Research Article

Seeing the world through GREEN-tinted glasses: Green consumption values and responses to environmentally friendly products☆

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Abstract

The primary goal of this research is to conceptualize and develop a scale of green consumption values, which we define as the tendency to express the value of environmental protection through one's purchases and consumption behaviors. Across six studies, we demonstrate that the six-item measure we develop (i.e., the GREEN scale) can be used to capture green consumption values in a reliable, valid, and parsimonious manner. We further theorize and empirically demonstrate that green consumption values are part of a larger nomological network associated with conservation of not just environmental resources but also personal financial and physical resources. Finally, we demonstrate that the GREEN scale predicts consumer preference for environmentally friendly products. In doing so, we demonstrate that stronger green consumption values increase preference for environmentally friendly products through more favorable evaluations of the non-environmental attributes of these products. These results have important implications for consumer responses to the growing number of environmentally friendly products.
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1. Introduction

In today's marketplace, consumers are increasingly faced with choices between "green" products and their more traditional counterparts, as more firms produce products whose composition and/or packaging are positioned as environmentally friendly. For example, Wal-Mart is pressuring its suppliers like General Electric and Procter & Gamble to provide environmentally friendly products (Rosenbloom & Barbaro, 2009). Moreover, many corporate initiatives now focus exclusively on environmental issues, such as KPMG's Global Green Initiative (KPMG, 2010; see also Menon &

Menon, 1997). However, the extent to which consumers value and therefore positively respond to such offerings through value-consistent behavior remains questionable.

Clearly not all consumers are willing to buy environmentally friendly (EF) products.[1] Some consumers may be reluctant to purchase EF products because they are perceived to be less effective (Luchs et al., 2010). Cost may also be a critical

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[1] We define an environmentally friendly product as one with at least one positive environmental attribute. An "environmental attribute" is an attribute that reflects the impact of the product on the environment. As such, environmental product attributes can be positive (i.e., the product has little to no negative impact on the environment and is considered environmentally friendly) or negative (i.e., the product harms the environment). This definition is consistent with the definition of "ethical attributes" used in past research (Irwin & Naylor, 2009; Luchs, Naylor, Irwin, & Raghunathan, 2010; Peloza, White, & Shang, 2013), with the key distinction being that environmental attributes are specifically about the environment, not more broadly about any issue that a consumer sees as relevant to their values/ethics (e.g., child labor concerns; unsafe work environments, donations to charity, discrimination; Mohr & Webb, 2005).

deterrent; eco-friendly products have historically cost more than their traditional[2] counterparts (Dale, 2008; Mintel, 2009), and not all consumers are willing to pay price premiums for ethical or EF products (Mintel, 2010). Clearly, some consumers are willing to purchase EF products while others are not, which suggests that there are individual differences among consumers in the value they place on conserving the environment in consumption settings. Therefore, the primary objective of our research is to develop a method to understand differences across consumers who do and do not value conserving the environment as part of their consumption behavior. As such, we introduce the construct of green consumption values, which we formally define as *the tendency to express the value of environmental protection through one's purchases and consumption behaviors.*

Across six studies, we demonstrate that the six-item measure we develop (i.e., the GREEN scale) can be used to reliably capture green consumption values. We further suggest that green consumption values are part of a larger nomological network associated with conservation of not just environmental resources but also personal financial and physical resources. In others words, consumers with stronger green consumption values (i.e., "green" consumers) are generally oriented toward protecting resources at both the environmental and personal level. We test these proposed nomological network relationships empirically as part of our larger scale development effort. Finally, to further validate the scale, we demonstrate that the GREEN scale predicts consumer preference for EF products. In doing so, we show that stronger green consumption values increase preference for EF products through more favorable evaluations of these products' non-environmental attributes, consistent with consumers' use of motivated reasoning in other decision making contexts (Kunda, 1990).

2. Understanding green consumers

Environmentally responsible behavior is receiving increasing attention in the literature (Catlin & Wang, 2013; Leonidou, Katsikeas, & Morgan, 2013; Peloza et al., 2013; Trudel & Argo, 2013; White & Simpson, 2013). This focus is consistent with a broader interest in understanding socially responsible consumption that has persisted for several decades (e.g., Anderson & Cunningham, 1972; Antil, 1984; Roberts, 1995; Webb, Mohr, & Harris, 2008; Webster, 1975). However, the extent to which consumers' environmentally responsible behaviors differ among individuals, and why, is not clear given that existing research has focused on responses to environmental products at the firm level (Leonidou et al., 2013) or as a result of differing situational factors (Catlin & Wang, 2013; Peloza et al., 2013; White & Simpson, 2013). To be sure, past research aimed at understanding socially responsible consumption has sought to understand differences among individual consumers. Yet, this research focused on broader social issues, as illustrated by Roberts' (1993) description of a socially responsible consumer as "one who purchases products and

services perceived to have a positive (or less negative) influence on the environment or who patronizes businesses that attempt to effect related positive social change" (p. 140).

Although we acknowledge that environmental issues have often been conceptualized as part of a broader effort to understand socially conscious consumers (Mohr, Webb, & Harris, 2001; Roberts, 1993; Webster, 1975), the more general notion of socially responsible consumption is multifaceted. As such, investigations of socially conscious consumption have often led to long and complex measures designed to capture the full scope of the constructs involved, which include issues not directly related to the environment (see, for example, Antil, 1984; Webb et al., 2008). Other scales designed to measure consumer social responsibility have become dated as perceptions of socially responsible behaviors change over time (Dunlap, Van Liere, Mertig, & Jones, 2000).[3] Thus, our primary goal is to develop a concise measure of exclusively green consumption values, as opposed to broader attitudes toward socially responsible behavior or environmental consciousness. As we develop this measure, we also seek to identify the consumer characteristics associated with green consumption values as part of a broader nomological network and understanding of the green consumer. In addition to the desire of consumers with strong green consumption values to use society's environmental resources wisely (i.e., clean water, clean air, flora, and fauna; Cunningham, Cunningham, & Woodworth, 2001), we suggest that green consumers also value conservation of their personal resources.

As such, we focus our conceptualization and nomological network of green consumption values on the underlying characteristics of concern for both individual-level financial and physical resources. Specifically, we expect consumers with stronger green consumption values to be more conscientious in the use of their financial resources, consistent with past research suggesting that green consumption (or conservation) may be related to concerns about spending money. For example, in one study, price consciousness was the only variable, other than household characteristics (i.e., number of rooms) and family size, to significantly predict energy use (Heslop, Moran, & Cousineau, 1981). In another study, care in shopping (reflecting shopping for specials and checking prices) significantly predicted making a special effort to buy environmentally-friendly products for both men and women (Shrum, McCarty, & Lowrey, 1995).

Relatedly, we also expect consumers with stronger green consumption values to be more careful users of physical resources, for example by using their products fully and by not using more than the necessary amount of a product for it to perform its function effectively, as suggested by Lastovicka, Bettencourt, Hughner, and Kuntze's (1999) work on frugal consumption. Specifically, we suggest that green consumers will be reluctant to give up their physical possessions because they will seek to extract full and complete value from goods

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[2] When we refer to a "traditional" product, we refer to offerings in which there is no known environmentally friendly attribute, though they are not necessarily harmful to the environment.

[3] For example, some scale items use figures that become dated (e.g., "I would be willing to accept an increase in my family's total expenses of $120 next year to promote the wise use of natural resources" from Antil, 1984), while others focus on avoiding trade with certain countries due to policies that have changed over time (e.g., "I do not buy products from companies that have investments in South Africa" from Roberts, 1995).

before discarding them, consistent with Haws, Naylor, Coulter, and Bearden's (2012) work on product retention tendency. Additionally, we theorize that green consumers will be more likely to be innovative users of existing physical resources, that is, that they will creatively reuse and find multiple uses for their products, as suggested by Price and Ridgeway's (1983) work on use innovativeness, a behavior indicative of self-recycling.

To understand consumers' green consumption values, the corresponding nomological net, and their predictive validity, we first conduct a series of four scale development and validation studies. In Study 1a, we discuss our development of a six-item scale to measure green consumption values, compare it to an existing measure of socially responsible consumption, and establish a nomological network including concern for both personal financial and physical resources. Study 1b provides further validation of the scale and nomological network using an adult sample. Study 1c demonstrates the test–retest reliability of the scale while also providing evidence of predictive validity relative to existing measures of environmental attitudes drawn from the literature. Study 1d provides further support for the predictive validity of our green measure with actual choice.

3. Study 1a: Developing the GREEN scale and testing the nomological network

3.1. Participants and method

To develop the GREEN scale, we initially compiled a list of 58 items intended to measure how much consumers valued the environment when making consumption decisions. These items were generated by the authors by adapting items from existing environmental attitude scales and drawing upon popular press articles regarding green marketing (e.g., Dale, 2008; Stone, 2009). We presented this set of items, plus other measures described below, to 264 undergraduate students who were participating in a multi-phased study for course credit. Given our intention to parsimoniously assess the tendency to express the importance of environmental protection through one's purchases and consumption behaviors, we anticipated a one-factor model for our GREEN scale.

In addition to the 58 proposed items to assess green consumption values, we also included the 40-item measure of Socially Responsible Consumption Behavior (SRCB) developed by Antil in 1984. Our intent was not to compare our measure against every existing measure of environmental or socially responsible values, attitudes, and behaviors, but rather to develop a concise scale that would not easily become outdated and would compare well with past measures. We used the Antil (1984) scale for these benchmarking purposes because of its inclusion of environmental values as a key part of socially responsible consumption as well as its existing use in the literature. We anticipated that our six-item measure would be strongly related to this existing 40-item measure.

