Designing Effective Environmental Corporate Social Responsibility Messages: Communication Strategies in the Automotive Industry

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Master's Thesis
June 24 2025

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ABSTRACT

As more companies invest in environmental corporate social responsibility (CSR), increasing attention has been given to how to effectively communicate their environmental CSR efforts. However, limited research has focused on how to enhance message credibility and brand attitude through environmental CSR communication. To fill this gap, this study investigates how the use of gain–loss message framing and the presence or absence of third-party environmental certification can affect perceived message credibility and brand attitude in automotive environmental CSR messages. The automotive industry was chosen because environmental CSR is especially important in this sector. Additionally, this study examines whether perceived message credibility serves as a mediator between gain-loss message framing, third-party environmental certification, and brand attitude.

This study used a quantitative online experimental survey, collecting data from 200 participants to test the hypotheses and answer the research question. The findings show that only gain-framed environmental CSR messages can result in a more positive brand attitude, while message framing did not affect perceived message credibility. Additionally, the presence of third-party environmental certification did not lead to changes in perceived message credibility or brand attitude. Although message credibility did not mediate the effect of gain-loss message framing and third-party environmental certification on brand attitude, it was found that message credibility can positively affect brand attitude.

The findings of this study confirmed the positive effect of gain-framed messages in environmental CSR communication. Future studies can further explore the effects of gain-loss message framing on different variables. Regarding the non-significant effect of third-party environmental certification, the issue may be that this study only focused on the visual presentation of the certification logo. Future research could test whether the results change when additional explanatory context about the third-party environmental certification is provided.

KEYWORDS: *environment CSR, environment CSR communication, gain-loss message framing, third-party environmental certification, message credibility, brand attitude*

Word count: 13389

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1. Introduction

In recent years, companies have paid growing attention to societal and environmental problems, and they show this attention by engaging in corporate social responsibility (CSR) initiatives (Lončar et al., 2018, p. 287). Taking CSR initiatives has become one of the main criteria for assessing successful companies (Lončar et al., 2018, p. 287). Companies tend to believe that engaging in CSR is beneficial for them to build competitive advantages and also supports their sustainable development (Ramesh et al., 2018, p. 377). Within the broader realm of CSR, environmental CSR has gained increasing recognition. As Kim et al. (2022) pointed out, environmental CSR has become the core CSR initiative for many companies today (p. 455). Part of the reason for this is that consumers are now more inclined to choose environmentally friendly products and services (Kim et al., 2022, p. 455).

Environmental CSR is of critical importance for the automotive industry. As Post et al. (2011) highlighted, environmental CSR is vital for companies with high carbon dioxide emissions (p. 191). The production and use of automobiles result in significant carbon dioxide emissions and environmental pollution, which emphasizes the importance of environmental CSR. Automotive companies have increasingly become aware of the critical role of environmental CSR and have made it the main focus of their CSR efforts (Chandrasekaran, 2022, p. 10). However, despite their effort in investing in environmental CSR activities, these companies still face challenges in effectively communicating these efforts. The first challenge, as mentioned, lies in the heavy pollution caused by the automotive industry. It is difficult for consumers to believe in these companies' environmental commitments when they themselves are a major contributor to environmental problems. The second challenge lies in the automotive industry's history of greenwashing scandal. One notable example is the 2015 Volkswagen scandal, when the company publicly announced it was taking environmental responsibility and aiming to contribute to a better environment while secretly violating the emission standards (Majláth & Ricordel, 2021, p. 30). This kind of incident further erodes the message credibility of automotive companies and also leads to negative consumer brand attitude.

However, in environmental CSR communication, it is essential to ensure the credibility of a company's message and to communicate it effectively in order to foster positive brand attitudes. As Du et al. (2010) emphasize, skepticism towards the credibility of CSR messages from stakeholders is the main obstacle for companies to achieve the full return on CSR investments (p. 17). When consumers doubt the credibility of a company's CSR claims, they are less likely to engage with the company's green claim or make purchases

from the company (Rahman et al., 2015, p. 1068). Nyilasy et al. (2013) also found that the skepticism consumers have towards one brand can significantly affect their attitude toward the brand (p. 703). Brand attitude is the core factor of branding (Rossiter, 2014, p. 534). Marketers consistently strive to improve brand attitude in order to build long-term consumer loyalty (Rossiter, 2014, p. 538). As a result, strengthening the credibility of environmental messages and forming positive brand attitudes have become essential priorities for automotive companies.

Therefore, this study focuses on strategies aimed at improving perceived message credibility and fostering positive brand attitudes, specifically the use of gain-loss message framing and the presence or absence of third-party environmental certification. Gain-loss message framing is a key concept in persuasive communication, but its role in environmental CSR communication remains underexplored. Researchers have called for further investigation into its application in this context (Kim & Chon, 2022, p. 765). Previous studies on message framing have shown that emphasizing either the benefits of engaging in a behavior or the costs of not engaging in it can affect the persuasiveness of the message (Harrington & Kerr, 2016, p. 131). Su and Li (2022) confirmed that the use of gain-loss message frames can affect consumers' willingness to pay more for environmentally responsible hotels (p. 713). Likewise, Decrinis et al. (2023) found that gain-loss message framing was more effective than normative and emotional message framing in influencing employees' willingness to choose electric vehicles (p. 5660). These findings show the potential of using gain–loss message framing in automotive companies' environmental CSR messages. However, the effectiveness of gain-loss message framing, particularly in enhancing message credibility and brand attitudes, remains underinvestigated.

A similar gap lies in the use of third-party environmental certification in environmental CSR communication. Kim and Ferguson (2016) advised companies to include third-party endorsements in their CSR messages to enhance message effectiveness, as consumers expect companies to do so (p. 563). Moreover, Park and Brorson (2005) conducted interviews with company representatives and found that the primary reason most companies apply for third-party environmental certification is their expectation that such certifications will enhance the credibility of their environmental messages (p. 1099). However, the effects of third-party environmental certification in the context of environmental CSR communication remain underexplored. Not to mention, in recent years, automotive companies have also been investing a great deal of effort in pursuing third-party environmental certifications as part of their broader sustainable development strategies. Yet,

the actual impact of these certifications on perceived message credibility and brand attitudes remains unclear. Therefore, this study aims to address these gaps with the following research question: *How do message framing (gain vs. loss) and third-party environmental certification (present vs. absent) in automotive brands' environmental CSR messages influence perceived message credibility and brand attitude?*

1.1 Academic Relevance

This study has academic relevance in several ways. First, this study focuses on two specific message design elements: gain-loss message framing and third-party environmental certification. It investigates how these two elements influence perceived message credibility and brand attitude. By doing so, this study offers insights that help deepen the understanding of environmental CSR communication, especially in terms of message design. As Kim et al. (2022, p. 450) emphasized, researchers need to better understand whether, why, and how particular types of green messages can be used in environmental CSR communication, and what types of green messages can be viewed as credible enough to overcome consumer skepticism (p. 450).

Second, even though the existing literature acknowledges the importance of perceived message credibility and brand attitude in CSR communication, very few studies have explored the potential relationship between these two. This study investigates whether perceived message credibility mediates the effects of gain–loss message framing and third-party environmental certification on brand attitudes. This could also help enrich the CSR communication literature, particularly highlight the importance of message credibility.

Third, this study further contributes to the understanding of gain-loss message framing by examining its effects within the context of environmental CSR and across different dependent variables, such as perceived message credibility and brand attitude. This research design allows for deeper insights into the effectiveness and generalizability of gain-loss message framing.

Fourth, this study also helps strengthen the understanding of third-party environmental certification. While most existing studies focus on the benefits of obtaining such certification (Brach et al., 2017, p. 260; Wang et al., 2016, p. 192; Xu et al., 2018, p. 956), few have experimentally tested how the presence versus absence of these certifications influences perceived message credibility and brand attitudes. Thus, by conducting this research, this study provides insights into the impact of third-party environmental certification in environmental CSR communication. Moreover, research on third-party

environmental certification in the automotive industry remains limited. By focusing on this sector, the present study deepens understanding of the role of these certifications across different industries and enhances the generalizability of previous findings on third-party environmental certification.

1.2 Societal Relevance

Except for academic relevance, this study also has societal relevance. First, it highlights the importance of effectively environmental CSR communication for companies. As Schmeltz (2012) noted, sometimes companies may avoid communicating their CSR initiatives, either because they feel uncomfortable communicating their CSR efforts themselves or they underestimate the key function of communication (p. 30). However, this study, by testing how different communication elements influence consumer perception, shows companies that they may benefit from their environmental CSR efforts by communicating these efforts effectively.

Second, this study offers practical and evidence-based suggestions for companies that aim to improve their environmental CSR communication. As Christis and Wang (2021) pointed out, nowadays when companies communicate their environmental CSR initiatives, they have to carefully balance the relationship between gaining credibility and avoiding skepticism (p. 14). By testing the effect of gain-loss message framing and the presence or absence of third-party environmental certification, this study provides actionable plans for companies to follow in order to improve message credibility and foster positive brand attitudes.

Last, the findings of this study can be particularly valuable for automotive companies, as it focuses on the automotive industry. Some automotive companies have already obtained third-party environmental certifications, such as BMW earning ISO 14001 certification (BMW Group, 2020, p. 66), while others are still trying to obtain one. However, these automotive companies may remain unclear about the functions of third-party environmental certifications and how to effectively use them. This study addresses these concerns and offers solutions for these companies.

2. Theoretical framework

This chapter aims to lay the theoretical foundation for this study. To do so, the research background and key concepts are first addressed and explained with reference to theory and previous research. Then, based on previous research findings, connections between key concepts are made to develop hypotheses.

2.1 Environmental CSR and Environmental CSR communication

Environmental CSR is a major pillar of CSR (Yin et al., 2021, p. 3). It refers to the integration of environmental management awareness into a company's products, facilities, and activities, aiming to minimize the impact of company operations on the environment (Yin et al., 2021, p. 3). Environmental CSR can also be viewed as a strategic tool for companies to reduce their environmental footprint and promote sustainability efforts (Christis & Wang, 2021, p. 3). Green manufacturing serves as an effective way for companies to promote environmental CSR activities (Yin et al., 2021, p. 9).

Research shows that taking part in environmental CSR activities can bring benefits to corporations. Khojastehpour and Johns (2014) found that engaging in environmental CSR activities helps build up corporations' reputations and has positive effects on profitability. Companies that successfully balance environmental CSR efforts with corporate performance can gain a sustainable competitive advantage (p. 335). However, failure to address environmental CSR issues can easily damage a company's reputation (p. 335). Chuang and Huang (2016) also emphasized that corporations should not treat doing environmental CSR as an extra cost or obstacle (p. 1105). On the contrary, doing environmental CSR helps enhance a company's competitiveness (Chuang & Huang, 2016, p. 1105). They suggest that environmental thinking should be embedded in companies' core values and included in their long-term promises in order to build a strong and environmentally responsible corporate image (Chuang & Huang, 2016, p. 1106).

