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Overcoming the Sustainability Liability: Can Stating Product Strength Increase Preference for Sustainable Products?

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Abstract

Consumer demand for sustainable products is rising, but there is still a value-action gap between consumers' pro-green attitudes and purchase behavior. This might partly be attributed to consumers associating sustainable products with gentleness-related attributes. As a result of these associations, the positive effect that sustainability often has on product preference is reduced for products where strength-related attributes are valued highly. In some cases, this even causes preference for non-sustainable alternatives, leading to the effect called the "sustainability liability." This study aims to determine if the sustainability liability can be overcome by explicitly stating the product's strength, and whether it is more effective to state manufactured or natural strength. We conducted an online experiment in which we manipulated product's sustainability and the source of product strength and measured environmental attitudes. The results support the existence of a sustainability liability. The main implication from these findings is that marketing sustainable products with strong performance attributes and overcoming the sustainability liability is a complex endeavor that needs to be studied further, and that consumers' green attitudes does not seem to affect the existence of the sustainability liability.

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Thank you.

Emilia Helander Olsen

Sissel Kristine Ougland

1.0 Introduction

1.1 Context

The past decade has seen rapid growth in the economy, increasing consumers' consumption of goods and services considerably (Chen & Chai, 2010). This overconsumption has been shown to be a significant cause of the depletion of natural resources and environmental deterioration (Chen & Chai, 2010; Joshi & Rahman, 2015). The negative impact of consumption on the environment has given rise to green consumption, with consumers becoming more conscious about choosing sustainable products to decrease the adverse effects their consumption has on the environment (Luchs et al., 2010; Sachdeva et al., 2015).

Understanding consumer behavior with regards to choosing sustainable products is essential for successfully promoting sustainable behavior. In recent years, consumers have reported a higher willingness to pay for sustainable offerings than non-sustainable offerings and have stated that they would change their consumption habits to reduce environmental impact (Nielsen, 2015, 2018). This shift is further evidence that there is a growing awareness among consumers of how consumption habits impact the environment, suggesting that there is a substantial market for sustainable products. However, despite consumers reporting positive attitudes towards sustainable consumption and behaviors, studies show that their displayed actions do not always follow these stated attitudes (Auger & Devinney, 2007; Young et al., 2010). While the number of consumers reporting being concerned with environmental issues has increased, there is a lack of evidence showing that consumption of sustainable products has grown, indicating that consumers are not translating their views and environmental concern into their purchases (Joshi & Rahman, 2015; Young et al., 2010). This shows that there is a gap between consumers' values and actions.

Luchs et al. (2010) have studied how the sustainability of products can impact consumers' preferences. They found that customers associate sustainable products with gentleness-related attributes (gentle, mild, sensitive) and less sustainable products with strength-related attributes (strong, powerful, effective) (Luchs et al., 2010). Further, they found that for product categories where strength-related attributes are valued, the positive effect of sustainability is reduced and can even become a liability, leading consumers to show a higher preference for non-

sustainable products (Luchs et al., 2010). These findings demonstrate that despite consumers valuing sustainability, other product attributes, such as strength, can outweigh the importance of sustainability and be perceived as more critical attributes (Luchs et al., 2010). Further, the study showed that the sustainability liability can be overcome by explicitly stating the product strength, thus making consumers aware of this attribute (Luchs et al., 2010). In this thesis, we want to build upon these findings by Luchs et al. (2010) and determine how to optimally overcome consumers' perception of sustainable products having less functional quality than traditional products in product categories where strength-related attributes are especially valued.

1.2 Personal Motivation

The background for us wanting to research the sustainability liability in our thesis is our continued interest and concern for environmental issues. We are puzzled by noticing the inconsistencies between our friends' and families' words and actions regarding sustainability, in addition to experiencing our own self-contradictory behavior. Thus, in this thesis, we wish to understand why many consumers state that they are concerned with sustainability but simultaneously do not seem to adhere to these values in their own consumption behavior. By investigating how to overcome the sustainability liability, we hope to understand the complexity of marketing products as sustainable, both for personal and career purposes. As we move on to work with marketing after our masters' degree, we see the value in getting a deeper understanding of this issue. More and more sustainable products are emerging on the market; thus, a good understanding of consumer behavior and potentially successful marketing efforts for these products will benefit us in understanding how to best market these products to consumers.

1.3 Research Question

Elaborating on the studies that Luchs et al. (2010) conducted on the sustainability liability, our research question is: *Can the sustainability liability be overcome by explicitly stating product strength, and if so, is the effect greater by explicitly stating manufactured or natural strength?*

2.0 Literature Review

2.1 Defining Sustainability

While the concept of sustainability is extensive with a broad spectrum of definitions, in its most simple form, the term denotes helping future generations inherit a world that is at least as abundant as the one we inhabited (UNESCO, 2015). Similarly, the Brundtland Commission describes sustainability as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987, p. 16). In other words, sustainability can be understood as a system that persists, and that consists of ensuring a better quality of life for the current generations and for the generations to come (Costanza & Patten, 1995; Procter & Gamble, 2010).

Sustainability has been the subject of immense research in recent years, and consequently, the issues it involves have progressed and been extended. While the concept of sustainability previously focused mainly on environmental factors, it has evolved to incorporate other conscience matters as well, such as animal welfare and human rights (Auger & Devinney, 2007). This evolution is also evident when examining The Sustainable Development Goals of the United Nations for a better and more sustainable future (The United Nations, n.d.). These 17 goals address the issues the world is facing regarding sustainable development, including climate change, environmental degradation, poverty, inequality, peace, and justice (The United Nations, n.d.). This shows how sustainability has grown to include other aspects exceeding solely environmental factors.

However, with this in mind, we will in this thesis define sustainable behavior as behavior that decreases unfavorable environmental impact and reduces the usage of natural resources during the lifecycle of the product (White et al., 2019). Thus, going forward, sustainable products will denote environmentally friendly products. Note that as sustainability is being placed on the global agenda, terms are being used interchangeably with sustainability to describe sustainable and environmentally friendly products, e.g., ethical products and green products.

2.2 Green Purchasing and Sustainable Consumption

With sustainability being placed on the agenda, consumers are placing increasingly more importance on the greenness of products, i.e., products causing

less harm to the environment and requiring fewer natural resources to produce (Gershoff & Frels, 2015; Luchs et al., 2010). This trend of green purchasing can be described as consumers buying products for their environmentally sustainable features and avoiding those that are harmful to the environment (Chan, 2001; Joshi & Rahman, 2015). To measure green purchasing, consumers' purchase intention and purchase behavior can be used as conceptualization. Purchase intentions are the motivation that influences behavior. In contrast, sustainable purchase behavior can be described as a form of ethical decision-making behavior and can be considered a form of socially responsible behavior (Joshi & Rahman, 2015).

However, green purchase intent and environmental intent are only some of the many factors affecting sustainable behavior. Consumer knowledge of sustainability has also been shown to be a central predictor of sustainable behavior (Stern, 2000). Hence, whether consumers act sustainably can be influenced by their environmental knowledge. Environmental knowledge denotes the information consumers have about the environment, ecology, and the influence that human actions have on the environment (Arcury & Johnson, 1987). Additionally, Stern (2000) argues that environmentally significant behaviors often are based on personal habits or routines and that consumers often lack knowledge of the actual environmental impact and effect of their behavior. Thus, consumers can have sustainable intent, but their behavior can still have a low environmental impact (Stern, 2000). In consequence, lack of knowledge can be a predictor of less sustainable behavior. In addition to this, personal capabilities, contextual forces, attitudinal factors, and habits and routines influence sustainable consumption (Stern, 2000). This describes how consumers' sustainable or unsustainable consumption can also be based on non-sustainable concerns, such as time or money (Stern, 2000).

Furthermore, Antonetti & Maklan (2015) suggest that consumption patterns are affected by the frame the consumer places the purchase in, i.e., altruistic-, socially responsible-, conspicuous responsible-, or political purchase. In other words, categorization shapes responsible consumption. Thus, consumers framing their responsible consumption in different ways might partly explain why consumers' actions in some cases do not represent their stated desire of green purchasing and

sustainable intent (Antonetti & Maklan, 2015). Building on this, Peattie (1999) argues that green consumerism should be studied by looking at consumers' individual purchase decisions, due to consumption behavior being made up of a series of purchase decisions. These purchase decisions can have shared values and be interconnected or be unrelated and not connected (Peattie, 1999). This suggests that green consumerism cannot be interpreted solely by examining whether consumers purchase sustainable products or not, but must be viewed in light of the consumers' values and the frame they place the product in.

2.3 Product Attributes

Consumers use salient product attributes as a basis for evaluating products and the benefits they hope to gain by purchasing the product (Brown & Dacin, 1997). What products consumers perceive to be sustainable is influenced by the attributes and features of the product category (Gershoff & Frels, 2015). These attributes can be either product-related or non-product-related, i.e., connected to central attributes of the product category or only peripherally connected to the product (Gershoff & Frels, 2015). Products with central attributes connected to the product have been shown to be perceived as more environmentally friendly, compared to products where sustainability is linked to peripheral attributes (Gershoff & Frels, 2015).

Studies done by Luchs et al. (2010) show that consumers associate higher ethicality with gentleness-related attributes, and lower product ethicality with strength-related attributes. Consequently, for product categories where consumers value strength-related attributes, they found that the positive effect of sustainability was noticeably reduced, leading to a higher preference for non-sustainable products (Luchs et al., 2010). For product categories where consumers valued gentleness-related attributes, sustainability increased preference (Luchs et al., 2010). These findings show that the degree to which sustainability increases product preference depends on what attributes consumers place the highest value on in the product category.

To examine more closely what motivates consumers to purchase sustainable products and the importance of relevant product attributes, the "theory of reasoned action" by Fishbein and Ajzen (1975, 1980) can be used. This model proposes that

three elements make up what attitude consumers have about brands and products. The first component consists of the product's relevant attributes, the second is the consumer's beliefs about whether the product has these attributes, and the third is the consumer's evaluation of the product possessing these attributes. How the attributes are rated depends on how relevant they are to the consumer. Thus, the consumer's attitude towards the product is the sum of evaluating the product attributes and their beliefs about the product having these attributes. Furthermore, Fishbein and Ajzen (1980) found that for important attributes, the results of the ratings were more polarized. This suggests that it is harder to create a significantly positive association for an attribute that the consumer does not find to be important or relevant.

2.4 Product Label and Packaging

Product labels and packaging are essential in the purchase situation as they influence purchase behavior by stimulating attention and conveying information, quality, and aesthetics (Bech-Larsen, 1996). Product labels are commercial information designed to attract attention and convey a message that motivates consumption of the product (Héroux et al., 1988). Product labels are also used to promote the product by communicating information such as brand name, logo, ingredients, price, and nutritional value (Héroux et al., 1988).

For consumers, product labels are used in the cue utilization process (Olson & Jacoby, 1972). This is a form of information processing, where the consumer makes inferences about the product based on the cues available (Olson & Jacoby, 1972). This helps consumers reduce risk and predict benefits of buying the product (Olson & Jacoby, 1972). The cues used in this process can be divided into two categories: extrinsic and intrinsic. Intrinsic cues are about the product characteristics, such as size, shape, and ingredients (Yan et al., 2019). Extrinsic cues are attributes related to the product, such as brand name, packaging, and product label (Yan et al., 2019). Extrinsic and intrinsic cues both have confidence and predictive values. Confidence values denote the consumer's degree of confidence in their judgment, while predictive values refer to the cue signifying product quality (Yan et al., 2019). In cases where the consumer is less familiar with the product, extrinsic cues are more important in influencing their decision, as they cannot immediately acquire the intrinsic cues of the product (Dodds et al.,

1991; Yan et al., 2019). The consumer's perception of the expected quality of the product is based on these extrinsic and intrinsic cues. For this thesis, we view explicitly stating product strength as an extrinsic cue that adds to the product label.

