

NHH



The Effect of Moderators in Green Marketing

*Stakeholder Evaluation and the Effect on
Green Brand Equity and Perceived Greenwashing*

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Abstract

While transparency is widely accepted as one of the key practices to gain stakeholders' trust, prior research has surprisingly found that transparency does not always pay off. Given a company with a high perceived contribution to a sustainability problem (e.g. an oil company), communicating efforts to reduce the problem is shown to negatively affect green brand equity and to increase perceived greenwashing. However, this insight is based on a single experiment and limited to the specific companies and messages in this study. It is premature to conclude that companies in low-sustainability industries cannot gain from communicating their sustainability efforts. The purpose of this research is to gain a more comprehensive understanding of the aforementioned relationships by investigating the presence of moderating variables. Specifically, focus is given to explaining *why* the company engages in the sustainability issue and the use of *relativity* messages (e.g. being better than others). A 2x2x2 factorial design and a three-way ANCOVA analysis were used to test for the main effect and the interaction effects on both green brand equity and greenwashing as dependent variables. No support was found for a relationship between perceived contribution to the problem and green brand equity. This is contradictory to previous findings, and indicates that this relationship might be more complicated than first thought. On the other hand, this study revealed that perceived contribution to a sustainability problem increases perceived greenwashing. Moreover, including the purpose of the initiative (why the company is engaged) in a sustainability message directly increases green brand equity and reduces perceived greenwashing. No evidence was found for any effect of using relativity nor for any interaction effects. These findings contribute to a deeper understanding of stakeholders' evaluation of green claims, which help bring clarity to the process of determining the most efficient strategies in green marketing.

Key Terms: *Sustainability, perceived contribution to a sustainability problem, green brand equity, greenwashing, why, relativity*

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1 Introduction

With the aim of increasing stakeholders' trust, transparency has been an accepted and generally expected practice across industries for several years (Cailleba & Casteran, 2010). Intentional communication and openness about sustainability efforts across operations are shown to increase perceived integrity and corporate performance (Duan et al, 2022). In fact, the majority of consumers are more likely to be forgiving and give a second chance to companies that are transparent (SproutSocial, 2018). The *Guide Against Greenwashing (n.d.)*, a framework signed by over 400 companies, even includes a principle that encourages not only openness about future goals and improvements but also about flaws. However, does full disclosure and openness about operations always increase stakeholder trust and benefit the company? Being transparent is not always easy, and if it is not executed correctly consumer skepticism can arise, causing perceived greenwashing to increase. As Duan et al (2022) argue, little research is done concerning the framing effects of sustainability messages, and show how various approaches trigger different responses in consumers. Accordingly, Kunnumpuram (2021) made a distinction between a company's "perceived contribution to a sustainability problem"(PCP) and "perceived opportunity to solve a sustainability issue" (POS). He found that the former had a significant negative effect on the company's green brand equity (GBE), and increased the threat of perceived greenwashing (GW), when companies communicated their intention to clean up their own mess (Kunnumpuram, 2021). These results challenge existing beliefs about transparency, and imply that some sustainability claims might harm rather than improve the brand reputation and image. This information is critical knowledge for marketers as various framing effects might generate different consumer associations and attitudes, and thus impact the level of customer loyalty. For this reason, this research aims to gain a clearer perspective on the proposed negative effect of PCP on GBE and GW when communicating the effort to mitigate negative externalities.

The overall goal of this thesis is to examine if there are ways companies can communicate the effort of cleaning up their own mess that weakens the negative impact of PCP, eliminates it, or even turns it into a positive relationship. Kunnumpuram (2021) suspected that when a company communicates how it attempts to mitigate its own induced negatives, the recipient of the message may be reminded of a problem of which he or she was previously unaware of. Thus creating negative associations to the sender of the message. Another possible reason for

this negative effect, according to Kunnumpuram (2021), is that stakeholders assume that companies already have implemented initiatives to reduce their environmental impact. Therefore, when the claim highlights the intention to do something in the future, recipients are reminded that the problem is not yet fixed. Unfortunately, for many companies (e.g. in oil and gas) it will be impossible to remove all negative externalities and still be in business. These companies will then always have to deal with negative effects when a sustainability claim like this is communicated. Identifying the most effective framing strategies for these messages will therefore be valuable in obtaining the least negative effect on GBE and GW.

Framing techniques in communication is a tool used by many companies. An example is Apple, who communicates *why* the company exists (e.g. “think different”) instead of overloading the consumer with product details and performance matrices in their marketing (Sinek, 2014). Moreover, comparative advertising has proven to be more persuasive than non comparative advertisement, implying that relative values can be created in order to influence attitudes (Thompson and Hamilton, 2006). This raises the question whether or not these techniques would be powerful enough to weaken the negative relationship between PCP and (a) GBE and (b) GW, or even turn them positive. As stated above, different framing effects are shown to generate various responses. Therefore, it is believed that moderating variables can influence the effect of PCP on GBE and GW, which is the foundation of this thesis’ research question.

RQ: *Which moderators, if any, affect the relationship between PCP and (a) GBE (b) GW.*

Now that studies confirm that transparency in regard to sustainability yields varying results, it can seem like the notion of transparency is not as simple and straightforward as first believed. However, the research on this topic is still limited and requires further investigation to fully determine how companies can ensure efficient communication that pays off. This is beneficial for both companies and society as a whole, as it can help paint a more accurate and clear picture of companies’ engagement in sustainability issues. By the aforementioned research question, this thesis aims to lift a corner of the veil under which the most efficient communication approach is hidden.

2 Theoretical background

2.1 Introduction to CSR

Corporate social responsibility (CSR) can broadly be understood as a firm's ethical role when interacting with its surroundings (Jimenez & Pulos, n.d.) While in the past a company's responsibility could be reduced to increasing profits, companies today are seen as one of the most important parts in solving social and environmental problems (Friedman 1970; Granum Carson et al., 2015). In the initial phase of the CSR definition process, Friedman (1970) stated that only people can be held responsible, not businesses, which implied that leaders who acted out of interest of the business had no obligations regarding the negative imprint on the environment (Bakan 2004). This is commonly known as the shareholder approach (Alcaniz et al., 2020). As a reaction to this view, French (1979) argued that companies use a Corporation's Internal Decision-making Structure which indicates that the responsibility for an act of a company can be transferred back to a group of employees. This paved the way for the acknowledged stakeholder approach, which aims to satisfy the needs of stakeholders, and believes that companies are moral agencies and thus able to bear moral responsibility (Lampert, 2016). *Stakeholders* are defined in this paper as “*any group or individual that is affected by or can affect the achievements of an organization's objectives*” (Freeman & McVea, 2001, p. 5). A firms' responsibilities and who they are accountable to is therefore at the core of CSR (Kakabadse et al., 2005).

Today, the term CSR is used when talking about compliance with government regulations, corporate philanthropy, stakeholder capitalism, sustainability issues and many other concepts related to the actions of a company (Jimenez & Pulos, n.d.). In 2000 the UN Global Compact was created as a global initiative to work towards a more sustainable future (UN Global Compact, n.d.). Additionally, in 2015 all members of the UN adopted the 2030 Sustainable Development Goals (SDG) - 17 goals with the aim of improving quality of life for people and on the planet (United Nations, n.d.). These initiatives, together with the increasing expectations of consumers, have put pressure on improving environmental, social and governance (ESG) management in corporations. Due to imperfect governments and lack of public provision it has also been argued that CSR initiatives could/should follow through where governmental policy falls short (Besley & Ghatak, 2007). Especially today, where several companies exceed the economic size of certain countries (Jimenez & Pulos, n.d.). Besides, Flammer (2015) indicated that acceptance of CSR initiatives in certain companies

lead to increased ROI, labor productivity and sales growth compared to similar companies where the initiatives were not accepted. This implies that CSR initiatives can generate satisfying results for stakeholders as well as shareholders. For the sake of this research, this thesis will solely focus on the *environmental* aspect of CSR and sustainability, and therefore not consider *social* responsibility when going further. Increasing focus and expectations regarding environmental-friendly actions, from both consumers and society as a whole, have led to the concept of green marketing where companies aim to position themselves as more sustainable.

2.2 Green marketing

Green marketing, or ecological marketing, refers to all activities a company does to promote and sell products that either create a positive- or reduce the negative impact on the environment (Rani et al., 2014). Accordingly, the green marketing mix aims to match the attitudes and buying behavior of environmentally conscious consumers, and shapes the actions of a company (Chen, 2010). This includes activities like reducing pollution and consumption of limited resources, recycling waste and using recycled materials, among others, and are found across industries (Sohail, 2017). Even though the demand for more sustainable alternatives has been growing, it has been repeatedly documented that consumer awareness of CSR practices is low (Du et al., 2007; Du et al., 2010). This could be the result of consumers' low motivation to actively search for information about the CSR initiatives of a company (Dawkins & Lewis, 2003). Which also aligns with the nature of credence attributes of green claims, as the degree of environmental impact is challenging for consumers to evaluate both before, during and after purchase (Kangun & Polonsky, 1995). Therefore, value can be created by enhancing the brand reputation by actively communicating these investments using promotional techniques (Ihlen et al., 2011).

Identifying the most effective way of communicating sustainability initiatives has however been challenging for many companies and scholars (Clark, 2000). The interpretation and evaluation of a message is dependent on various factors like *source credibility*, *organizational context* and *respondent characteristics* (Gailey & Lee, 2005). A company's credibility can be understood as the sum of how consumers perceive their expertise, trustworthiness and likability (Keller, 1998). The organizational context influences interpretation of a message in terms of level of formality and expectations from the various roles (Lumen. n.d.a.).

Furthermore, each consumer varies in their motivation, ability and opportunity to process the intended message (Hoyer et al., 2018). This is closely linked to Kahneman's (2013) “dual process theory”, which distinguishes between consumers' fast and slow thinking. The fast decision making process is the basis for why marketers rely on different tools and cues in the communication strategy. This is what the ELM-model refers to as a *persuasion cue*, which has the overall goal of driving change in the cognitive structure so that a positive attitude change occurs (Petty & Cacioppo, 1986). Popular examples of this in green marketing are the use of eco-labels, the color green and brown, cardboard instead of plastic, among many other effects to appeal to the conscious and subconscious decision making process in consumers (Sohail, 2017). Overall, green marketing and research on green consumers are conducted with the superior goal of controlling and increasing the company's green brand equity.

2.2.1 Green brand equity

Brand equity can be defined as “*the differential effect that brand knowledge has on customer response to the marketing of that brand*” (Keller & Swaminathan, 2020. p. 69). Consumers' brand awareness and the set of associations forming the brand image create the assets or liabilities of a company, and will impact whether or not the communicative message is persuasive and generate favorable attitudes (Keller & Swaminathan, 2020; Chen, 2010). Based on this, green brand equity (GBE) can be understood as a set of consumer perceptions related to the brand's environmental responsibility and commitment, which influence the value and utility of a product or service (Chen, 2010; Mehdikhani & Valmohammadi, 2022). Chen (2010) found a positive relationship between GBE and its drivers: green brand image, green satisfaction, and green trust.

Brand image is created in consumers' perception, and by developing strong, favorable and unique associations companies can achieve an advantageous position in the market (Keller & Swaminathan, 2020). Accordingly, *green brand image* can be defined as how consumers view the environmental responsibility and commitment of the brand (Chen, 2010). When perceived quality of a product or service exceeds the expectation, one can argue that it, at a certain level, satisfies the wants and needs of a consumer (Mai & Ness, 1999). Hence, *green satisfaction* refers to how a company manages to deliver a gratification level that meets or exceeds sustainability expectations and the environmental needs and desires of consumers (Chen, 2010). *Trust* can be seen as a fundamental prerequisite for any functioning relationship, and is determined by perceived integrity, benevolence and ability (Frei &

Morriss, 2020; Schurr & Ozanne, 1985). Consumer trust is based on the willingness to rely on a company's character and capabilities to meet expectations (Ganesan, 1994). Thus, *green trust* is defined by Chen (2010, p.309) as the “*willingness to depend on a product, service, or brand based on the belief or expectation resulting from its credibility, benevolence, and ability about its environmental performance*”. While green trust is shown to have a positive effect on GBE, Avcilar and Demirgünes (2016) found that green confusion and green perceived risk negatively influence green trust. Green confusion can be explained as the failure to understand an intended message, due to challenges in cognitive processing (Avcilar and Demirgünes, 2016), while green perceived risk is defined as “*the expectation of negative environmental outcomes related to purchase behavior*” (Chen & Chang, 2013. p. 491). It is suggested that customer trust positively influences brand loyalty (Park et al., 2017), and that GBE has a positive effect on overall brand attitudes and word of mouth (WOM) (Bekk et al., 2016). One can therefore advocate for the importance of companies improving their GBE, as this might lead to increased competitive advantage. As mentioned in the introduction, it is believed that one way to do this is by increasing perceived trustworthiness and integrity by practicing transparency.

2.2.2 Transparency

As the word implies, *transparency* refers to a company's ability to communicate in an open and honest way so that its actions are visible to its stakeholders. Schnackenberg & Tomlinson (2014, p.1788) define it as “*the perceived quality of intentionally shared information from a sender.*” They also argue that the concept is made of three concrete dimensions, namely to *disclose* relevant information at an appropriate timing, communicate with *clarity* so that the message can be understood, and lastly, with *accuracy* so that the information is correct and reliable. Furthermore, perceived transparency is seen as an antecedent to perceived trustworthiness, and influences the level of stakeholder trust through its dimensions *benevolence, integrity and ability* (Schnackenberg & Tomlinson, 2014). As trust is an essential element of GBE, also through perceived greenwashing, it is clear that the concept of transparency is highly relevant in discussing the effectiveness of green marketing.

Over the last two decades, transparency has become a business buzzword. This, much due to increasing flow and availability of information, growing environmental engagement among consumers, as well as reactions to corporate scandals (Schnackenberg & Tomlinson, 2014; Harrington, 2018). A study from 2015 shows that performance transparency can reduce

customer uncertainty, and have a positive effect on “willingness to pay” and purchase intention (Liu et al., 2015). Additionally, Heiberg et al. (2021) highlights the necessity of corporate transparency in order to facilitate effective and beneficial CSR initiatives. This illustrates that the opportunity to “see through” a company is valuable in reducing skepticism and improving business-stakeholder relationships. Especially as today's information technology and social media activity increases consumers' demand for honesty, integrity and sustainable solutions from companies (Heinberg et al., 2021). However, in terms of green claims, is it beneficial for companies to share everything? In the field of sustainability efforts and CSR initiatives little research is done concerning the effectiveness of various approaches. According to Heiberg et al. (2021) transparency has mostly only been used in relation to CSR reporting, and not to explain differences in effectiveness. Also, as Duan et al (2022) illustrate, various framing approaches in disclosing supply chain sustainability can generate different performance results. This implies that some approaches to intentionally shared information could be more beneficial than others. The question is not what information to hide, but rather what information to intentionally and actively share, and how to share it. To facilitate this, it is necessary to examine how stakeholders perceive various initiatives, and performing a materiality analysis is one approach to do that.