Additionally, we sought to examine our proposed nomological network with respect to the relationship between green consumption values and existing measures of consumers' use of personal financial and physical resources. The first of these

measures was Lastovicka et al.'s (1999) frugality scale. Lastovicka et al. (1999) characterized frugality as being about both the careful acquisition and careful consumption of goods, encompassing the vigilant use of both financial and physical resources. Therefore, we expect GREEN to be related to frugality because of the emphasis a frugal consumer places on the careful use of financial resources in acquiring goods and concern for physical possessions during consumption (Lastovicka et al., 1999). We also measured consumer spending self-control (CSSC) because we expect greener consumers to exercise more thoughtfulness and control in their spending decision making, which would be implied in a positive relationship between GREEN and CSSC (Haws, Bearden, & Nenkov, 2012). We also included Lichtenstein, Netemeyer, and Burton's (1990) measure of price consciousness and Lichtenstein, Ridgway, and Netemeyer's (1993) measure of value consciousness. We expect GREEN to be positively related to both of these constructs as these tendencies also suggest careful use of financial resources.

To address the conservative use of personal physical resources beyond that captured in Lastovicka et al.'s (1999) frugality scale, we measured the tendency to retain or relinquish possessions (using the product retention tendency scale; Haws, Naylor et al., 2012) and innovativeness in the use and reuse of products (using Price & Ridgeway's, 1983 three-dimensional use innovativeness scale). We expect these constructs to be positively related to GREEN, as they involve a focus on the careful disposition and use of physical resources.

Finally, to assess the potential for consumers to misrepresent themselves by responding in a socially desirable manner, which may be of particular concern for socially responsible and environmentally friendly behaviors (Luchs et al., 2010), we assessed the relationship between GREEN and both self-deceptive enhancement and impression management using a shortened version of Paulhus (1998) Balanced Inventory of Desirable Responding (BIDR) scale.

3.2. Results

We first conducted a series of factor analyses to reduce the set of 58 items. An initial exploratory factor analysis revealed that there was one primary factor that emerged from the set of 58 items, with an eigenvalue of 19.23 for the first factor versus 5.00 for the second factor, which explained 33% versus 9% of variance, respectively. A careful inspection of the factor loadings for the second and subsequent factors showed that the loadings were significantly smaller than the loadings on the first factor, supporting the proposed one-factor model as sufficiently capturing our construct.[4] As such, we focused on identifying items from this one factor that would assess green consumption values.

We found that 10 items had a loading of at least .70 or higher on the first factor. We carefully examined these 10 items to limit the use of redundant or unclear items in order to use as few items as

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[4] We also compared the one-factor model to a series of other models including two, three, and four factor models, and we consistently found evidence that one factor provided the best fitting model.

Table 1
Study 1a–1d: Confirmatory factor analysis results.

GREEN items	Factor loading estimates			
	Study 1a	Study 1b	Study 1c	Study 1d
It is important to me that the products I use do not harm the environment.	.73	.86	.73	.73
I consider the potential environmental impact of my actions when making many of my decisions.	.81	.91	.81	.80
My purchase habits are affected by my concern for our environment.	.78	.90	.77	.79
I am concerned about wasting the resources of our planet.	.75	.86	.76	.79
I would describe myself as environmentally responsible.	.78	.82	.77	.75
I am willing to be inconvenienced in order to take actions that are more environmentally friendly.	.83	.82	.83	.83
	Fit statistics			
Comparative fit index (CFI)	.96	.96	.96	.96
Normed fit index (NFI)	.95	.96	.96	.96
Standardized root mean residual (SRMR)	.05	.04	.05	.04
X^2, 9 df	72.6	156.4	56.1	57.3

possible while retaining high validity, which is consistent with recommendations by Bearden, Netemeyer, and Haws (2010) and Bearden, Netemeyer, and Teel (1989). This process led to the elimination of four items. Accordingly, we determined that the remaining six items were highly reliable (α = .89) and could succinctly capture the green construct (See Table 1 for final items). Confirmatory factor analysis using the six items demonstrated strong fit of the model (see Table 1). Procedures recommended by Fornell and Larcker (1981) showed: (1) the average variance extracted (.61) exceeded the recommended value of .50 and (2) construct reliability (.90) also implied a good fitting model. From both a managerial and a research perspective, the most

parsimonious measure possible that still captures the core construct fully is the most useful (Haws, Naylor et al., 2012; Richins, 2004).

With this six-item scale, we proceeded to analyze the relationships with Antil's SRCB and other constructs theorized as part of the nomological network. All existing measures were assessed for reliability and averaged into indices following the instructions of the original scales, except for price consciousness, which was reverse-coded, such that higher values indicate more price consciousness, to be consistent with the other measures. All descriptive statistics and correlations among constructs are also shown in Table 2. As expected, GREEN was highly correlated with Antil's SRCB index (r = .63, p < .0001). This strong correlation not only provides evidence of the validity of our measure but also suggests that our six-item measure sufficiently captures the content of the 40-item SRCB. However, we also expected the two measures to show distinction. Confirmatory factor analysis revealed a phi coefficient of .46 between GREEN and SRCB. Comparison of the AVE estimates with the squared phi coefficient reflecting the correlation between the measures of GREEN and SRCB provided additional evidence of discriminant validity between GREEN and SRCB (Anderson & Gerbing, 1988). A chi-square difference test comparing a one-factor model to a two-factor correlated model also supported discriminant validity between GREEN and SRCB ($\Delta\chi^2(1)$ = 5168.25, p < .001), while the corresponding RMSEA decreased from 0.16 to 0.07 (lower scores indicate a better fit; Anderson & Gerbing, 1988).

One possibility is that Antil's SRCB index is more comprehensive than our focus on green consumption values and a subset of these items would be more representative of our scale's environmental and consumption focus. Though Antil's SRCB index is one-dimensional, we conducted a factor analysis to determine the six items that were most closely associated with our GREEN scale. All six of these items concerned the environment and not other social issues; for example: "All consumers should be interested in the environmental consequences of the products they purchase" (see Appendix A for all items). Using this ad-hoc index created from

Table 2
Summary of correlations among green and consumer measures, study 1a.

	Alpha	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Green	.89	3.95	.67										
2. SRCB	.88	3.96	1.19	.63									
3. Short SRCB	.87	3.99	1.17	.69	.85								
4. Frugality	.82	5.14	1.19	.24	.21	.29							
5. CSSC	.94	5.57	.82	.19	.08	.13	.66						
6. Value consciousness	.87	3.56	1.27	.20	.21	.21	.49	.42					
7. Price consciousness	.83	5.46	1.10	.31	.27	.29	.40	.30	.49				
8. PRT	.93	4.66	1.58	.21	.20	.25	.20	.11	.17	.11			
9. Creative reuse	.54	3.25	1.10	.23	.25	.26	.27	.18	.41	.24	.30		
10. Multiple use	.64	4.15	.94	.32	.26	.28	.30	.25	.27	.31	.39	.68	
11. Voluntary simplicity	.89	4.16	1.27	.31	.22	.29	.25	.20	.24	.24	.26	.48	.56

Note. All correlations of .14 or greater are significant at p < .05. SRCB is Socially Responsible Consumption Behavior from Antil (1984); Short SRCB is six environmental items from Antil's SRCB; Frugality (Lastovicka et al., 1999); CSSC is consumer spending self-control from Haws, Bearden, et al. (2012); Value and price consciousness are from Lichtenstein et al. (1990); PRT is product retention tendency from Haws, Naylor, et al. (2012); and creative reuse, multiple use, and voluntary simplicity are from use innovativeness by Price and Ridgeway (1983).

just these six SRCB items, the correlation with GREEN increased only from .63 with all 40 items to .69. Other discriminant validity remained similarly unchanged. As such, we believe that GREEN is not only more parsimonious than Antil's SRCB scale, but is also distinct from an equally concise version of the Antil SRCB scale.

We next explored the nomological network by examining the proposed relationships between GREEN and the measures of how consumers use their personal financial and physical resources (see Table 2). Consumers with higher scores on the GREEN scale were found to be more frugal (r = .24, $p < .01$), more self-controlled in their spending (r = .19, $p < .05$), and both more value (r = .20, $p < .05$) and price (r = .31, $p < .001$) conscious, supporting our theory that consumers with stronger green consumption values are concerned with the wise use of their personal financial resources. Product retention tendency (r = .21, $p < .01$) and the creative reuse, multiple use potential, and voluntary simplicity subscales of the use innovativeness scale were also all positively related to GREEN (r's = .23, .32, and .31, respectively, all p's < .01), indicating that consumers with stronger green consumption values are more careful in how they use their personal physical resources; they are reluctant to discard possessions and are likely to extend the life of their possessions by finding new ways to use them.[5] We note that GREEN was not related to socially desirable responding (r = −.08 for self-deceptive enhancement and r = .08 for impression management; both p's > .10). As such, we conclude that GREEN provides good reliability and validity while also demonstrating the expected relationships with the careful use of personal financial and physical resources. We proceed to further test the scale's validity and reliability in additional studies.

4. Study 1b: Confirmatory factor analysis and validation of the GREEN scale with an adult sample

To provide further evidence of the reliability and validity of our GREEN measure, we used a sample of adult participants, which allowed us to conduct confirmatory factor analyses on a separate set of data, provide additional support for the nomological network, and examine the relationship between GREEN and demographic variables. To ensure that our measure and nomological network is valid for a more diverse population, we also included a subset (to limit respondent fatigue) of the measures used in study 1a: frugality (Lastovicka et al., 1999), consumer spending self-control (CSSC) (Haws, Bearden et al., 2012), and the creative reuse subscale of Price and Ridgeway's (1983) use innovativeness scale. We also included several demographic variables given that past research has shown mixed results regarding the relationship

between environmentalism and demographics (e.g. Antil, 1984; Straughan & Roberts, 1999; also see Roberts, 1995 for summary of relationships).