Research by Parker et al. (2020) finds that also the label structure can impact the consumer's evaluations of products. In the case of vice and virtue food, Parker found that although labeling food as organic could harm product evaluation, simple changes to the label structure could reduce this effect (Parker et al., 2020). These simple changes involved placing the use of "organic" either before the product name (product-level) or after the ingredients (ingredient-level), e.g., organic French fries or French fries with all organic ingredients (Parker et al., 2020). The study shows that product-level labels led to significantly lower product evaluations than ingredient-level labels (Parker et al., 2020). The results suggest that while one attribute can negatively influence the evaluation of certain products, investigations, and deconstruction of what parts of the labeling cause this negative evaluation can help producers overcome the effect. These findings emphasize the importance of labeling and label structure for products, as it can greatly impact consumers' decisions. In the case of explicitly stating product strength for sustainable products, this suggests that strength should be stated on an ingredient-level, i.e., after the ingredients, rather than before the product name to reduce the possible adverse effects of labeling the product as sustainable.

Furthermore, insufficient information on product packaging has also been shown to be a cause for consumers purchasing non-sustainable products over sustainable products. According to a study done by Rokka & Uusitalo (2008), one-third of consumers state that environmentally labeled packaging is the most crucial factor when making purchasing decisions. However, when there is a lack of information on the product packaging, it is hard for the consumer to know which product is better for the environment. In addition, this makes it more difficult for the consumer to see the connection between their purchase behavior and the effect it has on the environment (Rokka & Uusitalo, 2008). These findings show the importance of labeling products accurately and including environmental dimensions. Nonetheless, the consumer should not be overloaded with information about why they should choose the most environmentally friendly

product, but instead, the information should leave room for the consumer to make their own judgments and decisions (Thøgersen, 1999).

2.5 The Sustainability Liability

Consumers often translate positive feelings towards a product's attribute to the rest of the product attributes. The halo effect explains how people use exaggerated correlations to make overall judgments of people or situations (Murphy et al., 1993). Additionally, research on both heuristic and schema-consistent judgments suggests that if a product is judged to be superior on one attribute, it will also be perceived to be better along other attribute dimensions (Finucane et al., 2000; Fiske & Pavelchak, 1986; Pachur et al., 2012). Consumers rely on these evaluation-based assumptions in their judgments of products (Peloza et al., 2015). This means that if sustainability is valued in a product, consumers are likely to believe that the rest of the product attributes have the same favorability (Luchs et al., 2010).

A contrasting finding shows that the presence of a desirable attribute can result in consumers thinking that the rest of the product attributes are undesirable (Chernev & Carpenter, 2001). Consumers who are aware of producers' budgetary limitations and market efficiency in general can believe that by offering one desirable attribute, a tradeoff has been made at the expense of the rest of the product attributes (Chernev & Carpenter, 2001). This indicates that sustainability can result in consumers believing that the product performs worse by lacking in other attributes.

Peloza et al. (2013) studied the effects of self-accountability on product preference. The study found that in decision-making situations where consumers' self-accountability is activated, they experience an increased preference for sustainable products (Peloza et al., 2013). Further, they found that sustainable appeals can reinforce sustainable choices (Peloza et al., 2013). However, combining these appeals with explicit messages that can cause feelings of guilt was not shown to be beneficial but rather counterproductive (Peloza et al., 2013). The authors reasoned that this happens because consumers avoid consumption that falls short of their internal standards when self-accountability is activated (Peloza et al., 2013).

However, Luchs et al. (2010) found that the preference for sustainability was more complex and that the halo-effect, self-accountability, and affect heuristics did not explain the whole phenomenon. Instead, preference for sustainable products depends on the type of benefit wanted in a product. As mentioned, higher sustainability is associated with gentleness-related attributes, and lower sustainability is associated with strength-related attributes. Thus, the positive effect of sustainability is limited when these strength-related attributes are valued, which in turn results in a preference for unsustainable products - i.e., "the sustainability liability."

2.6 The Value-Action Gap and Tradeoffs

Even though there are widespread pro-green attitudes amongst consumers, when in a purchase situation, many consumers still choose non-sustainable products - a phenomenon called the "value-action gap" (Chai et al., 2015; Joshi & Rahman, 2015; Wheale & Hinton, 2007). Despite sustainable consumption growing, the market share of green products is still only 1-3% of the total market (Bray et al., 2011). Evidence of this gap is further illustrated by Hughner et al. (2007), who showed that despite consumers' generally favorable attitudes towards organic food (between 46% and 67% of the population), actual purchase behavior only forms 4–10% of different product ranges. Further, Binder & Blankenberg (2017) found that the value-action gap ranges from 2% to 65%, depending on the category of green behavior. The value-action gap is substantially larger for presumably more costly behaviors (Binder & Blankenberg, 2017). For example, only about 2% of individuals who are concerned about the environment leave the tap water running while brushing their teeth, whereas 65% would never reduce the number of flights taken, 53% would never share their car, and 50% would abide from purchasing something due to its packaging (Binder & Blankenberg, 2017).

Several reasons can explain this value-action gap. As mentioned, consumer knowledge is an essential antecedent to sustainable behavior (Stern, 2000). As people's knowledge about climate change increases, the value-action gap decreases (Chai et al., 2015). Demographics can also affect the size of the value-action gap. For instance, the older people are, the smaller the value–action gap is shown to be. This can be explained by a person's increase in consumption

experiences and skills over time. Thus, an older consumer can more easily modify their behavior to align with their attitudes and values compared to a younger consumer with less experience related to consumption (Chai et al., 2015). In addition, the value action gap may manifest itself because consumers are skeptical of the product's benefits (Loureiro et al., 2005, as cited in Parker et al., 2020).

Further, evidence suggests that social learning participates in aligning people's consumption lifestyles with their concern for climate change (Babutsidze & Chai, 2018). However, concern about climate change has been shown to increase the value-action gap (Chai et al., 2015). This concern may indicate that people view climate change as unavoidable and inevitable, thus perceiving their personal efficacy to be too low to make adequate efforts to reduce climate change (Chai et al., 2015; Reser et al., 2012).

Bray et al. (2011) further build on this idea by investigating the "ethical purchasing gap," i.e., "the significant differences between consumers' intentions to consume ethically, and their actual purchase behavior" (Bray et al., 2011, p. 597). They suggest that several external variables such as moral maturity, age, education level and beliefs, together with impending factors, such as consumer skepticism, an overload of marketing messages and prices, affect purchase decisions. Consumers demonstrate their ethical views through post-purchase dissonance and guilt, while others display a reluctance to consume ethically due to personal constraints, perceived negative impact on image or quality, or simply reject their responsibility (Bray et al., 2011).

Further, the value-action gap can be explained by the tradeoffs that green products often require. These tradeoffs include higher price, lower quality, and/or reduced performance (Bamberg, 2003; Barr, 2006; Olson, 2013; Rokka & Uusitalo, 2008; Shafie & Rennie, 2012). Olson (2013) suggests that tradeoffs often reduce the general product preference. Only the consumers highly concerned with green products are willing to choose these products if it offers few compensatory qualities (Olson, 2013). This can result in limited pro-green behavior, despite the pro-green attitudes of most consumers (Bamberg, 2003; Barr, 2006; Olson, 2013; Rokka & Uusitalo, 2008). However, if a green product offers some compensatory advantages on a conventional attribute, it attracts a broad spectrum of consumers

(Olson, 2013). Nonetheless, Luchs et al. (2010) suggest that in addition to tradeoffs, the type of benefit sought from a product should be included when assessing the complex relationship between sustainability and preference. Thus, sustainability is positively associated with some types of benefits that customers seek in products and negatively associated with others (Luchs et al., 2010).

Nevertheless, there is still limited research on the negative correlation between attributes and green product considerations (Young et al. 2010). Research in other fields finds that multi-attribute models' ability to predict accurately is reduced when negatively correlated attributes are included in the choice sets, as this makes it impossible for the consumer to "have it all" (Newman, 1977; Olson, 2013; Olson & Widing, 2002). In these cases, consumers may choose to compromise, resulting in an alternative with lower total utility. This is done to avoid the unattractive value of their highest utility option on a negatively correlated attribute (Olson, 2013; Simonson, 1993; Widing & Talarzyk, 1993).

3.0 Research Model and Hypotheses

3.1 Research Model

The purpose of the literature review was to present previous research and theoretical knowledge relevant to the research question and topics introduced in the introduction. The aim was to understand the attitudes, behaviors and value-action gaps connected to sustainability and consumption. The discrepancy between consumers' beliefs and actions suggests that sustainable consumption habits might be affected by the presentation and marketing of sustainable products. The preference for non-sustainable products in product categories where strength-related attributes are valued, i.e., the sustainability liability, made us want to further investigate what measures can be taken to overcome this potential negative effect of marketing strong products as sustainable. Luchs et al.'s (2010) research suggests the sustainability liability exists and that it can be overcome by stating product strength. However, the best way to state the product strength is not clear. Therefore, we want to study how to increase the perception of strength and preference most effectively for strong sustainable products, by investigating if the strength message is most powerful when stating the product's natural strength or manufactured strength. Further, we want to investigate if the consumer's green attitudes affect the results.

To summarize this, we present the following research model, illustrated in Figure 1.

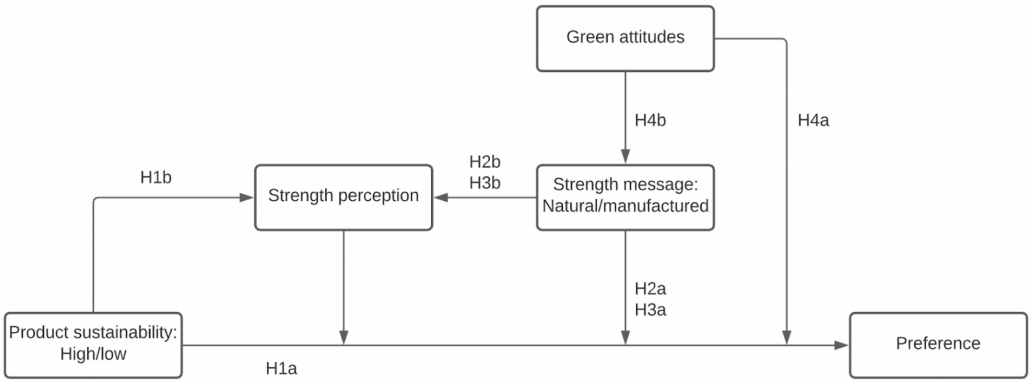

Figure 1. Research model

3.1.1 Product sustainability

Product sustainability is measured as either high or low. Products with low sustainability are manufactured "traditionally," meaning that no measures are taken to decrease unfavorable environmental impacts or reduce the usage of natural resources during the product's lifecycle (White et al., 2019). For products with high sustainability, these measures are taken.

3.1.2 Explicitly Stating Natural or Manufactured Strength

The product description will include a "strength message," stating that the product's strong attributes are natural or manufactured. In addition, some products have no strength message, serving as a control variable. Natural strength attributes denote attributes that already exist in the product, e.g., "naturally contains citric acid from lemon." Manufactured strength attributes indicate attributes that have been added to the product, e.g., "added sodium citrate."

3.1.3 Green Attitudes

Attitudes can be defined as "a positive or negative assessment of an object, action, issue or person" (Fishbein & Ajzen, 1977). In addition, attitudes can be seen as enduring evaluations of objects and environments (Solomon, 2016). Thus, green attitudes can be viewed as the assessment or evaluation of sustainable products and own sustainable consumption habits.

3.1.4 Preference

Preference is the liking of one alternative over another (Oxford English Dictionary, 2021). This implies that a consumer would rather choose one product over another product in a purchase situation.

