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Filtering by Footprint:

Nudging Norwegian Wine Consumers Towards Sustainable Packaging Choices

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Foreword

This thesis is written as part of the Master of Science in Economics and Business Administration at the Norwegian School of Economics (NHH), where we are pursuing degrees in the profiles of Strategy and Management, Marketing and Brand Management.

The study is part of an ongoing research collaboration between Vinmonopolet and NHH's Center for Sustainable Business (CBS), focused on how to increase sustainable operations and purchase behaviors at Vinmonopolet. This work aims to further their existing efforts, specifically with regard to the choices that shoppers make when shopping for wine and how environmental attributes can effectively be introduced in their selection process. We would like to thank the CBS for their financial support in securing from Norstat the sample that participated in this experiment.

We would like to thank our supervisor, Professor Helge Thorbjørnsen, who provided us with guidance and support throughout the process. His insights into the set-up of the experiment were crucial in the protection of the study's internal validity and thus the relevance of its results.

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Please note that neither the institution nor the examiners are responsible through the approval of this thesis for the theories and methods used, or results and conclusions drawn in this work.

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Abstract

This paper evaluates the problem of the misalignment between values and behaviors among Norwegian consumers in the selection of environmentally friendly wines and presents an online nudge strategy to be implemented on Vinmonopelet.no, helping shoppers to better align their choices with their values. After examining several options, as well as existing users' behavior on the website, it was determined that a new filter should be created for the attribute "Environmental Footprint".

Combining findings from theory and the existing website's analytics, a digital experimental environment was built to replicate the key features and functions available to shoppers on the real website, while allowing for the controlled introduction of this filter. A random sample of 450 Norwegians was split into three experimental groups: a control who "shopped" without the new filter and two manipulations who "shopped" with variations of the filter's design. Given a set shopping scenario and a budget of 500 NOK, users were asked to pick one wine in any quantity from the available inventory: 36 products with representative packaging types, flavors, origins, and price.

As a result of the filter introduction, 13.3% of users reported using it to find their selected wine. This was moderated by levels of reported sustainable values and normative beliefs, as well as individual differences in terms of demographics. Respondents who used the filter had significantly lower CO_2 footprints on average, with 75% of them choosing wines which Vinmonopolet considers to be "environmentally smart". The largest beneficiary of this switching behavior is the 3-liter bag-in-box option, which saw a 41% increase in both manipulation groups, compared to the control. This led to an overall increase in volume purchased among the users of the filter, suggesting the possible presence of licensing effects between lowered footprint on the justifiability of purchasing more wine.

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1. Introduction

In recent decades, the human impact on the planet and its resources has constantly increased, reaching extremely dangerous levels. As a result, many industries have increased their focus on sustainability to be able to meet the needs of the present without compromising the needs of future generations. In terms reducing the human footprint on the earth, decreasing CO_2 emissions plays a fundamental role.

In the wine industry, packaging has a considerable influence on the overall sustainability of the product, especially in terms of its carbon footprint. The impact of the bottling and packaging stages of wine production, when using a regular glass bottle, accounts for more than 40% of the CO_2 emissions produced in the wine's entire life cycle (Ferrara & De Feo, 2018). Glass melts at 1400-1600°C and is generally heavy, meaning that it requires a huge consumption of energy to be produced (Ferrara, Zigarelli & De Feo, 2020). Furthermore, non-experts believe that recycling, in particular glass recycling, is a non-impacting activity, while it is in fact an industrial process responsible for emissions, consumption of resources, and production of waste (Ferrara et al., 2020).

To reduce the impact of wine's packaging, a possible solution could be to adopt lighter glass bottles. The use of 30% lighter glass bottles could indeed result in a reduction of the carbon emissions from 2% to 10% (Point, Tyedmers & Naugler, 2012). However, thinner glass production still requires a high consumption of energy, therefore impeding a substantial reduction of CO_2 emissions.

Another option could be to substitute glass bottles with lower footprint packaging alternatives, such as PET (polyethylene terephthalate) and Tetra Pak, at least for some types of wine. These alternatives perform better in terms of CO_2 footprint, as their production requires a much lower quantity of raw material and energy needed to produce one unit of packaging (Ferrara et al., 2020). PET bottles are responsible for less than 45% of CO_2 emissions when compared to glass bottles (Cleary, 2013).

Nonetheless, making such a substantial change in the packaging of wines is relatively difficult, as consumers associate glass bottles with a higher quality of the product (Ferrara et al., 2020). Moreover, some believe that glass is the only material suitable to avoid the deterioration of the wine itself (Ferrara et al., 2020). However, while white and rosé wines stored for more than six months in an eco-packaging could actually lose some quality, sustainable alternatives are suitable to contain red wines, which preserve their characteristics in the same way as in glass bottles (Ferrara et al., 2020).

Therefore, to meet higher sustainability standards, a major challenge for companies operating in the wine industry is to inform consumers, in order to align their beliefs and perceptions with actual facts.

In recent years, Vinmonopolet has set requirements for its suppliers to provide more environmentally friendly packaging options at accessible prices (Vinmonopolet, 2021). However, a customer survey

conducted by Opinion, a Norwegian market-research consultancy, found that wines in plastic bottles were perceived as poorer quality by more than half of respondents (Opinion AS, 2020 a). Additionally, two thirds of participants preferred wine in glass bottles (Opinion AS, 2020 a). At the same time, when they learnt that plastic is significantly more eco-friendly than glass, more than half of respondents claimed that they would have switched to plastic bottles (Opinion AS, 2020 a).

As a result, Vinmonopolet is now investigating possible solutions to drive consumers towards more informed and environmentally friendly choices. The aim of this study is to identify and test a possible intervention aimed at increasing the focus on eco-sustainability in the online shopping experience. This tool will consist of a nudge, based on the theories presented in the following chapter.

2. Theoretical Background

The purpose of this chapter is to explain the theoretical background of the study, focused on two areas, Consumer Behavior, specifically in the context of wine purchasing, and Nudge Intervention.

2.1. Consumer Behavior

Consumer behavior is the study of all the elements of the decisions made by consumers in the acquisition, consumption, and disposal of goods, services, activities, experiences, and ideas (Hoyer, MacInnis and Pieters, 2018). Consumers' behaviors in commercial situations, as well as the products they choose, are largely dictated by three key factors: motivation, ability, and opportunity (MAO) (Hoyer et al., 2018). By understanding the nuances of how these elements are formed ahead of and during buyers' decision-making process, one can predict the level of involvement that buyers will have and the process they may use when making their decision.

2.1.1. Motivation

Motivation is a goal-directed stimulation resulting in information processing and decision making about the things that consumers view as important to that goal (MacInnis, Moorman and Jaworski, 1991). It dictates the level of emotional and cognitive involvement in purchases as well as brand interactions, from spending very little time evaluating or making a decision – known as low effort behavior – to spending a long time engaging with a product or product category before and after making a purchase – known as high effort behavior (Hoyer et al., 2018).

The sub-factors contributing to a consumer's level of motivation are tied to personal relevance, namely how important or consequential a decision will be to the life of the buyer (Celsi & Olson, 1988). Relevance can be impacted based on the strength of values, goals, or needs that are tied to a purchase evaluation and decision (Hoyer et al., 2018). Values are an abstract set of beliefs that guide perceptions of what is important or good (e.g., religious principles, sustainability, etc.), while goals are something more concretely applicable to daily life (e.g., eating healthier, reading a lot, etc.) (Ratner, 2013). Needs, when thought about in the context of a purchase decision, can largely be grouped into three categories: hedonic, functional, and symbolic (Park, Jaworski & MacInnis, 1986).

If hedonic needs are prevailing, consumers are mostly concerned with the experiential element of the product (Park et al., 1986). In the case of wine, pleasure and enjoyment are a very important motivator of purchase (Yuan, So & Chakravarty, 2005). Bruwer and Buller (2012) found that the sensory aspect, namely good taste and flavor, had the greatest predictive power of intention and behavior.

When functional needs are strongest, the primary criterion of choice for consumers is the performance of the product to a certain standard, regardless of how the product looks or what might mean to others (Park et al., 1986). Connoisseurs assess all the characteristics of a wine in detail, mainly regarding the functional attributes of the product (Agnoli et al., 2015).

Symbolic needs refer to the necessity for a product to be representative of the consumer to others (e.g., luxury goods) (Park et al., 1986). Purchasing wine can respond to symbolic needs when consumers buy products from well-known high-end brands such as Dom Perignon.

Ultimately, motivation can also depend on the risks involved in the outcomes of a decision, being the expected probability that negative results may emerge instead of positive ones (Bauer, 1960). When the perceived risks of not meeting goals, values, or needs is higher, motivation increases (Dowling, 1986). In the wine industry, most of consumers are highly risk sensitive, except for a niche of experts (Spawton, 1991). Spawton (1991) classifies wine consumers' risks into three categories: psychological risk, as the wrong choice can damage the individual's self-esteem; functional risk, regarding people's inability to gauge the quality of the wine before consumption; and economic risk, concerning the assessment of a wine's value with respect to its cost. When choosing a wine, consumers are exposed to a huge amount of information for each product (e.g., type of wine, brand, origin, vintage, etc.), affecting their perception of risk (Speed, 1998). Risks will be evaluated depending on the characteristics of the consumer. Consequently, the level of motivation to put effort in the selection of a wine will vary across different individuals.

While motivation can highly determine the effort and involvement consumers will put into achieving the goal behind it, they may not fulfill their ambitions if they lack the ability or opportunity to do so (Hoyer et al., 2018).

2.1.2. Ability

Consumers' ability to process information and make a decision is connected to their knowledge of the category they are evaluating and their experience in making similar decisions (Alba & Hutchinson, 1987). Gregan-Paxton and John (1997) found that novice wine consumers are more perceptive at a cognitive level, while experts are more epistemic. When people possess high levels of knowledge and the experience from which that knowledge was built, they can better process, understand and prioritize the various elements they value when buying wine, which will be important to meeting their goals. As a result, novices are often confused and frustrated when choosing a new wine, as they have lower experience in trying different types of products, have to deal with many detailed characteristics and often do not exactly understand what product attributes are able to meet their specific needs (Agnoli et al., 2015).

Therefore, novice consumers tend to base their assessment of a product on their general attitudes towards it, focusing on attributes or signals that do not require a technical knowledge, such as first impressions, evocations, design, promotional criteria, stereotyped information and emotions (Agnoli et al., 2015). Conversely, experienced consumers tend to base their judgement on multiple and concrete product attributes (Agnoli et al., 2015). Consequently, advertising has a stronger effect on novices than on experts: while the latter are only influenced by the persuasive effect of advertising, the former are influenced both by its persuasive and informative effects (Ackerberg, 2001). Novices also tend to rely on experts, such as the personnel in the shop, or peers, such as friends and family members, to advise them and cope with complexities (Agnoli et al., 2015).

Although the degree of expertise plays an important role in determining the behaviors before choice, for instance in terms of information searching and product judgement (Su, Comer and Lee, 2008), the link between wine expertise and involvement in the consumer decision-making process is debated (Agnoli et al., 2015). Barber, Ismail and Dodd (2007) consider novices as people with an apparent low degree of involvement, not including wine as part of their lifestyle and seldom spending much time in seeking information about it. However, Ritchie (2009) demonstrates that wine novices are not necessarily low-involvement consumers.