4.1. Participants and method

Data was collected from 370 adult consumers who were members of an online (Qualtrics) research panel and had been recruited to complete an online survey that consisted of multiple sections, not all of which were related to the present research. The focal measures for this study were our GREEN measure, scales assessing concern for financial and physical resources, and a series of demographic items. Participant age ranged from under 22 to over 70, with the median category falling into the 50–59 year range. Fifty percent of the respondents were female. Approximately 50% of the sample had at least a bachelor's degree, while another 33% of the respondents had some college education. About 55% of respondents had household incomes of less than $80,000.

4.2. Results

This adult sample confirmed the reliability of our GREEN measure, as it had a coefficient alpha of .95. We again used the procedures of Fornell and Larcker (1981) to demonstrate the reliability of our construct, finding an average variance extracted estimate of .74 and a construct reliability of .85. In addition, the one-factor model fit the data well (see Table 1 for details). As such, we find supporting evidence for the validity of the GREEN scale with an adult population.

Next, we considered the personal financial and physical resource usage components. With respect to the use of both financial and physical resources, we find that frugality (α = .89, r = .26, $p < .001$) is positively related to GREEN. Regarding financial resources, consumer spending self-control (α = .95, r = .26, $p < .001$) was again positively correlated with GREEN. Finally, support for the relationship between GREEN and use of physical resources was evident in a significant positive relationship with creative reuse (α = .88, r = .30, $p < .001$). These relationships are consistent with the results of Study 1a. Thus, this adult sample provides further evidence of the underlying relationship between GREEN and careful management of individual-level financial and physical resources.

A brief examination of the relationships between GREEN and the demographic items revealed mixed evidence, which is consistent with past examinations of the demographic correlates of environmentalism (Roberts, 1995). Specifically, GREEN did not differ based on gender (Males = 4.44, Females = 4.53; $F(1, 369) = .46, p = .49$), but it did increase with age ($F(6, 364) = 4.75; p < .0001$) and level of education ($F(4, 366) = 4.1, p < .01$). Higher income participants also tended to have higher scores on the GREEN scale ($F(7, 354) = 3.5, p < .001$). Thus, while green consumption values did not vary based on gender, results indicated that older consumers, more educated consumers, and higher income consumers hold stronger green consumption values. This study

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[5] We note that these relationships between green consumption values and the use of financial and physical resources were generally consistent for either Antil's original or the ad-hoc shortened environmental SRCB. However, we did find our measure of GREEN was more strongly associated with financial resource concerns based on stronger correlations of GREEN with CSSC and Price Consciousness than with Antil's six-item measure (see Table 2 for details).

provides further validation of GREEN and its nomological network by using an adult sample with more diverse demographics than an undergraduate student sample. We next move beyond the nomological network to assess the predictive validity of GREEN.

5. Study 1c: Test–retest reliability and predictive validity

In Study 1c, we test the ability of the GREEN scale to predict preference for an EF versus traditional product. Recall that we define an EF product as any product that has one or more known positive environmental attributes. In doing so, we compare the predictive validity of GREEN to that of existing environmental measures used in the literature that assess environmental consumption or a more general environmental consciousness. This study was conducted in two parts with a two week separation in order to (1) assess the test–retest reliability of the GREEN measure and (2) temporally separate the measurement of GREEN and the related measures from consumer decisions regarding environmentally-friendly behaviors.

5.1. Participants and method

A total of 167 undergraduate students participated in this study in exchange for course credit. In the first part of the study, participants responded to a series of environmental measures in a randomized order, as described below. In the second part, conducted two weeks later, participants responded to a series of consumer decisions, including three regarding environmentally friendly consumption that we anticipated to be predicted by green consumption values. Finally, following an unrelated distractor task involving evaluations of photographs, participants once again completed the GREEN measure.

5.1.1. Measures of environmental consumption and consciousness

In addition to our GREEN measure, in part one of the study, participants were also asked to complete other measures of environmental consumption and environmental consciousness drawn from previous research. In study 1a, we compared performance of GREEN to the Antil (1984) measure of socially responsible consumption, a measure that included items not related to the environment. In this study, we instead compared GREEN to scales drawn from the literature that focused exclusively on the environment. While there are several measures in the literature, we focused on those that were used in existing research and were relevant to product acquisition, consumption, and/or disposition. Specifically, we included (1) the 26-item Socially Responsible Purchase and Disposal (SRPD) measure from Webb et al. (2008),[6] and (2) Straughan and Roberts (1999) 30-item Ecologically Conscious Consumer Behavior (ECCB) scale. We also included the 14-item connectedness to nature scale (CNS) proposed and validated by Mayer and Frantz (2004) to

compare our measure of green consumption values to more general environmental consciousness that is not directly related to consumption.

5.1.2. Measures for predictive validity

In part two of this study, participants responded to various consumer decision making tasks, three of which were relevant to green consumption values (others included, for example, deciding between two snack choices).

First, participants were asked to make a choice between a traditional product (a pack of pens) and an EF product (a reusable grocery bag) of equal retail value ($1.50, clearly stated for each product). A pretest (n = 82) indicated that participants perceived the pack of pens to be of equal value to the reusable grocery bag (M = 2.74 vs. 2.71, $F(1, 80) = .007$, $p = .99$, where 1 = "not at all valuable" and 7 = "very valuable"). To indicate their relative preference between these two items, participants responded to one item on a seven-point scale ranging from one, "I have a strong preference for the bag," to seven, "I have a strong preference for the pens." We recoded this item such that higher values equal stronger preference for the EF option.

The second decision relevant to green consumption values was participants' willingness to pay for a new eco-friendly version of a well-known brand of laundry detergent (although the specific brand name was not revealed, participants were told it was a real, well-known brand on the market). Participants were shown information about two laundry detergents offered by this brand: a traditional and an "eco-friendly" version. The two detergents differed only on the product's "EPC" rating. Specifically, participants read the following information about the (hypothetical) EPC (adapted from Luchs et al., 2010): "The Environmental Product Council (EPC) rates similar products based upon their pro-environmental behaviors, actions, and processes and provides independent judgments of each product's environmental friendliness." The traditional version of the laundry detergent was rated as a five out of 10 (average) while the eco-friendly version was rated as a 10 out of 10 (superb) by the EPC. Participants were asked how much they would pay for the eco-friendly version. To provide a useful anchor, the regular version of the product was stated to retail at $7.99.

Finally, participants were shown information about an all-purpose cleaner presented as "Non-toxic, biodegradable, and good for the environment." They were then asked to rate how likely they were to buy this cleaner on a nine-point scale, with higher values indicating stronger likelihood of purchase. After completing these three green consumption relevant decisions and a distracter task consisting of evaluating pictures unrelated to the current study, participants once again completed our GREEN scale to assess test–retest reliability. See Appendix A for study stimuli.

5.2. Results

All measures were assessed for reliability (see Table 3) and averaged into indices following the instructions of the original scales. Consistent with their treatment in the original scale development by Straughan and Roberts (1999), we examined

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[6] We note that we included SRPD as opposed to several other environmental scales because Webb et al. (2008) demonstrated greater validity of SRPD relative to other environmental scales. Thus, we felt inclusion of SRPD was a succinct way to effectively compare GREEN to numerous past measures.

Table 3
Summary of correlations among green measures and outcomes, study 1c.

	Alpha	Environmental measures					Dependent measures		
		GREEN1	GREEN2	SRPD	CNS	ECCB	Relative preference for green bag (PREF)	WTP for EF laundry detergent (WTP)	Purchase likelihood for EF cleaner (LTB)
GREEN1	.94	1							
GREEN2	.94	.82**	1						
SRPD	.94	.54**	.67**	1					
CNS	.88	.48**	.57**	.49**	1				
ECCB	.96	.67**	.79**	.78**	.58**	1			
PREF	NA	.43**	.36**	.30**	.16*	.31**	1		
WTP	NA	.18*	.16*	.08	.10	.14	.14	1	
LTB	NA	.36**	.35**	.28**	.37**	.28**	.27**	.19*	1

*$p < .05$; **$p < .01$; GREEN1: GREEN scale, time 1 (same time as other environmental scales, separated from dependent measures); GREEN2: GREEN scale, time 2; SRPD: Socially Responsible Purchase and Disposal (Webb et al., 2008); CNS: Connectedness to Nature scale (Mayer & Frantz, 2004); ECCB: Ecologically Conscious Consumer Behavior (Straughan & Roberts, 1999).

the multiple dimensions of the SRPD using an overall index due to the high level of correspondence among the sub-dimensions. All correlations among constructs and the dependent outcome measures are shown in Table 3.

5.2.1. Relationships among GREEN and prior environmental measures

To begin, we examine the relationship between our GREEN scale and existing measures of environmental consumption and environmental consciousness. We focus on the measure of GREEN collected in part one of our study, as this is when the other scales were also assessed. As expected, the GREEN measure was significantly ($p < .001$) correlated with each of the three other measures: SRPD (.54), CNS (.48), and ECCB (.67). As such, our concise GREEN measure is strongly related to these other measures of environmental consumption as well as general environmental consciousness. Importantly, though, related, tests of discriminant validity using confirmatory factor analysis (following the procedures used in Study 1a; Anderson & Gerbing, 1988) demonstrated the distinction between GREEN and each of the other measures.

Table 4
Summary of regressions examining the effects of chronic environmental attitudes measures on dependent variables, study 1c.