3.2 Hypotheses

In the following section, we will present the hypotheses that will be used to answer our research question: *Can the sustainability liability be overcome by explicitly stating product strength, and if so, is the effect greater by explicitly stating manufactured or natural strength?*

Before finding out how to best overcome the sustainability liability, we want to investigate if we find support for there being a liability connected to strong sustainable products. Luchs et al. (2010) propose that the liability exists because sustainable products are associated with gentleness-related attributes, thus not appearing as strong as non-sustainable products. Therefore, we want to explore if there is a difference in the perception of strength of sustainable and non-sustainable products in product categories where strength-related attributes are highly valued.

> **H_{1a}**: *The **perception of strength** is higher for non-sustainable products than sustainable products, in product categories where strength-related attributes are highly valued.*

Based on Luchs et al.'s (2010) findings of consumers showing less preference for sustainable strong products due to sustainable products being associated with gentle attributes, we believe that by having a higher perception of strength, the overall preference for these products will also be higher.

> **H_{1b}**: *The **preference** is higher for non-sustainable products than sustainable products, in product categories where strength-related attributes are highly valued.*

Further, as sustainable products have been shown to be associated with gentleness-related attributes, this suggests that consumers might lack the

knowledge of the actual attributes of the products. This might be why consumers believe that sustainable products lack strong attributes. This is also in accordance with the findings in Luchs et al.'s (2010) study. Therefore, we believe that making consumers aware of the strength-related attributes in these products by explicitly stating the products' strength, will increase the strength perception, and thus also increase preference.

> **H_{2a}**: *Stating product strength is more effective in increasing* ***perception of strength*** *than not stating product strength, in product categories where strength-related attributes are highly valued.*

> **H_{2b}**: *Stating product strength is more effective in increasing* ***preference*** *than not stating product strength, in product categories where strength-related attributes are highly valued.*

Building on this, we want to explore what strength messaging is most effective for increasing strength perception and preference. As research suggests that consumers believe that the attributes found in sustainable products do not include strength-related attributes, we believe there will be a difference in stating the strength that is found naturally in the product (natural strength) and stating strength that is added to the product (manufactured strength). Based on this, we assume that stating manufactured strength that is added to the product will be more effective than stating natural strength that already exists within the product.

> **H_{3a}**: *Stating the product's manufactured strength increases the* ***perception of strength*** *more than stating the product's natural strength, in product categories where strength-related attributes are highly valued.*

> **H_{3b}**: *Stating the product's manufactured strength increases* ***preference*** *more than stating the product's natural strength, in product categories where strength-related attributes are highly valued.*

Additionally, we want to explore if the results are different depending on the consumer's green attitudes. We believe that the sustainability liability will be less present for consumers with high green attitudes, i.e., we believe that their

preference for sustainable strong products will be higher than for those with low green attitudes.

> **H_{4a}**: *High green attitudes increase **preference** for sustainable products more than low green attitudes do, in product categories where strength-related attributes are highly valued.*

Furthermore, we believe that for those with high green attitudes stating the product's natural strength will be more effective in increasing preference than stating manufactured strength. This is based on our belief that consumers with high green attitudes have higher environmental knowledge, thus they are likely to be more aware of the attributes found in sustainable products and prefer the most sustainable alternative. The manufactured strength might appear less sustainable to this group, due to it being added to the product during production.

> **H_{4b}**: *High green attitudes increase **preference** for sustainable products that state natural strength more than sustainable products that state manufactured strength, in product categories where strength-related attributes are highly valued.*

4.0 Research Methodology

To answer the research question, we conducted an online experiment. Based on an assessment of the research question, we decided to use a quantitative method to test the conceptual framework. In the following section, the research design and data collection process are presented in detail.

4.1 Research Design

The research design consisted of one pretest and one main study. The purpose of the pretest was to find out what products Norwegians view as strong products, i.e., what products they associate with having the most strength attributes. For the main study, the primary goal was to investigate if explicitly stating the strength of the product could overcome negative associations between sustainable products and strength. The main study also aimed to determine if sustainability is less of a liability when the sustainable products are explicitly stated as having natural or manufactured strength attributes, and if so, which strength message is most

effective. A quantitative research method was chosen to increase the quality of the study, as this enabled us to use statistical techniques to examine the relationship numerically.

4.1.1 Main Study Design

A 2 (Sustainable vs. Not Sustainable) x 3 (No Strength Message vs. Natural Strength vs. Manufactured Strength) between-subjects design was conducted for the main study. The group allocation of respondents was randomized, and results were interpreted by comparing the groups exposed to different stimuli. Respondents were placed into one of six stimuli groups, with each group experiencing only one condition. To administer the study, Qualtrics software was used to allocate participants randomly in one of the six groups, and the software ensured that the groups were equal in size.

4.2 Data Collection

4.2.1 Pretest

We conducted a pretest to determine what products Norwegians view as strong products. In accordance with the pretest done by Luchs et al. (2010), respondents were asked to "rate how important each of the following dimensions/characteristics are to you when you buy the following product." The products presented in the pretest were dish soap, hand sanitizer, and multi-purpose cleaner. The dimensions presented were *effective*, *powerful*, *strong, gentle, mild*, and *sensitive*. The sample size was 26, and we found this number of respondents sufficient, as pretest samples are usually small in size (Malhotra, 2010). The complete questionnaire of the pretest can be found in Appendix 1.

Table 1. Descriptive Statistics of the Product Pretest

Product	Strong Variables	Gentle Variables
Dish soap	19.96	17.22
Hand santizer	21.70	18.70
Multi-purpose cleaner	21.65	15.30

Hand sanitizer loaded highest of all products on the strong variables (effective, powerful, strong; M=21.70), but also highest of all products on the gentle variables (gentle, mild, sensitive; M=18.70) (Table 1). As also loading high on gentle variables is likely to diffuse the overall strength perception of the product, we decided to discard hand sanitizer. Instead, we determined multi-purpose cleaner to be the most appropriate product for the main study. Multi-purpose cleaner loaded high strong variables

(M=21.65), and in addition, it loaded the lowest of all the tested products on the gentle variables (M=15.3). Based on this, we predicted that we would be more likely to get significant results in our main study with multi-purpose cleaner, as this was more significantly perceived as a "strong product".

4.2.2 Procedure

After selecting the appropriate product to use in our main study, we conducted an online experiment. The online experiment was based on study 4 in Luchs et al. (2010), where they tested whether explicitly stating the product's strength could overcome the sustainability liability. We based the study on the same questionnaire as Luchs et al. (2010) used to ensure that our research would build on their findings consistently and that no unwanted factors would affect the outcome of the study. However, we modified the variables in the questionnaire to reflect the research objectives, i.e., we used the product found in our pretest and strong attributes relevant to this product category. Further, the questionnaire was translated to Norwegian to minimize translation errors and wrong interpretations by respondents.

We made the questionnaire in the survey software program Qualtrics. By having an online survey, it was easier to distribute it to our population. As the studies were conducted during the Covid-19 pandemic, having it online was even more essential. Further, it made it easy to transfer the responses to SPSS software to interpret the results.

We distributed the survey on several social media platforms, such as Facebook, Instagram, and Snapchat. To obtain a large enough sample, we incentivized the respondents to participate with a chance to win a gift card of 500 NOK. To keep respondents anonymous, they received a link on the closing screen after finishing the study to a form where they could register their email to enter the competition. This way we were able to collect respondents' emails without connecting it to their responses in the questionnaire.

After receiving all our responses, we downloaded the data to further analyze it in the statistical software SPSS.

4.2.3. Sampling

During a four-week period, 489 respondents participated in our online experiment hosted on the Qualtrics Survey Software. The participants were recruited from our personal social media platforms and the sampling method used was thus a non-probability convenience sampling method (Malhotra, 2010).

In addition to using a convenience sampling method, a virtual snowball effect was also created by encouraging respondents to share the online survey with their network. This enabled us to reach out to a wider set of participants outside of our personal networks. Snowball sampling denotes a sampling method where the initial group of respondents is selected at random (Malhotra, 2010). These respondents then go on to identify others who belong to the target population (Malhotra, 2010).

Out of the 489 responses, 250 responses were deleted from the data set due to being incomplete (N=244) or having a response time under 60 seconds (N=6). As the average response time was 9.4 minutes, responses under 60 seconds were likely to be rushed and indicated that the respondent had sped through the questions without giving them enough consideration. In addition, one response was deleted due to indications of incorrect and unserious responses. This respondent had responded "1" for all questions, "other" for gender and "not living in Norway" for location.

After removing the respondents mentioned above from the sample, the final sample (N=238) consisted of 172 females, 64 males, and 2 non-binary/other (Table 2). Most respondents

Table 2. Summary of participants

Variable	N	%
Gender		
Male	64	26.9
Female	172	72.3
Non-binary	2	0.8
Age		
Under 18	10	4.2
18-25	147	61.8
26-35	54	22.7
36-45	9	3.8
46-55	4	1.7
56-65	9	3.8
Over 65	5	2.1
Location		
Viken	34	14.3
Innlandet	6	2.5
Vestfold og Telemark	4	1.7
Agder	46	19.3
Rogaland	9	3.8
Vestland	17	7.1
Møre og Romsdal	2	0.8
Trøndelag	12	5
Nordland	9	3.8
Troms og Finnmark	3	1.3
Oslo	94	39.5
Not living in Norway	2	0.8
Occupation status		
Student	137	57.3
Working full-time	75	31.4
Working part-time	66	27.6
Unemployed	4	1.7
Retired	7	2.9
Other	11	4.6

were in the age group 18-25 (N=147) and lived in Oslo (N=94). In addition, the majority of respondents were students (N=137). This ratio was to be expected due to our network's composition, as we used a convenience sample and distributed the survey on our social media platforms. However, young people and students can be argued to be the appropriate respondents for this study, as they are highly concerned about sustainability and will be the primary consumers of products in the future (Keeble, 2013; Petro, 2020).

4.2.4 Questionnaire

As mentioned, the questionnaire was designed based on the questionnaire used in Luchs et al.'s (2010) study. The complete questionnaire of the experiment can be found in Appendix 2.

The questionnaire consisted of five parts: an introduction, treatment to one of the six conditions, questions about environmental beliefs, and demographic questions. In addition, the treatment questions were divided into two sections, where one section asked the participant to answer on behalf of an average person, and the other section asked them to answer on behalf of themselves. The questions in the survey were structured and specified the set of response alternatives and how they should respond (Malhotra, 2010). All questions were multiple choice.

The introduction section informed the participants of the purpose of the study, the approximate time needed to take the survey, and information about confidentiality. In addition, it provided participants with our contact information should they have any questions about the study.

Following this, the participants were introduced to the first part of the study. Here they were asked to answer the questions on behalf of an average person. To ensure correct results, the description emphasized that they should answer on behalf of an average person and included a definition of "average person." To confirm that they had read the description, respondents were asked to respond to a confirmatory question about who they were supposed to respond on behalf of. The participants were not able to proceed to the next step until they answered correctly on this question.

Next, the condition and product were presented. The participants were shown one out of six possible conditions. The questions were about the perceived strength, position in the market, preference, and sustainability of the product. As mentioned in the first section, participants were asked to answer on behalf of an average person. In contrast, in the next section, they were asked to respond on their own behalf and their personal opinions. The same treatment and questions were shown for both sections. To prevent participants from forgetting the product and directions, this information was available at the top of the page while completing the corresponding questions. Succeeding this, questions about the participant's environmental beliefs were presented. Finally, demographic factors were recorded with questions about gender, age, location, and occupational status.

After finishing the questionnaire, the participants were thanked for their participation and had the opportunity to enter a raffle to win a gift card. They were informed that the email address used to enter the raffle would not be connected to their answers in the study. To ensure this, those who wanted to enter the raffle did so by submitting their email addresses in a secondary questionnaire created in Qualtrics Survey Software.

