CHARLES UNIVERSITY

FACULTY OF SOCIAL SCIENCES

Institute of Sociological Studies

Department of Sociology

Bachelor's Thesis

2025 **Magdalena Pacovská**

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Conflict Between Declared and Manifested Environmental Friendliness of Companies as a Factor of Their Perceived Greenwashing

Bachelor's Thesis

Author of the Thesis: Magdalena Pacovská

Study programme: Sociologie a sociální politika

Supervisor: Mgr. Jan Urban, Ph.D.

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Abstract

This paper examines the process of forming consumer opinions about a company's environmental profile, focusing on the environmental signals that the company communicates as part of its marketing presentation. The research draws on costly signaling theory, which describes the behavior of individuals or companies who communicate their qualities to their surroundings through strong or weak signals. A strong signal is costly and difficult to falsify, while a weak signal does not require much effort on the part of the individual to send. In this thesis, strong signals are equivalent to a company's behavior, and weak signals are equivalent to the claims a company makes to consumers. This theory is tested in the context of greenwashing, which is becoming increasingly prevalent in the market in response to growing environmental awareness. Companies have two options for responding to the growing demand for environmentally friendly products: to make their products or services truly sustainable, or to merely pretend to do so and join those who deceive customers through greenwashing practices. The research employed an online experimental study, in which participants were presented with fictional company profiles featuring different environmental behaviors and claims, inspired by previous studies (De Vries et al., 2015; De Jong et al., 2018; Løhre et al., 2024). The aim of the study was to examine the influence of strong and weak signals on consumers and their subsequent evaluation of four aspects of the company: trustworthiness, environmental friendliness, moral behavior, and intention to purchase its product. The results showed that strong signals have a greater influence on consumer perception than weak signals, which is consistent with costly signaling theory (Bliege Bird & Smith, 2005; Lofgren et al., 2008; Al-Shawaf & Lewis, 2017; McAndrew, 2019; McManus & Sendinç, 2024). On the contrary, a surprising finding was that greenwashing did not reduce the overall perception of a company's environmental friendliness, even though it negatively affected its perceived credibility. The third result of the experiment showed that a weak pro-environmental signal from an environmentally friendly company did not increase its credibility with consumers, thus demonstrating that excessive promotion by a company may not always have a positive effect. The study's results show that while strong signals from companies significantly influence consumer opinion, the detection of greenwashing practices and their potential punishment depend on the specific context of the situation. Overall, the study contributes to the unification of previous findings using costly signaling theory and describes consumers' perceptions of companies' environmental friendliness.

Abstrakt

Tato práce zkoumá proces utváření spotřebitelova názoru na environmentální profil firmy s ohledem na environmentální signály, které firma v rámci své prezentace na trhu komunikuje. Proběhlý výzkum čerpá z teorie nákladné signalizace, která popisuje chování jedinců či firem, kteří dávají okolí najevo své kvality silnými nebo slabými signály. Silný signál je nákladný a obtížně zfalšovatelný, zatímco slabý signál nevyžaduje od jedince velké usílí k jeho vyslání. V této práci jsou silné signály ekvivalentem k chování firmy a slabé signály k tvrzení, kterými se firma prezentuje spotřebitelům. Tato teorie je testována v rámci praktiky greenwashing, která se na trhu v souvislosti s rostoucím environmentálním povědomím stále rozšiřuje. Firmy mají dvě možnosti, jak se postavit k sílící poptávce po environmentálně šetrných produktech: změnit své produkty či služby na skutečně udržitelné, nebo takové chování pouze předstírat a přidat se tak k těm, kteří zákazníky klamou prostřednictvím praktiky greenwashingu. Výzkum využil online experimentální studii, v níž byly účastníkům předloženy fiktivní profily firem s různým environmentálním chováním a tvrzeními, inspirovanou předchozími studiemi (De Vries et al., 2015; De Jong et al., 2018; Løhre et al., 2024). Cílem práce bylo prozkoumat vliv silných a slabých signálů firmy na spotřebitele a jeho následné hodnocení čtyř aspektů firmy: důvěryhodnosti, environmentální šetrnosti, morálního chování a úmyslu koupit si její produkt. Výsledky ukázali, že silné signály mají na spotřebitelovo vnímání větší vliv než signály slabé, což je v souladu s teorií nákladné signalizace (Bliege Bird & Smith, 2005; Lofgren et al., 2008; Al-Shawaf & Lewis, 2017; McAndrew, 2019, McManus & Sendinç, 2024). Naopak překvapivým zjištěním bylo, že greenwashing nesnížil celkové vnímání ekologické šetrnosti firmy, přestože negativně ovlivnil její vnímanou důvěryhodnost. Třetí výsledek experimentu ukázal, že slabý proenvironmentální signál ekologické firmy nezvýšil její důvěryhodnost u spotřebitele, a tedy ukázal, že přílišná propagace ze strany firmy nemusí mít vždy pozitivní přínos. Z výsledků studie vyplývá, že zatímco silné signály firmy dominují v utváření spotřebitelova názoru, odhalení praktiky greenwashingu a její případné trestání je závislé na kontextu konkrétní situace. Celkově studie přispívá ke sjednocení předchozích zjištění s využitím teorie nákladné signalizace a popisuje vnímání environmentální šetrnosti firem ze strany spotřebitelů.

Keywords

Costly signaling theory, greenwashing, consumers' perception, companys’ behavior and claim, environmental friendliness

Klíčová slova

Teorie nákladné signalizace, greenwashing, vnímání spotřebitelů, chování a tvrzení firem, environmentální udržitelnost

Title

Conflict Between Declared and Manifested Environmental Friendliness of Companies as a Factor of Their Perceived Greenwashing

Název práce

Rozpor mezi deklarovanou a projevovanou šetrností firem k životnímu prostředí jako faktor jejich vnímaného greenwashingu

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INTRODUCTION

Due to growing environmental awareness and consumer demand for sustainable products and services, companies are facing pressure to incorporate environmental strategies into their business operations (Kolcava et al., 2022). However, this trend also has a negative side, which is a phenomenon known as greenwashing, defined as the practice of misleading communication about a company's environmental activities in order to create a false impression of its ecological responsibility (Delmas & Burbano, 2011). This problem is widespread in marketing. The European Commission (2023) estimated that up to 53% of environmental claims on the European Union market are vague, misleading, or unsubstantiated.

The consequences of greenwashing are serious. Not only does it mislead consumers who are trying to make responsible purchasing decisions, but it also systematically undermines their trust. When consumers discover that a company’s advertising has misled them, their feelings can turn to frustration and cynicism, which can harm their perception of the entire sector (De Jong et al., 2018). Therefore, greenwashing can lead to apathy towards environmental efforts, thereby undermining genuine progress toward a sustainable future.

Despite extensive research examining the impacts of greenwashing, there are inconsistent conclusions regarding the conditions under which consumers detect and punish greenwashing. Studies such as De Vries et al. (2015) and De Jong et al. (2018) demonstrate that consumers react negatively to conflicting signals from companies. However, a replication study by Løhre et al. (2024) did not confirm these results, suggesting that the perception of greenwashing is a complex and contextual issue. Previous research has varied in the theories used to explain consumers' perceptions of companies' environmental practices, and this thesis proposes a theoretical framework that could unify these differences.

The key to understanding these differences can be found in a costly signaling theory (Bliege Bird & Smith, 2005; Lofgren et al., 2008; Al-Shawaf & Lewis, 2017; McAndrew, 2019; McManus & Sendinç, 2024). This theory, deducted from evolutionary biology, explains how individuals or groups communicate their qualities to others through signals that vary in their cost and thus in their credibility (McAndrew, 2019). It distinguishes between weak signals, which are inexpensive and easy to fake (e.g., marketing claims), and strong, costly signals, which require significant investment and are difficult to fake, thereby being more credible (e.g., real changes in the production process).

This paper aims to apply the theory of costly signaling to the issue of greenwashing. I argue that the difference in signal strength is the mechanism shaping consumers' attitudes and can help explain the varying interpretations of greenwashing in previous studies. The thesis examines whether, in the context of corporate environmental behavior, strong signals are more important to consumers than weak signals, and how they perceive situations where these two types of signals conflict or align.

This thesis is structured as follows: the theoretical part first defines greenwashing and summarizes previous research, then introduces the theory of costly signaling and formulates research hypotheses. The methodological section describes the characteristics of the sample, the experiment's design, and the analytical methods employed. The penultimate part presents and describes the results of the statistical analysis. The final discussion interprets the results in the context of the theory and previous studies, reflects on the limits of the research, and suggests directions for future research.

1. THEORETICAL BACKGROUND

1.1. What Is Greenwashing?

Greenwashing is typically defined as the provision of misleading information to consumers about the environmental attributes of goods and services, intended to mask their environmentally harmful impacts (de Freitas Netto et al., 2020; Delmas & Burbano, 2011).

The emergence of the practice of greenwashing can be linked to the increase in awareness of environmental problems and the environmental impacts of human activities in the 1960s and 1970s, when a growing number of activists concerned with the human impact on the environment causing climate change started to show up (de Freitas Netto et al., 2020; Chow, 2020). In 1970, the first official Earth Day in the U.S. took place, and at that time, the first recycling initiatives became visible, prompting people to seek eco-friendly products not only for the planet's sake but also for their own health (Chow, 2020).

The term "greenwashing" was first used by American journalist Jay Westerfeld in the 1980s, when he stayed in a hotel during his travels abroad and noted that the hotel management used signs urging guests to reuse towels to save the environment. Still, otherwise, the establishment made no effort to protect the environment. Westerfeld pointed out that the hotel used the environmental pretext only to reduce the costs of washing towels, even though it may have appeared to be an environmentally conscious business (Watson, 2017).

The issue of greenwashing has become increasingly important in recent decades (Delmas & Burbano, 2011), reflecting the growing focus on environmental protection (Kolcava et al., 2022) and the higher demand for environmentally friendly products and services (Kianpour et al., 2014). The sustainability aspect of marketed products conflicts with the growing trend of a consumer society (Rome, 2003), in which consumers focus on new and competing trends in almost all aspects of everyday life, such as fashion or technology. To achieve sustainable gains against their competitors, companies must decide whether to rebuild their strategic plan to be truly environmentally friendly or to lie about the sustainability of their products and services (Tinne, 2013).

Recently, the European Commission (2023) estimated that 53% of sustainability claims for products on the EU market are unclear, misleading, or unsubstantiated, and that

40% of products in the EU labeled as sustainable lack supporting evidence for such a label. This labeling problem may be due to insufficient communication, but it can also be an example of deceitful marketing resulting in greenwashing practices.

Greenwashing can help companies attract customers, but it can also harm them when detected, as the moral values of companies, such as accountability and transparency, play a key role in how their environmental initiatives are perceived (Shabani Shojaei et al., 2024). For instance, companies often attempt to present themselves as socially responsible actors, but if their behavior contradicts these proclamations, they may face accusations of hypocrisy and greenwashing, which can lead to reduced consumer interest in the company's products and services (De Jong et al. 2018).

Notably, the topic of organizational values has been addressed by leading sociological theorists since the beginning of the last century. For instance, Émile Durkheim (1893) explored the concept of collective consciousness, which describes a society based on shared values, norms, and beliefs that enable its members to function together as a cohesive whole. Nowadays, the term Corporate Social Responsibility (CSR) is used to describe these societies of shared values. Research suggests that positive CSR initiatives can enhance a corporation's reputation and lead to increased customer loyalty (Tran, 2022). Durkheim's theory (Durkheim, 1893) also discusses behavior enriched by moral values, which can strengthen a company's relationship with external partners and customers, ultimately leading to greater market success.