Finally, ability is also determined by each individual's general intelligence, cognitive ability to process complex information, educational background and monetary resources to engage in a behavior, process information or make a decision (Alba & Hutchinson, 1987).

While much of consumers' ability is related to personal characteristics, it can be strained by companies who use highly complex messages to communicate information, limiting understanding and processing to only those with the highest level of ability (Hoyer et al., 2018).

2.1.3. Opportunity

Opportunity focuses even further on the specific situation a user is in when processing information and making a decision. When people are constrained by time (Suri & Monroe, 2003), are distracted (Lord & Burnkrant, 1993), or lack control over information they are given to make a decision (Ariely, 2000), their opportunity to correctly process and evaluate their choices is strained, leading to decisions which may not align with their stated goals.

In the wine industry, information overload is a particularly determinant factor in the inhibition of consumers' opportunity to process in detail the decision of buying wine, as people are exposed to a huge variety of products with several different characteristics. This creates an overwhelming experience for shoppers, plausibly limiting their opportunity to understand and evaluate the options which might best suit their needs, values and goals (Schwartz, 2004).

Research into the effects of abundance on the way buyers make decisions has shown that increasing options can create attention, but decreases buying intention and behavior (Schwartz, 2004). In a study conducted in the United States in 2000, a stand was set up to sell specialty jams in a grocery store. The control group had six options to choose from, while the manipulation had thirty. While the table with thirty options drew many more shoppers to visit the stand to evaluate the jams being offered, the number of shoppers who purchased something from that stand decreased significantly with the addition of choice, from 30% to 3% (Iyengar & Lepper, 2001).

More recent studies about choice abundance have gone past the examination of assortment size on the likelihood to purchase, looking at how it impacts the purchase itself. As a result of a number of controlled studies, it was discovered that when faced with larger assortments, consumers look for justifications or reasons to buy connected to their needs and goals, while avoiding indulgent purchases or decisions that become harder to justify (Sela, Berger & Liu, 2009).

2.1.4. Segmentation of Norwegian Wine Consumers

Purchasing wine is a process with varied levels of motivation, ability, and opportunity, based on consumers' goals, knowledge, experience, and personality traits shaping their priorities. As a result of extensive focus groups with wine buyers from across the country, Vinmonopolet categorized Norwegian consumers in four groups, presented below, according to these characteristics: expertise about wine, need for variety, openness to experience, and price sensitivity (Opinion AS, 2020 b).

Dedicated: they have interest and knowledge about wine and generally prioritize quality. They usually want to be inspired and tend to be open to try new products. They highly value attributes such as grape type, acidity, craft production, sustainability, and sugar content (Opinion AS, 2020 b).

Conscious: they know what they like and have clear preferences about wines' taste, origin and winemakers. They normally like to shop inside of a set repertoire, where they tend to prioritize quality, also in terms of visual appearance, i.e., fancy looking wines (Opinion AS, 2020 b).

Searchers: they are quite open to try new wines. They usually do not have much familiarity with the products they are considering and often seek help to make their choice. However, they also tend not to spend too much (Opinion AS, 2020 b).

Price-focused: a low price is the most relevant criterion of choice when purchasing a wine. They tend to buy the same products meeting this criterion again and again (Opinion AS, 2020 b).

Table 1 breaks down the general composition of each segment's characteristics.

Segment	Wine Expertise	Openness to Experience	Need for Variety	Price Sensitivity
Dedicated	High	High	High	Low
Conscious	Moderate	Low	Low	Low
Searchers	Low	High	High	Moderate
Price-focused	Low	Low	Low	High

Table 1 – Characteristics of Norwegian Consumer Segments

Based on this categorization, as well as on research on wine buying behavior and consumer behavior in similar purchase categories or scenarios, the differences and similarities in terms of motivation, ability, and opportunity for the four groups can be mapped for wine selection.

2.1.5 Analysis of Motivation for Norwegian Consumers

When mapping motivation, openness to experience and need for variety can give the best indication of what types of goals, needs and values consumers are catering to when buying wine.

Buyers with high openness to experience and need for variety, such as people in the Dedicated and Searchers' group, tend to satisfy hedonic needs with their wine selection. This means that they usually value the experience they will have when drinking the wine they buy. As a result, they may also be concerned with other experiential elements of their consumption, such as the occasion they are drinking the wine in, the food they plan on drinking it with, and who they might be sharing it with. These elements will probably inform their wine search and the goals they want their purchase to fulfill. High openness to experience is also a personality trait that has been documented as a predictor of pro-environmental values, likely leading consumers with this personality trait to consider sustainability as part of the criteria used to select a wine (Hirsch, 2010).

While people in the Conscious segment may still look to fulfill hedonic needs with their selection of wine, their more rigid preferences may signal that these hedonic needs are unchanging. Additionally, the importance of perceived quality signals that symbolic needs are likely more important than in other segments. They may be trying to show their knowledge of wine by choosing products displaying expertise in a visible way to the other people who they are sharing the wine with.

The Price-focused segment is the only one who could possibly be categorized as having higher priority for functional needs, where the user is just looking for the most cost-effective way to purchase wine to drink. This is still somewhat debatable, as the focus on price could likely be constrained when the financial ability to purchase more than the cheapest option is inhibited. However, there may be cases where purchasing a wine for a low price remains important even when the consumer can afford to buy more expensive ones. These wine buyers would be considered to fulfill functional needs.

2.1.6 Analysis of Ability for Norwegian Consumers

The two characteristics that can be used to assess the ability of Norwegian wine buyers to process information and make goal-driven decisions are their level of expertise their sensitivity to price.

Ability can largely be observed and understood by the degree of consumers' knowledge due to the reasons already explained in section 2.1.2. It is interesting to note that a survey conducted by Opinion in 2021, on behalf of Vinmonopolet, confirmed that for non-experts receiving a recommendation from a friend or from an employee was among the most popular reason given for selecting a wine, compared to several other attributes, including origin, price, sustainability, type of grape, etc. This outsourcing of knowledge to trusted sources is a signal that novice consumers do not necessarily trust themselves to evaluate their options. This could be especially true among consumers who fall into the Searchers and the Price-focused categories.

Price sensitivity can also be treated as a strong indicator of buyers' financial ability to meet their motivation when purchasing wine. Consumers with high hedonic needs aiming to become more experienced and educated in wine may not be able to do so if they cannot afford to buy wines outside their strict budget. Trying a variety of wines is not a cheap hobby, thus, until financial conditions change in the buyers' life, it is likely that they will remail price-focused. As consumers have greater access to financial resources, they may change segment, probably by first entering the Searchers category and eventually either settling their preferences and becoming part of the Conscious group or holding their openness for experience and need for variation as a member of the Dedicated.

2.1.7. Analysis of Opportunity for Norwegian Consumers

Of all the three concepts, opportunity is probably the most consistent across Norwegian wine buyers and is mostly governed by the experience created by Vinmonopolet, rather than the characteristics of the single consumer. As already explained in section 2.1.3, wine buyers are normally exposed to an overwhelming amount of information. This is even more accentuated in the case of Norway, as everyone must purchase wine through the same storefronts or webstore and shoppers have an extraordinary abundance of choice. Depending on the size of the retail store, a shopper may have as few as 200 options and as many as 1000+, across red, white, rosé and sparkling wines (Vinmonopolet, n.d. c). Online, the wine catalog is even larger, carrying 18,000+ products across all wine categories (Vinmonopolet, n.d. c).

On Vinmonopolet.no, users are given a huge number of options and a few tools to narrow their search, and eventually evaluate and compare products. In the products' result page, shown in Appendix 1, wines are listed with some basic information. By clicking on a product, users can view the wine's individual page, showing all its detailed characteristics. Consumers with specified preferences for certain criteria can use the filters on the left to display products meeting specified characteristics. Interestingly, there is quite a high number of filters, distinguishing wines available for physical stores, flavor profile, flavor characteristics, origin, price, suitable foods, volume, alcohol percentage, type of grape used, storage recommendations and other criteria, such as sugar content and packaging type.

In total, the possible attribute combinations of these 20+ filters numbers in the tens of thousands. Thus, if users have time to explore and know what they want in advance, it is possible to locate the wines meeting their criteria. This is especially likely for individuals in the Dedicated and Searchers groups, who generally value variety and are open to new experiences.

It is probable that consumers in the Conscious and Price-focused segments have saved their favorite products in the "Favorites" list attached to their buying profile, as shown in Appendix 2, so that they

do not have to spend too much time exploring other options, unless the products fitting their interest are not in stock. Moreover, if they can remember the name of the product they are looking for, the search bar can also be used to find the wines these buyers are familiar and comfortable with.

2.1.8. Involvement Evaluation by Segment

Given the full understanding of each segment's MAO attributes, it is possible to make a prediction of the involvement level that can be expected in wine's purchase decisions. Table 2 gives a final assessment of each attribute and predicted level of involvement that buyers may have when shopping at Vinmonopolet.no:

Segment	Motivation	Ability	Opportunity	Predicted Involvement
Dedicated	High	High	Moderate	High
Conscious	Moderate	High	Moderate	Moderate/High
Searchers	High	Low/Moderate	Moderate	Moderate
Price-focused	Low	Low	Moderate	Low

Table 2 – MAO and Involvement level of Norwegian Consumer Segments

The various segments possess a different range of involvement in their purchases, making the category relatively unique. For Vinmonopolet, this adds complexity to the way the company must structure information about products online and in stores, ensuring to cater to the decision-making needs of all customers, regardless of how involved they may be.

2.1.9. Decision-Making Strategies for Wine Selection – An Overview

Wine is a category which has a combination of unique attributes to consider. Using the existing filters as an indicator, Vinmonopolet has already identified over 20 attribute categories by which wine is viewed and evaluated (Vinmonopolet, n.d. c). These do not even include factors like label packaging and label design, which users are left to evaluate by themselves as they shop. All consumers are presented the same information and tools to evaluate wine attributes, regardless of their preferences or involvement levels. As such, gaining an understanding of the ways high and low involvement shoppers make decisions is essential to comprehending how they likely use the existing available information. By knowing this, it is then possible to use a nudge strategy to intervene in the decision-making processes across all segments.

2.1.9.1 High-effort Attribute Evaluation

Buyers with higher motivation, ability, and opportunity to evaluate their choice of wine will process information more actively, forming opinions about the products they eventually buy (Hoyer et al., 2018). When products are evaluated based on attributes, consumers compare one attribute at a time to determine which products best meet their needs (Hoyer et al., 2018). The filters' design on Vinmonopolet.no allows users only to select one option from each filter category. Thus, consumers processing attributes in depth are forced into an "elimination-by-aspects" evaluation. Elimination-by-aspects involves the prioritization of certain attributes, where users eliminate options based on acceptable cutoffs determining which levels of certain attributes are acceptable to the decision (Tversky, 1972). In this case, the filters could all be considered together, and depending on the priority, as well as the cutoffs, the optimal wine can be selected.

