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Communicating Sustainable Initiatives

A quantitative study of the impact of using carbon offsetting claims in advertising to consumers

While carbon offsetting has been a common practice for companies as a method to mitigate their environmental impact, there has been relatively little theoretical research on whether the communication of it in advertising has an impact on consumers, and if yes, in what ways.

This thesis aims to fill this research gap by testing the effects generated from using carbon offsetting claims in advertising to consumers. The manipulations used in the study are the level of emissions (high versus low) of the company, the level of product involvement, and the detail level (high versus low) of the carbon offsetting claims. A quantitative experiment, based on different ad manipulations for an aviation company and a railway company, was conducted with 338 participants to test whether the use of carbon offsetting claims lead to positive effects regarding ad credibility, ad memorability, ad attitude, brand attitude, purchase intention, and sustainability perception for the company.

All in all, the results show that the use of carbon offsetting claims in advertisements, irrespective of the level of company emissions, the level of product involvement, or the detail level in the claims, does not lead to any significant brand-related or sustainability-related effects. This finding contributes with insights for both theoretical research and marketing practitioners.

Keywords: sustainability, climate compensation, carbon offsetting, green marketing, CSR, greenwashing, advertising, marketing communication

Author: Duc-Anh Bui, 41394

Tutor: Jonas Colliander

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1. INTRODUCTION

This introductory chapter begins with presenting the background behind the research area, the problematization, and the purpose of the thesis as well as the formulation of the research questions. Next, the expected contribution is presented, followed by the delimitations and their motivations for the study. Finally, a brief summary of key definitions and the thesis outline finish the chapter.

1.1. Background

Climate change and global warming

The topic of climate change and global warming has always been widely recognized and discussed worldwide. Evidences of climate change abound and are widely reported in the media (Gössling et al., 2007). Those evidences include global temperature rise, warming oceans, shrinking ice sheets, glacial retreat, decreased snow cover, sea level rise, declining Arctic sea ice, to name a few (NASA). In the last year, developments such as the wide bushfire in Australia and the flight shaming movement headed by Swedish climate activist Greta Thunberg have brought the topic to further awareness (Gössling et al., 2019). Consumer consumption is the main cause of limited availability of resources, and thus, is the main cause of polluting the environment (Chen & Hung, 2016). In general, people are becoming familiar with this issue and are taking measures to counter global warming such as switching to electric vehicles, cutting down on plastic bag use, separating waste or recycling on a more regular basis. That means businesses must recognize consumers want to change their consumption patterns and attempt to combine environmental protection into the industry, for example, applying green concepts in production, packaging and marketing; which would attract environmentally conscious consumers (Chen & Hung, 2016).

Greenhouse gas emissions from the aviation industry

It is also widely recognized that the transport sector accounts for a large share of carbon emissions in industrialized countries, and air travel contributes, by far, the largest proportion of greenhouse gas (GHG) emissions in the transport sector (Gössling et al., 2007). Also, the emissions from airplanes are especially harmful since they are released in the upper troposphere and lower stratosphere where their impact on ozone generation and cloudiness is much greater (Gössling et al., 2007). According to Sausen et al. (2005) the environmental harm in terms of global warming from air travel compared to emissions generated from traffic on the surface is between 1.9 to 5.1 times greater. Most of the longer distance trips involve aircraft and an estimated 57 percent of all international arrivals are now by air (UNWTO, 2018). Various measures

have been introduced to control or reduce aviation emissions, including modifying aircraft design, improvements in air traffic management, and enhancing operational efficiency (Hares et al., 2010). Some measures are market-based such as the European Union Emission Trading Scheme and Air Passenger Duty (Lu & Shon, 2011), or the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA, agreed on in 2018), which mandates airlines that fly internationally to offset any extra emissions (Scheelhaase et al., 2018). However, despite continuing improvements in aircraft technology, the expected growth of air travel will likely lead to increasing emissions to the environment (Araghi et al., 2014). The question about whether people should, or could, fly less received global attention when it was raised by the Fridays for Future movement and the reporting of “flight shame” in 2019 (Gössling et al., 2019).

Carbon offsetting

Carbon offsetting comes to the picture as an offer to “neutralize” emissions caused by consumption in one sector (i.e. a flight) through compensation in another sector, for instance by investing in renewable energy or forestry projects. By paying someone else to absorb or avoid the release of a ton of CO₂ elsewhere, the purchaser of a carbon offset can aim to compensate for their own emissions. This is possible because climate change is a non-localized problem, greenhouse gases spread evenly throughout the atmosphere, so reducing them anywhere contributes to overall climate protection (Liu et al., 2015). Voluntary offsetting schemes have grown rapidly in the past 20 years (Gössling et al., 2009) and informing passengers regarding corporate social responsibility (CSR) by implementing this policy and the benefits of this policy for the passenger as well as the society can enhance the willingness to participate in the policy (MacKerron et al., 2009). However, despite their growing popularity, the efficiency and credibility of those offsetting schemes have been questioned; and substantial, often project-specific, criticism of offsetting has been published in the media (Gössling et al., 2009). Moreover, offsetting schemes may deter consumers from environmental-friendly behavior changes, since they might believe they are entitled to enjoy it having paid for the offsetting fees (Dhanda & Hartman, 2011; Young et al., 2014). It can be seen from the current literature that how carbon offsetting impacts the aviation industry and how consumers react to carbon offsetting schemes is still a complex issue although it has been around in the market for a long time.

The role of companies and consumers on emissions

Companies today are powerful actors who have possibilities to directly influence and impact on large entities of stakeholders, supply chains, production, consumption as well as the capacity and resources to confront environmental challenges (Wright & Nyberg, 2015). The dual role of corporations is communicated by Wright & Nyberg (2015) as they are the main agents of greenhouse gas emissions in the global economy yet they are also seen as “our best hope in reducing emissions through technological

innovation” (Wright & Nyberg, 2015, p.3). Previously, carbon offsetting was primarily considered a sustainability strategy among largely polluting industries, such as energy and transportation, to fight the environmental impact of their operations, production and/or supply chain (Dhanda & Murphy, 2011). However, today, companies in various industries are also engaging in carbon offsetting in order to improve their green brand image. An increasing number of companies have taken on carbon offsetting strategies to reduce their carbon emissions or become “carbon neutral” and it is not only popular with “green firms” but also firms who want to improve their green image (Taiyab, 2006)

Meanwhile, consumers have been generally exhibiting an increased awareness of environmental issues and resultantly a heightened level of environmental concern, taking refuge in green consumption as a means of tackling the environmental challenge (ShabbirHusain & Varshney, 2019). A study by Lacy et al. (2010) showed that a total of 58% of CEOs surveyed rated consumers as their most important stakeholder who influences their companies’ actions aimed towards the environment and society. However, increased consumer awareness as well as a business focus on pro-environmental products have not translated into a corresponding consuming purchase of eco-friendly products (ShabbirHusain & Varshney, 2019). While 40% of consumers exhibited a willingness to buy pro-environmental products, only 4% actually exercised the option (Dupré, 2005). Academic research so far has failed to conclusively answer the discrepancy between the consumer’s concern toward the environment (attitude) and failure to purchase environmentally friendly or green products (behavior) (Gupta & Ogden, 2009).

1.2. Problematization

While more and more companies are embracing carbon offsets as a way to mitigate their carbon footprint and communicate to consumers their environmental responsibility, carbon offsetting still has a long way to go to make a meaningful contribution to carbon emissions (Niller, 2020). In 2018, the volume of transactions in voluntary carbon markets hit a seven-year high, equivalent to 98.4 million metric tons of carbon dioxide (Forest Trends, 2018), however, in 2019, industrial carbon dioxide emissions reached nearly 37 billion metric tons (Friedlingstein et al., 2019). It is apparent that the carbon emissions amount that carbon offsetting has been saving is only a tiny proportion of the emissions generated. At the same time, carbon offsetting has been faced with ongoing criticism from the media and the consumers. Gössling et al (2007) pointed out that it supports the illusion that simple solutions to unsustainable lifestyles exist, meaning if people can compensate for it financially they do not have to change their way of life. Besides, carbon offset providers usually use their subjective standards for verification and validation. That fact, together with the existence of many different kinds of carbon offset schemes available, makes it difficult for consumers to distinguish among them and evaluate their credibility (Gössling et al., 2007). As a result, in the

aviation industry, tourists have not shown much willingness to adopt voluntary mitigation strategies (McKercher et al., 2010). Nevertheless, the popularity of carbon offset programs is still growing, and studies have stated that they have the potential to contribute to meet carbon emissions targets and reduce global warming (MacKerron et al., 2009)

Meanwhile, the effective communication of carbon offsetting initiatives is still a relatively new area within research. In general, limited research has investigated when environmental advertising works (Kong & Zhang, 2014). Most of the current literature on carbon offsetting programs within air travel discuss areas including air passengers' psychographic factors (for example environmental attitudes, personal norms, emotions), air passengers' cognitive factors (for example environmental knowledge, awareness of carbon offset), demographic profiles or aviation carbon offsetting project attributes (Zhang et al., 2019). Although carbon offsetting programs have been around for almost a decade, besides certain areas as mentioned previously, there is a lack of research about purchasing behavior of consumers for offsetting programs as well as how to communicate carbon offsetting advertising messages (Lu & Wang, 2018; Zhang et al., 2018). This provides the framework for an unexplored research gap, in which the effects, if any, of carbon offsetting on advertising are yet to be discovered.

1.3. Purpose

The overarching purpose of this research is to continue, build on, and contribute to previous literature related to carbon offsetting. It aims to decrease the gap between theories of relevant domains such as green marketing, CSR, greenwashing; and the practice of using carbon offsetting on advertisements for companies.

In particular, firstly, this thesis aims to investigate the effectiveness of using carbon offsetting claims by conducting an empirical study within the travel transportation industry. The reason for this decision is due to the aviation industry's prominence in carbon offsetting programs. Regarding brand-related effects, the study seeks to explore carbon offsetting communication's impact on ad credibility, ad memorability, ad attitude, brand attitude, and purchase intentions, as well as sustainability perception.

Secondly, while heavy polluters such as the energy and aviation industries are prominent in using carbon offsetting schemes, other companies in other industries have also been participating in carbon offsetting efforts. Examples include fast-moving consumer good companies, investment and university pension funds, tech companies like Google, Amazon and Lyft, or home heating distributors (Niller, 2020). While most of the existing literature concerning carbon offsetting schemes only consider the aviation industry, there is a lack of research into carbon offsetting for low-emissions, low-involvement products. The author considers

the impact of carbon offsetting advertising claims for a high-emissions industry, with a high carbon footprint and a high involvement product, different from the impact of using these similar claims for a low-emissions industry and a low-involvement product.

Last but not least, most current carbon offsetting advertising messages employ vague statements of carbon offsetting without details of how it is actually done. Considering how carbon offsetting works is still an unclear concept to consumers, the author aims to investigate whether using more detailed, explicit carbon offsetting messages has a different impact compared to using vague claims with little information.

To summarize, the purpose of this thesis is to answer the following research questions:

- *Can exposure to carbon offsetting advertising claims positively impact consumers' brand-related effects and sustainability perception for a brand?*
- *Is there a difference in the impact of the use of carbon offsetting advertising claims for high-emissions versus low-emissions industries, or high-involvement versus low-involvement products?*
- *Does the level of details in carbon offsetting advertising claims impact consumers' brand-related effects and sustainability perception for a brand differently?*

1.3. Expected Contribution

While brands have recognized the need of consumers to engage in social and environmental issues, and more and more companies are bracing carbon offsetting initiatives (Niller, 2020), the effect of communicating carbon offsetting claims in advertisements is still a fairly uncharted area of market communication research. Consequently, there is a need for contributions to the understanding of the role of carbon offsetting in advertising, and in particular, the effects of it on brand and product evaluations. This study aims at bridging this gap and potentially shedding some light on whether the communication of carbon offsetting can contribute positively to brand and sustainability perception effects for brands and companies. Although the study attempts at conducting an early-stage empirical investigation of this subject, and by no means to provide a conclusive answer to the proposed problem area, it aims to provide empirical observations and implications both theoretically and practically.

