Signaling Environmental Altruism through Design: *The Role of Green Cue Prominence in Hybrid Cars*

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We examined prototypical design characteristics of an environmentally-friendly product, which we call green cue prominence. In this paper, we performed two studies. In Study 1, we searched for characteristics of emblem, color, texture (matte vs. glossy), and shape (static vs. dynamic; simple vs. complex; rounded vs. edged) that might act as cues for environmental friendliness in the design of hybrid cars. Results show that cars deemed to be more environmentally friendly were those with a modified emblem, simple and rounded shape, and with a matte finish. Also, green, blue, and white colors were better signs of environmental friendliness than red or black. In Study 2, we examined two circumstances under which green cue prominent design is desired. In the first circumstance, we showed that green cue prominent design is perceived as being more attractive when it is for a hybrid car, but not for gasoline engine cars. In the second circumstance, green cue prominent design is perceived as being more attractive when the buyer of the car has a high status-seeking motive.

Keywords **–** Green Consumption, Product Design, Environmentally-Friendly Design, Signaling Altruism, Status Seeking, Hybrid Cars.

Relevance to Design Practice **–** Our research indicates that there are design cues that strongly signal environmental-friendliness of products, and that consumers are more attracted by design that is congruent with the environmental concept of the product. We also show that being able to signal "greenness" is important for status-seekers.

Citation: Lee, J., Jung, B. & Chu, W. (2015). Signaling environmental altruism through design: The role of green cue prominence in hybrid cars. *International Journal of Design, 9*(2), 79-91.

Introduction

It is an understatement to say that "green" is becoming an important consumption keyword today. Products ranging from detergents to buildings have their environmental-friendly versions readily available in the market, and among them the automobile is probably one of the most important, both in terms of expenditure and visibility. Commercial popularity of environmentally-friendly vehicles has waxed and waned with the ups and downs of oil prices, but the general long-term trend is for them to increase (Nemry, Leduc, & Muñoz, 2009).

Most of the previous literature on environmentally-friendly vehicles have focused on the comparative energy efficiency of various powertrains (electric, hybrid, plug-in hybrid, fuel cells), and how their comparative advantage will change given different assumptions on future oil and battery prices (Nemry, Leduc, & Muñoz, 2009). Some studies have also been carried out on the reasons consumers choose environmentally-friendly vehicles: two main reasons being economy (Diamond, 2009; Gallagher & Muehlegger, 2011) and concern for the environment (Ewing & Sarigöllü, 2000; Jansson, 2011; Koller, Floh, & Zauner, 2011). Concern for the environment has dual aspects to it. On the one hand, consumers are genuinely concerned about the deterioration in the environment and would strive to do whatever they can to prevent it. On the other hand, consumers may have an ulterior motive of wanting to be "seen as environmentally-responsible," and thus create a better image for themselves (Griskevicius, Tybur, & Van den Bergh, 2010). Namely, certain consumers want to signal something about themselves to others through the use of environmentally-friendly vehicles.

One example of signaling through consumption is in luxury goods, where people signal their wealth by adorning themselves with expensive products that not everyone can afford. However, objects of signaling can go beyond wealth and power to concern for social issues, including "making a statement" about the environment. Ecological values are being taught from an early age, and studies have found that environmental education in school children is effective in changing attitudes and behaviors (Chawla & Cushing, 2007; Dillon et al., 2006). Also, insofar as environmental-consciousness is viewed as a desirable characteristic, consumers will want to show others that they have such an attribute. An interesting example is the Freitag designer bag which is made from recycled truck tarpaulin. Since the Freitag bag is made from 100% recycled material, it signals to onlookers

Received June 24, 2013; **Accepted** January 29, 2015; **Published** August 31, 2015.

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that the person carrying the bag is environmentally-conscious. This positioning has been quite successful for Freitag, and it is now sold globally.

In this paper, we are particularly interested in design elements that might signal environmental-friendliness for automobiles. In particular, we explore design cues that would lead consumers to perceive that a car is more environmentally friendly. The Toyota Prius, now a well-established hybrid car, would be a signal of environmental consciousness, but what about a new brand that is freshly introduced? Would it be possible for a newly introduced hybrid car or an electric car to signal its environmental image right from the start? Are there elements in the shape, color, or texture that would signal that the car is environmentally friendly? Put another way, "Is there a trade dress that would signal that a car is environmentally friendly?" In this paper, we call these design characteristics "green cue prominence." Namely,

> Green cue prominence is defined as design characteristics that project an environmentally-friendly image of the product.

In this definition, the perception of environmental-friendliness is subjective and it could imply numerous things such as (a) products that use less energy, (b) have lower carbon dioxide emission, (c) are recyclable, or (d) any other characteristic that is good for the environment.

This paper is arranged as follows. First, we conduct a literature survey on how brands and products can signal certain characteristics about their owners, and what is implied by the term "green cue prominence." Then in Study 1, we develop hypotheses around design cues (e.g., emblem, shape, texture, color) that would be considered as environmentally friendly by applying ideas from aesthetics and design theory and test them with experimental data. Subsequently in Study 2, we ask "who are the people that are interested in signaling environmental altruism, and what is the connection between the signaling motive and green cue prominence?" We show that green cue prominence is desired by consumers who are seeking status in their consumption, thereby establishing the signaling motive for being a green car owner. Lastly, we did a follow up of Study 2 to check the robustness of our findings.

Jeongmin Lee graduated with a BA in psychology (Seoul National University), and went on to earn a MA in art history (Tufts University) and a PhD in spacial design (Hongik University). Her primary interests are in human-centered design, human perception & cognition in design, and the psychological process of design's symbolic story-telling. She has published numerous papers in design journals in Korea. She also serves as an advisor to the Jung-gu District on environmental design, and has participated in many public design projects that were funded by the Ministry of Trade Industry & Energy, and Ministry of Culture, Sports & Tourism. She is currently Associate Professor of Industrial Design at Gachon University.

Bohee Jung is a research associate at the College of Business Administration, Seoul National University in South Korea, where she received a MS degree and a PhD degree in marketing. She earned a BS from the College of Human Ecology at Yonsei University in South Korea. Her research interest is in consumer's reaction and interpretation of design stimuli. In her previous research, she examined the effect of fine art infusion in package design. She has published numerous research papers in design, consumer psychology, and marketing in Korean journals. Her current research focuses on the relationship between color and consumer's prosocial behavior.

Wujin Chu graduated from Seoul National University with a BA in business administration and the Wharton School with a PhD in marketing. He is currently Professor of Marketing at Seoul National University. He has published numerous articles in *Marketing Science, Journal of Marketing, Journal of Marketing Research, Organization Science* and *Journal of International Business Studies.* In 2003, he was cited by J*ournal of Marketing Education* as the second-ranked professor in the Asia-Pacific region in terms of research performance; and in 2010 he was awarded the *JIBS Decade Award* by the Academy of International Business. His research interests are in consumer decision making, product innovation, and the airlines industry.

Green Consumption and Social Value

Consumers attach various values to products that they consume, and these values can be categorized as functional, conditional, emotional, epistemic, and social (Sheth, Newman, & Gross, 1991; Sweeney & Soutar, 2001). Amongst these value categories, social value is the utility that depends on how product consumption is viewed or liked by others. Becker (1991) decomposed a person's utility for a product into two components: one which is determined by its objective characteristics (quality, features, price, etc.) and another which is determined by how it is viewed or liked by others. Social value can be the approval of others (Crowne & Marlowe, 1964; Leary & Kowalski, 1990) or earning the respect of others (Han, Nunes, & Drèze, 2010; Koller, Floh, & Zauner, 2011; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008).

In the consumption of environmentally-friendly automobiles, which is still confined to a small segment of the population, social value leans more towards standing out from others and gaining respect or admiration. Griskevicius, Tybur, and Van den Bergh (2010) showed that there is a strong status-seeking motive in the consumption of hybrid cars. Through a controlled experiment, they showed that consumers strove to seek status through altruistic consumption of hybrid cars, even if there were costs associated with it. In fact, the greater the sacrifice in terms of higher payment made for the product, the stronger the altruistic signal will be. Koller, Floh, and Zauner (2011) also included the "need to be better than others" as a key component of social value. In this paper, we will focus on this promotion focus of purchasing a hybrid car, although there could be a prevention focus as well (Higgins, 1998).