	Relative preference for green bag [a]	Willingness to pay for EF detergent	Likelihood to buy EF cleaner
Single predictor results [b]			
GREEN	.43**	.18*	.36**
SRPD	.30**	.08	.28**
CNS	.16*	.10	.37**
ECCB	.31**	.14	.28**
Regressions including all four green measures [c]			
GREEN	.41**	.16†	.26**
SRPD	.11	−.08	.10
CNS	.09	.01	.27**
ECCB	.02	.08	−.12

*$p < .05$; **$p < .01$; †$p < .10$.
[a] Standardized coefficients are reported.
[b] Each cell in the first half of the table represents a single regression.
[c] Each cell represents the standardized coefficient for the predictor with all four predictors included in the model.

5.2.2. Predictive validity

Next, we examined the relationship between GREEN and the three measures assessing (1) relative preference for an equally priced EF vs. traditional product, (2) willingness to pay for an eco-friendly version of a well-known brand of detergent, and (3) likelihood of buying a natural cleaner. GREEN was significantly correlated in the expected direction with each of these three outcome variables (.43, .18, and .36, respectively, p's < .05). After verifying that GREEN predicted these environmental preference measures, we conducted a series of regressions to examine the relative effectiveness of GREEN when the other environmental measures from past research were simultaneously used to predict these outcomes (see Haws, Bearden, et al., 2012 for a similar approach). The results are summarized in Table 4. These results reveal that GREEN is the only significant predictor for relative product preference, a marginally significant predictor for willingness to pay, and also a significant predictor for likelihood to buy. We note that CNS also predicted likelihood to buy, but it did not attenuate the effect of GREEN. Moreover, CNS did not predict the other two measures. Additionally, neither SRPD nor ECCB were significant predictors of any of the three environmental preference measures when included with GREEN. Thus, we conclude that our measure of GREEN sufficiently predicts relevant environmental consumption behaviors at least as well as and, in most cases better than, the environmental measures drawn from past research. We again emphasize the two week gap between the measurement of the environmental constructs and the dependent outcomes, making these correlations a conservative test of the predictive validity of our GREEN measure.

5.2.3. Test–retest reliability

Finally, we examined the test–retest reliability of GREEN. The measures, taken two weeks apart, showed strong reliability over time, with a correlation coefficient of .82 ($p < .001$) (Peter, 1979).

6. Study 1d: Predictive validity of GREEN for real choice

Study 1d provides an additional opportunity to demonstrate the model fit and validity of our GREEN measure. Importantly,

this study was conducted at three separate points in time, minimizing concerns about demand effects and effects of self-perception (Bem, 1972). We test the ability of the GREEN scale to predict a series of self-reported environmentally friendly consumption behaviors, as well as the actual choice of an EF versus traditional product that participants received in exchange for study participation. The predictive validity of GREEN for actual and not just hypothetical consumer choice is particularly important given findings regarding the weak link between expressed concern about the environment and actual EF product choice (Mintel, 2009; Prothero et al., 2011; Straughan & Roberts, 1999).

6.1. Participants and method

Undergraduate participants (n = 235) responded to a battery of measures including GREEN in an online study. One week later, the participants were asked to indicate how often they engaged in a series of eight environmentally friendly consumption behaviors (adapted from past research; Straughan & Roberts, 1999) on a one ("never") to seven ("all the time") scale (e.g., purchase products from eco-friendly companies, avoid using styrofoam products, recycle products such as newspaper, glass, plastic, etc.; α = .88). Another week later (two weeks from the initial assessment of GREEN), participants came to the research lab and were informed they would receive a small gift as a thank you for their participation in the research session, which included studies unrelated to the current research. Participants chose between the same reusable shopping bag (the EF choice) and pack of pens (non-EF choice) used in study 1c and took their chosen product with them at the end of the session.

6.2. Results

First, a confirmatory factor analysis provided strong support for our unidimensional measure (see Table 1 for details). As expected, scores on the GREEN scale were strongly correlated with reported environmentally friendly consumption behaviors (r = .73, p < .0001), indicating that stronger green consumption values result in more frequent environmentally friendly behaviors. In addition, a binary logistic regression indicated that GREEN predicted product choice (χ^2 = 10.71 (1, 234), p < .001), such that participants with higher scores on GREEN were more likely to choose the EF reusable bag over the traditional pack of pens. Overall, 42% of participants selected the bag while 58% selected the pens. Thus, this study provides evidence of predictive validity with actual product choice, even when there was temporal separation of the measurement of GREEN and the choice of product.

Given the evidence presented in Studies 1a–1d, we suggest that our GREEN construct is an important part of a larger nomological network that can help researchers understand how green values impact consumption and how they can be assessed in a reliable, valid, and parsimonious manner. Across these four studies, we have demonstrated that our GREEN scale (1) is related, but distinct from existing environmental measures, (2) is reliable over time, and (3) predicts various environmental

behaviors, preferences, and even actual product choice. To further demonstrate the power of GREEN as a valid predictor of consumer's environmental choices, in the subsequent studies we demonstrate that consumers' green consumption values result in stronger preferences for EF products through their evaluations of the non-environmental attributes of these products.

7. Examining GREEN through motivated reasoning

We next explore how the strength of green consumption values impact consumers' responses to EF products (i.e., those with positive environmental attributes as defined earlier). We propose that while EF products may help greener consumers express their green consumption values, these same products may be seen as inconsistent with a greener consumer's desire to be a careful user of financial and physical resources at the individual level, potentially creating a conflict with other values in the green consumption values nomological network. In other words, greener consumers may be reluctant to buy an EF product if it is perceived to be of lower value for the money (which could be interpreted as a careless use of financial resources) or less effective (requiring them to use more of it, which could be viewed as a careless use of physical resources). This potential tradeoff among important product attributes could result in negative emotions that can be avoided by a biased outcome (Luce, 1998; Luce, Payne, & Bettman, 1999). For example, value-consistent behaviors, which in this case would be making more favorable evaluations of non-environmental product attributes of an EF product and preferring an EF product, can reduce dissonance (Steele & Liu, 1983). Drawing upon this literature, we propose that greener consumers may evaluate non-environmental attributes (e.g., effectiveness, style, aesthetic appeal) of an EF product more positively than do less green consumers to overcome possible financial and physical resource concerns associated with EF products.

More favorable evaluations of non-environmental attributes by consumers with stronger green consumption values may result from motivated reasoning (Kunda, 1990). That is, to prefer EF products that are consistent with their strong green consumption values, we theorize that consumers may process information about an EF product in a manner consistent with their green consumption values (i.e., more favorably). This processing of information to result in a preferred outcome is consistent with motivated reasoning (Kunda, 1990; Verplanken & Holland, 2002) in that consumers with stronger green consumption values interpret information differently than another consumer who does not have the same value-consistent consumption motives (MacInnis & De Mello, 2005; Naylor, Droms, & Haws 2009). In this case, the motivated reasoning process manifests through consumers with stronger green consumption values, who are motivated to prefer EF products based on their green consumption values, perceiving the non-environmental attributes (e.g., effectiveness) of EF products to be more attractive than those consumers with lower green consumption values. We would not expect similar differences in non-environmental product attributes based on green consumption values to occur for non-EF products

since consumers with stronger green consumption values should have no motivation to prefer the non-EF product.

This motivated reasoning process that consumers with stronger green consumption values use with respect to EF products is similar to that demonstrated in prior motivated reasoning literature in more traditional consumption (i.e., non-pro-social) contexts. We therefore test whether green consumption values predict product preferences and non-environmental product attribute evaluations in the context of an EF product versus general product category in Study 2 and, in Study 3, demonstrate empirically that this process for another EF product is a similar process to the one exhibited by a consumer who values social approval (i.e., just as green consumption values alter evaluations of the non-environmental attributes of an EF product, a consumer who values social approval alters the non-popularity related attributes of a product high on brand popularity).

8. Study 2

In Studies 1c and 1d, we demonstrated the predictive validity of GREEN such that higher green consumption values increased preferences for EF products. However, these studies did not examine how consumers with stronger green consumption values arrived at their preferences for EF products, particularly considering that such preferences may conflict with other consumer values in the green consumption values nomological net (e.g., frugality, value consciousness). Thus, we examine whether GREEN influences evaluations of non-environmental attributes in a manner consistent with their preferences for EF-products, which would suggest motivated reasoning processes. As such, in Study 2, we test whether green consumption values predict evaluations of non-environmental attributes for an EF-product and, in turn, preference for the product. Further, we demonstrate the manner in which the motivated reasoning process effects evaluations by showing that it is those consumers higher in green consumption values raising their evaluations of non-environmental attributes that are driving our effects and not consumers low in green consumption values lowering their evaluations of non-environmental attributes. We also demonstrate that there is no effect of GREEN on non-environmental attribute evaluations and product preferences for the product category more generally.

8.1. Method

A total of 126 participants from Amazon Turk completed an online study in exchange for nominal compensation. Participants saw an image of an unbranded all-purpose cleaner described either as EF ("This all-purpose cleaner is formulated to be very environmentally friendly") or representative of the product category ("It is very similar to other all-purpose cleaners available in stores") (see Appendix A for full text). Following the description of the product, respondents were asked to assess the cleaner on a variety of non-environmental attributes on a seven-point scale (1 = "very bad"; 7 = "very good"). The attributes were: fragrance, color, deodorizing ability, appeal of product packaging, removing dried-on food or stains from

counter, removing stains from sinks, and cutting through grease. Evaluations of these seven attributes were combined to form a non-environmental attribute evaluation index (alpha = .87). We then assessed preference for the product using two measures averaged to form a product preference index (r = .85, p < .0001): "Overall, how likely would you be to buy this all-purpose cleaner?" (1 = "not at all likely"; 9 = "very likely") and "Overall, how much do you like the all-purpose cleaner?" (1 = "not at all"; 9 = "very much so"). We also included a seven-point measure anchored by "not good for the environment" and "very good for the environment" to serve as a manipulation check. Following a distractor task in which participants indicated their liking for a series of eight abstract art images, all participants completed the GREEN measure, the Antil (1984), and CNS (Mayer & Frantz, 2004).