The issue of CSR activities (Tran, 2022) can also be traced back to Max Weber's concept of moral values in his theory of rationalization (Weber, 1930), where he highlights the importance of work ethics and integrity in supporting organizational behavior alongside economic goals. Modern sociology offers a perspective on the formulation of organizational values in the marketplace and their influence on the consumer's environment. This problem has also been highlighted by Richard Sennett (1998), who shows the tension companies face between long-term moral commitments and the flexibility demanded by a globalized market, supporting the statement about the evolution of a company's moral values in time, based on circumstances in the societal, economic, and technological fields. In addition, companies demonstrate their responsibilities toward society and its environmental goals through CSR activities. These activities can be interpreted as signals of moral integrity, based on the theory of costly signaling (McAndrew, 2019), or as a means of building social capital, as outlined in Bourdieu's theory (Bourdieu, 1986).

Studies on consumer perceptions of greenwashing have been a trend, particularly in the last decade (Delmas & Burbano, 2011; De Vries et al., 2015; De Jong et al., 2018; Shabani Shojaei et al., 2024; Løhre et al., 2024), mirroring the growing importance of the practice among companies (De Jong et al., 2018). These studies seek to understand how consumers infer greenwashing from available information and how this affects their decision-making.

1.2. Previous Studies on Greenwashing

As mentioned in the previous chapter, greenwashing has been examined from several different perspectives in recent years. As sustainability efforts to protect the environment grow, companies are forced to adapt to the demand for sustainable promises and products. There are only two ways to remain a strong competitor in the market: change your product range to a sustainable one or mislead your customers about the sustainability of your business (Tinne, 2013), thereby contributing to the practice of greenwashing. When choosing the misleading path, this manipulative technique can take several forms: disinformation about the company's environmental practices (Laufer, 2003), vague claims lacking specific details in sustainable definitions (de Freitas Netto et al., 2020), falsely green branding such as green logos or packaging (Ende et al., 2023) or hidden trade-offs while highlighting one positive aspect and ignoring all the negative ones (Polonsky & Rosenberger, 2001). What unites these mentioned forms of greenwashing and, at the same time, defines this concept is the company's conflicting behavior and claims.

Every type of business often involves a dual narrative consisting of what the company says in the context of marketing and what it does within the scope of its business (Porter & Kramer, 2011). For example, many companies highlight their CSR activities in public statements, mentioning their eco-friendliness or ethical labor practices, while remaining silent about the harmful aspects of their business (Delmas & Burbano, 2011). This fact supports research (Lyon & Maxwell, 2011) on the behavior of oil companies, which emphasizes their investments in renewable energy sources while using the majority of their resources for fossil fuel extraction. We can see that marketing is a powerful tool, even for influencing consumers' opinions, which, under the right conditions, can serve as a valuable means of generating profits through greenwashing practices. The only threat to these practices can be disclosure by the consumer, but under what conditions does a consumer expose a greenwashing practice?

In their study, De Vries et al. (2015) conducted an experiment in which they manipulated the motives of energy companies to defend their investments in green practices. Results showed that consumers perceive less corporate greenwashing when the company defends itself with a profit motive than when it communicates an environmental motive. In contrast, a replication of this study (Løhre et al., 2024) found no support for this finding in their experiment, which involved enriching energy companies with those from the construction industry. While De Vries et al. (2015) cautioned against environmental messaging in environmentally sensitive sectors, Løhre et al. (2024) imply that such messaging might not harm, and could even improve, general attitudes toward companies. It is worth noting that both studies aimed to stimulate general attitudes of customers, with the type of company serving as the independent variable.

Another phenomenon connecting previous studies is when a company's behavior contradicts its claims towards customers, thereby reducing the company's credibility. In their experiment, De Vries et al. (2015) demonstrated that an energy company cannot effectively defend its green initiatives with environmental sympathy, as it will be accused of greenwashing. In this situation, it is evident that the company's claim contradicted its behavior, thereby undermining its initial credibility. A similar pattern can be seen in the research of De Jong et al. (2018) where the greenwashing company (non-environmental direction hidden behind proclaimed environmental sympathy) was ranked the weakest in the category "perceived integrity of communication" or credibility, compared to a company (non-environmental direction but not hidden behind environmental sympathy) which was ranked ahead of it and among the other types.

Results of these studies (De Vries et al., 2015; De Jong et al., 2018; Løhre et al., 2024) may reveal different perspectives on how consumers react to greenwashing, but I suggest that it is only the type of behavior or promoted claim that differs. It may seem that the basis of fictional companies in previous studies has no significant difference. Still, it exists in the strength of the signal that each company or its behavior creates for the customer's perception. This relation can be described with the theory of costly signaling, where the costs of behavior or claim signals are examined.

1.3. The Theory of Costly Signaling

As already mentioned, the perception of a company's environmental efforts can be understood through the costly signaling theory, which derives from evolutionary biology and social sciences. The costly signaling theory mainly focuses on explaining how individuals communicate their qualities or intentions using strong (costly) or weak signals in their behavior and claims (Bliege Bird & Smith, 2005; Lofgren et al., 2008; Al-Shawaf & Lewis, 2017; McAndrew, 2019; McManus & Sendinç, 2024).

There are more ways in which said signals can be transmitted. A signal can be physical (McAndrew, 2019), material (Connelly et al., 2011), or behavioral (Lofgren et al., 2008) and can serve to demonstrate the qualities of each being. People and animals tend to showcase their abilities or demonstrate their commitment to increase their credibility within their species, trying to stand out.

According to the theory of costly signaling, there are weak and strong (costly) signals (Lofgren et al., 2008):

1. Weak signals are made with minimum effort and are less reliable when talking about the signaler's qualities. Because of their low-cost origin, these can be easily forged or misinterpreted. An example is a product labeled as "made with natural ingredients" without clarifying certification. The problem here is that the term "natural" may not be strictly regulated, and the claim seems misleading. In addition, everyone on the market can claim such a thing without providing evidence, which makes the signal less reliable and therefore also weaker.
2. Strong or costly signals, on the other hand, require more investment from the signaler. The substantial cost shows that only individuals with demonstrated quality can afford to produce such a signal. Regarding the market, a notable example of a strong signal of competence in the job market context is holding an advanced degree. This signal is believable due to the resources and time required, which necessitate dedication and are difficult to fake.

In this paper, a weak signal refers to the company's claim about its environmental stance, while a strong signal describes the company's behavior in the context of its business operations.

The costly signaling theory is based on two main characters: a signaler and a recipient

(Bliege Bird & Smith, 2005). In the case of greenwashing, companies signal some sort of quality that customers, as recipients, expect from them. Although the company attempts to signal its sustainability and positive approach to the environment within the framework of greenwashing, it ultimately depends on the customer's perception of this presentation to determine whether the signal is credible or not, thereby revealing the costliness of the signal or exposing the practice of greenwashing (Feghali et al., 2025).

The recipient's perception plays a key role in the signal's strength, which means everyone is trying to customize their signals to those they want to interest. An example from nature is the peacock, which displays its large and colorful feathers as a sign of its genetic quality, even though these feathers may simultaneously increase the risk of predation (Al-Shawaf & Lewis, 2017). Among humans, costly signals are often promoted by wearing expensive and famous brands or participating in social rituals to demonstrate certain social status, wealth, or general commitment to a group (McAndrew, 2019).

Costly signaling theory serves as an excellent tool for understanding why individuals, as well as companies, engage in costly activities to communicate information about themselves, even though it requires more effort. The theory also helps to understand how these signals influence social interactions and evolutionary dynamics (Henrich, 2009). Therefore, while sustainable products are generally preferred among consumers due to ecological considerations, the authenticity of a company's environmental claims plays a crucial role in maintaining consumer trust and positive perceptions (Tinne, 2013).

When talking about green marketing, the information in different types of communication must be consistent and thus believable to the environment, otherwise, misleading claims are made, including the practice of greenwashing, in which, the conflict usually lies between the behavior of the company and the message it's trying to convey (De Vries et al., 2015; Ende et al., 2023; Shabani Shojaei et al., 2024).

This paper distinguishes between companies based on their environmental behavior (green or brown) and their environmental claims (vocal or silent) (De Jong et al., 2018). A division like this leads to four types of companies: vocal brown (greenwashing) (1), silent brown (2), silent green (3), and vocal green (4), which were deduced within the framework of De Jong et al.'s (2018) study.

1.4. Possible Theoretical Contribution of the Paper

This paper is linked to two main fields, drawing on previous studies and their respective courses, as well as their results that will be gradually verified.

The first field is where De Vries et al. (2015) and Løhre et al. (2024) have addressed the perception of environmental friendliness, focusing on the impact of the type of company and the claims it makes to defend its environmental initiatives. I suggest that the focus on company type and company claims can be simplified by identifying strong and weak signals that shape customer opinion, and that strong signals are more important. As a part of my work, I plan to add to the above literature by applying the already introduced costly signaling theory (Bliege Bird & Smith, 2005; Lofgren et al., 2008; Al-Shawaf & Lewis, 2017; McAndrew, 2019, McManus & Sendinç, 2024), which put the strong signal influence (company behavior) before the weak one (company claim) (see H1) and can serve as a better tool to explain consumers' inferences about environmental practices. It will also clarify the results of previous studies (De Vries et al., 2015; De Jong et al., 2018; Løhre et al., 2024) from the perspective of costly signaling theory.

The second phenomenon that I believe can be explained by costly signaling theory is a situation where the weak signal (claim) of a company contradicts the strong signal (behavior) of the company, thereby reducing the perceived environmental friendliness of the company (De Vries et al., 2015; De Jong et al., 2018). Considering these results, I propose that the environmental claim reduced the non-environmental company's credibility about environmental friendliness because a conflicting weak signal undermines the strong signal's message (see H2) (McManus and Sendinç, 2024). The opposite side of this mechanism, where the behavior is consistent with the company's or individual's claim and thus increases its credibility (see H3), forms the basis of costly signaling theory (Bliege Bird & Smith, 2005; Lofgren et al., 2008; Al-Shawaf & Lewis, 2017; McAndrew, 2019, McManus & Sendinç, 2024) and will also be tested in lines of environmental friendliness of companies.

1.5. Research Question and Hypotheses

Based on the theoretical framework above, I aim to answer the following research question:

Q: How do strong and weak environmental signals, as well as their combination, affect consumers' perceptions of a company's environmental friendliness?

I relate a total of three hypotheses to the research question:

H1: A silent green company will be rated more positively in environmental friendliness than a silent brown company (consumers will take a strong signal into account).

H2: Conflict between a weak pro-environmental signal (verbal statement) and a strong anti-environmental signal (actual behavior) will harm the perception of the company's environmental friendliness (compared to a situation of a neutral weak signal).

H3: Aligned pro-environmental signals (both strong and weak) will have a stronger effect on perceived environmental friendliness than just a strong signal (with a neutral weak signal).

1.6. Research Objectives

In this work, I am interested in how strong and weak environmental signals, as well as their combination, affect consumers' perceptions of a company's environmental friendliness. By testing three above mentioned hypotheses I tend to prove that while previous studies (De Vries et al., 2015; De Jong et al., 2018; Løhre et al., 2024) came up with various conclusions of their experiments, their results can be simplified by the theory of costly signaling that is able describe the consistent mechanism affecting the perception of environmental engagement.