1.4. Delimitations

Several delimitations due to restrictions in time and scope are worth mentioning. These delimitations have implications for result interpretations and the outcome of the study.

While green marketing is a global phenomenon, this study is delimited to a Swedish advertising context and Swedish-speaking respondents. The reason for that is firstly because Sweden is consistently ranked among the most sustainable countries in the world (Robecosam, 2018) thus making it a valid choice. Secondly, limited resources and access to respondents constrained the study to a single nation sample. Thirdly, while the aim of the thesis is to generalize across different industries, only companies in the travel transportation industries were used in the experiment to facilitate comparison. In order to facilitate comparison and exclude other visual cues that can influence different perceptions for respondents, a single fictional ad design was used for both brands, which in reality use different design approaches for their advertisements, and thus might not be a completely authentic setting for the consumers who are familiar with how the ads of these companies look in reality.

1.5. Definitions

These following concepts will be central and frequently used throughout the study, and explanations of these terms are provided below to aid the readers' comprehension.

Carbon offsetting Programs that implement a measurable avoidance, reduction or sequestration of carbon or greenhouse gases (Polonsky et al., 2010). It can be grouped into four categories: “(1) *biological sequestration* whereby trees are preserved or new trees are planted which absorb carbon; (2) *renewable energy projects* that involve activities that undertake or invest in projects that produce energy without producing carbon (e.g. solar/ wind farms), (3) *energy efficiency* which involves improving energy efficiency, developing environmentally responsible buildings, or switching/funding the switch to long-life light bulbs, and (4) *reduction of non-CO2 emissions* from specific sources (e.g. phasing out greenhouse gases)” (Polonsky et al., 2010, p.50).

Green advertising Any ad that meets one or more of the following criteria: (1) explicitly or implicitly addresses the relationship between a product/service and the biophysical environment, (2) promotes a green lifestyle with or without highlighting a

product/service, and (3) presents a corporate image of environmental responsibility (Banerjee et al., 1995, p.22).

Greenwashing The act of disseminating disinformation (false information to obscure the truth) to consumers regarding the environmental practices of a company or the environmental benefits of a product or service (Baum, 2012).

Low and high involvement products Low involvement products: “products that are relatively cheap, are bought frequently without much consideration, and are low risk” (Ouwersloot & Duncan, 2008)
High involvement products: “products for which people perceive differences among brands and are willing to invest pre-purchase decision-making energy” (Ouwersloot & Duncan, 2008)

Corporate social responsibility Situations where the firm goes beyond compliance and engages in “actions that appear to further some social good, beyond the interests of the firm and that which is required by law” (McWilliams et al., 2006, Khan M.T. et al., 2012)

1.6. Thesis Outline

The thesis consists of main sections: Introduction, Theoretical Framework, Methodology, Results & Analysis, Discussion and Conclusion. In the initial chapter, an introduction to the topic is given with a description of the background, the problem area and purpose of the study and the expected knowledge contribution. In the second chapter, the theoretical framework of relevant theoretical constructs is presented serving as a base for the study, and from this reasoning, the research question is presented and the hypotheses are generated. The third chapter describes the method in terms of ontology, epistemology and research design, survey and experiment design, the main study, and a discussion of the reliability and validity of the study at the end. Subsequently, the fourth chapter presents the results gathered from the quantitative experiment. The fifth chapter follows up with a discussion based on the results. Finally, the last chapter consists of a conclusion, implications, limitations, and suggestions for future research to conclude the study.

2. THEORETICAL FRAMEWORK

In this section, relevant theories which make the base for the generation of the research question and hypotheses are presented. Firstly, theories about brands are presented. Next, theories about storytelling and using stories as a communication tool is shown. Afterward, theories about sustainability and climate compensation are provided, leading to the generation of the research question and relevant hypotheses. At the end of the chapter, an overview and summary of the theory are presented.

2.1. Green advertising and Corporate social responsibility (CSR)

During the past few decades, companies' investments in environmental activities have drawn significant attention from the media and society in general (do Paço & Reis, 2012). As a result, individuals are increasingly concerned about the planet, which has consequently increased levels of environmental awareness and changed the way people live and the products they purchase (do Paço & Reis, 2012). Green consumers' orientation has thus increased interest in the link between marketing, consumer behavior, and the environment (Awad, 2011). Companies can show environmental sensitivity by using several strategies, one of which can be environmental, or green advertising (do Paço & Reis, 2012). Green advertising aims to create awareness and positive attitudes toward environmentally friendly brands and companies (D'Souza & Taghian, 2005) or just simply to inform clients about the environmental aspects of companies' products and services (Pranee, 2010)

The credibility of environmental advertisements is believed to influence consumers' attitudes toward the ad and consequently their purchase intentions to the product (Kim & Damhorst, 1999). A low level of perceived credibility of environmental claims is a significant barrier for environmental purchase decisions (González et al., 2012, do Paço & Reis, 2012). Consumers are prone to "greenwashing", in which a company's actual environmental performance does not match their environmental claims to the public (Delmas & Burbano, 2011) and also are generally skeptical about environmental ads, as their messages can be misleading or confusing (Matthes & Wonneberger, 2014). Therefore, the credibility of environmental claims is an issue that brands must expect to overcome if they use those claims in their ads. Several studies have demonstrated that message framing has a significant influence on message recipients' perceived credibility of the message (Zhang et al., 2019)

Corporate social responsibility (CSR) has become a business imperative as executives are repeatedly informed that their corporations will gain a competitive advantage by managing their CSR communications that might appeal to a growing number of socially-oriented customers (Hamann et al., 2003) While CSR

has been gaining importance and visibility as a public relations tool for companies (Basil & Weber, 2006) the evidence for the financial reward is rather weak (Epstein & Roy, 2003). According to Wang (2008), CSR practices and purchase intention were also not directly related. Consumers may process CSR communications differently and as a result, form attitudes to CSR communications and assess CSR practices differently (Wang & Anderson, 2014)

Research has shown that when marketing communications are presented to consumers, their brand attitudes are likely to be affected by positive assessments of marketing communications (Gammoh et al., 2006), and brand attitude, subsequently, is likely to affect purchase intention (Broniarczyk & Alba, 1994). Also, consumers' assessments of CSR practices must be preceded by the recognition of the existence of CSR practices (Ferrell & Gresham, 1985). Therefore, CSR communications are likely to affect the recognition of CSR practices and the extent to which assessments of those CSR practices impact consumers' brand attitudes (Wang & Anderson, 2014). This is in line with Magee (2019)'s finding that the detail level used in an ad influences how a consumer perceives a CSR-related ad. When an ad presents ambiguous information, both consumers' persuasion knowledge and their environmental worldview influence their attribution of the firm's motives. However, when the ad includes environmental-specific information, consumers' worldview do not influence their attribution of motives. This attribution leads to a corresponding attitude toward the ad and the brand (Magee, 2019). Other authors have suggested that consumers are more likely to support positive communications related to a familiar brand compared to an unfamiliar brand (Dahlén & Lange, 2005). According to Aaker & Keller (1990), consumers also generally indicate favorable attitudes to messages offered by relatively well-liked brands. CSR communications provide consumers attitudinal consistency that can be aligned with consumers' positive brand attitudes (Herr et al., 1991). Therefore, consumers' positive initial brand attitudes should enhance consumers' perceived argument strength of CSR communications.

2.2. Psychological theories

Consumers nowadays are bombarded with a massive amount of marketing messages and this sheer abundance of these messages causes marketers to be increasingly concerned with advertising effectiveness (McKay-Nesbitt et al., 2011) Consequently, researchers exploring advertising effectiveness have identified message framing as a factor contributing to persuasion (Chandran & Menon, 2004). How ad information is presented, or framed, influences consumers' willingness to attend to and remember ad content.

Marketing messages can be framed in various ways (Bagozzi et al., 1999) On a similar note, Rossiter et al. (1991) show that there is no one way in which ads work, but "rather, it depends on the advertising situation: the type of product, the nature of the target audience, and the purchase motivation for buying the brand are

some of the major factors that determine what type of ad will work best” (Rossiter et al., 1991, p.11). For example, rationally-framed messages provide information to persuade through appeals to recipients’ thoughts. Alternatively, emotionally-framed messages attempt to persuade through appeals to emotions, which can be further differentiated in terms of valence: positive or negative (McKay-Nesbitt et al., 2009)

2.2.1. Need for cognition and Elaboration likelihood model

Need for cognition (NFC) is the tendency of an individual to derive intrinsic enjoyment from engaging in effortful information processing (Cacioppo & Petty, 1982). According to Cacioppo et al.’s (1996), in general, higher-NFC individuals can better recall information, think more about substantive arguments in persuasive communication, are less influenced by heuristic message cues, exhibit more positive attitudes toward stimuli requiring thought, and have attitudes that are more predictive of subsequent behavior than lower-NFC individuals. Besides, higher-NFC individuals are expected to find ad appeals containing factual information more appealing and persuasive than messages containing emotional information. They enjoy thinking intrinsically, while lower-NFC individuals tend to avoid cognitive work. High-NFC individuals reported expending more cognitive effort in evaluating messages, and that verbal intelligence and NFC accounted for independent sources of variance in message recall and persuasion (Cacioppo et al., 1992). Similarly, a study by Batra & Stayman (1990) also found that the attitudes of high NFC subjects were more influenced by the cogency of the claims in an ad than those of low NFC individuals.

The elaboration likelihood model (ELM) is a general framework for organizing, categorizing, and understanding the effectiveness of persuasive communications (Petty & Cacioppo, 1984). According to the ELM, persuasion can be characterized as the relative operation of one of two routes to persuasion. Attitude change via the central route is likely when individuals possess both the motivation and ability to evaluate message arguments thoughtfully. In these situations, peoples’ thoughts about the cogency of the issue-relevant information are the primary determinant of persuasion. In contrast, attitude change via the peripheral route occurs when individuals, lacking requisite motivation or the ability to scrutinize message arguments carefully, use some heuristic or cue (e.g. the sheer number of arguments presented) as the primary basis of their judgments (Petty & Cacioppo, 1984).

The NFC theory and ELM theory together are helpful to understand different ways consumers perceive environmental-related advertising, which will be explained shortly in the hypothesis generation.