A pretest (n = 50) examined the extent to which consumers perceived the product attributes to be environmentally relevant. Participants were asked how relevant each of the attributes used in the main study were to the environmental friendliness of an unbranded all-purpose cleaner (1 = "very little relevance to the environment" to 7 = "very relevant to the environment"). T-tests indicated that an index of the seven items (alpha = .89) was not perceived as environmentally relevant given a mean of 2.48, which was significantly below the scale mid-point of four (t(49) = −7.73, p < .001). These results also held for each attribute individually. As such, any differences in evaluations of these attributes will not be attributable to general perceptions of these as environmentally-relevant attributes. Moreover, these evaluations of environmental relevance did not differ by GREEN (ps > .15).

8.2. Results and discussion

8.2.1. Manipulation check

As expected, participants in the EF product condition perceived the product to be better for the environment than those in the general product category condition (M = 5.66 vs. 4.10, t(124) = 7.58, p < .0001). Neither GREEN nor the interaction of GREEN with product type impacted this measure. Thus, the manipulation check was successful and results are not explainable by differential perceptions of how environmentally friendly the product was based on differences in green consumption values. Since the GREEN measure was completed after the main study, we also examined whether product condition predicted GREEN. We did not find evidence that GREEN was influenced by product condition (F(1, 124) = .49, ns).

8.2.2. Product preference

We conducted a regression analysis with the continuous measure of GREEN (mean-centered), product type (EF vs. general product category), and the interaction of these two variables as independent variables and product preference as the dependent variable. Results revealed a main effect of GREEN (b = .37, t = 4.10, p < .01) on the measure of product preference, such that consumers with higher GREEN scores liked the cleaner more. There was also a main effect of product condition on product preference, such that consumers like the EF product

better than the product described as being similar to the overall product category (b = .38, t = 3.08, p < .01). Most importantly, and consistent with our expectations, these main effects were qualified by an interactive effect between product condition and scores on the GREEN scale (b = .22, t = −2.48, p < .02), as depicted in Fig. 1, panel a. Follow-up spotlight analyses (Irwin & McClelland, 2001) revealed that green consumers liked the all-purpose cleaner more than did non-green consumers when it was positioned as an EF product (b = .59, t = 5.00, p < .01). In contrast, preference for the product described as being similar to the overall product category did not differ by GREEN score (b = .15, t = 1.07, p = .28).

8.2.3. Evaluations of non-environmental product attributes

To determine if green consumption values also predicted evaluations of non-environmental product attributes, we

conducted the same regression with evaluations of non-environmental product attributes as the dependent variable. Results revealed a main effect of GREEN (b = .10, t = 1.94, p = .05), such that green consumers rated the cleaner's non-environmental attributes more positively. There was also a main effect of product condition such that the non-environmental attributes of the EF product were rated more favorably than those of the product described as being similar to the overall product category(b = .27, t = 3.83, p < .01). Importantly, an interactive effect between product condition and scores on the GREEN scale emerged (b = .11, t = 2.11, p < .05), as depicted in Fig. 1, panel b. Follow-up spotlight analyses revealed that green consumers evaluated the non-environmental attributes of the cleaner more favorably than did non-green consumers when it was positioned as an EF product (b = .21, t = 3.08, p < .01). In contrast, evaluations of the non-environmental attributes did not differ by GREEN score for the product described as being similar to the overall product category (b = −.01, t = −.11, p = .91).

8.2.4. Mediating role of non-environmental product attribute evaluations

We next examine the potential for non-environmental product attribute evaluations to mediate the relationship between the interaction of GREEN and product condition and EF product preference. Mediation analysis was conducted using model 8 (mediated moderation; Preacher, Rucker, & Hayes, 2007) from Hayes (2013) process macro in which GREEN was entered as the independent variable, product type was the moderator, non-environmental product attribute evaluations were the mediator, and product preference was the dependent variable. Following the bootstrapping procedure recommended by Preacher and Hayes (2004), we used 5,000 iterations to derive a 95% confidence interval for the indirect effect of GREEN and product condition on EF product preference. The 95% confidence interval for the higher order interaction excluded zero, ranging from .0029 to .2435, indicating mediated moderation. Examining the conditional indirect effects, we found that, for the EF product, the 95% confidence interval excluded zero, ranging from .0310 to .4261, indicating a significant indirect effect of GREEN on product preference through evaluations of non-environmental product attributes. However, for the product described as being similar to the overall product category, the 95% confidence interval for the indirect effect did not exclude zero, ranging from −.1388 to .1012, indicating GREEN did not have a significant indirect effect on product preference through evaluations of non-environmental product attributes.

8.2.5. Additional analysis

We also conducted the same regressions with product preference and non-environmental attribute evaluations as the dependent variables for the alternative environmental measures collected in this study (i.e., CNS and the 40-item and reduced 6-item Antil SRCB). See Table 5 for all regression results. Although both the original 40-item Antil (1984) scale and our shortened six-item version produce similar results to GREEN when product preference is the dependent variable, the patterns
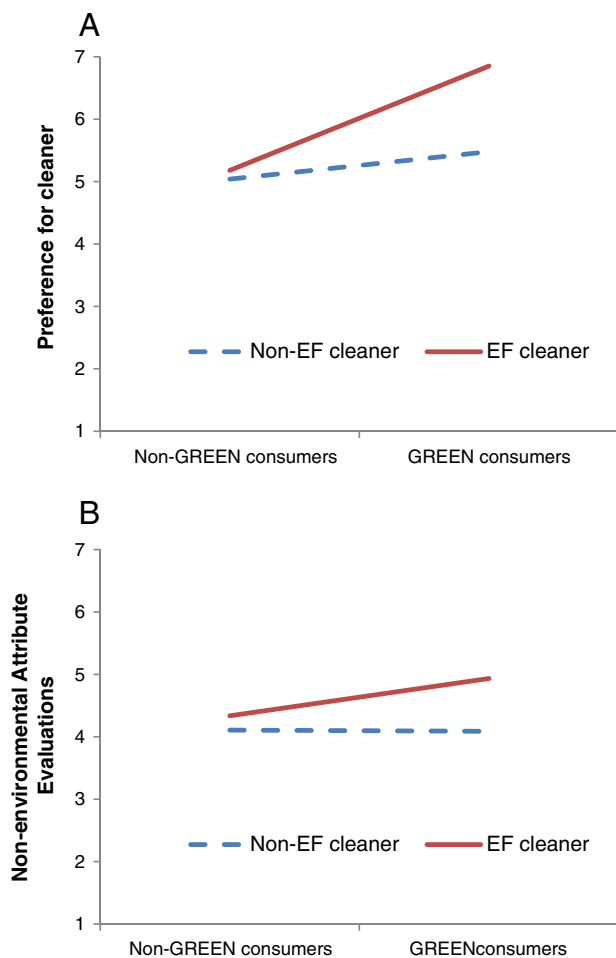

Fig. 1. Study 2: Effects of green consumption values on environmentally-friendly all-purpose cleaner preference (panel A) and non-environmental product attribute evaluations (panel B). This figure was created from analyses using continuous scores on the GREEN measure. GREEN scores were graphed at one standard deviation above the mean to represent GREEN consumers and one standard deviation below the mean to represent non-GREEN consumers (per procedures recommended in Irwin & McClelland, 2001).

for the non-environmental attribute evaluations fail to reach significance for CNS or either version of the Antil scale. Thus, this study provides additional evidence of the validity of our GREEN measure in predicting not only EF product preference but also evaluation of non-environmental attributes of EF products.

Overall, the results of Study 2 reveal that stronger green consumption values increased evaluations of a wide range of non-environmental product attributes, which, in turn, impacted consumers' preference for an EF product. Importantly, this effect of green consumption values only occurred when the product was described as environmentally friendly, with attribute evaluations of and preferences for the EF product (vs. control) being more favorable among those with stronger green consumption values (attributes: b = .42, t = 4.16, p < .01; preference: b = .69, t = 3.90, p < .01) and no effect of product type among those with lower green consumption values (attributes: b = .12, t = 1.19, p > .20; preference: b = .07, t = .39, p > .60). Therefore, the pattern of results underscores that motivated reasoning is used to enhance evaluations of non-environmental product attributes of EF products for those higher in GREEN rather than lower evaluations by those lower in GREEN.

9. Study 3

In Study 3, we test whether the effect of green consumption values on evaluations of non-environmental attributes for an EF-product is consistent with the effect of other consumer values (i.e., social approval or acceptance) on the attribute evaluations and preference for a product that reflects those values, which would be consistent with the more general motivated reasoning processes that occur for value-consistent behavior (Kunda, 1990; MacInnis & De Mello, 2005; Verplanken & Holland, 2002). Specifically, as in Study 2, in this study we examine whether green consumption values result in differential evaluations of an EF product on non-environmental attributes. At the same time, we examine whether the desire to be accepted by others impacts evaluations of a product described as highly popular on non-popularity based attributes to demonstrate that the motivated reasoning we observe in a pro-social context is similar to that which occurs in non-pro-social contexts. To do so, we employ Bearden et al.'s (1989) consumer susceptibility to interpersonal influence scale (hereafter, CSII), which has been found to impact assimilation in terms of product preferences, such that consumers higher in CSII are likely to buy products that others

around them have bought. We focus specifically on the first dimension of the CSII, susceptibility to normative influence. Consistent with motivated reasoning, we propose that when a product is described as a popular brand, consumers with higher normative CSII will evaluate non-popularity based attributes more positively than those with lower normative CSII. However, when the product is described as EF rather than popular, normative CSII will not impact evaluations of the product (while GREEN does). Such findings would demonstrate that the effect of green consumption values on non-environmental attributes is consistent with consumers' motivated reasoning for self-interested goals.