The results of the experiment should explain and possibly unificate previous findings and simultaneously describe customers' perceptions of environmental engagement based on four categories of relationships between strong and weak signals (vocal green, silent green, vocal brown-greenwashing, silent brown) (De Jong et al., 2018) and by using the theoretical framework of costly signaling.

2. METHOD

2.1. Participants

Participants were recruited for the study through several methods. Given that it was a verification of several behavioral patterns, supported by the already established theory of costly signaling, no quota criteria were needed for participant selection. Invitations to an online study examining the perception of environmental friendliness among companies were posted on social media and shared through my contacts and those of my supervisor. Questionnaires were sent via email to approximately 100 students from the Faculty of Social Sciences of Charles University. Then, Facebook groups were used to connect students for the mutual completion of questionnaires for their final theses. In conclusion, the target group primarily consisted of students from the Czech Republic. The three previous studies (De Vries et al., 2015; De Jong et al., 2018; Løhre et al., 2024) also used the same strategy, testing their hypotheses on students, which makes the results even more comparable.

Sample size was along the lines of previous studies, where De Vries et al. (2015) collected in their three experiments always under 100 participants (82, 77, 93), it's replication Løhre et al. (2024) collected 113 participants, and De Jong et al. (2018) worked with 246 participants (divided into eight experimental groups). Due to the limited recruitment, this experiment aimed to target 100 or more participants to facilitate a more accurate comparison with a similar study design (De Vries et al., 2015; Løhre et al., 2024). In total, 207 people entered the study online, of whom 109 completed it, resulting in a completion rate of 57%. 58% were women, and the average age among participants was 29.66 (SD = 13.270). Focusing on the education of recruited participants, 53% had completed secondary education with a leaving exam, and 39% had some higher education at a university level.

2.2. Materials

2.2.1. Company's name (independent variable)

The first independent variable is the company name. It is essential to maintain the company name variable, as one of the study's primary objectives is to demonstrate that factors beyond a company's name or industry type (De Vries et al., 2015; De Jong et al., 2018) significantly influence its perception. The company names were created for universal use, ensuring that the fictitious companies would best align with each variable due to the random matching of the name with the focus and claim. The eight Czech names that were created are as follows: Elysian Elements a.s.; Modrý Horizont s.r.o.; Amber Isle, Ltd.; Katak a.s.; Růžička a synové s.r.o.; MIDSON s.r.o.; Český Produkt v.o.s.; Kompas s.r.o. Each company name can only be used once in one launch.

2.2.2. Company's environmental behavior (independent variable, strong signal)

The second independent variable is the environmental behavior of a company, which also represents a strong signal in this experiment. I have proposed eight different industry types, which vary in the research and whose sole purpose is to paint a credible picture of the company, demonstrating that industry types can vary without any significant difference in customer perception. However, what is more important in terms of a strong signal is that each industry type has two options, pro-environmental and anti-environmental behavior, following the example of De Jong et al. (2018), who similarly work with "green" and "brown" companies. For each company profile, the participant is given either pro-environmental or anti-environmental behavior of the chosen industry type. Once the industry type is used, it can't be used again in one launch.

For details, see Table 1.

Table 1

Environmental Behavior of the Company

Industry type	Pro-environmental	Anti-environmental
Clothing	The company is a clothing manufacturer. In the process of producing new clothes, it has developed a way to renovate leftover items and return them to sale.	The company is a clothing manufacturer. It launches a new collection of its products on the market every month.
Furniture	The company is a home furniture manufacturer. The main raw material for most of its products is wood from environmentally friendly plantations.	The company is a home furniture manufacturer. The main raw material for most of its products is imported exotic wood.
Footwear	The company is a fashion footwear manufacturer. Leftover products from older collections are sent to charity drives, where they find further use.	The company is a fashion footwear manufacturer. Leftover products from older collections are regularly delivered to a heating plant for incineration.
Cosmetics	The company is a manufacturer of facial and hair cosmetics. The safety of new products is not tested on animals, which is why it holds the Cruelty Free certification.	The company is a manufacturer of facial and hair cosmetics. To ensure the safety of new products, they test them on animals in laboratories.
Electronics	The company is an electronics manufacturer. In case of a device malfunction, it guarantees up to a ten-year warranty period, during which repair and after-sales service are provided.	The company is an electronics manufacturer. In case of a device malfunction within the first two years, it offers the customer a replacement with a new one.
Automotive	The company is a car manufacturer. It has long invested in activities to reduce the carbon footprint created by car production.	The company is a car manufacturer. It has long invested in marketing activities to increase the sales of its cars.
Windows	The company is a window manufacturer. New units are packed in cardboard or other compostable papers and fillers to prevent damage during distribution to the retail store or to the customer.	The company is a window manufacturer. New units are packed in plastic packaging and plastic fillers to prevent damage during distribution to the retail store or the customer.
Toys	The company is a manufacturer of children’s robotic toys. The products have an integrated battery, and the package includes a charger.	The company is a manufacturer of children’s robotic toys. The products are designed to use alkaline batteries, which are included in the package.

Note. The experiment was conducted in Czech. Translation into the language of the thesis.

2.2.3. Company’s claim (independent variable, weak signal)

The third independent variable is the company's claim, which is either pro-environmental or neutral, representing the weak signal of this experiment. Unlike previous experiments, the environmental claim was not assigned a contrasting variable, economic (De Vries et al., 2018) or mixed (economic + environmental) (Løhre et al., 2024). For the above hypotheses (H2 and H3) of this experiment, a neutral claim is sufficient as the second variable, functioning as a control when comparing the two options. Nine pro-environmental and nine neutral claims were proposed, each with the same chance of being assigned to one of six company profiles during a launch.

For details, see Table 2.

Table 2

Company's Claim Towards Consumers

Pro-environmental	Neutral
Our mission is to contribute to nature conservation.	Last year, we acquired twice as many new contracts.
We contribute to sustainable development and the protection of natural resources.	We will be opening new branches in three additional countries.
We are a responsible player in the field of environmental protection.	We plan to expand our range with new products.
We support initiatives for nature conservation and sustainable lifestyles.	We have started using new technology that increases production efficiency.
We strive to preserve biodiversity and ecological stability.	We are developing a new program to support employees and develop their skills.
We are a supporter of ecological innovation and technologies for sustainable development.	Our new customer support web portal will be launched soon.
We have launched a campaign focused on neutralizing our environmental impact.	We are preparing a rewards program for loyal customers.
We focus on reducing greenhouse gas emissions and protecting air and water quality.	We have started operating a new distribution center to improve logistics.
We are working on a new warranty repair program for our products.	We are expanding our team of employees to increase customer satisfaction.

Note. The experiment was conducted in Czech. Translation into the language of the thesis.

Combinations of these variables create, following the example of De Jong et al. (2018), four different company profiles that the participant will encounter in the questionnaire.

2.2.4. Dependent variables

Participants are asked to answer the following four questions about each of the six fictitious company profiles they read throughout the questionnaire. Each dependent variable is measured using a Likert-type scale composed of five statements that represent the level of agreement.

Credibility of the company's declaration. I measured the credibility of the company's statement by asking participants to rate how much they believed the company's declaration (*Do you believe what the company says about itself?*). Participants evaluated trustworthiness on a five-point Likert-type scale (1 = *definitely no*; 2 = *rather no*; 3 = *neither yes nor no*; 4 = *rather yes*; 5 = *definitely yes*). This was repeated for each of the six trials.

Environmental aspect of the company. The second dependent variable measures the company's environmental aspect from the consumer's perspective (*Does this company want to protect the environment?)*. It checks whether the participant detects the company's greenwashing practice and examines consumers' overall impression of the company's environmental performance. A five-point Likert-type scale (1 = *definitely no*; 2 = *rather no*; 3 = *neither yes nor no*; 4 = *rather yes*; 5 = *definitely yes*) was used to evaluate the perceived environmental performance of the company in all six trials. This question determines the values of the dependent variable related to all three hypotheses.

Moral aspect of the company. With the third question, I measured in all six trials how consumers perceive the particular type of company from a moral standpoint (*Does this company behave morally?*). The range of possible answers was again on a five-point Likert-type scale (1 = *definitely no*; 2 = *rather no*; 3 = *neither yes nor no*; 4 = *rather yes*; 5 = *definitely yes*).

Intention to buy the company's product. The fourth question used a Likert-type scale (1 = *definitely no*; 2 = *rather no*; 3 = *neither yes, nor no*; 4 = *rather yes*; 5 = *definitely yes*) to determine whether consumers would be willing to buy the company's product for each of the six company profiles (*Would you buy a product from this company?*). This is an additional question based on the experiments of De Vries et al. (2015) and De Jong et al.

(2018), who found no relationship for this variable in their studies. It serves as an additional variable to examine the relationship between this dependent variable and the others.

2.3. Study Design

Experiments that this paper follows (De Vries et al., 2015; De Jong et al., 2018; Løhre et al., 2024) were based on a design where participants were presented with different combinations of company profiles, which were later rated through a Likert-type scale. De Vries et al. (2015) divided participants into two experimental groups: one read about a fictitious energy company defending its ecological initiatives with environmental awareness, while the second group was presented with the same fictitious type of company defending the same initiatives with an economic motive. On the other hand, De Jong et al. (2018) showed participants a description of a fictive company profile, varying in the strength of its environmental claim. In both experiments, participants were asked to rate the company's credibility and willingness to buy the company's product. Further, there were questions about manipulation intentions (De Vries et al., 2015) or perceived greenwashing (De Jong et al., 2018). In this way, the studies reached the results mentioned above and inspired an experiment in this thesis.

An experiment in the form of an online questionnaire emerged as the most effective way to collect data on the above hypotheses and to build upon previous studies. The main idea of the questionnaire was to present the participant with a variable fictitious company profile, which was then evaluated. The variability of each company profile was based on several independent variables.

It was possible to randomize certain variables using JavaScript, which was used to program the questionnaire. Each experiment run combines six fictitious company profiles, which vary in name, industry type, and claim. The random arrangement for each participant aims to avoid the influence of company name or industry type on the customer's opinion, or to demonstrate the unimportance of these variables. With that, the randomization allows us to test and show that previous experiments (De Vries et al., 2015; De Jong et al., 2018) gave weight to the wrong variable.

2.4. Procedure

Firstly, when participants entered the study, they were presented with an informed consent form, which was necessary to proceed with the questionnaire (for details, see Figure 1). After agreeing to the terms of the experiment, the central part was ahead of them. Here, data about participants' entrance in the survey were automatically stored and later used to calculate the questionnaire response rate.

After reading the brief instructions, each participant was shown a randomly combined profile of a fictitious company, for which they were asked to answer four mandatory questions. With each question, they could choose from five different options on a Likert-type scale and express their level of agreement. The company profile consisted of a random name, the type of industry, and a claim towards consumers. Consumers were not informed about the specific type of the company (vocal brown, silent brown, silent green, or vocal green), and they had to answer based on their impression. This process was repeated six times until the participant had evaluated six different companies with their answers. It was not possible to go back to the previous part of the experiment. For details, see Figure 2.