Beyond the general focus on environmental CSR, recent years have seen studies specifically addressing environmental CSR communication. Murillo-Avalos et al. (2020) explored how large corporations share environmental CSR information. They found that the most frequently reported environmental categories were emissions and energy (p. 162). However, their results also revealed that 56.12% of environmental indicators were not shared by large companies in their environmental CSR communications (p. 165). The greatest gaps in reporting were found in the categories of biodiversity, environmental grievance mechanisms, and effluents and waste (Murillo-Avalos et al., 2020, p. 165). Ineffective

communication of environmental CSR can carry serious consequences. Aji and Sutikno (2015) found that when companies fail to communicate their environmental CSR efforts effectively, consumers may perceive these actions as greenwashing (p. 433). This perception is associated with increased confusion, skepticism, and perceived risk, and also lowering consumer trust in the company's environmental claims (Aji & Sutikno, 2015, p. 454).

A few studies have also examined which types of environmental CSR messages are more effective. Schmeltz (2012) investigated what type of CSR communication young people prefer and found that youngsters are more likely to respond positively to CSR messages that are direct and transparent, rather than the subtle, indirect communication style that some companies tend to use (p. 44). When evaluating corporate CSR behaviors, young people are also more likely to assess them based on competence-based values rather than ethical considerations, and their evaluations are also influenced by their personal values (p. 45). Nyilasy et al. (2013) discovered that communicating companies' environmental CSR messages through paid advertisements can have negative consequences, especially for companies with weak environmental performance (p. 702). When companies with poor environmental records advertise their environmental efforts, consumers tend to view this behavior as self-interested and perceive the motives behind these advertisements as insincere and opportunistic (Nyilasy et al., 2013, pp. 702–703). Christis and Wang (2021) examined the impact of environmental CSR message design on consumer perceptions. Their findings indicated that environmental CSR messages presenting consistent information and understating the company's actual environmental actions tend to generate more favorable consumer responses than messages that exaggerate the company's efforts (p. 10).

Both Nyilasy et al. (2013) and Christis and Wang (2021) call for more research on environmental CSR communication, as current studies in this area remain limited (Christis & Wang, 2021, p. 15; Nyilasy et al., 2013, p. 704). Therefore, this study focuses on how message framing and third-party environmental certification influence consumers' perceived message credibility and brand attitude in automotive environmental CSR communication, thereby contributing to the literature on environmental CSR communication.

2.2 Message Credibility

Message credibility refers to an individual's assessment of the truthfulness of message content (Appelman & Sundar, 2015, p. 63). Rosenthal (1971) found "verifiability" is the primary linguistic factor affects message credibility (p. 400). Their study also found The specificity of the message directly affects message credibility (p. 400). Precise and verifiable

messages are perceived as more credible, while vague or ambiguous language suggests a lack of clearly defined beliefs (Rosenthal, 1971, p. 401). Additionally, Nedelcu and Blaban (2021) emphasize that message credibility is not only affected by message structure and content but also by its delivery, such as whether the communication style is persuasive enough (p. 48). Message credibility plays a fundamental role in communication as it significantly affects the impactfulness of the message (Wathen & Burkell, 2001, p. 134). Once consumers view the message as credible, the credibility of the message can affect their following behavior. For example, Nedelcu and Blaban's (2021) research showed that perceived high credibility messages can significantly increase participants' willingness to discuss it with friends (p. 55).

In the CSR domain, message credibility depends on how people cognitively assess the credibility of the CSR message and how much they trust it (Boukes & LaMarre, 2021, p. 5). Marschlich and Hurtado (2025) also concluded that the credibility of a company's CSR message depends on how truthful and authentic individuals perceive the message to be (p. 7). How companies communicate their environmental CSR messages can affect the perceived message credibility. Kang and Atkinson (2019) found that when hotels emphasized specific positive outcomes they had already achieved through their CSR efforts, consumers were more likely to perceive the message as credible and to view the hotel as genuinely committed to serving the public interest (p. 242). Similarly, Kim et al. (2022) found that narrative-framed CSR messages, which use a storytelling strategy to communicate CSR, can enhance message credibility and lead consumers to make more positive comments (p. 455). Their research also shows that, to enhance CSR message credibility, companies should avoid vague or general statements and instead communicate with specific and concrete facts (Kim et al., 2022, p. 456). Supporting this idea, Wathen and Burkell (2001) found that messages backed by specific data and examples are perceived as more credible (p. 136). Besides message characteristics, individual characteristics also play a role in affecting message credibility. If the message receiver already tends to accept the message, they are more likely to view the message as credible (Wathen & Burkell, 2001, p. 140). Kang and Atkinson's (2019) study on corporate environmental CSR communication also found that individuals with high environmental concern are more likely to perceive the message as credible and trust the company's environmental CSR activities (p. 239).

Based on the above content, even though the importance of message credibility in communication has been addressed, more studies are still needed to test how consumers' perceived message credibility can be affected through message design in the context of environmental CSR communication.

2.3 Brand Attitude

Brand attitude refers to a generally lasting and one-dimensional evaluative judgment that consumers have toward a brand (Spears & Singh, 2004, p. 55). It differs from feelings toward the brand, which tend to be more temporary (Spears & Singh, 2004, p. 55). Ramesh et al. (2018) also view brand attitude as the overall judgment consumers form towards a brand (p. 379). Brand attitude can be either positive or negative, depending on how much consumers know about the brand and the overall experience they have had with it (Ramesh et al., 2018, p. 384). Consumers' current attitudes toward a brand's name and logo can influence their overall brand attitude, and the brand attitude they form may also change over time (Foroudi, 2018, p. 272). Lee et al.'s (2017) research also found that consumers' brand attitude can be affected by their perception of the brand advertisements (p. 1024). Both advertisement value and advertising attitude have a positive impact on brand attitude (Lee et al., 2017, p. 1024). A positive brand attitude can be a valuable asset for companies, as it encourages consumer purchase behavior and plays a key role in brand communication (Percy & Rossiter, 1992, p. 266). Kim et al. (2019) found that brand attitude predicts consumer brand preference (p. 12). Ko and Chiu (2008) also revealed that brand attitude directly influences consumer satisfaction, with more positive brand attitudes associated with higher satisfaction levels (p. 91).

In the realm of CSR, increasing attention has been paid to the role of brand attitude. Ramesh et al. (2018) found that there was a positive direct relationship between CSR and brand attitude (p. 381). When consumers believe that a company's CSR is the right thing to do and see the company genuinely involved in its CSR activities, they tend to develop a positive attitude towards the brand (Ramesh et al., 2018, p. 383). Ferrell et al. (2018) also found consumers' reactions to a company's CSR efforts can significantly strengthen their brand attitude. They suggest that when a company gets involved in unethical behavior, CSR may be used as a tool to help improve brand attitude (p. 498). Besides that, research also shows that the fit between a corporation and its CSR activities significantly affects brand attitude, higher CSR fit leads to a more positive brand attitude (Kim & Lee, 2019, p. 6). The same applies to authenticity, the more authentic consumers perceive a brand's CSR efforts to be, the more positive their brand attitude becomes (Kim & Lee, 2019, p. 6). In addition, environmental CSR communication can also influence brand attitude. Nabivi's (2025) study, which focuses on the relationship between brand attitude and brands' social media posts, found that the amount of information, the entertainment value, and the perceived relevance of

posts all significantly affect brand attitude (p. 12). More informative, entertaining, and personally relevant posts lead to a more positive brand attitude (Nabivi, 2025, p. 12). Similarly, Yan et al. (2010) found that the explicitness of environmental CSR messages plays an important role in shaping brand attitude (p. 162). When brands clearly communicate information related to their green products, consumers are more likely to develop a positive brand attitude (Yan et al., 2010, p. 162).

Despite the growing research interest in brand attitude, further studies are still needed to explore how it can be influenced by a company's environmental CSR messages through different message designs.

2.4 Gain-Loss Message Framing

Gain–loss message framing originated from Prospect Theory, developed by Kahneman and Tversky (1979, p. 274). They found that under risk, when presenting the same problem to individuals but describing the outcome in different ways, either in terms of gains or losses, it can affect their decision-making (Kahneman & Tversky, 1979, p. 274; Tversky & Kahneman, 1981, p. 453). According to Prospect Theory, when evaluating options, people make decisions based on psychological principles (Tversky & Kahneman, 1981, p. 453). They tend to think in terms of potential gains (receiving the positive outcome) and losses (avoiding the negative consequence), and form judgments based on how outcomes differ from a reference point rather than on the actual result (Levy, 1992, p. 171). Therefore, when the same problem is framed in different ways to highlight the possible gain or loss, it can affect their psychological responses and lead them to make different judgments (Tversky & Kahneman, 1981, p. 453). People are generally less likely to take risks when exposed to a gain-framed message and more likely to take risks with a loss-framed message (Levy, 1992, p. 171).

Based on Prospect Theory, research has found that gain-framed messages tend to be more effective than loss-framed messages in encouraging individuals to engage in prevention behaviours. Latimer et al. (2008) found that gain-framed messages can help boost their participants' self-efficacy and make them participate more in physical activities to prevent illness than loss-framed messages (p. 677). Similarly, O'Keefe and Jensen (2007) conducted a meta-analytic review of 93 studies and found that gain-framed messages are more persuasive than loss-framed messages in dental disease prevention messages (p. 633). Gain-framed messages have also been found to be more effective in communicating climate change messages that aim to prevent the climate from worsening. Two studies conducted by Morton

et al. (2010) showed that gain-framed messages, by highlighting possible positive outcomes, can make their participants more likely to believe in the effectiveness of actions to prevent climate worsening (p. 108). This perception of effectiveness, in turn, makes them more likely to act (Morton et al., 2010, p. 108). In contrast, loss-framed messages, which highlight possible losses, may trigger negativity, causing people to doubt the effectiveness of the actions and be less willing to act (Morton et al., 2010, p. 108).

Although few studies have focused on gain-loss message framing in environmental CSR, based on the above findings and the fact that environmental CSR activities mainly involve actions companies take to prevent environmental conditions from worsening, these actions can be viewed as prevention behaviors. Therefore, gain-framed messages are also expected to be more effective in the environmental CSR context.