2.3 Materiality analysis

Companies tend to impact a large variety of sustainability issues, which makes it problematic to include everything in a sustainability report as it leads to information overload for the reader (Mio and Fasan, 2014). Prioritizing environmental, social and economic challenges based on level of importance is one of the first crucial steps in reporting CSR. This assessment can be done by using a materiality analysis in which *materiality* is referring to the concept used in financial reporting. This is the ability of the reporter to evaluate whether or not a reporting error would lead to a different outcome when it is used in a decision making process (Pistoni & Songini, 2015). In the context of sustainability, *materiality* refers to a company's ability to report on the topics that are perceived as relevant by its stakeholders (Machado et al., 2020). Approximately 80% of the 250 world's biggest companies indicate that they use a materiality assessment to prevent resources from being spent on translating complex data into understandable sustainability actions that ultimately have no effect on the reader (KPMG, 2013).

One of the leading organizations which provides guidance in the process of the materiality assessment is the Global Reporting Initiative (GRI). In their guidelines a four step action plan is developed to implement materiality: *identification, prioritization, validation* and *review*. In the first step, all sustainability issues which have an impact on the company and its stakeholders will be listed. Hereafter, the topics will be ranked based on priority. During the prioritization stage, the use of the materiality matrix is highlighted in which the issues are visualized in a 2x2 matrix where the “*significance of economic, environmental and social impacts*” is represented on the x-axis and “*influence on stakeholder assessments and decisions*” on the y-axis. This framework aims to integrate the impact of the issue on both internal and external stakeholders in the analysis. Despite this focus, a common mistake made when following this framework is that the focus shifts from the impact *of* the business to the impact *on* the business (Scandeliuss & Cohen, 2016). Instead of shifting the focus to the needs of the company, the company should be included in the analysis as a stakeholder (GRI, n.d.). Once all issues are prioritized, internal decision makers validate the assessment and determine which sustainability incentives will be externally communicated. Although companies follow a guided process in allocating sustainability issues to a spectrum, no quantitative uniform threshold is set for deciding at which point of the spectrum issues no longer affect the decision making process of stakeholders (Whitehead, 2017). The last step, *the review*, takes place after the sustainability report has been published and the stakeholder feedback is evaluated.

Effective use of the materiality analysis can help a company to identify essential threats and opportunities regarding sustainability efforts, and specify and improve accountability to its relevant stakeholders so that shared value is created in the process (Calabrese et al, 2019). However, despite being a growing practice since the 1990s, materiality analysis still varies in form and content and leaves a gap for companies to adjust, manipulate and leave out important information to their advantage (Machado et al., 2020). Even though stakeholders' perception is essential to materiality analysis, it is shown that the interest of relevant stakeholders lacks consideration in defining content, and that companies only disclose a limited amount of information (Beske et al., 2020). It is therefore argued that sustainability reporting is in need of more standardization in order to obtain more accuracy and transparency (Machado et al., 2020). For the purpose of this paper it is therefore of interest to understand and determine the source and motivation of stakeholders evaluation of sustainability claims.

2.4 Ethical principles and stakeholder evaluation: Hypothesis 1(a)

Ever since the dawn of economics, ethical theories have guided the beliefs about “fair” behavior and how to achieve and maintain the ideal society (Faccarello & Kurz, 2016). For consumers, ethics help navigate decision making, purchase behavior and beliefs about peoples’ or companies’ character (Bonde & Firenze, 2013). Generally, ethical theories can be categorized into three main groups: 1) *consequentialist theories*, including “the utilitarian approach”, “the egoistic approach” and “the common good approach”. These theories largely focus on the ethical outcome produced by certain actions. 2) *Non-consequentialist theories* are defined by the ethical intentions of the individual behaving in a particular way. Some of the main theories within this category are “the duty-based approach” (deontological ethics), “the rights approach”, “the fairness or justice approach” and “the divine command approach”. Lastly, 3) *agent-centered theories* value the ethical character or reputation of an individual or businesses more than the outcome of decisions. “The virtue approach” and “the feminist approach” are examples of theories within this group (Bonde & Firenze, 2013).

When analyzing the effectiveness of green communication, it is necessary to understand how stakeholders evaluate the importance of various CSR initiatives. In line with the ethical theories mentioned above, several sets of ethical principles have been proposed in the attempt to understand the foundation of decision making (Langhorne, 2016; Weiss, 2014). Building on this and other relevant literature, Valle & Borm (2021) identified nine general ethical principles that can help explain the process of evaluating CSR initiatives and messages. It is worth mentioning that other factors like religion, culture, and/or the nature of an individual's cognitive processing might also affect how a message is perceived by the receiver. With the goal of analyzing the effects of stakeholder evaluation on GBE and GW, Kunnumpuram (2021) categorizes these nine principles into two main perspectives of ethical responsibility; the “good samaritan principle” and the “do-no-harm principle”.

2.4.1 The Good Samaritan principle

The first principle captures the altruistic action of assisting society with the available means and expertise a company possesses, both in form of what is needed and to compensate for loss (Schwartz & Carroll, 2003). This implies taking on the risk the action entails, for the purpose of the greater good of stakeholders, which aligns with the consequentialist theories of both the *utilitarian* and *common good* approach. It also captures an universalistic view, where

respect for others and equality stand as steady pillars. Furthermore, due to the increasing importance of CSR initiatives, and particularly in situations where special relationships are present, this principle has expanded to include the non-consequentialist theory of companies' duty to assist (Schwartz and Carroll, 2003). This type of deontological ethics views some actions as morally required, forbidden or permitted, and guides business decisions in the direction of what should be done (Larry & Moore, 2021). Businesses differ however in size, monetary ability and expertise, which all affect the level of responsibility to contribute to the common good and the duty to assist (Kunnumpuram, 2021). In order to examine the effect of this principle on GBE and GW, Kunnumpuram (2021) created the metric “*perceived opportunity to solve*” (POS) which measures how stakeholders view the company's ability and responsibility to assist society for the greater good. From his research Kunnumpuram (2021) found that when respondents perceived a company through the lense of this principle it indeed had a positive effect on GBE and reduced the threat of GW.

2.4.2 Do-no-harm principle

The other principle focuses on the externalities produced in the value-chain, how companies (intend to) clean up their own mess, and how they work to reduce the danger for people and damage on the planet (Crilly et al, 2016). In line with the ethical theories, companies should communicate alignment and cooperation with rules and regulations, and prioritize fixing or improving the activities which are harmful for the environment and/or society. Accordingly, “do no harm” is closely connected to acting when you have the responsibility to do so (Valle & Borm, 2021). The challenge however, is the subjective nature of determining the level of responsibility. An experiment of Darley and Latané (1968) showed that people are less likely to help if they believe there is an opportunity for others to help instead. This is referred to as the bystander effect or diffusion of responsibility, and can explain why companies in some cases do not act on environmental issues. An example of this is the level of pollution in the fashion industry, where one company’s perceived responsibility weakens due to the number of agents in the same situation. Regardless of this accountability question, the growing focus on CSR has led to increased expectations of companies mitigating the negative externalities they are producing throughout the value chain. In other words, companies are expected to clean up their own mess, and it would be reasonable to assume that communicating the intention to do so would have a positive effect on green brand equity and reduce the threat of greenwashing. In his research, however, Kunnumpuram (2021) found that when companies

have a high perceived contribution to a sustainability problem (PCP) (e.g. oil and gas companies), communicating the effort to clean up one's own mess actually led to a reduction of GBE and increased the threat of GW.

This finding challenges the existing belief about transparency and openness. Kunnumpuram (2021) argues that this relationship can be explained by stakeholders' existing belief that companies should continuously focus on cleaning up the mess they contribute to. Therefore, by reminding consumers of the problem they are responsible for, and have not yet fixed, it can seem like the green message can harm rather than help the company. This is however the results of only one experiment, which is limited to the companies and manipulations used in that research. Hence, the effect PCP has on GBE and GW requires more research and needs to be examined in more detail. Based on Kunnumpuram's (2021) findings, and to facilitate a foundation for the measurement of moderators, the first hypothesis of the study is formulated as follows.

H1a: *PCP has a negative effect on GBE.*

2.5 Greenwashing: Hypothesis 1(b)

More talk and less action regarding green efforts has paved the way for the trending term *greenwashing*, which is the action of providing misleading information about the degree of sustainability within the value chain (Parguell et al, 2011). In the case of greenwashing, companies are motivated by the financial benefits instead of the intrinsic drivers behind social and environmental responsibility (Brebbia & Pineda, 2012). Companies might extensively use green communication in an attempt to distract attention from their unethical conduct (Lyon and Maxwell, 2011). Since high investments in CSR is proven to be effective, some companies can also be tempted to exaggerate their CSR initiatives or even come up with non existing incentives when communicating their sustainability efforts (Bazillier and Vauday, 2010). Previous literature actually claimed that CSR does not exist at all, but is exclusively used by companies for marketing practices as companies are only accountable to their shareholders (Bakan, 2004; Friedman, 1970). Even though this statement might not gain many followers today, the European Commission (2021) found that 59% of green messages on websites did not provide evidence to back up its claim. This paints a picture of companies easily spilling an overflow of vague green words without much effort to be transparent and

sustainable. The result of greenwashing by insincere companies is that consumers are often skeptical when reading green claims (Zinkhan & Calson, 1995). Consumers can therefore perceive green claims and commitment as greenwashing even though there is a genuine attempt to improve activities and processes. Because sustainability is such an attractive quality in companies today, managers and marketers need to know how to avoid evoking perceived greenwashing in their communication. Therefore, when referring to greenwashing in this thesis, it is from the perspective of stakeholders perceptions and evaluation.

Greenwashing can be perceived at product level where the consumer receives misleading information about the sustainable performance of a product, and at company level where emphasis is placed on the environmental friendliness of the company as a whole (Delmas & Burbano, 2011). Both situations are deemed to provoke negative responses by stakeholders (Foreh & Grier, 2003). Accordingly, Avçılar & Demirgüneş (2017) found that consumers' perceived greenwashing had a direct negative effect on GBE. They also found an indirect effect, in line with the study of Chen et al. (2012), where perceived greenwashing positively influences green confusion and perceived risk, which have a negative effect on green trust. Moreover, greenwashing negatively affects perceived credibility and subsequently the consumers' purchase intentions (Elving, 2013). In an even more pessimistic scenario, greenwashing can harm the established brand image and reputation, thus harming the relationships to its customers. Therefore, perceived greenwashing can be seen as one of the key challenges in green marketing as it negatively affects the effectiveness of messages.

When companies communicate the effort to mitigate negative externalities, it would be reasonable to expect a positive outcome in consumers' trust and attitudes. However, as for the effect on GBE, Kunnumpuram (2021) found an opposite relationship to what was expected, namely that PCP significantly increases the threat of greenwashing. He argues that this relationship can be explained in the same manner as for GBE. Because consumers already expect companies to clean up their own mess, any attempt to communicate these initiatives could generate skepticism and possibly increase green confusion and perceived risk. This can also be connected to the nature of credence attributes of green claims, as the lack of possible fact-checking and cognitive judgment of the level of disclosure, accuracy and clarity can result in low perceived transparency and trust. For these reasons the next hypothesis of this study is stated as follows.

H1b: *PCP has a positive effect on GW*

2.6 Moderating variables: Hypothesis 2 and 3

The expected relationship between PCP and GBE (H1a) and between PCP and GW (H1b) is visualized in the conceptual model below (see figure 2.1). In order to analyze and gain a more comprehensive understanding of these relationships, and to answer the research question, the effect of possible moderating variables needs to be measured. Two moderators are chosen for this thesis, and are based on characteristics of the communication. Specifically, to communicate *why* the company exists and the use of *relativity* in the message. Elaboration of both will now be provided together with the connecting hypotheses.

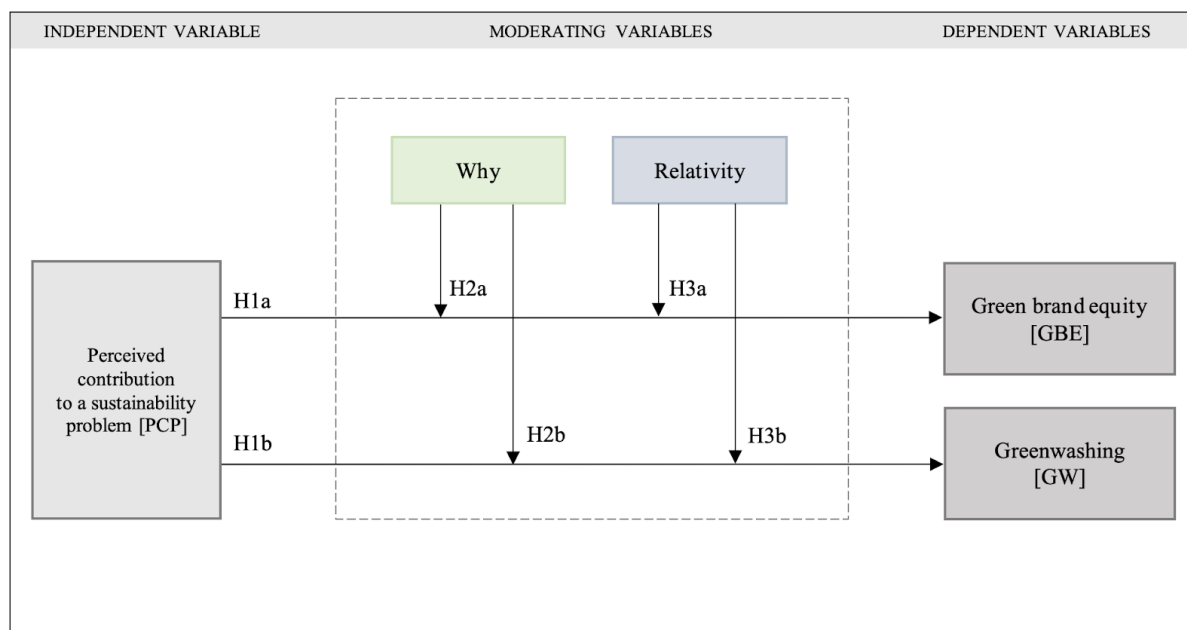


Figure 2.1: Conceptual model

2.6.1 Communicating *why*

“People don't buy what you do, they buy why you do it.” (Sinek, 2014). In what he refers to as “The Golden Circle” (*why, how, what*), Sinek (2014) points out the fact that successful companies are those that communicate from the inside out - they start with *why*. This is however not the case for most brands. All companies know *what* they deliver to customers - which products or services they provide. Many companies also know *how* they do this, which can be recognised in their differentiation tactics or value proposition. However, fewer

companies are able to inspire consumers with their purpose - *why* they exist (Sinek, 2014). This “why” is not about increasing profit, expansion or increasing market share, which are mere objectives of a business strategy. Communicating *why* has its roots in the personality of the brand and the cause it seeks to contribute to. It attracts consumers not based on manipulation of perceived value, but on a company's ability to inspire. Sinek argues that communicating *why* appeals to feelings and trust rather than the rational aspect in decision making (Sinek, 2014). A well known example of this is the tech company Apple, who advocates for thinking differently and disrupting the status quo (Hulls, 2012). Another is the apparel brand Nike, who encourages big dreams, the greatness in people and promotes equality and diversity (Nike, 2019; Nike, 2020). These messages create personalities, appeal to attitudes and values in people, and generate sales and loyal customers because it feels right not because it sounds smart.