Since products have social value, it is ever more important to incorporate social value into the way products are designed (Hardy & Van Vugt, 2006). As a way to achieve this goal, some companies adhere to a distinct design philosophy resulting in the family look, while other companies design each product separately, and use the brand identity to achieve a common social theme (Noble & Kumar, 2010). Across these cases, there will be design cues that would effectively signal something about the product (Creusen & Schoormans, 2005). Also, even apart from the brand name, various design elements such as material, shape, texture, and color will signal certain characteristics. Watches made from precious metals, cashmere sweaters, and silk shirts signal luxury by the very materials that are used. Electric drills can signal greater power by their size, while body lotion might signal softness through color. Along these lines, we explore design cues for a hybrid car that will be effective in signaling environmental-friendliness.

Design Prototypicality and Visibility

Veryzer and Hutchinson (1998) have shown that typicality in product design is likely to elicit a positive aesthetic response. This is because a product with design typicality aligns itself with the viewer's existing knowledge structure, and products with high typicality tend to be more easily and accurately categorized, leading them to be considered more frequently (Armstrong & Detweiler-Bedell, 2008; Loken & Ward, 1990). Other studies have shown that consumers prefer designs that are slightly different from the prototype rather than just typical or atypical (Meyers-Levy & Tybout, 1989). For hybrid cars, design typicality is yet to be determined because it is still early in its product life cycle.[1] Given this fact, companies have an opportunity to guide the market to their design as being typical of a hybrid car. In the first part of this paper, we identify design characteristics that signal to consumers the environmentally-friendly characteristics of the product (i.e., green cue prominent product).[2]

Consumers construct and maintain self-concepts through the use of branded products, and the conspicuous nature of certain products makes the "value expressiveness" function even stronger, resulting in a greater impact on self-concept formation (Sirgy, 1982). It has been shown that product visibility is an important channel through which consumers communicate with the people around them, and consumers who want to stand out from their peers seek products that have high visibility (Berger & Ward, 2010; Charles, Hurst, & Roussanov, 2009). Han, Nunes, and Drèze (2010) showed that for luxury goods, consumers with a high need for status were likely to prefer products with a highly visible brand label, while those with low need for status preferred a subdued brand label. Since an automobile is highly conspicuous, it can be an effective medium of making a statement about oneself. However, as in the case of luxury goods, the need to signal can vary amongst consumers. Further, for that segment that has a high need to signal environmental altruism, it is important that the product be visibly "green."

The Toyota Prius and Honda Insight, designed as hybrid cars from inception, are more distinctive compared to the hybrid versions of existing models such as the Camry Hybrid or Civic Hybrid. Although developing a hybrid version of an existing model would lower new product development costs, it will make it harder for the designer to differentiate the look. Our study hopes to provide implications in designing both pure environmentally-friendly cars and hybrid versions of existing models.

Design Elements for Green Cue Prominence

We identified design elements for automobile design as emblem, color, shape, and finish/texture: the emblem being an element of brand identity, with the others being elements of exterior design (Noble & Kumar, 2010; Lauer & Pentak, 2012; Lewin, & Borroff, 2010; Macey & Wardie, 2009).[3]

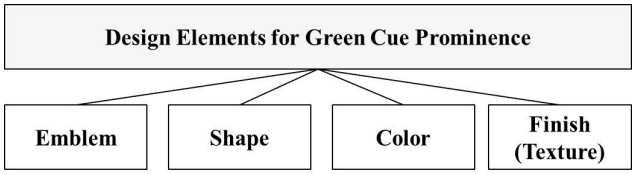


Figure 1. Design elements for green cue prominence.

Emblem

The emblem distinguishes one car manufacturer from another. Although car manufacturers would want their cars to be recognizable without even looking at the emblem, the reality is that car designs are sufficiently similar such that emblems continue to play a key role in distinguishing the maker of the car. Most manufacturers (e.g., BMW, Mercedes Benz, Honda, Chrysler, Volkswagen) have one emblem that represents the entire range of products that they manufacture, but there are others with a separate emblem for each division (e.g., GM: Chevrolet, Cadillac, Buick). In our study, we hypothesize that having a modified emblem for the entire range of environmentally-friendly cars would be considered more attractive by consumers. Such an emblem would strongly differentiate the green characteristics of the car. For example, Toyota's traditional logo is the character "T" that is written over a white background, but their modified emblem for their environmentally-friendly cars is the same design with the white space filled in with cobalt blue color. By comparison, Honda uses the same emblem for both gasoline and hybrid cars. We hypothesize that Toyota's strategy of using a modified emblem would be viewed as more environmentally friendly than Honda's.

- H1: People will perceive that a car with a modified emblem is more environmentally friendly than a car with a regular emblem.

Color

Our hypothesis is that color will also affect the way a car is viewed environmentally. Color is associated with characteristics of the product in our associative memory. Along this framework of the associative memory network, studies have shown that colors have distinct psychological symbolisms. For example, yellow is connected with optimism, friendliness, and extraversion; while purple is linked to royalty and luxury (Bellizzi, Crowley, & Hasty, 1983; Labrecque & Milne, 2012). Luchs, Naylor, Irwin, and Raghunathan (2010) and Kaya and Epps (2004) have shown that green is most closely associated with safety, health, and gentleness, which are also characteristics associated with environmentally-friendly products.

The color blue is most often associated with trust and reliability (Fraser & Banks, 2004; Mahnke, 1996; Wright, 1988). However, other studies have shown blue to be aligned with words like restful, calm, and peaceful (Bellizzi, Crowley, & Hasty, 1983; Murray & Deabler, 1957; Schaie, 1961; Sharpe, 1974; Wexner, 1954). Dutton (2009) has argued that humans have an evolutionary affinity to both green and blue colors because they signify habitation that were salutary—vegetation and water,

respectively—for their survival. Finally, Sherman and Clore (2009) have shown that black signifies immorality, while white signifies purity in most cultures. Thus, white is more likely to signal cleanliness of the environment. Hence, we now have the following hypothesis.

- H2: People will perceive green, blue and white-colored cars as being more environmentally friendly than cars with other colors.

Shape

The classic work on semantic differential scales (Osgood, Suci, & Tannebaum, 1957) has long since been adopted by designers to measure design characteristics (Holbrook & Moore, 1981; Hsiao & Chen, 2006; Hung & Chen, 2012). Among numerous adjectives examined in Holbrook and Moore (1981), we focus on static–dynamic, simple–complex, and rounded–edged designs for our study.

Static–dynamic Design

First, we hypothesize that a static design will be viewed more environmentally friendly than a dynamic one. The static–dynamic difference is expressed by directionality of lines: static lines being horizontal and dynamic lines being diagonal. Horizontal lines project tranquility and comfort, such as a human body that is lying down. By contrast, diagonal lines signify speedy movement of objects, such as imageries of a sprinter or a skater (Lauer & Pentak, 2012). Sports cars are designed with diagonal lines to project a speedy image. Therefore, dynamism has stronger connotations with sports cars, which do not have an environmentally-friendly image. In fact, a report by the US EPA states that of all the cars sold in the U.S. which were mid-sized or smaller, sports cars had the worst gas mileage.[4] Thus, we have the following hypothesis.

- H3: People will perceive that a car with a static design is more environmentally friendly than a car with a dynamic design.

Simple–complex Design

The simplex-complex dimension is an important factor in design. Hsiao and Chen (2006) listed complexity as one of four factors that elicits affective responses to product shapes. Blijlevens, Creusen, and Schoormans (2009) suggested that simplicity is an important dimension that consumers perceive in product design. While past literature has examined the simplex-complex dimension of product design and its effect on affective responses (Hsiao & Chen, 2006), product attributes evaluation (Blijlevens, Creusen, & Schoormans, 2009), and novelty and aesthetic preference (Hung & Chen, 2012), our study focuses on its effect on perception of environment cues.