2.2.2. Theory of reasoned action & theory of planned behavior and their link to green consumption

Researchers have explored what constitutes green consumption behavior, suggesting models that explain how an individual's pro-environmental attitudes and perceptions lead to actions and engagement (Bamberg & Moser, 2007; do Paço et al., 2013). While these individual-level models concern several factors influencing motivation such as awareness, beliefs, values, behavioral control, and knowledge, they all strongly emphasize the role of pro-environmental cognitions (i.e. values, attitudes, beliefs, perceptions (Liu et al., 2017). Individuals with strong environmental attitudes support the idea of interdependence between humanity and the biophysical environment, noting that the current state of the environment is a serious problem and radical changes in people's lifestyles and economic systems are required to prevent further degradation (Banerjee & McKeage, 1994)

The theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) model discusses an individual's motivations as determinants of the probability of engaging in a behavior, emphasizing the link among attitudes, subjective norms, and behavior. Individuals' behaviors are driven by their intention to act, which is influenced by their attitude to this behavior and how their subjective norms (i.e. social influences or what others think one should do) affect their thought patterns (Fishbein & Ajzen, 1975). This means that people's beliefs about the outcomes or attributes of engaging in a certain behavior determine their attitudes, and people who hold strong beliefs that positive outcomes will result from engaging in a certain behavior will have a positive attitude toward that behavior, which increases the likelihood of doing it (Liu et al., 2017)

Researchers have used the TRA to predict green behavior and both attitudes and intentions are significant predictors of green behavior (Liu et al., 2017). A study of Kang et al. (2013) which investigated green textile and apparel consumption demonstrated that individual's beliefs about the results of buying and wearing organic cotton apparel affected their purchase intentions. Also, in a study exploring the effect of three environmental attitude concepts on ecological behavior, including environmental knowledge, environmental values and ecological intentions, Kaiser et al. (1999) found that intentions predicted 75 percent of the variance in general ecological behavior, compared to only 40 percent of environmental knowledge and values.

While the TRA has been used to predict green behavior, other researchers believe it cannot fully explain behavior because different factors may affect behavioral intentions; and thus the theory of planned behavior, an extension of the TRA (Ajzen, 1991), can better predict and explain human behavior (Chen & Hung, 2016). The theory of planned behavior (TPB)'s core argument is that human behavior results from

rational choices which are influenced by “attitude (evaluation of the target behavior), subjective norms (judgment about others’ potential attitude toward the target behavior), and perceived behavioral control (perceived ability of performing the target behavior)” (Chen & Hung, 2016, p.156). The study of Chen & Hung (2016) on factors influencing the acceptance of green products based on the TPB found that “the attitude, perceived behavioral control, environmental consciousness of consumers and the environmental ethics and beliefs of consumers have a significant positive association with their intention to use green products, while the subjective norms consumers and the social impression consumers are positively but not significantly correlated to their intentions towards using green products” (Chen & Hung, 2016, p.155).

2.3. Product involvement level & environmental impact level and their impact to ads

Consumer involvement in a product category is a topic that has been widely studied in research. Ouwersloot & Duncan (2008, p. 104) defined low-involvement products as products that are “relatively cheap, are bought frequently without much consideration, and are low risk” such as “food staples (milk, bread, butter) and utility products (brooms, batteries, detergents, toilet tissue, petrol)”. High-involvement products, on the other hand, are “products for which people perceive differences among brands and are willing to invest pre-purchase decision-making energy” such as cars and computers (Ouwersloot & Duncan, 2008, p. 104). These purchases are typically more expensive and have greater social consequences and are perceived as high risk. While the consideration for purchasing low-involvement products is likely to be “feeling” or “doing”, the majority of people consider purchasing decisions for high-involvement products by “thinking” about them first. (Ouwersloot & Duncan, 2008). These authors explain that considering advertising messages can be described similarly to decision making as requiring different degrees of attention, concentration, and involvement; messages for high and low involvement products also differ: while messages for high-involvement products are likely to be detailed and quality assuring, messages for low-involvement products are likely to emphasize “fun” or “convenience” to stimulate impulsive purchase decisions.

Further, Ouwersloot & Duncan (2008) explain that relevance and risk are two factors driving the degree of involvement. Firstly, relevance is defined as “the extent to which a product is pertinent and connects with a customer’s personal interests” and is the key to determine the level of involvement (Ouwersloot & Duncan, 2008, p.105). For example, if a person needs a new pair of glasses, they would be more receptive to brand messages of this product category than they otherwise would be. Secondly, risk is the other important factor when it comes to high-involvement products and marketing communication messages for them, due to a higher-than-average risk and expense, which motivates customers to evaluate brand choices carefully. These

risks include financial risk, performance risk, physical risk, psychological risk, and social risk. By knowing what kind of risks concern customers most, companies can relate their brands' features and benefits to these risks, design brand messages to minimize the perceived risk, and improve chances of their products being purchased (Ouwersloot & Duncan, 2008)

Besides, Laurent and Kapferer (1985) stated that product involvement level is widely recognized as a major variable relevant to advertising strategy. Rossiter et al. (1991) compared that while in situations where the target audience is highly involved with the purchase decision, ads with multiple, convincing claims may be required; in situations of low purchase involvement (e.g. bathroom tissues) ads with rather "peripheral" content may be the most effective. Similarly, according to the Elaboration Likelihood Model (Petty et al., 1983; Petty and Cacioppo 1984), customers of high involvement products need to be persuaded with strong arguments whereas customers of low involvement do not need such as strong arguments or persuaded to the same extent as high involvement customers.

On another angle related to product type, environmental impact level is also a possible mediator to advertising performance specifically for green products. Kong & Zhang (2014) proved that a green appeal might benefit a product with high environmental impact more than a product with low environmental impact. The reason is because more environmental-related thinking occurs when encountering a green appeal for high environmental impact products than low environmental impact products, thus leading to higher motivations to adopt eco-friendly alternatives for high environmental impact products, and in turn, higher ad attitude and purchase intention (Kong & Zhang, 2014)

2.4. The impact of guilt and pride to environmental advertising

Marketing and advertising practitioners are continually looking for more effective ways to persuade consumers to buy their products and services (Coulter & Pinto, 1995). Advertisers rely on both informational and emotional appeals to help form and change attitudes to convince consumers to purchase (Rossiter et al., 1991). The guilt appeal, one type of emotional appeal, is becoming more popular as a persuasion technique (Edmondson, 1986). Research by Chang and Chen (2010) shows how the guilt appeal can be relevant to CRM and that guilt appeals might not be equally persuasive in all conditions, and could be moderated by product type (hedonic vs. practical vs. both) and donation magnitude (low vs. high). When a guilt appeal is employed, a practical product or a product containing both practical and hedonic value is more effective than a hedonic product for promoting CRM. However, Schneider et al. (2017)'s research challenges pro-environmental messaging strategies that favor inducing negative emotions such as guilt to advocate mitigation behaviors, because while the anticipation of guilt can lead to positive behavior, it can also fall flat or even boomerang, leading to lack of change of behavior or even retaliatory behavior.

Negative moral framing of messages such as guilt appeals might be a threat to a person's self-image and morality, which may result in defensive reactions instead of intended behavioral outcomes (Täuber et al., 2015). Thus, the implication is that inducing a proud anticipating feeling of one's mitigation efforts in the future has a more positive effect on pro-environmental motivation than inducing guilty feeling for inaction (Schneider et al., 2017)

2.5. Willingness to participate in carbon offsetting schemes

Researchers have investigated and analyzed the acceptance and willingness to participate in carbon offset schemes (MacKerron et al., 2009; Van Birgelen et al., 2011; Lu & Shon, 2012). The commonality these authors have reached is that personal goals, desires, and emotions all have a part to play in affecting individuals' intention to participate in carbon offset schemes. Chen (2013) stated that passengers develop a desire to participate when they believe that protecting the environment is the right thing to do; that the positive emotions resulting from anticipating the achievement of goals are an important psychological driving factor during developing personal desires; and that desires have a positive and significant influence on participation intention, which increases with a developing desire to protect the earth and environment. The author emphasized the implication of this finding is that airlines must pay attention to the role of emotive factors, which can play aside from rational appeals. Airlines' environmental communications should be conveyed in a healthy and positive manner and should put emphasis on the psychological states of happiness, pleasure, and contentment brought about by the understanding that individuals' participation in carbon offsetting activities can make up for the damage caused to the environment. These anticipated positive emotions can be used to inspire motivations on the passengers and trigger their attention to participate in carbon offset schemes (Chen, 2013). On a similar note, the work of Van Birgelen et al. (2011) also proved that someone's perception of the contribution of air travel to climate change, as well as the importance of behaving ecologically, was shown to have a significant positive influence on willingness-to-compensate. A significant relationship was also found between self-perception and willingness-to-compensate, that is, air travelers who behave in an environmentally conscious manner in areas other than aviation (e.g. recycling) appear to transfer this behavior to air travel (Van Birgelen et al., 2011). MacKerron et al. (2009) in their study into the willingness to pay (WTP) of private consumers (mostly young people educated to a degree level) for carbon offset schemes found out that respondents were willing to pay substantially more for certified offsets, but only once they were made aware of the existence of certification regimes. This not only confirms the value of verification and certification to consumers but also indicates the likely importance of public awareness or educational programs regarding the success of such regimes (MacKerron et al., 2009). Similarly, Lu & Shon (2012) also stated that if people know nothing about the scheme, or if they believe the scheme is ineffective in reducing aviation carbon emissions, they are

willing to pay less for the offsets. In contrast, if they believe that the scheme results in considerable emissions reductions they are willing to pay more for the offsets.

2.6. Hypothesis generation

Ad credibility

As stated above, message credibility is an issue for companies when communicating environmental claims. Because of the possible skepticism from customers, message framing has a significant influence in order to influence how credible a customer might perceive an ad is. By adding carbon offset claims, especially when the detail level in the ad is high, it is likely to help mitigate the skepticism from consumers and as a result, lead to higher credibility for the ad. This is especially true for high-involvement products since customers considering purchasing these products need to be persuaded with strong arguments and convincing claims (Rossiter et al, 1991; Petty & Cacioppo, 1984). Therefore, the first hypothesis is formed as below.

H1: Ad credibility for carbon-offsetting-communicated ads will be higher than ad credibility for ads with no carbon offsetting.

Memorability

Regarding memorability, there is a lack of research connecting carbon offsetting and its impact on ad memorability. Nevertheless, looking at theory of storytelling, it is clear that storytelling has a positive impact on the memorability of a narrative. According to Fog et al (2010), a brand story consists of the same structure as a traditional story: a message, a conflict, a character, and a plot. Through stimulating visual images in the consumers' minds, they will be more memorable than listed information (Swap et al., 2001). The author considers an explicit claim about the carbon offsetting act and how it will happen (that is, the brand will carbon offset by growing a tree for a specific amount of travel by the passenger, more information found in the Methodology section) an embodiment of storytelling, albeit a short one. This claim can be considered a story as it has a message, two characters (the travel company as the main character and the passenger as a supporting character), a plot (the sequence of consumer travel leading to the act of growing trees), and a conflict (a frequent contributor to carbon emissions acting to mitigate it). Thus, the second hypothesis is generated as below.

H2: Ad memorability for carbon-offsetting-communicated ads will be higher than ad credibility for ads with no carbon offsetting.

Ad and brand effects

Consumers are switching to pro-environmental behaviors and placing greater importance on environmentally friendly purchases (Gleim et al., 2013). According to the Theory of planned behavior (Ajzen, 1991), a higher environmental consciousness of consumers and the environmental ethics and beliefs of consumers have a significant positive association with their intention of using green products (Chen & Hung, 2016). Moreover, CSR communications are likely to affect the recognition of CSR practices and in turn might serve as the basis of brand attitudes (Wang & Anderson, 2014).

