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ORIGINAL PAPER

Perceived Greenwashing: The Effects of Green Marketing on Environmental and Product Perceptions

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Abstract
Many firms are striving to improve their environmental positions by presenting their environmental efforts to the public. To do so, they are applying green marketing strategies to help gain competitive advantage and appeal to ecologically conscious consumers. However, not all green marketing claims accurately reflect firms' environmental conduct, and can be viewed as 'greenwashing'. Greenwashing may not only affect a company's profitability, but more importantly, result in ethical harm. Therefore, this research extends past greenwashing studies by examining additional influences on and outcomes of perceived greenwashing. To do so, we conducted two studies, an interview study with consumer product and consulting firms, as well as an experiment examining consumers interacting with a company website. For these studies, we used multiple methods, including interviews, questionnaires, and neurophysiological techniques. We found that perceived greenwashing relates not only to environmental and product perceptions, but also to consumers' happiness while interacting with the website. We also found that website interactivity relates to perceived greenwashing, environmental and product perceptions, and to the amount of interaction with the website. We conclude by discussing managerial and ethical implications for research and practice.

Keywords Environmental sustainability · Website design · Interactivity · Green value · Green risk · Purchase intentions · Brand attitudes · Facial expressions · Mouse interactions

Introduction

Ever since the beginning of the environmental movement in the 1960s, concerns about environmental pollution and degradation have continued to rise. For example, between 2009 and 2010, greener product offerings increased by 73% (TerraChoice 2010). Supporting this trend, the United Nations' (2017) *Sustainable Development Goals* includes a goal to "ensure sustainable consumption and production patterns". These increasing environmental concerns and pressures to engage in environmentally responsible conduct have moved environmental management to the top of many corporate agendas (King and Lenox 2002). Consequently, many firms are striving to improve their environmental positions by presenting their environmental efforts to the public.

To communicate their environmental efforts, firms have applied green marketing strategies to help raise their competitive advantage and appeal to ecologically conscious consumers. However, not all green marketing claims accurately reflect firms' environmental conduct. While some companies have genuinely decreased their environmental footprints, others exaggerate their efforts or simply claim to be environmentally responsible when they are not (Garfield 1991). This phenomenon is known as greenwashing.

Although consumers react better to companies they trust are taking actions against environmental issues (Carlson et al. 1993), green consumers often hold anti-corporate biases and distrust advertising, making it difficult to gain confidence in the legitimacy of green marketing (Zinkhan and Carlson 1995). As a result, this can undermine confidence as consumers usually rely on corporate advertising and messaging to make their purchase decisions (Hamann and Kapelus 2004). Undermining confidence may make consumers feel more confused as they do not know *who* or *what* to trust. Consequently, more consumers appear to be skeptical toward firms that take opportunistic advantage of

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environmental trends through greenwashing (Pomering and Johnson 2009).

Several factors appear to drive the proliferation of greenwashing, including various external, organizational, and individual issues (Guo et al. 2017). Nevertheless, greenwashing has received too little research attention (Aji and Sutikno 2015; Berrone et al. 2017; Nyilasy et al. 2012, 2014; Parguel et al. 2011; Rahman et al. 2015; de Vries et al. 2015). More study is needed because greenwashing may not only undermine favorable perceptions (Darke and Ritchie 2007) and company profitability (Du 2015), but more importantly, can result in ethical harm (Nyilasy et al. 2014). Consequently, the present research extends past studies by examining additional influences on perceived greenwashing and their resulting outcomes (including environmental and product perceptions, as well as objective outcomes). Specifically, we explore the influence of green communication (through interactive green components): uncovering the persuasive capabilities of interactive media is essential to determining how to effectively and ethically communicate green marketing. To examine this, we conduct two studies, an interview study with two types of green organizations, consumer products and consulting, as well as an experiment with consumers.

Conceptual Model and Hypotheses

Green marketing, also known as ecological marketing or environmental marketing (Polonsky 1994), refers to any form of advertising that states or implies an environmental benefit. In contrast, greenwashing represents "the act of misleading consumers regarding the environmental practices of a company or the environmental benefits of a product or service" (TerraChoice 2010).

A number of green marketing papers have made valuable contributions to the greenwashing literature, yet many of these do not, in fact, measure greenwashing perceptions (e.g., Gosselt et al. 2019; Guo et al. 2017; Nyilasy et al. 2012, 2014; Parguel et al. 2011, 2015; Rahman et al. 2015). Nevertheless, they help to inform our understanding of the phenomenon. Attribution theory (Kelley and Michela 1980) is the most cited theoretical perspective, with researchers arguing that ethical attributions have consequences for consumers' affect, attitudes and behaviors. For example, organizations' environmental claims that are more specific and detailed (rather than vague) will result in more informed consumer decisions; consumers will attribute helping motives to organizations concerning the environment (Davis 1994).

A small number of articles assess perceived greenwashing (see Table 1 for examples). For instance, Chen and Chang (2013) present a research model concerning several outcomes of greenwashing (green consumer confusion, perceived risk, and trust); as well, they develop a perceived greenwashing measure. To create their model, Chen and Chang drew on cognitive load theory to suggest that greenwashing restricts consumers' cognitive abilities to process information, helping to confuse them and making them uncertain about green products.

Most of the other articles in Table 1 build on Chen and Chang's (2013) model and utilize their perceived greenwashing measure. However, as outlined in the table, these papers typically utilize surveys as their method. Thus, most cannot assess outcomes of hands-on interactions with green marketing sites. Further, most do not assess the effects of (green) designs nor individual environmental characteristics on greenwashing perceptions. In terms of perceived outcomes, the papers do a good job at assessing green outcomes; however, fewer of them measure other perceived product or organizational outcomes. None measure objective outcomes. In contrast, our model responds to calls for more research addressing these identified gaps (e.g., Gosselt et al. 2019) by incorporating website designs, individuals' environmental beliefs, product perceptions, and objective outcomes (see Fig. 1). We describe each of the links in our model next.

Website Design

Green marketing can be designed into websites. At one end could be 'greenwashed' websites, or those containing unjustified claims. At the other end of the spectrum could be websites that contain justified claims backed up with specific evidence, such as third-party certifications or company narratives. One way to incorporate explicit justifications in websites is to create interactive elements, such as hyperlinks or accordions (expandable/collapsible elements), that provide specific (green) information to consumers. The more interactive the website, the more information that consumers can potentially discover about the organization. That is, a website high in interactivity "successfully provides information to the user, is perceived as responsive, and allows a sense of connection" (Cyr et al. 2009, p. 850).

We expect that website designs with more interactive green components (e.g., presenting a sustainability visual through an expand/collapse accordion) will relate positively to the perceived interactivity of these websites. Perceived interactivity refers to "the ability of an artifact to allow users' participation in modifying its form and content" (Jiang et al. 2016, p. 239), that is, the "dynamic aspect of interaction … the experience a user of an interactive artifact has when he or she makes inputs to the artifact through its interface and obtains feedback behavior " (Lim et al. 2011, p. 116). Thus, we expect that:

Table 1 Example empirical articles measuring perceived greenwashing

Authors	Conceptual model	Method	Green design	Individual environmental characteristics	Greenwashing measure	Perceived environmental outcomes	Perceived organizational/product outcomes	Objective outcomes
Aji and Sutikno (2015)	*Model:* Added Skepticism and Switching intention to Chen and Chang's (2013) model	Survey of Indonesian green consumers	–	–	Chen and Chang (2013)	Green skepticism, Green risk, Green confusion, Green trust	Switching Intention	–
Avcilar and Demirgunes (2017)	*Model:* Added Brand equity (Value) to Chen and Chang's (2013) model	Survey of Turkish gasoline customers	–(Gas Station Ads used, but not modeled)	–(Gas purchase behaviors measured, but not modeled)	Chen and Chang (2013)	Green confusion, Green risk, Green trust, Green brand equity	_	–
Chen et al. (2019)	*Model:* Perceived greenwashing, Green trust, Intention to revisit, Intention to participate, Intention to spread negative word of mouth	Survey of American consumers who have stayed in hotels	–(Two scenarios, towel reuse and energy-saving sign, but not modeled)	Prior experience with green hotels	Chen and Chang (2013)	Green trust, Intention to participate	Intention to revisit, Intention to spread negative word of mouth	_
Chen and Chang (2013)	*Model:* Perceived greenwashing, Green confusion, Green risk, Green Trust	Survey of Taiwanese electronic consumers	–	–	Developed based on Horiuchi and Schuchard (2009) and Laufer (2003)	Green confusion, green risk, green trust	_	_
Chen et al. (2014)	*Model:* Perceived greenwashing, Green quality, Green satisfaction, Green word-of-mouth	Survey of Taiwanese electronic consumers (appears to be the same dataset as Chen and Chang 2013)	–	–	Chen and Chang (2013)	Green quality, Green satisfaction, Green word-of-mouth	_	_
More (2019)	*Model:* Perceived greenwashing, Green brand image, Loyalty, Trust	Survey of Indian consumers	–	–	Chen and Chang (2013)	Green brand image, loyalty, trust	_	_
de Vries et al. (2015)	*Model:* Perceived greenwashing, Motive, Skepticism, Suspicion of strategic behavior	Surveys of Dutch undergraduate students	Communication motive (environmental, economic, or none)	Dispositional skepticism	Self-developed 3-item scale	Suspicion of strategic behavior	_	_

Table 1 (continued)

Authors	Conceptual model	Method	Green design	Individual environmental characteristics	Greenwashing measure	Perceived environmental outcomes	Perceived organizational/product outcomes	Objective outcomes
Zhang et al. (2018)	*Model:* Perceived greenwashing, Green concern, Green word-of-mouth, Purchase intentions	Survey of Chinese consumers with experience buying energy products	–	Green concern	Chen and Chang (2013)	Green word-of-mouth, Green purchase intentions	–	–

H1 Website designs with more interactive green components will relate positively to perceived interactivity of the website.

Perceived Greenwashing

Environmental beliefs may affect consumers' perceptions of greenwashing. Some argue that individuals who "see the world more ecologically" have higher pro-environmental beliefs and attitudes (Pierce et al. 1999) with resulting intentions to purchase greener products (Han et al. 2011). Similarly, a study of 8,000 consumers in 16 countries demonstrates that consumers believe that environmental responsibility has become increasingly important, with 85 percent indicating that they are willing to change brands or their own behaviors to protect the environment (Edelman 2012). However, research also indicates that more ecologically conscious consumers tend to show more skepticism to advertising claims (Shrum et al. 1995). Therefore, consumers' positive environmental beliefs may make them more skeptical, improving their ability to identify deceptive marketing content. Thus, we expect that:

H2 Environmental beliefs relate positively to perceived greenwashing.

In addition to consumers' characteristics, perceived website interactivity may affect perceptions of greenwashing. Customers look for cues from the online environment when making purchases online (Chang and Chen 2008). Specifically, websites higher in interactivity (with the resulting sharing of company information) may be viewed as more believable. Interactivity may be beneficial to firms because involvement holds more benefits than merely being a witness to interactions (Burgoon et al. 2001). Therefore, it is important to examine how varying levels of perceived interactivity impact the perception of greenwashing online. Under non-deceptive circumstances, greater interactivity should result in corresponding increases in perceptions of corporate image (Jiang et al. 2016), trust, and credibility (Burgoon et al. 2001). Thus, as perceived interactivity increases, green marketing claims should be viewed as more credible, decreasing perceptions of greenwashing:

H3 Perceived interactivity relates negatively to perceived greenwashing.

Outcomes: Environmental Perceptions, Product Perceptions, and Objective Responses

We propose that both perceived greenwashing and interactivity will influence outcomes. Starting with greenwashing, we suggest that it will affect environmental perceptions by

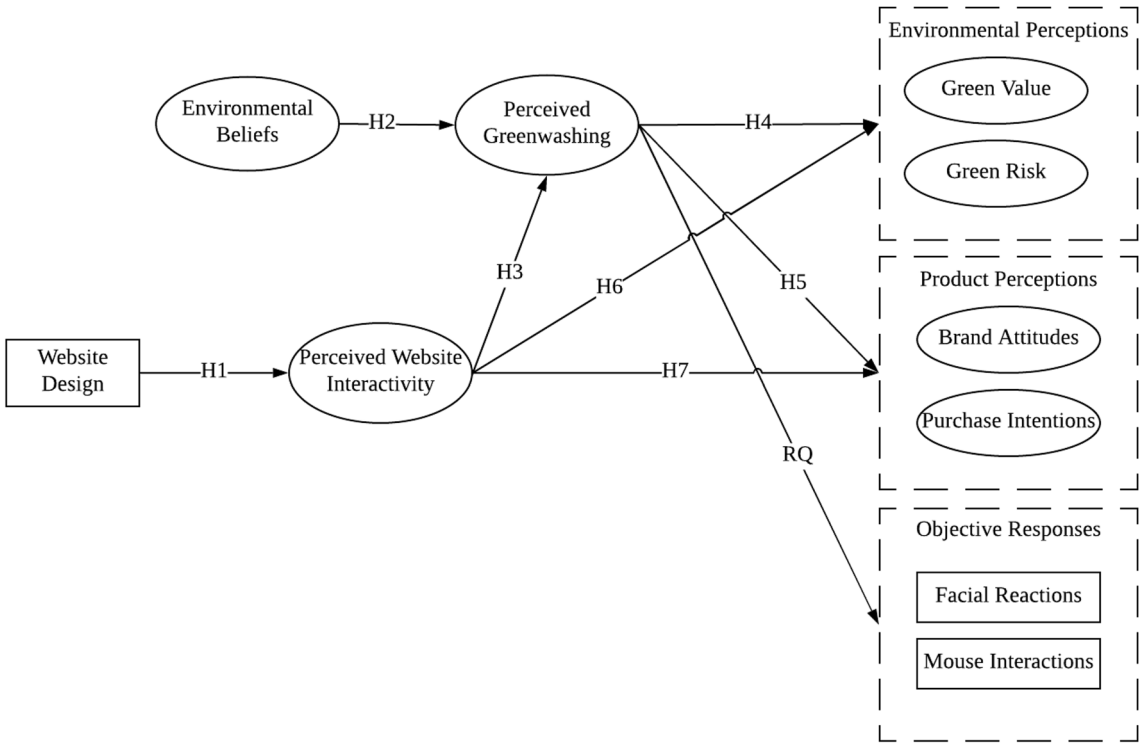


Fig. 1 Hypothesized Greenwashing model

diminishing green value and increasing green risk. That is, consistent with attribution theory, perceptions of greenwashing represent negative ethical attributions that have consequences for perceptions (Davis 1994).

Perceived green value characterizes "a consumer's overall appraisal of the net benefit of a product or service between what is received and what is given based on the consumer's environmental desires, sustainable expectations, and green needs" (Chen and Chang 2012, p. 505). Previous retailing research demonstrates that perceived value relates positively to marketing performance (Sweeney et al. 1999). However, the use of deceptive marketing substantially decreases a firm's market value as fewer consumers are willing to purchase their products (Tipton et al. 2009). Therefore, when a consumer perceives an environmental claim to be a form of greenwashing, their perception of green value will decrease.