Renowned designer Dieter Rams has argued for minimalism in product design following "the less is more" design philosophy (Klemp & Ueki-Polet, 2011). In popular culture, the word "minimalism" is connected to environmentalism through simpler living and using less of the earth's resources. Minimalism conjures up the image of living with bare necessities and no more (Jay, 2010). Therefore, we hypothesize as follows.

- H4: People will perceive that a car with a simple design is more environmentally friendly than a car with a complex design.

Rounded–edged Design

While the static–dynamic difference is expressed through directionality of lines, the rounded–edged difference is expressed by their curvature, especially at the edges. Organic shapes are in opposition to geometric shapes in design theory. Hsiao and Chen (2006) showed that curvilinear and organic forms have a positive effect on the emotional factor of design, whereas sharp and geometric forms have a negative effect. Geometric shapes are more often identified with architecture, industry, and technology (Jirousek, 2005; Noble & Kumar, 2010), and they are precise, edged, and mathematically consistent. On the other hand, organic shapes are often identified with objects in nature such as trees, rivers, and clouds (Pearson, 2001; Stewart, 2006). Since an organic shape, found in nature, has fluid and curvilinear form, we hypothesize that a rounded design will be perceived as being more environmentally friendly than an edged design.

- H5: People will perceive that a car with a rounded design is more environmentally friendly than a car with an edged design.

Finish

Finally, we hypothesize that a matte finish will be viewed as more environmentally friendly than a glossy one. Many natural surfaces such as the bark of a tree or terrain are not smooth (Hosey, 2012), while manufactured products have smooth and glossy surfaces due to the polishing process of production. Thus, matte surfaces give a greater connotation of materials in their natural form. So we have the following.

- H6: People will perceive that a car with a matte finish is more environmentally friendly than a car with a glossy finish.

Study 1: *Design Cues that Signal Environmental-Friendliness*

Methodology

Study 1 was conducted to identify design characteristics for green cue prominence by obtaining responses from 110 students (mean age = 22.62, 60% female) at a large public university in Seoul, Korea. Students participated in the study for cash payment (U.S. $5 equivalent) or as extra course credit. All data was collected by paper and pencil method. Subjects were sequentially shown 22 drawing stimuli with 2 different emblem types, 6 shapes (static–dynamic, simple–complex, rounded–edged), 12 colors, and 2 finishes (matte-glossy), and asked to assess the degree to which the stimuli were environmentally friendly. The questionnaire was printed in color laser (Samsung CLX-3185FW), and images were drawn using Adobe Illustrator CS5 and Adobe Photoshop CS5. The stimuli were presented in pairs.

Regarding the emblem types, students were shown two emblems: the first emblem was the representative Toyota logo used on most of their cars, and the second one was the emblem Toyota used only for their hybrid cars, which had the white space filled in with cobalt blue color (See Appendix). Respondents were asked to what extent they agreed with the following statements; "A car with Emblem 1 (Emblem 2) looks like an environmentally-friendly car," and "A car with Emblem 1 (Emblem 2) is definitely an environmentally-friendly car."

Various design elements interact to present certain aesthetic values. However, we needed to isolate individual design elements (e.g., shapes, color, finish) for our study. In order to do so, regarding the design characteristics related to shapes, we built our stimuli from line drawings rather than using full 3D drawings. This line drawing methodology was also employed by Veryzer and Hutchinson (1998) in their study of product typicality and by Leder and Carbon (2005). The drawings were made by a design professional. Three pairs of line drawings were made depicting examples of (a) static–dynamic, (b) simple–complex, and (c) rounded–edged designs (See Appendix). Figure 2 below is an example of simple–complex shapes.

After the stimuli pair was shown, respondents were asked to indicate on a bipolar scale (1 to 9) to what extent the design of Car (a) or Car (b) was simple (1) or complex (9), as a manipulation check. Respondents were then asked to what extent they agreed with the two statements, on how environmentally friendly the design was. "Car (a) or Car (b) looks like an environmentally-friendly car.", "Car (a) or Car (b) is definitely an environmentally-friendly car." Similar measures were taken for static–dynamic designs and for rounded–edged designs.

For colors, we filled the line drawings with a color from the Munsell Color System (Nickerson, 1976; red, yellow-red, yellow, green-yellow, green, blue-green, blue, purple-blue, purple, red-purple) plus black and white (See Appendix). Then, respondents were asked to what extent they agreed with the two statements on the environmental-friendliness of the designs (i.e., looks like an environmentally-friendly car; is definitely an environmentally-friendly car).

Finally, we contrasted the two finishes glossy and matte. For stimuli we used one of our line drawings filled in with the color black. We added design features in one of the pictures to give it a glossy image, while the other picture was designed to give it a matte texture (See Appendix). After presenting the respondents with the two stimuli, we asked them on separate Likert scales to what extent the design of each car was "glossy," as a manipulation check. Then, we asked the same two dependent measures of environmental-friendliness of the designs.

Results

We first conducted manipulation checks for (a) static–dynamic, (b) simple–complex, (c) rounded–edged, and (d) matte-glossy distinctions. The t-test results for all pairs confirmed that our stimuli were interpreted by the respondents as intended. Respondents interpreted our static line drawing as being static, relative to the dynamic line drawing (M_{static} = 2.36 vs. $M_{dynamic}$ = 7.73, t = -36.18, p = .000). Also, the simple drawings were interpreted as being simple, relative to the complex drawings (M_{simple} = 2.78 vs. $M_{complex}$ = 7.29, t = -23.81, p = .000). Similar results were confirmed for the rounded–edged pair of drawings (M_{round} = 3.81 vs. M_{edge} = 8.00, t = -21.19, p = .000), and for the glossy-matte pair of drawings (M_{glossy} = 7.75 vs. M_{matte} = 3.49, t = 18.261, p = .000).

Emblem, Shape, Finish

Results of hypotheses tests for emblem, shape and finish are summarized in Table 1. The variable of interest is the green cue prominence (i.e., degree of environmentally-friendliness). Our results show that respondents viewed a car with a modified emblem (i.e., Toyota's emblem for hybrid cars) as having a more green cue prominence compared to one with a regular emblem ($M_{modified\ emblem}$ = 4.65 vs. $M_{regular\ emblem}$ = 3.08, t = 7.50, p = .000). It is also shown that a simple design was viewed more green cue prominent than a complex one (M_{simple} = 5.13 vs. $M_{complex}$ = 3.36, t = 7.75, p = .000) and a rounded design was viewed more green cue prominent than an edged one (M_{round} = 5.58 vs. M_{edge} = 3.13, t = 10.14, p = .000). Finally, matte finish was considered more green cue prominent than a glossy one (M_{matte} = 4.45 vs. M_{glossy} = 3.83, t = 2.80, p = .006) (Table 1).

Thus we were able to confirm that a simple, round, matte finish designed car with a modified emblem was viewed as being more environmentally friendly than a complex, edged, glossy finished car with a regular company emblem. Thus hypotheses H1, H4, H5 and H6 are confirmed.

However, we did not find support for H3, which stated a static design would be viewed more environmentally friendly than a dynamic design. Contrary to our original assumption, it is possible that a static design was construed as being traditional or imitative, and a dynamic design as contemporary or innovative as reported in a previous study (Hsiao & Chen, 2006).