As an additional layer to this evaluation, knowledge is also playing a part in the prioritization of attributes in the decision-making process (West, Brown & Hoch, 1996). Experts have a wider vocabulary in relation to wine, meaning that they can better describe and find products meeting their preferences (West et al., 1996). In the case of Vinmonopolet, wine buyers with higher knowledge are more likely to understand and use filters related to complex attributes, such as "Characteristics", "Grapes", "Storage", as well as those tied to production ways such as natural wines.

2.1.9.2 Low-effort Judgement

Some wine buyers may not have the motivation, the ability, or the opportunity to form strong opinions about the wines they purchase. When the overall involvement is lowered, consumers put less effort in their decision-making process (Hoyer et al., 2018). In this case, consumers are likely to be influenced by biases helping them to understand complex attributes, as well as simplification strategies allowing them to quickly process information in order to find a satisfactory option (Deshpande, Hoyer & Jeffries, 1982).

Heuristics, unconscious rules of thumb used to make decisions, often result in biases used in low effort judgements (Samson & Voyer, 2012). One of these is the representative bias, where consumers demonstrate a preference for products sharing physical attributes with the category leader or prototype, namely the expected form that is generally consistent across a category (Samson & Voyer, 2012). This is particularly relevant in the context of wine purchases, because of the potency of the category's prototype: glass packaging, ornate labels, and cork closure.

Moreover, to make decisions faster, consumers utilize simplification strategies allowing them to quickly find their ideal choice or at least a satisfactory alternative meeting their overall needs

(Deshpande et al., 1982). Key strategies to the wine-buying segments are price, habits, and normative strategies.

Wine buyers often use price as a proxy for quality, where the higher the price is, the higher the expected quality (Mueller, Osidacz, Francis & Lockshin, 2001). This is a price strategy playing a fundamental role in the context of wine buying at Vinmonopolet.

Habits are a repetitive decision based on stimuli from familiar cues, allowing consumers to reiterate behaviors (Hoyer et al., 2018). In this case, habits can be developed by those customers relying on the "Favorites" list to purchase wine.

Normative strategies concern the direct or indirect influence of others, usually trusted individuals such as close friends or family members, on the outcomes of a decision (Hoyer et al., 2018). Social interaction and a desire to share wine with others is indeed another factor playing a fundamental role in wine purchasing and consumption (Mitchell, 2006). Consumers may buy certain wines due to the social pressure they feel or because they were recommended by others with a higher knowledge in the category (Taylor, Bing, Reynolds, Davison & Ruetzler, 2018). This exact effect was observed by Opinion (2021) in their most recent study of the Norwegian wine market.

2.1.9.3 Conclusion

All in all, while a small number of consumers – especially those with high levels of knowledge – may take high-effort routes to evaluate the wines they choose, most of the other wine purchasers will likely be limited in either their capacity to understand the subtle differences between wines or how those characteristics match their buying preferences. As a result, users will probably either rely on simplified tools available on Vinmonopolet's webstore, or use normative, price, or habit strategies to make sure that their choice is satisfactory to their understanding of their needs.

2.1.10. Decision-Making Strategies by Segments

Usually, the Dedicated are highly motivated to have experiences with the wines they drink, as well as a high level of ability, due to their greater knowledge and financial resources. While their opportunity is somewhat limited due to environmental factors of choice abundance, they will probably be the most involved in their evaluation and choice of wine. Moreover, they will likely be able to correctly interpret the meaning of more complex filters such as "Characteristics". They may also be more open to new information about the wines they are evaluating. As such, these users will probably compare several attributes in order to select a wine, likely resulting in slower processing and careful evaluation of whether that wine will meet their needs and goals.

The Conscious' lower motivation to try new wines will likely lead them to avoid exploring the variety offered by Vinmonopolet, unless they are forced to choose an alternative from their regular purchases. Nevertheless, their desire for quality, knowledge and financial ability should allow them to participate in high-involvement decisions when necessary. For instance, if they are buying wine for occasions where their selection is socially visible, the risks of their symbolic needs not being met may increase and consequently force them to make more involved choices. Their higher level of knowledge will probably allow them to use most of the filters to narrow their selection. However, they may be unlikely to look for wines with different traits than their set preferences. While still dependent on the availability of their regular purchases, it is reasonable to believe that this segment is capable of evaluating wines using a complex attribute analysis.

The Searchers are normally very motivated to explore different wines but lack the knowledge and the financial resources to fully explore and evaluate their needs. As a result, they may attempt to take a careful approach to decision making, but their information processing may not be accurate enough to align with their goals, due to their inability to understand information about their options. This may make them more influenced by people in their life or preferences they may already have. Biases such as the representative bias may lead them to believe that wines looking like the category prototype will meet their needs, without looking deeply into what might make the wine suitable for them. Nevertheless, their high level of motivation to try new wines should make them explore the available filters as they narrow their selection. As a result, they may be most drawn to filters putting their wine in a context, such as the "Good with (food)" filter or the "Taste and Aroma".

Price-focused consumers will probably be the least involved in their purchases, with very little motivation to explore options and with the price attribute being heavily considered, when their regularly purchased products are not available. Their purchases will likely be made mostly on habit alone, with very little consideration of options, relying on tools like the favorites' list and the "Search" function on the website, enabling their low involvement purchasing.

2.2. Nudging

When trying to influence behavior changes among consumers, firms have two main routes available. The first, and most historically common, is to attempt to change the attitudes influencing behaviors by targeting relevant consumers with marketing messages using traditional communication channels (Hoyer et al., 2018). These attitude campaigns attempt to supply information or generate emotions with the hope that winning hearts and minds will ultimately change the behavior. While they may be effective in some cases, there are many others where attitudes are not the key determinant of choice,

due to added complexity or other psychological factors limiting decision-making. The second method is more targeted towards the decision-making situation itself. It acknowledges that, even if people intend to do something, they may fail to actually do it, because they do not possess the frame of mind, information or tools to carry out that decision (Thaler & Sunstein, 2009). This is a particularly common problem in issues related to sustainability, where consumers claim to value it, but then do not show it in the decisions they make (White, Habib & Hardisty, 2019). In recent decades, the approach aiming at influencing decisions directly has become known as "nudging".

Nudging is defined by Thaler and Sunstein (2009) as a "libertarian paternalism". In other words, it is an attempt to "gently" influence the behavior of consumers, in order to make them take decisions meeting their long-term goals, without imposing any preventive constraints to avoid "bad" options (Thaler & Sunstein, 2009). This occurs thanks to an indirect interruption of the decision process, reminding individuals of their goals and possibly presenting them the ability and opportunity to evaluate whether there are options which best align with those goals (Thaler & Sunstein, 2009).

The outcomes of a nudge cannot be considered the result of a libertarian paternalist intervention, unless the decision makers judge themselves to be better off as a result of their choice (Thaler & Sunstein, 2009). Today, many consumers have positive attitudes towards pro-environmental behaviors and choices (Trudel & Cotte, 2009). Furthermore, the increasing importance of sustainable behaviors in social norms implies that patterns like those observed in conspicuous conservation behavior are more and more common, as people feel judged by others to not only comply socially, but also to be seen as an "environmentally friendly" person (Griskevicius et al., 2010).

Unfortunately, the environmental impact is an external cost of consumption, or externality, making its evaluation an often complex and difficult task. As a result, individuals do not actually behave the way they say they intend to (Auger & Devinney, 2007; Gatersleben, Steg & Vlek, 2002; Kollmuss & Agyeman, 2002; Young, Hwang, McDonald & Oates, 2010). People who intend to buy sustainably fail to do so at alarming rates, signaling that there is a high opportunity for environmentally-focused nudge interventions to be implemented across consumer markets and sectors. This is the same pattern observed by Vinmonopolet in terms of consumption of wines produced in low-footprint packaging – where packaging is currently the only part of the wine formally evaluated for each product sold (Rolf Erling Eriksen, personal communication, March 2021).

In the context of choice evaluation, nudge strategies are applied in the form of "choice architecture", namely the manipulation of information presentation structures which supply the user with information and allow them to evaluate options (Münscher, Vetter & Scheuerle, 2016). Sustainable consumer behavior is a deeply studied sub-field and the topic of many choice architecture and nudge

strategies. As a result, there are specific tactics and attributes which have been documented to help predictably encouraging sustainably minded outcomes, as summarized and described in the SHIFT framework for sustainable consumer marketing (White et al., 2019).

2.2.1. Choice Architecture

Choice architecture is the study of how the structure and presentation of decision situations influence certain behavioral choices and alternatives (Münscher et al., 2016). In the context of nudging, this is specifically applicable when looking to design evaluation processes encouraging outcomes which are deemed socially desirable, such as consumer protection, public health, and financial decision-making (Münscher et al., 2016). A review of relevant studies regarding the application of choice architecture has revealed nine key choice intervention strategies, which can be organized in three groups: decision information, decision structure, and decision assistance (Münscher et al., 2016).

2.2.1.1. Decision Information

Decision information strategies focus on changing the presentation or availability of relevant information, without changing its content, to encourage a socially desirable outcome (Münscher et al., 2016). The techniques used to change decision information are translation of information, making information visible, and providing social reference points.

Translation of information focuses on the format and presentation of relevant information to encourage socially desired outcomes. Reframing information to change perspectives about decision outcomes is one way to achieve this translation. In a study on the effect of framing blood donation as "death-preventing" instead of "life-saving", as it was described in the control group, it was found that the first framing increased participation (Chou & Murnighan, 2013). The aversion to "losses" is a common tactic in framing applications of translation, as the association with negative outcomes is often threatening to the self-concept among decision makers (Münscher et al., 2016). Another common application is to simplify complex information which may otherwise require high effort to process (Münscher et al., 2016). This reduction in the required effort allows for a reduced capacity to understand and consider complex attributes that may otherwise need higher levels of knowledge and ability to process.

Making information visible is a technique focusing on two areas: behavioral feedback and external information (Münscher et al., 2016). Behavioral feedback records and summarizes consumption information allowing decision makers to reflect and self-optimize their decisions to be aligned with perceptions of their ideal self (Münscher et al., 2016). While this information is available to

consumers, it is often not retrievable without feedback mechanisms. On the other hand, external information about a product or service which is not clear on the surface, such as the calories contained in an item of food and the hygiene of a restaurant, can be influential factors when presented in choice evaluation (Münscher et al., 2016). In a study researching presentation of restaurant hygiene, restaurants were independently evaluated and their results were bundled and conveniently displayed at the front door with a colored label. After the implementation of these labels, people could more easily choose to avoid unsanitary restaurants and the incidence of foodborne disease was reduced (Simon, Leslie, Run & Jin, 2005).

Providing a social reference point appeals to the subjective and social norms attached to a decision, encouraging the decision maker to reflect on the external perceptions of their decision (Münscher et al., 2016). The two applications of this technique are either to place a consumer's decision in context with a descriptive norm, or to refer to an opinion leader. Descriptive norms are summaries of what other people making the same decision have done (Münscher et al., 2016). Their use has been particularly effective in the realm of sustainable consumption. For instance, when high-consuming energy customers were presented with their energy consumption numbers compared to their neighbors, they adjusted their consumption down (Allcott & Mullainathan, 2010; Dolan & Metcalfe, 2015) Another study looked to encourage hotel visitors to use their towels multiple times instead of having them washed every day. By adding signs stating that other guests used their towels more than once, they were able to increase the reuse rate by using this descriptive norm (Goldstein, Cialdini & Griskevicius, 2008). The use of opinion leaders can also reinforce the information, in order to increase its relevance, by leaning on the credibility and strength of the source (Münscher et al., 2016).