4.2.4.1 Ethical Consideration

To follow the Norwegian National Research Ethics Committees' guidelines for conducting ethical research, no personal data was collected from the study, and participants were informed of the purpose of the research, intended use of the results, as well as who the researchers were that would receive access to the information (The Norwegian National Research Ethics Committees, 2019). At the beginning of the survey, the participants were made aware that no identifying data, such as name or IP address, would be collected. In addition, it was informed that the responses would only be used for our master thesis, and all data would be deleted as soon as the research was concluded.

4.2.4.2. Treatment

Participants were shown one of the six possible combinations of the two attributes: 2 (Sustainable vs. Not Sustainable) x 3 (No Strength Message vs. Natural Strength vs. Manufactured Strength) (Table 3). The development of the description of these products and attributes was based on the study done by Luchs

et al. (2010) and information about sustainable and unsustainable chemicals and materials commonly used in multi-purpose cleaners.

Table 3. Treatment conditions

	No strength message	Manufactured strength message	Natural strength message
Sustainable	Environmentally friendly and eco-labeled. Without unnecessary chemicals and dyes.	Environmentally friendly and eco-labeled. Without unnecessary chemicals and dyes. Added sodium citrate to effectively remove grease and dirt.	Environmentally friendly and eco-labeled. Without unnecessary chemicals and dyes. Naturally contains citric acid from lemon which effectively removes grease and dirt.
Non-sustainable	With chemicals and dyes traditionally used in cleaning.	With chemicals and dyes traditionally used in cleaning. Added sodium citrate to effectively remove grease and dirt.	With chemicals and dyes traditionally used in cleaning. Naturally contains citric acid from lemon which effectively removes grease and dirt.

The sustainable attribute was described as environmentally friendly and without unnecessary chemicals and dyes, while the non-sustainable attribute was with chemicals and dyes traditionally used in cleaning.

The strength message was designed to either portray manufactured strength or natural strength, in addition to a control condition with no strength message. The manufactured strength message was developed to denote strength attributes added to the product that do not exist in the product naturally. On the other hand, the natural strength message described attributes that already exist in the product that were highlighted to increase consumer knowledge about the attribute.

4.2.4.3 Self condition and Other Condition

Similar to Luchs et al.'s (2010) study, one section of our questionnaire asked the participants to provide answers on behalf of an average person (the Other condition), while another section asked them to give ratings based on their preferences (the Self condition). As participants are likely to adjust and enhance their own portrayal when ethics are involved (Epley et al., 2004; Kruger & Gilovich, 2004), it can be assumed that the Other condition will provide responses that are more in line with the participant's actual thoughts and preferences (Luchs et al., 2010). Due to this, the responses from the Other condition will be used as the basis for our analysis.

In Luchs et al.'s study, the Other condition consisted of participants answering on behalf of an "Average American." This was adjusted in our questionnaire to an "Average Person," due to cultural differences between America and Norway.

While an "Average American" for North Americans is indicative of a completely average person, the term "Average Norwegian" can be interpreted differently by Norwegians. As Norway is significantly smaller than America, the term "Average Norwegian" could make participants contemplate what Norwegians' values are and what is typical for a Norwegian. Instead, we wanted participants to answer on behalf of a normal, average person without biasing them towards incorporating national values and morals.

4.2.5 Measures

In the following section, scales measuring the constructs of interest are presented.

As mentioned, the respondents were presented with one of six products varying in sustainability and strength message and were asked to assess their preference and strength perception. All statements in the treatment conditions were on a Likert scale from 1 to 9, where 1 was lowest, and 9 was highest. The specific response alternatives varied depending on the question (e.g., when asked about likelihood the scale was 1 = not at all likely and 9 = very likely).

4.2.5.1 Green attitudes

The moderating variable for green attributes was measured on a 9-point Likert scale. The first five questions assessed the importance of different environmental issues, and thus the scale ranged from "not at all important" to "very important." The last question regarding green attitudes assessed how often the respondents purchased sustainable products, and the scale ranged from "never" to "always."

4.2.5.2 Preference

The dependent variable for preference was again measured on a 9-point Likert scale. When asked about the likelihood of the respondent buying the product, the scale ranged from "not at all likely" to "very likely."

4.2.5.3 Strength Perception

Strength perception was measured with four questions on a 9-point Likert scale. When asked how strong, powerful and effective they perceived the product to be, respondents rated the product from "not at all strong/powerful/effective" to "very strong/powerful/effective." For the question of whether they believed the product

effectively removed grease and dirt, the scale ranged from “no, definitely not” to “yes, definitely.”

4.2.5.4 Control variable

To ensure that our manipulations worked as planned, we included a control variable. This control variable was the question “do you personally think that this multi-purpose cleaner is a sustainable product” and the scale ranged from “no, definitely not” to “yes, definitely.”

4.3 Validity and Reliability

Securing validity and reliability was crucial to ensure that our results could be seen as scientific proof and that our study could be trusted and replicated (Saunders et al., 2009).

4.3.1 Validity

To ensure the validity of our study, entailing that the study measures what it is intended to measure (Malhotra, 2010), we followed Luchs et al. (2010)’s survey design. The questionnaire included several questions to measure the same construct, and clear instructions to secure all participants’ understanding of the questions. To confirm construct validity, an exploratory factor analysis was conducted to address the question of what construct the scale is measuring and why this scale works (Malhotra, 2010).

To secure internal validity, we tried to minimize hypothesis guessing by distributing our pretest independently before the main study. This was done to limit the chance that respondents would guess the purpose of the study and thus adjust their answers accordingly. In addition, the study had a between-subject design to reduce respondent fatigue and learning effects. We also assessed the participants’ environmental beliefs after presenting the questions about the product. This was done to not influence the responses to questions in the treatment condition.

The study was distributed on several social media channels to different audiences to increase external validity and thus increase the ability to generalize the study results to other relevant settings. In addition, the product in our study (multi-

purpose cleaner) was used to represent strong products. Therefore, the results should be generalizable to other products where strength attributes are highly valued as well.

4.3.2 Reliability

Reliability is the extent to which the measurement scales give consistent results if repeated (Malhotra, 2010; Saunders, 2015). To reduce participant bias, we emphasized that the survey was anonymous and that no personal data about the respondents was collected. Further, it can be argued that having an online survey limits participant error. The participant can decide to participate in the study when they have enough time, energy surplus, and are at an appropriate location. Further, it was essential for us to secure a reliable scale. This was done by following the same scale as Luchs et al. (2010) by measuring all constructs on a 9-point Likert scale. This was important since the aim of our study was to build on and extend their findings. Utilizing an already defined and tested scale reduces the potential for researcher error and researcher bias.

To acquire acceptable reliability, the rule of thumb is that the alpha value should not be under .6 (Malhotra, 2010). Our Cronbach's alpha is .860, which indicates a high level of internal consistency for our scale.

Questions about the sustainability of the product are the only two questions that resulted in a higher Cronbach's alpha (Appendix 3). Additionally, their "corrected item-total correlation" was low (.181 and .129). This can indicate that this question should have been removed from the questionnaire to ensure even higher reliability. However, the research fulfills replicability requirements and could be applicable in other studies with other populations.

5.0 Analysis and results

5.1 Factor Analysis

Before the hypothesis testing, an exploratory factor analysis (EFA) was conducted using the software IBM SPSS 27. The purpose of the EFA was to reduce the number of variables, making the results easier to interpret (Malhotra, 2010). As our original data set contained a large number of variables for each experimental condition, factor analysis was valuable for identifying which of these variables

were correlated and reducing the data to a more manageable level (Malhotra, 2010). In addition, the EFA was conducted to ensure that our proposed research model was accurate. The common factors found in this analysis are the linear combinations of the original variables (Malhotra, 2010).

The variables for the experimental conditions, *purchase likelihood* (Q1), *effectiveness* (Q2), *powerfulness* (Q3), *strength* (Q4), *effectiveness in removing grease and dirt* (Q5), *perception of sustainability* (Q6), and *perception of being a best-seller* (Q7), were on a 9-point Likert scale. As they were on a Likert scale with more than five points, they were treated as continuous variables in the analysis (Malhotra, 2010). Analysis of the correlation matrix (Table 4) shows a high correlation between multiple of these selected variables.

Table 4. Correlation Matrix.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7
Q1	1.00	.66	.46	.38	.43	.10	.45
Q2	.66	1.00	.66	.52	.61	-.04	.36
Q3	.46	.66	1.00	.76	.56	-.13	.30
Q4	.38	.52	.76	1.00	.46	-.18	.21
Q5	.43	.61	.56	.46	1.00	-.05	.38
Q6	.10	-.04	-.13	-.18	-.05	1.00	.06
Q7	.45	.36	.30	.21	.38	.06	1.00

Furthermore, Bartlett's test of Sphericity and Kaiser-MeyerOlkin test (KMO) was performed to examine if the variables were correlated (Table 5), as well as find out if the sample was adequate for factor analysis (Malhotra, 2010). Bartlett's test of Sphericity was significant (p = < .001), showing that the variables are correlated. The conduction of factor analysis was also supported by high KMO (KMO = .79) between the ideal values of 0.5 and 1.0, indicating that a factor analysis was appropriate.

Table 5. KMO and Barlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.79
Bartlett's Test of Sphericity	Approx. Chi-Square	674.13
	df	21
	Sig.	.00

Following this, a Principal Component Analysis (PCA) was conducted with the rotation method Varimax with Kaiser Normalization. A PCA considers the total variance in the data and was chosen for the analysis to identify "the minimum

number of factors that will account for the maximum variance in the data" to be used in further analysis (Malhotra, 2010). A Varimax procedure was chosen as a rotation method to reduce the number of variables with high loadings on a factor, thus making it easier to interpret the factors by creating a clearer distinction (Malhotra, 2010). No variables were excluded based on low communalities (<.5) (Table 6).

Table 6. Communalities.

	Initial	Extraction
Q1	1	.67
Q2	1	.74
Q3	1	.81
Q4	1	.79
Q5	1	.59
Q6	1	.96
Q7	1	.85

Extraction Method: Principal Component Analysis.

To determine how many factors to extract, we used three methods; Kaiser's rule, explained variance, and scree plot. Kaiser's rule claims that the selected factors should have eigenvalues above 1. Table 7 shows that there are 2 factors with eigenvalues above 1. This indicates that according to Kaiser's rule, two factors might be appropriate for this analysis.

Table 7. Total variance explained.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.45	49.33	49.33	3.45	49.33	49.33	2.78	39.70	39.70
2	1.18	16.92	66.24	1.18	16.92	66.24	1.60	22.87	62.57
3	.78	11.13	77.37	.78	11.13	77.37	1.04	14.81	77.37
4	.57	8.08	85.45						
5	.53	7.61	93.06						
6	.28	3.10	97.06						
7	.21	2.94	100						

Extraction Method: Principal Component Analysis.

The scree plot (Figure 2) shows the 'elbow' being at two factors, indicating a two-factor solution being optimal.

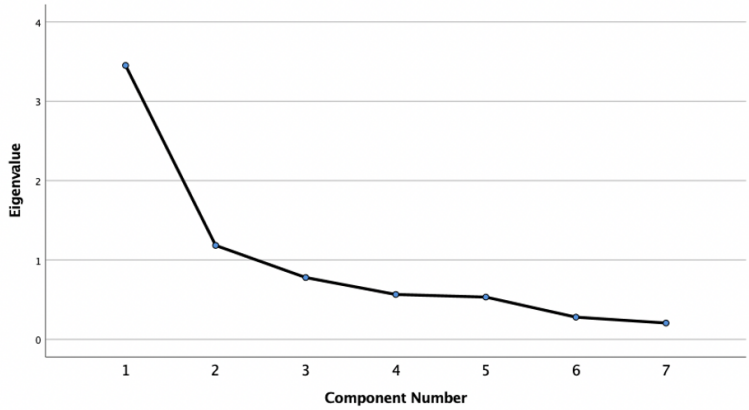

Figure 2. Scree plot.

Looking at the total percentage of variance (Table 7), two factors explain 66.2% of the variance, while three factors explain 77.3%. As a higher explained percentage of the total variance is preferred, this could indicate that three factors might be appropriate.