9.1. Method

A total of 155 female participants completed the study, which was a 2 (product: EF vs. popular) between-subjects design with both green consumption values and normative CSII measured as continuous individual difference variables. Participants were a combination of undergraduate students who received extra course credit and Mechanical Turk workers who received a small payment. We control for participant type in the analysis. All participants completed the study online.

First, participants were informed they would be evaluating a consumer product and were shown a picture of a female wearing a blue dress shirt that was described as a "Long-sleeved woven light blue dress shirt". Additionally, participants in the EF product condition saw the following information: "Eco-friendly design and development process, made of 100% organic cotton poplin." In the popular condition, participants saw: "Made of 100% cotton, Brand popularity: Ranked #1 out of 100 brands in the category (where #1 indicates the most popular brands; brand popularity rankings are generated by a third party firm that tracks brand engagement)." We limited our sample to females due to the fashion-related product category (Park & Burns, 2005). Note that the picture of the shirt was the same regardless of product condition. Only the descriptions of the shirt differed.

Following the description of the shirt, participants indicated their likelihood to buy the shirt on a 7-point scale (1 = "very unlikely"; 7 = "very likely"). Then, participants responded to three items assessing attributes of the shirt unrelated to environmental friendliness or popularity: "This shirt would be comfortable" "This shirt would be a good value," and "This shirt would make me look good." Responses to these three items were on a 7-point scale

Table 5
Regression model results for GREEN and alternate environmental measures, study 2.

| Scale	GREEN		CNS		SRCB		Short SRCB	
Variable	Non-environmental attributes	Product preference	Non-environmental attributes	Product preference	Non-environmental attributes	Product preference	Non-environmental attributes	Product preference
Scale	.10**	.37	.07	.26*	.13**	.38**	.11**	.36**
Product condition	.27**	−.38	.27**	.39**	.26**	.35**	.26**	.36**
Scale × product condition	.11**	.22**	.06	.13	.06	.20*	.05	.20**

*p < .10, **p < .05
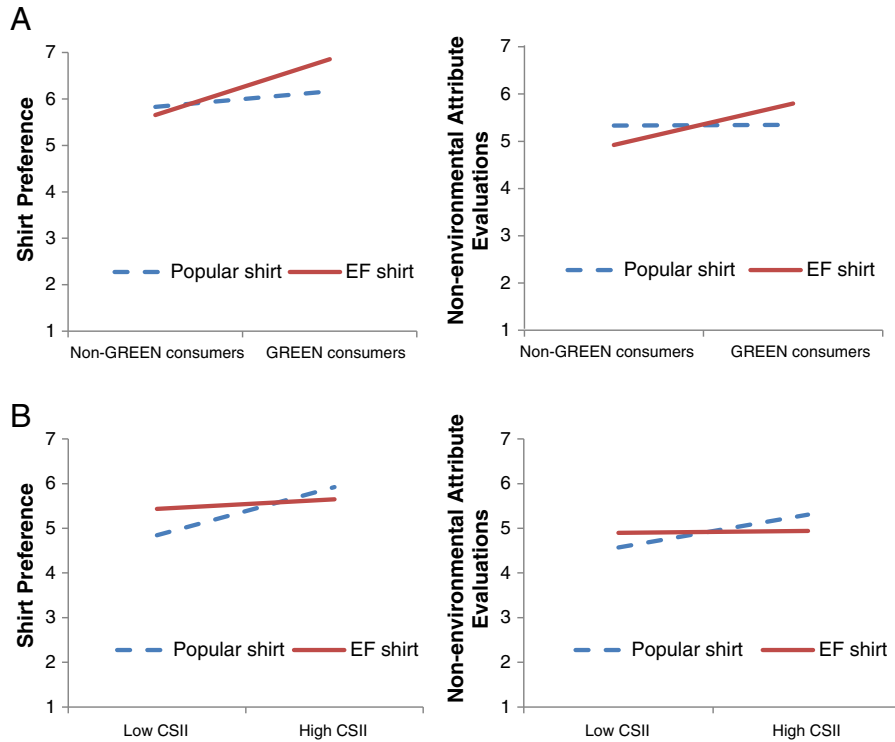
Fig. 2. Study 3: Effects of green consumption values (panel A) and normative CSII (panel B) on shirt preference and non-environmental attribute evaluations.

(1 = "strongly disagree"; 7 = "strongly agree") and were averaged to form a product evaluation score (α = .79). Participants then responded to a filler task that asked them to view and evaluate a series of artistic images. Then, all participants completed the GREEN measure (α = .95) as well as the CSII. We measured the two dimensions of Bearden et al.'s (1989) CSII scale, but we were interested in the eight items for the normative dimension (α = .94).[7] Responses were measured on a 7-point Likert scale (1 = "strongly disagree" to 7 = "strongly agree").

9.2. Results and discussion

9.2.1. Pretests

We conducted a pretest (n = 17 females) for the popular versus EF product positioning. Each participant saw either the EF shirt description or the popular shirt description, described earlier, and then indicated their agreement with six randomly-ordered items on a 7-point scale (1 = "strongly disagree", 7 = "strongly agree"). Three items regarded the product popularity: "This shirt is a top seller," "Other people like this shirt," and "This shirt is relatively more popular than other shirts" (α = .91). Three items pertained to environmental friendliness: "This shirt is friendly to the environment," "This shirt is relatively more eco-friendly than other shirts," and "The manufacturing of this shirt causes less harm to the environment" (α = .92).

After a brief filler task evaluating a series of pictures, participants completed both the GREEN (α = .95) and CSII (normative: α = .89) scales. As expected, participants in the EF product condition perceived the product to be better for the environment than those in the popular product condition (M = 6.06 vs. 3.91, $t(15) = 4.03$, $p < .01$). In contrast, participants in the popular product condition perceived the product to be more popular than those in the EF product condition (M = 6.00 vs. 4.27, $t(15) = 3.78$, $p < .01$). Further analysis showed that neither GREEN nor normative CSII predicted either shirt popularity or shirt environmental friendliness. Additionally, neither GREEN nor normative CSII interacted with product positioning to influence perceptions of product positioning (p's > .14).

A second pretest (n = 113) examined the extent to which consumers perceived the three product attributes to be environmentally relevant, as in Study 2 (1 = "not at all" to 7 = "very environmentally relevant"). T-tests indicated that an index of the three items (alpha = .87) was not perceived as environmentally relevant given a mean of 3.39, which was significantly below the scale mid-point of four ($t(112) = -3.49$, $p < .001$). These results also held for each attribute individually. Moreover, these evaluations of environmental relevance did not differ by GREEN (ps > .15).

9.2.2. Product preference

First, we conducted a regression model with product description (EF or popular), GREEN (mean-centered continuous variable), participant type, and the two-way interaction of GREEN and product description as the predictor variables for

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[7] Though we did not expect informational CSII to interact with product positioning to impact shirt evaluations, we examined the two-way interaction to be sure. It was not significant (b = −.07, t(148) = −.95, p = .34).

product preference (likelihood to buy). Results revealed a main effect of GREEN (b = .26, t = 2.86, p < .01) on preference, such that consumers with higher GREEN scores were more likely to buy the shirt, but no effect of product description (b = .13, t = 1.05, p > .25). Participant type also had a significant main effect (b = −.90, t = −3.37, p < .01), such that students were more likely to buy the shirt. More importantly, and consistent with our expectations, there was a marginally significant interactive effect between product description and scores on the GREEN scale (b = .15, t = 1.76, p = .08). To depict the nature of this interaction, we examined the simple effects of GREEN by product description. When the shirt is described as EF, participants with higher GREEN scores were more likely to buy the shirt (b = .41, t = 3.53, p < .01). In contrast, when the shirt is described as popular, GREEN has no effect on likelihood of purchase (b = .11, t = .82, p > .40). See Fig. 2, panel A. This is consistent with the pattern of results in study 2, such that higher GREEN scores increase preference for the EF product.

Then, we conducted a second regression analysis with product description, normative CSII (mean-centered continuous variable), and the two-way interaction of normative CSII and product description as the predictor variables for product preference (likelihood to buy). There was a main effect of normative CSII (b = .23, t = 2.70, p < .01), such that participants with higher normative CSII were more likely to buy the shirts, but no main effect of product description (b = .08, t = .68, p > .40). Participant type had a significant main effect (b = −.52, t = −2.05, p < .05) such that students were more likely to buy the shirt. More importantly, and consistent with our expectations, there was a significant interactive effect between product description and scores on normative CSII (b = −.15, t = −2.05, p < .05). To depict the nature of this interaction, we examined the simple effects of normative CSII by product description. When the shirt is described as EF, normative CSII has no effect on likelihood of purchase (b =.07, t = .60, p > .50). However, when the shirt is described as a popular brand, participants with higher normative CSII were more likely to buy the shirt (b = .38, t = 3.32, p < .01). See Fig. 2, panel B. This pattern for normative CSII is the reverse pattern of that obtained for GREEN, as expected.