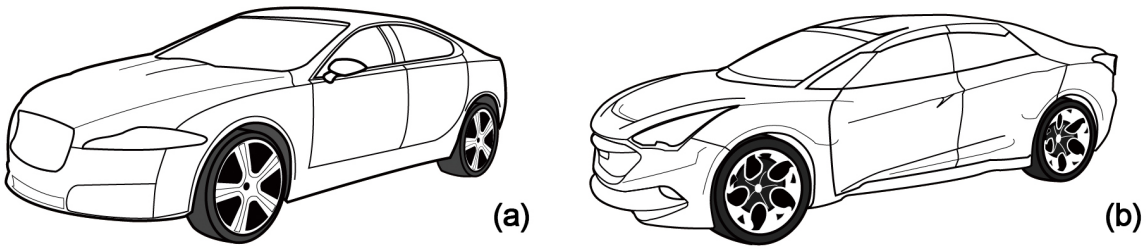


Figure 2. Example of simple vs. complex shapes: (a) simple shape, (b) complex shape.

Table 1. Green cue prominence by design characteristics (emblem/shape/finish).

Design Features		*Degree of Green Cue Prominence*			
		① Mean (*SD*)	② Mean (*SD*)	①-② Mean (*SD*)	Significance Test T-Value (p-value) N = 110
Emblem	(H1) Modified vs. Regular	4.65(.18)	3.08(.14)	1.56(.21)	7.50(.00)*
Shape	(H3) Static vs. Dynamic	3.67(.19)	4.01(.19)	-.34(.29)	-1.14(.25)
	(H4) Simple vs. Complex	5.13(.19)	3.36(.16)	1.77(.23)	7.75(.00)*
	(H5) Rounded vs. Edged	5.58(.18)	3.13(.18)	2.45(.24)	10.14(.00)*
Finish	(H6) Matte vs. Glossy	4.45(.16)	3.83(.17)	.63(.22)	2.80(.01)*

Note: *Significant differences at α = 0.01.

Color

We further examined the relationship between color and green cue prominence. The results are shown in Table 2, which show that the colors green, green-yellow, blue green, blue, purple-blue, and white are most strongly associated with green cue prominence. And all colors that signal environmental-friendliness contain the words green, blue, or white. The rank order of environmental-friendliness is green-yellow > green > white > purple-blue > blue-green > blue. Black is furthest from being seen as environmentally friendly followed by red. It should be noted that yellow by itself is somewhat neutral in terms of environmental-friendliness. Although yellow combined with green is deemed most environmentally friendly, however, it is not so when combined with red.

Table 2. Degree of green cue prominence by color.

Color	*Mean N = 110*	*SD*	*Color*	*Mean N = 110*	*SD*
Black	2.52	1.32	Purple-blue(④)	4.86	1.92
Blue(⑥)	4.61	1.79	Red	2.96	1.57
Blue-green(⑤)	4.84	1.73	Red-purple	2.90	1.59
Green(②)	5.70	1.85	Yellow	3.82	1.85
Yellow-red	3.93	1.83	Green-yellow(①)	6.15	1.84
Purple	2.99	1.49	White(③)	4.98	2.03

Note: *( ) number in parenthesis represents rank order of environmentally friendly colors.

The mean scores for green, blue and white colors and their variants (blue-green, purple-blue, green-yellow) are shown to be higher than those of the remaining six colors ($M_{green,blue,white}$ = 5.19 vs. M_{other} = 3.19, t = 15.73, p = .000). Thus hypotheses H2 was accepted.

Discussion

Our first study aimed to elicit design cues that were deemed to be important signals for environmental-friendliness. Drawing on design and aesthetic theory, we showed that certain colors and shapes are viewed by people as being environmentally-friendly. We categorized the exterior design elements into emblem, color, shape and finish, and showed the following results.

- Cars with a modified emblem were deemed more environmentally friendly than cars with a regular emblem.
- Green, blue, or white-colored cars were seen as being more environmentally friendly than cars of other colors, especially red and black.
- Cars with a simple, rounded design and matte finish were seen as being more environmentally friendly than cars with a complex, edged design and glossy finish.

One hypothesis that was not accepted was the static–dynamic distinction. In a factor analysis study by Hsiao and Chen (2006), it was shown that static design is clustered with terms imitative and traditional; and dynamic design with contemporary and innovative. Based on this study, our subjects may have viewed static design as traditional and imitative, rather than environmentally-friendly.

Signaling Role of Green Cue Prominence

A much cited NY Times article[5] reported a study by a market research agency, CNW Marketing Research, that asked Prius owners their reasons for purchase. A surprising finding was that the most frequent answer was "it makes a statement about me" (57%), followed by "higher fuel economy" (36%) and "distinctive styling" (33%). One owner's quote that was quite representative of the first group was "I really want people to know that I care about the environment."

The abovementioned survey indicates that many people bought the Prius because they felt that owning it was a form of prosocial behavior. By driving a hybrid car, the owner is forgoing the power and comfort of a traditional gasoline engine car because he/she cares about the environment. Through such prosocial behavior, hybrid car owners signal their altruism, which in turn can enhance their status in a community or peer group (Griskevicius, Tybur, & Van den Bergh, 2010). Moreover, studies have shown that people with higher status are more likely to assume leadership positions, be seen as more trustworthy, and be more desirable as friends and partners (Barclays, 2004; Hardy & Van Vugt, 2006). Owners of Prius cited by the NY Times article are seeking status, not through power or money, but through prosocial behavior. From this, we identify a sequence of cause and effect as shown in Figure 3.

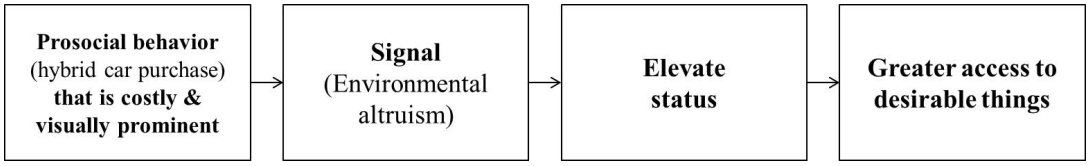


Figure 3. Social value of hybrid car purchase.

Products that are consumed publicly are more amenable to signaling, which is the case for automobiles. Thus, green cue prominence will be more important for status seekers. For consumers who bought a hybrid car purely for better fuel efficiency, the need to signal is absent, and the consumer is benefiting most in terms of lower fuel bills. By contrast, those whose first priority is to seem environmentally friendly to others, green cue prominence will be an important factor in the purchase decision for a hybrid car. Lastly, it should be mentioned that there are a segment of consumers for whom environmental altruism is sought for its own sake. For such people, the intrinsic reward from having done something positive to help the environment will be reward itself (Ewing & Sarigöllü, 2000; Jansson, 2011; Ottman, 2011). So no signaling is necessary. We now have the following hypotheses.

- H7: Design with high green cue prominence will be perceived more attractive for a hybrid car, but not for a gasoline car.
- H8: In the case of hybrid cars, people with high status-seeking motives will perceive a car design with high green cue prominence as being more attractive.

Study 2: *Signaling Role of Green Cue Prominence*

Methodology

In this experiment, we devised a 2 × 2 between subject design where one dimension was green cue prominence (High vs. Low) and the other was type of car (Hybrid vs. Gasoline engine). We ran 117 subjects, who were undergraduate students (mean age = 22.89, 58% female) in a Korean university, located in Seoul, through the experiment. As before, data collection was done by paper and pencil method. All drawing stimuli were made using Adobe Illustrator CS5 and Adobe Photoshop CS5, and printed in color laser (Samsung CLX-3185FW). Participants were randomly assigned to one of four situations and were asked to imagine a car buying situation and evaluate the design attractiveness of the car stimuli. We also asked them about their need for status in owning an automobile. The drawing stimuli used are shown in Figure 4.

The makeup of the stimulus is a direct reflection of the results of the first experiment. The car with high green cue prominence has a special hybrid emblem, is green-yellow, simple, rounded, and matte. On the other hand, the car with low green cue prominence has a regular emblem, is black, complex, edged, and glossy. The dependent variable was a single-item design attractiveness measure, which was used in the prior literature (Blijlevens, Carbon, & Mugge, 2011; Page & Herr, 2002; Veryzer & Hutchinson, 1998); "The above design is attractive." (1: strongly disagree, 7: strongly agree). Each subject was only shown one drawing, and was asked to evaluate the design attractiveness either as a gasoline engine car or as a hybrid car, depending on the treatment design. Subjects that were shown the hybrid car were presented with a brief description of hybrid technology. Those shown the gasoline engine car were also told explicitly what type of car it was, and given some characteristics of the car's engine.