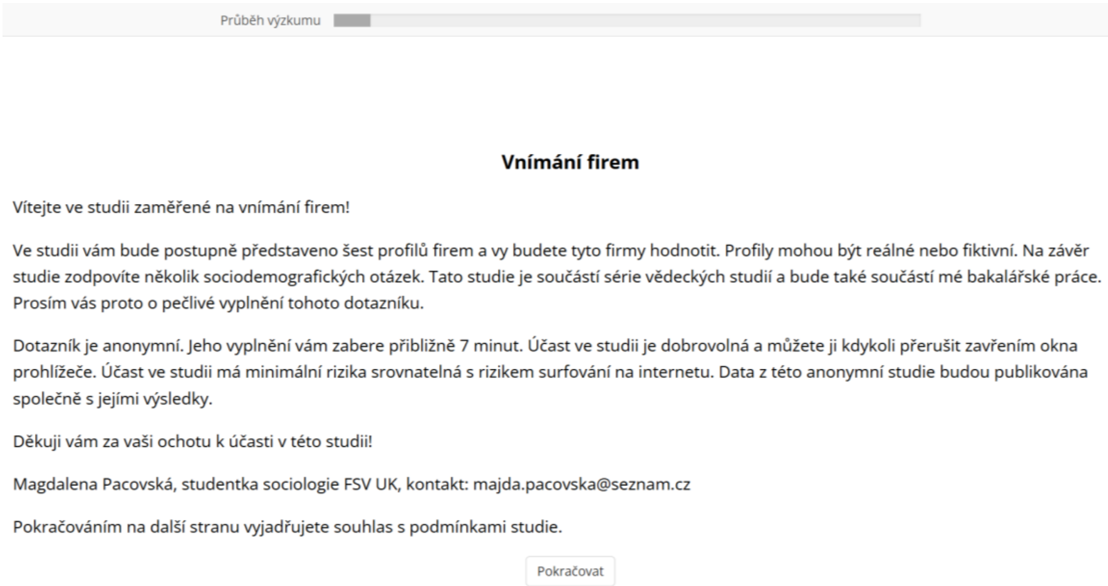
After the central part of the questionnaire, there were socio-demographic questions, collecting information about participants' gender, age, and highest level of education achieved.

At the very end of the experiment, three additional questions were placed. Firstly, the accuracy of the answers was assessed (*How hard did you try to answer as accurately as possible?*). The possible answers were: I didn't try at all, I tried a little, I tried quite a bit, and I tried very hard. This was followed by a question asking whether the participant had concentrated on completing the questionnaire (*How much did you concentrate on the instructions in the questionnaire?*). The possible answers were: I did not concentrate at all, I concentrated a little, I concentrated quite a lot, and I concentrated very much. The repeated completion of the questionnaire was determined by asking participants whether they had already answered this questionnaire before, with response options of yes or no.

After participants answered every question, they were presented with a debriefing where they learned about the fictitious nature of the companies listed. They learned that this study aimed to determine how various attributes of companies influence consumers' perception. Lastly, we thanked them for finishing the questionnaire, and they could close the website. For details, see Figure 3.

Figure 1

Informed Consent


Průběh výzkumu

Vnímání firem

Vítejte ve studii zaměřené na vnímání firem!

Ve studii vám bude postupně představeno šest profilů firem a vy budete tyto firmy hodnotit. Profily mohou být reálné nebo fiktivní. Na závěr studie zodpovíte několik sociodemografických otázek. Tato studie je součástí série vědeckých studií a bude také součástí mé bakalářské práce. Prosím vás proto o pečlivé vyplnění tohoto dotazníku.

Dotazník je anonymní. Jeho vyplnění vám zabere přibližně 7 minut. Účast ve studii je dobrovolná a můžete ji kdykoli přerušit zavřením okna prohlížeče. Účast ve studii má minimální rizika srovnatelná s rizikem surfování na internetu. Data z této anonymní studie budou publikována společně s jejími výsledky.

Děkuji vám za vaši ochotu k účasti v této studii!

Magdalena Pacovská, studentka sociologie FSV UK, kontakt: majda.pacovska@seznam.cz

Pokračováním na další stranu vyjadřujete souhlas s podmínkami studie.

Pokračovat

Figure 2

Example of One Trial of a Company Profile


Průběh výzkumu

Název firmy: MIDSON s.r.o.
Co firma dělá: Firma je výrobcem automobilových vozů. Dlouhodobě investuje do marketingu s cílem zvýšit prodejnost svých automobilů.
Co firma říká: V minulém roce jsme získali dvojnásobné množství nových zakázek.

Věříte tomu, co o sobě firma říká?

ROZHODNĚ NE | SPÍŠE NE | ANI ANO, ANI NE | SPÍŠE ANO | ROZHODNĚ ANO

Chrání tato firma životní prostředí?

ROZHODNĚ NE | SPÍŠE NE | ANI ANO, ANI NE | SPÍŠE ANO | ROZHODNĚ ANO

Chová se tato firma morálně?

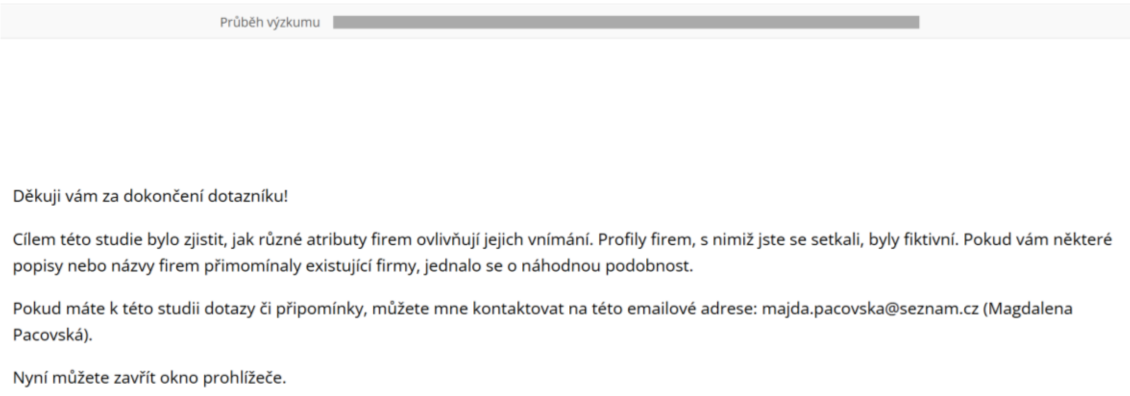
ROZHODNĚ NE | SPÍŠE NE | ANI ANO, ANI NE | SPÍŠE ANO | ROZHODNĚ ANO

Koupil/a byste si produkt této firmy?

ROZHODNĚ NE | SPÍŠE NE | ANI ANO, ANI NE | SPÍŠE ANO | ROZHODNĚ ANO

Figure 3

Debriefing



Průběh výzkumu

Děkuji vám za dokončení dotazníku!

Cílem této studie bylo zjistit, jak různé atributy firem ovlivňují jejich vnímání. Profily firem, s nimiž jste se setkali, byly fiktivní. Pokud vám některé popisy nebo názvy firem připomínaly existující firmy, jednalo se o náhodnou podobnost.

Pokud máte k této studii dotazy či připomínky, můžete mne kontaktovat na této emailové adrese: majda.pacovska@seznam.cz (Magdalena Pacovská).

Nyní můžete zavřít okno prohlížeče.

2.5. Ethical Considerations

The study was conducted following the ethical standards, and I am not aware of any ethical risks or challenges associated with the study design. After reading the research conditions, the participants gave their informed consent. The overall risk associated with completing the questionnaire was comparable to working in an office, which is considered very low. Following the informed consent of each participant, it was consistent to collect data anonymously and to analyze and publish the data in the same way. At the end of the study, participants read a debriefing that informed them they had only been exposed to fictitious company profiles in the questionnaire. However, this manipulation was deemed not to be risky, considering previous studies of a similar nature. Participants had the option of contacting me via email if necessary, which was not used.

3. ANALYSIS

As a statistical approach, mixed linear regression was used because it allows the combination of fixed effects with random effects. Due to the study's design, in which each participant evaluated six fictitious company profiles whose characteristics were derived from the final list of vignettes, dependencies arose between observations that needed to be eliminated. The mixed linear regression accounts for this by including participant IDs as random intercepts, thereby modeling individual variability while estimating fixed effects of signaling types. Another valuable aspect of mixed linear regression is its ability to handle unbalanced designs and missing data, which are common in experimental research. This model ensures maximal use of available data and reduces biases.

The analysis also included contrast coding, which allows testing research hypotheses about differences between specific groups in the experimental design of this work, i.e., between types of companies differing in their combination of strong and weak environmental signals. Unlike classic dummy coding, which compares each group with a reference category, contrast coding allows for a direct comparison of the perception of a specific pair of companies. This approach maximizes the interpretive value of the results, allowing for more accurate answers to the research question.

3.1. Variable Coding and Structure

The independent variable (IVs), which was the type of signal sent by the company, was coded as a categorical predictor with four levels, based on De Jong et al.'s (2018) previous categorization:

1. Vocal Brown - Greenwashing (1): The Company declares environmental activity but does not engage in it.
2. Silent Brown (2): The Company neither declares nor engages in environmental activity.
3. Silent Green (3): The Company engages in environmental activity without declaring it.
4. Vocal Green (4): The Company both declares and engages in environmental activity.

These variables were converted into a factor in R, with contrast coding applied to enable pairwise comparisons between different levels (e.g., 1 vs. 2, 2 vs. 3, 3 vs. 4).

The dependent variable (DVs), as the four outcome measures (credibility, environmental performance, morality, and buying intention), were maintained as ordinal variables.

Participant IDs were included as random intercepts in the models to account for individual response differences across repeated measures or clustered data.

3.2. Contrast Coding Implementation

To test my hypothesis concerning the effects of varying levels of pro-environmental signals, I used contrast coding of signal levels. Contrast coding is a method for testing specific hypotheses about differences between levels of a categorical variable in regression models. To test hypotheses H1-H3, a contrast matrix with explicit codes was used, which corresponds exactly to the research hypotheses. This approach allows direct testing of planned comparisons without the need for post-hoc analyses. Definition of contrasts corresponding to hypotheses:

1. Contrast 1 (H2): Vocal Brown (1) vs. Silent Brown (2).
2. Contrast 2 (H1): Silent Brown (2) vs. Silent Green (3).
3. Contrast 3 (H3): Silent Green (3) vs. Vocal Green (4).

The specific data analysis steps used to test each of the three hypotheses of this paper will now be presented:

H1. To test H1 regarding the effect of strong signals on perceived environmental friendliness (compared to the impact of weak signals on the same DV), we employed the mentioned mixed linear regression model. From the four different types of companies, which reflect various combinations of environmental behavior and claims, Silent Brown (2) and Silent Green (3) were necessary. We constructed a second contrast (type 3-2) that isolates this comparison and compares the coefficients of perceived environmental friendliness as DV.

This approach serves not only to prove the importance of strong signaling in the costly signaling theory, but also to check for internal validity, i.e., whether participants copy the theory and the experiment scheme at all.

H2. We also tested H2 using the same model as H1, but with a different contrast. Here, the environmental friendliness of Vocal Brown (1) (Greenwashing) company was examined, comparing it to Silent Brown (2) company. First contrast (type 2-1) was used, intervening both (1) and (2) types of companies and comparing, again, their coefficients of perceived environmental friendliness.

The analysis in this way tested whether conflicting both weak and strong signals harm environmental perceptions compared to a neutral weak signal situation.

H3. The third hypothesis, H3, tests whether a claim that is consistent with a company's pro-environmental behavior (4) reinforces its perceived environmental friendliness. We determine this by comparing the company's results with those of a Silent Green (3) situation. To do this, we used the third contrast (type 4-3).