2.2.1.2. Decision Structure

When information about a decision cannot be changed, a strategy to address the structure of the decision is then necessary (Münscher et al., 2016). This may include the arrangement of options and the decision-making format by setting defaults, rearranging the composition of options, or changing option-related efforts or consequences (Münscher et al., 2016).

Default options are the settings pre-selected for a user, which may also be de-select if people choose to do so (Münscher et al., 2016). Studies have shown that decision makers are very likely to accept the default in a variety of situations. This effect has been observed in both minor decisions such as online privacy settings (Johnson, Bellman & Lohse, 2002), as well as more important decisions such as pension savings (Thaler & Benartzi, 2004), end-of-life care (Halpern et al., 2013), and organ donation (Johnson & Goldstein, 2003). The effect of defaults on behavior is caused by several

different processes, including effort reduction and the unwillingness to give up the status quo (Dinner, Johnson, Goldstein & Liu, 2011).

Changing the range or composition of options is the specific choice to display certain products or options with one another, in order to highlight benefits or costs (Münscher et al., 2016). These tactics cater specifically to allocation biases, namely biases that are formed due to one's limited ability to spread time or financial resources to evaluate options. As a result of the diversification bias, decision makers who are limited in their involvement will try to spread their attention across all presented categories, evaluating them equally (Fox, Ratner & Lieb, 2005). By controlling the presented categories or decision-making criteria, consumers will be more likely to evaluate options based on this presentation, instead of evaluating all possible attributes (Kahn & Wansink, 2004). In the wine industry, this has been observed in an experiment. The same list of wines, containing wines from 3 grape types and 3 countries, was presented in two formats: organized by grape type or by country. Participants were then asked to select 3 bottles of wine from the list. When the list was organized by country, people were most likely to choose one bottle from each country, with the reverse being true if the list was organized by grape type (Fox et a., 2005).

Changing option-related efforts involves increasing or decreasing the level of effort required to make a decision, in order to encourage a desired outcome. While this is very closely related to standard transaction costs, it can be qualified as choice architecture as long as the changes in the effort level are "marginal" in terms of their overall scope, as opposed to being substantial adjustments to financial or opportunity costs to prevent a choice (Münscher et al., 2016). These marginal structural changes are applied in two forms: physical effort and financial effort. For example, to reduce the physical effort required to buy healthy foods in grocery stores, the candy at the checkout counter was swapped with healthier options. This led to a measured increase in the purchase of healthier foods (Ashe, Graff & Spector, 2011). Financial effort changes can be made to the structure of the payments, such as offering no- or low-interest payments for environmentally friendly appliances unavailable for more energy consuming competitors (Cabinet Office and Behavioural Insights Team, 2011).

By changing the consequences of an option, consumers can be asked to account for additional costs for their decision, such as social costs. Highlighting negative consequences of certain decisions may force people to recognize the conflict of one choice with how they would like to be perceived by others. One such behavioral pattern emerging in sustainable consumption is called "conspicuous conservation", in reference to "conspicuous consumption", namely making purchase decisions specifically because of their visible and symbolic value. Conspicuous conservation describes how the social normalization of sustainable purchases has become so strong that buyers are more likely to buy

green items in purchases that are visible to others, or in environments where they can be seen making green purchases (Griskevicius, Tybur & Van den Berg, 2010). This presents challenges for online purchase decisions, as the lack of visibility diminishes the normative value to the consumer, resulting in less frequent sustainable purchases made online than in physical stores, even when the products are being communicated and offered in the same way in both places (Griskevicius et al., 2010).

2.2.1.3. Decision Assistance

Decision assistance is the final strategy reminding individuals of optimal choices in the decision-making process, or encouraging commitment to follow certain standards within the targeted behavior.

Reminders harness the available cues that all decision makers use to break through the clutter of information and highlight alternatives which encourage the best outcomes by bringing certain options into focus (Münscher et al., 2016). These reminders are often found attached to socially desirable and recurring decisions like participations in voting (Greenwald, Carnot, Beach & Young, 1987), or saving money (Karlan, McConnell, Mullainathan & Zinman, 2010). Reminder strategies can also be used to suppress cues that may trigger choice of non-desirable options (Münscher et al., 2016), such as limiting the visibility of certain cues, or positioning unhealthy options in the middle of a menu to avoid primacy and recency advantages of the first and last placements (Dayan & Bar-Hillel, 2011; Li & Epley, 2009).

Commitments, both those made privately and publicly, make decision makers more likely to follow through with the goals they have formally stated (Münscher et al., 2016). Acting against those commitments can create cognitive dissonance, or a need to justify the deviating decision in front of others (Münscher et al., 2016). Firms looking to integrate commitments into their choice architecture should look for ways to facilitate private commitments that people make with themselves, or public commitments that consumers can make to their personal audiences in order to better secure accountability to those choices.

2.2.3. SHIFT-ing to Sustainable Behaviors

In 2019, Katherine White and her colleagues assembled a review of all nudge and behavior change tactics implemented in consumer marketing settings, each of which have had documented success of appealing to consumers in relation to the sustainability of their choices. This framework is called SHIFT – an acronym for the five key strategies and appeals that can be applied to encourage sustainable consumption: **S**ocial influence, **H**abit formation, **I**ndividual-self, **F**eelings and cognition, and **T**angibility. This framework examines all methods of behavioral change, even those that are not

considered nudging. For the purposes of this context, concepts and studies which pertain directly to nudging and choice architecture in sustainability will be highlighted below.

2.2.3.1. S: Social Influence

Social influence focuses on the impact and interactions of individuals and the people around them when making decisions involving environmental footprint (White et al., 2019). It breaks down into 3 main categories of influence: social norms, social identities, and social desirability (White et al., 2019). Social norms focus on the use of descriptive norms, as discussed earlier in section 2.2.1.1, to compare consumers to the actual behavior of others (White et al., 2019). Social identities look at the participation of consumers in groups and the predictability of their motivation to comply with environmental social norms (White et al., 2019). These groups can be political parties, clubs, social or environmental action groups, and even neighborhoods. One way to motivate change based on social identities is to instigate competition between groups, where they compare their performance to others (Ferguson, Branscombe & Reynolds, 2011). Social desirability relates to the desire to be seen as a green consumer, similar to principles found in the study of conspicuous conservation (White et al., 2019). By using strategies such as commitment facilitation, companies can encourage people to make their positions and choices about sustainability more visible, while also creating internal motivations within the consumers to hold to their commitments (White et al., 2019).

2.2.3.2. H: Habit Formation

As discussed in section 2.1.9.2, habits are a type of decision giving consumers the ability to repeat behaviors based on stimuli from familiar cues (Hoyer et al., 2018). In the context of environmental sustainability, bad habits need to be intentionally interrupted to enable changes to those repeated behaviors (White et al., 2019). These habits can be broken by employing tactics to increase option-related costs for non-desirable outcomes, discouraging the continuity of the habit, or reduce option-related costs for desirable outcomes, making it easier to take the right decision (White et al., 2019). Using prompts stating what the desirable outcome is can also be a good way to encourage consumers to form habits aligned with their sustainability goals (White et al., 2019). Additionally, giving feedback about the environmental impact of people's choices has been shown to help change habits in a variety of marketing situations (White et al., 2019). This is especially true when it is done consistently, with real time information, over an extended period (Chiang, Mevlevioglu, Natarajan, Padget & Walker, 2017; Fischer, 2008; Karjalainen, 2011).

2.2.3.3. I: Individual Self

The individual self and the factors linked to it are very influential on the consumption behaviors of that person (White et al., 2019). The most important factor related to sustainability is the positivity of the self-concept (White et al., 2019). The positivity of the self-concept focuses on the core identity that individuals have and how the choices they make help them building and supporting that positive self-image (White et al., 2019). When consumers view themselves positively, they often have self-defensive reactions after learning that their behaviors have negative environmental impacts (Dickinson, 2009; Feygina, Jost & Goldsmith, 2010). Challenges to self-concept appeals can also cause negative responses, especially when sustainable behaviors conflict with one's social identity, such as a political party or affiliation (Gromet, Kunreuther & Larrick, 2013). In these cases, consumers will tend not to change behavior and instead seek out information confirming their previously held biases and behaviors (White et al., 2019). To buffer against these outcomes, alignments of sustainable behavior with positive outcomes can have the widest appeal when there is a risk of unintended responses (White et al., 2019).

2.2.3.4. F: Feelings and Cognition

Combined with the foundation formed in the individual self, attitudes towards consumers' decisions are generally formed mainly from feelings or cognition (Hoyer et al., 2018). Strategies attached to this section focus specifically on the impacts of communication on creating affect towards a decision.

Using sustainability messages to stimulate emotions can encourage constructive behavioral changes (White et al., 2019). Negative emotions, particularly guilt, can play a strong role in influencing sustainable intentions and behaviors (Carrus, Passafaro & Bonnes, 2008; Mallett, Melchiori & Strickroth, 2013; Muralidharan & Sheehan, 2018; Onwezen, Antonides & Bartels, 2013). In cases where consumers feel directly responsible for unsustainable outcomes, they also feel higher levels of personal responsibility for the environment (Kaiser & Shimoda, 1999). However, in cases where buying sustainably can generate an hedonic pleasure, positive emotions are more effective to boost behavioral changes (White et al., 2019). Sustainable behaviors can be responsible for decreasing negative feelings and increasing positive emotions, creating the "warm glow" effect among consumers (Onwezen et al., 2013; Rezvani, Jansson & Bengtsson, 2017).

Cognitive tools concern the way information is presented to the end consumers and the impacts of their choices (White et al., 2019). By carefully presenting information about why their choices are more sustainable, people can become more knowledgeable, increasing their ability to evaluate the sustainability of their actions (Gifford & Nilsson, 2014). Nevertheless, research has also shown that

interventions that only provide information may be too weak to lead to longer-term behavior changes (Abrahamse, Steg, Vlek & Rothengatter, 2007). As a result, combining information with other techniques and strategies can lead to stronger results (White et al., 2019). One common implementation of this information is in the application of eco-labels, helping translate environmental impacts into consistent and easy to understand formats for consumers to interact with (White et al., 2019). Research has also demonstrated that labels' effects on behavior change are stronger when highlighting unsustainable choices in addition to the sustainable ones (Borin, Cerf & Krishnan, 2011).

2.2.3.5. T: Tangibility

Tangibility makes the abstract and intangible factors related to sustainability appear in simplified and easy to understand ways (White et al., 2019). In Vinmonopolet's studies, shoppers across Norway said that using the figures of the actual CO_2 footprint on the products would not be helpful (Opinion AS, 2021). These complex metrics can often be greater sources of confusion than valuable information (Reczek, Trudel & White, 2018). Sustainability can be more tangible and relatable to consumers when the focus of negative outcomes is placed most heavily on those that may impact the present day, even if most negative externalities are experienced in the future (White et al., 2019).