Based on the factor generation and our assessment of the variables, we select three factors for the EFA. As mentioned, the factors are rotated with a Varimax procedure to give a simpler structure that is easier to interpret. The results place the variables into three factors (Table 8). Based on the variables included, we name the factors; (1) *Strength perception,* (2) *Preference*, and (3) *Sustainability perception*.

Table 8. Rotated component matrix.

	Component		
	Strength perception	Preference	Perception of sustainability
Q1	.50	.60	.23
Q2	.75	.42	.08
Q3	.89	.16	-.08
Q4	.88	.00	-.14
Q5	.63	.44	-.04
Q6	-.10	.03	.98
Q7	.09	.91	-.03

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Having reduced the total number of variables in the data set with EFA, we compute three new variables from the identified factors: Strength_Perception, Preference, and Sustainability_Perception. Strength_Perception includes Q2 (effectiveness), Q3 (powerfulness), Q4 (strongness), and Q5 (effectiveness in removing grease and dirt). Preference includes Q1 (purchase likelihood) and Q7 (perception of being best-selling). Strength_Perception includes Q6 (perception of sustainability).

We use these generated variables in our further analysis.

5.2 Hypothesis test

5.2.1 Strength Perception: Analysis of Variance

To analyze the results of the study and understand the relation between the dependent variable and the factors, a 2 (Sustainable vs. Not Sustainable) x 3 (No

Strength Message vs. Natural Strength vs. Manufactured Strength) design was utilized. The dependent variable in our dataset is continuous and metric, as it is measured on a 9-point Likert scale. Further, we have two categorical variables, one with two categories, and one with three categories. These features make it fitting to utilize "Analysis of Variance," and since we have two factors, it will be a Two-Way Analysis of Variance (Malhotra, 2010). An advantage of using this technique is that it makes it possible to examine the interactions between the factors (Malhotra, 2010). Interactions describe the occurrences when the effects of one factor on the dependent variable depend on the level of the other factor (Malhotra, 2010).

5.2.1.1 Assumptions

Before starting the analysis, it is important to check whether the assumptions for the ANOVA model are met, i.e., each condition contains a random sample, scores in each condition are independent of each other, normal distribution in each condition, and equal variances in each condition (Rutherford, 2000). Outliers will also be identified. The first two assumptions were secured during the design and execution of the study. The following two assumptions are tested in SPSS. First, our dependent variable needs to be normally distributed through all conditions. Running a histogram on the dependent variable (strength perception) in general shows that it is relatively normally distributed (Figure 3). However, there are very high values between 6 and 8, which distorts the normal distribution.

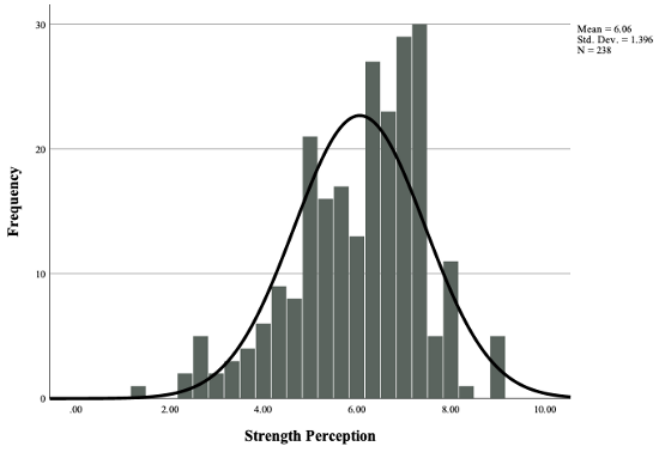

Figure 3. Histogram of Strength Perception

To investigate the normality for each condition, a test was run for normality through the Shapiro-Wilk procedure (Table 9). This shows that Strength

Perception is not normally distributed across the "not sustainable, natural strength," "not sustainable, manufactured strength," and "sustainable, manufactured strength" conditions while there is a normal distribution across the rest. Non-normality can result in falsely rejecting the null hypothesis (Lix et al., 1996). However, ANOVA is a robust model that is not very sensitive to moderate deviations from normality (Driscoll, 1996; Rutherford, 2000)**.** As the histogram shows a relatively normally distributed variable, this is acceptable, but will be considered when analyzing the results.

Table 9. Test of Normality

		Shapiro-Wilk
Not Sustainable	No Strength	.41
	Natural Strength	.02
	Manufactured Strength	> .01
Sustainable	No Strength	.06
	Natural Strength	.66
	Manufactured Strength	.03

With the Explore function in SPSS, 12 outliers were identified. These were checked thoroughly in the data set to assess whether they should be removed. All answers seemed to be valid, so none was removed.

Further, for the assumptions of ANOVA to be met, each combination of the groups within the two independent variables needs to have homogeneity of variances. The Levene's test (Table 10) showed that the variances for Strength Perception were not equal, $F(5,232) = 2.39$, $p = .04$. However, ANOVA is also robust against moderate violations of variance homogeneity, given that the condition sample sizes are equal and greater than five, which applies to this case (Rutherford, 2000).

Table 10. Levene's Test of Equality of Error Variances

		Levene Statistic	df1	df2	Sig.
Preference	Based on Mean	2.39	5	232	.04

5.2.1.2 Results

After checking the assumptions, we ran a Two-Way ANOVA to check the following hypotheses:

> **H_{1a}**: *The **perception of strength** is higher for non-sustainable products than sustainable products, in product categories where strength-related attributes are highly valued.*

H_{2a}: *Stating product strength is more effective in increasing **perception of strength** than not stating product strength, in product categories where strength-related attributes are highly valued.*

H_{3a}: *Stating the product's manufactured strength increases the **perception of strength** more than stating the product's natural strength, in product categories where strength-related attributes are highly valued.*

Initially, it is clear from the descriptives (Table 11) that the mean for Strength Perception for Not Sustainable is generally larger than for Sustainable (M = 6.53, 5.61). This can also be seen in the Sustainability*Strength Line Chart (Figure 4).

Table 11. Descriptives

		Mean	Std. Deviation	N
Not Sustainable	No Strength	6.46	1.02	35
	Natural	6.58	1.02	42
	Manufactured	6.54	1.32	39
	Total	6.53	1.12	116
Sustainable	No Strength	5.43	1.51	40
	Natural	5.64	1.57	45
	Manufactured	5.77	1.37	37
	Total	5.61	1.49	122
Total	No Strength	5.91	1.40	75
	Natural	6.10	1.40	87
	Manufactured	6.17	1.39	76
	Total	6.06	1.40	238

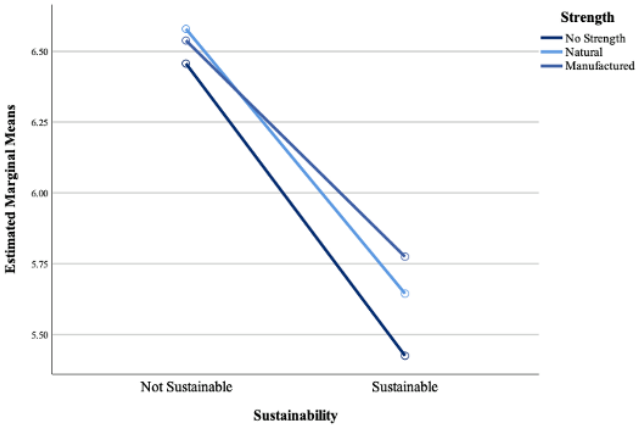

Figure 4. Estimated Marginal Means of Strength Perception

As seen in Table 12, the interaction effect "Sustainable x Strength" is not significant (F(2,232) = .20, p =.82). Assessing the main effects, Sustainable is a significant main effect (F(1,232) = 27.78, p = .00), and H_{1a} is supported. However, Strength is not a significant main effect F(2,232) = .56, p = .57), and H_{2a} and H_{3a} are not supported.

Table 12. Test of Between Subjects Effects

	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	52.69	5	10.54	5.98	.00	.11
Intercept	8710.49	1	8710.49	4941.71	.00	.96
Sustainable	48.97	1	48.97	27.78	.00	.11
Strength	1.96	2	.98	.56	.57	.00
Sustainable * Strength	.70	2	.35	.20	.82	.00
Error	408.93	232	1.76			
Total	9198.44	238				
Corrected Total	461.62	237				

Running post-hoc tests can be insightful when there are no significant results. Assessing the Bonferroni test (Table 13), we again see no significant comparisons within the "Strength" variable. The condition with the largest mean difference is "Manufactured Strength" and "No Strength" (M = .26, -.26). This is however not significant (p = .69).

Table 13. Multiple Comparisons

					95% Confidence Interval	
(I) Strength	(J) Strength	Mean Difference (I-J)	Std. Error	Sig	Lower Bound	Upper Bound
No Strength	Natural Strength	-.19	.209	1.00	-.69	.32
	Manufactured Strength	-.26	.216	.69	-.78	.26
Natural Strength	No Strength	.19	.209	1.00	-.32	.69
	Manufactured Strength	-.07	.208	1.00	-.57	.43
Manufactured Strength	No Strength	.26	.216	.69	-.26	.78
	Natural Strength	.07	.208	1.00	-.43	.57

5.2.2 Preference: Analysis of Variance

To gain further understanding of how the respondents evaluate the products, we assessed how strength message and sustainability explain the preference for the products amongst respondents. To understand this relation, a Two-Way ANOVA was conducted with the same 2 (Sustainable vs. Not Sustainable) x 3 (No Strength Message vs. Natural Strength vs. Manufactured Strength) design. As our dependent variable is measured on a 9-point Likert scale, it is again counted as continuous and metric, and independent variables are the same categorical variables, one with two categories and one with three categories.

5.2.2.1 Assumptions

Running a histogram on the dependent variable (preference) shows that it is somewhat normally distributed. It has a skew to the right, which is natural due to the nature of the variable (Figure 5).

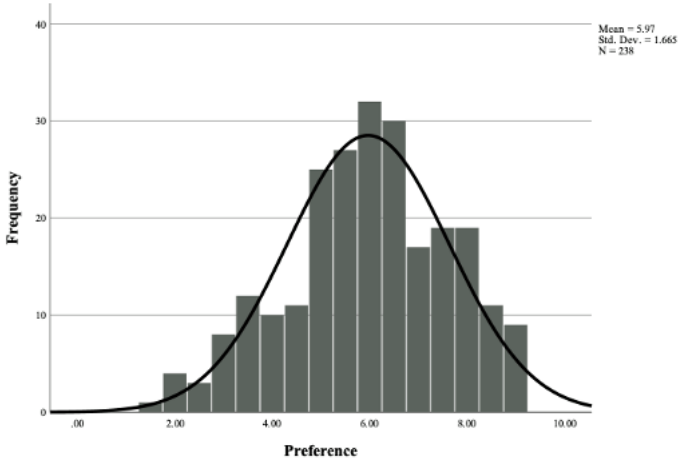

Figure 5. Histogram of Preference

The Shapiro-Wilk procedure was run to check for normality for each condition (Table 14). This shows that Preference is not normally distributed across the "Not Sustainable" conditions, while there is a normal distribution across all the "Sustainable" conditions.

Table 14. Test of Normality

		Shapiro-Wilk
Not Sustainable	No Strength	> .01
	Natural Strength	.03
	Manufactured Strength	.04
Sustainable	No Strength	.54
	Natural Strength	.17
	Manufactured Strength	.65

10 outliers were identified. These were checked thoroughly in the data set to assess whether they should be removed. However, none was removed as they seemed to be reliable.

Further, for the assumptions of ANOVA to be met, each combination of the groups within the two independent variables needs to have homogeneity of variances. The Levene's test (Table 15) showed that the variances for Preference were equal ($F(5,233) = 1.50$, $p = .19$).