We also expect that higher perceptions of greenwashing will result in greater perceived risk, or "the expectation of negative environmental consequences associated with purchase behavior" (Chen and Chang 2012, p. 506). Consumers perceive risk when they become more aware of the uncertainty or undesirable consequences associated with a purchase (Mwencha et al. 2014), resulting in lower purchase probability (Wood and Scheer 1996). When consumers fail to trust a firm's green claims, they perceive risk in its environmental performance (Gillespie 2008). Misleading and deceptive green marketing can increase perceived risk because consumers may perceive that the use of these products could harm their image or reputation concerning the environment (Aji and Sutikno 2015; Chen et al. 2014). Thus, perceived greenwashing will affect perceived risk (Avcilar and Demirgunes 2017; Chen and Chang 2013) and we propose that:

H4 Perceived greenwashing relates (a) negatively to green value and (b) positively to green risk.

We suggest that perceived greenwashing will relate to lower brand attitudes, as it can be considered a form of deceptive advertising. Deceptive ads result in negative attitudes (Goldsmith, Lafferty, and Newell, 2000; Krafft and Saito, 2014) and lower credibility towards the advertised product and the company (Newell et. al, 1998). In contrast, for consumers who cannot tell the difference between true or deceptive (i.e., greenwashed) ads, they do not experience a negative effect on their attitudes (Krafft and Saito, 2014).

Perceived greenwashing also results in a negative intent to purchase products or services (Newell et al. 1998). When consumers feel an increased sense of skepticism, there is a negative association between green marketing and purchase intentions (Albayrak et al. 2011). Therefore, we suggest that:

H5 Perceived greenwashing relates negatively to (a) brand attitudes and (b) purchase intentions.

In addition to greenwashing affecting the outcome variables, we expect that perceived interactivity will also do so. The more interactive the website, the more information that consumers can potentially discover about the organization. A website high in interactivity provides a sense of connection to the organization (Cyr et al. 2009). Thus, interactivity is a tool that allows good marketing to become good conversation as it considers individuals' unique needs and responses (Sorrell et al. 1996).

Previous research demonstrates that perceived interactivity relates to users' emotions (Sheng and Joginapelly 2012) as well as their perceptions of website aesthetics, utility, and attitudes (Jiang et al. 2016). Studies further indicate that website interactivity relates positively to both hedonic and utilitarian online shopping experiences, which in turn relate positively to online purchase intentions (Lim 2014). Thus, we expect that perceived interactivity will relate positively to green value, brand attitudes, and purchases intentions, and negatively to green risk.

H6 Perceived interactivity relates (a) positively to green value and (b) negatively to green risk.

H7 Perceived interactivity relates positively to (a) brand attitudes and (b) purchase intentions.

Finally, we turn to objective outcomes, specifically website interactions and emotional reactions. For these outcomes, we explore relationships rather than proposing hypotheses because little research has examined objective reactions such as emotions in relation to environmental issues (Koenig-Lewis et al. 2014).

We suggest that consumers will be less likely to want to interact with greenwashed websites and therefore interactions will be fewer when they suspect greenwashing. Website interactions, such as mouse clicks, demonstrate participants' interest in the site (Oard and Kim 2001; Zemirli 2012), and thus mouse clicks should be lower when participants suspect greenwashing.

Similarly, we propose that participants will demonstrate less positive emotions such as happiness ("feelings that are enjoyed, that are sought by the person," Ekman & Cordaro 2011, p. 365) when they perceive greenwashing. This is because cognitions (e.g., perceived greenwashing) can evoke emotions (e.g., facial reactions) and these emotions can be more important drivers of pro-environmental behaviors than cognitions (Koenig-Lewis et al. 2014; Nyer 1997). For instance, previous research has demonstrated that anger relates to intention to boycott a company with environmental problems (Nerb and Spada 2001) and that positive emotions relate negatively to both green risk (Kim and Lennon 2013) and trust (Myers and Tingley 2011). Extending this logic to greenwashing, we explore whether perceived greenwashing will result in fewer website interactions and less positive emotions. Consequently, we ask:

RQ Does perceived greenwashing relate to objective (a) website interactions and (b) emotional expressions?

Overview of Studies

We conducted two studies, an interview study with employees and a controlled experiment with university students. For these studies, we used multiple methods, including interviews, questionnaires, and neurophysiological techniques such as facial expressions and mouse interactions. Using mixed methods represents a strong design because the weaknesses and biases of one method can be balanced by the strengths of other methods (Creswell 2009). For example, one criticism of qualitative research is that the process can be biased by the researcher's implicit assumptions, interests, and prejudices (Collins 1992). Although some would recommend the use of questionnaires, scholars have also acknowledged the limits of self-report measures; they have called for neurophysiological methods that can measure constructs such as emotions and behaviors in real time (Appel et al. 2015; Hibbeln et al. 2017). Still, not all constructs can be measured using neurophysiological methods (e.g., attitudes and intentions). More importantly, neurophysiological methods have their own limitations (Galluch et al. 2015) and some empirical evidence suggests that these methods do not replace but complement each other (Tams et al. 2014). Thus, our use of multiple methods helps to shed light on greenwashing from multiple perspectives.

Study 1: Interviews with Organizations

The purpose of Study 1 was to gather organizational members' perceptions of greenwashing in their industries, as well as to provide some support for our hypotheses and suggest key design considerations for Study 2. To do so, we conducted interviews with two types of organizations, those that use green marketing content to sell a product or service and consulting companies that develop green programs or campaigns for their clients (hereafter called companies or consultants).

Participants

To identify the organizations, we conducted Internet, Instagram, and Facebook searches for consumer organizations that make environmental claims, focusing mainly on certified B Corporations in North America (using https://bcorporation.net/directory). We focused on certified B Corporations because of their likelihood to participate in green marketing: we expected that they would be willing to discuss

their experiences as they follow strict environmental transparency guidelines to maintain their certifications. Their tendency to follow guidelines requires them to collect, track, and understand processes (e.g., life-cycle analyses) that may otherwise be overlooked. Therefore, certified B Corporations are likely to have a deep understanding of the inner workings of their businesses due to their access to data and analytics used to remain certified.

We emailed recruitment notices to 146 organizations, identifying 17 who agreed to be interviewed (eight consumer product companies and nine consulting firms). Our interviews took place through telephone or Skype and we typed detailed notes during them and then added missing information at the completion of each interview.

Procedure

The interviews were semi-structured. Questions were adapted from a theoretical framework developed by Ottman (2011) that summarizes how organizations can effectively communicate green marketing to mainstream consumers and the obstacles they may face in doing so. For example, one question posed in Ottman's checklist includes: "What are the key sources of sustainability-related information on which our consumers rely?" We adapted this to create two questions for our interviews: "How does your company communicate the environmental friendliness of the < item(s) > you sell to your customers?" and "What words has your company found most effective in communicating that a product is environmentally friendly?" As another example, we also adapted Ottman's "How has environmentalism affected the shopping habits of our consumers?" to "What do you think the effects of green marketing have been on your customers' purchase intentions?" The same thematic questions were posed in every interview, although variations occurred depending on the participant's role in the green marketing process.

The semi-structured interview process followed the techniques recommended by Leech (2002). This approach allowed us to combine pre-determined open-ended questions (questions that prompt discussion) with the opportunity to explore themes or responses further. Furthermore, it gave us flexibility in our choice of the wording for each question and enabled the use of probes (Hutchinson and Skodol-Wilson 1992). Probing can be an invaluable tool for ensuring the reliability of the data as it can elicit more complete information (Gordon 1975), which allowed us to explore and clarify inconsistencies within respondents' accounts.

Results

The average interview took 30 min and typical participant job titles were "Cofounder" and "Marketing Manager". From our typed transcripts, we inferred overarching themes based on both our questions and those that emerged from the interviews. We utilized a variation of the widely used pile-sorting technique that applies moving and sorting (Ryan and Bernard 2003). Themes were color-coded and sections of each transcript were highlighted and placed into a master document that organized all major and sub-themes in the interviews. Table 2 presents the results by type of organization, that is, green companies and green consulting organizations.