Results

We conducted several manipulation checks to see if the treatment was interpreted as intended. Our analysis shows that subjects did interpret the high green cue prominence car as being simple, rounded, and matte. For (a) simple–complex distinction, we have $M_{GCP\ high} = 3.31$ vs. $M_{GCP\ low} = 5.98$, $p = .000$; (b) rounded–edged, we have $M_{GCP\ high} = 3.25$ vs. $M_{GCP\ low} = 5.50$, $p = .000$; and (c) matte–glossy, we have $M_{GCP\ high} = 5.61$ vs. $M_{GCP\ low} = 7.68$, $p = .000$. We also asked an overall question of whether the designs were more like that of an environmentally-friendly car. It turned out that the high green cue prominent stimulus was indeed deemed to be more environmentally friendly ($M_{GCP\ high} = 4.62$ vs. $M_{GCP\ low} = 3.88$, $F(1,115) = 4.12$, $p = .045$). Finally, we did a reality check manipulation ("I can imagine a design like that actually being commercialized"), and it turned out that the stimuli were quite realistic ($M = 5.31$, $SD = 1.28$).

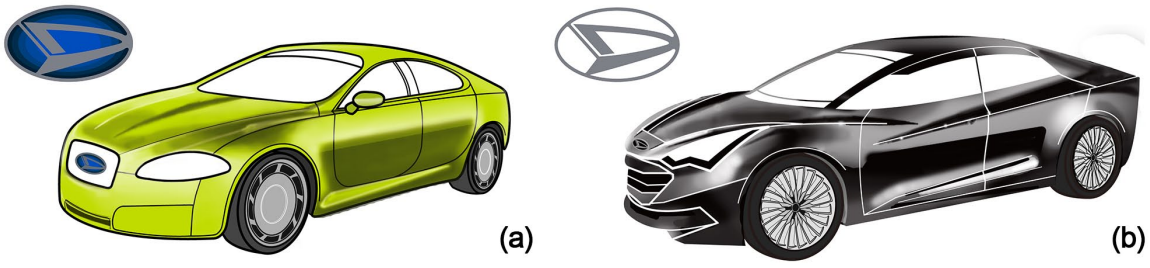


Figure 4. Designs with different degrees of green cue prominence: (a) high, (b) low.

Green Cue Prominence and Car Type

The ANOVA model that was used to test H7 was as follows.

$$Attractive_{Design} = \beta_0 + \beta_1 GCP + \beta_2 Type + \beta_3 GCP*Type$$

($Attractive_{Design}$: design attractiveness; GCP: green cue prominence; Type: car type)

To test H7, we needed to show that the interaction term is statistically significant. The ANOVA results were as follows.

Table 3. Effect of green cue prominence (GCP) and car type on design attractiveness.

Source	*Sum of Square*	*d.f.*	*Mean Square*	*F-value*	*sig.*
GCP	7.72	1	7.72	3.43	.06
Car Type	.03	1	.03	.01	.90
GCP*Car Type	15.98	1	15.98	7.10	.01*
Error	254.16	113	2.17		
Total	1994.00	117			

Note: Dependent variable: design attractiveness (N = 117), *Significant differences at α = 0.05.

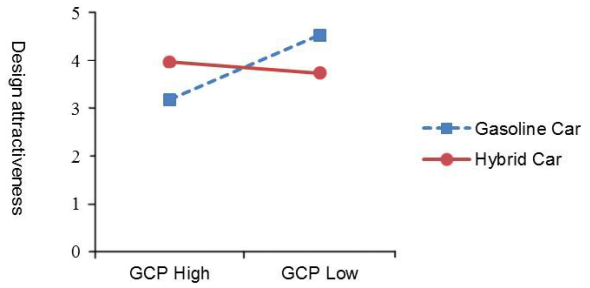


Figure 5. Effect of green cue prominence (GCP) **and car type on design attractiveness.**

Results indicate that the main effects of car type and GCP are either only marginally significant (MS_{GCP} = 7.72, $F(1,113)$ = 3.43, p = .06), or not significant ($MS_{Car\ Type}$ = .03, $F(1,113)$ = .01, p = .90), respectively. However, their interaction effect is significant at 0.01 ($MS_{GCP*Car\ Type}$ = 15.98, $F(1,113)$ = 7.10, p = .01). Mean values of design attractiveness (Table 4) show that high GCP design is more effective as a hybrid car ($M_{GCP\ high,Hybrid}$ = 3.97 > $M_{GCP\ high,Gasoline}$ = 3.19, p = .05). Conversely, the low GCP design is marginally more effective as a gasoline car ($M_{GCP\ low,Gasoline}$ = 4.45 > $M_{GCP\ low,Hybrid}$ = 3.74, p = .08). Also the attractiveness for low GCP design on average, across the two car types, was higher than the high GCP design. These results seem to indicate that there is a design prototype that a consumer looks for in a hybrid car, and that manufacturers should approach an environmentally-friendly car and a gasoline car from different design perspectives.[6]

Table 4. Cell means of green cue prominence (GCP) and car type.

	Hybrid Car Mean(SD)	*Gasoline Car* Mean(SD)	*Significance Test* F-Value(p-value)
GCP HIGH (N = 61)	3.97(1.45)	3.19(1.60)	3.90 (.05)*
GCP LOW (N = 56)	3.74(1.56)	4.45(1.44)	3.19 (.08)

Note: Dependent variable: design attractiveness, N = 117, *Significant differences at α = 0.05.

Status Seeking

We then examined whether status seeking is facilitated by designs with high GCP. To do this, we analyzed whether the status seeking motive would make car buyers seek hybrid cars with a high GCP. Status seeking was measured by asking how important the three factors below were in making an automobile purchase. The three factors adapted from Koller, Floh, and Zauner (2011) were "Friends and colleagues should envy me for my car"; "My car should improve the way I am perceived by others"; and "My car should make me feel distinct from other people." Reliability coefficient (Cronbach's alpha) for the three items was 0.834.The models tested are shown below.

$$Attractive_{High\ GCP\ Design\text{-}Hybrid\ Car} = \beta_0 + \beta\ Status\ Seeking$$

($Attractive_{High\ GCP\ Design\text{-}Hybrid\ Car}$: Design attractiveness for a hybrid car with high GCP)

We also conducted an analogous analysis for gasoline cars only. Not surprisingly, we found no significant effect relationship between status-seeking and green cue prominence.

$$Attractive_{High\ GCP\ Design\text{-}Gasoline\ Car} = \beta_0' + \beta'\ Status\ Seeking$$

($Attractive_{High\ GCP\ Design\text{-}Gasoline\ Car}$: Design attractiveness for a gasoline car with high GCP)

We predicted that β would be positive and significant (H8) and β' would be insignificant. The models can be estimated either separately by simple regression or be estimated simultaneously by seemingly-unrelated regression estimation (SURE; Kennedy, 1987). In both cases, the results are the same for our particular model set up, and for this reason simple regression was used.

Results for the hybrid car design (Table 5) show that status seeking is positively related to the attractiveness of cars with high GCP (β = .521, t = 1.969, p = .059). The R-square value (R^2 = .122) indicates that 12% of the variance is explained by the status seeking variable. Here, significance falls just short of α = 0.05, but in the next section we show that we were able to replicate a similar model in which the status seeking variable is significant at α = 0.05 (See Table 7). Thus we may conclude that high status seekers will find that hybrid cars with high GCP are more attractive. However, our results imply that low status seekers are indifferent between high and low GCP designs.

Table 5. Attractiveness for High GCP Design and Status Seeking: Hybrid Cars (N = 30).