For products with high environmental impact, messages with green appeals are likely to have a strong effect (Kong & Zhang, 2014). Kong & Zhang (2014) explained that the mechanisms governing green appeals can be grouped into two categories: affective and cognitive. Affective mechanisms involve feelings and emotions, which in an environmental context includes experiential benefit (customers' satisfaction from believing that they are contributing to social welfare), symbolic benefit (personal feeling that the brand reflects their ideology), and nature-related feelings. Cognitive mechanisms are related to the attitude effects of green positioning strategies and studies prove that in general consumers value products that are perceived as environmentally sound (Kong & Zhang, 2014). By using carbon offsetting messages on ads, it is likely that brands can appeal to two distinct groups of consumers possible to categorize by the Need for Cognition and Elaboration likelihood model. The first group are the consumers with a high need for cognition, who think more about substantive arguments and find ad appeals with factual information more persuasive (Cacioppo et al., 1996), and who are likely to follow a central route to persuasion with the motivation and ability to evaluate arguments thoroughly (Petty & Cacioppo, 1984). The second group are the consumers with lower need for cognition who are likely to follow the peripheral route of persuasion by using heuristics or cues. As the brands provide the first group with the functional message of the environmental contribution the brand makes, and the second group with the affective emotion that the brand will contribute to the benefit of the environment, it is likely to contribute to positive consumers' receptivity to the ads, considering the inducing of a proud anticipating feeling of a possible mitigation effort has a positive effect on pro-environmental motivation (Schneider et al., 2017).

Besides, as mentioned previously, research has suggested that consumers are more likely to support positive communications and indicate favorable attitudes related to a familiar brand compared to an unfamiliar brand (Dahlén & Lange, 2005, Aaker & Keller, 1990). Research has also shown that the ad attitude has a direct effect on brand attitude (Belch & Belch, 2003) and purchase intention (Mitchell & Olson, 1981), therefore, a positive, favorable attitude would likely correlate to positive effects for brand attitude and purchase intention as well. Considering that SJ and SAS, the two companies chosen in the study are familiar brands to the sample used in the study, this effect is likely to be emergent in the study.

From a synthesis of the aforementioned theories, these hypotheses about ad and brand effects are made as follows.

H3: Ad attitude for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting.

H4: Brand attitude for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting.

H5: Purchase intention for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting.

Sustainability perception effects

It has been established that CSR communications are likely to affect the recognition of CSR practices and the extent to which assessments of those CSR practices impact consumers' brand attitudes (Wang & Anderson, 2014). Therefore, the author hypothesizes that when carbon offsetting is communicated, sustainability perception for the brand will be higher.

H6: Sustainability perception for a brand will be higher with carbon offsetting communicated on its ad than without carbon offsetting on its ad.

Differences between industry emissions level and product involvement level

The theories explaining product involvement levels are particularly relevant to how companies selling products in different product involvement levels frame their advertising messages. According to Ouwersloot & Duncan (2008), relevance and risk are two relevant factors when it comes to the degree of involvement. In the context of this study, for a service that has a heavy carbon footprint such as a flight, consumers considering purchasing a flight might perceive a psychological risk knowing that such purchase makes him or her guilty of polluting the environment. This risk can be more pronounced when sustainability and environmental responsibility are of high relevance and closely connect to the consumer's personal interest. This means that companies providing such services should design brand messages with information to help customers minimize the perceived risk (Ouwersloot & Duncan, 2008). This is in line with Rossiter et al. (1991)'s comparison that while in situations where the target audience is highly involved with the purchase decision, ads with multiple, convincing claims may be required; and with the implication of the Elaboration Likelihood Model (Petty et al., 1983; Petty and Cacioppo 1984) that customers of high involvement products need to be persuaded with strong arguments.

For the experiment, an airline company and a railway company are chosen. That is because flight purchases can be considered higher involvement purchases compared to train travel purchases due to a generally

higher level of prices and distances possible to cover. Besides, they differ greatly in terms of industry emissions level. While railway has a minimal carbon footprint, aviation releases a greater amount of emissions from 1.9 to 5.1 times compared to road traffic (Sausen et al., 2005). While multiple theories explain the differences in marketing message framing for high and low-involvement products, there is a lack of research connecting marketing message framing to different industry emissions levels. Nevertheless, these two variables can be interrelated in this study, because a flight is both high-involvement and high-emissions while train travel is both low-involvement and low-emissions. Thus, this likely infer that communication of carbon offsetting will have a greater impact on ads to customers when it is on a flight ad than when it is on a train travel ad.

H7: Carbon offsetting communication has a greater effect on a high-emissions than a low-emissions industry and on a high-involvement than a low-involvement product.

2.7. Summary

In order to give the readers a comprehensive overview of the research questions and hypotheses in the study, Table 1 provides a summary of the research questions and hypotheses generated for the purpose of the thesis.

Research questions		<ul style="list-style-type: none"> • <i>Can exposure to carbon offsetting advertising claims positively impact consumers' brand-related effects and sustainability perception for a brand?</i>
		<ul style="list-style-type: none"> • <i>Is there a difference in the impact of the use of carbon offsetting advertising claims for high-emissions versus low-emissions industries, or high-involvement versus low-involvement products?</i>
		<ul style="list-style-type: none"> • <i>Does the level of details in carbon offsetting advertising claims impact consumers' brand-related effects and sustainability perception for a brand differently?</i>
Hypothesis	Ad credibility & memorability	<i>H1: Ad credibility for carbon-offsetting-communicated ads will be higher than ad credibility for ads with no carbon offsetting.</i>
		<i>H2: Ad memorability for carbon-offsetting-communicated ads will be higher than ad credibility for ads with no carbon offsetting.</i>

Brand-related effects	<i>H3: Ad attitude for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting.</i>
	<i>H4: Brand attitude for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting.</i>
	<i>H5: Purchase intention for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting.</i>
	<i>H6: Sustainability perception for a brand will be higher with carbon offsetting communicated on its ad than without carbon offsetting on its ad.</i>
The role of industry emissions and product involvement level	<i>H7: Carbon offsetting communication has a greater effect on a high-emissions than a low-emissions industry and on a high-involvement than a low-involvement product.</i>

Table 1. Summary of research questions and hypotheses

The theoretical overview figure below provides an overview of independent, dependent variables and mediating variables used for the experiment as well as how they are connected. The use of carbon offsetting advertising claims is the primary independent variable and affects the mediating variables of credibility and memorability, and subsequently, the dependent variables which are brand-related effects and sustainability perception. The industry emission level, the product involvement level, and the detail level in the ad claims are also potential moderating variables that affect the mediating and dependent variables.

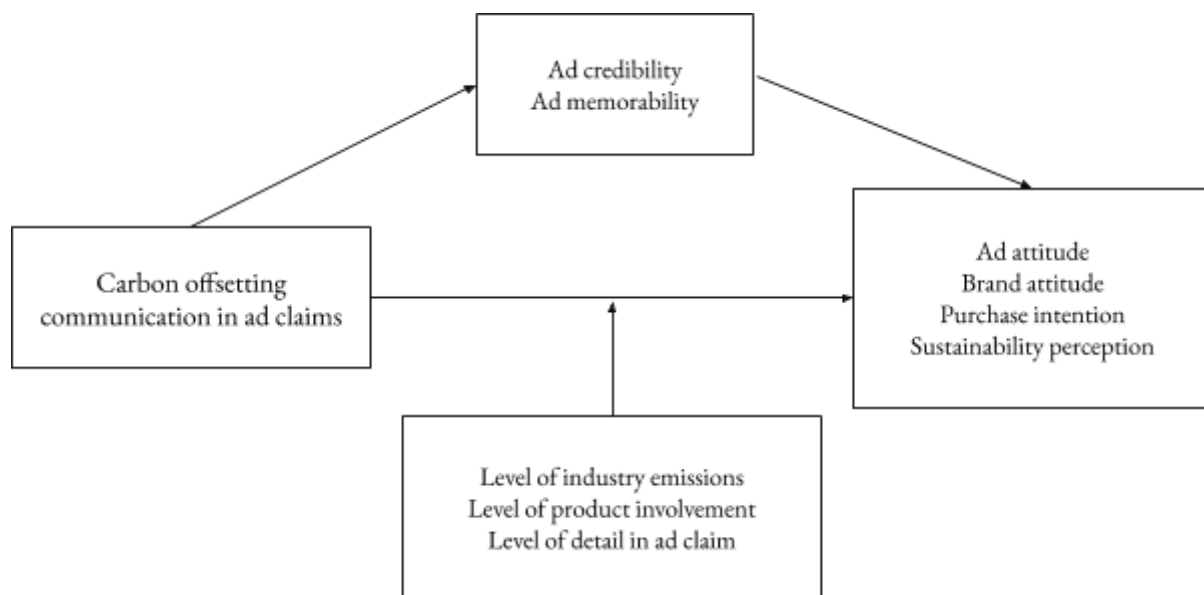


Figure 1. Theoretical overview

3. METHODOLOGY

The chapter describes the methodology of the study, beginning from the chosen scientific approach, a description of the research design and main study design, and finished by a discussion of the reliability and validity of the study.

3.1. Scientific approach

According to Bryman & Bell (2011, p.20), ontology is concerned with the nature of social entities. Its central orientation is questioning “whether social entities can and should be considered objective entities that have a reality external to social actors, or whether they can and should be considered social constructions built up from the perceptions and actions of social actors”. Since this study concerns the impact of the phenomenon of carbon offsetting and the impact of using it in advertisements to consumers’ behaviors, it means the ontological position of objectivism is used. It asserts that social phenomena and their meaning have an existence independent of social actors, implying social phenomena have an existence that is independent or separate from actors (Bryman & Bell, 2011). The study, therefore, follows a positivist epistemological position with the purpose of theory generating hypotheses that can be tested and thus allowing assessment of explanations of laws, and also follows a functionalist research paradigm, which is explained as “the dominant framework for the study of organizations, based on problem-solving orientation which leads to rational explanation” (Bryman & Bell, 2011, p.24).

The thesis is based on deductive research orientation, meaning that “the researcher, based on what is known about a particular domain and of theoretical considerations in relation to that domain, deduces a hypothesis, or hypotheses” (Bryman & Bell, 2011, p.11), following a quantitative research design, and there is a research gap to be empirically tested. The choice of a quantitative research design is because it emphasizes quantification in data collection and analysis, entails a deductive approach, incorporates positivism, and considers social reality as an objective reality (Bryman & Bell, 2011). The point of departure is within theories of consumer behavior and green marketing related to CSR, carbon offsetting, and the use of guilt appeals; and the research gap is to identify whether the communication of carbon offsetting initiatives in advertisements leads to positive brand and sustainability perception effects for brands. Subsequently, relevant hypotheses are generated and tested through data collection, which, in turn, leads to implications for existing theories (Bryman & Bell, 2011).

Causality is part of the thesis’ nature as the author wants to investigate the effects of several independent variables on dependent variables including ad and brand effects and sustainability perception (Bryman &

Bell, 2011) which leads to the choice of a between-subject experimental design for data collection in order to ensure a high level of internal validity. Experiments have been found to help understand phenomena of interest as they allow for a large sample as well as comparisons between groups, thus allowing generalizability and enabling external validation of the study (Bryman & Bell, 2011), in order to meet the purpose of the thesis of finding out the impact of communicating carbon offsetting claims on ads. Respondents were randomly divided into different groups in order to vary between two different kinds of travel transportation services and three levels of carbon offsetting communication, resulting in six groups in total (table 1).

	Low-emission industry	High-emission industry
Company	SJ (railway)	SAS (aviation)
No carbon offsetting (CO)	SJ – no carbon offsetting	SAS – no carbon offsetting
CO – low information level	SJ – CO with a low detail level	SAS – CO with a low detail level
CO – high information level	SJ- CO with a high detail level	SAS – CO with a high detail level

Table 2. Experimental groups

3.2. The main study

3.2.1. Selecting the industry and brands

While the study aims at comparing the impact of carbon offsetting communication between high and low-emission industries, the experiment operationalizes in the travel transportation industry with different natural characteristics: air travel and railway travel. It includes different stimuli and variations used for two different brands considered typical for each category to the Swedish consumers. The reason the travel transportation industry was chosen for the study is because climate change has been a central discussion recently, with air travel being a central contributor and “influencers” such as Greta Thunberg raising their voices up about “flight-shaming” as a means of combating carbon emissions and climate change (Gössling et al., 2019). Meanwhile, railway travel is known for minimal carbon emissions and therefore provides an interesting contrast to air travel as well as enabling the possibility to make comparable advertisements for the experiment. As the study is delimited to the Swedish market, SAS and SJ are chosen as two primary choices for each kind of transportation service because they have a long-standing tradition and familiarity for Swedish customers.