The Golden Circle, and the fact that people are affected by why a company exists, has its roots in the biology of the brain (Sinek, 2014). Neuroscience shows that the neocortex, the newest and outer part of the human brain, is responsible for rationalization and language (Douglas & Martin, 1998). This part of the brain can be linked to communicating *what* and *how*, but is, as Kahneman (2013) argues, only responsible for 5% of all decisions. He refers to this as “system 2”, which is defined by slow, conscious thinking. 95% of consumers' decisions however are automatic, subconscious reactions to stimuli, and take place in the limbic system (Kahneman, 2013). Renvoise and Morin (2007) also argue that the reptilian brain, the inner part responsible for instinct, has a larger impact on decision making and is therefore the basis for purchase intention. These inner parts of the brain have no capacity for language, which explains why you cannot persuade or convince someone to act against something that does not *feel* right. It is why people make choices based on the feeling of right or wrong and explain it with following their gut (Kuehn, 2013). Therefore, in order to generate trust, a positive brand image and the right gut feeling, companies need to appeal to the inner part of the brain in consumers. According to Sinek (2014), one way to do this is to inspire by communicating *why* - the purpose of the existence of the company.

When companies intentionally communicate sustainability efforts, emphasis is usually placed on *how* production or packaging is changed, or *what* should be done in the future to reach sustainability goals (e.g. using recycled polyester, reducing water usage in production and

lowering emissions) (H&M Group, n.d.; Carlings, n.d.; Volkswagen group News, 2021). Due to credence attributes of green claims, consumers face challenges in interpreting, evaluating and/or fact-checking this information. One can therefore argue that the nature of these claims create a challenging foundation for the drivers of transparency. The lack of ability to process green claims can lead to low perception of disclosure, clarity and accuracy, and therefore result in low perceived transparency and trustworthiness. The combination of credence attributes and low perceived transparency give rise to the argument that green messages with the intention of rationalizing with consumers (what/ how) do not generate the necessary level of trust, but rather lay the foundation for GW.

For GBE to increase and perceived GW to decrease, it can seem like companies need to appeal to the inner part of the brain, namely consumers' emotions and instinct - they need to communicate *why*. Why is it important to clean up their own mess? What is the purpose of mitigating negative externalities, and why do they care? An example of a company who has accomplished this is the apparel brand Patagonia, who is recognized for their sustainability efforts (Nudelman, 2021). Patagonia has implemented several environmental management tools, and are Fair Trade and B Corporation certified (Patagonia, 2022a; Patagonia, 2021). However, what makes them stand out is not detailed information about fabrics and processes, it is the commitment to their purpose: “*We’re in business to save our home planet*” (Patagonia, 2022b). Their environmental engagement defines the core of their existence. Not every company has the same ability, opportunity or interest to prioritize sustainability as much as Patagonia. Nevertheless, the perspective on why sustainability efforts are implemented is something that can be communicated from every level of engagement. Based on all this it is hypothesized that communicating *why* will have a positive influence on both GBE and GW.

H2a: *Communicating why, rather than only what and how, weakens the effect of PCP on GBE.*

H2b: *Communicating why, rather than only what and how, weakens the effect of PCP on GW.*

2.6.2 Relativity

In behavioral economics relativity is a term used to describe the psychological process of consumer's decision making (Kortam & Abbas, 2021). As mentioned above, 95% of all choices people make are automatic responses and happen without conscious reflection (Kahneman, 2013). Because of this, consumers rely on heuristics (mental shortcuts) to help ease decision making and purchase behavior (Keller & Swaminathan, 2020). These shortcuts help in processing information and problem solving, but they are also a source of cognitive biases. An example of this is *anchoring bias*, where the first piece of information given is perceived as more important than the more relevant information (Rezaei, 2021). A jeans normally priced at €100, but now on 50%, would in most cases be a more tempting offer than a €50 jeans without discounts. This illustrates that price is relative, and depends on heuristics, utility and customers' perceived value. In their article on relativity, Ariely and Kreisler (2018) say that "*When it is hard to directly measure the value of something, we compare it to other things, like a competing product or other versions of the same product. When we compare items, we create relative values*". In the case of perceived sustainability efforts, where the information search and fact checking process is challenging, it can therefore be relevant for consumers to look to the industry and compare initiatives and strategies. Thus, whether or not green brand equity increases might be reliant on what other companies do, and not the initiative in itself. Accordingly, focusing on how the company performs better than competitors might increase the relative perceived value of a green claim.

Within the realm of relativity, two frequently used advertising techniques exist called *comparative* and *competitive* advertisement. The former refers to explicit or implicit comparison of one or more specific attributes of the promoted brand to the ones of competitors, and thus provides the consumer with suggestions for the most logical choice. The latter seeks to boost the overall demand for the specific brand by indicating exceptional value compared to other inferior brands (Lumen, n.d.b). Overall, both techniques attempt to emphasize superior product/service value by juxtaposing one brand to competing brands in order to guide attitudes and purchase intention in a desired direction. Strategies like these are used in many situations, for example in sustainability reports and commercials which include statements like "(...) *unlike our peers who have not made any pledges in this regard*" (TotalEnergies, 2021, p.10), "*if only everybody did their job as well as Volkswagen*" (The Car Media, 2018, 0:49), and "*doesn't your skin deserve better care?*" by Dove (Bond, 2021).

Other examples are Apple using a PC to highlight the qualities of a MacBook, and Samsung making fun of loyal Apple enthusiasts (Bond, 2021).

This form of advertisement gained larger interest in the 1970s and much research is done concerning the effectiveness of this type of marketing. For instance, the intensity and credibility of the message have shown to moderate the effectiveness of comparative ads (Donthu, 1992; Gotlieb & Sarel 1991). Yucel-Aybat and Kramer (2018) also found that more competitive consumers, who show greater tendencies of schadenfreude, respond more favorably to comparative ads. Implying that consumer characteristics might also determine the effectiveness of comparative and/or competitive advertisement. Furthermore, Grewal et al. (1997) showed that comparative ads, in contrast to non-comparative ads, gain more attention, generate higher brand awareness, favorable attitudes and increase purchase behavior. Based on this, one can argue that communicating superior performance in sustainability issues compared to other companies positively influences GBE.

H3a: *Communicating relativity weakens the effect of PCP on GBE.*

Even though Grewal et al. (1997) found that comparative ads had a positive effect on the overall brand perception, they also discovered that they were less believable and generated more negative attitudes towards the advertisement than non-comparative ads (Grewal et al., 1997). One can therefore argue that while shedding a bad light on a competitor might be beneficial for the promoted brand's results, it also creates negative attitudes towards the specific message. As greenwashing is largely connected to green trust, green confusion and green risk (see 2.5), and comparative ads evoke low believability and negative attitudes, there is reason to assume that communicating relativity has a negative moderating effect on the relationship between PCP and GW.

H3b: *Communicating relativity strengthens the effect of PCP on GW.*

2.7 Summary of hypotheses

An overview of all the hypotheses presented in this chapter can be found in table 2.1.

Table 2.1: *Reference Table for hypotheses*

H1a	PCP has a negative effect on GBE.
H1b	PCP has a positive effect on GW.
H2a	Communicating why, rather than only what and how, weakens the effect of PCP on GBE.
H2b	Communicating why, rather than only what and how, weakens the effect of PCP on GW.
H3a	Communicating relativity weakens the effect of PCP on GBE.
H3b	Communicating relativity strengthens the effect of PCP on GW.

3 Research Methodology

As discussed above, Kunnumpuram (2021) found a negative relationship between PCP and GBE and a positive relationship between PCP and GW. The objective of this study is to obtain valuable insights regarding the effect of the communication techniques when sending out a sustainability message. Specifically, if including *why* and the use of relativity in the message have a moderating effect. This research utilizes the pre-established relationships by Kunnumpuram (2021) and aims to test several hypotheses regarding the moderating effect of the above discussed communication techniques. In other words, this research has a confirmatory focus as well as it attempts to establish new relationships between the different involved variables. In this chapter, an overview of the research design and data collection is described. Lastly, a data summary is given, providing information about the sample data used.

3.1 Research methodology and design

To test the hypotheses as stated in chapter 2, an experiment according to a 2x2x2 factorial design is formulated and conducted. A factorial design allows for testing the effect on the dependent variable at different levels of the independent variables, and allows for testing an interaction effect between these variables (Malhotra et al., 2017). In this research, three binary dependent variables are included: PCP, including the levels high and low, *why* and the use of relativity which both consist of the levels not included and included. This results in eight different treatment groups, of which an overview can be found in figure 3.1. The respondents were allocated to one of the different treatment groups implying that a between subject design is utilized (Charness et al., 2012). The measurement of the constructs is done by using an online survey, allowing the acquisition of large quantities of data, giving the possibility to increase the external validity (Calder, 1982). The theoretical structure of the relationships between the different items and the constructs has been established using an exploratory factor analysis, of which the validity is assessed using a confirmatory factor analysis subsequently (Watkins, 2018). Two three-way ANCOVA analyses are conducted to test for a main effect of the three variables *PCP*, *why* and *relativity* on GBE and GW while also determining if there is an interaction effect between the three independent variables on the dependent variables. The possible influence of demographic variables on the results of the analysis, makes that a three-way ANCOVA analysis is preferred above a three-way ANOVA

analysis since this technique allows for control of covariates (Rutherford, 2011). The included covariates and their expected effect can be found in section 3.6, Data Summary.

3.2 The treatment

The treatment message is integrated in the first part of an online questionnaire. To exclude any influence of pre-existing perceptions of the brand's sustainability performance on the results as much as possible, a fictional airline company is used as the sender of the sustainability message. No specific name has been given to this company as reading a brand name can evoke brand perceptions (Friese et al., 2006). The company is therefore referred to as CompanyX. Prior to the sustainability message, the respondents were presented with a brief explanation of the company which states as follows:

CompanyX is one of the players in the airline industry, facilitating flights to over one hundred international destinations.

The treatment messages focus on one of the two sustainability issues; either the production of waste which represents a low PCP, or CO₂ emissions which corresponds with a high PCP. To enhance the difference between high and low PCP, only the high PCP group was presented with key figures of the sustainability problem prior to receiving the sustainability message from the company. The following information was presented to this group:

“More than a quarter of all CO₂ emissions caused by transport come from air traffic. Since 2004, the emissions of this industry have increased every year. This growth highlights the importance and need for more sustainable solutions in the airline industry.”

The low PCP group was directly presented with the sustainability message of the company. Both the low PCP group and the high PCP group were further divided into four different treatment groups: a group receiving a sustainability message using both *relativity* and *why*, one including *relativity* but no *why*, one including *why* but no *relativity* and one excluding both the use of *relativity* and *why*. This results in eight different treatment groups, which can be found in the table on the next page (figure 3.1).

<p>“CompanyX is one of the players in the airline industry, facilitating flights to over one hundred international destinations.” + <i>treatment</i></p>			
<p><u>LOW PCP</u></p> <p><i>Waste reduction, no text.</i></p>		<p><u>HIGH PCP</u></p> <p><i>“More than a quarter of all CO2 emissions caused by transport come from air traffic. Since 2004, the emissions of this industry have increased every year. This growth highlights the importance and need for more sustainable solutions in the airline industry.”</i></p>	
<p>Relativity</p>		<p>No Relativity</p>	
<p>Why</p>	<p>(1) We believe in protecting the planet so that you can travel and see all it has to offer. This is why we are reducing single use plastic in servings, recycling materials, and reducing food and water waste in our operations. This is how we minimize waste, making us the airline company with the lowest waste production compared to other companies.</p>	<p>(2) We believe in protecting the planet so that you can travel and see all it has to offer. This is why we are reducing single use plastic in servings, recycling materials, and reducing food and water waste in our operations. This is how we minimize waste.</p>	<p>(5) We believe in protecting the planet so that you can travel and see all it has to offer. This is why we have invested in innovative technology with focus on increasing efficiency of the fleet and creating more sustainable aviation fuel. This is how we reduce our environmental footprint, making us the airline company with the most fuel efficient flights compared to other companies.</p>
	<p>(3) We are reducing single use plastic in servings, recycling materials, and reducing food and water waste in our operations. This is how we minimize waste, making us the airline company with the lowest waste production compared to other companies.</p>	<p>(4) We are reducing single use plastic in servings, recycling materials, and reducing food and water waste in our operations. This is how we minimize waste.</p>	<p>(7) We have invested in innovative technology with focus on increasing efficiency of the fleet and creating more sustainable aviation fuel. This is how we reduce our environmental footprint, making us the airline company with the most fuel efficient flights compared to other companies.</p>
<p>No Why</p>	<p>(8) We have invested in innovative technology with focus on increasing efficiency of the fleet and creating more sustainable aviation fuel. This is how we reduce our environmental footprint.</p>	<p>(8) We have invested in innovative technology with focus on increasing efficiency of the fleet and creating more sustainable aviation fuel. This is how we reduce our environmental footprint.</p>	<p>(8) We have invested in innovative technology with focus on increasing efficiency of the fleet and creating more sustainable aviation fuel. This is how we reduce our environmental footprint.</p>

Figure 3.1: The factorial design with texts used in the treatment groups

3.3 Questionnaire and measurements

After the respondents were exposed to the sustainability message, they were asked to evaluate different statements. Most items used in this survey are derived from previously conducted surveys by researchers to measure the constructs (see table 3.1). However, in an attempt to increase the validity of the constructs, some items are adjusted and/or added. The first two items measuring the independent variable PCP (PCP1 and PCP2) are derived from Kunnumparam's (2021) research on the same construct, and address the belief about contribution. Furthermore, PCP3 and PCP4 are added items, seeking to measure perceived consequences if the company did not exist and the belief about its responsibility, respectively. The first two items within GBE (GBE1 and GBE2) are adopted from Chen et al. (2010) and measure the dependent variable directly through preference for the company. Furthermore, green brand image, green trust and green satisfaction, which are shown to be the drivers of GBE, are added as additional objectives of measurement within this construct. GBE3 measures the satisfaction from the green initiative, GBE4 measures green brand image through attitudes towards the company, and GBE5 measures green trust through perceived commitment to sustainable actions. In order to create an even more comprehensive GBE construct, the last item (GBE6) is inspired by the Theory of Reasoned Actions and seeks to measure purchase intention (Fishbein, 1979). Furthermore, the items measuring the dependent variable GW are mostly derived from Chen and Chang (2013). Specifically, GW1 addresses the presence of misleading words, GW2 captures the vagueness of the message, and GW3 deals with potential exaggeration in the claim. Additionally, GW4 aims to measure whether or not the respondents feel important information is left out of the claim, making it seem better than it is. Several other studies have also adopted these, and they are therefore believed to be reliable items for the measurement of this construct (Avcılar & Demirgüneş, 2017; Chen et al., 2014). Lastly, GW5 is an added item with the purpose of measuring the credibility of the green claim.

The respondents were asked to evaluate the items based on a 7-point Likert scale: ((1) *Strongly disagree*, (2) *Disagree*, (3) *Somewhat disagree*, (4) *Neither agree nor disagree*, (5) *Somewhat agree*, (6) *Agree*, (7) *Strongly agree*). This scale is often used in psychological measurements since it allows the respondent to use a neutral anchor to give a neutral response (Wakita et al., 2012). Adding two additional options allows the respondent to select a more

applicable answer in comparison to using a 5-point Likert Scale (Joshi et al., 2015). At the end of the survey, the respondents were asked to answer some demographic questions such as, gender, age and income level. This ensures that an overview of the respondents group can be created.

