Journal of*

    Experimental Psychology: General, 134, 565-584.

Ouellette, J.A., Hessling, R., Gibbons, F.X., Reis-Bergen, M., & Gerrard, M. (2005). Using

    images to increase exercise behavior: Prototypes versus possible selves. *Personality and*

    Social Psychology Bulletin, *31*, 610-620.

Panzone, L., Hilton, D., Sale, L., & Cohen, D. (2016). Socio-demographics, implicit attitudes, explicit attitudes, and sustainable consumption in supermarket shopping. *Journal of Economic Psychology*.

Perlaviciute, G., & Steg, L. (2015). The influence of values on evaluations of energy alternatives. *Renewable Energy*, *77*, 259-267.

Pew Research. (2011). Global attitudes project. Retrieved from: http://www.pewglobal.org/category/publications/survey-reports/2011/

Rabinovich, A., Morton, T., & Postmes, T. (2010). Time perspective and attitude-behaviour consistency in future-oriented behaviours. *British Journal of Social Psychology*, *49*, 69-89.

Radman, M. (2005). Consumer consumption and perception of organic products in Croatia. *British Food Journal,* 107, 263-273. re-oriented behaviors. *British Journal of Social Psychology,* 49, 69-89.

Ranganath (Ratliff), K. A., Smith, C. T., & Nosek, B. A. (2008). Distinguishing automatic and controlled components of attitudes from indirect and direct measurement methods. *Journal of Experimental Social Psychology*, *44*, 386-396.

Ratliff, K. A., & Howell, J. L. (2015). Implicit prototypes predict risky sun behavior. *Health Psychology*, *34,* 231-242.

Redford, L., Howell, J. L., Meijs, M. M., & Ratliff, K. A. (2016). Implicit and explicit evaluations of feminist prototypes predict feminist identity and behavior. In press at *Group Processes and Intergroup Relations*.

Rodwan, J. (2012). 2012 *statistics reveal bottled water's U.S. and international growth.* Retrieved from http://www.bottledwater.org/public/BMC%202012%20BW%20Stats_low%20res.pdf#overlay-context=economics/industry-statistics

Rosch, E.H. (1973). Natural categories. *Cognitive Psychology, 4*, 328-350.

Schlegelmilch, B. B., Bohlen, G. M., & Diamantopoulos, A. (1996). The link between green purchasing

    decisions and measures of environmental consciousness. *European Journal of Marketing*, *30*(5),

    35-55

Siegrist, M., Keller, C., & Cousin, M. (2006). Implicit attitudes towards nuclear power and mobile

    phone base stations: Support for the affect heuristic. *Risk Analysis,* 26, 1021-1029.

Smith, C. T., De Houwer, J., & Nosek, B. A. (2013). Consider the source: Persuasion of implicit

    evaluations is moderated by source credibility. *Personality and Social Psychology Bulletin, 39,*

    193-205.

Spijkerman, R., Larsen, H., Gibbons, F. X., & Engels, R. C. M. E. (2010). Students' drinker

    prototypes and alcohol use in a naturalistic setting. *Alcoholism: Clinical Experimental*

    Research, *34*, 64–71.

Stangor, C., & Schaller, M. (1996). Stereotypes as individual and collective representations. In

    Macrae C. N., Stangor C, Hewstone M.(eds.), *Steroeypes and Stereotyping* (pp.3-27). New

    York: The Guilford Press.

Steg, L. (2005). Car use: lust and must. Instrumental, symbolic and affective motives for car use.

    Transportation Research Part A: Policy and Practice, *39*(2), 147-162.

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and

    research agenda. *Journal of Environmental Psychology*, *29*(3), 309-317.

Stern, P. C. (2000). New environmental theories: Toward a coherent theory of environmentally

    significant behavior. *Journal of Social Issues*, *56*(3), 407-424.

U.S. Census Bureau (2013). *American community survey questionnaire*. Retrieved

    from https://www.census.gov/hhes/commuting/files/2014/acs-32.pdf

Vegetarianism in America. *Vegetarian Times*, 2008. Retrieved

from http://www.vegetariantimes.com/article/vegetarianism-in-america/

Vlek, C., & Steg, L. (2007). ⊡ Human Behavior and Environmental Sustainability: Problems, Driving

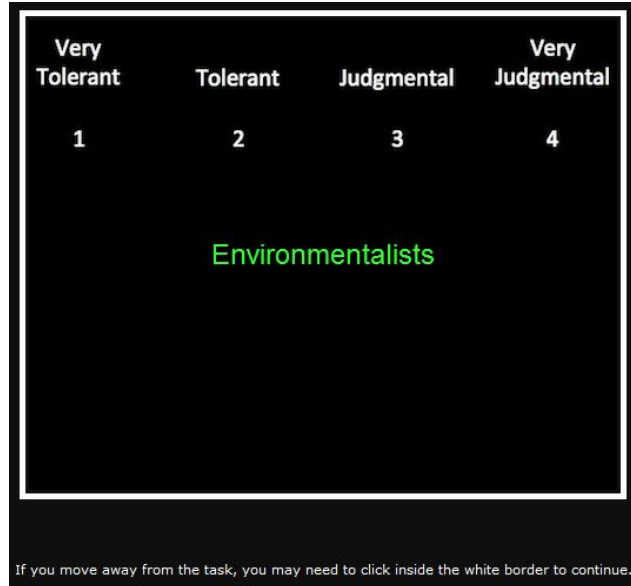Forces, and Research Topics. *Journal of Social Issues*, *63*(1), 1-19.

Weis, A., Zucker, A., Redford, L., & Ratliff, K.A. (2017). Attitudes toward feminist prototypes, feminist

identity, and willingness to intervene when confronted with everyday sexist events. Unpublished

manuscript.

Worldwatch Institute (2004). Global municipal solid waste continues to grow. Retrieved from:

http://www.worldwatch.org/global-municipal-solid-waste-continues-grow

Yeager, D. S., Larson, B. S., Krosnick, J. A., & Tompson, T. (2011). Measuring Americans' issue

priorities: A new version of the most important problems question reveals more concern about

global warming and the environment. *Public Opinion Quarterly, 75,* 125-138.

Appendix A

Very Tolerant | Tolerant | Judgmental | Very Judgmental
1 | 2 | 3 | 4

Environmentalists

If you move away from the task, you may need to click inside the white border to continue.

Appendix B

Study 1 Environmentally-Friendly Behavior Scale

1 = Never, 2 = Rarely (about 25% of the time), 3 = Sometimes (about 50% of the time), 4 = Usually (about 75% of the time), 5 = Always

1. When a light bulb pops, I replace it with a low-energy light bulb.
2. I buy renewable batteries even if they are more expensive than conventional ones.
3. When it is cold inside, I turn up the thermostat instead of putting on a warm sweater. (R)
4. When I wash my clothes, I wash them with lower temperatures to save energy.
5. I make sure that all lights are switched off in unoccupied rooms.
6. I run the washing machine when it is not fully loaded. (R)
7. I make sure that my thermostat is turned off when I am away.
8. I take short showers to save energy.
9. I reuse items rather than throwing them in the trash.
10. I recycle items rather than throwing them in the trash.
11. I take environmental factors into account when buying new products.
12. I bring reusable bags with me to the grocery store.
13. I use the air conditioning to keep my house cold when it is hot outside. (R)
14. I drive even when walking, biking, or public transportation is an option. (R)
15. When I get water or other drinks, I use a reusable container.
16. I eat vegetarian or vegan.