Model	*Unstandardized coefficients*		*Standardized coefficients*	*t*	*Sig.*
		Std. Error	Beta		
(constant)	1.559	1.318		1.182	.247
Status Seeking	.521	.265	.349	1.969	.059
R^2 = .122, Adjusted R^2 = .090, F = 3.876, p = .059					

However for gasoline cars (Table 6), the effect of status seeking on the attractiveness for high GCP cars is not present (β' = .271, t = 1.096, p = .282). Unlike hybrid cars, the need to signal status through GCP is irrelevant for gasoline cars, as expected.

Table 6. Attractiveness for High GCP Design and Status Seeking: Gasoline Cars (*N* = 31).

Model	*Unstandardized coefficients*		*Standardized coefficients*	*t*	*Sig.*
		Std. Error	Beta		
(constant)	1.971	1.515		1.713	.097
Status Seeking	.271	.248	.199	1.096	.282
R^2 = .040, Adjusted R^2 = .007, F = 1.201, p = .282					

Table7. Attractiveness for High GCP Design/No Color and Status Seeking: Hybrid Cars (*N* = 34).

Model	*Unstandardized coefficients*		*Standardized coefficients*	*t*	*Sig.*
		Std. Error	Beta		
(constant)	1.880	1.071		1.775	.089
Status Seeking	.472	.224	.349	2.108	.043
R^2 = .122, Adjusted R^2 = .094, F = 4.442, p = .043					

Replication of Results without the Color Effect

Perhaps color has higher attention value than other design elements, due to its ability to affect one's feelings and to elicit emotional response (Lauer & Pentak, 2012). Since the effect of color is so strong, one could argue that the difference between high and low GCP stimuli was due mostly to color.[7] Therefore, in order to show the effect of other design elements (i.e., emblem, shape, and finish), we replicated a part of Study 2 without color, and obtained identical results. The study design was identical except for the fact that both the high-GCP and low-GCP stimuli did not have any color filled in. Data was collected through the participation of 71 undergraduate students at a Korean university, located in Seoul (mean age = 22.46, 61% female). Manipulation checks confirmed our treatment design. An overall question to the participating students of whether the designs were more like that of an environmentally-friendly car obtained the results $M_{\text{GCP high}}$ = 5.00 vs. $M_{\text{GCP low}}$ = 3.43, $F(1,69)$ = 13.00, p = .001, (a) simple–complex contrast was $M_{\text{GCP high}}$ = 3.35 vs. $M_{\text{GCP low}}$ = 5.41, p = .000, (b) rounded–edged contrast was $M_{\text{GCP high}}$ = 2.74 vs. $M_{\text{GCP low}}$ = 5.45, p =.000, and (c) matte-glossy contrast was $M_{\text{GCP high}}$ = 5.12 vs. $M_{\text{GCP low}}$ = 7.28, p = .000. As before, we estimated the following simple regression model.

$$\text{Attractive}_{\text{High GCP Design/No color-Hybrid Car}} = \beta_0\text{''} + \beta\text{'' Status Seeking}$$

($\text{Attractive}_{\text{High GCP Design/No color-Hybrid Car}}$: Design attractiveness for a hybrid car with high GCP but no color).

The results of the estimation (Table 7) showed that as before, status seeking is positively related to the attractiveness for high GCP design (β'' = .472, t = 2.108, p = .043). Therefore, we were able to replicate the results of Study 2 without the color effect. We also showed the equivalence of the two regression models (i.e., $\text{Attractive}_{\text{High GCP Design-Hybrid Car}}$ = Status Seeking, and $\text{Attractive}_{\text{High GCP Design/No color-Hybrid Car}}$ = Status Seeking), by performing a Chow test (Chow, 1960). And the Chow test results showed that the two models were not significantly different (F(2, 60) = .0336, p = .997).

In some sense, it is surprising that the green color did not increase the attractiveness of high GCP design compared to the no-color stimulus. A possible explanation is that the green color, while being a better status symbol for environmental consciousness, may be inferior as an overall status symbol compared to other colors. These two opposing effects of the green color might be canceling each other out in this study. Such summation and combination effects in perceptual cognition is explained by Brunswik's theory of perceptual cognition, which posits that "organism's perceptual systems functioning as it must in the face of uncertainty, would act like an 'intuitive statistician'... *to permit particular cues to substitute for and/or predict one another* (Goldstein and Hogarth (1997)." In our study, design elements such as emblem, shape, and texture may be acting as substitutes for color.

Discussion

In the second study, we examined when and by whom a green cue prominent design is sought after. We showed the following results.

- People did not have a general preference for high or low green cue prominent design. However, people perceived the high green cue prominent design more attractive when they were told that it was for a hybrid car, while they perceived the low green cue prominent design marginally more attractive when told that it was for a gasoline car.
- People who are purchasing a hybrid car with a high status-seeking motive valued high green cue prominence more than those with a low status-seeking motive.

Our results show that there are design elements that signal environmental-friendliness and that these elements should be congruent with the concept of the product. We also showed that green cue prominent designs were perceived as being more attractive by buyers who have a strong status-seeking motive. Namely, status-seeking buyers are signaling their environmental altruism by purchasing hybrid cars, and they want to show this to others through design.

General Discussion

There are benefits from prosocial behavior. Numerous psychological studies have shown that prosocial behavior leads to the elevation of status, which in turn bestows benefits to those who have it (Barclay, 2004; Hardy & Van Vugt, 2006). We showed that green consumption is one of the ways that a person can engage in prosocial behavior. By engaging in green consumption such as buying environmentally-friendly cars; using products made from recycled materials; and using products that use less energy, a person shows that he/she cares about the environment. By engaging in such prosocial behavior, the consumer is signaling to an audience that he/she is "altruistic." Moreover insofar as altruistic acts elevate a person's status within a community, it is actively sought. Ottman (2011) claimed that there is a segment of consumers who want to "appear" concerned about the environment because it is fashionable. For such a group, having

some form of a green certification is important. However, in addition to such certification, product design itself can be a strong signal of environmental friendliness, and also more noticeable.

As we have shown, a car design with high green cue prominence is more likely to be seen as an environmentally-friendly car than the one with low green cue prominence. In particular, certain colors (green, blue, white) or shapes (rounded, simple, matte) can signal environmental-friendliness. When a car manufacturer is designing a hybrid car from scratch, it can use all of the elements of green cue prominence to signal environmental-friendliness. However, in cases where the manufacturer is introducing a hybrid version of an existing model, emblem, color, and finish can be used to make the car appear more environmentally friendly but not the shape.

In the age of social consumption, consumers are eager to make a statement about social issues. Marketers and designers can use the power of design to make products more appealing to consumers who have a concern for the environment. Our study has shed light on design cues that consumers readily identify with environmental-friendliness.

In our experiment, we contrasted two images which are polar examples of high and low green cue prominent cars. However, the MAYA (most-advanced-yet-acceptable) principle states that people will find designs that are "most advanced yet acceptable" to be aesthetically pleasing (Loewy, 1951). This principle calls for a balancing of typicality (i.e., acceptable) and novelty (i.e., most advanced) in design (Bornstein, 1989; Hekkert, Snelders, & Van Wieringen, 2003). In design attractiveness for hybrid cars, consumers who are status-seeking will give greater weight to the novelty aspect, rather than to the typicality aspect. However, consumers who do not have a need to stand out may be hesitant to go to a novel hybrid car design, opting to purchase a hybrid version of an existing model instead. In such a case, there could be a natural segmentation of the market based on design preference, which correlates with the purchase motive.

Our paper has some limitations. We only considered two types of car emblems, the regular one versus a modified version. However, in the real world, there are companies that keep the original emblem, but supplement it with a sub-emblem such as a green leaf or a hybrid signature. The relative effectiveness of different types of main emblems and sub-emblems would have provided greater managerial implications. Secondly, it is possible that some of the variables considered in our study could have had interaction effects with size and price range of the car. For example, blue cars are attractive for small (inexpensive) hybrid cars but not for large (expensive) ones. The use of student samples is also a limitation, as there may be an age difference in the attractiveness for environmentally-friendly design. Age can play a role in the amount of educational exposure to environmental issues (i.e., younger aged have more exposure).