Table 3.1: *Measurements items used in this study*

Item	Goal
<i>Factor name: Perceived Contribution to the Problem</i> (1 = strongly disagree; 7 = strongly agree)	
PCP1	Contribution
PCP2	Contribution
PCP3	Impact if withdrawal
PCP4	Responsibility
<i>Factor name: Green Brand Equity</i> (1 = strongly disagree; 7 = strongly agree)	
GBE1	Overall GBE (preference)
GBE2	Overall GBE (preference)
GBE3	Green Satisfaction (Expectations)
GBE4	Green brand image (Attitudes)
GBE5	Green trust (Commitment)
GBE6	Purchase intention
<i>Factor name: Perceived Greenwashing</i> (1 = strongly disagree; 7 = strongly agree)	
GW1	Misleading words
GW2	Vagueness
GW3	Exaggeration
GW4	Exclusion
GW5	Credibility

3.4 Manipulation Checks and Attention Check

Manipulation checks are added to the survey to confirm if the use of *why* and *relativity* was perceived by the respondent (Hauser et al., 2018). Additionally, an attention check was added to check if the respondents read the statement before they answered. The respondents are asked to not answer the question and move on to the next. Table 3.2 summarizes the questionnaire and the associated goal of each item.

Table 3.2: Reference Table for Questionnaire measurement scales.

Construct Measured	Variable Type	Question Number	Theoretical Reference
Use of relativation	Moderating variable	Q1	
Why message	Moderating Variable	Q2	
Green Brand Equity	Dependent Variable	Q3, Q4, Q5, Q6, Q7, Q8	Partly adopted from Chen, 2010
Intrest of respondent	Covariate	Q9	
Perceived Contribution to the problem	Independent Variable	Q10, Q11, Q12, Q13	Partly adopted from Alan, 2021
Attention check		Q14	
Perceived Greenwashing	Independent Variable	Q15, Q16, Q17, Q18, Q19	Partly adopted from Chen et al. (2013)
Demographics	Covariate	Q20, Q21, Q22, Q23, Q24	

3.5 Data summary

The collection of respondents is facilitated with the help of the online survey platform SurveyMonkey. This platform allows for filtering restrictions which makes it possible to closely define the target audience. The respondents are exclusively located in the United states while no restrictions were drawn up regarding gender, age and level of income. Additional filtering criteria as “*device used*” and “*Regional location*” are not used when delineating the target audience. The survey is completed within an average time of three minutes and has a mortality rate of zero procent. The eight different questionnaires were

conducted by 786 respondents collectively. After elimination of unsuitable responses based on the attention check, a dataset of 533 observations remained. After filtering out the responses which did not pass the manipulation check, the dataset was reduced dramatically to 291 adequate responses. As can be seen in the table below, the treatment in which the *why* was not included resulted in most respondents eliminated. These eliminated respondents felt like they had been informed with why the company pursued the sustainability incentive presented and thus answered “yes” on the manipulation check (MC2), while this was actually not the case.

Table 3.3: *Sample size the treatment groups*

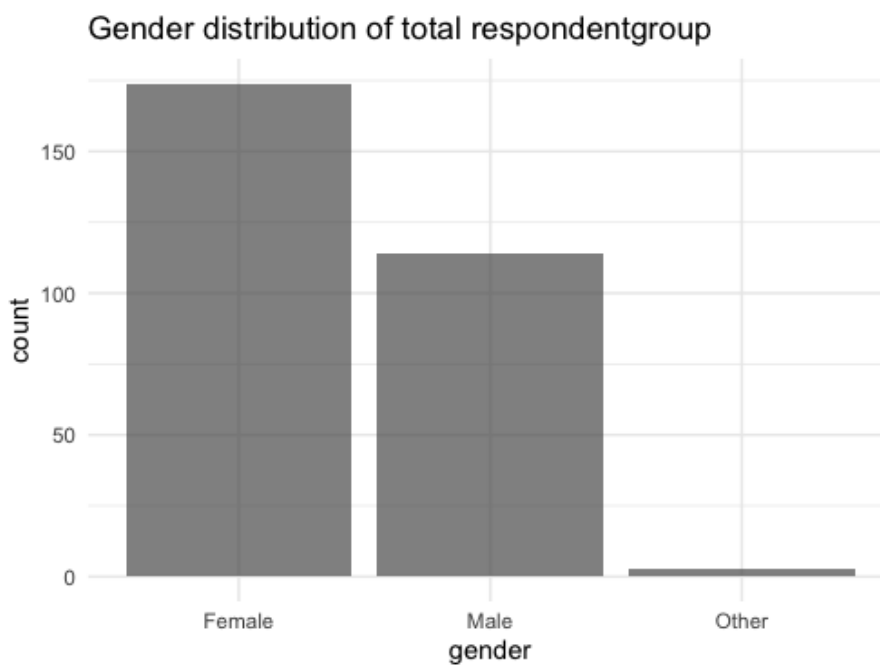
	Low PCP		High PCP		Total
	Relativity	No relativity	Relativity	No relativity	
Why	$n = 55$ excl. = 13	$n = 39$ excl. = 18	$n = 36$ excl. = 11	$n = 35$ excl. = 34	$n = 165$ excl. = 76
No Why	$n = 36$ excl. = 45	$n = 38$ excl. = 52	$n = 27$ excl. = 36	$n = 25$ excl. = 33	$n = 126$ excl. = 166
Total	$n = 91$ excl. = 58	$n = 77$ excl. = 70	$n = 63$ excl. = 47	$n = 60$ excl. = 67	$n = 291$ excl. = 242

3.5.1 Respondent demography

The sample used for the analysis consists of 173 (59.5%) female, 114 (39.2%) male and 2 (0.7%) respondents who identify themselves as “other” (see table 3.4). A gender imbalance is especially present in treatment group 7 where 77.8% of the respondents are female and 22.2% male. A visual overview of the gender distribution can be found in figure 3.2. Women are more likely to sign a higher score for GBE, which was also reflected in the pre-tests (Miller et al., 2008). Due to the asymmetry in the observations and the possible influence of gender on GBE, this variable has been added as a covariate in the analysis.

Table 3.4: *Sample size grouped by gender*

Treatment group	Female		Male		Other	
	Amount	Percentage	Amount	Percentage	Amount	Percentage
TG1	27	49,1%	28	50.1%	0	0%
TG2	26	66.7%	13	33.3%	0	0%
TG3	20	55.6%	13	36.1%	1	8.3%
TG4	26	68.4%	12	31.6%	0	0%
TG5	19	52.8%	17	47.2%	0	0%
TG6	18	51.4%	17	48.6%	0	0%
TG7	21	77.8%	6	22.2%	0	0%
TG8	16	64.0%	8	32%	1	4%
<i>n</i> = 291	173	59.5%	114	39.2%	2	0.7%

*Figure 3.2: Frequency polygon – respondent gender*

The age distribution of the respondent group can be viewed below (table 3.5). The largest proportion of respondents belong to the age category 25-34 and 35-44 accounting for more

than half of the respondents group (52.9%). This variable is added to the analysis as a covariate. A visual overview of the age distribution can be found in figure 3.3.

Table 3.5: *Sample size grouped by age category*

Age group	TG1	TG2	TG3	TG4	TG5	TG6	TG7	TG8	Total
Under 18	0	0	1	0	0	1	0	0	2
18-24	7	9	7	9	6	5	6	2	50
25-34	13	9	12	13	8	14	6	15	90
35-44	16	8	6	11	9	4	7	3	64
45-54	7	4	3	5	4	4	1	3	31
55-64	6	5	3	1	5	4	4	0	28
65+	6	4	3	0	4	4	3	2	26
Total	55	39	34	38	36	35	27	25	291

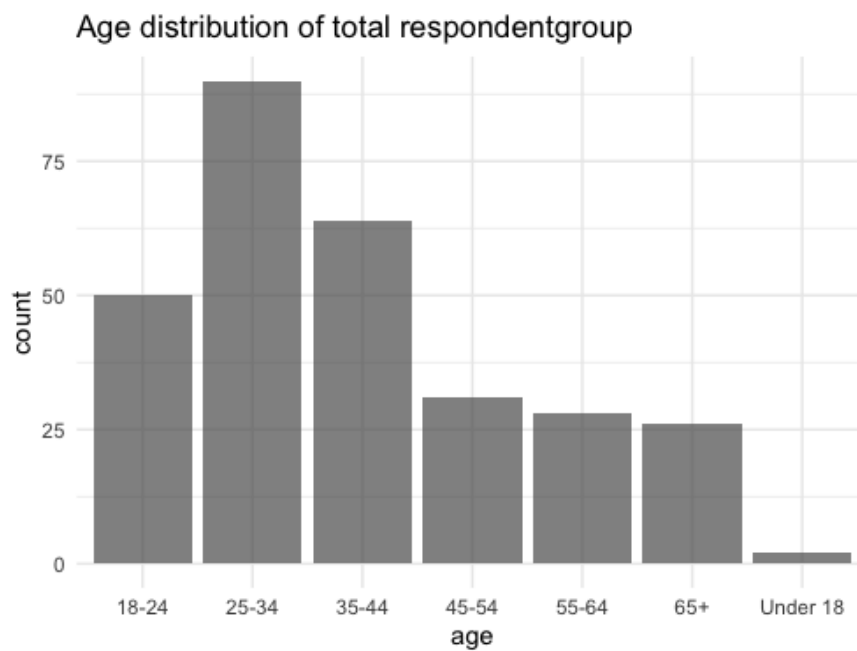
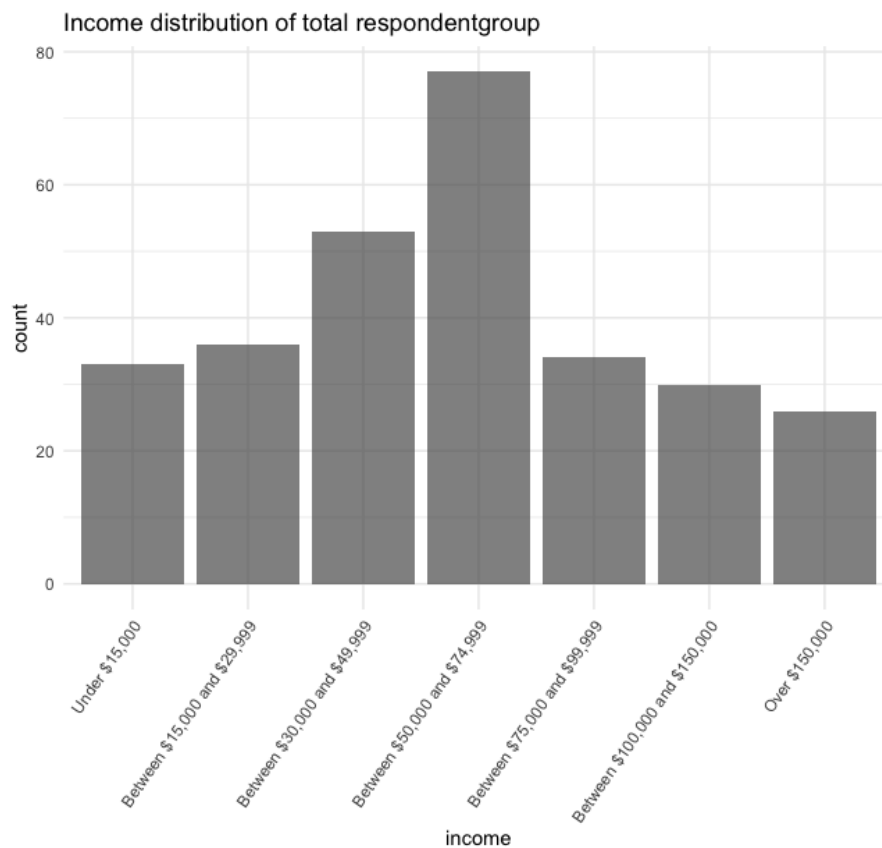


Figure 3.3: Frequency polygon – respondent age

The frequency and the distribution of the income categories can be found in table 3.6 and figure 3.4 respectively.

Table 3.6: *Sample size grouped by income category*

Income group	TG1	TG2	TG3	TG4	TG5	TG6	TG7	TG8	Total
Under \$15,000	8	1	8	5	5	4	1	1	33
\$15,000 - \$29,999	7	6	1	3	5	7	4	3	36
\$30,000 - \$49,999	11	6	3	9	9	5	4	6	53
\$50,000 - \$74,999	8	13	10	12	6	12	9	7	77
\$75,000 - \$99,999	6	5	5	5	5	3	3	2	34
\$100,000 - \$150,000	9	7	2	1	2	1	3	5	30
over \$150,000	6	1	5	3	4	3	3	1	26
Total	55	39	34	38	36	35	27	25	291

*Figure 3.4: Frequency polygon – respondent income*

3.5.2 Interest of the respondents

The ATU1 check aims to measure the interest of the respondents in the sustainability efforts of a company whenever a purchase is conducted. No difference in average score is observed between the sustainability problems of waste production and CO2 emission (see table 3.7). However, visual inspection of the plot of ATU1 on the average score of all the GBE items suggest that there is a positive relationship between the two variables and is therefore included in the analysis as a covariate. On the contrary, based on the plot of ATU1 on average score of all greenwashing items, no clear relationship is present. Both plots can be found in figure 3.5.