The results help shed light on our hypotheses as well as provide ideas for designing our second study. Concerning interactive green components (related to H1 and H3), organizations provided many suggestions, including gaining 3rd-party certifications, presenting narratives, conveying sustainability visuals, displaying educational materials, and partnering with other green organizations. For example, most organizations mentioned publicizing 3rd-party certifications. They viewed these certifications as one method to help overcome consumer mistrust of green marketing, removing consumer barriers to fact-checking company claims.

In terms of narratives, organizations suggested that images and videos are the most effective strategies for illustrating a storyline, and infographics the most successful for easily conveying statistics. They proposed that—not only do companies underestimate how interesting their behind-the-scenes operations are and fail take full advantage of them—they also do not recognize their viewers' level of sophistication. For instance, one interviewee argued that the internal workings of a company can make for good storylines and are important for attracting younger demographics, as they pay more attention to what companies do rather than the products alone. From these findings, we decided to incorporate 3rd-party certifications, narratives, and the use of images and videos in our next study.

Relating to communication methods, organizations emphasized maintaining a strong social media presence on major platforms such as Facebook and Instagram; some companies also stressed the value of email marketing and print. In addition, blogging and podcasts were considered valuable tools to provide deeper insights into their campaigns and initiatives and to discuss topics relevant to their company culture. Organizations also performed outreach through direct actions (such as planting a tree), participating in local activism (e.g., through pop-up shops), and taking part in other local events.

Two themes related to individual characteristics, such as environmental beliefs (H2). The first theme concerns consumer values. Organizations believe that consumer values are important but reported that environmental values are not necessarily predominant: other values such as product quality, health, and price are also important. That is, although

Table 2 Interview Themes found in study 1

Theme	Description	Green product/service companies		Green Consultants	
		Example quote	Number of organizations	Example quote	Number of organizations
Individual characteristics (H2)					
Importance of Green to Consumers	Importance of a (green) innovation, service, or feature to make their company or product attractive to customers	"Most people buy from us particularly because we have a good product. I would say that 80% of sales are because of the quality of our product. A lot of our clients don't know or care about the green impact. When we started, there was not a lot of knowledge on these things." (G8)	7/8	"We look at our client's customer profile and for some of their customers the green aspect might not be the #1 message they are looking for. That might be a problem because it is usually massively important to our client. But you really need to figure out why people would buy from them—the benefit that their customers see." (M3)	5/9
Workforce Age	The recruitment of a younger workforce represents a driver for being green		–	"There is no doubt. For young millennials green impact is important for recruitment and loyalty." (M5)	2/9
Communication design (H1, H3)					
Certifications	The impact of obtaining 3rd party assessment certifications	"They lend authority, and by being partnered with established brands and third-party certifications, it adds credence and trust for the consumer. Our customers will look back and think it wasn't just us just making these claims, because we can show them the work and certifications to back us up." (G7)	7/8	"To avoid being lost in the green marketing industry we decided to become a Certified B Corporation. This also helps to verify our claims and shows that we are the real deal." (M6)	7/9
Narratives	The importance of telling a story to their customers	"We went to our supplier to film them cutting 1,500 bags at a time, which is seriously impressive. They take the layers and cut it all by hand. People underestimate how interesting things are behind the scenes and don't take full advantage of it." (G6)	4/8	"Overall, I think the main thing that works is to tell a good story about the products. Telling our customers where it comes from and why." (M8)	7/9

Table 2 (continued)

Theme	Description	Green product/service companies		Green Consultants	
		Example quote	Number of organizations	Example quote	Number of organizations
Communication Methods	The types of methods used to communicate to their customers (outlets, strategies, media)	"We mainly focus on Facebook and Instagram. We try to promote on both outlets. What we do is mostly visual. We try to post photos that evoke environment and nature (example: plants)." (G1)	8/8	"What I think is the key to helping people to understand is getting them to ask questions. Don't say I'm better, but instead get them to ask questions about what you claim. Frame your impact in a way that your consumer will be hooked. Too often, companies don't do this. For example, when I worked with [a telecom operator] the word 'divestment' really worked because people asked us what it meant. You should focus on education." (M2)	6/9
Partnerships	Creating partnerships with value-aligned organizations	"We avoid greenwashing by having a more credible client profile. It's also important to know who to partner up with. Partnering with credible organizations is a way to show that you understand your customers' concerns." (G5)	7/8	"On a smaller scale, we often partner with smaller organizations to promote an event. This is effective because it's much easier to tap into someone else's network, rather than creating that network. We want to find new people to hear ideas to think about their environmental response. If they are an organization that is already tapping into that, it saves our time and allows us to expand easier and faster." (M9)	8/9
Outcomes (H4-H7)					
Greenwashing	The prevalence, method, or impacts of greenwashing	"Some companies might be falling victim to greenwashing from their manufacturers. The middle agent (source) is crucial. Very few companies are creating things vertically—working directly with mills, and knitting those yarns into fabrics. They're usually buying finished fabrics and products." (G7)	8/8	"I saw one example of greenwashing recently when a digital marketing company was claiming to be environmentally friendly because they don't print any emails in the office. But one of their clients is a heavy GHG emitter. Their claims don't match up—it's contradictory." (M4)	9/9

Table 2 (continued)

Theme	Description	Green product/service companies		Green Consultants	
		Example quote	Number of organizations	Example quote	Number of organizations
Green Challenges	Challenges within green companies	"We have a very function-orientated product, and no one has seen it before. So our challenge is that people need to hear about what our product is, and there is a risk of overwhelming them with green things. We have to walk a fine line to provide enough information to make an informative purchase choice and understand why." (G8)	7/8	"My concern is that we are now desensitized from green marketing because of all the buzz around it. There's a lot of misconceptions around products. I do think we are influenced, and there is general good will for better choices amongst people but they question credibility more and more." (M6)	9/9
Transparency	The importance of transparency in business operations	"We never brag or make claims. We just state what it is, and are transparent with the facts. It's not about saying you are sustainable, but about saying something that makes the consumer come to that conclusion themselves." (G7)	5/8	"We communicate about all the money we don't make. We specifically communicate about the money we leave on the table. We could easily increase our profits by 30% if we sold products we thought weren't good for our customers. But we want to sell products that we would personally use." (M2)	4/9
Consumer Impacts	Impacts of green marketing on consumers	"I think green marketing impacts your customers' purchase intentions, attitude towards your brand, and trust. More and more people are getting informed. They are aware of the impact of green purchases and it does make a difference." (G5)	3/8	"A lot of people know how to tell if something is greenwashed now. So, is there is a way to regain that trust after you do it? It impacts loyalty, maybe not forever, but it depends on the scale of greenwashing." (M4)	6/9
Technology Impacts	The application of technology to decrease or track their environmental footprints	"We focus on eco-logistics, an eco-center—established with solar energy. Reusing is important so that the circular system is not broken within the packaging area. Analytics is important to us for sure, technology advancement." (G5)	7/8	"We talk a lot (as a digital agency) about all of our impacts (pixels/people) in pixels. Pixels are really costly in terms of environmental impact, and the energy that is used to create them. Serving the green movement by reducing the digital footprint. People think that online is free from impact since it's less tangible, but emailing still has a cost." (M5)	4/9

organizations note that consumer awareness of sustainability appears to be rising, most company participants stated that product quality is more important to consumers than their green beliefs; similarly, over half of the consultants noted the importance of quality to consumers. The second individual theme relates to age: a few consultants highlighted the importance of sustainability to younger employees. For example, one participant noted that one of the major factors in their decision to become a Certified B Corporation was to attract younger employees. They stated that the younger workforce looks at a company's conduct before they accept a job offer: being more environmentally conscious can make an organization more attractive. From this finding, we decided to study younger consumers in our next study.

Participants discussed many outcomes (H4-H7). Participants noted that consumers generally do not fact-check companies: many consumers fail to research whether a company's claims are valid, leading them to fall victim to greenwashing.