Building on this, regarding perceived message credibility, previous research also shows that gain-framed messages are perceived as more credible than loss-framed messages. Cordero-Gutiérrez et al. (2023) found that when communicating a company's CSR activities, gain-framed messages are perceived as more credible because they highlight the activities' positive consequences and trigger positive associations, whereas loss-framed messages trigger only negative associations and fail to enhance perceived credibility (p. 541). Besides that, they also found that gain-framed messages can evoke participants' happiness, and the evoked happiness further strengthens the perceived credibility of the message (p. 541). Borah and Xiao's (2018) research on messages aimed at promoting physical exercise among university students also found that their participants viewed gain-framed messages as more credible than loss-framed messages (p. 403). They explain this is because loss-framed messages can evoke negative emotions, which can lead to psychological resistance and thus lower the perceived message credibility (Borah & Xiao, 2018, p. 404). Therefore, based on the above information, the following hypothesis is made:

H1: A gain-framed environmental CSR message from an automotive brand will lead to higher perceived message credibility compared to a loss-framed message.

The use of gain-loss message framing might also affect brand attitude. Stadlthanner et al. (2022) found that a gain-framed CSR message evokes hope, whereas a loss-framed CSR message evokes guilt, however, only hope positively influences attitudes toward the company (p. 792). When guilt is generated, people tend to think they have done something morally wrong (Lazarus, 1991, as cited in Stadlthanner et al., 2022, p. 791), which may explain why guilt failed to improve consumer attitudes toward the company. Cho and Sands (2011)

reported that when exposed to a loss-framed message, their participants perceived a higher threat to freedom compared to a gain-framed message (p. 6). Perceived threats to freedom showed significant connections to anger (Cho & Sands, 2011, p. 6). However, anger cannot result in positive brand attitudes, which also suggests that gain-framed messages are more likely to result in positive brand attitudes. Moreover, it was found that when communicating climate change messages to farmers, gain-framed messages can generate more favorable attitudes toward climate change actions compared to loss-framed messages (Ngo et al., 2022, p. 8). Therefore, based on the above information, the following hypothesis is made:

H2: A gain-framed environmental CSR message from an automotive brand will result in a more positive brand attitude compared to a loss-framed message.

2.5 Third-party Environmental Certification

An environment certification can be defined as "a voluntary procedure that sets, assesses, monitors, and gives written assurance that a business, product, process, service, or management system conforms to a specific requirement" (Geerts, 2014, p. 87). When a manufacturer certifies its own environmental claims, the certification is viewed as "manufacturer's self-certification" or "first-party certification" (Sivapalan et al., 2024, p. 1558). However, if an independent organization, such as a government or non-governmental organization, certifies the manufacturer's environmental claims, then this certification can be regarded as a third-party environmental certification (Sivapalan et al., 2024, p. 1558). According to Font (2002), third-party environmental certification can be regarded as a more formal recognition to demonstrate environmental commitment, as it requires verification by an independent third party and provides related technical advice (p. 198). Moreover, these certifications can only be acquired through repeated assessments, with standards that evolve gradually (Font, 2002, p. 198). Therefore, companies that earned third-party environmental certifications like ISO 14001 can demonstrate to consumers that their production processes meet green requirements and are sustainable and environmentally friendly (Wang et al., 2016, p. 190).

There are very few studies focusing on the effect of third-party environmental certification in the context of environmental CSR, but research in other areas has found that the presence of such certifications tends to bring benefits to companies. Brach et al. (2017) found that consumers showed higher purchase intention toward sustainable products with third-party environmental certification compared to those without it (p. 260). Their research also revealed that, compared to other types of products, sustainable products without third-

party environmental certification can face higher financial and performance risks (Brach et al., 2017, p. 260). Similarly, Wang et al. (2016) pointed out that the presence of such certification can amplify the persuasive effect of product information related to energy and material savings on clients, increasing their likelihood of purchasing the product (p. 192). In addition, Xu et al. (2018) found that exporting companies in developing countries tend to have information asymmetry with their clients in developed countries regarding the environmental claims made by these companies, as it is difficult for the clients to verify such information (Xu et al., 2018, p. 956). The presence of third-party environmental certification can help reduce this information asymmetry and enhance the legitimacy of the products for clients (Xu et al., 2018, p. 956).

In terms of perceived message credibility, previous academic findings suggest that the presence of third-party environmental certification may help enhance credibility. Marschlich and Hurtado (2025) found external CSR certifications can enhance the credibility of CSR communication (p. 11). Their study revealed that these certifications reduce individuals' perceived CSR skepticism, thereby increasing the perceived credibility of the messages (Marschlich & Hurtado, 2025, p. 11). Likewise, De Leaniz et al. (2019) showed that third-party environmental certification adds credibility to hotels' claims about their corporate environmental performance and sustainable practices (p. 209). When hotels obtain third-party environmental certification, they can not only learn environmental expertise from the certification organizations but also receive tailor-made advice regarding their own environmental practices (De Leaniz et al., 2019, p. 209). This guidance and advice can make these hotels less likely to face accusations of greenwashing, thus earning credibility (De Leaniz et al., 2019, p. 209). Furthermore, Chaudhry and Wald (2022) emphasize that, when addressing skeptical audiences, communicators can use signals that are "difficult-to-fake," "verifiable," and "self-sacrificing" to enhance message credibility (p. 5). Accordingly, third-party verified environmental certifications may serve as such signals, since they are difficult to fabricate, easily verifiable, and require substantial effort to obtain. Therefore, based on the above information, the following hypothesis is made:

H3: The presence of a third-party environmental certification in an automotive brand's environmental CSR message will lead to higher perceived message credibility compared to messages without such certification.

The presence of third-party environmental certification may also help foster a positive brand attitude. Gosselt et al. (2017) found that positive external CSR certification can lead to

more favourable brand attitudes (p. 420). As information directly from a company is often perceived as self-serving, consumers may question the sincerity of a company's motives, which can negatively affect their perception of the brand (Gosselt et al., 2017, p. 421). In contrast, positive external certification can enhance consumers' perceptions of a company, thereby contributing to more favourable brand attitudes (Gosselt et al., 2017, p. 421). Wagner et al. (2009) further note that when a company's actions do not align with its claims, this can lead to perceptions of corporate hypocrisy, which negatively impacts consumer attitudes (p. 77). The presence of third-party environmental certification may serve as evidence that a company has made genuine efforts to achieve environmentally friendly goals, thereby reducing the risk of being perceived as hypocritical and helping to foster more positive brand attitudes. Additionally, Lončar et al. (2018) found that consumers are more likely to support companies that have obtained third-party environmental certifications, as they tend to prefer businesses that are environmentally friendly (p. 295). This further suggests that the presence of third-party certification may help foster a more favorable brand attitude. Therefore, based on the above information, the following hypothesis is made:

H4: The presence of a third-party environmental certification in an automotive brand's environmental CSR message will result in a more positive brand attitude compared to messages without such certification.

2.6 Perceived Message Credibility as a Mediator

Based on the previous hypotheses, a gain-framed message and the presence of third-party environmental certification are expected to enhance perceived message credibility and brand attitude. As Appelman and Sundar (2015) suggest, individuals' perceptions of message credibility influence their later decisions (p. 63). Wathen and Burkell (2001) also found that perceived message credibility strongly affects the impact of a message (p. 134). Thus, perceived message credibility may influence brand attitude.

Although few studies have examined the link between message credibility and brand attitude, existing research has shown that consumer skepticism toward companies' CSR messages is negatively associated with their brand attitudes (Kwon & Ahn, 2020, p. 69; Rim & Kim, 2016, p. 264). It has also been found that consumers' skepticism toward a company's CSR message is negatively related to their perceived message credibility (Marschlich & Hurtado, 2025, p. 11), implying that higher perceived message credibility is associated with lower skepticism.

Therefore, it is hypothesized that perceived message credibility may serve as a mediator, fostering more positive brand attitudes. As perceived message credibility increases and skepticism decreases, consumers are more likely to trust the message and perceive the company as genuinely engaging in environmental CSR activities, which leads to more favorable brand attitudes. This also aligns with findings that CSR has a direct positive impact on brand attitudes (Ramesh et al., 2018, p. 381). Therefore, based on the above information, the following hypotheses are proposed:

H5: Perceived message credibility mediates the relationship between gain-loss message framing and brand attitude.

H6: Perceived message credibility mediates the relationship between third-party environmental certification and brand attitude.

3. Methodology

3.1 Research Design

This research used a quantitative method to answer the research question. Quantitative research typically involves collecting numerical data and conducting statistical analyses to test theory-based hypotheses (Fallon, 2016, p. 3), making it suitable for this study. More specifically, an experimental survey was used. The experiment was chosen because it is an effective method for testing and providing evidence of causal relationships (Neuman, 2014, p. 282). This study aimed to examine the potential causal relationships between message framing (gain vs. loss) and third-party environmental certification (present vs. absent) on perceived message credibility and brand attitude. The experimental approach enabled the manipulation of these variables and the measurement of their effects. Moreover, since this study focuses on individual consumers' perceptions, the use of an experiment is more appropriate because experiments are well-suited for micro-level topics involving individuals or small groups, rather than macro-level societal phenomena (Neuman, 2014, p. 283). Therefore, a 2 (message framing: gain vs. loss) × 2 (third-party environmental certification: present vs. absent) between-subjects experimental design was adopted. In addition, because this study needed to collect individual perceptions of message credibility and brand attitude, an experimental survey was used. Surveys allow participants to complete the questionnaire online or in person, making it possible to gather sufficient data to test the hypotheses and answer the research question (Fallon, 2016, p. 5).

3.2 Operationalization

3.2.1 Stimulus Material

The experiment stimulus mimicked a real Instagram post from an automotive company. In recent years, companies are more likely to use social media platforms to communicate their CSR messages, and consumers also prefer to use these platforms to engage in companies' CSR activities (Chu & Chen, 2019, p. 455; Fernández et al., 2021, p. 386). Instagram is one of the most popular social media platforms, with over 2 billion monthly active users (Dixon, 2025, para. 2). Based on the above reasons, Instagram was chosen as the platform for presenting the automotive brand's environmental CSR message.

As for the brand of the automotive company featured in the Instagram post, this study chose the Chinese automotive brand Geely to present the environmental CSR message. Geely was chosen because it is a real automotive brand that is dedicated to adopting new technologies to reduce its impact on the environment. Geely was also selected because the

experimental survey was designed in English, and most English speakers are not familiar with Geely, which can minimize prior brand bias in the experiment.