A comparison of two chosen brands' characteristics is given below.

- SAS: Air travel, premium, long-distance travel, international coverage, high carbon emissions
- SJ: Train travel, the monopoly in Sweden, mostly national/local coverage, low carbon emissions

3.2.2. Experimental design

As the purpose of the thesis is to find out whether potentially mediating variables have an effect on consumers' attitudes, perceptions, and intentions, it is concerned with causality (Bryman & Bell, 2011). Consequently, an experimental design was employed as it is the most often used method in causal research (Malhotra, 2010)

The experiment design was configured using six different manipulations. A total of two brands were tested, where each brand has three different versions of the same service. The first original version, which is used for the control group, only states what the service is about, in this case mainly about the daily frequency and the price of the service. The second version is exactly the same as the original version but with an additional phrase with meaning "We do climate compensation for our journeys", as a way of communicating a sustainable initiative. The third version complements the second version by further explicitly mentioning in the added phrase: "We do climate compensation for our journeys – We grow one tree for X kilometers you travel", with X varying between the two different kinds of travel serviced by two different travel industries – flights or trains.

To ensure a high level of internal validity, respondents were assigned one of the six ad versions in a random manner, in which the manipulation variable of the carbon offsetting claims is employed in four out of the six versions. Among these four variants, two are assigned for each brand. Among two variants for each brand, one communicates carbon offsetting on a basic level and one has a higher, more explicit level saying how carbon offsetting is done.

The service advertised was chosen to be the same for both brands to ensure a high level of validity, in this case, travel between Stockholm and Copenhagen as this is a common itinerary purchased by customers of both brands. Additionally, it is a travel route that is in general feasible and common to go with either by taking a train or taking a flight. The utility gained for the traveler would be comparably similar no matter which means they choose: if they choose to take the flight, it takes in total a shorter amount of time, but costs more, while if they choose to take the train, it is slower but the expenses are generally lower. For the simplicity of the study, it is assumed that the frequency and price of two different services are the same, thus

leading to a similar ad appeal. The ad is shown in a portrait format, with the similar plot describing the daily frequency of the service, the price, and the ad appeal, followed by the brand logo at the bottom.

The design of the fictional ads was done in the software Adobe Photoshop and was inspired by real ad designs of SJ to make it as realistic as possible to the respondents. The design for the SAS ad versions also is made similar to the SJ ads with the purpose of making the content of the ad the sole mediator instead of the graphics or design of the ad.

3.2.3. Sampling and data collection

The questionnaire was conducted entirely online with the use of Qualtrics Survey Software and distributed through personal networks. This resulted in 338 responses, of which all were valid and used for final analysis. Indexes were created for different groups of questions in order to capture all aspects of the measured area. In order to determine that the variables can be grouped into indexes Cronbach's Alpha was used. If the indexes' Cronbach Alpha was over 0.7 they would be accepted.

Number of respondents		338		
Respondent gender	Male	Female	Other	
	56.94%	42.78%	0.28%	
Age	18-24	25-34	Older than 34	
	60.91%	33.99%	5.1%	

Table 3. Statistics of main study respondents

For the experimental method chosen, a completely independent random sample is the most critical aspect of the collected data. To do so, respondents were randomly allocated to six different ad versions with the same questions, creating a differing number of respondents for each group, which is inevitable when complete randomization is employed.

3.2.4. The questionnaire

To ensure the validity of the study, the ads were designed to be in Swedish to most resemble real life designs of the companies' ads to the Swedish market. However, the questionnaire was designed to be in English in order to allow non-native Swedish speakers who have been in Sweden for a long time and know the brands

well, like the author, to understand the questions completely and be able to participate. Another reason is to avoid the possibility of translation mistakes from English to Swedish with the author not yet commanding a high level of Swedish. The questionnaire comprised 12 questions and the estimated time to finish was about 3 minutes.

All six versions of the survey contained identical questions. To make it easier for the respondents to answer the questions the low values in the interval scale (1) and negative answers such as “disagree”, “unpleasant” or “bad” were placed to the left, and high values (7) and positive answers such as “agree”, “pleasant” or “good” were placed to the right. Each factor was measured using a 1-7 Likert scale to increase the reliability and significance of the answers (Malhotra, 2010). The design of the ad as a print ad is linked to increasing the credibility of the ad as it resembles the ads normally used by the brands across different advertising channels such as out-of-home or digital channels.

The questions were divided into dependent variables, potentially mediating variables and other questions. For variables consisting of more than one measurement, an analysis was done using Cronbach’s alpha and all were considered high enough, in order to allow these to be computed into a single variable.

Potentially mediating measurements

Ad credibility was measured using a seven-point scale consisting of two items: unconvincing/convincing and unbelievable/believable. The correlation between the two items was 0.612.

Ad memorability was measured using a 1-7 Likert scale from strongly disagree to strongly agree for the statement “I remember a lot about the ad”. (MacInnis & Jaworski, 1989)

Another potentially mediating variable is the industry emissions level, or type of transportation for this specific experiment, which was recoded 1 for SJ and 2 for SAS in SPSS for data analysis.

Dependent measurements

The main dependent variables include ad attitude, brand attitude, purchase intention, and sustainability perception. The first variable was tested on a four-item scale, the second was tested on a two-item scale, the third was tested by a one-item scale, and the fourth was tested using a three-item scale.

Ad attitude was measured using a seven-point scale consisting of four items: good/bad, pleasant/unpleasant, not likable/likable, and favorable/unfavorable (Smith et al., 2007). Averaging the points produced an index with a Cronbach’s alpha of 0.955.

Brand attitude was also measured using a seven-point scale consisting of two items: good/bad and negative/positive (Smith et al., 2007). The correlation between the 2 items is 0.927.

Purchase intention was measured using a 1-7 Likert scale from extremely unlikely to extremely likely for the question “After seeing the ad, how likely is that you would choose this company for your next travel”.

Sustainability perception was measured using a seven-point scale from the first item: not sustainable/sustainable, and a 1-7 Likert scale from strongly disagree to strongly agree for the statements “The service advertised seems sustainable” and “The company seems sustainable” which are another two items. Averaging the points of the three items produced an index with a Cronbach’s alpha of 0.917.

Other measurements

The demographic variables – gender and age – were measured to give an overview of the survey respondents.

The questionnaire contained several more measurements than the ones used for the main analysis and are not presented to facilitate the reading of the thesis. The full questionnaire can be found in the Appendix.

3.3. Data Quality

In order to ensure proper data quality, reliability and validity are the two most important variables (Bryman & Bell, 2011). Therefore, these two concepts have been taken into consideration throughout the entire study.

3.3.1. Reliability

Reliability in a quantitative research design is dependent on the executed experiment. It is about the consistency of measure and is concerned with making results that are replicable by a second study and that the experiment is implemented in the right way so that the results are correct. It can be divided into two different constructs: internal and external (Bryman & Bell, 2011)

Internal

Internal reliability means the match of theoretical development with the researcher’s findings, also the strength of the study. It involves whether scales or indexes in the study are interrelated, and is often very closely connected to Cronbach’s alpha, which measures “the average of all possible split-half reliability coefficients” (Bryman & Bell, 2011)

To check for this, Cronbach's alpha was used to investigate the possibility of combining indexes. To achieve internal reliability, only values at or higher than 0.7 were accepted and thus can be considered good measurements (Bryman & Bell, 2011). With generally high results, the internal reliability of the experiment should be considered good.

External

External reliability refers to the extent to which a study can be replicated (Bryman & Bell, 2011). In order to ensure this, the questionnaires were sent to and answered by respondents during different times for a period of 12 days.

3.3.2. Validity

Validity refers to the extent to which the study truly examines what it aims to measure and that the conclusion can be drawn accurately (Bryman & Bell, 2011)

Internal

Internal validity is concerned about if there is truly a causal relationship between the dependent variable and the observed effects of the independent variables. While there may be a correlation, there is not always a causal relationship, which could give a test low validity (Bryman & Bell, 2011). The author has adopted measures in the questionnaire from previous studies which have been proven by other researchers before.

It is ensured that the research experiment design exposes the stimuli to respondents before the measurement of dependent variables in order to ensure a high level of internal validity. Besides, all questions in the study are measured on a 7-point differential scale with bipolar labels to increase validity (Bryman & Bell, 2011)

External

External validity is concerned with the possibility of generalizing the findings of the research to other contexts (Bryman & Bell, 2011). That means the results can be generalized into other areas and the sample is representative for the larger population. Using a convenient sampling, e.g. a business school student doing research at his or her business school for the sake of convenience can affect the results of the study since it is not guaranteed that this sample is representative. One way of creating high external validity is to have a large sample as when the sample size increases the precision does as well (Bryman & Bell, 2011). In order to achieve that, the questionnaire was sent to the author's personal connections in Sweden on social media (Facebook and LinkedIn) and also to all current SSE students' emails. As the final sample size is relatively large (338 respondents in total and minimum 53 respondents for each manipulation) and that only a

significance level of minimum 5% is supported, the external validity can be considered good. Besides, as Zhang et al. (2019) pointed out that carbon offsetters tend to be those who are younger, with higher education and income levels and that the promotion of carbon offsetting schemes could focus more on this niche market, the sample used should be a valid choice.

3.4. Analytical tools

The collected data was analyzed using the statistical computer program IBM SPSS Statistics after being directly transferred from Qualtrics. This direct transfer rules out the possibility of human error in this step. In order to minimize the inclusion of erroneous responses, only wholly completed responses were chosen and used for the analysis and non-complete responses were disregarded. A significance level of 5% was used for all tests.

4. RESULTS AND ANALYSIS

4.1. Hypothesis testing

4.1.1. *Ad credibility and memorability*

Hypotheses 1-2 state that climate compensation communication will generate positive effects on the dependent ad credibility and ad memorability variables, compared to ads without it.

Ad credibility

To test the first hypothesis of industry emissions level and the level of carbon offsetting communication on the dependent variables of ad credibility, a two-way ANOVA was performed with ad credibility as the dependent variable, and emission/involvement level and carbon offsetting communication level as the two factors. Afterwards, a Scheffe post-hoc test was conducted. The descriptive statistics are presented below.

Ad credibility				
Emission/ involvement level	Carbon offsetting level	Mean	Std. dev.	N
Low (SJ)	None	4.82	1.48	56
	Low	4.64	1.38	55
	High	4.64	1.43	57
High (SAS)	None	4.73	1.45	63
	Low	4.84	1.34	55
	High	4.19	1.70	53

Table 4. Descriptive statistics of ad credibility divided by emission/involvement level of brands and carbon offsetting level on ads.

The overall results show no significant main effect of emission/involvement level of brands ($F = 0.566$, $p = 0.45$, partial eta squared = 0.002), no significant effect of carbon offsetting level ($F = 2.409$, $p = 0.131$,

partial eta squared = 0.012) and no significant interaction effect ($F = 1.359$, $p = 0.25$, partial eta squared = 0.008).