4. RESULTS

The results of the experiment will be presented in the order of the questions, examining each dependent variable in turn.

4.1. Credibility of the Company's Declaration

A linear mixed model testing the influence of a company's environmental type on its perceived credibility revealed statistically significant differences. Fixed effects analysis showed that Vocal Brown (greenwashing) companies were rated as significantly less trustworthy than Silent Brown companies (b = 0.95, 95% CI [0.75, 1.15], $p < .001$). Silent Green achieved higher credibility than Silent Brown, b = 0.32, 95% CI [0.12, 0.52], p = .002. The difference between Silent Green and Vocal Green was only marginally statistically significant (b = -0.20, 95% CI [-0.41, 0.00], p = .052). However, a negative trend indicated a slight decline in credibility for companies with explicit communication.

Random effects calculated that 17% of the total variance in credibility is attributed to individual differences between participants (ICC = 0.17). Fixed effects (company environmental type) explained 19.1% of the variance (marginal R^2 = .191), while the entire model (including random effects) explained 33.2% of the variance (conditional R^2 = .332).

An analysis of perceived credibility showed that companies sending mixed signals are rated as significantly less credible than companies without environmental signals. Furthermore, pro-environmental communication combined with pro-environmental behavior did not lead to a further increase in the company's credibility and may even be counterproductive.

For details, see Table 3.

Table 3

Model of Credibility Perception by Type of Company

Predictors	*Estimates*	*CI*	*p*
(Intercept)	2.34	2.24 – 2.45	**<0.001**
type2-1	0.95	0.75 – 1.15	**<0.001**
type3-2	0.32	0.12 – 0.52	**0.002**
type4-3	-0.20	-0.41 – 0.00	0.052
Random Effects			
σ^2	0.81		
$\tau_{00\ id}$	0.17		
ICC	0.17		
N_{id}	109		
Observations	654		
Marginal R^2 / Conditional R^2	0.191 / 0.332		

Note. The number of observations, 654, equals 109 participants times 6 observations for each.

4.2. Environmental Aspect of the Company

The mixed linear model for perceptions of environmental friendliness revealed the following results: the contrast between Silent Green and Silent Brown showed a statistically significant difference, $b = 1.44$, 95% CI [1.23, 1.65], $p < .001$, with Silent Green companies being rated significantly more positively. In contrast, the contrast between Silent Brown and Vocal Brown did not show a significant difference, $b = -0.09$, 95% CI [-0.30, 0.11], $p = .377$. Similarly, the contrast between Vocal Green and Silent Green was not significant, $b = 0.08$, 95% CI [-0.13, 0.29], $p = .447$.

Random effects showed low variability among participants (ICC = 0.08), with fixed effects explaining 35.8% of the variance (marginal $R^2 = .358$) and the entire model explaining 40.7% (conditional $R^2 = .407$).

The results of the analysis of the dependent variable, perceived environmental friendliness of companies, are related to all three hypotheses; therefore, we can evaluate them. H1, suggesting that Silent Green companies would be perceived as more environmentally friendly than Silent Brown companies, was confirmed. The analysis showed a statistically significant difference between these two types of companies, with Silent Green companies being rated significantly more positively. It can therefore be concluded that a strong signal has a key influence on consumers' perception of environmental friendliness, thus confirming the validity of the costly signaling theory: consumers respond primarily to the actual actions of companies, not just their communication.

On the other hand, H2 explores the conflict between weak pro-environmental statements and strong anti-environmental behavior (Vocal Brown). Moreover, the difference between the Vocal Brown and Silent Brown companies was not statistically significant; therefore, we reject the hypothesis. As a result, greenwashing with its conflicting signals did not worsen the perception of companies' environmental friendliness. Consumers either did not recognize the conflict or did not attach importance to it, suggesting that the effect of greenwashing on environmental perception was not demonstrated in this experiment.

Hypothesis H3, which assumed that consistency in a company's pro-environmental signals would have a stronger effect on the perception of its environmental friendliness than a strong signal alone, was also not supported. The difference between the Vocal Green and Silent Green companies was not statistically significant. Adding a weak signal (claim) to a strong signal (behavior) did not further increase the perception of environmental friendliness. This shows that a weak signal does not have an additive effect if a strong signal is already present.

For details, see Table 4.

Table 4

Model of Environmental Friendliness Perception by Type of Company

Predictors	*Estimates*	*CI*	*p*
(Intercept)	1.79	1.70 – 1.87	**<0.001**
type2-1	-0.09	-0.30 – 0.11	0.377
type3-2	1.44	1.23 – 1.65	**<0.001**
type4-3	0.08	-0.13 – 0.29	0.447
Random Effects			
σ^2	0.86		
$\tau_{00\ id}$	0.07		
ICC	0.08		
N_{id}	109		
Observations	654		
Marginal R^2 / Conditional R^2	0.358 / 0.407		

4.3. Moral Aspect of the Company

Examining the influence of company type on the perception of its moral side revealed that only one of the three tested contrasts was statistically significant. Specifically, Silent Green was rated as significantly more moral than Silent Brown, as evidenced by the coefficient, $b = 1.02$, 95% CI [0.83, 1.21], $p < .001$. The other contrasts, i.e., the difference between Vocal Brown and Silent Brown, $b = 0.15$, 95% CI [−0.04, 0.34], $p = .123$, and between Silent Green and Vocal Green, $b = 0.01$, 95% CI [−0.19, 0.20], $p = .952$, were not statistically significant.

The mixed model revealed an ICC of 0.14, meaning that only 14% of the total variability in moral integrity ratings can be attributed to individual differences between participants (nesting structure in responses captured by random intercepts across individuals). Fixed effects (contrasts characterizing types of signals) explained 26.3% of the variance (marginal R^2 = .263), while fixed and random effects together explained 36.4% of the variance (conditional R^2 = .364).

The results of this dependent variable suggest that real pro-environmental behavior significantly increases the perceived moral integrity of a company, while adding statements has no additional effect, and greenwashing itself does not substantially worsen moral evaluations.

For details, see Table 5.

Table 5

Model of Morality Perception by Type of Company

Predictors	*Estimates*	*CI*	*p*
(Intercept)	2.23	2.13 – 2.32	**<0.001**
type2-1	0.15	-0.04 – 0.34	0.123
type3-2	1.02	0.83 – 1.21	**<0.001**
type4-3	0.01	-0.19 – 0.20	0.952
Random Effects			
σ^2	0.73		
$\tau_{00\ id}$	0.12		
ICC	0.14		
N $_{id}$	109		
Observations	654		
Marginal R^2 / Conditional R^2	0.263 / 0.364		

4.4. Intention to Buy the Company's Product

The mixed linear model for purchase intention revealed a statistically significant difference only in the contrast between Silent Brown and Silent Green, b = 0.81, 95% CI

[0.61, 1.01], $p < .001$, with Silent Green companies stimulating significantly higher purchase interest than Silent Brown companies. Other contrasts did not show significance: Vocal Brown vs. Silent Brown, b = 0.07, 95% CI [−0.13, 0.27], $p = .520$, and Silent Green vs. Vocal Green, $b = 0.00$, 95% CI [−0.20, 0.21], $p = .986$.

Random effects analysis revealed that 19% of the total variability in purchase intention can be attributed to differences between participants (ICC = 0.19), with fixed effects accounting for 15.3% of the variance (marginal $R^2 = .153$) and the entire model explaining 31.3% (conditional $R^2 = .313$).

The results of this dependent variable indicate that a company's actual environmental behavior is crucial in increasing consumers' interest in purchasing its products. In contrast, statements or greenwashing alone do not have a significant impact on purchasing intentions.

For details, see Table 6.

Table 6

Model of Buying Intention Perception by Type of Company

Predictors	*Estimates*	*CI*	*p*
(Intercept)	2.05	1.94 – 2.15	**<0.001**
type2-1	0.07	-0.13 – 0.27	0.520
type3-2	0.81	0.61 – 1.01	**<0.001**
type4-3	0.00	-0.20 – 0.21	0.986
Random Effects			
σ^2	0.80		
$\tau_{00\ id}$	0.19		
ICC	0.19		
N_{id}	109		
Observations	654		
Marginal R^2 / Conditional R^2	0.153 / 0.313		

5. DISCUSSION

This thesis focused on consumers' perceptions of environmental statements made by companies and how these affect consumers' decision-making. The experiment aimed to examine whether and how companies' behavior and their claims influence four aspects of consumers' perception: the company's credibility, environmental friendliness, moral aspect, and intention to buy their product.

The theoretical framework supporting this thesis was the theory of costly signaling, which explains why a company's behavior (strong signal) creates a more credible image for consumers than its claims (weak signals) do, and how any conflict between the behavior and claims affects their perception. Thereby, it was possible to contribute to previous results in this field and possibly clarify the mechanism behind them.

The three main hypotheses were related to the theory of costly signaling. H1 assumed that strong signals of a company have a greater influence on consumer perception of its environmental friendliness than weak signals do. H2 suggested that the conflict between weak pro-environmental and strong anti-environmental signals reduces the perceived environmental friendliness of the company. Thirdly, H3 predicted that aligned strong and weak pro-environmental signals will elevate a company's perceived environmental friendliness.

5.1. Strong Signal Before Weak Signal

The results of my research show that a company's behavior is more important in shaping consumers' opinions than its claims. This is supported by the fact that H1 of this research, comparing the environmental perception of silent green companies versus silent brown companies, was confirmed. A pro-environmental company, which used no further claims to support their action, performed better than an anti-environmental company with no claims either. With that being said, consumers' opinions of a company are therefore formed primarily by the company's behavior, with its claims being secondary. These results directly confirm the basic principles of costly signaling theory as mentioned in this paper.

Furthermore, the results of H1 are consistent with those of De Jong et al. (2018), who also found that the company's actual environmental behavior is more important in shaping consumers' perceptions compared to the company's claims. In their study, silent green companies were rated significantly better in terms of environmental performance and buying intention than silent brown companies, confirming that behavior speaks louder than claims.

Examining the results of the three other dependent variables in this study, the trend of behavior being more important remains consistent. In terms of credibility, silent green companies also perform better than silent brown companies, as evidenced by their stronger moral aspect and higher buying intention. We can therefore conclude that the company's behavior has a persuasive effect on consumers, due to its high costs and reliability. This fact allows for an interpretation of varying result explanations in previous studies (De Vries et al., 2015; Løhre et al., 2024), as differences in consumers' perceptions are not primarily caused by the type of industry but by the strength of the signal present in a company's behavior. Additionally, similar results to those of De Jong et al. (2018) confirm that the costly signaling theory applies to consumers' environmental perceptions of companies on the market.

5.2. Perception of Greenwashing Companies

Secondly, the results showed that greenwashing companies with conflicting anti-environmental behavior and pro-environmental claims do not receive worse evaluations of their environmental friendliness than do anti-environmental companies with no additional claims. From the costly signaling theory perspective, this result was not expected. The theory predicts that consumers, as recipients, should punish companies, as signalers, for dishonesty, because claims that contradict actual behavior should undermine the company's credibility. However, we observe no aversion towards hypocrisy in this experiment. The results of this type of relationship could not be described even by two other independent variables, such as the moral aspect and buying intention, as they had low significance levels. De Jong et al. (2018) came to the opposite conclusion in their research, in which greenwashing companies received worse ratings than other types of companies in the variable perceived integrity of communication. Similarly, De Vries et al. (2015) concluded that conflicting signals damage a company's reputation.