The same image showing a scene of Geely's manufacturing process in its factory was used in all four experimental conditions. The image is simple, with one car presented in the center and the factory scene as the background. No additional information was included in the image. This image fits Bornemann and Hattula's (2021) suggestion for choosing experimental stimuli, as they highlight that experimental stimuli should avoid complexity and minimize distractions for participants (p. 10).

To manipulate the third-party environmental certification variable, a real third-party environmental certification, ISO 14001, was used. ISO 14001 is an internationally acknowledged environmental management system, and companies that meet its standards can obtain the certification (Ojiako et al., 2024, p. 2). Using a well-known third-party certification may help better separate the present condition from the absent condition, while also minimizing participants' doubts about the legitimacy of the certification. In the present condition, the certification was displayed in the bottom left corner of the image, while in the absent condition, the certification was not presented.

Below the image, in the caption section, the environmental CSR message was framed as either a gain-framed message or a loss-framed message, depending on the stimulus condition. Both messages conveyed the exact same fact: Geely uses solar power instead of burning coal to generate electricity in its manufacturing factory. The gain-framed message highlighted the environmental benefits of Geely using solar power to generate electricity, while the loss-framed message highlighted the damages that could be caused to the environment if Geely did not use solar power to generate electricity. The only difference between the two messages lies in the framing, all other content is the same. The design of the gain-loss framed messages also applied previous experiment designs of gain-loss message framing, where, in experimental design, the gain-framed message focus on the positive outcomes of a behavior, and the loss-framed message focuses on the negative consequences of not performing the behavior (Jang & Feng, 2017, p. 190; Leshner & Cheng, 2009, p. 222; Rothman et al., 1999, p. 1363).

3.2.2 Pre-test

To ensure the effectiveness of the experiment stimulus, 32 participants were recruited to take part in the pre-test. These participants were recruited from the

researcher's WhatsApp contacts. Participants took part in the experimental survey and provided feedback.

A few participants suggested adding the word "gain" at the beginning and end of the gain-framed caption sentences and adding the word "loss" at the beginning and end of the loss-framed sentences, to better emphasize the focus of the message. Based on their advice, changes were made accordingly to both the gain- and loss-framed messages to highlight this focus. Two participants advised that, considering the manipulation of gain–loss message framing was only shown through the caption of the post, it would be clearer to ask participants whether the caption of the post mainly focused on gains or losses. They recommended this instead of asking about the post itself, as the image had nothing to do with the framing. Adjustments were made to the manipulation check question based on this feedback. Additionally, some participants suggested adding descriptive sentences before asking them to choose the framing of the caption, so they could better understand what is considered a gain and what is considered a loss. Based on the suggestion, descriptive sentences were included in the final experimental survey.

3.2.3 Control Variables

Three control variables were included and measured in the experimental survey to ensure that the effects of gain-loss message framing and the presence or absence of third-party environmental certification on perceived message credibility and brand attitude were not influenced by these variables.

First, participants' environmental concern was included as a control variable. An individual's environmental concern can directly affect their perception and judgment of specific situations, especially when these situations involve behaviours that are personally relevant (Bamberg, 2003, p. 30). Bamberg (2003) showed that students with high environmental concern had notably different perceptions towards the same environmental scenarios compared to students with low environmental concern (p. 30). Additionally, Hartmann and Apaolaza-Ibáñez (2009) found that individuals with high environmental concern tend to show more positive brand attitudes toward brands featured in green advertising (p. 124). Therefore, participants' environmental concern might affect their perceived message credibility and brand attitude toward an automotive environmental CSR message, so it was included as a control variable.

Besides environmental concern, participants' attitudes toward whether automotive companies should engage in environmental CSR were measured and included as a control

variable. Participants chose between "yes" or "no" in response to whether they think automotive companies should engage in environmental CSR activities. Individual consumers vary in values and opinions and place different levels of importance on different CSR domains (Öberseder et al., 2011, p. 457). Not all consumers have a positive attitude toward environmental CSR (Öberseder et al., 2013, p. 1850). Participants who think that automotive companies should not engage in environmental CSR activities might perceive the environmental CSR messages differently. Therefore, their attitude was also included as a control variable. Lastly, age was included as a control variable. Grau and Folse (2007) found that older consumers tend to be more skeptical toward companies' cause-related marketing activities (p. 232). Higher levels of skepticism may also affect how they perceive message credibility and brand attitude. Therefore, age was measured and controlled for in the analysis.

3.2.4 Measurements

As Pallant (2020) highlights, selecting appropriate measurement scales is essential to ensure the quality of research data (p. 6). Therefore, all scales used in this study are pre-existing multi-item scales that have been developed and validated by previous researchers.

Message credibility was measured using a three-item scale developed by Boukes and LaMarre (2021, p. 5), who reported $\alpha = .94$. This scale was originally adapted from Lock and Seele (2017), who created it to assess recipients' perceptions of the credibility of CSR reports (Lock & Seele, 2017, p. 606). Boukes and LaMarre (2021, p. 5) adjusted the items to better show how people evaluate corporate CSR messages. Participants rated their perceived message credibility using these three items on a seven-point Likert scale ranging from "completely disagree" to "completely agree" (Boukes & LaMarre, 2021, p. 5).

Brand attitude was measured using a five-item scale developed by Spears and Singh (2004, p. 61), who reported $\alpha = .97$. This scale has been widely used in previous research to assess consumer attitudes toward brands, including studies by Mackay et al. (2009, p. 428) and Sarkar et al. (2019, p. 198) in the context of green advertising. Participants evaluated their attitudes toward the brand using five pairs of bipolar adjectives on a seven-point semantic differential scale (Spears & Singh, 2004, p. 61).

Environmental concern was measured using a four-item scale developed by Goh and Balaji (2016, p. 634), who reported $\alpha = .81$. This scale has also been used by Chuah et al. (2020, p. 6) to assess consumers' environmental concern in the context of CSR. Participants rated their agreement with the four statements on a seven-point Likert scale ranging from "completely disagree" to "completely agree" (Goh & Balaji, 2016, p. 634).

3.2.5 Manipulation Check

Two manipulation check questions were included in the experiment to verify the effectiveness of the manipulations: message framing (gain vs. loss) and the presence versus absence of third-party environmental certification.

To check the message framing manipulation, the manipulation check question developed by Stadlthanner et al. (2022, p. 786) was adapted and used. This manipulation check has also been used by Cordero-Gutiérrez et al. (2023, p. 538) to assess participants' perception of message framing. Participants were asked to respond to the following single-item statement: "The caption of the Instagram post you just saw primarily focused on gains or losses," using a seven-point Likert scale ranging from 1 (losses) to 7 (gains).

For the manipulation check regarding third-party environmental certification, participants were asked whether they saw the green ISO 14001 certification logo in the bottom-left corner of the Instagram post image. In conditions where third-party certification was present, the ISO 14001 logo was shown on the post's image. In conditions without certification, the logo was not shown.

3.3 Sampling

This study aimed to research individual consumers' perceived message credibility and brand attitude, thus the unit of analysis was the individual. Due to ethical considerations, only individuals older than 18 were allowed to participate in this study, and no upper age limit was set. In is common for individuals of different ages to be exposed to automotive brands' environmental CSR messages. Including participants from various age groups helped improve the representativeness of the sample and thus enhanced the validity of the findings.

To recruit enough participants, this study used the crowdsourcing platform Prolific instead of relying on social media snowball sampling. In snowball sampling via social media, researchers use their personal accounts to share the survey link and rely on voluntary responses (Neuman, 2014, p. 248). Although this method can be convenient and easy to conduct, it can lead to unrepresentative samples (Neuman, 2014, p. 248). In contrast, Prolific is an online platform specifically designed for researchers to recruit participants for their scientific studies (Palan & Schitter, 2017, p. 23). It has a high-standard recruitment process, charges reasonable fees, and participants are clearly informed that they are taking part in scientific research (Palan & Schitter, 2017, p. 23). Thus, using Prolific can help reduce sampling bias and recruit more diverse participants. To meet the university's methodological

requirement of at least 30 participants per experimental condition, 200 participants were recruited through Prolific to ensure that each condition included enough participants.

3.4 Experimental Procedure

The experimental survey was conducted using the online survey platform Qualtrics. Before the survey started, participants were briefly introduced to the topic and purpose of the research. They were also ensured of their anonymity and voluntary participation in this research. Then participants had to provide their consent and confirm that they met the age sampling criteria to start the survey.

Next, participants were asked about their attitudes towards whether they think automotive companies should take part in environmental CSR activities. After that, their environmental concern was measured. Then one of the four Instagram posts as experiment stimulus was randomly presented to participants. Participants were asked to carefully read both the image and caption of the post.

After presenting the stimulus, participants' perceived message credibility and brand attitude were measured. One attention check question was included in the scale measuring participants' perceived message credibility. After participants completed the measurement scales, two manipulation check questions were presented. The second attention check question was embedded after the last manipulation check question. After answering that attention check question, participants answered demographic questions. The design of the two attention check questions aimed to ensure participants were concentrating when filling in the survey.

3.5 Validity and Ethics

As pointed out by Neuman (2014), validity is extremely important in social scientific research, as validity determines the extent to which the measurement used can precisely assess the researched social phenomenon (p. 212). This research adopted multiple ways to enhance its internal validity and external validity.

First, regarding internal validity, Neuman (2014) explained that internal validity can be achieved only when the independent variables affect the dependent variables (pp. 288–289). If there are other variables that affect the dependent variables, internal validity can be threatened (Neuman, 2014, pp. 288–289). To address this concern, three control variables were included in this research to try to minimize external factors' influence on perceived message credibility and brand attitude. Besides that, this research also used manipulation

check questions to ensure the successful design of the stimulus showing the independent variables, which were the gain-loss message framing and the presence or absence of third-party environmental certification. Furthermore, this research used the randomization function of Qualtrics to randomly assign participants to one of the four experimental stimuli at an even rate, to further reduce selection bias and enhance internal validity (Neuman, 2014, p. 300). Additionally, all the multi-item measurements used in this research were developed by previous researchers and have been widely used in other research. Therefore, using these measurements can help ensure precise measurement of perceived message credibility and brand attitude and avoid measurement errors caused by the scales, further enhancing internal validity.

As for external validity, Neuman (2014) defines it as the extent to which the research results can be generalized to other settings, populations, and situations (p. 306). He also pointed out that laboratory experiments tend to have lower external validity, as they are conducted in laboratory environments where the researchers have a high degree of control (Neuman, 2014, p. 308). To address this issue, this research used an online experimental survey, which allows the participants to fill in the survey in their natural surroundings. The stimulus material was designed as an Instagram post that participants could see in their everyday life, to further enhance external validity. Besides, all participants for the final survey were recruited via Prolific, which allows the hired participants to go beyond the researcher's personal network and come from various age groups and different backgrounds to obtain more diverse samples, to further helping generalized the research findings.