A Scheffe's post-hoc test was also done to test if the ad attitude effects differ depending on different levels of carbon offsetting. The results show no significant differences between the none and low carbon offsetting level ($p = 0.99$), between the none and high levels ($p = 0.20$) or the low and high levels ($p = 0.26$). Since there are no significant differences observed among the different carbon offsetting levels, the hypothesis *H1: Ad credibility for carbon offsetting communicated ads will be higher for ads with no carbon offsetting*, is not supported.

H1: Ad credibility for carbon offsetting communicated ads will be higher for ads with no carbon offsetting – NOT SUPPORTED

Ad memorability

To test the second hypothesis of industry emission/involvement level and the level of carbon offsetting communication on the dependent variables of ad memorability, a two-way ANOVA was performed with ad memorability as the dependent variable, and industry emission/involvement level and carbon offsetting communication level as the two factors. Afterwards, a Scheffe post-hoc test was conducted. The descriptive statistics are presented below.

Ad memorability				
Emission/ involvement level	Carbon offsetting level	Mean	Std. dev.	N
Low (SJ)	None	5.91	0.94	56
	Low	5.27	1.35	55
	High	5.46	1.33	57
High (SAS)	None	5.08	1.68	63
	Low	5.49	1.37	55
	High	5.36	1.52	53

Table 5. Descriptive statistics of ad memorability divided by emission/involvement level of brands and carbon offsetting level on ads.

The overall results show no significant main effect of emission/involvement level of brands ($F = 2.452$, $p = 0.12$, partial eta squared = 0.007), no significant effect of carbon offsetting level ($F = 0.21$, $p = 0.81$, partial eta squared = 0.001) and no significant interaction effect ($F = 4.31$, $p = 0.14$, partial eta squared = 0.025).

A Scheffe's post-hoc test was also done to test if the ad memorability effects differ depending on different levels of carbon offsetting. The results show no significant differences between the none and low carbon offsetting level ($p = 0.89$), between the none and high levels ($p = 0.94$) or the low and high levels ($p = 0.99$). Since there are no significant differences observed among the different carbon offsetting levels, the hypothesis *H2: Ad memorability for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting*, is not supported.

H2: Ad memorability for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting
– NOT SUPPORTED

4.1.2. Ad and brand-related effects

It was hypothesized in hypotheses 3-5 that climate compensation communication will generate positive effects on the dependent variables ad attitude, brand attitude, and purchase intention, compared to ads without it.

Four two-way ANOVA tests were conducted to test the effects of different ad versions and of different emission/involvement levels of brands to the respective dependent variables. Levene's tests were used to indicate that the assumption of homogeneity of variance was met for all groups.

Ad attitude

To test the third hypothesis of industry emissions level and the level of carbon offsetting communication on the dependent variables of ad attitude, a two-way ANOVA was performed with ad attitude as the dependent variable, and industry emission/involvement level and carbon offsetting communication level as the two factors. Further, a Scheffe post-hoc test was conducted. The descriptive statistics are presented below.

Ad attitude

Emission/ involvement level	Carbon offsetting level	Mean	Std. dev.	N
Low (SJ)	None	4.28	1.71	56
	Low	4.17	1.58	55
	High	4.04	1.56	57
High (SAS)	None	3.81	1.59	63
	Low	4.08	1.57	55
	High	3.53	1.63	53

Table 6. Descriptive statistics of ad attitude divided by emission level of brands and carbon offsetting level on ads.

The overall results show a significant main effect of emission/involvement level of brands ($F = 4.079$, $p = 0.044$, partial eta squared = 0.023) but no significant effect of carbon offsetting level ($F = 1.318$, $p = 0.269$, partial eta squared = 0.008) and no significant interaction effect ($F = 0.579$, $p = 0.561$, partial eta squared = 0.003).

A Scheffe's post-hoc test was also done to test if the ad attitude effects differ depending on different levels of carbon offsetting. The results show no significant differences between the none and low carbon offsetting level ($p = 0.908$), between the none and high levels ($p = 0.548$) or the low and high levels ($p = 0.322$). Since there are no significant differences observed among the different carbon offsetting levels, the hypothesis *H3: Ad attitude for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting*, is not supported.

H3: Ad attitude for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting. – NOT SUPPORTED

Brand attitude

To test the fourth hypothesis of industry emissions/involvement level and the level of carbon offsetting communication on the dependent variables of brand attitude, a two-way ANOVA was performed with brand attitude as the dependent variable, and industry emissions/involvement level and carbon offsetting

communication level as the two factors. Afterwards, a Scheffe post-hoc test was conducted. The descriptive statistics are presented below.

Brand attitude				
Emission/ involvement level	Carbon offsetting level	Mean	Std. dev.	N
Low (SJ)	None	4.90	1.42	56
	Low	4.64	1.38	55
	High	4.56	1.33	57
High (SAS)	None	4.38	1.42	63
	Low	4.60	1.38	55
	High	4.20	1.31	53

Table 7. Descriptive statistics of brand attitude divided by emission/involvement level of brands and carbon offsetting level on ads.

The overall results show a significant main effect of emission/involvement level of brands ($F = 4.209$, $p = 0.041$, partial eta squared = 0.012) but no significant effect of carbon offsetting level ($F = 1.277$, $p = 0.28$, partial eta squared = 0.008) and no significant interaction effect ($F = 0.914$, $p = 0.402$, partial eta squared = 0.005).

A Scheffe's post-hoc test was also done to test if the brand attitude effects differ depending on different levels of carbon offsetting. The results show no significant differences between the none and low carbon offsetting level ($p = 1.00$), between the none and high levels ($p = 0.42$) or the low and high levels ($p = 0.431$). Since there are no significant differences observed among the different carbon offsetting levels, the hypothesis *H4: Brand attitude for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting*, is not supported.

H4: Brand attitude for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting – NOT SUPPORTED

Purchase intention

To test the fifth hypothesis of industry emissions/involvement level and the level of carbon offsetting communication on the dependent variables of purchase intention, a two-way ANOVA was performed with purchase intention as the dependent variable, and industry emissions level and carbon offsetting communication level as the two factors. Afterwards, a Scheffe post-hoc test was conducted. The descriptive statistics are presented below.

Purchase intention				
Emission/ involvement level	Carbon offsetting level	Mean	Std. dev.	N
Low (SJ)	None	5.62	1.29	56
	Low	5.13	1.32	55
	High	5.26	1.44	57
High (SAS)	None	5.05	1.41	63
	Low	5.13	1.44	55
	High	4.89	1.49	53

Table 8. Descriptive statistics of purchasing intention divided by emission/involvement level of brands and carbon offsetting level on ads.

The overall results show a significant main effect of emission level of brands ($F = 4.358$, $p = 0.038$, partial eta squared = 0.026) but no significant effect of carbon offsetting level ($F = 1.125$, $p = 0.326$, partial eta squared = 0.007) and no significant interaction effect ($F = 1.241$, $p = 0.29$, partial eta squared = 0.007).

A Scheffe's post-hoc test was also done to test if the purchase intention effects differ depending on different levels of carbon offsetting. The results show no significant differences between the none and low carbon offsetting level ($p = 0.58$), between the none and high levels ($p = 0.44$) or the low and high levels ($p = 0.97$). Since there are no significant differences observed among the different carbon offsetting levels, the hypothesis *H5: Purchase intention for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting*, is not supported.

H5: Purchase intention for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting – NOT SUPPORTED

4.1.3. Brand sustainability perception effect

To test the sixth hypothesis of industry emissions/involvement level and the level of carbon offsetting communication on the dependent variables of sustainability perception, a two-way ANOVA was performed with sustainability perception as the dependent variable, and industry emissions/involvement level and carbon offsetting communication level as the two factors. Afterwards, a Scheffe post-hoc test was conducted. The descriptive statistics are presented below.

Sustainability perception				
Emission/ involvement level	Carbon offsetting level	Mean	Std. dev.	N
Low (SJ)	None	4.90	1.40	56
	Low	4.76	1.47	55
	High	4.91	1.28	57
High (SAS)	None	2.98	1.19	63
	Low	3.10	1.17	55
	High	3.16	1.39	53

Table 9. Descriptive statistics of sustainability perception divided by emission/involvement level of brands and carbon offsetting level on ads.

The overall results show a significant main effect of emission level of brands ($F = 154.62$, $p = 0.000$, partial eta squared = 0.317) but no significant effect of carbon offsetting level ($F = 0.243$, $p = 0.784$, partial eta squared = 0.001) and no significant interaction effect ($F = 0.276$, $p = 0.76$, partial eta squared = 0.002).

A Scheffe's post-hoc test was also done to test if the sustainability perception effects differ depending on different levels of carbon offsetting. The results show no significant differences between the none and low carbon offsetting level ($p = 0.97$), between the none and high levels ($p = 0.56$) or the low and high levels ($p = 0.72$).

Since there are no significant differences observed among the different carbon offsetting levels, the hypothesis *H6: Sustainability perception for a brand will be higher with carbon-offsetting-communicated on its ad than without carbon offsetting on its ad*, is not supported.

H6: Sustainability perception for a brand will be higher with carbon-offsetting-communicated on its ad than without carbon offsetting on its ad. – NOT SUPPORTED

4.1.4. The role of the industry emissions level and product involvement level

It was hypothesized that the type of industry emissions level or product involvement level, which are represented by two different transportation services in this experiment, would play a role in the effect of carbon offsetting communication on ads for respective companies. In this study SJ and SAS were chosen as two typical representatives of the train travel and air travel industry.

In the hypothesis tests conducted above, it can be observed that the industry emissions level did not have any significant effects on all dependent variables considered: ad attitude, brand attitude, purchase intention, and sustainability perception. Therefore, the hypothesis *H7: Carbon offsetting communication has a greater effect on a high-emissions than a low-emissions industry and on a high-involvement than a low-involvement product*, is not supported.

H7: Carbon offsetting communication has a greater effect on a high-emissions than a low-emissions industry and on a high-involvement than a low-involvement product - NOT SUPPORTED

4.2. Additional test for the sustainability-conscious group

After observing the results of the hypothesis testing, considering previous literature showing that different consciousness of sustainability and CSR practices lead to different attitudes and intentions for different consumers, the author conducted another test to analyze whether there is a significant effect among the respondents who were specifically sustainability-conscious. This is also in line with the previous finding that “those purchasing voluntary carbon offsetting tend towards an ecocentric worldview and share a number of characteristics with those who adopt pro-environmental behavior” (Mair, 2011, p.227). An index called “Sustainability consciousness” was made from responses from the two questions that ask respondents to choose an answer that resonate to them the most: “Do sustainable initiatives influence your purchase intentions of a brand” and “Do sustainable initiatives influence your purchase intentions of a travel transportation service”, which produced responses from a 1-7 Likert scale. The correlation between the two items was 0.773 and deemed valid to make an index on. Only respondents who gave responses with a means

from 4 above were considered for this additional test, considering that they are generally conscious about sustainability and it is a factor that influences their purchase intentions.

After selecting these special cases and conducting all the same tests as above, the results are the same as before. No significant effects could be found across all dependent variables. Due to space constraints and in order to aid the easy readability of the thesis, detailed reporting results of this additional test are not provided here. Thus, it is concluded that there is no difference in the effects observed between the sustainability-conscious group and the rest of the group.

4.3. Summary of results

The table below summarizes the results of the hypothesis testing.