3. Nudge implementation for Vinmonopolet

When looking at Vinmonopolet's problem – that there is a conflict between consumers' positivity towards buying sustainably and their actual purchase behavior in their store – clearly, there are limits to consumers' ability and opportunity to correctly evaluate and select sustainable wines in their stores, regardless of their motivation to do so. Given the complex set of product attributes and varying consumer segments, communication campaigns to change attitudes around sustainability may not lead to widespread or long-term changes in behavior.

Many of Vinmonopolet's shoppers will do much of their information searching on the website, even if they do not make their actual purchase there. In 2020, only 2.32% of revenue came from the website (Vinmonopolet, 2021), even though they had a total of 17.5 million total visits and over 90 million unique product views (Google Analytics - VMP Rapportering, 2021). Additionally, wines in physical stores are generally sorted by category and then country, giving few other ways to narrow the selection based on other deeper attributes. This requires shoppers to go from product-to-product to see if wines match their decision criteria, based on information on product labels. The website and its database are not bound to these constraints. For that reason, nudge strategies targeting the choice

architecture along the online customer journey will be most flexible, implementable, and impactful for changing orders made online, and customer evaluations leading to in-store purchases.

3.1. Customer Journey – Wine Purchase on Vinmonopolet.no

To understand the opportunities available for nudging on Vinmonopolet's website, every step where visitors can interact with their options and make evaluations must be mapped out. A customer journey includes all points of contact a customer has with a company throughout the use of a product, from the acquisition to the disposal (Lemon & Verhoef, 2016).

For the purposes of this study, the purchase phase will be the point of focus, which normally includes choice, ordering and payment (Lemon & Verhoef, 2016). For the most part, purchasing on Vinmonopolet.no can be considered a straightforward purchase process, assuming it is followed linearly by every consumer. However, given the identified consumer segments, it is likely that many consumers will have large degrees of variation in the tools they use to find products, the information they are looking for to narrow their products, and the amount of evaluation they may engage in. These differences may lead to a wide spectrum of engagement: some consumers may exit the site after not quickly finding what they're looking for, others may spend a long amount of time exploring options and loop back from product to results' page, until eventually selecting some items, which they may or may not purchase online. Figure 1 gives a detailed view of each step in the customer journey, the channels and tools available to users, and the behavioral problems that are encountered at each stage.

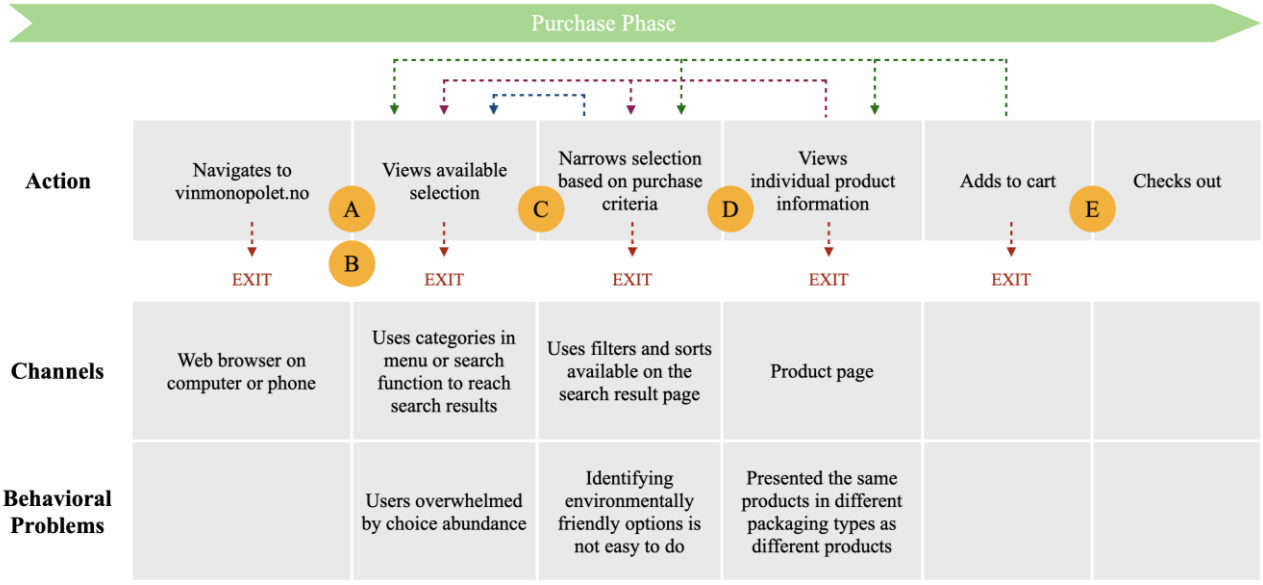


Figure 1: Vinmonopolet.no Customer Journey

3.1.1. Intervention Opportunities

Each of the orange dots in the consumer journey above represents an opportunity for a nudge intervention, based on techniques about choice architecture and sustainability nudges suggested by the SHIFT framework. Table 3 presents several proposed nudges, their choice architecture techniques, and sustainable marketing appeal. For a complete description of each nudge, as well as their preliminary visuals, please see Appendix 3.

Opportunity	Description	Choice Architecture Techniques	SHIFT Alignment
A	"CO_2 efficient" label on products' tiles	Information: simplification, display external information	I: affirm positive self-concept F: eco-labeling
B	Labeling on products' tiles based on an environmental footprint scale from 1 to 4, with an info box explaining how the scale is evaluated	Information: reframing, simplification, display external information; Structural: highlight social consequences	I: challenge positive self-concept F: eco-labeling, guilt generation, providing information
C	Filter based on the carbon footprint scale (nudge B) implemented in products' results page	Information: reframing, simplification, display external information; Structural: highlight social consequences, change categories/groupings	H: making it easy I: challenge positive self-concept F: eco-labeling, guilt generation, providing information
D	Default packaging change to most sustainable option	Structural: default control	H: making it easy
E	Cart's impact summary compared to descriptive norm at checkout	Information: information feedback, descriptive norms, changing social consequences	S: social norms H: feedback I: self-consistency F: guilt generation

Table 3 – Nudge Intervention Opportunities

3.2. Nudge Selection: Filter for Environmental Footprint

Considering the customer journey, the varying levels of customer involvement that different buyers may have, and the shared challenges to consumers' ability and opportunity presented by the high variety of options, the implementation of an "Environmental Footprint" filter allows consumers to quickly find products that match their self-concept with respect to their private and subjective associations with sustainability.

While some nudges, later in the customer journey, such as default switching and checkout feedback messages, use tactics that have been proven to work in a variety of settings, their effectiveness to change the actual purchase behavior relies on the use of the web shop as a primary purchasing tool. Most buyers are still going to physical Vinmonopolet stores instead of ordering online. Nonetheless, Vinmonopolet.no had 17.5 million visits last year, enough to equate to over 4 visits per adult in Norway over the course of the year. This shows that nearly all shoppers look at the website as a part of their information search, even when they go to their local store to make a purchase. By focusing on the early stages of the customer journey, the nudge can be more influential on information searches, resulting in purchases both on and off the website.

When comparing the benefits of the filter and labeling tactics, filtering is one of the most complex and robust nudges, harnessing techniques from both informational and structural parts of the choice architecture to encourage sustainable purchase behavior. It has the unique ability to introduce sustainability as a key decision criterion among all other filter attributes, giving users the ability to choose the level of sustainability matching their preferences.

A footprint scale is the foundation of the filter, instead of a binary "Low CO_2" labeling, because it does not just highlight the best options, but also the worst. This will also give buyers the ability to avoid options which are considered to have the highest impact in cases where the highest impact is mis-aligned with their self-concept. Moreover, this will turn the labeling system into something which both works on a cognitive level, allowing to better understand a wine's impact, and potentially generates some guilt, associated with choosing a bottle on the higher end of the scale. In situations where buyers experience guilt, they are likely to have a loss-avoidance response leading them to make choices which are most consistent with their perceived individual self (Münscher et al., 2016). To build credibility with users who form attitudes more cognitively, the scale also presents a good opportunity to inform about the products' classification at each level. By adding a pop-up box when the scale is displayed, users who are curious or skeptical can see the comparisons of packaging types and their relative CO_2 footprints, to further encourage and inform their use of the filter.

3.2.1. Nudge Design

Vinmonopolet already has a binary filter for "Environmentally Smart Packaging". However, it is mostly unused or misunderstood by users and hence is not solving the problem in its current form (Rolf Erling Eriksen, personal communication, March 2021). Figures 2 and 3 show the new filter in its closed and open formats.

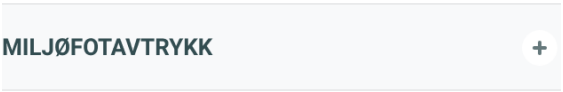


Figure 2: Proposed Filter, Closed

Figure 3: Proposed Filter, Open

The design choices made for this filter aim to three things: gain the attention of the user, use colors to subconsciously communicate outcomes, and translate the complex concept of environmental footprint to the available wines (making it more tangible).

By using bright colors in the scale, the users' eyes are drawn to the scale options and can clearly tell differences between them. The color profile of the website is very neutral, aside from product images; therefore, the high level of contrast created by the scales is difficult to ignore. Green is also a color which has been connected to environmentally friendly behavior for decades in consumer marketing (Wróblewska, 2016). Thus, it is the natural option to select for the lowest footprint option. Red is a color which has been documented to create tension among shoppers (Hoyer et al., 2018). Hence, by associating it with the highest footprint option, it should generate the negative emotion of guilt intended by the nudge.

Additionally, the use of footprint icons is something which has had a long-standing connection to the human impact on the environment and is a part of the lexicon of the eco-sustainability language. In Vinmonopolet's own consumer research, in partnership with Opinion (2021), Norwegians have reacted favorably to footprint-based icons, correctly identifying its meaning as related to the sustainability of the products sold. Based on the CO_2 evaluations of products sold by Vinmonopolet, a 4-step scale is used in this nudge, following the four main groupings for CO_2 footprint. By grading bottles on a scale from "Lowest footprint" to "Highest footprint", it is possible to further communicate differences by showing a single-footprint icon for the lowest and a four-footprint icon for the highest. A breakdown of the actual CO_2 footprint values corresponding to scale assignment can be found in Appendix 4, based on data provided by Vinmonopolet (Vinmonopolet, n.d. b).

By hovering over the "information" icon, users will see the chart displaying the relative footprint of the options available to them, based on their CO_2 footprint as analyzed by Vinmonopolet (n.d. b). By

using the same colors, it is possible to achieve the same communication effects as the scale, as well as give a preview for the type of results a user will see by using the filter. Figure 4 illustrates the chart.