This research also took ethical issues into consideration and followed the ethical requirements of social scientific research. First, all recruited participants were above 18, and informed consent was obtained from all participants. Participants were fully aware that participation was voluntary and that they could exit at any moment. The research topic and goal were also shared with participants before the research started. Besides that, all data collected for this study were used anonymously. Before the data analysis started, to ensure anonymity, participants' personal information that was automatically recorded by Qualtrics, such as their IP address, location, and Prolific ID, was deleted.

4. Results

4.1 Randomization Check and Data Cleaning

After collecting data from 200 participants, the dataset was analyzed using SPSS. Before analysis, randomization checks and data cleaning were conducted. First, responses were reviewed to ensure full survey completion. Two dummy variables were then created to represent the manipulated conditions. Message framing was coded as a dummy variable (0 = loss framing, 1 = gain framing), and the certification condition also coded as a dummy variable (0 = Absent, 1 = Present). A randomization check confirmed that participants were evenly distributed across the four conditions, with 50 participants per condition.

Next, data cleaning was conducted. Survey completion times were reviewed, and two participants who finished in under a minute and five who took over fifteen minutes were removed, as these times were unusually fast or slow given the survey's length. Completing the survey too quickly may indicate a lack of attention, while taking too long could lead to memory decay, both of which might compromise data quality. Additionally, two attention check questions were included, and one participant who failed the attention checks was also excluded.

After removing these 8 participants, a 5% trimmed mean analysis was performed on the variables message credibility, brand attitude and environmental concern to ensure the remaining data was clean and that no extreme values would affect the results. The results showed minimal differences between the trimmed and original means, indicating that no outliers needed to be removed, as shown in Table 4.1 (Pallant, 2020, p. 66). Therefore, 192 valid responses remained. The distribution across conditions can be found in Table 4.2.

Table 4.1 *Descriptive Statistics and Trimmed Mean (N = 192)*

	M	*SD*	95% confidence interval		5% trimmed mean
			Lower Bound	Upper Bound	
Message credibility	4.94	1.28	4.76	5.13	5.00
Brand attitude	5.25	1.35	5.06	5.44	5.34
Environmental concern	5.39	1.34	5.19	5.58	5.50

Each variable was measured using a seven-point Likert scale or a bipolar scale.

Table 4.2 Overview of the experimental conditions (N = 192)

		Certification		Total
		Certification absent	Certification present	
Message frame	Loss framed message	47	48	95
	Gain framed message	49	48	97
Total		96	96	192

4.2 Sample Characteristics

Among the 192 valid participants, 87 (45.3%) participants were male, 104 (54.2%) were female, and 1 (0.5%) identified as Non-binary / third gender. Participants were from 13 different countries, with the UK (62.0%), US (14.6%), South Africa (7.8%), Australia (4.2%), and Ireland (3.1%) being the most prominent. As for the education level, 0.5% of participants obtained less than a high school degree, 1.0% of participants reported having a high school degree, 65.6% of participants obtained a bachelor's degree, 29.2% a master's degree, and 3.6% a PhD or equivalent. The age of the participants ranged from 21 to 69, with an average age of 41 years (M = 41.43, SD = 13.12). The sample characteristics of the respondents are presented in Table 4.3.

Table 4.3 Descriptive statistics of participants (N = 192)

Characteristic	Frequency in sample	Percentage of sample
Age		
18-30	50	26.0
31-40	57	29.7
41-50	33	17.2
51-60	30	15.6
61-70	22	11.5
Gender		
Male	87	45.3
Female	104	54.2
Non-binary / third gender	1	.5
Level of education		
Less than a high school degree	1	.5
High school degree or equivalent	2	1.0
Bachelor's degree	126	65.6
Master's degree or MBA	56	29.2
PhD or equivalent	7	3.6

4.3 Factor and Reliability Analysis

To examine the structure of the scale items and internal consistency of the multi-item scales used in this study, exploratory factor analysis and reliability tests were conducted using SPSS (Pallant, 2020, p. 104).

First, to explore the underlying dimensions of the four environmental concern items, a Principal Component Analysis (PCA) was conducted using direct oblimin rotation based on eigenvalues (>1.00). The Kaiser-Meyer-Olkin (KMO) value of .85 verified the sampling adequacy for the analysis, as this exceeds the acceptable minimum value of .60 (Kaiser, 1970). Bartlett's Test of Sphericity was significant, χ^2 (6) = 567.18, $p < .001$, thereby indicating that the correlations between items were sufficiently large for a PCA (Bartlett, 1954). The resultant model consisted of one factor, explaining 80.63% of the variance in environmental concern. All four items had factor loadings ranging from .86 to .92 on the single extracted component. The reliability analysis showed the Cronbach's alpha of the environmental concern scale with an $\alpha = .92$, indicating high internal consistency.

Next, to explore the underlying dimensions of the three message credibility items, a PCA was also conducted using direct oblimin rotation based on eigenvalues (>1.00). The KMO value of .74 verified the sampling adequacy for the analysis. Bartlett's Test of Sphericity was significant, χ^2 (3) = 341.18, $p < .001$, indicating that the correlations between items were sufficiently large for a PCA (Bartlett, 1954). The resultant model consisted of one factor, explaining 82.41% of the variance in message credibility. All three items had factor loadings ranging from .89 to .92 on the single extracted component. The reliability analysis showed the Cronbach's alpha of the message credibility scale with an $\alpha = .89$, indicating high internal consistency.

Lastly, to explore the underlying dimensions of the five brand attitude items, a PCA was conducted using direct oblimin rotation based on eigenvalues (>1.00). The KMO value of .89 confirmed the sampling adequacy for the analysis. Bartlett's Test of Sphericity was significant, χ^2 (10) = 1018.03, $p < .001$, indicating that the correlations between items were sufficiently large for a PCA (Bartlett, 1954). The resultant model consisted of one factor, explaining 86.05% of the variance in brand attitude. All five items had factor loadings ranging from .91 to .94 on the single extracted component. The reliability analysis showed the Cronbach's alpha of the brand attitude scale with an $\alpha = .96$, indicating high internal consistency.

4.4 Test of Normality

A test of normality was performed to assess whether the collected data followed a normal distribution. Skewness and kurtosis values were examined for the variables of perceived message credibility, brand attitude, and environmental concern (Pallant, 2020, p. 66). Overall, the data demonstrated distributions that were very close to normal. Perceived message credibility had a skewness of -0.59 (*SE* = 0.18) and a kurtosis of 0.15 (*SE* = 0.35), while brand attitude showed a skewness of -0.68 (*SE* = 0.18) and a kurtosis of 0.15 (*SE* = 0.35). Environmental concern had a skewness of -1.05 (*SE* = 0.18) and a kurtosis of 0.97 (*SE* = 0.35), indicating a relatively peaked and left-skewed distribution, with values clustered toward the higher end. This suggests that more participants reported higher levels of environmental concern. However, as all skewness and kurtosis values fall within the acceptable range, they are not expected to significantly affect the validity of the results (Byrne, 2012, p. 99).

4.5 Descriptive Statistics

Correlation analysis can be used to assess the strength and direction of linear relationships between variables (Pallant, 2020, p. 135). Therefore, Pearson's correlation test was conducted in this study to examine the relationships between the variables.

The results (Table 4.4) indicated a weak positive correlation between message framing and brand attitude, $r = .19$, $p = .008$, suggesting that gain-framed messages were associated with higher levels of brand attitude. A strong positive correlation was also found between perceived message credibility and brand attitude, $r = .73$, $p < .001$, indicating that higher perceived message credibility is associated with more positive brand attitudes. In addition, regarding the control variables, environmental concern showed a moderate positive correlation with perceived message credibility, $r = .42$, $p < .001$ and a weak positive correlation with brand attitude, $r = .30$, $p < .001$. Participants' environmental CSR attitude showed weak positive correlations with both perceived message credibility, $r = .24$, $p < .001$ and brand attitude, $r = .25$, $p < .001$. Age, however, only showed a weak negative correlation with perceived message credibility, $r = -.19$, $p = .007$.

Table 4.4 Descriptive Statistics and correlations (N = 192)

	1	2	3	4	5	6	7	8	9	*Mean*	*SD*
1. Message frame	-									0.51	0.50
2. Certification	-.01	-								0.50	0.50
3. Perceived message credibility	.06	-.02	-							4.94	1.28
4. Brand attitude	.19**	.01	.73**	-						5.25	1.35
5. Message framing manipulation check	.78**	.00	.16*	.33**	-						
6. Certification manipulation check	-.06	.68**	.10	.09	.03	-					
7. Environmental concern	.02	.03	.42**	.30**	.10	.12	-			5.39	1.34
8. ECSR attitude	.00	.00	.24**	.25**	.18**	.04	.43**	-			
9. Age	-.02	.00	-.19**	-.11	-.06	.01	-.08	-.15*	-	41.43	13.12

**$p \leq .01$, *$p \leq .05$ (2-tailed)

The third-party environmental certification manipulation check question was recoded into a dummy variable named “certification manipulation check” (0 = no certification seen, 1 = certification seen).

Participants’ responses to whether they think automotive companies should engage in environmental CSR, with “yes” and “no” answer options, were also recoded into a dummy variable named “ECSR attitude” (0 = no, 1 = yes).

4.6 Manipulation Check

Two manipulation questions were designed to make sure the experiment manipulation design worked as planned. First, for the manipulation of message framing, the participants were asked to choose based on the focus of the caption of the post they saw, using a seven-point Likert-type scale where 1 means the caption is entirely focused on losses and 7 means the caption is entirely focused on gains. An independent samples t-test was conducted to examine the result of the message frame manipulation check**.** Levene's test indicated unequal variances, F (1, 190) = 16.26, $p < .001$, so the results for unequal variances were used. The analysis revealed a statistically significant difference between the gain-framed message (M = 6.23, SD = 1.26, n= 97) and the loss-framed message (M = 2.48, SD = 1.74, n = 95), t (171.46) = -17.05, $p < .001$. As the results show, participants who received the loss-framed message tended to think the caption focused on losses, reflected in the lower scores, and those who received the gain-framed message tended to think the caption focused on gains, reflected in the higher scores. Therefore, the manipulation of message frame was successful.