There are many fruitful avenues of future research that arise from our study. If status seeking is important for some people, car companies should introduce a car that is environmentally-friendly, yet image-enhancing. Namely, if one can signal that he/she bought a fuel-efficient car by choice rather than due to a budget constraint, he/she will more effectively project environmental altruism. Since competitive altruism is "a competition to give away more resources than the next person," it is important that the signal be somewhat costly (Murdock, 1970). Moreover, since an environmentally-friendly car is the result of a significant amount of high technology, the purchaser of such a car can be viewed as an innovator (Jansson, 2011). In this regard, the Toyota Prius is projected as being environmentally friendly but also forward thinking (Carter, 2003). A formal study of this "environmental-looking-but-not-shabby" phenomenon is left for future research.

Another extension of this study would be to see if our results are robust with regard to other categories of environmentally-friendly products. It is possible that design implications of a hybrid car, which employs a large proportion of high technology, could be different from more mundane products. Also, it would be interesting to see under what circumstances consumers seek down-to-earth and unadorned green designs, or forward thinking and snazzy green designs. Further, we only examined the exterior of the car. A comparison of the relative importance of the interior and exterior could be interesting. It may be hypothesized that exterior appearance signals greenness to others, while interior design signals greenness to one-self (i.e., self-signaling).

Finally, it is meaningful to examine in future research whether there are some green cues that will substitute for other green cues, resulting in the conclusion that the inclusion of all green cues may not be necessary. Better understanding of which cues substitute with each other could give the designer much more flexibility in achieving green cue prominent designs without overdoing it.

Acknowledgement

This paper has received financial support from The Institute of Management Research, Seoul National University.

Endnotes

1. Although hybrid cars have been around since 2000, market share of hybrid cars have never gone beyond 3% in the US (www.edmunds.com), and most consumers do not have any experience owning a hybrid car. Some would argue that the Toyota Prius can be viewed as a prototypical hybrid design. However, with the recent proliferation of hybrid models in the market, it remains to be seen whether the Prius will continue to be that standard for hybrid car design or whether other designs will prevail.
2. Han, Nunes, and Drèze (2010) use the term "brand prominence" to depict visual design characteristics that make a brand instantly recognizable. Our terminology is an application of theirs to the environmental context.
3. Of course, for the sake of tractability, we cannot include all the elements of design. In particular, we focus on the exterior body, leaving out interior design for future research. We also do not consider the retailing environment.

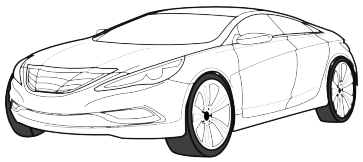
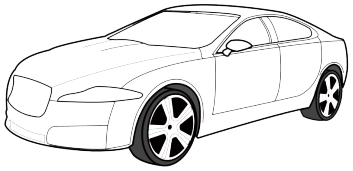
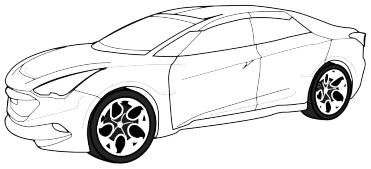
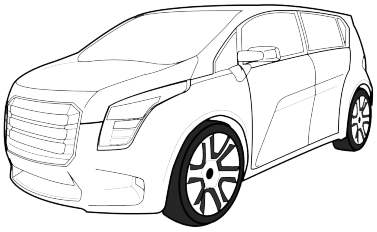
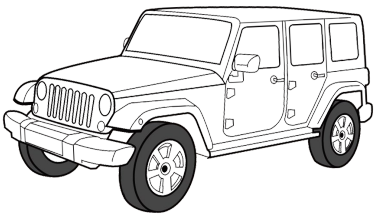
4. US Environmental Protection Agency, Lowest Fuel Economy by Vehicle Class: 2013 Model Year, http://www.epa.gov/fueleconomy/class-low.htm.
5. Say hybrid and most people will hear Prius, New York Time, July 4, 2007, M. Maynard.
6. Design characteristics are components of GCP, rather than variables that have an effect on GCP. Thus, we have decided not to treat GCP as a mediating variable between design characteristics and attractiveness for hybrid car design.
7. We thank an anonymous reviewer for pointing out this possibility, which led us to conduct this replication.

References

1. Armstrong, T., & Detweiler-Bedell, B. (2008). Beauty as an emotion: The exhilarating prospect of mastering a challenging world. *Review of General Psychology, 12*(4), 305-329.
2. Barclay, P. (2004). Trustworthiness and competitive altruism can also solve the tragedy of the commons. *Evolution and Human Behavior, 25*(4), 209-220.
3. Bellizzi, J. A., Crowley, A. E., & Hasty, R. W. (1983). The effects of color in store design. *Journal of Retailing, 59*(1), 21-45.
4. Berger, J., & Ward, M. (2010). Subtle signals of inconspicuous consumption. *Journal of Consumer Research, 37*(4), 555-569.
5. Blijlevens, J., Carbon, C. C., & Mugge, M. (2011). Aesthetic appraisal of product designs: Independent effects of typicality and arousal. *British Journal of Psychology, 103*(1), 44-57.
6. Blijlevens, J., Creusen, M. E. H., Schoormans, J. P. L. (2009). How consumers perceive product appearance: The identification of three product appearance attributes. *International Journal of Design, 3*(3), 27-28.
7. Bornstein, R. F. (1989). Exposure and affect: Overview and meta-analysis of research, 1968-1987. *Psychological Bulletin, 106*(2), 265-289.
8. Carter, K. (2003, March 31). *Hybrid cars were Oscars' politically correct ride.* USA Today Retrieved May 20, 2013, from http://usatoday30.usatoday.com/life/2003-03-30-hybrids_x.htm
9. Charles, K. K., Hurst E., & Roussanov, N. (2009). Conspicuous consumption and race. *Quarterly Journal of Economics, 124*(2), 425-467.
10. Chawla, L., & Cushing, D. F. (2007). Education for strategic environmental behavior. *Environmental Education Research, 13*(4), 437-452.
11. Chow, G. C. (1960). Tests of equality between sets of coefficients in two linear regressions. *Econometrica, 28*(3), 591-605.
12. Creusen, M. E. H., & Schoormans, J. P. L. (2005). The different roles of product appearance in consumer choice. *Journal of Product Innovation Management, 22*(1), 63-81.
13. Crowne, D. P., & Marlowe, D. (1964). *The approval motive: Studies in evaluative dependence.* New York, NY: Wiley.
14. Diamond, D. (2009). The impact of government incentives for hybrid-electric vehicles: Evidence from US states. *Energy Policy, 37*(3), 972-983.
15. Dillon, J., Rickinson, M., Teamey, K., Morris, M., Choi, M. Y., Sanders, D., & Benefield, P. (2006). The value of outdoor learning: Evidence from research in the UK and elsewhere. *School Science Review, 87*(320), 107-111.
16. Dutton, D. (2009). *The art instinct: Beauty, pleasure, & human evolution.* New York, NY: Bloomsbury Press.
17. Ewing, G., & Sarigöllü, E. (2000). Assessing consumer preferences for clean-fuel vehicles: A discrete choice experiment. *Journal of Public Policy & Marketing, 19*(1), 106-118.
18. Fraser, T., & Banks, A. (2004). *Designer's color manual: The complete guide to color theory and application*. San Francisco, CA: Chronicle Books.
19. Gallagher, K. S., & Muehlegger, E. (2011). Giving green to get green? Incentives and consumer adoption of hybrid vehicle technology. *Journal of Environmental Economics and Management, 61*(1), 1-15.
20. Goldstein, W. M., & Hogarth, R. M. (1997). *Research on judgment and decision making: Currents, connections, and controversies.* Cambridge, MA: Cambridge University Press.
21. Griskevicius, V., Tybur, J. M., & Van den Bergh, B. (2010). Going green to be seen: Status, reputation, and conspicuous conservation. *Journal of Personality and Social Psychology, 98*(3), 392-404.
22. Han, Y. J., Nunes, J. C., & Drèze, X. (2010). Signaling status with luxury goods: The role of brand prominence. *Journal of Marketing, 74*(4), 15-30.
23. Hardy, C. L., & Van Vugt, M. (2006). Nice guys finish first: The competitive altruism hypothesis. *Personality and Social Psychology, 32*(10), 1402-1413.
24. Hekkert, P., Snelders, D., & Van Wieringen, P. C. W. (2003). Most advanced, yet acceptable: Typicality and novelty as joint predictors of aesthetic preference in industrial design. *British Journal of Psychology, 94*(1), 111-124.
25. Higgins, E. T. (1998). Promotion and prevention: Regulatory focus as a motivational principle. *Advances in Experimental Social Psychology, 30*, 1-46.
26. Holbrook, M. B., & Moore, W. L. (1981). Feature interactions in consumer judgments of verbal versus pictorial presentations. *Journal of Consumer Research, 8*(1), 103-113.
27. Hosey, L. (2012). *The shape of green: Aesthetics, ecology and design.* Washington, DC: Island Press.
28. Hsiao, K. A., & Chen, L. L. (2006). Fundamental dimensions of affective responses to product shapes. *International Journal of Industrial Ergonomics, 36*(6), 553-564.
29. Hung, W. K., & Chen, L. L. (2012). Effects of novelty and its dimensions on aesthetic preference in product design. *International Journal of Design, 6*(2), 81-90.
30. Jansson, J. (2011). Consumer eco-innovation adoption: Assessing attitudinal factors and perceived product characteristics. *Business Strategy and the Environment, 20*(3), 192-210.
31. Jay, F. (2010). *The joy of less: A minimalist living guide.* Medford, NJ: Anja Press.