To assess greenwashing, we asked participants what they had seen in other organizations, as companies are unlikely to report that they, themselves, greenwash. All companies presented others' greenwashing examples, often related to the wider supply chain (see Table 2 examples). In this case, these organizations could be viewed as 'unintentional greenwashers' rather than the typical 'evil greeners' who make false claims intentionally. 'Unintentional greenwashers' may fall victim to greenwashing done by their middle agents. The middle agents, where they source their materials or products, may be the actual 'evil greeners'. The reasoning behind this observation was that many companies are not working vertically: for example, in the clothing industry they may not be working directly with mills for their fabrics or yarns. However, participants told us that becoming an 'unintentional greenwasher' is preventable: it is important for companies to ask their suppliers questions to fully understand the environmental impacts of their supply chains.

In the interviews, we also discovered another type of company that performs the opposite of greenwashing, but keeps it hidden: these types of companies hide their positive environmental initiatives. For example, one consultant said: "There are also what we call green blushers. They think it's better to keep their philanthropy/green impact anonymous for moral reasons. They don't think it's right to make more profit because of the positive environmental impact they have. … [So] there are three types of greenwashers: evil greeners, green blushers, and unintentional greenwashers" (M2). Interviewees reported that green blushing often occurs among the wealthiest one percent of the population: these are the individuals in companies who control a lot of wealth but keep their philanthropy and positive green impacts anonymous. This has given rise to a considerable amount of hidden positive environmental impacts that may have the potential to change the status quo if these impacts were known. An important finding stemming from this is the realization that there are multiple types of green(washer) organizations: the 'unintentional greenwasher', the intentional greenwasher (the 'evil greener'), the truthful green marketer, and the 'green blusher'.

Most participants mentioned challenges in describing the green attributes of their products. There was concern that consumers are desensitized to green marketing because of the 'buzz' around it and the presence of greenwashing. Greenwashing was considered one of the leading contributors to perpetuating negative stereotypes, as the majority of interviewees could name one or more competitors that manipulated their consumers into thinking their practices were greener than they were.

Half of the organizations described how they try to avoid consumers' perceptions of greenwashing by relying on transparent communications. To decrease pushback, they recommended that companies never make claims to be 'perfect' or the 'best' in their industry; instead, they should specifically communicate how they are better than their competitors. Consultants suggested that transparency decreases perceptions of greenwashing by increasing organization's accountability, preventing pushback from other companies, and showcasing company values.

Participants mentioned many possible outcomes that can be impacted by greenwashing, including trust, company loyalty, purchase intentions, and brand attitudes (see Table 2). For example, one company stated that transparency has a positive impact because it builds loyalty and respect among its customers by helping them to understand who it is as a company. Organizations argued that this leads to greater trust, even if not all the aspects of their operations are sustainable. Some also described the impacts of information technologies on environmental outcomes, both for good (e.g., the application of eco-logistics) and to the detriment of the environment (e.g., increased energy use for emailing, tweeting, and uploading files). Consequently, we examined a variety of these greenwashing outcomes in our next study.

Study 2: Experiment with Generation Z Participants

To investigate our model, we examined perceptions of greenwashing through the lens of online shopping. Online shopping is becoming increasingly popular due to its convenience and time-saving benefits (Horrigan 2008). However, unlike in-person retail stores, customers are not able to interact with a salesperson or the merchandise, which can increase the perceived risk of online shopping (Sarkar 2011).

This study collected data through three methods, questionnaires, facial expressions, and computer interactions. It consisted of a controlled experiment with undergraduate university students and took about 1 h to complete. Before

running our main experiment, it was pretested with nine graduate students and minor changes were made to the experimental materials and lab setup based on these pretests.

Participants

To examine online shopping, we chose to study Generation Z participants for several reasons. First, they, along with Millennials, are the most likely to make purchases online, and are twice as likely as older generations (27% vs. 14%) to be influenced by advertising (Wallace 2017). Generation Z is the next generation to move into its prime spending years after Millennials, and is likely to soon overshadow their predecessors in size and influence (Boroujerdi and Wolf 2015). Second, as noted in the Study 1 results, this target group will play a crucial role in the development of an environmentally conscious population, providing a possible snapshot of future society in terms of green purchasing behaviors and how they respond to green marketing content.

The sample comprised undergraduate students from a North American university who were part of a 'subject pool'. For participation, they earned partial credit that they could apply to a course of their choosing. Most were individuals born after 1994 (Generation Z), with 166 participants recruited.

Procedure

The study was conducted in a behavioral lab on campus. A lab research associate helped run the study and analyze the results.

Participants interacted with one of five versions of a product webpage for a consumer product (a t-shirt), described below. Four participants were able to take part in the study at once (they were separated so that they would not look at others' work, but each of the four was randomly assigned to the same website version).

Upon arrival at the lab, the participants completed the Consent Form and then they completed a background questionnaire that included their environmental attitudes and demographics. Next, they were seated at a lab computer and watched a 5-min video showcasing neutral images: this was done in order to calibrate their emotions (Zhang et al. 2014) for the facial expressions data capture. These neutral photos were chosen from the GAPED database (Dan-Glauser and Scherer 2011; with a valence of 45–55, intensity < 30, and SD < 20).

Participants were then instructed to interact with the website. During this interaction, their facial expressions were recorded with webcams mounted on the lab computers (using Noldus FaceReader software) and their mouse clicks were recorded with Mixpanel (mixpanel.com)—see Appendix for a diagram of this setup. At the end of this interaction, participants were presented with a second questionnaire that measured a manipulation check, their webpage perceptions, and their perceptions of greenwashing and outcomes. Participant responses across questionnaires, facial expressions, and mouse interactions were connected through the use of anonymous ID numbers.

Measures

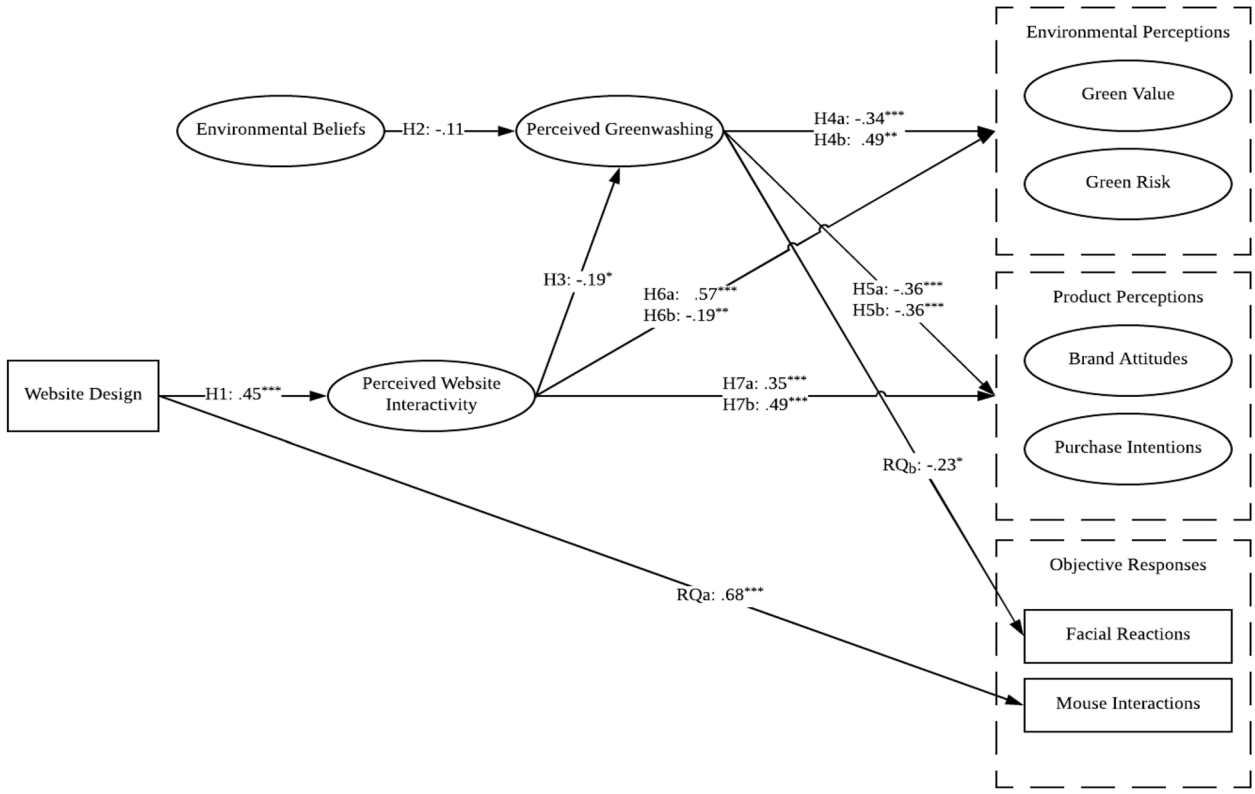
For website design, the company website we presented to participants was drawn from an actual organization's website selling men's and women's clothing (with the organization's permission). The five webpage versions included men's and women's t-shirts and encompassed the same content; however, they included different interactive green components to communicate their green information. To design the webpages, we drew on Study 1 results, specifically those around 3rd-party certifications, narratives, and the use of images and videos for illustrating a storyline. Table 3 outlines the characteristics of the five webpage versions, that we coded from 1 to 5 for analyses.