Second, for the manipulation of the third-party environmental certification, participants were asked whether they saw the certification on the image of the post they viewed. A Chi-Square test of independence was performed to check if participants recognized the certification correctly. An equal number of participants (n = 96) were assigned to the environmental certification present and absent conditions. For the condition where the certification was absent, 72 participants chose "no," indicating they didn't see a certification in the image, while 24 participants chose "yes," claiming they saw the certification. For the condition where the certification was present, 88 participants chose "yes," claiming they saw the certification, while 8 participants chose "no," claiming they didn't see the certification. The result of the chi-square test also showed a statistically significant association between the presence/absence of third-party environmental certification and participants' recognition of the certification, χ^2 (1, N = 192) = 87.77, $p < .001$. Based on the results, the manipulation of the certification condition was also successful.

Table 4.5 Manipulation Check - third-party environmental certification

Did the Instagram post you just saw include a green certification in the bottom-left corner of the image?			
	YES	NO	Total
Certification absent	24	72	96
Certification present	88	8	96
Total	112	80	192

4.7 Hypothesis Testing

The Hayes PROCESS macro was used in SPSS to test all six hypotheses of this research. 5000 bootstrap samples with 95% confidence intervals were used to assess the significance of the effects. In the PROCESS macro, brand attitude was entered as the dependent variable (Y), message framing as the independent variable (X), and perceived message credibility as the mediator (M). Certification, environmental concern, participants' environmental CSR attitude, and age were included as covariates.

Hypothesis 1 proposed that a gain-framed environmental CSR message from an automotive brand will lead to higher perceived message credibility compared to a loss-framed message. However, there was no significant effect of message framing on credibility (b = .13, t = .77, p = .44). The 95% confidence interval ranged from -.20 to .46. Therefore, H1 was not supported.

Hypothesis 2 proposed that a gain-framed environmental CSR message will result in a more positive brand attitude compared to a loss-framed message. The result showed a significant positive effect of the gain-framed message on brand attitude (b = .39, t = 3.02, p < .001). The 95% confidence interval ranged from .14 to .65. Therefore, H2 was supported.

Hypothesis 3 proposed that the presence of a third-party environmental certification will lead to higher perceived message credibility compared to messages without such certification. However, there was no significant effect of third-party certification on perceived message credibility (b = -.06, t = -.37, p = .71). The 95% confidence interval ranged from -.39 to .27. Therefore, H3 was not supported.

Hypothesis 4 proposed that the presence of a third-party environmental certification will result in a more positive brand attitude compared to messages without such certification. The result again showed no significant effect of presenting the third-party environmental certification on brand attitude (b = .07, t = .56, p = .58). The 95% confidence interval ranged from -.18 to .33. Therefore, H4 was not supported.

Hypothesis 5 proposed that perceived message credibility mediates the relationship between gain-loss message framing and brand attitude. The result showed the indirect effect was not significant, with b = .10 and the 95% confidence interval ranging from -.15 to .35, as the interval includes zero. Therefore, H5 was not supported.

Hypothesis 6 proposed that perceived message credibility mediates the relationship between the third-party environmental certification condition and brand attitude. To test this, the PROCESS macro was run again with third-party environmental certification as the independent variable (X), and message framing, environmental concern, participants'

environmental CSR attitude, and age included as covariates. The result showed the indirect effect was not significant with b = -.05 and the 95% confidence interval ranging from -.32 to .20, as the interval includes zero. Therefore, H6 was not supported.

Additionally, the direct effect of perceived message credibility on brand attitude was examined. The results showed perceived message credibility has a positive and significant effect on brand attitude (b = .77, p < .001), with the 95% confidence interval ranging from .66 to .89. This suggests that higher perceived message credibility leads to a more positive brand attitude. The effects of control variables were also examined. Environmental concern had a significant positive effect on perceived message credibility (b = .37, p < .001) but no significant effect on brand attitude (b = -.05, p = .36). Age showed a significant negative relationship with perceived message credibility (b = -.02, p = .02) but not with brand attitude (b = .00, p = .33). Participants' environmental CSR attitude had no significant effect on either perceived message credibility (b = .35, p = .46) or brand attitude (b = .65, p = .08).

Table 4.6 Results of the Hayes PROCESS analyses (Model 4)

	Perceived message credibility	Brand attitude
Control variables		
Environmental concern	.37**	-.05
Age	-.02*	.00
Participants' environment CSR attitude	.35	.65
Main Effects		
Message Frame	.13	.39**
Certification	-.06	.07
Perceived Message Credibility		.77**
R^2	.21	.57
F-value	9.79	40.78

n=192. ** $p \leq .01$, * $p \leq .05$. Note: One-tailed tests were used for hypothesized effects (H1-H6).

4.8 Robustness Check

As shown in the certification manipulation check results, 24 out of 96 participants incorrectly reported seeing a certification when it was not present, while 8 out 96 participants failed to notice the certification when it was present. Therefore, to ensure the validity of the research, all hypotheses were re-tested using The PROCESS macro (Model 4) after removing these 32 participants who failed the certification manipulation check. The cleaned dataset consisted of 160 valid participants, and the results remained consistent with the original analysis.

For H1, there was still no significant effect of the gain-framed message on perceived message credibility (b = .12, t = .64, p = .53). The 95% confidence interval ranged from -.24 to .47. Therefore, H1 was again not supported.

For H2, the gain-framed message continued to have a significant effect on brand attitude (b = .48, t = 3.48, p < .001). The 95% confidence interval ranged from .21 to .75. Therefore, H2 was again supported.

For H3, there was still no significant effect of presenting the third-party environmental certification on perceived message credibility (b = .06, t = .31, p = .76). The 95% confidence interval ranged from -.30 to .42. Therefore, H3 was again not supported.

For H4, there was still no significant effect of presenting the third-party environmental certification on brand attitude (b = .09, t = .64, p = .52). The 95% confidence interval ranged from -.18 to .36. Therefore, H4 was again not supported.

For H5, the indirect effect of message framing on brand attitude was not significant (b = .09), with a 95% confidence interval ranging from -.18 to .36, as the interval includes zero. Therefore, H5 was again not supported.

For H6, the indirect effect of certification on brand attitude was not significant (b = .05), with a 95% confidence interval ranging from -.24 to .30, as the interval includes zero. Therefore, H6 was again not supported.

Table 4.7 Overview of Hypotheses

Hypothesis	Original Analysis *(N=192)*	Robustness check *(N=160)*
H1: A gain-framed environmental CSR message from an automotive brand will lead to higher perceived message credibility compared to a loss-framed message.	Rejected	Rejected
H2: A gain-framed environmental CSR message from an automotive brand will result in a more positive brand attitude compared to a loss-framed message.	Accepted	Accepted
H3: The presence of a third-party environmental certification in an automotive brand's environmental CSR message will lead to higher perceived message credibility compared to messages without such certification.	Rejected	Rejected
H4: The presence of a third-party environmental certification in an automotive brand's environmental CSR message will result in a more positive brand attitude compared to messages without such certification.	Rejected	Rejected

H5: Perceived message credibility mediates the relationship between gain-loss message framing and brand attitude.	Rejected	Rejected
H6: Perceived message credibility mediates the relationship between third-party environmental certification and brand attitude.	Rejected	Rejected

5. Discussion

This thesis aims to answer the following research question: *How do message framing (gain vs. loss) and third-party environmental certification (present vs. absent) in automotive brands' environmental CSR messages influence perceived message credibility and brand attitude?* Drawing on prior studies on gain–loss message framing and third-party certification, six hypotheses were developed. A quantitative online experimental survey with four conditions was conducted, manipulating both message framing and the presence of third-party certification. Data were collected from 192 valid participants and analyzed using SPSS.

The results showed that gain-loss message framing did not influence perceived message credibility but did affect brand attitude. More specifically, gain-framed messages can result in a more positive brand attitude. The presence or absence of third-party environmental certification had no significant impact on either perceived message credibility or brand attitude in the context of automotive environmental CSR communication. The study further hypothesized that message credibility would mediate the relationship between both message framing and brand attitude, and certification and brand attitude. However, because neither gain-framed messages nor the presence of certification significantly affected perceived message credibility, no mediating effect was found. Nevertheless, the study confirmed that perceived message credibility can positively influence brand attitude.

To further explore factors influencing message credibility and brand attitude, participants' environmental concern, prior attitudes toward whether automotive companies should engage in environmental CSR, and age were included as control variables. The results showed that both environmental concern and age had a significant effect on perceived message credibility but not brand attitude. Participants with higher environmental concern were more likely to find the message credible, whereas older participants were less likely to perceive the message as credible. In contrast, participants' prior attitudes toward automotive companies' involvement in environmental CSR did not significantly affect either perceived message credibility or brand attitude.

5.1 Theoretical Implications

This thesis first aimed to examine the use of gain-loss-framed messages in automotive environmental CSR communication. The study did not find that gain-framed messages resulted in higher perceived message credibility compared to loss-framed messages, which contrasts with findings from previous research (Borah & Xiao, 2018, p. 403; Cordero-Gutiérrez et al., 2023, p. 541). One possible reason for this inconsistency may lie in the role

played by participants' level of environmental concern. The results of the normality test showed that participants in this study generally had high environmental concern. Moreover, the PROCESS macro results showed that environmental concern only influenced perceived message credibility, higher levels of environmental concern were associated with higher perceived message credibility. Previous studies have also shown that individuals with greater environmental concern tend to be less skeptical of companies' environmental CSR messages and are more likely to view them as credible (Kang & Atkinson, 2019, p. 239). Therefore, it is possible that participants' pre-existing high environmental concern led them to perceive the automotive company's environmental CSR message as credible, regardless of whether it was gain-framed or loss-framed.

Another explanation might be that people today are generally less skeptical of companies' CSR messages. Schmeltz (2012) found that, contrary to earlier findings suggesting that consumers tend to be skeptical toward corporate CSR communication, participants in their study adopted a less skeptical view and were more likely to believe in the messages (p. 42). If people are already likely to view a company's CSR message as credible, then the framing effect on message credibility may also be weakened. Although the study showed that gain-framed messages did not lead to higher perceived message credibility, the findings highlight that the effect of message framing on credibility may be influenced by other factors, such as participants' pre-existing skepticism toward the message and their level of environmental concern.

However, regarding brand attitude, the results of this study showed that a gain-framed message led to a more positive brand attitude compared to a loss-framed message in an automotive company's environmental CSR communication. The positive effect of the gain-framed message on brand attitude is consistent with previous findings (Ngo et al., 2022, p. 8; Stadlthanner et al., 2022, p. 792). This result also aligns with earlier research grounded in prospect theory, which suggests that gain-framed messages are generally more persuasive in promoting prevention behaviors. Moreover, the finding supports the effectiveness of gain-framed messaging in environmental CSR communication, in contrast to Kim and Chon's (2022) study, which found limited effects of gain-loss framing and called for further research on its application (p. 771). Therefore, the present study offers new insights by demonstrating the impact of gain-loss message framing on brand attitudes within corporate environmental CSR communication.