Table 3.7: Score ATU1 check grouped by sustainability problem

Group	Average ATU1 score	Std ATU1 score
Waste production (TG1-TG4)	4.79	1.26
CO2 emission (TG5-TG8)	4.80	1.20

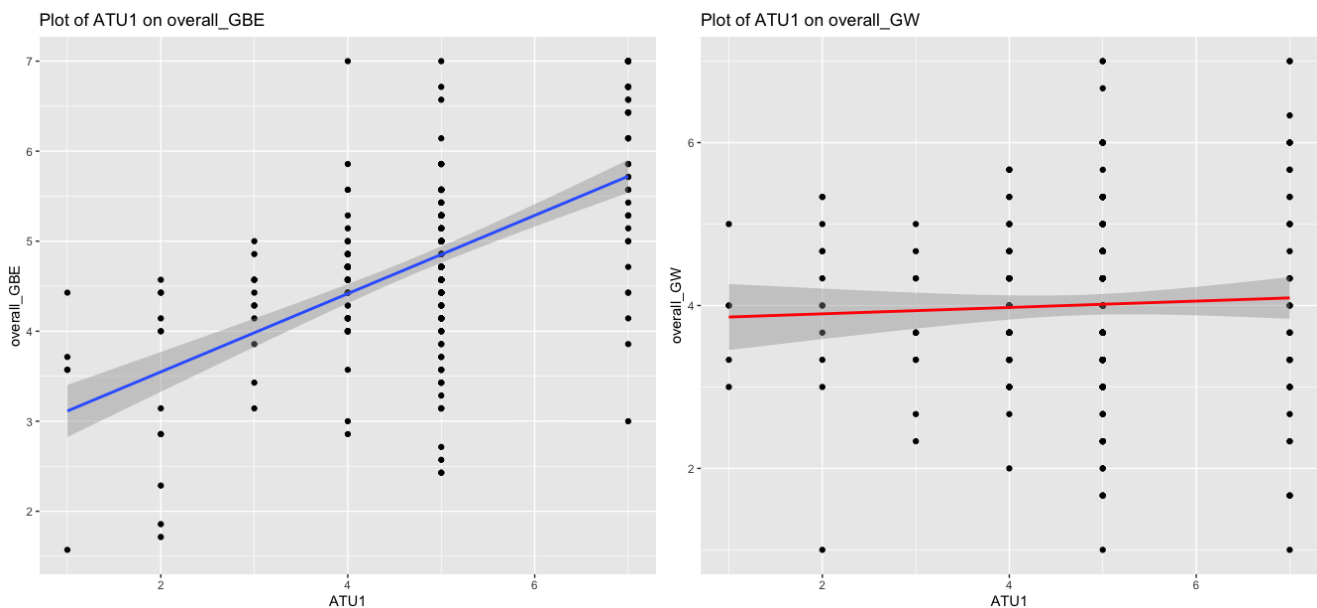


Figure 3.5: Plot ATU1 on overall GBW (left) and plot ATU1 on overall GW (right)

4 Data Analysis

4.1 Reliability and validity of the constructs

4.1.1 Confirmatory factor analysis

The questionnaire utilizes both previously established constructs by Kunnumpuram (2021) and newly formulated items. Therefore, evaluation of the validity and reliability of the constructs GBE, PCP and GW is desired, which are assessed using a factor analysis and Cronbach's alpha respectively. As communicated in table 3.1, the variables *PCP*, *GBE* and *GW* are measured by the use of constructs consisting of multiple items in which the individual items are designed to measure a specific aspect of the construct. Prior to the analysis, the items GW5 and PCP4 are reversed. The level of measurement of these items is accessed by performing a confirmatory factor analysis (hereafter referred to as CFA) using the *lavaan* package (version 0.6-11) in R (version 1.4.1717). Based on the lower threshold of 0.6 of standardized factor loading, the item PCP4 needs to be removed from the PCP construct. However, this three factor model shows a poor fit. Due to the sensitivity of the χ^2 regarding the sample size, Chi-square value/df ratio is used. Complementary to the unadjusted Chi-square value ($\chi^2 = 374.7$, $p < 0.001$), this ratio indicates a poor model fit ($\chi^2/df = 4.31$ instead of the desired value of 2 or lower). Additionally, Comparative Fit Index and Tucker-Lewis Index have a value of 0.860 and 0.832 respectively. These performance measures suggest a poor fit as well since it is lower than the desired value of 0.9 (Fan et al., 1999; Schumacker & Lomax, 2004). The root mean square error of approximation of 0.107 and standardized root mean square residual of 0.116 are higher than the desired value 0.08 for a good model fit. Based on these performance measurements, this CFA model was rejected for the validity evaluation of the constructs. With the aim to find a better fitting model, conducting an exploratory factor analysis (hereafter referred to as EFA) is the next step of the validity analysis (Bofah & Hannula, 2015).

4.1.2 Exploratory factor analysis

An EFA analysis was run using all the 15 items derived from the questionnaire. Prior to the analysis, the suitability of the EFA was assessed. First, the correlation matrix is evaluated, in which attention is given to correlations above 0.30. The correlation matrix can be viewed in

appendix B. The matrix shows relatively high correlations for multiple items, which means that there may be interrelations between items. Based on these high correlations, a factor analysis is deemed to be appropriate in this situation (Hair et al. 1995; Tabachnick & Fidell 2001). A Kaiser-Meyer-Olkin (KMO) and a Bartlett's Test are performed prior to the extraction of the constructs to further examine the suitability of the data to perform an EFA. The sampling adequacy is assessed by the KMO analysis of which the results can be found in table 4.1. According to Netemeyer et al. (2003), a KMO correlation above 0.60 is defined as sufficient for keeping the item within the further process of the EFA. The overall MSA is equal to 0.85 and all individual KMO measures are classified as “mediocre”, “meritorious” or “marvelous” according to Kaiser's (1974) classification. Based on these results, the data is deemed to be suitable for the factor analysis.

Table 4.1: *Results Kaiser-Meyer-Olkin factor adequacy*

GBE1	GBE2	GBE3	GBE4	GBE5	GBE6	PCP1	PCP2	PCP3	PCP4	GW1	GW2	GW3	GW4	GW5
0.88	0.85	0.92	0.89	0.89	0.91	0.68	0.66	0.81	0.86	0.88	0.85	0.81	0.83	0.87

Bartlett's test of Sphericity (Bartlett, 1950) is significant ($\chi^2 = 2114.91, p < 0.0005$) implying that not all groups have the same variance and the correlation matrix is not an identity matrix and the data is likely factorizable (Hair et al. 1995; Tabachnick and Fidell 2001). EFA revealed three components that had eigenvalues greater than one and which explained 26.3%, 17.2% and 13.5% of the total variance, respectively. Additionally, visual inspection of the scree plot shows that the inflection point lies at 4 components and therefore concludes a retention of three components (see figure 4.1) (Cattell, 1966).

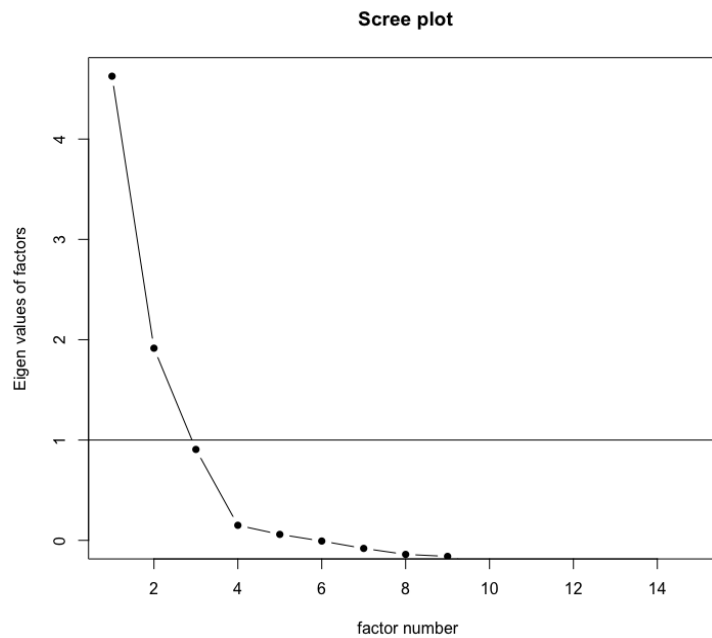


Figure 4.1: Scree plot EFA

Based on the prior established relationship between GW and GBE, correlation between the latent variables is expected (Ukturan, 2018). Additionally, the analysis is performed on a relatively large sample set, hence, the oblique rotation promax is most suitable. The factor loadings can be found in table 4.2. Although item GW1 is allocated to both factor one as factor two, cross loading is not problematic since the factor loading differs more than 0.05 from one another. Note that GW1 is not reversed in this analysis since all items for GBE are directed positively. Further evaluation of these results show that item PCP4 has an insufficient factor loading of < 0.40 and is therefore removed. After elimination of PCP4, The four-component solution explained 59.0% of the total variance. It must be concluded that the interpretation of the data is not consistent with the design of the questionnaire. There is strong loadings of items GBE1, GBE2, GBE3, GBE4, GBE5, GBE6 and GW5 on Component 1, items GW1, GW2, GW3, GW4, on Component 2 and items PCP1, PCP2, PCP3 on Component 3. Although PCP4 is removed from the analysis, a reduction of numbers of factors is not desired since all factors consist of 3 items or more.

Table 4.2: *Factor loadings EFA*

	Factor 1	Factor 2	Factor 3
GBE1	0.853		
GBE2	0.762		
GBE3	0.665		
GBE4	0.840		
GBE5	0.698		
GBE6	0.801		
GW1		0.744	
GW2		0.606	
GW3		0.833	
GW4		0.825	
GW5	0.533	0.360	
PCP1			0.812
PCP2			0.912
PCP3			0.600
PCP4			0.367 (removed)

Subsequently, a new CFA model was fitted to the data to examine whether the newly established dimensions result in a more accurate CFA model. This three factor model shows a better fit than the previously established model. Contradictory to the unadjusted Chi-square value ($\chi^2 = 374.7$, $p < 0.001$), the Chi-square value/df ratio indicates a relatively better fitting model fit ($\chi^2/df = 3.23$ instead of 4.31 of the previous model). Additionally, Comparative Fit Index and Tucker-Lewis Index have a value of 0.917 and 0.900 respectively. These performance measures suggest a good fit as well since it is higher than the desired value of 0.9 (Fan et al., 1999; Schumacker & Lomax, 2004). The root mean square error of approximation of 0.080 and standardized root mean square residual of 0.068 are equal and lower than the desired value 0.08 for a good model fit. Based on these performance measurements, this CFA model was accepted for the validity evaluation of the constructs.

Based on the desired factor loading of > 0.6 , no additional items were removed from the constructs which can be found in table 4.3. To assess the internal consistency of the scale items in accordance with the newly developed factors, a reliability analysis is performed of which the results can also be found in table 4.3 (Netemeyer et al., 2003). A Cronbach's alpha above 0.6 is considered to be satisfactory, resulting in keeping all items as defined in the EFA for PCP, GBE and GW accordingly (Malhotra et al., 2017). Additionally, an average variance extracted (AVE) score of greater than 0.5 indicated adequate convergent validity and a construct reliability (CR) score of more than 0.6 indicated good construct reliability (Fornell & Larcker, 1981). The constructs are translated as the mean score of the items allocated to that specific construct.

Table 4.3: *Factor loadings CFA second model*

Variable	St. Factor Loading	Error Variance
GBE (Cronbach's alpha = 0.9, CR = 0.902, AVE = 0.568)		
GBE1	0.761	0.429
GBE2	0.674	0.595
GBE3	0.758	0.397
GBE4	0.802	0.355
GBE5	0.761	0.441
GBE6	0.800	0.358
GW5	0.709	0.553
PCP (Cronbach's alpha = 0.81, CR = 0.828, AVE = 0.622)		
PCP1	0.813	0.342
PCP2	0.916	0.226
PCP3	0.605	0.661
GW (Cronbach's alpha = 0.79, CR = 0,828, AVE = 0,548)		
GW1	0.631	0.590
GW2	0.798	0.395
GW3	0.775	0.399
GW4	0.745	0.497

Table 4.4: *Discriminant Validity - Calculated Value*

Latent Construct	PCP	GBE	GW
PCP	0.000		
GBE	0.124	0.000	
GW	0.371	0.126	0.000

The discriminant validity is assessed by analyzing the correlation between the latent factors. “A correlation value which is less than 1 by an amount greater than two standard errors” is categorized as acceptable discriminant validity (Xie et al., 2015). The ratio between the correlation and the standard error is calculated by the use of the formula below. Table 4.4 contains the calculated values accordingly and verifies that no value was zero or below.

$$1 - \text{corr}(x, y) - (2 \times \sigma_{\text{corr}(x, y)}) > 0$$

Table 4.4: *Discriminant Validity - Calculated Value*

Latent Construct	PCP	GBE	GW
PCP	0.000		
GBE	0.124	0.000	
GW	0.371	0.126	0.000

4.2 Check of the PCP manipulation

The degree of PCP is manipulated using two different sustainability problems in which generation of waste represents a low PCP and high carbon emissions represent a high PCP. The use of a construct allows for validation of the difference between the two groups. There are 123 observations in the high PCP group and 168 in the low PCP group. An independent-samples t-test was run to determine if there were differences in the overall PCP score between the two PCP groups. One outlier was present in the data as assessed by the boxplot, however, this observation did not affect the outcome of the t-test and is therefore not removed. Engagement scores for each level of gender were normally distributed, as assessed by Shapiro-Wilk's test ($p > .05$), and there was homogeneity of variances, as assessed by

Levene's test for equality of variances ($p = .08$). The overall PCP score was higher for the observations in the high PCP group ($M = 4.57$, $SD = 1.39$) than the observations in the low PCP group ($M = 3.83$, $SD = 1.28$), a statistically significant difference ($F=1.405$, $p = 0.04$). This implies that the manipulation of the PCP using the two different sustainability problems was successful.

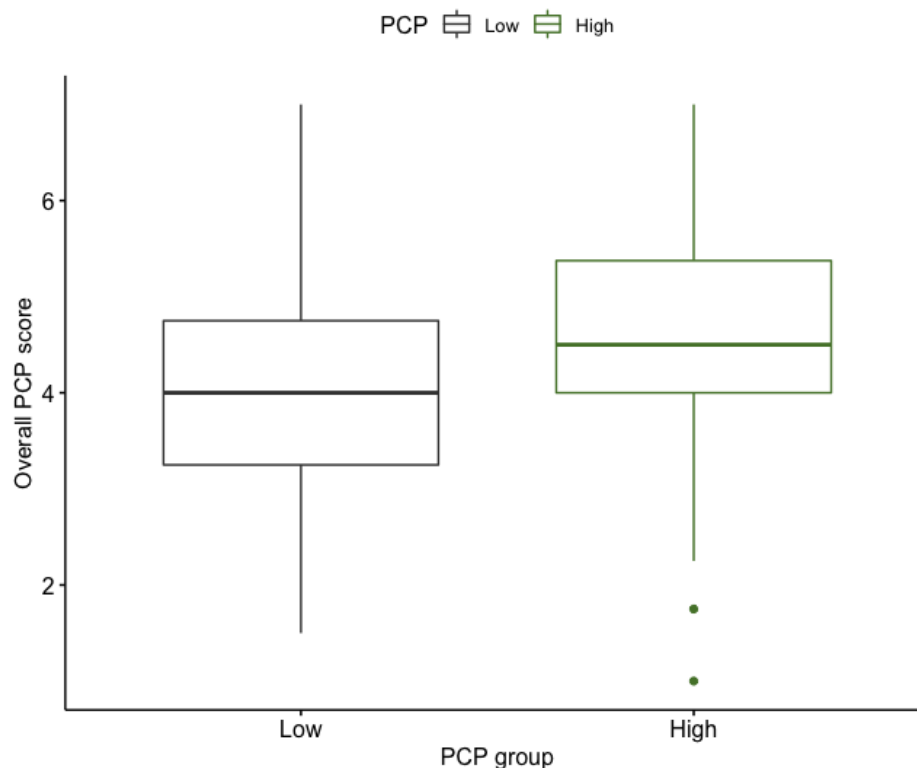


Figure 4.2: Boxplot of PCP group as the overall PCP score

4.3 Three-way ANCOVA with GBE as dependent variable

4.3.1 Assumptions Check

A three way ANCOVA is conducted to investigate the effect of PCP, communicating *why* and using *relativity* in the sustainability message on GBE. The analysis allows control for possible covariates which might have an effect on the GBE (Malhotra et al., 2017). As discussed in section 3.5 Data summary, the covariates included in this analysis are the respondents demographics age and gender. Furthermore, the respondents interest in solving the discussed sustainability problem (ATU1) is included in the analysis as a covariate. The respondents were exposed to one of the eight treatments which implies that the assumption of

independence of observations is met. Examination of outliers within the GBE score shows that 32 outliers are present in the data, of which seven are identified as extreme. Removal of these outliers result in similar results of the ANCOVA analysis and it is therefore concluded that these outliers have little to no influence on the research conclusion and hence are not removed from the dataset. The GBE score is normally distributed for all groups except one as assessed by Shapiro-Wilk's test of normality. The group with high PCP, including *why* and *relativity* is deemed to be non normal distributed. These results can be found in table 4.5. Homogeneity of variances in the different groups is confirmed by using the Levene's test, which is not significant ($p > 0.05$).