As indicated, we used a combination of self-report and physiological measures. For the questionnaires, constructs were previously validated ones, measured on seven-point Likert scales from strongly disagree to strongly agree. The measures incorporated were: environmental beliefs (Dunlap et al. 2000), perceived website interactivity (Jiang et al. 2016), perceived greenwashing (Chen and Chang 2013, which they adapted from Horiuchi and Schuchard 2009 and Laufer 2003), green value and green risk (Chen and Chang 2012), and purchase intentions and brand attitudes (Muehling and Laczniak 1988).

We captured two types of physiological measures, facial expressions and mouse interactions, representing objective responses. Facial expression analysis is based on early work by Haggard and Isaacs (1966) and Ekman and Friesen (1969): while some may try to mask their true emotions for a multitude of personal and social reasons, they suggest that changes in emotions are still reflected in micro-changes in facial expressions. Although this early and more recent (e.g., Hurley 2012) work focuses on detecting and analyzing facial expressions by others, another possibility is to detect and analyze facial expressions through technology. One of the well-known tools for this is Noldus FaceReader (Loijens et al. 2016), which can recognize facial expressions by "distinguishing six basic emotions (happy, angry, sad, surprised, scared, disgusted, and neutral) with an accuracy of 89%" (Terzis et al. 2013, p. 45). Noldus FaceReader determines facial expressions using three steps: (1) finding accurate face positioning using the Viola-Jones algorithm, (2) face modeling with the Active Appearance Model in combination with Deep Face algorithm for higher classification accuracy, and (3) classifying based on basic expressions. In addition,

Table 3 Website design conditions used in study 2

Condition number	Description	Interactive Green Components			
		Example marketing claim	Certification	Green narrative	Interactive elements
1 (Greenwashed)	Product webpage with unjustified green marketing claims	"The world's most sustainable tee"	Green Leaf icon (non-certified)	None	T-shirt selection (color, size) + Expand/Collapse Accordion (for product description)
2 (Neutral)	Same product webpage as Condition 1, but with neutral (green) marketing claims	"Made from soft cotton"	None	None	Same as Condition 1
3 (True green)	Same product webpage as Condition 2, but with certified green marketing claims	"6 km of driving emissions avoided"	Green Leaf icon (3rd-party certified), with hover-information on water, CO_2, and energy saved	None	Same as Conditions 1 & 2 + Hover (impact calculator)
4 (True green with text)	Same product webpage as Condition 3, with the addition of a text narrative	Same as Condition 3	Same as Condition 3	Text storyline	Same as condition 3 + Link (to text storyline)
5 (True green with video)	Same product webpage as Condition 3, with the addition of a video narrative	Same as Condition 3	Same as Condition 3	Video storyline (the voice-over content was equivalent to the text content presented in Condition 4)	Same as Condition 4, but Link (to video storyline) + Play/Pause button



* p ≤ .05; ** p ≤ .01; *** p ≤ .001

Fig. 2 Study 2 results

it classifies mouth open-closed, eyes open-shut, eyebrows raised-neutral-lowered, head orientation, gaze direction, and the characteristics of gender, age, and facial hair (beard and/or mustache): noldus.com). For example, happiness is measured through the following contributing action units: AU 6, Cheek Raiser (Orbicularis oculi muscle); AU 12, Lip Corner Puller (zygomaticus major muscle); and AU 6–12, Eye Wrinkles (Duchenne Marker) (https://www.noldus.com/facereader/facial-action-units).

Participants' mouse interactions were recorded using Mixpanel (mixpanel.com). Mixpanel is a web and mobile analytics tool running on JavaScript that gathers data from users when pasted into a website's source code. It allows one to see how individual users are using a website (actions they take) and it tracks different events to see the locations of the biggest drop-off rates (the percentage of people who do not continue on the intended path of the user flow).

Results

The average participant was female (58.4%), 19.81 years old, in second year of a 4-year business degree program, unemployed (52.4%), with 17.87 months of part-time work experience and 7.43 months of full-time work experience, and purchased products online moderately often. None of these demographic variables related to greenwashing.

Before examining the research model, we conducted several preliminary analyses, including checking variables' distributions, outliers, and reliabilities. We compared variables' distributions to the normal and checked for skewness and kurtosis: none were significant. Similarly there were no significant outliers. All Cronbach's alphas were above 0.76. Further, a manipulation check assessed whether the participants' recollections of their condition's characteristics matched with the condition's actual characteristics: 94.49% of the participants correctly identified the characteristics of the website with which they interacted.

To assess the research model, we conducted structural equation modeling (SEM) using AMOS 25 (Arbuckle 2017). As indicated earlier, we treated website design as an ordered scale from 1–5 in the analyses (however, we also tested website design as an unordered scale by conducting an ANOVA for perceived website interactivity, with website design as a factor: the results were consistent to those using the ordered scale). We conducted AMOS with and without the exploratory research question and the results were consistent across the two. Consequently, Fig. 2 presents the results with the exploratory research results included.

Overall SEM results fall within expected ranges ($\chi 2/df = 0.39$ (n.s.); AGFI = 0.94; NFI = 0.97; RMSEA = 0.01) (Hair et al. 2010). All hypotheses, except for one, were supported. That is, for H2, environmental beliefs related negatively, but not significantly, to perceived greenwashing. (To explore whether environmental beliefs may have had a moderating rather than a direct effect, consistent with Chen et al. (2019) and Zhang et al. (2018), we also conducted post hoc tests to see if environmental beliefs moderated any of H3-H7 or the RQ: none of these moderating effects were significant.)

The remainder of the hypotheses were statistically significant. As expected, the website design related positively to perceived website interactivity (H1) and website interactivity related negatively to perceived greenwashing (H3). Perceived greenwashing associated positively with green risk and negatively to green value, brand attitudes, and purchase intentions (H4 and H5). Similarly, perceived interactivity related negatively to green risk and positively to green value, brand attitudes, and purchase intentions (H6 and H7).

Turning to the exploratory research question, we found that perceived greenwashing related negatively to happiness as measured through facial expressions (see Fig. 2). In contrast, greenwashing did not relate to website interactions (mouse clicks). However, our exploratory analysis demonstrated a strong and positive relationship between the website design and mouse clicks (see Fig. 2). That is, with designs containing more interactive green components, participants interacted more with the website.