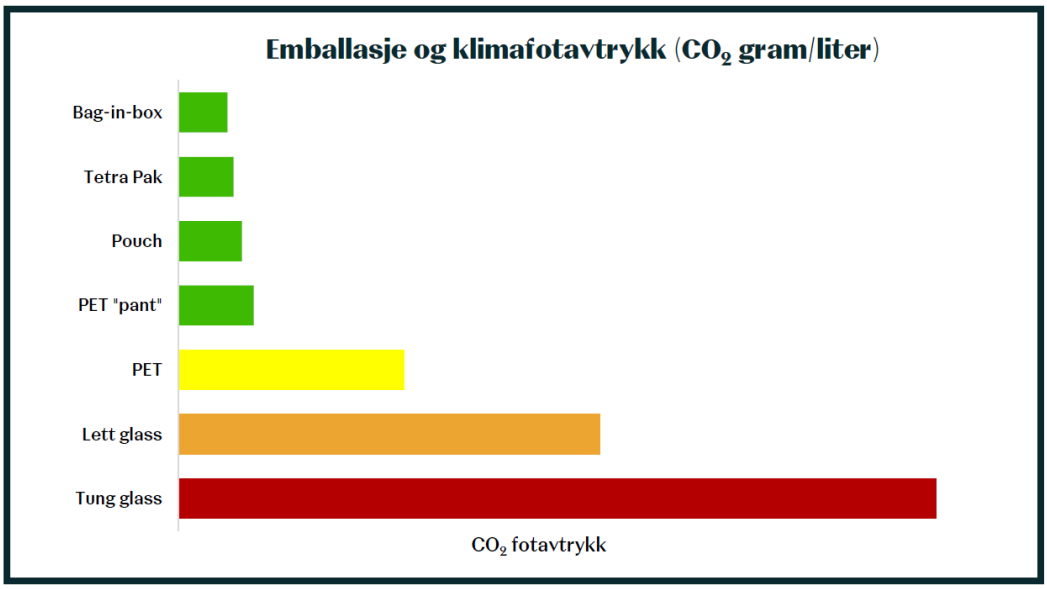


Figure 4: Pop-up Window Providing Comparative Footprints of Packaging Options

3.2.2. Nudge Implementation and Testing

The key difficulty of implementing a new filter on Vinmonopolet's webstore is that there are already so many filters available for shoppers to use. Currently, there are 12 main categories, with 20+ classifications when counting all sub-categories like those found in the "Characteristics" filter and the "Other Options" filter (Vinmonopolet, n.d. c). This abundance of filters on the website makes it difficult to confidently implement a new one without knowing its effects on a smaller scale. Additionally, the attention-grabbing effects of the filter design are only effective when the filter is open – something which requires the user to interact, as all filter categories are closed by default. To test the effectiveness of this filter properly, an experiment is designed to compare the proposed filter against few top filters used by consumers in the actual website. Removing filters that are less utilized will improve the exposure of the new filter and encourage interaction.

To further test the attention-grabbing nature of the new filter and learn about the effectiveness of a more deliberate tactic, the experiment also introduces a second manipulation, where the filter is open by default when the users open the initial page, therefore immediately exposing them to the graphic elements of the filter without requiring their interaction. The two test manipulations can be summarized as follows:

- Manipulation 1 (M1): addition of the new filter alongside top filters; all filters start closed.
- Manipulation 2 (M2): addition of new filter alongside top filters; the new filter is open by default.

To learn more about how users on Vinmonopolet.no interact with existing filters and identify the filters that should be placed in the test with the proposed nudge, the behavioral data accumulated by Google Analytics about the website itself should be analyzed.

4. Research Question

After having analyzed existing literature and applied it to how Vinmonopolet could influence consumers' behavior towards more sustainable wine purchases, as well as having described the proposed nudge intervention, the research question of this study can be formulated as follows:

Can the implementation of a filter for eco-sustainability nudge consumers towards purchasing more environmentally friendly wines?

5. Current Use of Filters on Vinmonopolet.no

To understand how the proposed filter should fit in with the current suite of filters, as well as which filters are the most relevant to include in the study, based on their importance to shoppers, it is important to first understand the performance data produced from real users on Vinmonopolet's website. Thanks to the tracking in Google Analytics, every visit, interaction, and transaction are recorded and stored online. This allows the data to be analyzed on a macro level, looking at large trends in visits, shopping, and the devices used. At a more micro level, specific interactions between pages or paths that users take through the website and specific behaviors can be closely examined.

To conduct this analysis independently, researchers were given access to Vinmonopolet's account, allowing them to examine data directly inside of the platform and create visuals using dashboarding tools like Google Data Studio. Throughout this work, charts and tables will be presented to demonstrate learnings, with all data coming from the Google Analytics account and further processed to generate insights. For an overview of how Google Analytics tracks websites, please read Appendix 6. The Google Data Studio report for this analysis can also be found in full in Appendix 7.

5.1. Tracking and Data Structure for Filter Interactions

Vinmonopolet uses a systematic approach to track the use of filters, where all filters selected by the users are automatically tracked in the website URL. This data is then stored in the menu normally

reserved for the “site search” tracking – where users search for products or categories by typing in keywords into the search bar. To demonstrate this, here is an example URL one sees after clicking on the “Rødvin” button in the navigation menu:
https://www.vinmonopolet.no/search?q=:relevance:visibleInSearch:true:mainCategory:r%C3%B8dvin&searchType=product

Google Analytics treats this interaction as a “search”, where everything following the first term “q=” describes the selected filters and sorting applied. Here, the “mainCategory” is “Rødvin”, although the “ø” is encoded, as it is a special character. If one were to navigate to “Hvitvin”, apply a filter for Italy, and sort by ascending price, the URL would look like this:
https://www.vinmonopolet.no/search?q=:price-asc:visibleInSearch:true:mainCategory:hvitvin:mainCountry:italia&searchType=product&currentPage=0

Here, the sorting changed from “relevance” to “price-asc”, the category changed to “hvitvin” and a new filter for “mainCountry”, “italia”, was added.

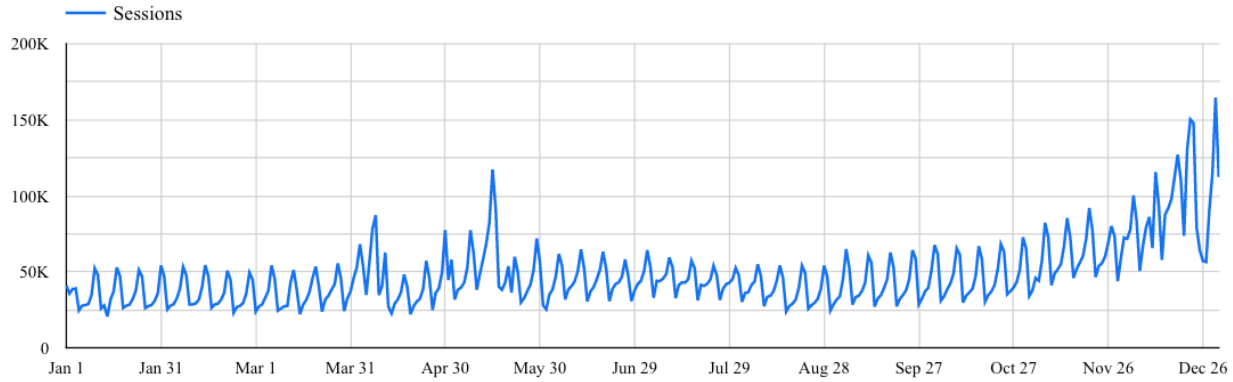
All filters offered by Vinmonopolet are set up in a similar style, with a unique encoding, consistent with the filter name, followed by that filter’s selection. The order of application of filters is also always visible based on the order that these parameters appear in the URLs themselves. Going back to the example, removing the filter for “Hvitvin” and then re-selecting “Rødvin” from the “product group” filter, will result in the orders of the filter swapping in the URL:
https://www.vinmonopolet.no/search?q=:price-asc:visibleInSearch:true:mainCountry:italia:mainCategory:r%C3%B8dvin&searchType=product&currentPage=0

This method of tracking is very efficient because it structures the data in a programmatic way, without having to rely on human coding to track filter use. By storing this information so neatly in the URL, every time a filter is used this is recorded alongside all the other filters and sorts that were applied. As a result, Vinmonopolet has an extremely clean and usable dataset delivering reliable counts of each filter’s use, as well as the order and combination that they are used in.

While the advantages of this are clear, the main disadvantage is that there are tens of thousands of URL possibilities accounting for every possible configuration. As such, answering small questions, such as “How many visitors shopped for red wine?” become complex to answer, since there are many possible forms that page can come in. Additionally, filter data must be heavily reprocessed from its raw form in the URLs to be made meaningful to decision makers in the webstore. Google Analytics is not set up to process this type of filter implementation, even though it can easily store it.

5.2. Vinmonopolet.no - Performance Overview

To understand the scale of small interactions taken on the website, it is necessary to understand the large trends in behavior, so that they can correctly be placed in context. Figure 5 is a summary of the traffic to the website by day, over the course of 2020, accompanied by a data table which gives session summary data for each device.



Device Category	Users ▾	Sessions	Pageviews	Pages / Session	Transactions	Revenue
mobile	5,619,537	11,728,862	42,126,462	3.59	55,517	kr 66,503,199
desktop	1,854,446	5,198,570	34,271,506	6.59	117,458	kr 227,086,154.2
tablet	255,057	596,201	3,409,885	5.72	6,639	kr 10,694,401.1
Grand total	**7,742,371**	**17,523,633**	**79,807,853**	**4.55**	**179,614**	**kr 304,283,754.3**

Figure 5: Website Summary of Vinmonopolet.no

Google Analytics describes any unique device as a "user", any visit to the website as a "session", including all pages viewed, and tallies the views of individual pages on the site as "pageviews". For a full overview of the metrics and how they are generated, please see Appendix 6.

Analyzing first the sessions' graph above, there are clear seasonality patterns of buildup every week to the weekend, with extreme spikes at holidays such as Easter, in early April, the Norwegian Constitution Day, on May 17th, as well as Christmas and New Year's Eve.

In the summary table, users are most often coming into the site on their mobile phones, with 72.6% of all users and 66.9% of sessions. This has become a normal trend for all types of websites and Vinmonopolet is no different, with many people finding their store via Google Search to check in on products they might want. However, this mobile traffic is not nearly as valuable – in terms of pages viewed on the site and actual transactions – than the traffic from computers and tablets. Desktop visitors visit on average 83% more pages than mobile users. Despite only being 24% of users, they are responsible for 65.4% of transactions and 74.6% of total revenues from the webstore. As a result,

it is clear that Vinmonopolet's most engaged web visitors are on desktop computers and tablets, despite mobile visits are the most frequent source of traffic.

5.3. Wine Shopping by the Numbers

Diving deeper into the wine segment and shopping data, in 2020 there were 1.43M unique users who visited wine pages at least once and visited the site 2.2M times over the course of the year. While browsing the website, these 1.43M users generated a total of 5.58M unique shopping pageviews containing a wine category. Of all these pages, 5.3M million are the result of navigation and filtering – while the rest come from people who search for wine categories in the search-bar itself. This means that 95% of customers use the navigation and filtering as their primary tool to find products.