Table 4.5: Results Shapiro-Wilk test of normality of overall_GBE by treatment groups

PCP	Why	relativity	Statistic	p- value
High	No	No	0.977	0.685
		Yes	0.980	0.480
	Yes	No	0.939	0.068*
		Yes	0.960	0.277
Low	No	No	0.976	0.573
		Yes	0.976	0.674
	Yes	No	0.931	0.078
		Yes	0.970	0.349

Significance level: * $p < .1$, ** $p < .05$, *** $p < .01$

A linear regression model was fitted for ATU1 on overall_GBE, which resulted in a significant p -value (p -value < 0.05). No pattern was observed in the residual plot. Hence, the assumption of linearity between the covariate ATU1 and overall_GBE was met. Lastly, there was homogeneity of regression slopes as the interaction terms, between the covariates (age, gender and ATU1) and grouping variables (PCP, why and relativity), was not statistically significant, $p > 0.05$. The result for testing the homogeneity of regression slopes can be found in table 4.6. The analysis is divided in the relationship between the covariates and the independent variables separately.

Table 4.6: Homogeneity of regression slopes for ANCOVA with for GBE as dependent variable

	PCP*covariates	why*covariates	relativity*covariates
<i>p</i> - value	0.475	0.617	0.909

4.3.2 Testing hypotheses with GBE as dependent variable

The first three hypotheses which are tested are focused on the effects of the independent variables on GBE. More specifically it is hypothesized that a high PCP would lead to a lower GBE. Additionally, it is hypothesized that the communication strategies of including *why* and comparing the specific company to other companies in the industry would weaken the relationship between PCP and GBE.

H1a: *PCP has a negative effect on GBE.*

H2a: *Communicating why, rather than only what and how, weakens the effect of PCP on GBE.*

H3a: *Communicating relativity weakens the effect of PCP on GBE.*

The overall score of GBE of the eight different groups are visualized using a boxplot which can be found in figure 4.3. Visual inspection of this plot suggests that including *why* results in a higher overall score of GBE.

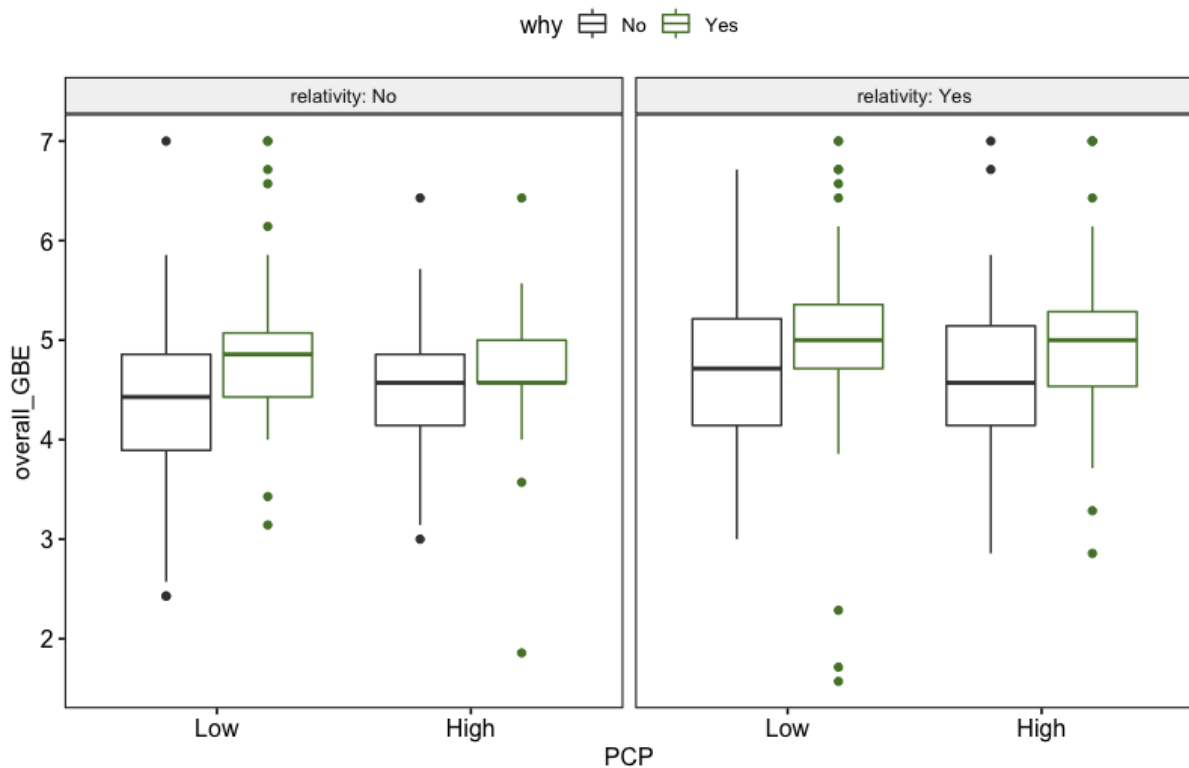


Figure 4.3: Three way boxplot PCP, why and relativity on GBE

When testing the hypotheses, the covariates age, gender and ATU1 are included in the model to control for these effects. The results of the three way ANCOVA suggest that there is no significant main effect between PCP and GBE ($F = 0.181, p > 0.05$). This implies that the null hypothesis is accepted and hypothesis 1a is rejected. Hypothesis 2a suggests that there is an interaction effect between PCP and communicating *why* for GBE. However, no interaction effect is observed between including *why* and PCP for GBE ($F = 0.045, p > 0.05$). The null hypothesis is accepted and hypothesis 2a is rejected. Lastly, hypothesis 3a assumes an interaction effect between PCP and the use of *relativity* for GBE. The ANCOVA analysis shows that no interaction effect is present, implying an acceptance of the null hypothesis and hypothesis 3a is rejected ($F = 0.204, p > 0.05$).

Table 4.7: Results three-way ANCOVA with GBE as dependent variable

Effect	F	<i>p</i> -value
PCP	0.181	0.566
Why	3.848	0.008***
Relativity	1.282	0.127
PCP×Why	0.030	0.813
PCP×Relativity	0.023	0.838
Why×Relativity	0.398	0.395
PCP×Why×Relativity	0.011	0.887

Significance level: * $p < .1$, ** $p < .05$, *** $p < .01$

4.3.3 Additional findings

A main effect is observed between *why* and GBE ($F = 3.848, p < 0.001$). Since no interaction effect is present in the data, the effect of *why* is not dependent on one of the two other variables. Therefore, the main effect can directly be interpreted, in which the group including *why* results in a higher score for GBE ($4.91 \pm 0.917 \mu$) (see table 4.8).

Table 4.8: Main effect of including *why* on the average GBE score

Group	Average GBE score	Std
including why	4.91	0.917
Not including why	4.56	0.921

4.4 Three-way ANCOVA with GW as dependent variable

4.4.1 Assumptions Check

A second three way ANCOVA is conducted to investigate the effect of PCP, communicating *why* and using *relativity* in the sustainability message on GW. Contradicting to the previous analysis, only the covariates age and gender are added to control for possible effects on GW (Malhotra et al., 2017). A linear regression model was fitted for ATU1 on overall_GW, which resulted in non-significant *p*-value (p -value > 0.05). The residuals plot showed a clear parabol

shape, implying that there is a pattern. Since there is no linearity between ATU1 and overall_GW, no reduction of the variances will be achieved when including ATU1 as a covariate and is therefore excluded from the analysis. As the same treatment scheme is used to allocate the respondents to one of the eight treatment groups, the assumption of independence of observations is met. In contradiction to the overall GBE score, no outliers were present within the overall GW construct. The GW score is normally distributed for all groups except one as assessed by Shapiro-Wilk's test of normality. The group with low PCP, excluding *why* and use of *relativity* is deemed to be non normal distributed. These results can be found in table 4.9. Homogeneity of variances in the different groups is confirmed by using the Levene's test, which is not significant ($p > 0.05$)

Table 4.9: Results Shapiro-Wilk test of normality of overall_GW by treatment groups

PCP	Why	relativity	Statistic	p- value
High	No	No	0.965	0.524
		Yes	0.931	0.100
	Yes	No	0.970	0.466
		Yes	0.969	0.471
Low	No	No	0.970	0.500
		Yes	0.934	0.04**
	Yes	No	0.975	0.578
		Yes	0.966	0.194

Significance level: * $p < .1$, ** $p < .05$, *** $p < .01$

Lastly, there was homogeneity of regression slopes as the interaction terms, between the covariates (age and gender) and grouping variables (PCP, why and relativity), was not statistically significant, $p > 0.05$. The result for testing the homogeneity of regression slopes can be found in table 4.10.

Table 4.10: Homogeneity of regression slopes for ANCOVA with for GW as dependent variable

	PCP*covariates	why*covariates	relativity*covariates
p - value	0.505	0.539	0.521

4.4.2 Testing hypotheses with GW as dependent variable

The second three hypotheses which are tested are focused on the effects of the independent variables on GW. More specifically it is hypothesized that high PCP increases the threat of greenwashing. Additionally, it is hypothesized that including *why* in a sustainability message weakens the effect of PCP on GW while comparing the specific company to other companies in the industry would strengthen the relationship between PCP and GW.

H1b: *PCP has a positive effect on GW.*

H2b: *Communicating why, rather than only what and how, weakens the effect of PCP on GW.*

H3b: *Communicating relativeity strengthens the effect of PCP on GW.*

The overall scores of GW of the eight different groups are visualized using a boxplot which can be found in figure 4.4. Visual inspection of this plot suggests that including *why* results in a higher overall score of GW. This effect seems mainly present when there is no relativeity used in the sustainability message.

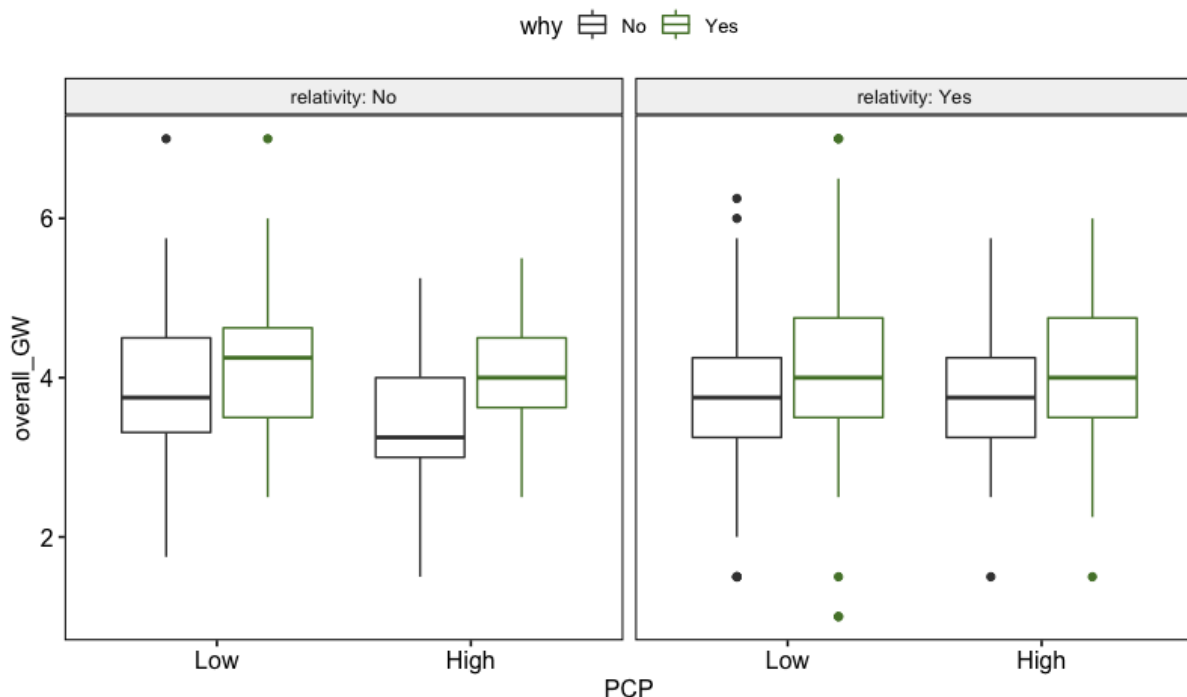


Figure 4.4: Three way boxplot PCP, why and relativeity on GBE

When testing the hypotheses, the covariates age, gender and ATU1 are included in the model to control for these effects. The results of the three way ANCOVA suggest that there is a significant main effect between PCP and GW ($F = 4.877, p < 0.05$). Since no interaction effect is present in the data, the effect of a high PCP is not dependent on one of the two other variables. Therefore, the main effect can directly be interpreted, in which the group categorized as high PCP results in a higher score for GW ($4.00 \pm 0.94 \mu$) (see table 4.11). This implies that the null hypothesis is rejected and hypothesis 1b is accepted. Hypothesis 2b suggests that there is an interaction effect between PCP and communicating *why* for GW. However, no interaction effect is observed between including *why* and PCP for GW ($F= 1.652, p > 0.05$). The null hypothesis is accepted and hypothesis 2b is rejected. Lastly, hypothesis 3b assumes an interaction effect between PCP and the use of *relativity* for GW. The ANCOVA analysis shows that no interaction effect is present, implying an acceptance of the null hypothesis and hypothesis 3a is rejected ($F= 3.334, p > 0.05$).

Table 4.11: Results three-way ANCOVA with GW as dependent variable

Effect	F	p-value
PCP	4.877	0.030 **
Why	6.464	0.012**
Relativity	0.514	0.474
PCPxWhy	1.652	0.205
PCPxRelativity	3.334	0.072
WhyxRelativity	1.312	0.258
PCPxWhyxRelativity	1.651	0.205

Significance level: * $p < .1$, ** $p < .05$, *** $p < .01$

Table 4.12: Main effect of the level of PCP on the average GW score

Group	Average GW score	Std
High PCP	4.00	0.94
Low PCP	3.88	1.17

4.4.3 Additional findings

A main effect is observed between why and GW ($F = 6.464, p < 0.05$). Since no interaction effect is present in the data, the effect of *why* is not dependent on one of the two other variables. Therefore, the main effect can directly be interpreted, in which the group including *why* results in a lower score for GW ($3.74 \pm 1.03 \mu$) (see table 4.13). Furthermore, a main effect is present between age and GW.