Discussion

Greenwashing represents an important issue for society. Our two studies demonstrate that perceived greenwashing can have detrimental results for organizations, relating to consumers' product and environmental perceptions, as well as their happiness and website interactions. Conducting multiple studies and using a variety of data collection methods helped strengthen our findings and suggest areas for future research.

Future Research Implications

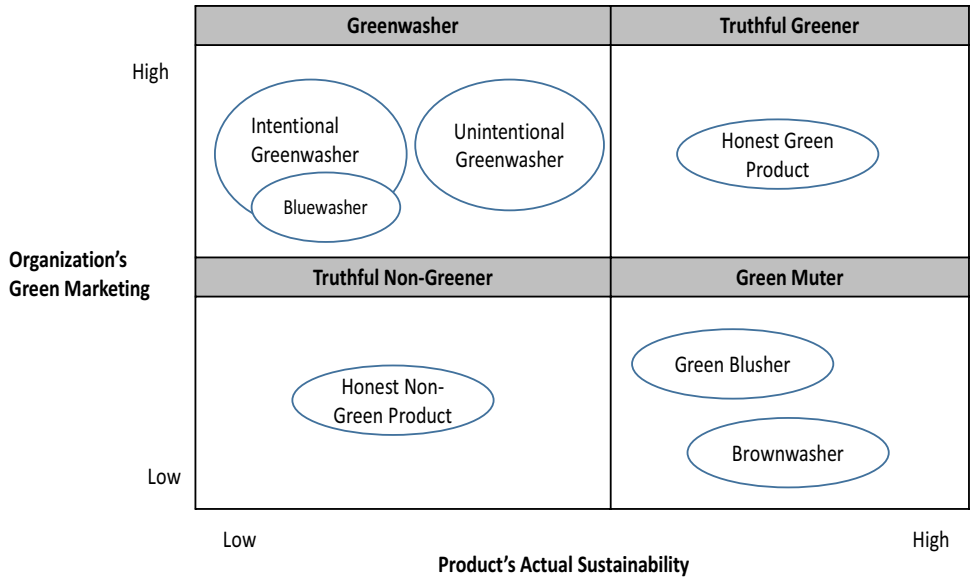
Our interview results provided us with insights into shades of green(washed) organizations, explored more below, as well as reinforcing the hypothesized relationships tested in our second study. Our experimental results support the model's hypothesized relationships, except for the relationship between environmental beliefs and greenwashing: beliefs did not relate significantly to perceived greenwashing (nor did beliefs moderate any of greenwashing's relationships). Our interview results suggest several possible explanations for this finding. One explanation concerns values: although environmental beliefs may be held, it could be that other values are more important to consumers than green ones. Another explanation could be that holding higher environmental beliefs may not relate to consumers' dedication to fact-checking. Or, those with stronger environmental beliefs may not possess higher abilities to recognize less obvious forms of greenwashing. Finally, consumers may view many forms of truthful green marketing as greenwashing as a result of past negative experiences with deceptive marketing. These explanations concerning the relation of individual characteristics to perceptions of greenwashing represent intriguing areas for future research.

In contrast to the majority of research that uses surveys (e.g., de Vries et al. 2015) or has consumers view static advertisements or webpages (e.g., Nyilasy et al. 2014), we designed our experimental websites so that consumers could interact with them. In addition to greenwashing, we found that perceived interactivity of organizations' websites relates to outcomes of interest to organizations: interactivity relates negatively to perceived greenwashing and green risk and positively to green value, brand attitudes, and purchase intentions. In addition, we found a strong relationship between website interactions (mouse clicks) and the website design, demonstrating that consumers interact more with websites containing more interactive green components.

In addition to website interactions, we explored another objective measure—facial expressions. Doing so responds to calls for more empirical research exploring emotions and pro-environmental products (e.g., Koenig-Lewis et al. 2014). Emotions are complex to measure as they are physiological responses that last for a limited amount of time (Koenig-Lewis et al. 2014). Nevertheless, they are generally measured through self-report rather than through more objective means (e.g., Nerb and Spada 2001; Nyer 1997). In contrast, we used a physiological measure (facial expressions) to assess emotions. We found that perceived greenwashing related to lower expressions of happiness. In contrast to our study, few have examined multiple observable behaviors related to websites (Oard and Kim 2001), but objective behaviors provide promise for future research.

Our studies are subject to several limitations that suggest additional areas for future research. Both studies investigated a circumscribed set of participants. Our first interview study focused on employees of green organizations and consulting firms: we did not capture consumers' perceptions in this study. However, studying employees in organizations helped us to explore current industry practices around green marketing, provided support for the hypotheses tested in the following study, and highlighted the importance of a better understanding generation Z. Consequently, our second experimental study examined this generation as consumers; we utilized university students as they are more easily

Fig. 3 Shades of Greenwashing



available to participate in in-person lab studies. Nevertheless, we believe that students are appropriate to study as consumers as they are likely to make online purchases and are heading into their prime spending years. Further, we believe that our two types of participants complemented each other and we encourage future work to consider both organizational and consumer perspectives in order to capture a more complete picture. Future investigations should also extend our research to examine a wider set of stakeholders.

Our studies were also subject to several other limitations that we develop next in terms of directions for research and practice. That is, in our first interview study, interviewees discussed different shades of greenwashing: future research should further tease apart these types. The design of our conditions in our second experimental study could also be strengthened: they differed in both green marketing content and interactivity. That is, their content ranged from greenwashed to truthful green information at the same time that objective interactivity ranged from lower to higher. Future research should examine the relative influence of green content and interactivity. Most importantly, researchers need to investigate the ethical issues that arise when green marketers rely on interactivity to help persuade their consumers.

Shades of Greenwashing

We discovered in our interviews that organizations view green marketing from multiple perspectives, as intentional greenwashing (the 'evil greener'), unintentional greenwashing (e.g., from their supply chains), no greenwashing (truthful green marketing), and unadvertised green initiatives (the 'green blusher'). If we put these into a matrix of organizational green marketing by actual product sustainability, then Fig. 3 results.[1] This figure describes organizations by their transparency, their actual greenness, and their green marketing. Specifically, greenwashers are not transparent with the market, marketing non-green products as green. Some of these organizations greenwash intentionally. A special case of intentional greenwashing has been called 'bluewashing' or firms that "figuratively drape themselves in the blue UN flag in order to distract stakeholders from their real, as opposed to cosmetic, poor environmental … records" (Berliner and Prakesh 2015, p. 132). Or, as we found in our interviews, organizations may greenwash unintentionally because of others in their supply chains: these organizations believe that they are being transparent to the market, when, in fact, they are greenwashing. In contrast, truthful greeners demonstrate transparent green marketing about their green products. Similarly, truthful non-greeners are transparent about their non-green products (Simula et al. 2009), not marketing them as green. Finally, green muters deliberately do not project an external image of green, when in fact they are green (Glavas and Godwin 2013): thus, they are not transparent about their sustainable products. They may not participate in green marketing for a variety of reasons, including ethical ones (e.g., our green blushers), because of uncertainty around scientific knowledge concerning environmental decisions (Simula et al. 2009), or over worries of investor backlash (Kim and Lyon 2015). Some use the term brownwashing for this latter type of green muting, that is, those that understate their environmental achievements for various reasons, including fear of being attacked

[1] Simula et al. (2009) developed a related 'green matrix' in which they compared consumers' perceived greenness of products (rather than green marketing, as in our figure) to actual product greenness.

for focusing on environmental to the possible detriment of performance issues (Kim and Lyon 2015). Future research needs to explore these various types of marketing further: for example, should organizations be transparent in their (truthful) green marketing or can they reap some of the benefits of their green activities through green muting?