However, the adverse effect of the company's behavior and claims being in conflict was confirmed in the credibility perceived by consumers. In this variable, greenwashing companies were ranked the lowest out of the four types of companies. At least in one of the variables, this confirms the assumption that consumers are sensitive to the discrepancy between a company's behavior and its claims, which they can demonstrate through various types of punishment. This finding is consistent with costly signaling theory, as it suggests that although the claim was not strong enough to influence the overall perception of the company, it was sufficient to undermine its credibility, precisely as the theory would predict for such a signal.

5.3. Additional Weak Signal

Thirdly, the examined relationship between aligned pro-environmental behavior and companies' claims showed no additional positive effect on their perceived environmental friendliness compared to the situation of pro-environmental behavior alone. From that, we can deduce that for consumers, it is enough if companies' behavior is pro-environmental, and there is no need to support this fact with additional pro-environmental claims. The results of this relationship were neither significant for the dependent variables, namely the moral aspect and buying intention.

However, this assumption of an additional positive effect of the pro-environmental claim was proven wrong by the marginal significance of the variable credibility. Respondents rated a pro-environmental behavior company claiming its position with pro-environmental claims worse than a pro-environmental company with no additional claims. This result shows that the claim did not strengthen the company's position among consumers but rather undermined their trust. This is consistent with De Jong et al. (2018), who also found no significant advantage for vocal green companies over silent green companies in terms of purchase interest. This result can also be interpreted through the theory of costly signaling, where, after observing a company's behavior, the additional claim could be perceived by some recipients as over-protesting and may provoke skepticism that was not inherent in the behavior itself. This is consistent with the warning by Løhre et al. (2024), whose results suggest that the impact of pro-environmental claims is highly dependent on context and may not always build greater trust than actions do.

5.4. Theoretical Contributions of the Thesis

The key theoretical contribution of this work is the application of costly signaling theory in an area where it has been poorly used until now: consumers' perception of companies' environmental performance and connection to market hypocrisy. The theory offers a more straightforward explanation of consumers' behavior than, for example, frameworks such as cognitive dissonance. While De Jong et al. (2018) explained consumers' negative perception of greenwashing in terms of psychological discomfort related to conflicting received information, the costly signaling theory assumes a more direct and rational mechanism: consumers don't rely on claims because they are less reliable.

According to this theory, signals are only credible if they are costly to the signaler, who perceives them as impossible to fake (McAndrew, 2019). The insignificant results for H2 can therefore be interpreted in two possible ways: Firstly, not as a failure of the theory, but as a failure of signal detection by the receiver. This is consistent with the central principle of signaling theory, which states that for a signal to be effective, it must be observed and correctly interpreted by the receiver (Connelly et al., 2011). The problem here might be that the study design used did not allow respondents to detect the signal as intended when programming the questionnaire. Secondly, it is possible that respondents perceived the conflicting signals of a company, but they were not crucial for their decision-making. If so, it would be interesting to re-examine this effect in future research, which would also include individual characteristics.

Conflicting findings from previous studies suggest that consumers' detection of a company's actions can be fragile. For example, De Vries et al. (2015) found that even the framing of claims (e.g., defending green initiatives with environmental consciousness vs. for economic reasons) could determine whether a company was accused of greenwashing, suggesting that the interpretation of signal believability is highly dependent on the context. The fact that Løhre et al. (2024) were unable to replicate this effect proves its variability. The online experimental setting and purely textual versions of fictional company profiles in this experiment may have prevented participants from clearly identifying the false signal, which was not deceptive enough to convince consumers to punish the company, as the costly signaling theory would otherwise predict.

This work presents several directions for future research. Future studies could manipulate the mentioned cost and clarity of both behavior and weak signals to explore the effects of such variability on consumers. For example, how do consumers respond when a weak signal is supported by a small but verifiable financial investment, such as a small donation to an environmental cause? This would test whether even a low-cost but verifiable action can overcome the credibility gap left by verbal claims alone. The different results of

De Vries et al. (2015) and Løhre et al. (2024) about the impact of framing motives also highlight a critical area for future study, where the conditions under which specific claims are perceived as true or false could be clarified.

Future research could further explore the role of personal aspects of consumers, as this may also be an essential factor in interpreting the results. As Connelly et al. (2011) emphasize in their comprehensive review of signaling theory, the receiver's ability to perceive and evaluate a signal is a key factor in the signaling process. For this reason, it would be helpful to investigate whether consumers with higher environmental consciousness or potential skepticism toward a company's claims are more successful at detecting and punishing greenwashing. This could explain why some consumers react negatively to this signal conflict (De Jong et al., 2018), whereas in this study, the negative effect was more limited and did not impact the overall perception of environmental friendliness. The finding by Løhre et al. (2024) that environmental messages may not always be harmful could also be explored from the perspective that less skeptical consumers may interpret such claims as positive rather than deceptive. Exploring these moderate factors would provide a deeper understanding of when and why signals, both true and false, succeed or fail in the market, changing the question from whether they work to under what conditions they work most effectively.

When interpreting the results of this research, it is also necessary to acknowledge the limitations that may affect the results. One of them is a relatively small sample of respondents, which resulted in low statistical power of the research results.

Although the representativeness of the sample was not entirely crucial for testing decision-making patterns, it is possible that a more representative population would have yielded different results for the experiment.

Another limitation of the research was the use of one-item measures of outcome variables, which had unknown measurement error and were likely larger than more comprehensive measures. This could have attenuated the observed effect sizes.

A significant limitation is also that respondents were only exposed to text descriptions of company profiles. While this design provides high internal validity by isolating key variables (behavior and claims), it does not correspond to the real consumer environment. In reality, companies present their signals through visually appealing formats such as logos or green packaging. A weak signal (claim) described in a single sentence, as was the case in this research, may not have been sufficiently distinctive for consumers. This simplification may be one of the main reasons why hypotheses H2 and H3 were not confirmed. Related to the previous point is the limitation caused by the online environment, which also deprived respondents of stimuli that affect them in everyday life. The results of the research further suggest that greenwashing companies attempt to formulate weak signals more credibly to achieve success, while the research conducted in this study may have oversimplified the information presented to respondents.

CONCLUSION

This study aimed to describe consumers' perceptions of companies' environmental friendliness using costly signaling theory, which serves as a useful theoretical framework providing a universal explanation for previous studies, where similar results were interpreted in different ways. This study examined the perception of companies through four variables: credibility, environmental friendliness, moral aspect, and intention to purchase the company's product.

The current study demonstrates that a company's behavior, which consumers may act upon, plays a more significant role in shaping consumer opinion. This experiment further demonstrates that greenwashing companies, which make claims that contradict their actual behavior, receive different responses from consumers depending on the situation. Similarly, consumers' perceptions of pro-environmental companies that seek to emphasize their activities with pro-environmental claims are also context-dependent. Sometimes, such additional claims can be perceived as superficial. The results of this work are important for their theoretical contribution, enriching the impact of companies' environmental behavior with a new perspective focused on consumer opinion. This work demonstrates that the theory of costly signaling is effective in describing the consumer decision-making process and could lead to a deeper understanding of greenwashing practices in the future if the experiment's design focused on more variables, such as the personal level of the consumer.

SUMMARY

Cílem této práce bylo popsat vnímání ekologické šetrnosti firem z pohledu spotřebitele s využitím teorie nákladné signalizace, která slouží jako užitečný teoretický rámec poskytující univerzální vysvětlení předchozích studií, ve kterých byly podobné výsledky interpretovány rozdílnými způsoby. Tato práce zkoumala vnímání firem prostřednictvím čtyř proměnných: důvěryhodnost, environmentální šetrnost, morální aspekt a záměr koupit si firmy produkt.

Současná studie ukazuje, že v utváření spotřebitelova názoru hraje důležitější roli firmy chování, na jehož základě spotřebitel i případně jedná. Tento experiment dále dokazuje, že greenwashingovým firmám prohlašujícím skutečnosti, které jsou v rozporu s jejich chováním, se dostává různých reakcí od spotřebitelů v závislosti na situaci. Stejně tak

je na kontextu závislé i spotřebitelovo vnímání pro-environmentálních firem, které se své aktivity snaží navíc podpořit pro-environmentálním tvrzením. Občas může být takové dodatečné tvrzení vnímáno jako povrchní. Výsledky této práce jsou důležité pro svůj teoretický přínos, v rámci kterého obohacují dopady environmentální chování firem o nový úhel pohledu zaměřený na spotřebitelův názor. Tato práce dokazuje, že teorie nákladné signalizace je pro popis procesu rozhodování spotřebitelů účinná a v budoucnu by mohla přinést hlubší pochopení praktiky greenwashingu, pokud by byl design experimentu zaměřen na více proměnných, například i v osobní rovině spotřebitele.

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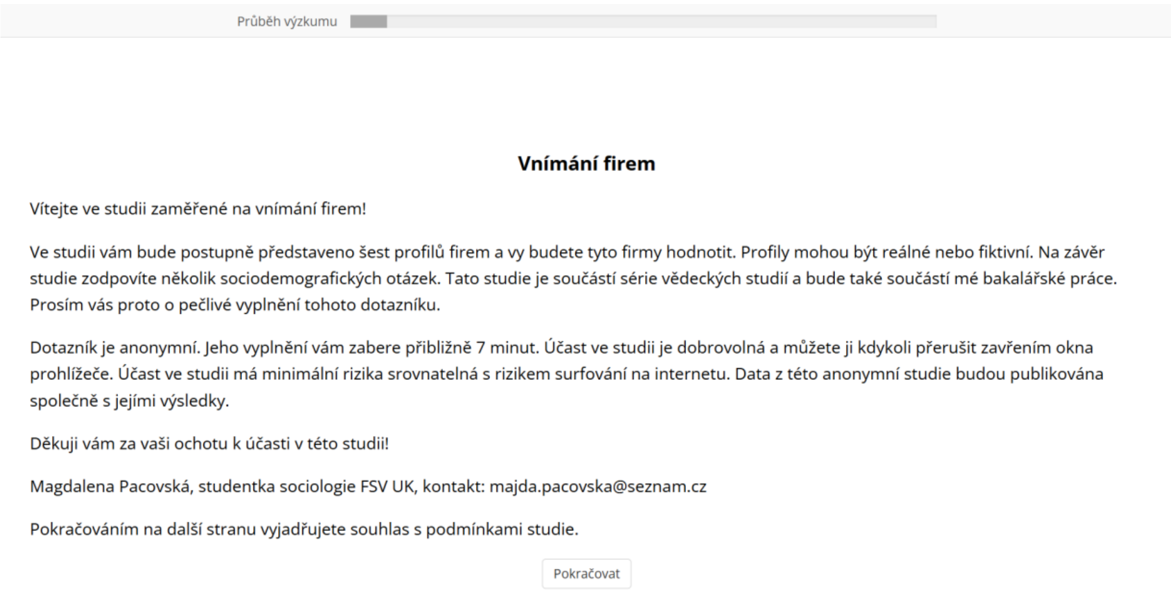
List of Appendices

APPENDICES

Appendix no. 1: Text version of the online experiment

{informed consent}



Vnímání firem

Vítejte ve studii zaměřené na vnímání firem!

Ve studii Vám bude postupně představeno šest profilů firem a vy budete tyto firmy hodnotit. Profily mohou být reálné nebo fiktivní. Na závěr studie zodpovíte několik sociodemografických otázek. Tato studie je součástí série vědeckých studií a bude také součástí mé bakalářské práce. Prosím vás proto o pečlivé vyplnění tohoto dotazníku.