Table 15. Levene's Test of Equality of Error Variances

		Levene Statistic	df1	df2	Sig.
Preference	Based on Mean	1.50	5	233	.19

5.2.2.2 Results

After checking the assumptions, we ran a Two-Way ANOVA to test the following hypotheses:

H_{1b}: *The **preference** is higher for non-sustainable products than sustainable products in product categories where strength-related attributes are highly valued.*

H_{2b}: *Stating product strength is more effective in increasing **preference** than not stating product strength, in product categories where strength-related attributes are highly valued.*

H_{3b}: *Stating the product's manufactured strength increases **preference** more than stating the product's natural strength, in product categories where strength-related attributes are highly valued.*

Again, it is clear from the descriptives (Table 16) that the mean for Preference for Not Sustainable is generally larger than for Sustainable (M = 6.33, 5.63). This can also be seen in the Sustainability*Strength Line Chart (Figure 6). From the chart, it seems that the largest gap in Preference from Sustainable to Not Sustainable is with Manufactured Strength. However, assessing each sub-group further (Table 16), there are no apparent differences in the means.

Table 16. Descriptives

		Mean	Std. Deviation	N
Not Sustainable	No Strength	6.63	1.92	35
	Natural	6.02	1.81	42
	Manufactured	6.38	1.75	39
	Total	6.33	1.83	116
Sustainable	No Strength	5.46	1.50	40
	Natural	5.64	1.44	45
	Manufactured	5.80	1.33	37
	Total	5.63	1.42	123
Total	No Strength	6.01	1.80	75
	Natural	5.83	1.63	87
	Manufactured	6.10	1.58	76
	Total	5.97	1.67	238

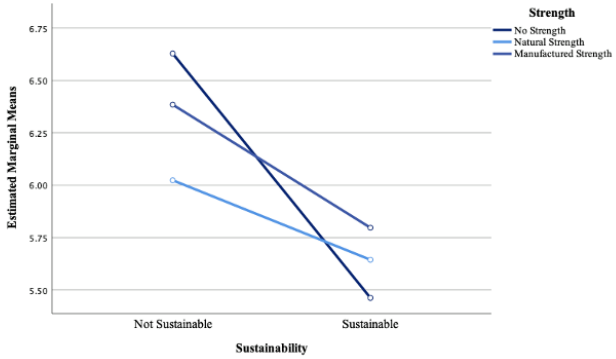

Figure 6. Estimated Marginal Mean of Preference

As seen in table 17, the interaction effect "Sustainable x Strength" is not significant ($F(2,233) = 1.22$, $p = .30$). Assessing the main effects, Sustainable is a significant main effect ($F(1,233) = 11.19$, $p < .001$). Thus, H_{1b} is supported.

However, Strength Message is not significant F(2,233) = .58, p = .56), and H_{2b} is not supported. Thus, H_{3b} is also not supported.

Table 17. Test of Between Subject Effects

	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	38.18	5	7.64	2.86	.02	.06
Intercept	8483.37	1	8483,37	3178.78	<.001	.93
Sustainable	29.87	1	29.87	11.19	<.001	.05
Strength	3.10	2	1.55	.58	.56	.00
Sustainable * Strength	6.53	2	3.26	1.22	.30	.01
Error	619.11	233	2.67			
Total	9141.50	239				
Corrected Total	657.29	238				

Assessing the Bonferroni test (Table 18), we see again that there are no significant comparisons within the "Strength" variable. The condition with the largest mean difference is "Manufactured" and "No_Strength" (M = .27, -.27). This is however not significant (p = .89).

Table 18. Multiple Comparisons

					95% Confidence Interval	
(I) Strength	(J) Strength	Mean Difference (I-J)	Std. Error	Sig	Lower Bound	Upper Bound
No Strength	Natural Strength	.18	.257	1.00	-.44	.80
	Manufactured Strength	-.09	.266	1.00	-.73	.55
Natural Strength	No Strength	-.18	.257	1.00	-.80	.44
	Manufactured Strength	-.27	.256	.87	-.89	.35
Manufactured Strength	No Strength	.09	.266	1.00	-.55	.73
	Natural Strength	.27	.256	.87	-.35	.89

5.2.3 Spotlight analysis

To investigate whether the respondents' level of green attitudes influenced preference for sustainable products with different strength messages, we conducted a spotlight analysis. The hypotheses we tested with the spotlight analysis were:

> ***H_{4a}**: High green attitudes increase **preference** for sustainable products more than low green attitudes do, in product categories where strength-related attributes are highly valued.*
>
> **H_{4b}**: *High green attitudes increase **preference** for sustainable products that state natural strength more than sustainable products that state manufactured strength, in product categories where strength-related attributes are highly valued.*

Spotlight analysis is a technique that uses "basic statistics from regression analysis to analyze the simple effect of one variable at a particular level of another variable" (Spiller et al., 2013, p. 178). In this case, the spotlight analysis will help

us determine whether the effect of strength message (i.e., no vs. natural vs. manufactured) upon preferences is contingent on the level of green attitudes.

First, we computed the mean of the variables measuring green attitudes. Further, the spotlight analysis was used to test for the significance for preference for sustainable products, with the green attitudes variable one standard deviation below and above the mean value. Our regression regards only sustainable products. Thus, the spotlight analysis was conducted only for these conditions (sample size = 123). The mean value and standard deviation were calculated for the sustainable conditions (M=6.34, SD=1.54). Therefore, the spotlight analysis was conducted for 4.8 and 7.88. The spotlight analysis was conducted with Stata software.

We look at the following regression that we run only for sustainable products.

Preference = a + b Strength + c *Mean Green Attitudes + d * (Strength X Mean Green Attitudes).*

Strength message was treated as the continuous variable for the estimations of margins command. From conducting the margins command (spotlight analysis), the results (Table 19) show that the effect of strength on the dependent variable (preferences) does not change with differences in green attitudes, as the t-test was non-significant for both those who were low (95% CI = .73) and high (95% CI = .63) in Green Attitudes. The preference for sustainable products stating different strength messages is therefore not shown to be different depending on the level of green attitudes and H_{4a} and H_{4b} is not supported.

Table 19. Delta-method

Strength _at	dy/dx	Std. Err.	t	P > |t|	[95% Conf. Interval]
1	.28	.23	1.2	-.18	.73
2	.18	.23	.78	-.27	.63

6.0 Summary of results

The aim of the study was to find support for the previous research conducted by Luchs et al. (2010) and build on their findings on explicitly stating product strength by investigating if the results differed depending on strength message. We found support for the sustainability liability existing (H_{1a} and H_{1b}). However,

we had insignificant results and thus no support for stating product strength having an effect on overcoming the sustainability liability (H_{2a}, H_{2b}, H_{3a}, and H_{3b}). In addition, we also did not find support for high green attitudes limiting the liability (H_{4a} and H_{4b}). See Table 20 for an overview of our findings.

Table 20. Summary of results.

Hypotheses	Variables	Results
H_{1a}	The perception of strength is higher for non-sustainable products than sustainable products, in product categories where strength-related attributes are highly valued.	Supported
H_{1b}	The preference is higher for non-sustainable products than sustainable products in product categories where strength-related attributes are highly valued.	Supported
H_{2a}	Stating product strength is more effective in increasing perception of strength than not stating product strength, in product categories where strength-related attributes are highly valued.	Not supported
H_{2b}	Stating product strength is more effective in increasing preference than not stating product strength, in product categories where strength-related attributes are highly valued.	Not supported
H_{3a}	Stating the product's manufactured strength increases the perception of strength more than stating the product's natural strength, in product categories where strength-related attributes are highly valued.	Not supported
H_{3b}	Stating the product's manufactured strength increases preference more than stating the product's natural strength, in product categories where strength-related attributes are highly valued.	Not supported
H_{4a}	High green attitudes increase preference for sustainable products more than low green attitudes do, in product categories where strength-related attributes are highly valued.	Not supported
H_{4b}	High green attitudes increase preference for sustainable products that state natural strength more than sustainable products that state manufactured strength, in product categories where strength-related attributes are highly valued.	Not supported

7.0 General Discussion

The study conducted provides insight into how to overcome the sustainability liability. The study builds on Luchs et al.'s (2010) findings, which show that despite consumers valuing sustainability, the importance of a product being sustainable can be outweighed by the importance of strength attributes in certain product categories. To further the understanding of this liability and how to overcome this, we have investigated whether stating the product's strength can mitigate the effect, and further if it is most effective for the strength message to focus on the product's natural or manufactured strength attributes. We have also explored how consumer's green attitudes moderate the effect on product preference to understand the extent of the sustainability liability further. The following section comments on the results from our analyses and aims to answer the research question: *Can the sustainability liability be overcome by explicitly*

stating product strength, and if so, is the effect greater by explicitly stating manufactured or natural strength?

7.1 Sustainable versus Non-Sustainable Products

As predicted, our results showed that there is in fact a higher preference for non-sustainable products than sustainable products (H_{1a}). This supports previous research about "The Sustainability Liability" (Luchs et al., 2010). There are several possible underlying reasons for this lowered preference. One explanation can be that consumers today still expect tradeoffs when purchasing sustainably, as reported in previous literature (Olson, 2013). Even though the sustainable product market has grown, assumptions of higher prices or lower performances are still present, which many consumers are not willing to accept. As this study was conducted with a product classed as strong, literature has shown that the potentially positive effect of sustainability is reduced for products with strength-related attributes, leading consumers to show a higher preference for non-sustainable products (Luchs et al., 2010), which is consistent with our findings.

However, the results may be different for actual products that are sold to consumers. In purchase situations, customers often rely heavily on branding. In this study, the respondents were presented with generic product information without branding. We did this to avoid issues related to actual products on the market, such as brand familiarity. Our results illustrate the basic notion of lower preference for sustainable products but ignore the mitigating role that brand familiarity or brand preference might play.

Additionally, information on product packaging is important in customer evaluation of products, and insufficient information has been shown to be the reason behind many non-sustainable purchases (Rokka & Uusitalo, 2008). While our study included manipulations on sustainability, other results may have occurred if these manipulations were even stronger.

Furthermore, as expected, the perception of product strength was higher for the non-sustainable products than for the sustainable products (H_{1b}). This supports Luchs et al.'s (2010) findings that gentle product attributes are related to sustainable products, while strong product attributes are related to non-sustainable

products (Luchs et al., 2010). People may believe non-sustainable products utilize more strong chemicals, while sustainable products use more natural ingredients that may not have the same strong performance characteristics.

7.2 The Effect of Stating Product Strength

A surprising finding was the insignificant effect of stating product strength on consumers' strength perception (H_{2b}). This was unexpected as previous literature on the sustainability liability and tradeoffs indicate that strength perception in product categories where strength is a valued attribute is lower for sustainable products (Luchs et al., 2010; Olson, 2013). Thus, it would be natural to assume that the strength perception would increase by making the respondents aware of the product's strength attributes. However, this was not supported by our analysis. A reason behind this might be that the bias towards sustainable products having mostly gentle attributes is stronger than anticipated (Luchs et al., 2010). The product used in the study, multi-surface cleaner, might also have affected the results. In the pretest, we discovered that multi-surface cleaner is a product consumers view to be associated with strength-related attributes. However, this product could also have associations we are unaware of. As purchase behavior is often based on habit and routine, respondents might have consciously or subconsciously compared the presented product with the product they usually buy when responding to the survey. With their usual multi-surface spray in their consideration set, this might have affected their ratings of the strength perception of the product.

Furthermore, it was also surprising to discover the insignificant effect on preference by stating product strength (H_{2a}). However, this is probably due to the findings that strength perception was not sensitive to stating product strength (H_{2b}). As strength perception did not increase, respondents might have viewed the sustainable products to be lacking in strength attributes, thus leading to the sustainability liability (Luchs et al., 2010). Another explanation can be that the manipulations with strength messages might not have been strong enough to affect respondents' attitudes. As Fishbein and Ajzen's (1975; 1980) theory of reasoned action suggests, consumers' attitudes towards products are affected by whether the consumer believes that the products contain the attributes they state that they do. Thus, the respondents' attitude and preference for the product might not have

changed if they did not find the strength message of the product to be believable. Similarly to strength perception, their preference might also have been affected by their consumption habits and the multi-surface cleaner they usually buy.