32. Jirousek, C. (2005). *Art, design and visual thinking.* (Web page available at char.txa.cornell.edu)
33. Kaya, N., & Epps, H. H. (2004). Relationship between color and emotion: A study of college students. *College Student Journal, 38*, 396-405.
34. Kennedy, P. (1987). *A guide to econometrics* (2nd ed.). Cambridge, MA: MIT Press.
35. Klemp, K., & Ueki-Polet, K. (2011). *Less and more: The design ethos of Dieter Rams.* Berlin, Germany: Gestalten.
36. Koller, M., Floh, A., & Zauner, A. (2011). Further insights into perceived value and consumer loyalty: A "green" perspective. *Psychology & Marketing, 28*(12), 1154-1176.
37. Labrecque, L. I., & Milne, G. R. (2012). Exciting red and competent blue: The importance of color in marketing. *Journal of the Academy of Marketing Science, 40*(5), 711-727.
38. Lauer, D. A., & Pentak, S. (2012). *Design basics.* Boston, MA: Wadsworth, Cengage Learning.
39. Leary, M. R., & Kowalski, R. M. (1990). Impression management: A literature review and two-component model. *Psychological Bulletin, 107*(1), 34-47.
40. Leder, H., & Carbon, C. C. (2005). Dimensions in appreciation of car interior design. *Applied Cognitive Psychology, 19*(5), 603-618.
41. Lewin, T., & Borroff, R. (2010). *How to design cars like a pro.* Minneapolis, MN: MBI Publishing.
42. Loewy, R. (1951). *Never leave well enough alone.* Baltimore, MD: The Johns Hopkins University Press.
43. Loken, B., & Ward, J. (1990). Alternative approaches to understanding the determinants of typicality. *Journal of Consumer Research, 17*(2), 111-126.
44. Luchs, M. G., Naylor, R. W., Irwin, J. R., & Raghunathan. R. (2010). The sustainability liability: Potential negative effects of ethicality on product preference. *Journal of Marketing, 74*(5), 18-31.
45. Macey, S., & Wardie, G. (2009). *H-point, the fundamentals of car design & packaging.* Culver City, CA: Design Studio Press.
46. Mahnke, F. H. (1996). *Color, environment, and human response.* New York, NY: Reinhold.
47. Maynard, M. (2007, July 4). *Say 'hybrid' and many people will hear 'Prius'.* The New York Times. Retrieved May 1, 2013, from http://www.nytimes.com/2007/07/04/business/04hybrid.html
48. Meyers-Levy, J., & Tybout, A. M. (1989). Schema congruity as a basis for product evaluation. *Journal of Consumer Research, 16*(1), 39-54.
49. Murdock, G. P. (1970). *Rank and potlatch among the Haida*. Yale University publications in anthropology, No.(13). New Haven, CT: Human Relations Area Files Press.
50. Murray, D. C., & Deabler, H. L. (1957). Colors and mood-tones. *Journal of Applied Psychology, 41*(5), 179-283.
51. Nickerson, D. (1976). History of the Munsell color system, company, and foundation, I. *Color Research and Application, 1*(1), 7-10.
52. Nemry, F., Leduc, G., & Muñoz, A. (2009). *Plug-in hybrid and battery-electric vehicles: State of the research and development and comparative analysis of energy and cost efficiency*. Luxembourg: Office for Official Publications of the European Communities.
53. Noble, C. H., & Kumar, M. (2010). Exploring the appeal of product design: A grounded, value-based model of key design elements and relationships. *Journal of Product Innovation Management, 27*(5), 640-657.
54. Nolan, J. M., Schultz, P. W., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2008). Normative social influence is underdetected. *Personality and Social Psychology Bulletin, 34*(1), 913-923.
55. Osgood, C., Suci, G., & Tannebaum, P. H. (1957). *The measurement of meaning.* Champaign, IL: University of Illinois Press.
56. Ottman, J. A. (2011). *The new rules of green marketing: Strategies, tools, and inspiration for sustainable branding.* San Francisco, CA: Barret-Koehler Publishers.
57. Page, C., & Herr, P. M. (2002). An investigation of the processes by which product design and brand strength interact to determine initial affect and quality judgments. *Journal of Consumer Psychology, 12*(2), 133-147.
58. Pearson, D. (2001). *Breaking wave: New organic architecture.* London, UK: Gaia Books.
59. Schaie, K. W. (1961). Scaling the associations between colors and mood tones. *American Journal of Psychology, 74*(2), 266-273.
60. Sharpe, D. T. (1974). *The psychology and design.* Chicago, IL: Nelson-Hall.
61. Sherman, G. D., & Clore, G. L. (2009). The color of sin: White and black are perceptual symbols of moral purity and pollution. *Psychological Science, 20*(8), 1019-1025.
62. Sheth, J. N., Newman, B. I., & Gross, B. L. (1991). Why we buy what we buy: A theory of consumption values. *Journal of Business Research,* 22(2), 159-170.
63. Sirgy, M. J. (1982). Self-concept in consumer behavior: A critical review. *Journal of Consumer Research, 9*(3), 287-300.
64. Stewart, M. (2006). *Launching the imagination: A comprehensive guide to basic design* (2nd ed.). New York, NY: The McGraw-Hill.
65. Sweeney, J. C., & Soutar, G. N. (2001). Consumer perceived value: The development of a multiple item scale. *Journal of Retailing, 77*(2), 203-220.
66. Veryzer Jr., R. W., & Hutchinson, J. W. (1998). The influence of unity and prototypicality on aesthetic responses to new product designs. *Journal of Consumer Research, 24*(4), 374-394.
67. Wexner, L. B. (1954). The degree to which colors (hues) are associated with mood-tones. *Journal of Applied Psychology, 38*(6), 432-435.
68. Wright, A. (1988). *The beginner's guide to colour psychology.* London, UK: Colour Affects.

Appendix: *Stimuli for Study 1*

Variable		*Green Cue Prominence-High*	*Green Cue Prominence-Low*
Emblem		 Modified Emblem	 Regular Emblem
Shape	**Static vs. Dynamic**	 Static	 Dynamic
	Simple vs. Complex	 Simple	 Complex
	Rounded vs. Edged	 Rounded	 Edged
Finish		 Matte	 Glossy
Color