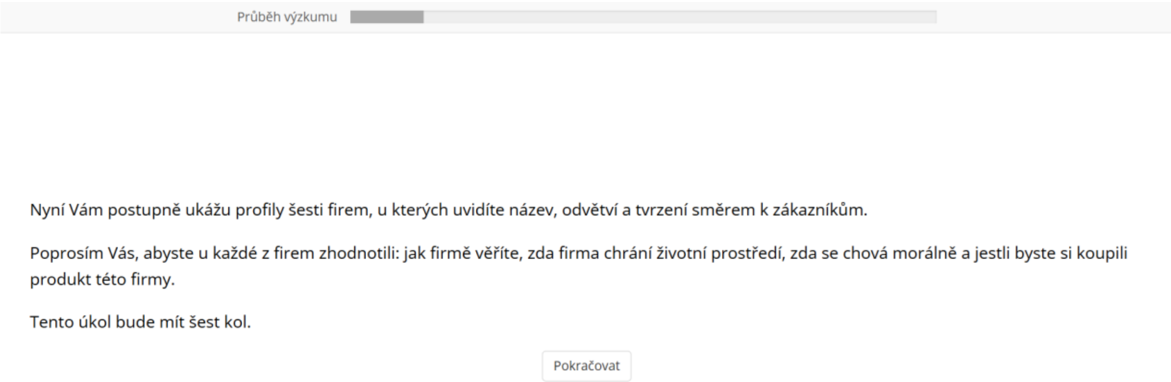
Dotazník je anonymní. Jeho vyplnění vám zabere přibližně 7 minut. Účast ve studii je dobrovolná a můžete ji kdykoli přerušit zavřením okna prohlížeče. Účast ve studii má minimální rizika srovnatelná s rizikem surfování na internetu. Data z této anonymní studie budou publikována společně s jejími výsledky.

Děkuji vám za vaši ochotu k účasti v této studii!

Magdalena Pacovská, studentka sociologie FSV UK, kontakt: majda.pacovska@seznam.cz

Pokračováním na další stranu vyjadřujete souhlas s podmínkami studie.

{intro_text}



Průběh výzkumu

Nyní Vám postupně ukážu profily šesti firem, u kterých uvidíte název, odvětví a tvrzení směrem k zákazníkům.

Poprosím Vás, abyste u každé z firem zhodnotili: jak firmě věříte, zda firma chrání životní prostředí, zda se chová morálně a jestli byste si koupili produkt této firmy.

Tento úkol bude mít šest kol.

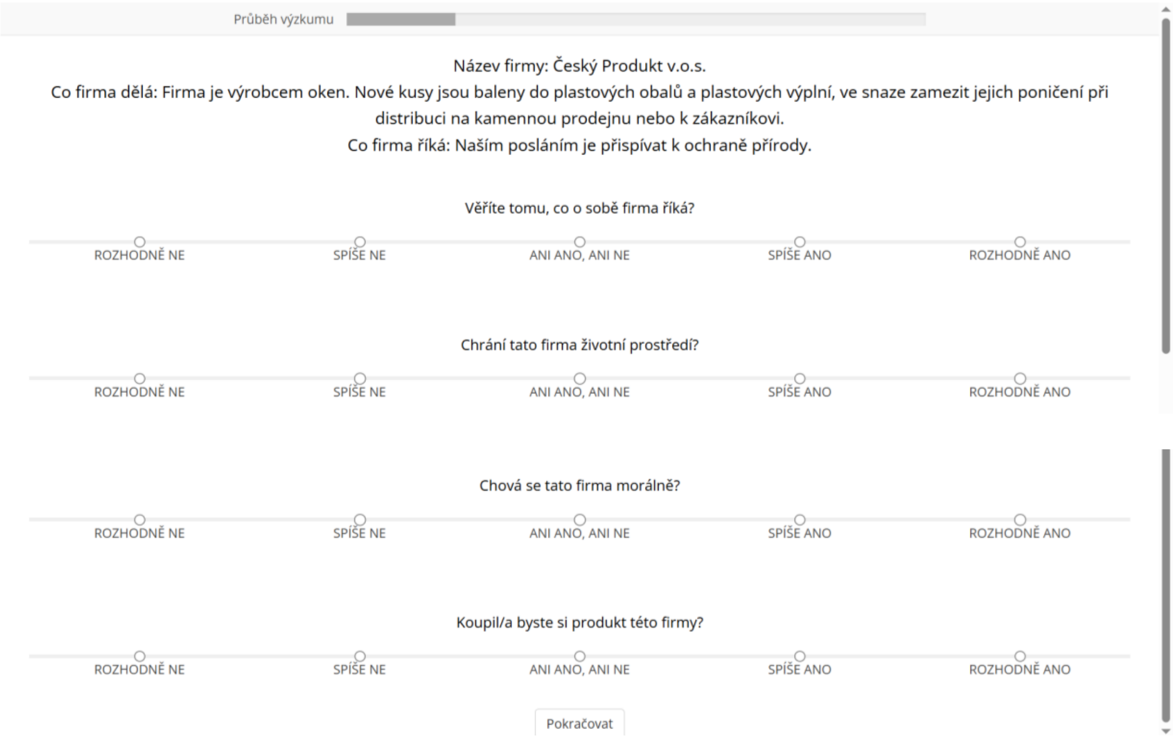
Pokračovat

Nyní Vám postupně ukážu profily šesti firem, u kterých uvidíte název, odvětví a tvrzení směrem k zákazníkům.

Poprosím Vás, abyste u každé z firem zhodnotili: jak firmě věříte, zda firma chrání životní prostředí, zda se chová morálně a jestli byste si koupili produkt této firmy.

Tento úkol bude mít šest kol.

{manipulated_company_profile} 6x



Průběh výzkumu

Název firmy: Český Produkt v.o.s.
Co firma dělá: Firma je výrobcem oken. Nové kusy jsou baleny do plastových obalů a plastových výplní, ve snaze zamezit jejich poničení při distribuci na kamennou prodejnu nebo k zákazníkovi.
Co firma říká: Naším posláním je přispívat k ochraně přírody.

Věříte tomu, co o sobě firma říká?

ROZHODNĚ NE | SPÍŠE NE | ANI ANO, ANI NE | SPÍŠE ANO | ROZHODNĚ ANO

Chrání tato firma životní prostředí?

ROZHODNĚ NE | SPÍŠE NE | ANI ANO, ANI NE | SPÍŠE ANO | ROZHODNĚ ANO

Chová se tato firma morálně?

ROZHODNĚ NE | SPÍŠE NE | ANI ANO, ANI NE | SPÍŠE ANO | ROZHODNĚ ANO

Koupil/a byste si produkt této firmy?

ROZHODNĚ NE | SPÍŠE NE | ANI ANO, ANI NE | SPÍŠE ANO | ROZHODNĚ ANO

Pokračovat

Název firmy: *variabilní*

Co firma dělá: *variabilní; pro-environmentální x anti-environmentální chování*

Co firma říká: *variabilní; pro-environmentální x neutrální tvrzení*

{credibility}

Věříte tomu, co o sobě firma říká?

ROZHODNĚ NE – SPÍŠE NE – ANI ANO, ANI NE – SPÍŠE ANO – ROZHODNĚ ANO

{environmental role}

Chce tato firma chránit životní prostředí?

ROZHODNĚ NE – SPÍŠE NE – ANI ANO, ANI NE – SPÍŠE ANO – ROZHODNĚ ANO

{moral values}

Chová se tato firma morálně?

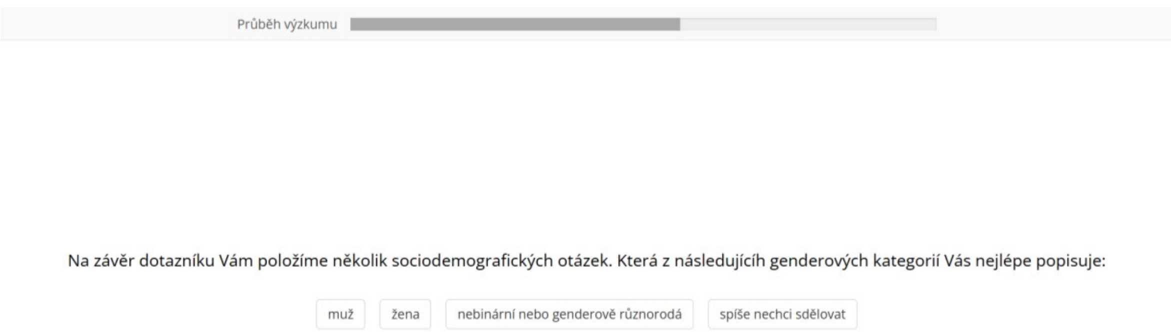
ROZHODNĚ NE – SPÍŠE NE – ANI ANO, ANI NE – SPÍŠE ANO – ROZHODNĚ ANO

{product interest}

Koupil/a byste si produkt této firmy?

ROZHODNĚ NE – SPÍŠE NE – ANI ANO, ANI NE – SPÍŠE ANO – ROZHODNĚ ANO

{sociodemographics}



Na závěr dotazníku Vám položíme několik sociodemografických otázek.

{gender}

Která z následujících genderových kategorií Vás nejlépe popisuje:

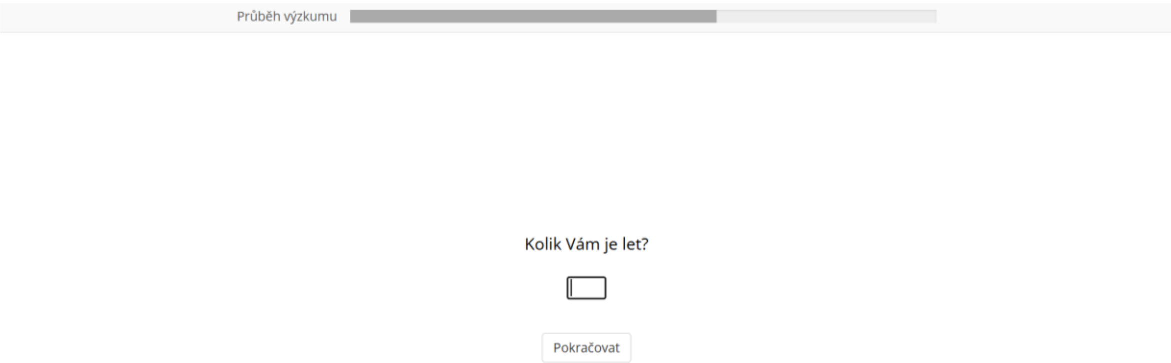
muž

žena

nebinární nebo genderově různorodá

spíše nechci sdělovat

{age}



Kolik Vám je let? {fill-in field}

{education}

Jaké je Vaše nejvyšší dokončené vzdělání?