Ad credibility & memorability	<i>H1: Ad credibility for carbon-offsetting-communicated ads will be higher than ad credibility for ads with no carbon offsetting.</i>	NOT SUPPORTED
	<i>H2: Ad memorability for carbon-offsetting-communicated ads will be higher than ad credibility for ads with no carbon offsetting.</i>	NOT SUPPORTED
Brand-related effects	<i>H3: Ad attitude carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting.</i>	NOT SUPPORTED
	<i>H4: Brand attitude carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting.</i>	NOT SUPPORTED
	<i>H5: Purchase intention for carbon-offsetting-communicated ads will be higher for ads with no carbon offsetting.</i>	NOT SUPPORTED
	<i>H6: Sustainability perception for a brand will be higher with carbon offsetting communicated on its ad than without carbon offsetting on its ad.</i>	NOT SUPPORTED
The role of industry emissions and product involvement level	<i>H7: Carbon offsetting communication has a greater effect on a high-emissions than a low-emissions industry and on a high-involvement than a low-involvement product.</i>	NOT SUPPORTED

Table 9. Summary of hypothesis test results

5. DISCUSSION

In this section, a comprehensive overview of the results presented above is provided together with a discussion of how the findings relate to theory. Based on hypothesis testing, the findings concerning the brand-related effects and then the findings regarding sustainability perception are discussed. Since no significant effect was found, the findings open possibilities to discuss aspects of carbon offsetting to provide possible explanations for why the results became as they did.

While it was hypothesized based on relevant previous research that the communication of carbon offsetting in advertisements would have a significant positive effect on consumers' ad attitude, brand intentions, and sustainability perception, the results proved otherwise. Thus, further investigation into literature review of the underlying factors that can impede green consumption is done in order to find explanations for the findings.

5.1. The potential impact of “greenwashing” and ad skepticism

While firms globally have identified the need to develop products that minimize their environmental impact, and at the same time targeting consumers who increasingly become environmentally aware (Ginsberg & Bloom, 2004), consumers are also seeking to modify their behavior and become more responsible. In some cases people are making significant changes to their behavior, such as using public transportation or alternative transportation modes (e.g. riding bicycles), or they may be simply integrating environmental criteria in their normal purchases without making radical changes to their life, such as choosing reusable shopping bags rather than plastic bags (Polonsky et al., 2010). Polonsky et al. (2010) also noted that changes in behavior, whether they are governmental, corporate or consumer, rely on making purchases while assessing environmental information and choosing the least harmful alternatives, which is particularly true for consumers who are often bombarded with messages about environmentally harmful products. More importantly, any environmental information needs to be in a form that consumers can actually understand and assess if they are to act upon it. This is where there is an increasing difficulty, as in many cases, there is no agreement on the environmental “facts” associated with all issues (Polonsky et al., 2010).

The way in which information about carbon offsets is presented is complicated by the fact that there are multiple carbon offset schemes applied globally. Kollmus et al. (2008) showed that a study by the World Wildlife Federation identified at least ten major carbon offset schemes, each established by different bodies with different sets of criteria. With no uniform, accepted standards for carbon offset-related claims and a

number of divergent scientific opinions and definitions, it is difficult for consumers to interpret these claims, especially considering the scientific complexity associated with the technologies involved. The use of terms such as “environmentally friendly” or “sustainable” is usually hard to verify by consumers even if they have used the product or service (Carlson et al., 1993). Even though vague claims, emotional cues or fabricated promises are not unique for green advertising (Naderer et al., 2017), the dissemination of misleading information about ecological issues may affect the way the global environmental crisis problem is dealt with (Kilbourne, 1995) and obvious greenwashing has a negative effect on consumers’ trust (do Paço, Reis, 2012). This outcome could have a negative impact on the purchase intentions of legitimate green products, consequently damaging a crucial aspect of dealing with the environmental crisis (Kilbourne, 1995)

There has been evidence suggesting that individuals negatively evaluate advertised brands when they mistrust companies’ environmental efforts. Additional information about companies’ environmental efforts in advertising has been found to decrease consumers’ attitudes to advertising and purchase intentions when a company’s actual environmental performance is low; while when no additional information about companies’ environmental efforts was presented, the same advertised product and brand was evaluated favorably (Nyilasy et al., 2014). Related to trust, ad skepticism also has been widely studied in relation to green marketing: consumers consider green advertising as vague or misleading (Fowler & Close, 2012), consumers are skeptical of green claims (Sheehan & Atkinson, 2012), and the use of the functional green ad triggers negative emotions such as untruthful or misleading, leading to ad skepticism (Mo et al., 2018)

Thus, this might be one possible explanation of why there were no positive brand-related and purchase intention effects in the study. Consumers might have been conscious of the emission footprint of the aviation company represented and therefore the additional information about carbon offsetting in the ad, paradoxically, did not enhance their perception of the company.

5.2. Consumers’ environmental involvement

Another issue that could have been playing a part in the results is consumer’s environmental involvement. Research on the moderating role of environmental involvement is scarce and there is not yet a single consensus on the topic. Parguel et al. (2015) noted that consumer’s involvement with the issues relating to the advertisement has to be taken into account to entirely understand consumers’ responses to an advertising message. Highly involved green consumers have long been considered as particularly skeptical (do Paço & Reis, 2012) and the more pro-environment a consumer’s worldview is, the greater the likelihood that that consumer would attribute self-interested motives to a firm’s reforestation project, or CSR

initiatives in general (Magee, 2019). If this is actually always true, it can possibly help explain why the use of carbon offsetting messages in the ads did not result in a significantly positive effect for the study's respondents, who are based in Sweden and thus likely to be pro-environment, highly involved green consumers, considering Sweden is consistently well-known as one of the most sustainable countries in the world (Robecosam, 2018). What happened could have been linked to respondents' skepticism in the ad and possible attribution to companies' self-interested motives, especially considering airline companies' notoriety as a big polluter (Gössling et al., 2017). A related study of Grankvist et al. (2004) conducted in Sweden also discovered only a weak correlation between environmental concerns and the choice of green products with eco-labels, echoing other previous studies with the same finding. The authors stated that a possible reason could be that while some consumers might pay attention to eco-labels when choosing products, that attention is not strong enough to make them pay for eco-label alternatives.

However, other findings have proved otherwise. Matthes et al. (2014) found that the mere association of a brand with textual or visual green claims led to more favorable brand associations among highly involved individuals, no matter whether the ad presented objective factual information about the brand's greenness or solely contained visual green cues.

As it was discovered after the additional analysis that how important sustainability perception is to consumers when they make purchasing decisions did not impact differences in perceiving carbon offsetting ad messages, it is further consolidated that how consumers' environmental involvement links to green marketing ads is still a question open to further investigations.

5.3. Consumers' expertise related to carbon offsetting

Previous research into barriers of green consumption has identified that expertise plays a significant role in green purchasing decisions and that it is a significant impediment regardless of a consumer's innate personal orientation (Gleim et al., 2013). These authors further explained that the reason why it deters the purchase of green products is because if the consumers' expertise about green products is high, they would understand the impact of a single purchase, why prices are higher, and what makes them environmentally friendly. Considering that carbon offsetting is still a relatively unclear and ambiguous phenomenon to consumers, meaning the expertise of consumers regarding it is still low; it was possible that the amount of information provided in the ads was not enough to create expertise at a high enough level for consumers to consider purchasing the product. Scholars have discussed the role of companies in creating expertise for consumers, which involves stimulating an awareness of green products by detailed verbal informational messages, educating consumers about the benefits of green products, and building trust with consumers

(Gleim et al., 2013). Thus, the result from the study is a possible result from, and also can attest by, the fact that just a simple message on an ad about such an ambiguous and even controversial topic as carbon offsetting is not enough for companies to persuade consumers to buy the product.

5.4. The use of imageries as peripheral cues

Another potentially mediating variable that the author did not consider for the experiment was the use of nature-evoking images. A study by Schmuck et al. (2018) also found that vague claims can even promote brand attitudes when they are combined with pleasing nature imagery, which activated feelings compared to those experienced in real nature, and as a result, consumers do not recognize disinformation through vague claims, but even experienced a positive effect on their attitudinal outcomes. In their study of the “executional greenwashing” effect, which is defined as the use of nature-evoking elements in advertisements to artificially enhance a brand’s ecological image, Parguel et al. (2015) pointed out that a sole focus on the content of the advertising message may not be sufficient to understand consumers’ responses to it. Even though according to the ELM, knowledgeable consumers’ “superior elaborative ability” should allow them to correctly process and interpret product-related assertions without relying on peripheral cues (Alba & Hutchinson, 1991, p.5), the authors discovered in their study that nature-evoking executional cues can influence consumers, regardless of their level of knowledge: simple nature-evoking images enhanced a brand’s ecological image among consumers with low environmental knowledge, and also among those with high expertise although to a lesser degree. Considering that the fictional ads did not employ any nature-evoking imagery in the ads and only employed a functional advertising message with the carbon offsetting claims, even if the majority of respondents are high-knowledge consumers who typically follow a central route to persuasion, the use of nature-evoking imagery could have made the effects more significant. The fact that the size of the carbon offsetting message was relatively small could also have played a part and some respondents might not have noticed it.

6. CONCLUSION

In this section, the main conclusions are summarized, based on the discussion of the empirical findings above. Furthermore, the key theoretical contributions and managerial implications based on the study's findings are outlined. Lastly, the limitations of the study and suggestions for future research are presented.

6.1. Summary

The fundamental motivation of this study was derived from the ongoing prevalence of carbon offsetting programs used by companies globally, most notably aviation companies as well as companies in the fast-moving consumer goods industry, as a way to tackle the climate change and global warming problem. Based on the empirical experiment, the purpose of the study was to investigate whether using carbon offsetting claims in an ad would positively affect the ad credibility, ad memorability and ad attitude, brand attitude, purchase intention and sustainability perception of customers for companies; whether this outcome differs between industry emissions level, namely high or low, or between product involvement level, namely high or low; and whether this outcome differs between different detail levels in the ad claim. Further, the study additionally explored whether these effects are different specifically for the sustainability-conscious consumers. In order to fulfill the aforementioned purpose, these three research questions were formulated, which will be answered below.

- *Can exposure to carbon offsetting advertising claims positively impact consumers' brand-related effects and sustainability perception for a brand?*

Firstly, the overarching result of the research is that the use of carbon-offsetting claims in ads did not have a significant effect on all dependent variables including ad credibility, ad memorability, ad attitude, brand attitude, purchase intention as well as sustainability perception.

- *Is there a difference in the impact of the use of carbon offsetting advertising claims for high-emissions versus low-emissions industries, or high-involvement versus low-involvement products?*

Furthermore, the results indicated no significant difference between using carbon offsetting claims in ads for high-emissions industries compared to low-emissions industries; as well as for high-involvement products compared to low-involvement products.

- *Does the level of details in carbon offsetting advertising claims impact consumers' brand-related effects and sustainability perception for a brand differently?*

Last but not least, there was also no difference between using a high versus low level of information in the carbon offsetting claim.

In short, the implication is that there are no significant benefits of using carbon-offsetting claims for companies in their advertisements and that carbon offsetting should not be treated as a prominent marketing tool for companies and brands, and that marketers need to be careful so that they effectively communicate information in a meaningful way to consumers. Nevertheless, the results should be viewed tentatively and it should not be generalized that using carbon-offsetting claims does not lead to any positive brand effects such as ad attitude, brand attitude and purchase intention or sustainability perception. There are several factors that could have potentially influenced the results in the study as discussed in the Discussion section above, as well as will be discussed further in the Limitations section below.

6.2. Theoretical contribution

This study has contributed to the research of using carbon offsetting claims as a marketing communication tool by investigating using it on different storytelling levels as well as across different industry emissions levels. By doing so, the study aims to fill the research gap of whether using carbon offsetting claims in ads lead to positive brand and sustainability-related effects, which is absent in current literature. While existing literature might have suggested that the use of carbon offsetting can be a positive initiative for companies within CSR, especially companies with a high emissions footprint such as airline companies; the empirical results demonstrated that it does not have a significant influence yet in a marketing perspective.