9.2.3. Evaluations of non-environmental product attributes

First, we conducted a regression model with product description, GREEN (mean-centered continuous variable), participant type, and the two-way interaction of GREEN and product description as the predictor variables for the three non-environmental product attribute evaluations. Results revealed a main effect of GREEN (b = .15, t = 2.31, p < .05) on evaluations, such that consumers with higher GREEN scores had more favorable attribute evaluations, but no effect of product description (b = .02, t = .17, p > .80) or participant type (b = −.32, t = −1.63, p > .10). More importantly, and consistent with our expectations, there was a significant interactive effect between product description and scores on the GREEN scale (b = .15, t = 2.36, p < .05). To depict the nature of this interaction, we examined the simple effects of

GREEN by product description. When the shirt is described as EF, GREEN has a significant positive effect on evaluations (b = .31, t = 3.54, p < .01). In contrast, when the shirt is described as popular, GREEN has no effect on evaluations (b = .01, t = .06, p > .90). See Fig. 2, panel A. This is consistent with the pattern in study 2 such that higher GREEN scores increase non-environmental attribute evaluations for the EF product.

Then, we conducted a second regression analysis with product description, normative CSII (mean-centered continuous variable), and the interaction of normative CSII and product description as the predictor variables for the non-environmental attribute evaluations. There was a main effect of normative CSII (b = .14, t = 2.24, p < .05), such that participants with higher normative CSII also had more favorable evaluations, but no effect of product description (b = −.01, t = −.12, p > .90). Participant type did not have a significant effect (b = −.08, t = −.43, p > .60). More importantly, and consistent with our expectations, there was a marginally significant interactive effect between product description and scores on normative CSII (b = −.12, t = −1.88, p = .06). To depict the nature of this interaction, we examined the simple effects of normative CSII by product description. When the shirt is described as EF, normative CSII has no effect on evaluations (b = .02, t = .24, p > .80). However, when the shirt is described as a popular brand, normative CSII increases evaluations (b = .26, t = 3.03, p < .01). See Fig. 2, panel B. This pattern for normative CSII is the reverse pattern of that obtained for GREEN. We also conducted a regression with the three-way interaction of product description, GREEN, and normative CSII, but it was not significant (b = .03, t = .64, p = .52).

9.2.4. Mediating role of non-environmental product attribute evaluations

Consistent with Study 2, we also examined the potential for non-environmental product attribute evaluations to mediate the relationship between the interaction of GREEN and product description and product preference (purchase likelihood) and between the interaction of normative CSII and product description and product preference. Mediation analysis was conducted using the bootstrapping procedure recommended by Preacher and Hayes (2004) with 5,000 iterations to derive a 95% confidence interval. First, using model 8 of Hayes (2013) process macro, GREEN was entered as the independent variable, product description was the moderator, non-environmental product attribute evaluations were the mediator, and product preference was the dependent variable. Examining the conditional indirect effects, we found a significant indirect effect of GREEN on purchase likelihood through non-environmental attribute evaluations when the shirt was described as EF (95% CI: .0524 to .4609) but not when the shirt was described as popular (95% CI: −.2003 to .1307). Then, using the same model, normative CSII was entered as the independent variable, product description was the moderator, non-environmental product attribute evaluations were the mediator, and product preference was the dependent variable. In this case, we found a significant indirect effect of normative CSII on purchase likelihood through non-environmental attribute evaluations when the shirt was described

as popular (95% CI: .0808 to .4105) but not when the shirt was described as EF (95% CI: −.1738 to .1712).

Overall, the results of Study 3 reveal that the effect of green consumption values on product preference through non-environmental attribute evaluations is consistent with motivated reasoning, replicating Study 2. Importantly, this effect of green consumption values only occurred when the product was described as being environmentally friendly, with attribute evaluations of and preferences for the EF product (vs. popular) being more favorable among those with stronger green consumption values (attributes: b = .24, $t = 1.87$, $p = .06$; preference: b = .36, $t = 207$, $p < .05$) and no effect of product description among those with lower green consumption values (attributes: b = −.20, $t = -1.52$, $p > .10$; preference: b = −.09, $t = -.47$, $p > .60$). This pattern of results allows us to conclude that those higher in GREEN enhance evaluations of non-environmental product attributes for EF products rather than those lower in GREEN lowering their evaluations.

Moreover, this study reveals that the more favorable non-environmental product attribute evaluations that appear to be motivated to maintain consistency with green consumption values are driven by the same process that occurs in other consumption contexts. Specifically, we demonstrate that when a product is described as popular, the extent to which a consumer is susceptible to normative influence determines how favorably they evaluate the product on attributes not related to popularity, with their non-popularity product attribute evaluations predicting their product preference. Similarly, green consumption values determine how favorably consumers evaluate EF products on non-environmental attributes with non-environmental attribute evaluations predicting their product preference. Notably, green consumption values do not impact evaluations when the product is described as being a popular brand and normative influence does not impact evaluations when the product is described as EF. Thus, consumers' evaluations are only impacted when the product is described such that it may aid in achieving a goal they hold (i.e., social approval or protecting the environment and its resources).

10. Contributions and implications

Understanding the impact of green consumption values on consumption behavior is critical as more and more companies focus on products and processes designed to minimize environmental harm. This research examines the relationship between GREEN and other existing environmental measures while also demonstrating the ability of GREEN to predict relevant purchase behaviors. Moreover, we suggest that our GREEN construct is an important part of a broader nomological network that can help researchers understand how green values impact consumption. We further validate the predictive ability of GREEN on consumer decisions regarding environmentally relevant purchases by demonstrating more favorable attribute evaluations, which are consistent with motivated reasoning processes in more traditional consumer decisions not related to the pro-social context of environmental decisions.

The effects demonstrated in this series of studies make several contributions. First, we note that past research has considered socially responsible consumption more broadly (Anderson & Cunningham, 1972; Webb et al., 2008; Webster, 1975), and some researchers have examined correlates specific to environmentally responsible consumption, such as demographics and liberalism (Roberts, 1995). Yet, less clear are the psychological correlates that drive green consumption. We demonstrate that green consumption values are strongly related to the careful use of not just collective, environmental resources, but also personal resources. That is, both the tendency to use financial resources wisely (expressed through frugality, value and price conscious-ness, and consumer spending self-control) and the tendency to use physical resources wisely (expressed through frugality, use innovativeness, and product retention tendency) are positively correlated with green consumption values. Consistent with our findings that greener consumers not only have concern for environmental resources but also for personal resources, recent work on sustainability emphasizes the need to focus on the personal and economic well-being of consumers (Sheth, Sethia, & Srinivas, 2011).

In determining the consumer characteristics associated with green consumption values, we also develop a parsimonious and valid measure of green consumption values which predicts actual environmental product choice. We believe that our measure will have value to future researchers interested in understanding how consumers' green consumption values affect their responses to environmentally-based marketing actions, which has been of growing interest to researchers and marketers alike (Catlin & Wang, 2013; Peloza et al., 2013; White & Simpson, 2013). We note that our measure did not explicitly capture varying motivations for green behaviors, as our emphasis was on the overall patterns of behavior that green consumption values would predict, as well as the psychological correlates of green consumption values. Future research can explore the role of personal financial and physical resource motivations identified in this research as well as the role wealth or status (Griskevicius, Tybur, & Van den Bergh, 2010) in the purchase of EF products as these factors may interact for more nuanced predictions regarding environmentally friendly consumption behaviors. The GREEN measure will be a valuable part of such future research endeavors, which may result in a taxonomy of different types of green consumers. In addition, this scale may serve as a useful starting point for manipulating or priming environmental attitudes.

Our GREEN measure and corresponding nomological network should also be useful for practitioners seeking to understand current markets or segments and their responses to EF products. For example, marketers may need to continue to emphasize a value-conscious focus when positioning EF products to reach consumers with higher green consumption values that also value personal financial resources. However, at the same time, our results suggest that consumers with stronger green consumption values may need less convincing to purchase EF products as they appear to engage in motivated reasoning processes by evaluating the non-environmental attributes of these products more favorably. As such, marketers

of EF products may need to focus more on what can be done to increase purchase of EF products among consumers with weaker green consumption values since those with stronger green consumption values are motivated to do so on their own. We also note the potential for green values to vary across cultures, which may suggest adaptations to the GREEN scale based on cultural differences, an important avenue for future research.

In validating our GREEN scale, we show that green consumption values predict more favorable non-environmental product attribute evaluations of EF products. Specifically, studies 2 and 3 suggest that consumers higher in green consumption values in part justify their preferences for EF-product by enhancing their perceptions of non-environmental product attributes, consistent with motivated reasoning. Since non-environmental attribute evaluations and product preferences are greater for EF versus non-EF products among those with stronger green consumption values (and we observe no effect of product type among those with lower green consumption values), we can conclude that the motivated reasoning is occurring among those with stronger green consumption values rather than those with weaker green consumption values. Future research should more directly test motivated reasoning processes. For example, do these more favorable evaluations and EF product preferences hold in response to a stimulus that directly challenges green values (Jain & Maheswaran, 2000)? Additionally, potential moderators of the motivated reasoning effects we observe could be examined; for example, at a certain level of price premium, green consumers may no longer be able to justify EF purchases through motivated reasoning processes. In addition, products that contain both positive and negative EF characteristics might be interpreted differently based upon underlying green consumption values.

Finally, in examining the effects of green consumption values in response to EF products, we focused on the extent to which green consumption values are guiding principles (Schwartz, 1994). However, future research should consider the extent to which green consumption values may also develop from behaviors that lead to the perception that one is a green consumer not because they have strong green consumption values but because they observe their engagement in environmentally-friendly behaviors, consistent with self-perception theory (Bem, 1972).