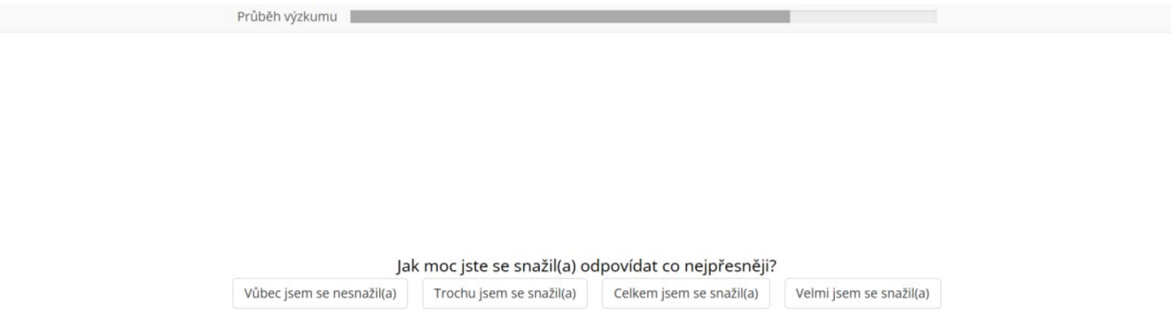
Základní

Středoškolské bez maturity

Středoškolské s maturitou

Vysokoškolské

{effort_check}



Jak moc jste se snažil(a) odpovídat co nejpřesněji?

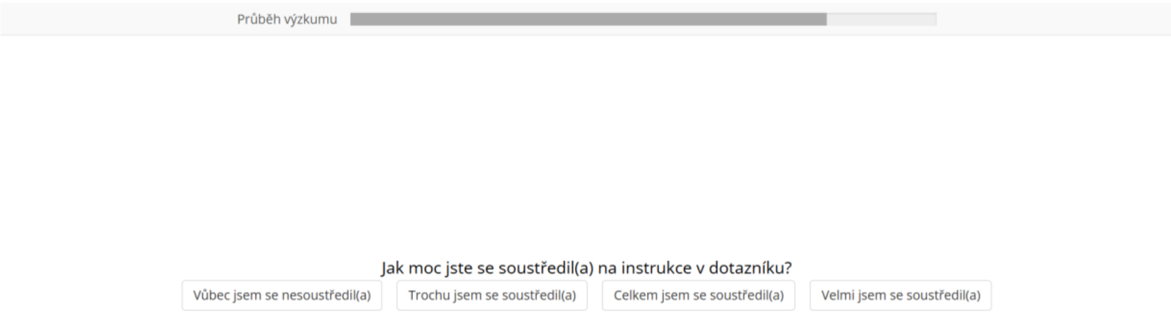
Vůbec jsem se nesnažil(a)

Trochu jsem se snažil(a)

Celkem jsem se snažil(a)

Velmi jsem se snažil(a)

{attention_check}



Jak moc jste se soustředil(a) na instrukce v dotazníku?

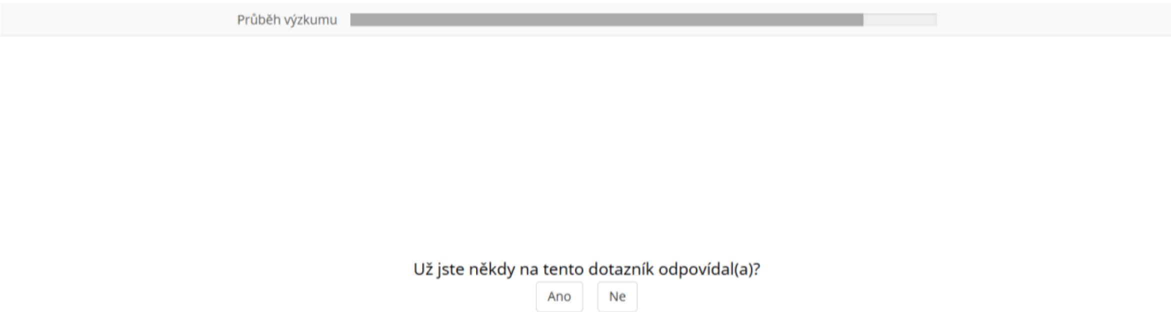
Vůbec jsem se nesoustředil(a)

Trochu jsem se soustředil(a)

Celkem jsem se soustředil(a)

Velmi jsem se soustředil(a)

{repetition_check}



Už jste někdy na tento dotazník odpovídal(a)?

Ano

Ne

{debriefing}

Průběh výzkumu

Děkuji vám za dokončení dotazníku!

Cílem této studie bylo zjistit, jak různé atributy firem ovlivňují jejich vnímání. Profily firem, s nimiž jste se setkali, byly fiktivní. Pokud vám některé popisy nebo názvy firem přimomínaly existující firmy, jednalo se o náhodnou podobnost.

Pokud máte k této studii dotazy či připomínky, můžete mne kontaktovat na této emailové adrese: majda.pacovska@seznam.cz (Magdalena Pacovská).

Nyní můžete zavřít okno prohlížeče.

Děkuji vám za dokončení dotazníku!

Cílem této studie bylo zjistit, jak různé atributy firem ovlivňují jejich vnímání. Profily firem, s nimiž jste se setkali, byly fiktivní. Pokud vám některé popisy nebo názvy firem připomínaly existující firmy, jednalo se o náhodnou podobnost.

Pokud máte k této studii dotazy či připomínky, můžete mne kontaktovat na této emailové adrese: majda.pacovska@seznam.cz (Magdalena Pacovská).

Nyní můžete zavřít okno prohlížeče.

Appendix no. 2: SZZ Sociologie

Vybraná témata k okruhům SZZ ze Sociologie

OKRUH 1: TEORIE

Klíčové slovo: Teorie nákladné signalizace

OKRUH 2: POJMY

Klíčové slovo: Klimatická změna

OKRUH 4: PROCESY

Klíčové slovo: Globalizace

Seznam literatury ke SZZ ze Sociologie:

1. McAndrew, F. T. Costly signaling theory [online]. In: Shackelford, T. K. & Weekes-Shackelford, V. A., eds. *Encyclopedia of Evolutionary Psychological Science*. Cham: Springer, 2019, pp. 1–8. ISBN 978-3-319-16999-6. https://doi.org/10.1007/978-3-319-16999-6_3483-1

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Appendix no. 3: SZZ Metodologie

Vybraná témata k okruhům ze SZZ z Metodologie

Okruh 1: Teoretická východiska výzkumu

Téma: Kvantitativní výzkum - Znaky (proměnné) v sociologii, jejich klasifikace - úrovně měření

Okruh 2: Příprava a organizace výzkumu

Téma: Kvantitativní výzkum - Typy a příprava experimentů, metodologické a etické aspekty experimentálních studií

Okruh 3: Vytváření a sběr dat

Téma: Kvantitativní výzkum - Metody sběru dat (CAWI, CATI, PAPI). Online dotazování. Online panely a jejich kritika.

Okruh 4: Analýza dat

Téma: Kvantitativní výzkum - Příprava dat pro analýzu (transformace a čištění)

Okruh 5: Reflexivita, etika a prezentace výzkumu

Téma: Kvantitativní výzkum - Informovaný souhlas a důvěrné nakládání s osobními údaji, GDPR

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Appendix no. 4: SZZ Sociální politika

Vybrané otázky k SZZ ze Sociální politiky

5. Jak se dělá politika? Charakterizujte hlavní rozdíly mezi „policy“ a „politics“. Popište fáze veřejně-politického cyklu a vztáhněte je ke konkrétní veřejné nebo sociální politice.

8. Sociální vyloučení jako hodnotový koncept. Zamyslete se nad příčinami sociálního vyloučení a možnými způsoby řešení tohoto problému. (Lze demonstrovat na konkrétním příkladu.)

9. Co to je nezaměstnanost? Vymezte pojem, a jeho měření, typy nezaměstnanosti, její příčiny a způsoby řešení.

14. Demografické stárnutí přináší nové výzvy pro moderní společnost. Diskutujte některé z nich a zamyslete se nad praktickými možnostmi současné (české nebo evropské) sociální politiky je naplnit.

30. Na příkladu konkrétní veřejné politiky vysvětlete základní strukturální prvky veřejné politiky (vymezení podle definice veřejné politiky, aktéři, místa, cíle, nástroje).

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Appendix no. 6: Teze bakalářské práce

Projekt bakalářské práce

Jméno a příjmení studujícího: Magdalena Pacovská

Studijní program: Sociologie a sociální politika

Předpokládaný název práce: Conflict between declared and manifested environmental friendliness of companies as a factor of their perceived greenwashing

Klíčová slova v angličtině: greenwashing, consumer perception, environmental claim, behavior

Vedoucí práce: Mgr. Jan Urban, Ph.D.

Námět práce

Greenwashing is a contemporary term invented by journalist Jay Westerfeld in the 1980s (Tinne, 2013), describing a manipulative technique that has appeared in the market since the 1950s (Motavalli, 2013). The trend in recent decades has been the issue of climate change and its solution, leading to requirements about the product's ecological aspect, which has become an influential factor (Kianpour et. al, 2014). These factors have come into conflict with the growing trend of a consumer society (Rome, 2003). To make sustainable profits, companies had to choose either to rebuild their business plan to be truly environmentally friendly or to lie about the unsustainability of their services/products (Tinne, 2013), which is the concept of greenwashing.

The success of greenwashing depends on the perception of customers, who either can recognize a deceptional claim or not. For example, Urbański and Haque's (2020) paper concludes that consumers with high sustainability concerns are more likely to fail to recognize greenwashing practices. This introduces a whole new factor of consumer values and attitudes that further shape their perception of greenwashing. In their study De Vries et al. (2015) demonstrated a link between the way a company presents itself and how it is viewed by society. If an energy company tries to explain its pro-environmental efforts through concern for the environment, society will perceive its behavior as greenwashing. This poses a problem for communicating environmental attributes and services, linked to a company's purpose. In this study, limits of this correlation will be explored, beyond the boundaries of energy companies, where company behavior takes many forms. The main interest is in how consumers make judgments about a company's greenwashing based on the observed behavior of the company and its environmental claims.

In this research project, we aim to use the theory of costly signaling (Zahavi, 1977; for an overview of the applications in social sciences, see, e.g., McAndrew, 2019). This theory, derived from evolutionary theory, suggests that for a company to communicate its environmental friendliness, it has to use a costly signal of environmentally friendly activity. A "cheap" signal of environmental friendliness will be interpreted by receivers as an attempt at strategic manipulation of the consumers. Based on this theory, we predict that (H1) upon observing a conflict between the environmentally unfriendly activity of the company and "cheap" signaling of environmental friendliness, the observers will infer that the company has engaged in greenwashing. We also predict that (H2) the importance of costly signalization of environmental friendliness will be highest in areas where participants suspect the highest level of strategic manipulation of the signal. Finally, we predict that (H3) consumers will punish the company for sending a false signal of environmental friendliness by rejecting the company's products and services.

Předpokládané metody zpracování

This work will consist of a pilot study (or studies) and the main study.

In the pilot studies, we will examine in what areas of production and consumption people suspect the highest level of strategic manipulation of information about environmental friendliness (i.e., greenwashing). The pilot studies will also allow us to prepare a set of vignettes presenting companies, their core activities, and their statements about their environmental profile.

The main study will be an experiment in which we will manipulate, using vignettes developed in pilot studies, environmental profiles of companies and their environmental statements, and the cost of these statements. We will measure, as the dependent variable, the perceived greenwashing of these companies given by observers (participants of the study).

The sample size will be determined based on power analysis prior to the main study. Expected effect sizes will be derived from the pilot studies and/or based on the literature review. The sample will be most likely a convenience sample of students and contacts.

Etické souvislosti zvažovaného projektu

Informed consent from each participant will be obtained. The study has a negligible risk for participants comparable to Internet browsing and office work. The manipulation has only a short-term effect. No personal or sensitive data will be collected. All data will be anonymous.

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