Table 4.13: *Main effect of including why on the average GW score*

Group	Average GW score	Std
including why	3.74	1.03
Not including why	4.11	1.01

4.5 Summary of the analysis

Table 4.14: *Summary of the analysis*

Hypothesis	<i>p</i> - value	Result	Explanation
H1a: PCP has a negative effect on GBE.	> 0.05	Rejected	No evidence is found for a relationship between the “perceived contribution to a sustainability problem” and Green brand equity
H1b: PCP increases the threat of GW.	0.030 **	Accepted	The “perceived contribution to a sustainability problem” is identified as a significant factor, which <u>positively</u> affects greenwashing
H2a: Communicating why, rather than only what and how, weakens the effect of PCP on GBE.	> 0.05	Rejected	No evidence is found for an interaction effect of communicating <i>why</i> on the relationship between the “perceived contribution to a sustainability problem” and Green brand equity.
H2b: Communicating why, rather than only what and how, weakens the effect of PCP on GW.	> 0.05	Rejected	No evidence is found for an interaction effect of communicating <i>why</i> on the relationship between “perceived contribution to a sustainability problem” and greenwashing.
H3a: Communicating relativity weakens the effect of PCP on GBE.	> 0.05	Rejected	No evidence is found for an interaction effect of using relativity on the relationship between the “perceived contribution to a sustainability problem” and Green brand equity.
H3b: Communicating relativity strengthens the effect of PCP on GW.	> 0.05	Rejected	No evidence is found for an interaction effect of using relativity on the relationship between the “perceived contribution to a sustainability problem” and ‘Greenwashing’.

*Significance level: * $p < .1$, ** $p < .05$, *** $p < .01$*

5 Discussion

The purpose of this study is to contribute to the understanding of effective communication of sustainability claims. Specifically, if there are ways companies can communicate the effort of cleaning up their own mess that weakens the proposed negative impact of PCP on GBE and GW, eliminates it, or even turns it into a positive relationship. Even though most hypotheses were rejected, the research findings and underlying factors need to be discussed in order to gain a more comprehensive understanding of the forces at play. This chapter will therefore start by elaborating on the findings made from the analysis. Then, both theoretical and managerial implications of these findings will be discussed, as well as limitations and the validity of the research. Finally, the chapter will end with thoughts on how studies within this topic could proceed from here.

5.1 Main findings

To discuss and answer the research question of this thesis, this part will be structured according to the hypotheses presented in chapter 2.

RQ: *Which moderators, if any, affect the relationship between PCP and (a) GBE (b) GW.*

5.1.1 Hypothesis 1

H1(a): *PCP has a negative effect on GBE.*

The analysis shows that, for this research, there is no existing relationship between PCP and GBE. This is contradictory to the findings of Kunnumpuram (2021) who found a significant negative effect of PCP on GBE. While this study cannot argue for any relationship (positive or negative) between PCP and GBE, it can question the negative relationship found by Kunnapuram (2021). He argued that when consumers are reminded of the company's contribution to a sustainability problem, they get negative associations and GBE is reduced. From this study however, it seems like the level of contribution does not matter in terms of how stakeholders view and evaluate the company. Hence, there is reason to advocate for no direct relationship between PCP and GBE, but for the possible existence of moderators and/or mediators that influence the impact of contribution. Examples of these are types of company

activities and the industry it operates in, which might play a part in the development of attitudes and associations.

On the other hand, with the goal of providing alternative explanations, the lack of causality requires examination. Even though the manipulation of high PCP (carbon emissions) and low PCP (waste) was successful (4.2), there is a chance respondents did not fully perceive the environmental impact of the company. Despite a significant difference between the two groups, both had a fairly average mean score of 4.57 and 3.83 respectively, and not numbers on opposite sides of the scale. It could therefore be reason to speculate whether or not the contribution to the problems was communicated clearly enough to generate a substantial difference in GBE. Furthermore, asking the respondents to evaluate a non-existing “CompanyX” could have had an impact on the level of PCP, as the contribution of the company is not known. Additionally, rating attitudes and likability of an unfamiliar company could be confusing, thus making it complicated to give accurate feedback on the GBE questions. The combination of challenging PCP and GBE reporting regarding a hypothetical company could therefore also be a possible explanation for the lack of relationship between PCP and GBE.

H1(b): *PCP has a positive effect on GW.*

Interpretations of the analysis (4.4) shows that there is a significant positive relationship between PCP and GW, resulting in acceptance of H1(b). Hence, when stakeholders believe a company contributes more to a sustainability problem perceived greenwashing is deemed to increase. A possible reason for this could be higher levels of green confusion and green perceived risk, thus lower levels of green trust, for companies that score high on PCP. As Kunnumpuram (2021) argued, this could be because consumers already expect companies to try solving the problems they have caused, thus communicating the effort to attempt to fix them results in unfavorable attitudes. Another possible explanation could be that the more a company contributes to a problem, the higher is perceived risk and confusion, resulting in lower perceived trustworthiness and higher perceived greenwashing. A green claim from a large oil company with high CO₂ emissions might be seen as less obtainable, and therefore be harder to trust, compared to a small restaurant chain with low environmental impact. A high level of PCP might therefore not have a substantial impact on overall attitudes, green

brand image and green satisfaction (GBE), but could imply difficulties in believing and trusting in the green claim, and therefore be perceived as greenwashing.

5.1.2 Hypothesis 2 and 3

H2(a): *Communicating why, rather than only what and how, weakens the effect of PCP on GBE.*

H2(b): *Communicating why, rather than only what and how, weakens the effect of PCP on GW.*

The first moderator, communicating *why*, rather than only *how* and *what*, had no interaction effect on the relationship between PCP and GBE. Neither did it create any interaction effect on PCP and GW, resulting in rejection of both hypothesis 2(a) and 2(b). From this analysis it can therefore be argued that communicating *why* does not affect the relationship between PCP and (a)GBE nor (b)GW. This may be because the purpose of the company, *why* it exists, does not change the reality of its environmental impact, making it inapplicable in influencing stakeholders evaluations of PCP.

H3(a): *Communicating relativity weakens the effect of PCP on GBE.*

H3(b): *Communicating relativity strengthens the effect of PCP on GW.*

The results show the same conclusions for hypothesis 3(a) and 3(b) regarding *relativity*. These were rejected based on the findings of no moderating effect of *relativity* on the relationships between PCP and the dependent variables. This could be because the reality of how much a company contributes to a problem is not affected by comparison with other companies. Another possible reason for this could be that stakeholders exhibit low levels of *schadenfreude* and do not wish others harm in sustainability matters, making relativity and comparative advertisement ineffective strategies in green claims.

Using these communication characteristics in green marketing appear not to produce successful results when seeking to influence the effect of PCP on GBE and/or GW. However, despite finding no effect of the chosen moderators, it is excessive to argue that moderating variables in general do not affect these relationships. Considering framing effects of sustainability claims has just recently been brought to the attention of scholars, it is reason to assume that various communication strategies can result in different outcomes on GBE and

GW, also within *perceived contribution to a problem*. Only two selected moderators were chosen for this study, and while these did not generate any effect, many other strategies might be relevant and actually cause a moderating effect (examples of these are mentioned in section 5.6). Furthermore, a possible reason for the lack of effect is the absence of a relationship between PCP and GBE, as it is illogical that a variable can moderate a non-existing relationship. However, no effect is found on the existing relationship between PCP and GW, indicating that for the current thesis, the chosen variables did not affect the relationship between PCP and (a)GBE nor (b)GW. Possible explanations for this could be that the intended value of the moderators was not perceived by respondents, or that it was not relevant in the evaluation of the company's contribution to a sustainability problem. Communicating *why* and/or *relativity* does not change the reality regarding how much a company contributes to a problem, which might explain the lack of moderating effects.

5.2 Other findings

Even though the results met few of the expectations for this research, and resulted in only one significant relationship and acceptance of H1(b), the analysis revealed other findings worth mentioning. Despite not having a moderating effect on the relationship between PCP and the dependent variables, communicating *why* turns out to have a direct effect on both GBE and GW. Specifically, including why it is important for a company to behave in a sustainable manner, instead of only describing what and how they intend to do it, increases the company's green brand equity. Additionally, it reduces the threat of perceived greenwashing. Although *why* may not be an efficient moderating variable, it can seem like a valuable communication strategy for the purpose of improving green brand image, green satisfaction and green trust, as well as reducing perceived greenwashing among stakeholders.

5.3 Theoretical Implications

Recent literature has established that there is limited knowledge concerning framing effects of disclosing sustainability efforts in supply chain management (Duan et al., 2022). The negative effect of PCP on both GBE and GW, found in Kunnumparam's (2021) research, leads therefore to a questioning of the existing belief that more transparency generates better results. For this reason, this thesis aims to contribute to the theory regarding the most effective way to communicate sustainability initiatives. Specifically, within the realm of a

company's externalities, and the desire and attempt to reduce negative environmental impact. The goal is to provide theoretical contributions that enriches the literature on stakeholder perceptions and evaluation of sustainability claims.

Section 5.1.1 argues for a non-existing relationship between PCP and GBE, thus a company's level of contribution to a sustainability problem is not relevant in determining stakeholders' attitudes towards the company. Hence, green brand image, green satisfaction and green trust is not created or affected by the environmental impact from activities regarding the sustainability issue. A possible interpretation of this could be that associations, attitudes and brand loyalty are not established based on the scope or presence in the industry, but rather on the commitment to responsible environmental management. Which makes the efforts, initiatives and drive to implement changes and sustainable solutions the driving force behind a strong GBE. Based on the findings of no relationship, it can seem like stakeholders care less about "who you are", as in the size and contribution of the company, and place more value in "what you do". This thesis therefore contributes to theory by questioning the significant negative relationship Kunnumpuram (2021) found in his thesis. While this does not establish a new theory, it enriches the literature on stakeholder evaluation and its effect on green brand equity.

As discussed in chapter 2.5, GW is shown to have both a direct and indirect effect on green brand equity. Plenty of studies have been conducted on the effect of greenwashing, and the results are quite clear: it reduces trustworthiness and can damage relationships with stakeholders (Avçılar & Demirgüneş, 2017; Chen et al., 2020). Due to this, it is imperative to know what drives and impacts stakeholders' perceived greenwashing, which is the theoretical realm this thesis contributes to. The increasing effect PCP has on GW, as found in this study, aligns with the prior findings of Kunnumpuram (2021), which strengthens the assumption that perceived greenwashing is affected by the level of contribution. As perceived greenwashing both directly and indirectly (through green trust) influences GBE (2.5), it might be confusing to argue for a significant effect of PCP on GW, and a non-existing relationship with GBE at the same time. However, the extensive existing literature confirming the negative effect of greenwashing on GBE (2.5), together with the acceptance of H1(b), could support the speculation of PCP having an indirect effect on GBE through GW. This relationship is however not discovered in this analysis, and remains therefore as an educated

guess. On the other hand, the significant positive effect of PCP on GW supports the findings of Kunnumpuram (2021), which introduce a stepping stone towards a more comprehensive understanding of the concept of stakeholder evaluation and its effect on greenwashing.

Existing theory within consumer behavior acknowledge that decision making is influenced by the motivation, ability and opportunity to act, and that persuasive cues (ELM-model) are valuable in influencing system 1 thinking (Hoyer et al, 2018; Petty & Cacioppo, 1986; Kahneman, 2013). Based on the fact that 95% of all decisions are to be categorized as these subconscious, automatic responses, Sinek (2014) argues that consumers do not make purchases based on what or how companies deliver on their value proposition, but rather *why* they do it. Accordingly, this thesis finds that communicating why results in higher GBE and also reduces the threat of perceived greenwashing. This sheds an interesting light on existing theory regarding the concepts of transparency and green communication.

As commonly believed, and as Schnackenberg and Tomlinson (2016) argues, disclosure, clarity and accuracy, the drivers of perceived transparency, positively influences perceived trustworthiness. Furthermore, this influences trust, an important factor of both GBE and GW. While transparency is an essential factor to demonstrate capabilities, this thesis proposes the possibility of “*why*” being the missing piece in understanding the drivers of GBE and GW in the context of green marketing. This is based on the fact that the inner part of the brain, which is responsible for decision making, does not have the capacity for language. When companies communicate what they do, and how they aim to be more sustainable, they communicate with the neocortex, the rational part of the brain. While this is needed information, fewer companies appeal to the reptilian brain where the gut feeling is located. They forget to communicate why they care about sustainability, and what the purpose of implementing the initiatives are. Credence attributes of green claims and focus on transparency results in a contradicting combination – a paradox of explaining in detail what cannot be fully understood. When stakeholders are not able to fully understand or fact-check what is disclosed, even in a clear and accurate way, companies need to use a communication strategy that makes consumers trust what they are claiming. It is therefore suggested that communicating *why* can increase perceived integrity and benevolence, hence improving the character of the company which results in higher stakeholder trust. This resonates with the statement of Rachel Botsman: “*Trust is not built, it is earned (...) and transparency is not the*

way to do it” (Harrington, 2018). Implying that companies need to continuously show with words and actions that they are worth their stakeholders' trust. For this reason, green claims starting with *why*, then proceeding to *how* and *what*, are believed to appear more genuine and generate more favorable outcomes in stakeholder perception. These findings contribute to a deeper theoretical understanding of the effect of green claims on stakeholder evaluation, and together they create one piece of the puzzle that is green brand equity.

5.4 Managerial implications

As argued in chapter 1, the knowledge of what makes effective green communication is valuable to managers and marketers as sustainable practice increasingly gets more attention by stakeholders. Therefore, in order to gain loyal customers and a competitive advantage, green marketing needs to be performed in such a way that improves green brand equity and lowers the threat of perceived greenwashing. However, how is this done? Information is expected to be disclosed in an accurate and clear way, without vagueness, exaggeration or misleading words, which has led to an abundance of generic uniform sustainability claims. As a consequence, stakeholder skepticism and confusion have increased, resulting in more investigation and focus on greenwashing by consumers and the media. When even genuine attempts by companies are stamped as greenwashing, it can seem challenging to communicate sustainability in a correct way (Seignette, 2021). For this reason, this thesis aims to help managers one step closer to finding the best way to communicate genuine sustainability efforts.

Given the case of no relationship between PCP and GBE (4.3), one can argue that companies can continue to communicate efforts to improve past and ongoing sustainability issues, without this damaging their green brand equity. This would be good news for companies with high contributions to a sustainability problem (e.g. oil and gas companies), as they will struggle to eliminate their externalities fully. However, given the negative effect of PCP on GW, there is reason to act with caution in the case of high contributions. If these companies want to communicate their effort to mitigate negative externalities, they should be very clear and accurate with their information in order to avoid any confusion and perceived risk. They need to emphasize their competence and ability to make the initiative a reality, so that stakeholders believe it is possible and do not perceive it as greenwashing. This is of course

important for all companies, but in particular essential for companies with high PCP wanting to avoid the negative effects of perceived greenwashing.

Regarding the lack of effect of relativity, it seems like companies can forget some of their competitiveness when communicating sustainability. Taking care of people and the planet, and improving the ways of the world, is not fixed by one company. It is a collective collaboration of working towards more sustainable solutions and practices. Thus, for companies to drag others down for their own benefit appear to not yield favorable results within the realm of sustainability. It might even backfire, as shedding a bad light on a competitors' sustainability status could give the impression that the company cares more about winning customers than actual environmental practice. Green claims inspired by this type of extrinsic (rather than intrinsic) motivation can therefore be seen as less credible and thus perceived as greenwashing. This negative effect is however just speculations, as this thesis did not find a strengthening effect of relativity.

Lastly, the significant effect of communicating *why* leads to the conclusion that companies should be aware of, and convey, the purpose of their intention to become more sustainable. As mentioned earlier, this goes beyond being a market leader, meeting customer needs and making profits. Why a company cares about sustainability should resonate with their existence, their value proposition and what they wish to accomplish with their business. What technology that is used and how innovative solutions make it happen is important information, but the *why* needs to be communicated first. This is something every company, regardless of size or budget could do. If stakeholders are to believe that companies care about sustainability, the purpose of the commitment should also be expressed. In this way consumers and stakeholders can feel the genuinity behind the effort.