Looking at the categories of products chosen, 3.18M of the 5.58M come from views of the full category results page, including red, white, and rosé wines. Table 4 below gives a breakdown of the total number of views for each category page across Vinmonopolet's selection:

Category	Pageviews	% of Total
Red	1,645,400	52%
White	908,171	29%
Rosé	594,790	19%

Table 4 – Category Pageviews by Wine Type

Analyzing these results, red wine is clearly the most popular wine category among Norwegian wine shoppers, with its category page representing over half of all category pages viewed.

5.5. Common Filter Behavior in Wine Shopping

5.5.1. Users Filter More on Desktop

Like the macro findings, where users are most likely to engage with more pages on their computers, 58% of filter activity beyond the initial category page comes from PC users. Beyond just fitting the trend of higher engagement on desktops, this also makes sense when considering the user interfaces on both devices, since the mobile store only allows to view one product tile at a time in the product feed. Filters are also hidden from view on mobile and can only be adjusted from the very top of the results' page. On desktop versions, there are two to three products side by side, depending on the width of the display. All filters are displayed on the left pane of the screen to allow for quick and easy

use. A screenshot of the mobile store can be seen in Appendix 1, while the computer's version is visible in Appendix 8.

5.5.2. No More than Four

Figure 6 below displays the total number of results' pages in 2020, broken out by the number of filters applied by the user. The table is sorted from highest to lowest in terms of total pageviews, while the graph of totals is in ascending order.

How many filters?	Pageviews	%
3	437,623	36.66%
2	436,572	36.57%
4	252,961	21.19%
5	64,171	5.38%
6	23,028	1.93%
7	3,927	0.33%
8	1,363	0.11%
9	426	0.04%
Over 10	149	0.01%
Grand total	**1,193,839**	**100%**

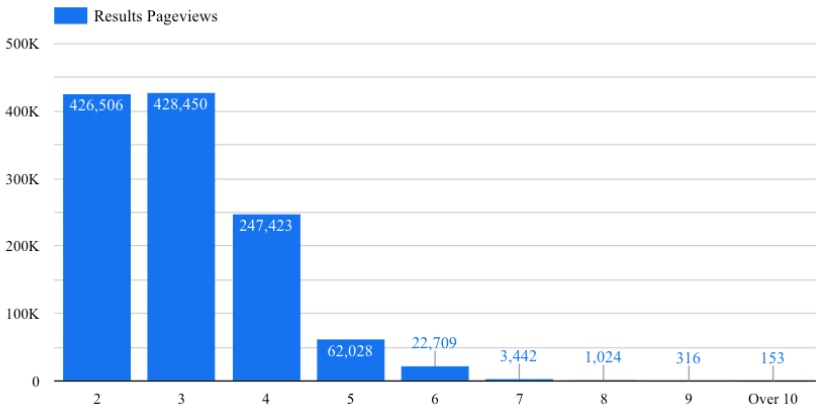


Figure 6: Number of Filters Used by Vinmonopolet's Shoppers

There is an overwhelming trend in the data showing that roughly 36% of sessions in the results' page sees the use of at least three filters, including the initial wine category filter discussed above. Interestingly, three is the most common number of filters, even more than two, likely because of users switching on and off between three and four filters in their search. Nonetheless, after three the numbers begin to drop fast, with only slightly over half of the users applying a fourth. After four, the numbers shrink further, with less than 2.5% of all results pageviews containing over six filters.

5.5.3. Most and Least Used Filters

To analyze which filters shoppers use the most, Regular Expressions, a textual analytical method for matching text based on context and content, was used to identify the filter names being used in each position. With that data for each filter level, the analysis of filters' use is carried out to map which filters shoppers use and in what order.

Figure 7 displays the top 10 filter categories used as the primary and secondary filters, as well as the percent of times they are chosen as that filter.

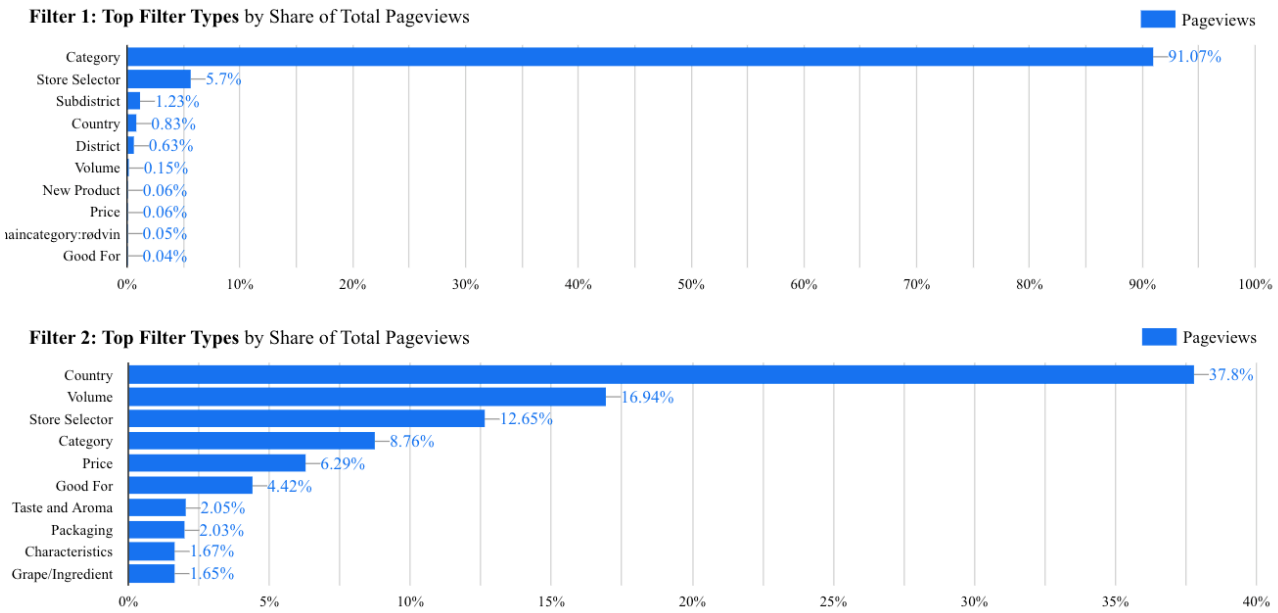


Figure 7: Top 10 Filters in Positions 1 and 2

Unsurprisingly, the category filter dominates the primary position because the navigation menu generates a pageview of the results' page with that filter applied. Secondary filters introduce some amount of competition, although "Country" is easily the most popular secondary filter, with "Volume" and "Store Selector" rounding out the top three. Together, these three filters account for approximately 66% of all filter options at this stage. Interestingly, after looking into the volume selections users make, its primary use is to filter for products "3 liters and over" – therefore essentially to find wines in bag-in-box packaging. Users have the option to distinguish products by packaging in a sub-filter of the "Other Options" filter. However, that goes virtually unused by comparison.

Figure 8 displays the same charts but for filters number 3 and 4.

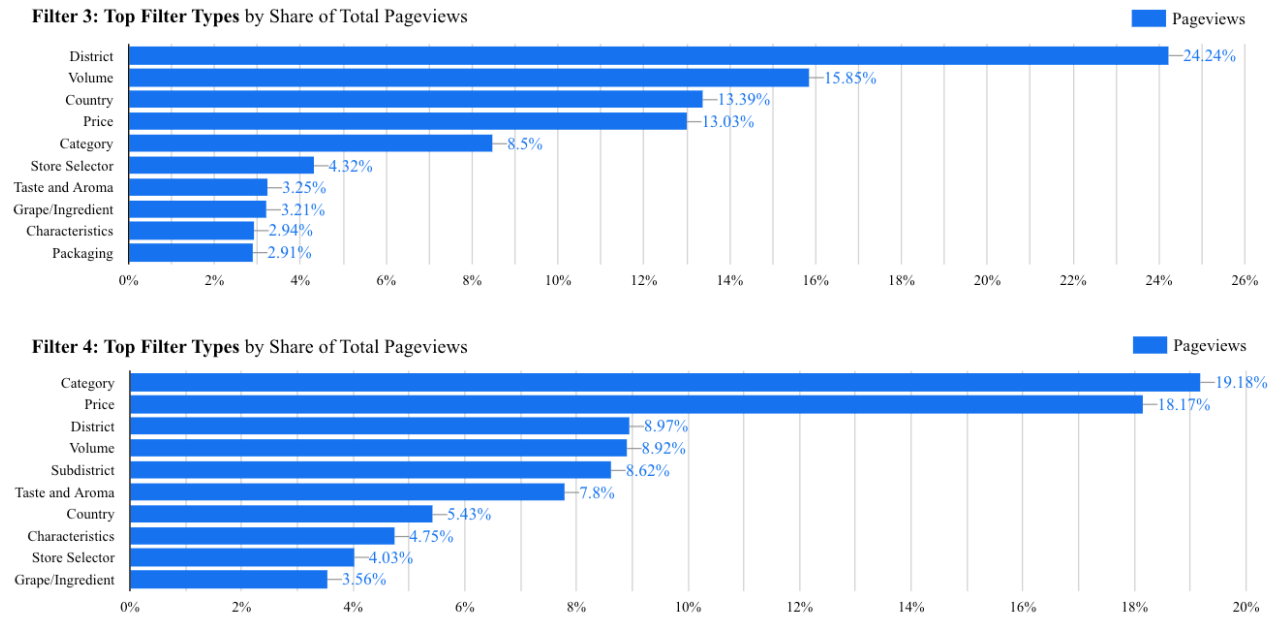


Figure 8: Top 10 Filters in Positions 3 and 4

As the user gets beyond the secondary filter, competition for the selection of the third filter gets much higher, with “District”, the region the wine is from, and “Volume” being dominant factors, followed by “Country”. A close fourth is “Price”, which is nearly as used as “Country” at this stage. “Category” is listed fifth, likely a result of the “Drink Finder” tool available on the website’s starting page, in which users are asked to choose their category as the third question.

Since “Category” is already of known importance, the fourth position is where price’s significance is clearly visible. “Price” stands relatively alone here, with all the following options also recycled from the filters generally used in position two and three. Outside of known top filters, “Taste and Aroma” performs best in the fourth position, making it the most used filter outside of “Country” and other location filters, Volume, and Price.

When looking at the least used filters, there is a very low relative interaction with those implying complex attributes, likely requiring knowledge or experience to interact with. Compared to other filters and especially considering its size and range of five different submenus, “Characteristics” receives very little engagement. Additionally, items in the “Other Options” filter, as well as in the “Eco/Ethics” one, are very small in their actual use. “Storage” and “Alcohol Content” are not even visible in any of these visuals, signaling that they are of quite low importance to wine buyers in terms of narrowing their consideration set.

5.5.4. “Environmentally Smart Packaging” Goes Largely Unnoticed

The filter where users can divide products for “Environmentally Smart Packaging” is located at the very bottom of the page, in the “Other Options” filter. This filter was used 19,400 times in the whole year across all wine search pages. That equates to roughly 0.35% of all results’ pages compared to the total of 5.58 million wine pageviews. Given the data discussed in the introduction about the increasing consumer demand for sustainable products, there are reasons to believe that this low level of interaction with the wines’ environmental product attribute could be improved by a more thorough filter design. The low use of this filter has likely more to do with its lack of prominence in the decision-making structure than a lack of demand for sustainable options.