As for third-party environmental certification, although such certifications are generally recognized as signals of expertise and environmentally friendly practices and can

help reduce skepticism about greenwashing (De Leaniz et al., 2019, p. 209; Geerts, 2014, p. 94; Wang et al., 2016, p. 194), this study did not find that the presence of such certification in an automotive brand's environmental CSR message led to higher perceived message credibility or improved brand attitude compared to messages without it. One possible explanation is that this study tested the effect of third-party certification by including or excluding a certification logo in the experimental stimuli, focusing solely on its visual presence. In contrast, previous studies that found third-party certifications to enhance perceived credibility often provided more contextual information to participants. For example, in Marschlich and Hurtado's (2025) experiment, instead of displaying a certification logo, they provided textual explanations stating that the company had received third-party certification, along with details about the certification's meaning and assessment procedures (p. 18). Without such explanations, information asymmetry between the company and the consumer likely remains (Xu et al., 2018, p. 956). Consumers may still not aware that companies must undergo significant efforts, meet stringent criteria, and pass rigorous evaluations to obtain and maintain third-party certifications (Font, 2002, p. 198). As a result, the intended credibility enhancing effect of third-party environmental certification may fail to materialize, and similarly, without additional explanation or introduction, such certifications may struggle to influence brand attitude.

Regarding brand attitude, another potential reason for the non-significant effect could be brand familiarity. In this experiment, a Chinese automotive brand was used to avoid prior brand bias. However, since most participants were from Western countries, they may have had low familiarity with the brand. This lack of familiarity could have further contributed to the failure to elicit a positive brand attitude. Kamins and Marks (1991) found that third-party certification did not lead to significant changes in brand attitude when the brand was unfamiliar (p. 182). However, when certification was combined with a familiar brand, it resulted in a more favorable brand attitude (Kamins & Marks, 1991, p. 182). They explained that when participants are exposed to an unfamiliar brand, more cognitive effort is required to process both the unfamiliar brand itself and the new information (Kamins & Marks, 1991, p. 179). As a result, less attention may be allocated to the certification, which may explain why no significant change in brand attitude was observed (Kamins & Marks, 1991, p. 179).

This study shows that the use of third-party environmental certification in environmental CSR communication is not always beneficial and highlights the importance of considering both the presentation of third-party certification and the level of brand familiarity when examining the effectiveness of such certification in CSR communication.

Additionally, although the possible mediating effect of perceived message credibility was not supported, the results still confirmed that perceived message credibility has a significant positive effect on brand attitude in the context of automotive environmental CSR communication. This finding reinforces the importance of message credibility in CSR communication, as proposed by prior studies (Boukes & LaMarre, 2021, p. 6; Nedelcu & Blaban, 2021, p. 55; Wathen & Burkell, 2001, p. 142). Moreover, the study found that participants' environmental concern and age significantly influenced perceived message credibility. These results suggest that future research may also consider including individual differences as control variables when investigating message credibility in environmental CSR communication.

5.2 Practical Implications

This study also offers practical insights for automotive companies. First, it highlights the importance of engaging in environmental CSR. A large majority of participants (184 out of 192) believed that automotive companies should participate in environmental CSR activities, such as reducing their environmental impact and promoting sustainability. Therefore, it is advisable for automotive companies to stay committed to such initiatives. Additionally, these efforts should be clearly communicated to the public so that consumers are aware of what automotive companies have been doing. Engaging in environmental CSR can also bring business benefits for companies, as it has been found to significantly enhance business competitiveness (Chuang & Huang, 2016, p. 991).

Second, the study offers practical guidance on how automotive companies should communicate their environmental CSR messages. When communicating environmental CSR to consumers, automotive companies should emphasize the positive outcomes of their initiatives. By focusing on these benefits, consumers are more likely to develop a positive brand attitude. For example, automotive companies can highlight the positive results their past environmental initiatives have achieved. Additionally, when introducing current or planned initiatives, they should also emphasize the expected positive outcomes to help improve brand attitude.

Additionally, when communicating their environmental CSR initiatives, automotive companies should pay close attention to message credibility, as it plays a crucial role in shaping consumers' brand attitudes. Message credibility has also been found to be a significant and positive predictor of behavioral intentions (Boukes & LaMarre, 2021, p. 7). Therefore, companies should strive to create credible environmental CSR messages for their

audiences. To achieve this, companies can take differences among consumers into consideration and develop tailored communication strategies targeting different consumer groups. For example, companies can divide consumers based on their environmental concern and age, as consumers with higher levels of environmental concern are more likely to perceive environmental CSR messages as credible, while older consumers tend to view such messages as less credible.

Last but not least, although environmental management schemes are extensively used and accepted within the automotive industry (Martinuzzi et al., 2011, p. 18) and companies often pursue third-party environmental certifications such as ISO 14001 to demonstrate their dedication to these schemes as part of their environmental CSR initiatives. The effectiveness of such certifications is not always guaranteed in practice. Therefore, automotive companies should be more cautious when using third-party environmental certifications in their environmental CSR communication. It is important not only to display the certification logo but also to provide introductory information about the certification, so that participants understand it was earned through the company's dedicated efforts toward environmental initiatives.

5.3 Limitations and Suggestions for Further Research

Like every other study, this research also has its limitations. First, this study only examined the effect of gain–loss message framing on perceived message credibility and brand attitude, and the results were mixed. Therefore, future studies could further explore the persuasive effects of gain–loss message framing on other dependent variables in the context of environmental CSR to better assess its overall effectiveness. For example, future studies could investigate how gain- and loss-framed messages influence electronic word-of-mouth (eWOM), which is a key indicator of consumer engagement with CSR activities on social media (Chu & Chen, 2019, p. 458). A favorable brand attitude has been shown to be positively associated with a higher intention to engage in eWOM (Chu & Chen, 2019, p. 459). Future studies can also examine the effect of gain-loss message framing on CSR skepticism, as consumer CSR skepticism presents a major obstacle to the success of CSR efforts, and scholars have called for more research in this area (Skarmeas & Leonidou, 2013, p. 1837).

Second, when designing the experimental stimuli, especially the manipulation of the presence or absence of third-party environmental certification, it was done only through

visual elements (the certification logo), without any accompanying textual explanation. Relying solely on visual cues may limit the effectiveness of the certification and influence the results for both perceived message credibility and brand attitude. Future research could conduct a comparative experiment with multiple conditions, such as one showing only the visual presence or absence of certification, one showing only textual information with the presence or absence of certification, and one showing both. This would help clarify whether different forms of presenting certification influence how consumers perceive its credibility and affect their attitude toward the brand.

Third, this study used the Chinese automotive brand Geely as the featured brand in the stimulus to avoid prior brand bias. However, it is important to note that for many participants from English-speaking countries, this brand may have had low brand familiarity. As previously discussed, brand familiarity could have influenced the outcomes of the experiment (Kamins & Marks, 1991, p. 184). Acharya (2020) also found that brand familiarity plays a significant role in shaping customer brand engagement by influencing the cognitive, emotional, and behavioral dimensions (p. 39). Therefore, Geely's low brand familiarity may have led to reduced engagement with the stimulus and potentially impacted the external validity of the findings. In real-life scenarios, when consumers are exposed to environmental CSR messages from automotive brands, they are more likely to have some degree of familiarity with the brands communicating the message. Future studies could consider using a well-known Western automotive brand to examine whether the results remain consistent.

Fourth, this study recruited participants through the crowdsourcing platform Prolific to obtain a more representative sample. However, since Prolific is a UK-based platform, approximately 62% of the participants were from the UK, and over 85% were from developed countries. It is worth noting that individuals from developed and developing countries may assign different levels of importance to CSR. While the concept of CSR is already well-established among consumers and companies in Western countries, it is still in a developmental stage in many developing countries (Stanislavská et al., 2020, p. 3). In addition, Stanislavská et al.'s (2020) study, which analyzed CSR-related Instagram posts worldwide, found that users from developed countries paid more attention to environmental sustainability content than those from developing countries (p. 6). This may suggest that people in developed countries generally place more importance on environmental issues and have relatively high environmental concern. However, individuals with high environmental concerns may interpret environmental messages differently compared to people with lower

environmental concerns (Bamberg, 2003, p. 30; Hartmann and Apaolaza-Ibáñez, p. 124). In reality, not everyone has high environmental concerns. Therefore, the overrepresentation of participants from developed countries with high environmental concerns may have somewhat compromised the generalizability of the results. Future research should consider recruiting a more balanced sample from both developed and developing countries to ensure the findings are more representative.