Based on this, it is reason to argue that green marketing needs to move away from the vague generic green words that create confusion, and towards more specificity and quality. Companies need to understand the nature of credence attributes of green claims, and generate trust beyond explaining technicalities in a clear and accurate way. In this way, transparency and purpose can work together to strengthen the company's capability and character, increase perceived trustworthiness and earn the loyalty of stakeholders. Hence, maybe if green brand image, green satisfaction and green trust is high enough, perceived contribution to a

sustainability problem would lose its negative effect on greenwashing. Hopefully, these insights can help companies communicate genuine sustainability efforts in such a way that overall brand equity increases and solid relationships with stakeholders are created.

5.5 Limitations

5.5.1 Reliability

The internal consistency of the scales used in this research is assessed by the CR and AVE score as part of the EFA. The recommended three construct structure showed a satisfactory score for both CR as AVE for all constructs, indicating an adequate convergent validity. Additionally, the Cronbach's Alpha score is used to further evaluate the internal reliability of the newly established construct. The scales of this study have a score of 0.79 or above which indicates an acceptable internal validity since a value of 0.6 or above is considered to be satisfactory (Malhotra et al., 2017). The construct of GBE has a Cronbach's Alpha of 0.90, associating a high level of internal consistency while still respecting the upper boundary of 0.95, which indicates the possibility of redundancy or duplication (Hulin, Netemeyer, and Cudeck, 2001).

During the recording of the responses, there was no interaction between the researcher and the participants. Discussing ethical issues such as sustainability incentives as in this research makes it attractive for respondents to give a more socially acceptable answer during a face to face interaction. The fact that the responses are recorded anonymously and autonomously ensures that the chances of miscommunications and the influence of the researcher on the answers of the respondents are relatively low.

5.5.2 Validity

5.5.2.1 Internal validity

The internal validity of a research design assesses to what extent the findings of the research are caused by the research's variables (Malhotra et al., 2017). Flaws in a research design can cause the validity to decrease. This research utilizes a survey and subsequently the responses of the participants to measure the variables which entails the necessary risks for internal validity. The responses of the participants may be influenced by extraneous variables other

than exclusively the independent variables. This research utilizes a between subject design, implying that all respondents are asked to conduct the study at only one specific point in time, in contrast to a within subject design in which respondents are evaluated before and after the treatment. This strategy eliminates the impact of threat of maturation, influence of historical events, differences in instrumentation and threat of testing effects.

The manipulation of PCP is therefore done by the use of two different sustainability problems; waste production for the low PCP group and CO₂ emissions for the high PCP group. In an ideal setting, the same environmental problem would have been used for both PCP groups. Unfortunately, it was concluded from different pre-tests that it was not feasible to generate a significant difference in PCP between the high and low PCP group by the use of one single sustainability issue. Past research shows a difference in the interest of the consumer between social responsibility and environmental responsibility (Green & Peloza, 2011). The effect of this inequality in interest is limited by the use of two problems which both appeal to the environmental responsibility of the company. However, these problems might raise differences in level of interest by the general public, potentially negatively affecting the internal validity. To address this issue, the interest of the respondent for solving the sustainability problem presented in the sustainability message is therefore included as a covariate in a three-way ANCOVA analysis.

To further reduce the impact of potential extraneous variables, attention is given to the demographics of the respondents. These showed that the age distribution was uneven with most respondents in the category 25-34. Furthermore, pre-testing the survey showed that gender is likely to have an effect on the dependent variables. Hence, the analysis is controlled for the demographic variables age and gender as well. Although this statistical control increases the internal validity of the research, it is acknowledged that other variables, which are not included in the analysis, could affect the GBE or the threat of GW, for instance the attitude toward traveling by plane. A fictional company (CompanyX) is used during the treatment to avoid the impact of a known brand name on the attitude of the respondents.

During the data collection process, the survey platform SurveyMonkey is utilized which compensates participants for every survey they conduct. This financial gain could give the respondents the motivation to fastly finish as many surveys as possible, leading to low effort

responses and an inaccurate evaluation of the presented statements (Oppenheimer et al., 2009). To motivate the respondents to finish the complete survey, the time needed to conduct the survey is limited to three minutes. By communicating the estimated time needed prior to the survey, respondents might be more motivated to fully complete the survey, resulting in a mortality rate of zero percent. In an attempt to filter out low effort responses, and increase the internal validity, a question assessing the attention of the respondent is added to the survey. This resulted in the elimination of approximately 32% of the total collected responses. However, this reduction of responses is not entirely risk-free and could result in a demographic bias since inattentive respondents probably belong to the same demographic group. As discussed in a previous paragraph, the analysis controls for multiple demographic characteristics in an attempt to ensure internal validity. Furthermore, the addition of this question can trigger a Hawthorne effect in which the respondent gets the impression that they are being watched resulting in more socially desirable answers (Clifford & Jerit, 2014).

Besides the use of an attention check, a manipulation check was included to determine the effectiveness of the *why* and *relativity* manipulation (Hoewe, 2017). Respondents which did not pass the manipulation check in accordance with the respective manipulation group were eliminated from the study resulting in a dramatic reduction of the sample size. These manipulation checks in combination with the attention check led to a sample size reduction of 62% and therefore increasing the margin of error.

5.5.2.2 External validity

The generalizability of the findings in this study might be limited by the presence of a selection bias (Saunders et al., 2019). The respondents in this study are all resident in the United States, which implies that the results of this study can be generalized to population groups with beliefs and values in line with those of inhabitants of this part of the world. The Country Similarity Index attempts to map the similarities between different countries using five measurements: demographics, culture, politics, infrastructure, and geography (objectivelists.com, 2022). This index identifies Canada, Australia, New Zealand, the United Kingdom, Ireland, Germany, France, Switzerland, Norway and the Bahamas as relatively similar to the United States. Hence, the results of this research are likely generalizable for the population of these countries.

During the survey, respondents were exposed to an example derived from the airline industry. Recent research shows that there is a development in the public opinion about traveling by plane. The so-called phenomenon of “*flightshame*” is starting to occur, making extensive traveling by plane more and more socially unacceptable (Flaherty & Holmes, 2020). Residents of Europe, the United States and China in particular say they plan to limit air travel in order to reduce the contribution to CO2 emissions (Reuters, 2020). This change of perception might mean that replicating this study in the future could result in different outcomes and findings.

5.5.2.3 Statistical conclusion validity

The probability of a type α or type β error is evaluated to assess the statistical conclusion validity. A significance level of 0.05 is used when evaluating the results, leading to the possibility of a falsely rejected null hypothesis and thus a type α error of five percent (Austin et al., 1998). Five out of the six tested hypotheses are rejected, creating a situation in which a type II error might occur. The chance of a type β error is highly dependent on the sample size (Austin et al., 1998). The sample used in this study was reduced in size drastically due to the use of manipulation checks and the attention check. The sample size of 291 over the eight groups combined resulted in a Power of approximately 75% for this specific research design. This is considered as unsatisfactory since it is above the desired lower boundary of 90% (Zhang & Yuan, 2018). This means that the possible occurrence of a type β error need to be taken into account when analyzing the results.

5.6 Future research

The findings of this thesis have brought the literature on green communication one step closer to a more comprehensive understanding of effective sustainability claims. However, research on various framing effects and stakeholder evaluation of green claims is still limited, and it is reason to believe that the current knowledge is just the tip of the iceberg within these topics. Further investigation is therefore required to fully grasp how a strong green brand equity is created, how perceived greenwashing is reduced and if all transparency is beneficial.

Due to the mixed results of the effect of PCP on GBE, this relationship needs a thorough examination. A more complex model, where different sustainability problems with various levels of PCP and/or several real companies are used could potentially provide more accurate

insights on the effect. As a relationship between PCP and GW was discovered, a potential indirect effect of PCP on GBE through GW should also be examined. Even though the chosen variables in this research did not show any moderating effect, other strategies could possibly strengthen or weaken the effect of PCP. Various communication characteristics like communicating accomplishments vs. aspirations for the future, or problem characteristics like problem awareness or the type of CSR problem might in fact moderate the effect of PCP.

For the lack of effect of relativity, the level of consumer schadenfreude in sustainability matters could be studied in order to confirm whether or not comparative advertisement within this topic generates unfavorable results. Additionally, it would be interesting to see if there is a different effect of communicating competition vs. collaboration in sustainability efforts. Lastly, as green trust is shown to be a critical factor in both GBE and GW, it could be valuable to know whether or not all drivers of trust are equally important in the evaluation of green claims, or if character or competence weights more than the other. In this way an accurate understanding of the effect of moderators in green marketing can be achieved. For illustrative purpose, a model of the literature concepts and research findings is presented together as concluding summary of this thesis:

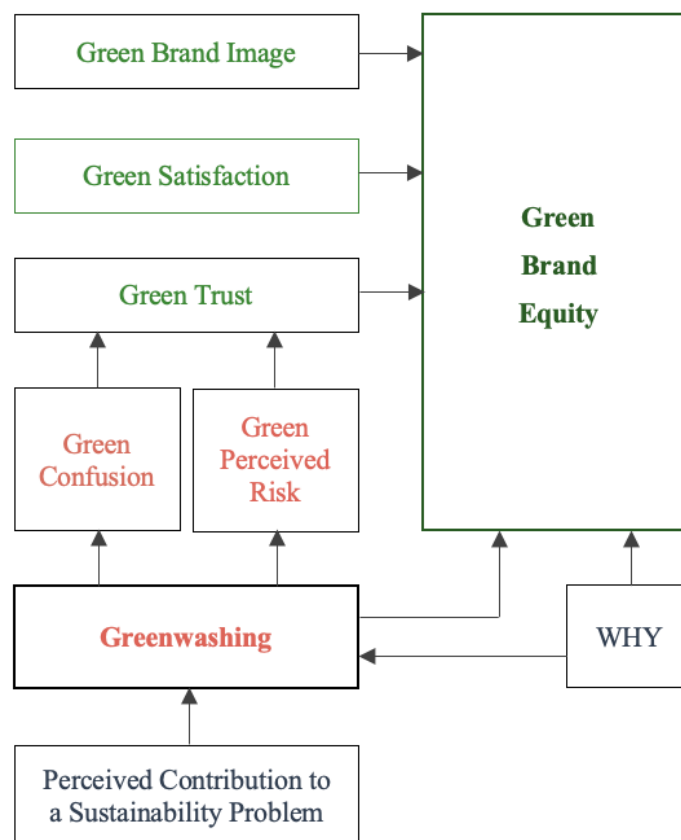


Figure 5.1: Concluding model

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7 Appendix A: questionnaire

Table 7.1: *The questionnaire*

			(1) Strongly disagree,	(2) Disagree,	(3) Somewhat disagree,	(4) Neither agree nor disagree,	(5) Somewhat agree,	(6) Agree,	(7) Strongly agree)
			1	2	3	4	5	6	7
<i>Manipulation check</i>									
1	MC1	CompanyX compares itself to other companies in its statement							
2	MC2	The sustainability statement of CompanyX explains <i>why</i> they want to solve the problem of high carbon emission/ high waste production and not only <i>how</i>							
<i>Green Brand Equity</i>									
3	GBE1	I would prefer buying from CompanyX compared to other companies in the same industry because of its environmental commitment							
4	GBE2	If another brand's offers are as good as CompanyX, I would still prefer to buy from CompanyX because of its sustainability efforts.							
5	GBE3	This initiative from CompanyX meets/exceeds my expectations of a company's sustainability performance							
6	GBE4	Because of this initiative I have a positive attitude towards CompanyX							
7	GBE5	Because of this initiative, I think CompanyX is committed to being environmentally responsible							
8	GBE6	Because of this sustainability initiative, it is likely that I will choose to buy from CompanyX next time I need to buy a plane ticket.							
<i>Attitude check</i>									
9	ATU1	I value companies' sustainability efforts when choosing where to buy my plane ticket							
<i>Perceived Contribution to the Problem</i>									
10	PCP1	I believe that CompanyX contributes significantly to the problem of high carbon emissions/ waste production							
11	PCP2	In my opinion companies like CompanyX contribute							

significantly to the problem of high carbon emissions/ waste production

- 12 PCP3 If a company like CompanyX would stop selling their product(s), the sustainability problem of high carbon emissions/ waste production would be reduced
- 13 PCP4 In my opinion, companies like CompanyX are not responsible for high carbon emissions/ waste production
-

Attention check

- 14 ATC1 Do not answer this question. Move to the next
-

Greenwashing

- 15 GW1 I find sustainability actions of companies like CompanyX credible
- 16 GW2 CompanyX misleads with words in the above shown statement
- 17 GW3 CompanyX possesses green claims in the above shown statement that is vague or seemingly un-provable
- 18 GW4 CompanyX overstates or exaggerates in the above shown statement how its green functionality actually is
- 19 GW5 In the statement above, CompanyX leaves out or masks important information, making the green claim in its statement sound better than it is
-

Demographics

- 20 DE1 What is your age
- 21 DE2 What gender do you identify with? Male Female Other
- 22 DE3 In what country do you live?
- 23 DE4 What is your education level?
- 24 DE5 What is your total annual income?
-

8. Appendix B: Correlation Matrix of the questionnaire items

Table 8.1: Correlation matrix items used in the survey

	GBE1	GBE2	GBE3	GBE4	GBE5	GBE6	PCP1	PCP2	PCP3	PCP4	GW1	GW2	GW3	GW4	GW5
GBE1	1.000														
GBE2	0.644***	1.000													
GBE3	0.537***	0.437***	1.000												
GBE4	0.634***	0.540***	0.610***	1.000											
GBE5	0.546***	0.364***	0.631***	0.649***	1.000										
GBE6	0.630***	0.600***	0.549***	0.632***	0.571***	1.000									
PCP1	0.111	0.198***	0.078	0.134*	0.021	0.096	1.000								
PCP2	0.120*	0.176**	0.064	0.115	0.076	0.087	0.743***	1.000							
PCP3	0.130*	0.110	0.053	0.071	0.044	0.080	0.476***	0.549***	1.000						
PCP4	-0.117*	-0.128*	-0.288***	-0.174**	-0.224***	-0.187**	0.302***	0.307***	0.298***	1.000					
GW1	0.452***	0.429***	0.602***	0.495***	0.609***	0.560***	0.078	0.075	0.073	-0.330***	1.000				
GW2	0.172**	0.135*	0.329***	0.265***	0.290***	0.215***	-0.083	-0.087	-0.050	-0.200***	0.476***	1.000			
GW3	0.142*	0.095	0.374***	0.166**	0.284***	0.266***	-0.108	-0.038	-0.044	-0.204***	0.396***	0.531***	1.000		
GW4	0.109	0.032	0.255***	0.177**	0.263***	0.199***	-0.108	-0.092	-0.122*	-0.212***	0.392***	0.487***	0.611***	1.000	
GW5	0.162**	0.097	0.333***	0.192***	0.282***	0.229***	-0.103	-0.066	-0.070	-0.282***	0.394***	0.396***	0.584***	0.597***	1.000

Significance level: * $p < .1$, ** $p < .05$, *** $p < .01$