Overall, this shows that we were not able to recreate the positive effects of explicitly stating product strength that were found in Luchs et al.'s (2010) study. In addition to the reasons stated above, this could also be due to the sample and product used in our study. Despite the pretest showing that Norwegians view multi-surface cleaner to be a product where strength-related attributes are highly valued, there could be some unknown differences between this product and car tires, which was the product used in Luchs et al. (2010) study. Cultural differences might also have affected the results, as Luchs et al.'s study was conducted in the United States while this study was done in Norway. Thus, there could be unexplored perspectives that differ in relation to what attributes are important for strong products and to what extent.

7.3 Manufactured versus Natural Strength Message

We also discovered no significant differences in strength perception (H_{3b}) or preference (H_{3a}) when stating manufactured versus natural strength. With the previous insignificant findings of the effect of strength message in mind, these results are not surprising. If there had been a significant effect on preference and strength perception by stating product strength, then there might have also been a difference between a manufactured and natural strength message. Unfortunately, in the absence of a basic effect of strength in our data, our study cannot conclude anything about the potential importance of the source of the strength.

7.4 Moderating Effect of Green Attitudes

As previous research states, more consumers choose sustainable products to decrease the negative effects of consumption on the environment (Luchs et al., 2010; Sachdeva et., 2015). However, this does not seem to mitigate the sustainability liability. Even though previous studies have found that consumer knowledge of sustainability has been shown to be a central predictor of sustainable behavior (Stern, 2000), this was not the case in our study. Our hypothesis that high green attitudes increase preference for sustainable products more than low green attitudes do (H_{4a}) was not supported. This illustrates the

phenomenon of "value-action gap" that is well supported by previous research (Chai et al., 2015; Joshi & Rahman, 2015; Wheale & Hinton, 2007).

As mentioned, demographics can affect the size of the value-action gap. Our sample consists of a large number of young people (88.7% under 35), which tend to have a larger value-action gap than the older population, explained by increase in consumption experiences and skills over time (Chai et al., 2015).

Furthermore, tradeoffs can provide explanations for the value-action gap. In this case, such a tradeoff is the perceived reduction in product strength or effectiveness. While previous research found that consumers with high green attitudes choose these products even if they offer few compensatory qualities (Olson, 2013), these findings were not replicated in our study.

Further, cleaning solutions are generally not sustainable, and are known to have a negative impact on the environment. It would be likely that people with high green attitudes would respond well to them being sustainable. However, sustainable consumption is highly affected by the consumer's knowledge about sustainability (Stern, 2000). Respondents might not be informed about the negative environmental issues related to the product, which can result in non-sustainable behavior (Stern, 2000).

The findings might also be affected by the product used in the study. Research by Peattie (1999) states that consumerism should be studied by looking at consumers' individual purchase decisions, due to consumption behavior being made up of a series of purchase decisions. These purchase decisions can have shared values and be interconnected or be unrelated and not connected (Peattie, 1999). Thus, even though our results show a clear value-action gap, it might be specific to the product multi-surface cleaner. The respondents, and perhaps consumers in general, might purchase sustainable products in some product categories, and non-sustainable in others.

Lastly, our prediction that high green attitudes would increase preference for sustainable products that state natural strength more than sustainable products that state manufactured strength was also not supported (H_{4b}). The reasoning behind

this prediction was that natural strength corresponds better with the sustainability message and would be less incompatible with gentleness than manufactured strength, which should appeal in particular to consumers high in green attitudes. Unfortunately, the lack of any effect of the strength attribute manipulation does not allow us to draw any conclusion about the role of environmental attitudes from our data.

7.5 Managerial implications

Our study has explored the growing field of sustainable products and marketing and has both similar and contrasting findings to previous literature. This section summarizes important takeaways that marketers should take into consideration in their practice. As sustainability has become more important in the past years, many marketers and product developers believe that sustainable products are guaranteed success. However, our findings suggest that the path to success is not always as straightforward as it might seem. Marketers should therefore be careful when deciding whether they should pursue a sustainable marketing message.

Our findings show that consumers generally have a lower preference for sustainable products in product categories where strength-related attributes are highly valued, compared to the non-sustainable alternatives. More specifically, consumers perceive products that have sustainable features as less strong than those that have non-sustainable features. However, our findings suggest that overcoming this issue might not be as simple as previous research suggests. That is, our findings do not show that stating a product's strength overcomes the negative impact of sustainability on consumers' preference for strong products.

Further, marketers should not overestimate the positive effect of consumers having high green attitudes on their willingness to buy sustainable strong products. Marketers with target groups that have a high interest in environmental issues and high green attitudes can hastily assume that the sustainability liability is less applicable for their audience. However, our findings do not show support for there being a difference between consumers with high or low green attitudes, when it comes to the sustainability liability. This demonstrates that despite your customer base having high green attitudes and sustainable interests, they might still have lower preference for sustainable products where strength attributes are

highly valued. In addition, explicitly stating product strength does also for this group does not seem to prevent this effect.

The conclusion is that it can be difficult to succeed in marketing sustainable products. Success is highly dependent on what type of product you are offering for whether it will be well received by customers. For product categories where strength-related attributes are highly valued, it entails great risks.

8.0 Limitations and further research

The following sections discuss the limitations connected to our research and suggest further research topics to broaden and explain the topic of sustainability liability.

8.1 Limitations

The study was conducted to gain a deeper understanding of the sustainability liability and ways to overcome this. Given the circumstances, time frame and practical reasons for collecting data, the study is not generalizable for the whole population of Norway. However, this was also never the intention with the study. The reasons for the decreased generalizability are the ecological validity of the study and the sampling method used (Malhotra, 2010). The survey consisted of an online questionnaire, which is an artificial setting for respondents to make the evaluations, compared to a real purchase situation. Thus, it is difficult to generalize this to natural settings where these consumption evaluations happen. Another limitation regarding generalizability is the use of convenience sampling through social media, which is not representative of the population. This entails that the insights generated from this study cannot be generalized for the population (Malhotra, 2010). However, as our study is exploratory with the aim of generating insight, ideas, and hypotheses, this method is sufficient for our case (Malhotra, 2010).

Ensuring the internal validity of our study was limited due to the Covid-19 pandemic. Initially, we had planned to execute a laboratory experiment to control for environmental factors that could affect responses. However, the Covid-19 pandemic put restraints on our planned procedure, and due to safety measures, we conducted an online experiment instead. This resulted in us not being able to

control for these potential environmental factors, which could potentially be a threat to the internal validity. Furthermore, it can also be argued that the variable "preference" in our study does not measure actual purchase behavior, but instead only purchase intention and preference for the product, which can give a skewed image of respondents' actual behavior and attitudes. However, given the circumstances and resources available, measuring the preference was the method most likely to give us accurate results.

Another limitation is in regard to the pretest and the questions the respondents were presented with. To ensure that we found the most fitting product for our main study, we included questions about both gentle and strong attributes that the respondents had to score the presented strong products on. We did this to ensure choosing a product that did not score high on both strong and gentle attributes. A possible limitation from doing this could be that the respondents felt that they had to give a high gentle score to one or more of the products. This could result in some products being perceived as more gentle in comparison to other products than they would be if they were presented independently. A way we could have prevented this is if the respondents only had to score the products on their strong attributes, as this was the only attribute we actually were interested in. However, by including both gentle and strong attributes, we were able to exclude the products that scored high on both gentle and strong attributes. An alternative way could have been to do a between-subjects design, thus only presenting each respondent with one product.

Additionally, we experienced some outliers in our data set. This is not ideal, as it can distort the statistical analysis and the assumptions. Nonetheless, the analyses showed varied responses and few statistical trends, which can explain the reason why there were a few outliers that were not following the same pattern as the rest of the responses.

All in all, our research has provided further understanding of the presence of the sustainability liability and the effect of strength messaging. However, there are still topics that need to be further investigated to get a full understanding of the issue.

8.2 Further Research

This study sheds light on potential changes and shifts in the phenomenon of the sustainability liability. Apart from offering further confirmation that the sustainability liability exists, our study was not conclusive in regard to ways to overcome this liability for strong, sustainable products. Further research should therefore assess whether there are other ways to overcome the sustainability liability that was proven in Luchs et al. (2010). As our results suggest that high green attitudes do not affect the existence of the sustainability liability, this can imply that the effect is greater than first anticipated. Further research should delve deeper into environmental attitudes' effect on the preference for sustainable and strong products, as well as explore if there are differences across demographics and psychographics. We also recommend that further research tests this in a more natural control setting in order to ensure higher ecological validity.

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Appendices

Appendix 1. Pretest Questionnaire

Description

Vi gjennomfører denne undersøkelsen som en del av vår masteroppgave ved Handelshøyskolen BI. Dine svar vil bli anonymisert.

I denne undersøkelsen er vi interessert i hvilke egenskaper du syns er viktig når du kjøper ulike produkter. Vi setter stor pris på din deltakelse.

Question 1

Hvor gammel er du?

- Under 18 år
- 18-30 år
- Over 30 år

Question 2

Er du student?

- Ja
- Nei

Question 3

Hvor viktig er de følgende egenskapene er for deg når du kjøper **oppvaskmiddel** til håndoppvask?

	1 Svært viktig	2	3	4	5 Verken viktig eller uviktig	6	7	8	9 Svært viktig
Effektivitet	☐	☐	☐	☐	☐	☐	☐	☐	☐
Kraftighet	☐	☐	☐	☐	☐	☐	☐	☐	☐
Skånsomhet	☐	☐	☐	☐	☐	☐	☐	☐	☐
Styrke	☐	☐	☐	☐	☐	☐	☐	☐	☐

Mildhet	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sensitivitet	☐	☐	☐	☐	☐	☐	☐	☐	☐

Question 4

Hvor viktig er hver de følgende egenskapene er for deg når du kjøper **anti-bac/hånddesinfeksjon**?

	1 Svært viktig	2	3	4	5 Verken viktig eller uviktig	6	7	8	9 Svært viktig
Effektivitet	☐	☐	☐	☐	☐	☐	☐	☐	☐
Kraftighet	☐	☐	☐	☐	☐	☐	☐	☐	☐
Skånsomhet	☐	☐	☐	☐	☐	☐	☐	☐	☐
Styrke	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mildhet	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sensitivitet	☐	☐	☐	☐	☐	☐	☐	☐	☐

Question 5

Hvor viktig er hver av de følgende egenskapene er for deg når du kjøper **universalspray**?

	1 Svært viktig	2	3	4	5 Verken viktig eller uviktig	6	7	8	9 Svært viktig

Effektivitet	☐	☐	☐	☐	☐	☐	☐	☐	☐
Kraftighet	☐	☐	☐	☐	☐	☐	☐	☐	☐
Skånsomhet	☐	☐	☐	☐	☐	☐	☐	☐	☐
Styrke	☐	☐	☐	☐	☐	☐	☐	☐	☐
Mildhet	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sensitivitet	☐	☐	☐	☐	☐	☐	☐	☐	☐

Appendix 2. Main Study Questionnaire

Introduction

Takk for at du har lyst til å bidra i vår undersøkelse!

Denne undersøkelsen gjennomføres som en del av datainnsamlingen til vår masteroppgave i Strategic Marketing Management ved Handelshøyskolen BI. Undersøkelsen innebærer å fylle ut et spørreskjema som vil ta omtrent 5 minutter. Dine svar er anonyme og vil bli behandlet konfidensielt, og vi samler ikke inn identifiserende data som navn eller IP-adresse. Vi vil kun bruke data fra denne undersøkelsen til masteroppgaven, og all data vil bli slettet i etterkant.