This matrix also has important implications for practice. Managers may experience difficulties when communicating the environmental benefits of their products or services, as they may need to overcome their customers' past negative experiences with greenwashing. Depending on the type of perceived (green)washing and the organization's desired outcomes, our interviews suggest that different strategies may be more or less effective in reducing the perception of greenwashing and/or improving performance. For example, (previously) intentional greenwashers could move to truthful non-greening, or preferably, to greener products. If greening projects is not possible, they might benefit from impact or sustainability reporting to improve their overall image. For example, they could create anti- (or non-) impact reports that illustrate their organizations' shortfalls or explain where or how they have fallen short on their sustainability goals and how they plan to do better. This may seem counterintuitive, but several interviewees reported that consumers respond better to organizations they believe are being truthful, and proposed increasing transparency as the best method of doing so. Turning to unintentional greenwashers, managers need to understand environmental impacts arising from sources such as their supply chains, and instead partner with more value-oriented organizations. Marketing managers who work for sustainable organizations that practice true green marketing could also focus on highlighting their product or service's additional differentiators in order to set themselves apart from their competitors. In other words, our interviewees suggested that organizations should not rest solely on their sustainability marketing, but find additional ways to be disruptive in their industries. Finally, green muters could reconsider why they have chosen to remain silent about their actual sustainability, determining if their customers or other stakeholders would value knowing about the green attributes of their products.

Ethical Issues

This research presents several ethical issues for organizations. The first concerns website interactivity. We found that perceived interactivity of websites related negatively to green risk and positively to green value, brand attitudes, and purchase intentions. However, knowing this, could organizations manipulate consumers by increasing website interactivity, thereby persuading them to hold more positive attitudes and to increase their interactions with the website (regardless of the ethical content of the organization's green marketing)?

We know from past research that interactivity can increase the persuasiveness of a technology (Oinas-Kukkonen and Harjumaa 2009). For instance, some website design elements promote flow, a psychological state of immersion into an activity, positively associated with converting e-commerce visitors to purchasers (McDowell et al. 2016). In addition, interactivity improves the customers' brand experiences as well as their relationship quality with the brand (Yoon and Youn 2016), increases their preferences over time for more interactive websites when compared to less interactive websites (Al-Shamaileh and Sutcliffe 2013), and generates higher brand loyalty through an increase in brand affect and brand trust (Lin and Lee 2012). Therefore, we propose that future studies take a closer look at the persuasive effects of website interactivity in green marketing.

Although some argue that any persuasion is bad (e.g., Santilli 1983), Emamalizadeh (1985) takes the view that all marketing aims to be persuasive and that green advertising can be moral in certain situations. Specifically, if the persuasion is rational (informative) or does not affect individual autonomy, then he suggests that green advertising can be considered moral. Spahn (2012) extends this thinking by proposing that persuasion is an act of communication, falling between 'manipulating' and 'convincing'. He draws on discourse ethics to argue that persuasive technologies (like interactive websites) should follow Habermas' (1973) four validity claims of comprehensibility of the message, truth of content, appropriateness, and truthfulness of speaker intentions. Drawing on these, he presents three ethical guidelines for designing persuasive technologies: providing (real or counterfactual) consent, providing as much autonomy to the consumer as possible, and aiming to educate (informing the consumer). In order to minimize perceptions of greenwashing, future green marketing practitioners should take these ethical guidelines into consideration when designing interactive technologies such as websites.

In addition to ethical issues around interactivity, the content of green marketing represents another potential concern. As Nyilasy et al. (2014) suggest, some companies may be better off by not taking part in green marketing if they cannot deliver it in an ethically responsible manner. However, in the past, ethical considerations were not sufficiently integrated into green marketing, with organizations tending to leave the assessment of environmental proof to the consumer (Davis 1992). But as we learned in our interviews, many consumers do not fact-check organizations. Third-party certifications are a step in the right direction in addressing this issue, but much more needs to be done.

Conclusion

We hope that this research finds its place in promoting more ethical green marketing practices in organizations. It should provide organizations with a deeper understanding of how to present a clearer path for everyday consumers to make more informed purchase decisions to support the development of sustainability. However, greenwashing will continue to be a scourge unless researchers and practitioners address this organizationally generated manifestation of 'fake news' head-on.

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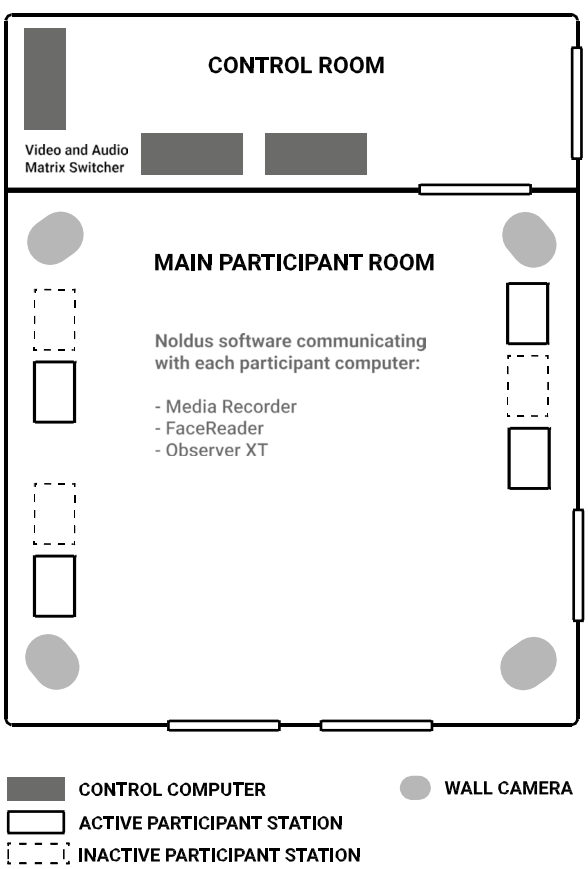
Appendix

Lab Design with neurophysiological data capture.

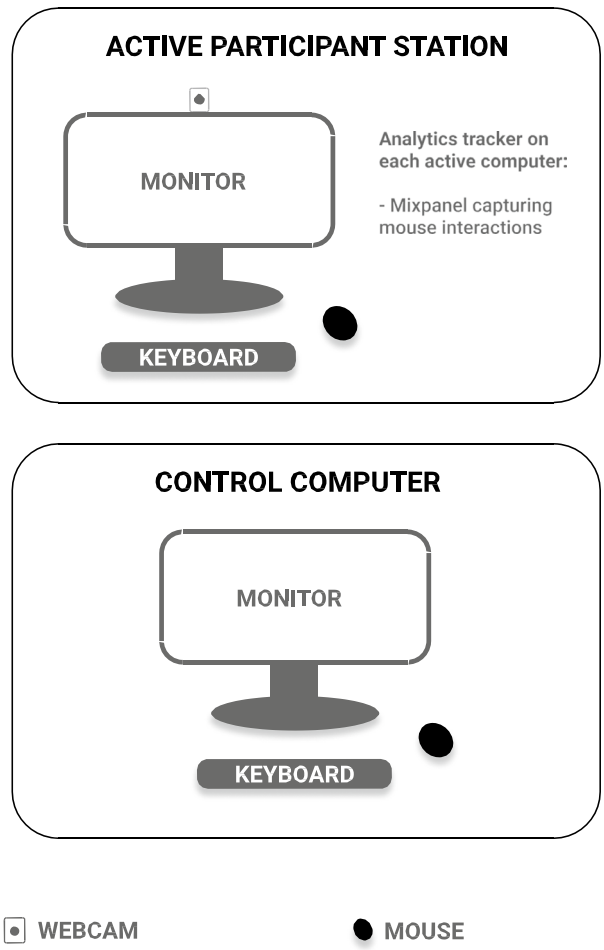
1. Lab rooms

1. Lab rooms:



2 Computers

2. Computers:



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