This study's results also can act as an indication to support previous findings of consumers' high skepticism towards green marketing, and that green marketing does not provide a linear correlation to positive brand-related effects for consumers, despite alarming concerns toward environmental issues and a growing adoption of a more sustainable way of living for consumers globally.

6.3. Managerial implications

As for managerial implications, the strongest implication managers can derive from this study is that carbon offsetting is not a strong marketing communication tool and does not translate directly into positive advertising effectiveness results irrespective of how a carbon offsetting message is framed. The reason is that the consumers did not show any significant positive effects after being exposed to an ad with a carbon offsetting claim on it compared to an ad without such a claim, irrespective of whether it was general or detailed, or whether it is from a high-emission company or a low-emission company. Greenwashing is a real phenomenon that is linked to higher skepticism for consumers towards the portrayal of sustainable

initiatives and environmental efforts through marketing channels, both when these initiatives are disinformation or when these are things that responsible companies actually do. Carbon offsetting schemes have been regarded with relatively low credibility, low transparency and subject to frequent criticism in the mainstream media, thus making it a likely case of greenwashing to many consumers.

In order to decrease the skepticism of consumers for carbon offsetting claims, the results of the study are in line with suggestions from previous research that companies should increase the effectiveness and transparency of the communication of their carbon offsetting efforts to consumers. They should educate customers in a friendly, understandable and transparent manner about how the consumers can offset, how the company will offset, why it should be done, and what are the environmental outcomes of the offset. This is in line with suggestions from Chen (2013) regarding the promotion of carbon offset schemes that environmental communications should be conveyed in a healthy and positive manner, and put more emphasis on the positive psychological states brought about by the understanding that individuals' participation in carbon offsetting activities can make up for the damage caused to the environment, which is useful to trigger passengers' intention to participate in carbon offset schemes. Multiple studies have confirmed the correlation between environmental consciousness to green purchasing behavior and emphasized companies' roles in educating consumers to increase environmental awareness (Magee, 2019; Chen & Wu, 2014). To continue building consumers' trust in carbon offset schemes, it is not enough for companies just to educate customers about what these schemes are about, but they should also inform consumers about the actual offset outcomes. Also, companies responsible for carbon offsetting projects should come to an agreement of common definitions and standards on how they deliver their projects, for easy understanding and interpretation for consumers.

Another implication for high-emissions industries such as the airline industry is that using carbon offsetting is not a shortcut for the consumers to consider the company a sustainable, or environmentally responsible brand. The "flight shame" movement and the CORSIA emission mitigation agreement, which is going to make carbon offsetting an aviation standard, make the environmental responsibility of airline companies higher than ever and carbon offsetting is going to be a given standard, instead of a voluntary action, for both airline companies which participate in the agreement and consumers of those companies. It is likely that the more companies participate in that agreement, the less the impact of using a carbon offsetting claim in the ad is, since it is becoming more a standard and less an unique selling point. In other words, carbon offsetting is reaching a mature stage with consumers becoming used to it and questioning whether it really works, or is just a hype, or even do not understand what it really means. This puts a stronger responsibility on companies to make carbon offsetting really work and educate consumers about it, or risk consumers considering it greenwashing and do not care about it at all.

6.4. Limitations

The first limitation concerns the generalizability of the findings. As the study is put in a Swedish context, with Swedish brands, ads in Swedish and Swedish-speaking respondents, the conclusions are primarily applicable to a Swedish context and generalizations to other samples beyond similar geographic markets should be treated with caution, even though it was noted that the sample used was representative of potential target customers for carbon offsetting schemes. Thus, it is possible that conducting the study among another sample geographically or demographically could have resulted in a different outcome.

The second limitation is the design used in the ad concerning the carbon offsetting claims. With the intention to make the ads for both brands look similar to each other, the overall design of the ads were inspired by current ads of SJ which has a clean, minimal look, without imageries. As stated in the Methodology section, the reasoning behind this intention was to make the carbon offsetting claims and the company itself the only independent variables instead of any visual differences related to design. However, as typical ads from SAS have a totally different look, making the ad for SAS look similar to an SJ ad might have caused the respondents to be doubtful about the ad and possibly negatively influenced the ad attitude. Besides, it is a possibility if the carbon offsetting claims were made more visually outstanding to the respondents, the results could have been different. For example, the font size could have been bigger, or some kinds of nature-evoking imagery as discussed above could have been used as emotive cues to support the claims and possibly that could have made the effects on respondents more substantial. Using a pre-test to test whether the respondents recognized the desired signals and reacted differently to the ads could have motivated revisions for the experiment stimuli, potentially leading to other results.

The third limitation concerns the difficulty in generating conclusions from experimental tasks that consist of a fictive ad concerning a single travel destination. Due to time and scope limitations, the experiment design consisted of a shared travel destination for both the train and air travel options. It is likely that the results can be different if the ads would concern a trip between cities that have a greater distance between them (e.g. from Stockholm to London or Paris). According to Gössling et al. (2019), participation for carbon offsetting programs is suggested to be higher for short-haul flights compared to long-haul flights, which subsequently suggested that a more expansive experiment with various distances of the journeys could have contributed to more significant insights.

Last but not least, another limitation is the communication channel used for the experiment. The channel employed was a still ad, which can be considered a print ad or digital ad, for easy distribution. As many consumers are still unclear or skeptical of how carbon offsetting works, a more interactive advertising

channel such as a video commercial or an animated banner could possibly have delivered the information about carbon offsetting better to the consumers.

6.5. Suggestions for future research

First of all, the author would suggest that a replicating study will help to validate the results. Due to time limitations, it was not possible for the author to test the hypotheses on more than one occasion, which can help to generalize the findings. Also, echoing the limitations above, future research can investigate the effect of ads with carbon offsetting in other samples geographically or demographically different from the sample used in this study, as well as employ journeys covering various distances as opposed to one single distance as employed in this study.

The second suggestion for future research would be to include other industries outside of the travel transportation industry, or of aviation which has been almost the only industry making headlines for carbon offsetting discussions. For example, the fast-moving consumer goods industry is one another industry that has been adapting carbon offsetting in product packaging and thus can be a potential choice.

Last but not least, it might also be interesting and insightful to consider adapting visual nature-evoking imagery used in the carbon offsetting ads to support the claims, or to use positive, emotive ad appeals targeting consumers' emotions which can lead to a more significant effect. Another related suggestion is considering another medium to convey and communicate the ad message, such as a short film or a TV commercial, as discussed in the Limitations above.

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8. APPENDIX

8.1. Ad design

The designs for the 6 versions of the ad are presented below. SAS ads are presented first and SJ ads are presented second. The order is from no to low and high levels of carbon offsetting.

**Sthlm-Köpenhamn
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från 300kr.**

Sthlm-Köpenhamn 16 avgångar varje dag.

Med frekventa flygresor dagligen blir resor till Köpenhamn
lika enkelt som vardagspendling i Stockholm.
Köp din biljett på sas.se



SAS - No carbon offsetting communication

**Sthlm-Köpenhamn
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från 300kr.**

Sthlm-Köpenhamn 16 avgångar varje dag.

Med frekventa flygresor dagligen blir resor till Köpenhamn
lika enkelt som vardagspendling i Stockholm.

Köp din biljett på sas.se

Vi klimatkompenserar på våra flygresor.



SAS - Low carbon offsetting communication

**Sthlm-Köpenhamn
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Sthlm-Köpenhamn
från 300kr.**

Sthlm-Köpenhamn 16 avgångar varje dag.

Med frekventa flygresor dagligen blir resor till Köpenhamn
lika enkelt som vardagspendling i Stockholm.

Köp din biljett på sas.se

Vi klimatkompenserar på våra flygresor - Vi planterar

1 träd för varje 100 km du reser.



SAS - High carbon offsetting communication

**Sthlm-Köpenhamn
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Sthlm-Köpenhamn
från 300kr.**

Sthlm-Köpenhamn 16 avgångar varje dag.

Med frekventa tågresor dagligen blir resor till Köpenhamn
lika enkelt som vardagspendling i Stockholm.
Köp din biljett på [sj.se](https://www.sj.se)



SJ - No carbon offsetting communication

**Sthlm-Köpenhamn
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Sthlm-Köpenhamn
från 300kr.**

Sthlm-Köpenhamn 16 avgångar varje dag.

Med frekventa tågresor dagligen blir resor till Köpenhamn

lika enkelt som vardagspendling i Stockholm.

Köp din biljett på sj.se

Vi klimatkompenserar på våra tågresor.



SJ - Low carbon offsetting communication

**Sthlm-Köpenhamn
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Sthlm-Köpenhamn
från 300kr.**

Sthlm-Köpenhamn 16 avgångar varje dag.

Med frekventa tågresor dagligen blir resor till Köpenhamn lika enkelt som vardagspendling i Stockholm.

Köp din biljett på sj.se

Vi klimatkompenserar på våra tågresor - Vi planterar 1 träd för varje 10km du reser.



SJ - High carbon offsetting communication

8.2. Survey design

Hi! I am a student writing my thesis in the field of marketing and advertising for the Master in Business & Management program at the Stockholm School of Economics. For data collection of my thesis, I kindly ask you to participate in my study regarding advertisement which will take approximately only 3 minutes to complete.

I would recommend that you complete the survey on your computer or tablet, but you are of course welcome to do so on the mobile as well. All responses will remain anonymous.

I value your input greatly and appreciate you taking the time to complete the survey. Thank you for your participation!

To begin with the survey, please take a look at the ad below. Read the whole ad and pay attention to all aspects shown regarding the content of the ad - the majority of questions in the survey are going to relate to it.

**Sthlm-Köpenhamn
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från 300kr.**

Sthlm-Köpenhamn 16 avgångar varje dag.
Med frekventa tågresor dagligen blir resor till Köpenhamn
lika enkelt som vardagspendling i Stockholm.
Köp din biljett på sj.se



My impression of the ad is

Bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Good
Unpleasant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Pleasant
Not likable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Likable
Unfavorable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Favorable
Hard to understand	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Easy to understand
Unconvincing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Convincing
Unbelievable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Believable

How sustainable do you think the company shown is?

Not sustainable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Sustainable
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How well do you know this company?

Not at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Very well
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My general impression of the company after watching the ad is...

Bad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Good
Negative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Positive

Before seeing the ad, how likely is that...

	Extremely unlikely	Moderately unlikely	Slightly unlikely	Neither likely nor unlikely	Slightly likely	Moderately likely	Extremely likely
... you would choose this company for your next travel?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
... you would recommend this company to someone?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please choose the level that you resonate to the most about the questions below.

	Definitely not	Mostly not	Probably not	Might or might not	Probably yes	Mostly yes	Definitely yes
Do you feel that the content of the ad align with your perception of the company?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Did your perception of how sustainable the company is change after seeing the ad?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do sustainable initiatives influence your purchase intentions of a brand or company?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do sustainable initiatives influence your purchase intentions of a travel transportation service?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate how much you agree with each of the following statements.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
It is easy to understand the ad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I remember a lot about the ad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The service advertised seems sustainable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The company seems sustainable	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoyed seeing the ad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The content of the ad was attractive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What is your age?

Under 18

18 - 24

25 - 34

35 - 44

45 - 54

55 - 64

65 - 74

75 - 84

85 or older

What is your gender?

Male

Female

Other

That is the end of the survey. Thank you very much for your participation!