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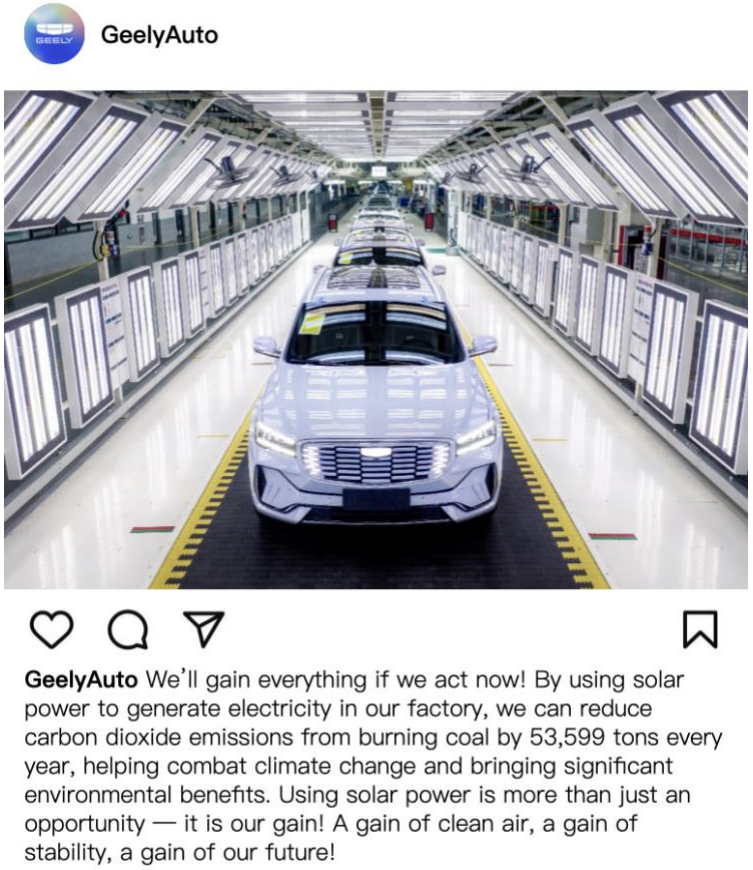
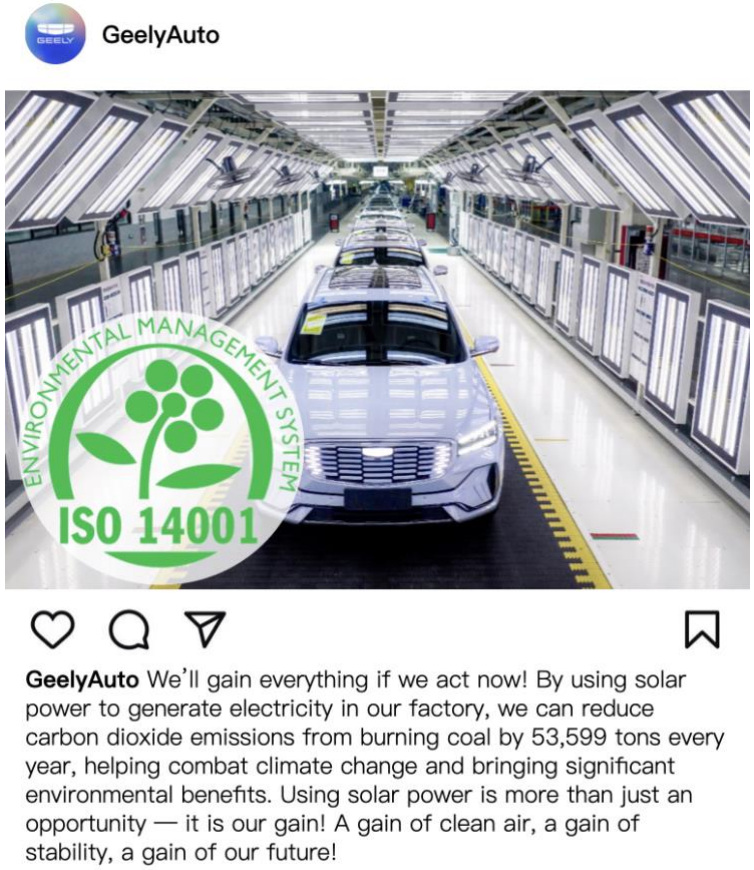
Appendix

Appendix A: Stimulus Material





GeelyAuto

GeelyAuto We'll lose everything if we don't act now! By not using solar power, an additional 53,599 tons of carbon dioxide will be released every year from burning coal to generate electricity in our factory, accelerating climate change and causing severe environmental damage. Not using solar power is more than just a missed opportunity — it is our loss! A loss of clean air, a loss of stability, a loss of our future!

GeelyAuto

GeelyAuto We'll lose everything if we don't act now! By not using solar power, an additional 53,599 tons of carbon dioxide will be released every year from burning coal to generate electricity in our factory, accelerating climate change and causing severe environmental damage. Not using solar power is more than just a missed opportunity — it is our loss! A loss of clean air, a loss of stability, a loss of our future!

Appendix B: Experiment Flow

Appendix B1: Introduction and Consent Form

Dear participant

Thank you for taking part in this research.
This research aims to explore how automotive companies communicate their environmental corporate social responsibility (CSR) messages to the public. During the survey, you will see an Instagram post from an automotive brand. After viewing the post, you will be asked a few questions about your opinions on it.

There are no right or wrong answers. Please answer honestly and carefully read the instructions. The survey will take approximately 3 minutes to complete.
Please note: This study includes one or more attention check questions. These questions are designed to confirm that participants are reading the instructions carefully.

Your participation in this survey is completely voluntary. All collected data will remain anonymous and your personal information will be protected. The data will be used for research purposes only and will not be shared with third parties.

If you have any questions about the survey, feel free to contact the researcher at 700673xy@eur.nl.
Thank you again for your participation!

To continue, please click the button below. You must be 18 years or older, understand and agree to the conditions of this survey, and voluntarily agree to participate.

- ○ YES
- ○ NO

Appendix B2: Question asks about participants' attitudes toward automotive companies engaging in environmental CSR

Do you think automotive companies should engage in environmental corporate social responsibility (CSR) activities, which involve reducing their impact on the environment and promoting sustainability?

- ○ YES
- ○ NO

Appendix B3: Measurement of participants' environmental concern

Please indicate to what extent you agree or disagree with the following statements.

	Completely Disagree	Mostly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Mostly Agree	Completely Agree
I am concerned about the environment.	○	○	○	○	○	○	○
The condition of the environment affects the quality of my life.	○	○	○	○	○	○	○
I am willing to make sacrifices to protect the environment.	○	○	○	○	○	○	○
I am emotionally involved in environmental protection issues.	○	○	○	○	○	○	○

Appendix B4: Measurement of participants' perceived message credibility, including one attention check question in the scale

Please indicate to what extent you agree or disagree with the following statements based on the Instagram post you just saw.

	Completely Disagree	Mostly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Mostly Agree	Completely Agree
I think the statements in the post are accurate.	○	○	○	○	○	○	○
This is an attention check. To confirm you are paying attention, please select "Neutral."	○	○	○	○	○	○	○
I am confident that the information presented is true.	○	○	○	○	○	○	○
The post reflects the genuine intentions of the company.	○	○	○	○	○	○	○

Appendix B5: Measurement of participants' brand attitude

Please rate your overall feelings toward Geely, the brand featured in the Instagram post you just saw. I think Geely is :

	1	2	3	4	5	6	7	
Unappealing	○	○	○	○	○	○	○	Appealing
Bad	○	○	○	○	○	○	○	Good
Unpleasant	○	○	○	○	○	○	○	Pleasant
Unfavorable	○	○	○	○	○	○	○	Favorable
Unlikeable	○	○	○	○	○	○	○	Likeable

Appendix B6: Manipulation check questions

The caption of the Instagram post you just saw primarily focused on:
1 = Entirely about what we'll LOSE by NOT using solar power
7 = Entirely about what we'll GAIN by USING solar power

	1	2	3	4	5	6	7	
Losses	○	○	○	○	○	○	○	Gains

Did the Instagram post you just saw include a green certification in the bottom-left corner of the image?

○ YES

○ NO

Appendix B7: Second attention check question

Please click " Agree" to show you're paying attention.

○ Disagree

○ Neutral

○ Agree

Appendix B8: Demographic questions

Almost done! Which gender do you identify with

- ○ Male
- ○ Female
- ○ Non-binary / third gender
- ○ Prefer not to say

How old are you? (Example: 24)

_____

In the last 10 years, in which country have you spent most of your time?

▼ Afghanistan (1) ... Zimbabwe (1357)

What is the highest level of education you have completed

- ○ Less than a high school degree
- ○ High school degree or equivalent
- ○ Bachelor's degree
- ○ Master's degree or MBA
- ○ PhD or equivalent
- ○ Other

What is your Prolific ID? Please note that this response should auto-fill with the correct ID

_____

Appendix C: Multi-item measurements

Construct	Items	Factor Loadings
Environmental concern (α = .92)	(1=strongly disagree, 7= strongly agree)	
	1. I am concerned about the environment.	0.92
	2. The condition of the environment affects the quality of my life.	0.86
	3. I am willing to make sacrifices to protect the environment.	0.92
	4. I am emotionally involved in environmental protection issues.	0.90
Message credibility (α = .89)	(1=strongly disagree, 7= strongly agree)	
	1. I think the statements in the post are accurate.	0.92
	2. I am confident that the information presented is true.	0.92
	3. The message reflects the genuine intentions of the company.	0.89
Brand Attitude (α = .96)	(1-2)	
	1. unappealing/ appealing	0.92
	2. bad/ good	0.91
	3. unpleasant/ pleasant	0.93
	4. unfavorable/ favorable	0.94
	5. unlikeable/ likeable	0.93

Appendix D: Declaration Use of Generative AI Tools

Student Information
Name: Xu Yan

Student ID: 700673

Course Name: Master Thesis CM5000

Supervisor Name: Dr. Serge Rijsdijk

Date: 24 June 2025

Declaration:

Acknowledgment of Generative AI Tools
I acknowledge that I am aware of the existence and functionality of generative artificial intelligence (AI) tools, which are capable of producing content such as text, images, and other creative works autonomously.

GenAI use would include, but not limited to:

- Generated content (e.g., ChatGPT, Quillbot) limited strictly to content that is not assessed (e.g., thesis title).
- ~~Writing improvements, including~~ grammar and spelling corrections (e.g., Grammarly)
- Language translation (e.g., DeepL), without generative AI alterations/improvements.
- Research task assistance (e.g., finding survey scales, qualitative coding verification, debugging code)
- Using GenAI as a search engine tool to find academic articles or books (e.g.,

☒ I declare that I have used generative AI tools, specifically ChatGPT. However, I only used it to correct grammar, spelling, punctuation and in-text citation mistakes. I did not use it to generate any content for my thesis.The purpose of using Chatgpt was to aid in correcting possible grammar, spelling, punctuation and in-text citation mistakes in my thesis work.

Extent of AI Usage
☒ I confirm that while I utilized generative AI tools to aid in content creation, the majority of the intellectual effort, creative input, and decision-making involved in completing the thesis were undertaken by me. I have enclosed the prompts/logging of the GenAI tool use in an appendix.

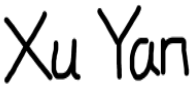
☐ I declare that I have NOT used any generative AI tools and that the assignment concerned is my original work.

Signature: Xu Yan
Date of Signature: 24 June 2025

Ethical and Academic Integrity

☒ I understand the ethical implications and academic integrity concerns related to the use of AI tools in coursework. I assure that the AI-generated content was used responsibly, and any content derived from these tools has been appropriately cited and attributed according to the guidelines provided by the instructor and the course. I have taken necessary steps to distinguish between my original work and the AI-generated contributions. Any direct quotations, paraphrased content, or other forms of AI-generated material have been properly referenced in accordance with academic conventions.

By signing this declaration, I affirm that this declaration is accurate and truthful. I take full responsibility for the integrity of my assignment and am prepared to discuss and explain the role of generative AI tools in my creative process if required by the instructor or the Examination Board. I further affirm that I have used generative AI tools in accordance with ethical standards and academic integrity expectations.

Signature: 

Date of Signature: 24 June 2025

ChatGPT prompts：

I only used ChatGPT to check for grammar, spelling, punctuation and in-text citation mistakes.

I gave the instruction: “ Please help me correct the possible grammar mistakes, spelling mistakes, punctuation and in-text citation mistakes in the following content. Do not change any content or expression, only correct grammar, spelling, punctuation and citation mistakes.”