In conclusion, we note that it has become nearly impossible for manufacturers and retailers to ignore concerns about the environment being expressed by advocacy groups, governments, and consumers. Many manufacturers and retailers have dealt with this concern by developing and promoting more environmentally friendly processes and products. Given this trend, it is extremely important to understand how consumers perceive and respond to EF products. Across our studies, we theorize and empirically demonstrate that green consumption values influence responses to EF products. Though there is still much left to examine in the area of green consumption, we hope our research will generate additional work related to EF products and sustainable consumption practices and that the results of our studies will provide important implications as

managers struggle to gain market share for their environmentally friendly products.

Appendix A

Measures from past literature compared to the GREEN measure during the scale development and validation process:

Studies 1a/2:

Antil (1984) Socially Responsible Consumption Behaviors (SRCB):

1. People should be more concerned about reducing or limiting the noise in our society.
2. Every person should stop increasing their consumption of products so that our resources will last longer.
3. The benefits of modern consumer products are more important than the pollution which results from their production and use.
4. Pollution is presently one of the most critical problems facing this nation.
5. I don't think we're doing enough to encourage manufactures to use recyclable packages.
6. I think we are just not doing enough to save scarce natural resources from being used up.
7. Natural resources must be preserved even if people must do without some products.
8. All consumers should be interested in the environmental consequences of the products they purchase.*
9. Pollution is not personally affecting my life.
10. Consumers should be made to pay higher prices for products which pollute the environment.
11. It genuinely infuriates me to think that the government doesn't do more to help control pollution of the environment.
12. Nonreturnable bottles and cans for soft drinks and beer should be banned by law.
13. I would be willing to sign a petition or demonstrate for an environmental cause.
14. I have often thought that if we could just get by with a little less there would be more left for future generations.
15. The Federal government should subsidize research on technology for recycling waste products.
16. I'd be willing to ride a bicycle or take the bus to work in order to reduce air pollution.
17. I would probably never join a group or club which is concerned solely on ecological issues.
18. I feel people worry too much about pesticides on food products.
19. The whole pollution issue has never upset me too much since I feel it's somewhat overrated.
20. I would donate a day's pay to a foundation to help improve the environment.
21. I would be willing to have my laundry less white or bright in order to be sure that I was using a nonpolluting laundry product.*

22. Manufacturers should be forced to use recycled materials in their manufacturing and processing operations.
23. I think that a person should urge her friends not to use products that pollute or harm the environment.*
24. Commercial advertising should be forced to mention the ecological disadvantages of products.
25. Much more fuss is being made about air and water pollution than is really justified.
26. The government should provide each citizen with a list of agencies and organizations to which citizens could report grievances concerning pollution.
27. I would be willing to pay a 5% increase in my taxes to support greater governmental control of pollution.
28. Trying to control water pollution is more trouble than it is worth.
29. I become incensed when I think about the harm being done to plant and animal life by pollution.
30. People should urge their friends to limit their use of products made from scarce resources.*
31. I would be willing to pay one dollar more each month for electricity if it meant cleaner air.
32. It would be wise for the government to devote much more money toward supporting a strong conservation program.
33. I would be willing to accept an increase in my family's total expenses of $120 next year to promote the wise use of natural resources.
34. Products which during their manufacturing or use pollute the environment should be heavily taxed by the government.
35. People should be willing to accept smog in exchange for the convenience of automobiles.
36. When I think of ways industries are polluting I get frustrated and angry.
37. Our public schools should require all students to take a course dealing with environmental and conservation problems.
38. I would be willing to stop buying products from companies guilty of polluting the environment even though it might be inconvenient.*
39. I'd be willing to make personal sacrifices for the sake of slowing down pollution even though the immediate results may not seem significant.*
40. I rarely ever worry about the effects of smog on myself and family.

*Item included in the ad-hoc environmental six-item version

Study 1c:
Socially Responsible Purchases and Disposal (Webb et al., 2008):

1. I recycle aluminum cans.
2. I recycle steel/tin cans.
3. I limit my use of energy such as electricity or natural gas to reduce my impact on the environment.
4. I try to buy form companies that support victims of natural disasters.

5. When I am shopping, I try to buy from companies that are working to improve conditions for employees in their factories.
6. I recycle paper.
7. I make an effort to buy products and services from companies that pay all their employees a living wage.
8. I try to buy from companies that help the needy.
9. I try to buy from companies that hire people with disabilities.
10. I recycle cardboard.
11. I avoid buying products or services from companies that discriminate against minorities.
12. I recycle plastic containers.
13. I recycle magazines.
14. I avoid buying from companies that hard endangered plants or animals.
15. Whenever possible, I walk, ride a bike, car pool, or use public transportation to help reduce air pollution.
16. I avoid using products that pollute the air.
17. When given a chance to switch to a retailer that supports local schools, I take it.
18. I try to buy from companies that make donations to medical research.
19. I make an effort to buy from companies that sponsor food drives.
20. I avoid buying products that pollute the water.
21. I make an effort to avoid products or services that cause environmental damage.
22. I avoid buying products that are made from endangered animals.
23. When given a chance to switch to a brand that gives back to the community, I take it.
24. I avoid buying products made using child labor.
25. When given a chance, I switch to brands where a portion of the price is donated to charity.
26. I avoid buying products or services from companies that discriminate against women.

Ecologically Conscious Consumer Behavior (ECCB) Items (Straughan & Roberts, 1999):

1. To save energy, I drive my car as little as possible.
2. I normally make conscious effort to limit my use of products that are made of or use scarce resources.
3. I try to buy energy efficient household appliances.
4. I always try to use electric appliances (e.g., dishwasher, washer and dryer) before 10 a.m. and after 10 p.m.
5. I will not buy products which have excessive packaging.
6. When there is a choice, I always choose that product which contributes to the least amount of pollution.
7. I have tried very hard to reduce the amount of electricity I use.
8. If I understand the potential damage to the environment that some products can cause, I do not purchase these products.
9. I have switched products for ecological reasons.
10. I use a recycling center or in some way recycle some of my household trash.

11. I make every effort to buy paper products made from recycles paper.
12. I have purchased a household appliance because it uses less electricity than other brands.
13. I use a low-phosphate detergent (or soap) for my laundry.
14. I have convinced members of my family or friends not to buy some products which are harmful to the environment.
15. I have replace light bulbs in my home with those of smaller wattage so that I will conserve on the electricity I use.
16. I have purchased products because they cause less pollution.
17. I do not buy products in aerosol containers.
18. Whenever possible, I buy products packaged in reusable containers.
19. When I purchase products, I always make a conscious effort to buy those products that are low in pollutants.
20. When I have a choice between two equal products, I always purchase the one which is less harmful to other people and the environment.
21. I buy toilet paper made from recycled paper.
22. I buy Kleenex made from recycled paper.
23. I buy paper towels made from recycled paper.
24. I will not buy a product if the company that sells it is ecologically irresponsible.
25. I have purchased light bulbs that were more expensive but saved energy.
26. I try only to buy products that can be recycled.
27. To reduce our reliance on foreign oil, I drive my car as little as possible.
28. I usually purchase the lowest priced product, regardless of its impact on society.
29. I do not buy household products that harm the environment.
30. I buy high efficiency light bulbs to save energy.

Connectedness to Nature (Mayer & Frantz, 2004):

1. I often feel a sense of oneness with the natural world around me.
2. I think of the natural world as a community to which I belong.
3. I recognize and appreciate the intelligence of other living organisms.
4. I often feel disconnected from nature.
5. When I think of my life, I imagine myself to be part of a larger cyclical process of living.
6. I often feel a kinship with animals and plants.
7. I feel as though I belong to the Earth as equally as it belongs to me.
8. I have a deep understanding of how my actions affect the natural world.
9. I often feel part of the web of life.
10. I feel that all inhabitants of Earth, human, and nonhuman, share a common 'life force'.
11. Like a tree can be part of a forest, I feel embedded within the broader natural world.
12. When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature.

13. I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees.
14. My personal welfare is independent of the welfare of the natural world.

Stimuli from Study 1c:
First DV task:

Reusable grocery bag
Retail Price: $1.50

10 pack of pens
Retail price: $1.50

Second DV task:

	Regular Laundry Detergent	Eco-Friendly Laundry Detergent
Size	64 oz bottle	64 oz bottle
Form	Liquid	Liquid
Availability	All major grocery stores, drug stores and mass merchants	All major grocery stores, drug stores and mass merchants
EPC rating (see below)*	5 (average)	10 (superb)
Price	$7.99	???

*The Environmental Product Council (EPC) rates similar products based upon their pro-environmental behaviors, actions, and processes and provides independent judgments of each product's environmental friendliness.

Third DV task:

From the cooktop to the countertop, our line of NATURAL all-purpose cleaners powers through grease, grime and dirt.

· Safety & Environmental Info: Non-toxic, biodegradable, good for the environment
· Indicated Use: General, all-purpose cleaning
· Available in 3 scents

It is currently sold in 22 and 32 oz bottles and can be sprayed on counters, appliances, stainless steel, sinks, and toilets.

This all-purpose cleaner is formulated to be safe for your family and the environment. This product does not create harsh fumes and is a non-toxic, biodegradable alternative to conventional petroleum-based cleaners.

Stimuli from Study 2:
NEW all-purpose cleaner

This all-purpose cleaner can be sprayed on counters, appliances, stainless steel, sinks, and toilets.

[EF-condition]: This all-purpose cleaner is formulated to be very environmentally friendly.

[Non-EF-condition]: It is very similar to other all-purpose cleaners available in stores.

Stimuli from Study 3:

EF condition	Long sleeved woven light blue dress shirt Eco-friendly design and development process, made of 100% organic cotton poplin
Popularity Condition	Long sleeved woven light blue dress shirt Made of 100% cotton Brand Popularity**: Ranked #1 out of 100 brands in the category (where # 1 indicates the most popular brand) **Brand popularity rankings are generated by a third party firm that tracks brand engagement.

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