Vi setter stor pris på din deltakelse!

NB: Merk at hvis du tar undersøkelsen på mobil kan deler av svaralternativene havne utenfor skjermen og kreve at du scroller til siden. For best brukeropplevelse anbefaler vi derfor å snu mobilen sidelengs.

Hvis du har noen spørsmål om undersøkelsen kan du kontakte Sissel Kristine Ougland (sissel.k.ougland@student.bi.no) eller Emilia Helander Olsen (emilia.h.olsen@student.bi.no).

Description

I denne delen av undersøkelsen er vi interessert i hvordan du tror en GJENNOMSNITTLIG PERSON sine preferanser og kjøpsvaner er. Med gjennomsnittlig person mener vi i denne undersøkelsen en typisk forbruker i samfunnet.

Med andre ord, vi vil at du skal fortelle oss hva du tror en gjennomsnittlig person ville tenkt om produktet du blir presentert for, ikke hva du personlig eller dine venner ville tenkt.

Du vil få mulighet til å fortelle oss hva du personlig tenker senere i undersøkelsen.

Question 1

For å forsikre oss om at du har lest instruksjonene, vennligst svar på følgende spørsmål. Under den første delen av undersøkelsen skal du fortelle oss hva

- ___ en GJENNOMSNITTLIG person tenker
- ___ hva du personlig tenker

Description

Nå skal vi stille deg noen spørsmål om et produkt. Husk at vi ønsker at du forteller oss hva du tror en GJENNOMSNITTLIG PERSON tenker om produktet, ikke hva du personlig tenker.

Dette er produktet *(respondents are shown one out of the six following images)*:

Question 2

Hvor sannsynlig er det at en GJENNOMSNITTLIG PERSON kjøper dette produktet?

	1	2	3	4	5	6	7	8	9	
Ikke sannsynlig i det hele tatt	☐	☐	☐	☐	☐	☐	☐	☐	☐	Svært sannsynlig

Question 3

Hvor EFFEKTIVT ville en GJENNOMSNITTLIG PERSON tenkt dette produktet er?

	1	2	3	4	5	6	7	8	9	
Ikke effektiv i det hele tatt	☐	☐	☐	☐	☐	☐	☐	☐	☐	Svært effektiv

Question 4

Hvor KRAFTIG ville en GJENNOMSNITTLIG PERSON tenkt dette produktet er?

1	2	3	4	5	6	7	8	9

Ikke kraftig i det hele tatt	☐	☐	☐	☐	☐	☐	☐	☐	☐	Svært kraftig

Question 5

Hvor STERKT ville en GJENNOMSNITTLIG PERSON tenkt dette produktet er?

	1	2	3	4	5	6	7	8	9	
Ikke sterkt i det hele tatt	☐	☐	☐	☐	☐	☐	☐	☐	☐	Svært sterkt

Question 6

Tenker en GJENNOMSNITTLIG PERSON at denne universalsprayen er et bestselgende produkt i Norge i dag?

	1	2	3	4	5	6	7	8	9	
Nei, definitivt ikke	☐	☐	☐	☐	☐	☐	☐	☐	☐	Ja, definitivt

Question 7

Tenker en GJENNOMSNITTLIG PERSON at denne universalsprayen er et bærekraftig produkt?

	1	2	3	4	5	6	7	8	9	
Nei, definitivt ikke	☐	☐	☐	☐	☐	☐	☐	☐	☐	Ja, definitivt

Question 8

Tenker en GJENNOMSNITTLIG PERSON at denne universalsprayen effektivt fjerner fett og smuss?

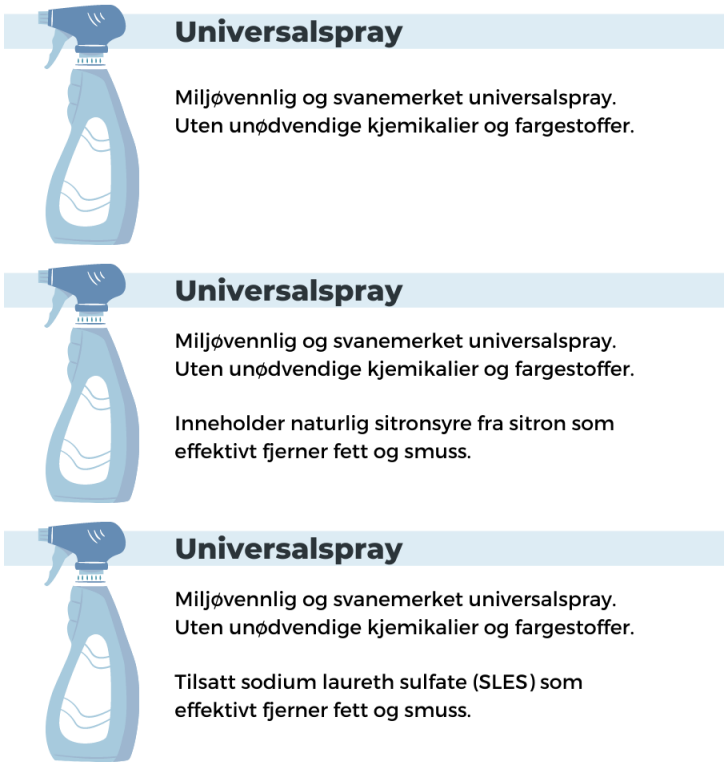
	1	2	3	4	5	6	7	8	9	
Nei, definitivt ikke	☐	☐	☐	☐	☐	☐	☐	☐	☐	Ja, definitivt

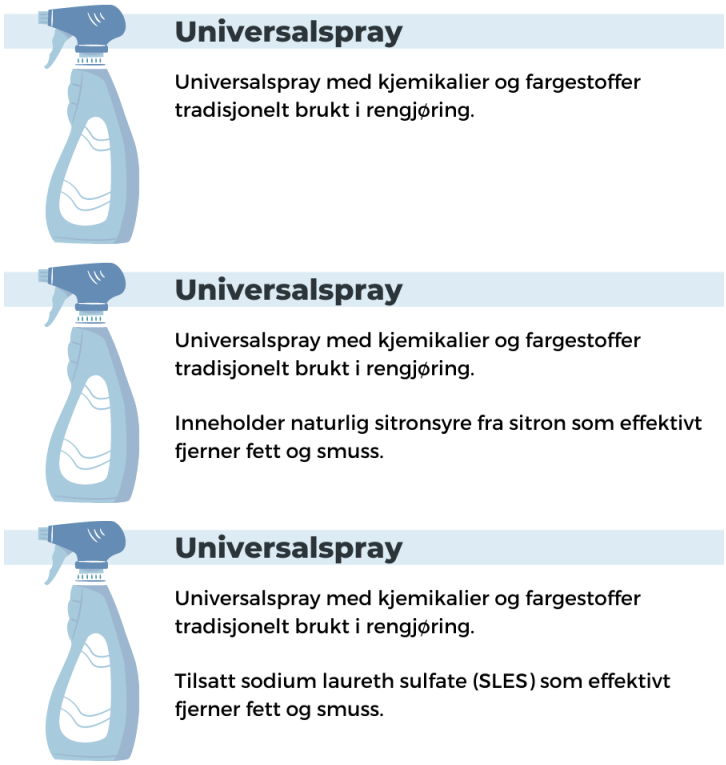
Description

Takk for at du fortalte oss hva du tenker en gjennomsnittlig person ville tenk om dette produktet.

For resten av spørsmålene i undersøkelsen, vennligst fortell oss hva DU PERSONLIG tenker om det samme produktet. Dette kan være det samme eller annerledes enn hva du svarte at en gjennomsnittlig person ville tenkt.

Som en påminnelse, dette er produktet *(respondents are shown one out of the six following images)*:





Question 9

Hvor sannsynlig er det at en DU PERSONLIG kjøper dette produktet?

	1	2	3	4	5	6	7	8	9	
Ikke sannsynlig i det hele tatt	☐	☐	☐	☐	☐	☐	☐	☐	☐	Svært sannsynlig

Question 10

Hvor EFFEKTIVT tenker du dette produktet er?

	1	2	3	4	5	6	7	8	9	
Ikke effektiv i det hele tatt	☐	☐	☐	☐	☐	☐	☐	☐	☐	Svært effektiv

Question 11

Hvor KRAFTIG tenker du dette produktet er?

	1	2	3	4	5	6	7	8	9	
Ikke kraftig i det hele tatt	☐	☐	☐	☐	☐	☐	☐	☐	☐	Svært kraftig

Question 12

Hvor STERKT tenker du dette produktet er?

	1	2	3	4	5	6	7	8	9	
Ikke sterkt i det hele tatt	☐	☐	☐	☐	☐	☐	☐	☐	☐	Svært sterkt

Question 13

Tror DU PERSONLIG at denne universalsprayen er et bestselgende produkt i Norge i dag?

	1	2	3	4	5	6	7	8	9	
Nei, definitivt ikke	☐	☐	☐	☐	☐	☐	☐	☐	☐	Ja, definitivt

Question 14

Tror DU PERSONLIG at denne universalsprayen er et bærekraftig produkt?

	1	2	3	4	5	6	7	8	9	
Nei, definitivt ikke	☐	☐	☐	☐	☐	☐	☐	☐	☐	Ja, definitivt

Question 15

Tror DU PERSONLIG at denne universalsprayen effektivt fjerner fett og smuss?

1	2	3	4	5	6	7	8	9

Nei, definitivt ikke	☐	☐	☐	☐	☐	☐	☐	☐	☐	Ja, definitivt

Question 16

Generelt, hvor viktig er miljøspørsmål for deg?

	1	2	3	4	5	6	7	8	9	
Ikke viktig i det hele tatt	☐	☐	☐	☐	☐	☐	☐	☐	☐	Svært viktig

Question 17

Hvor viktig synes du det er å kjøpe bærekraftige produkter?

	1	2	3	4	5	6	7	8	9	
Ikke viktig i det hele tatt	☐	☐	☐	☐	☐	☐	☐	☐	☐	Svært viktig

Question 18

Hvor viktig er det for deg å sørge for at ditt personlige forbruk ikke påvirker miljøet negativt?

	1	2	3	4	5	6	7	8	9	
Ikke viktig i det hele tatt	☐	☐	☐	☐	☐	☐	☐	☐	☐	Svært viktig

Question 19

Hvor ofte kjøper du bærekraftige produkter?

	1	2	3	4	5	6	7	8	9	
Aldri	☐	☐	☐	☐	☐	☐	☐	☐	☐	Alltid

Question 20

Hvilket kjønn er du?

- Kvinne
- Mann
- Ikke-binær/annet

Question 21

Hvor gammel er du?

- Under 18
- 18-25
- 26-35
- 36-45
- 46-55
- 56-65
- Over 65

Question 22

Hvor bor du?

- Viken
- Innlandet
- Vestfold og Telemark
- Agder
- Rogaland
- Vestland
- Møre og Romsdal
- Trøndelag, Nordland
- Troms og Finnmark
- Oslo
- Bor ikke i Norge

Question 23

Hvilke av de følgende kategoriene beskriver din arbeidsstatus? (Kryss av på alle som gjelder deg)

- Student
- Jobber fulltid
- Jobber deltid
- Ikke i arbeid
- Pensjonert
- Annet

Appendix 3. Cronbach's Alpha: Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1	82.06	239.31	.64	.84
Q2	82.17	244.70	.62	.85
Q3	82.92	248.01	.55	.85
Q4	82.12	250.57	.44	.85
Q5	83.27	235.34	.57	.85
Q6	82.24	245.12	.54	.85
Q7	82.36	259.57	.18	.87
Q8	82.33	239.74	.51	.85
Q9	82.52	240.12	.67	.84
Q10	83.07	241.11	.65	.84
Q11	83.29	243.22	.54	.85
Q12	83.59	233.95	.58	.85
Q13	84.07	261.17	.13	.88
Q14	82.79	244.49	.53	.85