5.6. Conclusion

Having analyzed the way that users behave on the website, how they shop for wine, and the filters that are most important to them, the nudge implementation would be most effective and useful for users on their desktop. Not only this is where users are more engaged with the site and with other

filters, but it is also where people show a much higher propensity to order online, which would be the most efficient way for the filter to have a direct impact on buying behavior.

An experiment to test the introduction of the new filter should include the existing "Country", "Volume", and "Price", in addition to the category. These are the filters which are interacted with the most by users. Therefore, competing with them will be an important part of the real-life filter's job on the actual website. Nonetheless, when considering the shopping experience, these are all visible variables, which are shown on product cards directly (Appendix 1). A filter having a more intangible subject is "Taste and Aroma", which is consistently just outside this grouping of filters and joins the key filter categories with 7.8% usage in the filter position four.

6. Research Model and Hypotheses

This chapter will present the research model and the hypotheses that lay the foundation for this study. These are described by the conceptual model in Figure 9. As the relationships between the variables are further discussed in this chapter's sections, the hypotheses of expected effects will be presented.

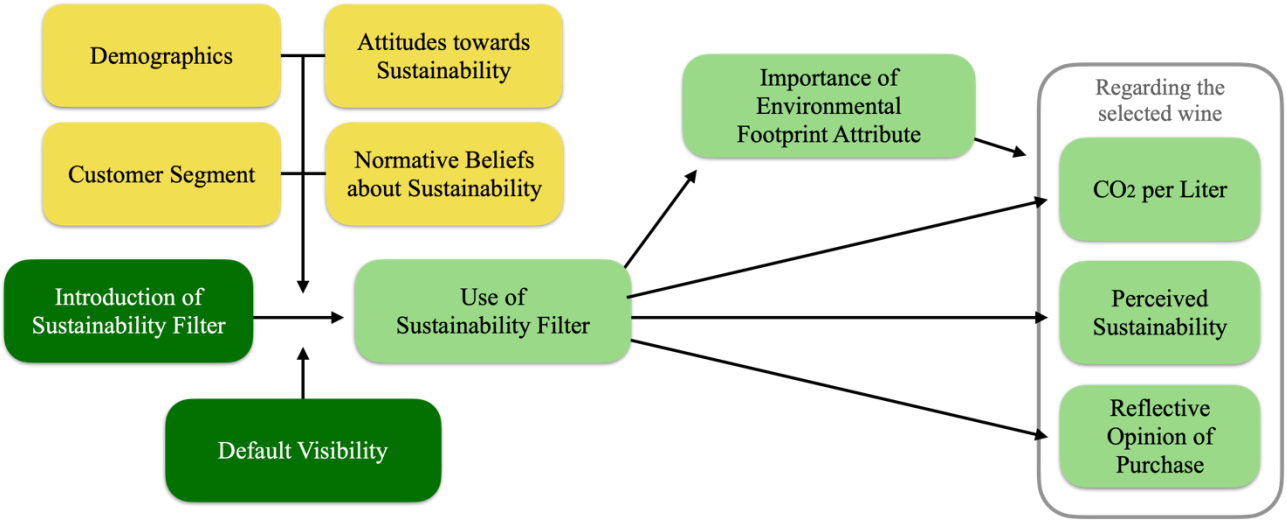


Figure 9: Conceptual Research Model for the Sustainability Filter Implementation

The main independent variable of this model, in the first dark green box, is the Introduction of the Sustainability Filter to the website. The Default Visibility of the filter changes across manipulation groups 1 and 2, and is an experimental independent variable playing a moderating effect between the Introduction of the Sustainability Filter and the Use of Sustainability Filter.

The dependent variables can be seen in the light green boxes. The most important and moderated one is the Use of Sustainability Filter. It represents how many people will use the filter after it is

introduced. CO_2 per Liter is another important dependent variable showing the CO_2 emissions produced by the wine selected after using the filter. Importance of Environmental Footprint Attribute is an in indicator of how relevant people think the environmental footprint of a product is when selecting wine. It is a dependent variable partially mediating the relationship between Use of Sustainability Filter and the CO_2 per Liter. The last two dependent variables, which are reflective about the choice of wine, are Perceived Sustainability and Reflective Opinion of Purchase.

There are also several external (non-experimental) moderating variables, represented in the yellow boxes. These are Normative Beliefs about Sustainability, consumers' Attitudes towards Sustainability, Demographics, including age, gender, education, and geographical location, as well as Customer Segment, being the Dedicated, the Conscious, the Searchers, or the Price-focused.

This model comprises two main areas. The first concerns how people will interact with the filter after it is introduced and the factors moderating its use. Based on the findings from Google Analytics, the competition for use is high among existing filters. Therefore, understanding how the new filter will compete for attention is of the upmost importance. The second describes the outcomes of the filter's use, investigating what effects the filter has on those who use it, the choices they make, and their opinions about those choices after selection.

6.1. Part 1: Interaction with Filter

Given that Norwegians report that environmental sustainability is of growing importance to their purchase decisions, and that the design of the filter matches the existing user experience from the website, it is expected that the filter will be used without requiring any specific instruction to do so.

H1: The introduction of the filter will result in the filter's use, without requiring specific instructions to do so.

The model shows that the Use of the Sustainability Filter is moderated by the Default Visibility of the filter, as well as the Normative Beliefs about Sustainability, Attitudes towards Sustainability, Demographics, and respondents' Customer Segment. This means that the likelihood of the new environmental filter to be used will likely fluctuate depending on these moderating factors.

6.1.1. Default Visibility

When the default visibility of the filter is set on "open", the filter is exposed to all users. This should increase its chance of being seen thanks to an increased exposure to its attention-grabbing design.

H1.1: Making the environmental filter visible by default will increase its interaction rate.

6.1.2. Normative Beliefs about Sustainability

Normative beliefs can best be described as what consumers think others want them to do. Social norms, as described in SHIFT, are among the most important strategies for nudging consumers towards sustainable decision-making (White et al. 2019). "Normative Beliefs about Sustainability" can thus be thought of as the level to which someone experiences social pressure to act sustainably.

H1.2: The more respondents feel external pressure to make sustainable choices, the higher their interaction rate with the filter.

6.1.3. Sustainable Values and Behaviors

Values are important parts of consumers' motivation, shaping the way consumers seek out their goals. The self-concept in SHIFT discusses how people want to make decisions that are in line with their idea of themselves. Hence, reporting that sustainability is a strong value should have a large effect on the motivation to use the filter, and vice versa.

As explored in the theory, there is often a gap between people claiming to believe that environmental sustainability is valuable to them and those acting on that value (White et al., 2019). By measuring the degree to which users claim to integrate sustainability into their everyday decisions, their consistency with those values can be evaluated.

H1.3: The more respondents value sustainability and try to be sustainable in their everyday life, the higher their interaction rate with the filter.

6.1.4. Demographics

Several studies have shown that there is usually a correlation between some pieces of demographic information and sustainable attitudes and behaviors (White et al., 2019). Thus, the higher or lower degree of sustainability in the categories presented below will have an impact on their use of the filter.

6.1.4.1 Age

Research has shown that there is usually a negative association between age and attitudes towards sustainability (Diamantopoulos, Schlegelmilch, Sinkovics & Bohlen, 2003; Klineberg, McKeever & Rothenbach, 1998; Arcury & Christianson, 1993; Zhang, 1993; Honnold 1985; Zeidner & Shechter,

1988; Jackson, 1983). The most common explanation of this phenomenon is that solutions to environmental issues require changes in habitual behaviors, traditional values and existing institutions, making it more effortful for the elderly to support pro-environmental ideologies and reforms than for younger generations (Van Liere & Dunlap, 1980).

This finding is also supported by the results of the above-mentioned survey from Opinion (2021), showing that younger people consider the products' environmental sustainability a more relevant criteria when buying alcohol than the elderly. For instance, the lower the age range, the higher the claimed importance of having a CO_2 efficient packaging, labels clearly marking products as eco-friendly, as well as high recyclability. Moreover, the higher the age, the more was given importance to traditional glass bottles, feeling solid and robust.

However, younger generations' higher environmental concerns do not always translate in more ecological behaviors (Gifford & Nilsson, 2014). Many studies highlighted that older people report more green consumer behaviors than younger (Hines, Pinto, Nique, Añaña, & Herter, 2011; Gilg, Barr & Ford, 2005; Scott & Willits, 1994; Schahn & Holzer, 1990; Vining & Ebreo, 1990; Hungerford & Tomera, 1987; Van Liere & Dunlap, 1980). It is possible that the inconsistency between intended and actual behavior is caused by a lack of financial security among younger members of the population to support environmental causes, although they are likely to state that they will commit more resources to protecting the environment in the future (Diamantopoulos et al. 2003).

Nonetheless, in the case of wine, products in environmentally smart packaging are usually less expensive than those in glass bottles, therefore, there should not be barriers to transform favorable attitudes towards sustainability into sustainable behaviors.

H1.4.1: The interaction rate with the environmental footprint filter will be decreasing with age.

6.1.4.2. Gender

Examining the effects of gender, females have been found to show higher concerns about sustainability than men as well as greener behaviors, such as sustainable shopping habits, recycling, energy conservation, and political action (White et al., 2019; Scannell & Gifford, 2013; Luchs & Mooradian, 2012; Diamantopoulos et al. 2003; Tikka, Kuitnen & Tynys, 2000; Blocker & Eckberg, 1997; Roberts, 1993; Gutteling & Wiegman, 1993; Zhang, 1993). This may occur as women tend to be higher in traits such as social responsibility, altruism, agreeableness, and openness to change (Luchs & Mooradian 2012; Dietz, Kalof & Stern 2002; Zelezny, Chua & Aldrich, 2000).

The Opinion (2021) survey was in line with these findings, highlighting that women cared more about the products' ecological packaging, environmental labels making them recognizable as climate smart,

as well as their recyclability. Conversely, men valued that their alcohol selections were in glass bottles and perceived as traditional, exclusive, solid, and robust.

H1.4.2: The interaction rate with the environmental filter will be higher among women than men.

6.1.4.3. Education

Furthermore, research has shown that individuals with higher education levels tend to be more concerned about the environment (Chanda, 1999; Klineberg, McKeever & Rothenbach, 1998; Hsu & Rothe, 1996; Arcury & Christianson, 1993; Ostman & Parker, 1987). This reflects the fact that the nature of ecology is sometimes a complicated matter to understand and assimilate, with its complex interactions between the organisms and the environment (Maloney, Ward & Braucht, 1975).

H1.4.3: The interaction rate with the environmental filter will increase with levels of education.

6.1.4.4. Geographic Location

Research from different countries led to inconclusive results when examining the role of location on attitudes and behaviors towards sustainability. For instance, students in the UK who had grown up in rural areas reported more positive orientations towards the natural environment than urban-raised students (Hinds & Sparks, 2008). Other studies found that there were no consistent differences of location on environmental concern among both rural and urban dwellers (e.g., Xiao & McCright, 2007; Lutz, Simpson-Housley & de Man, 1999; Arcury & Christianson, 1993). These varied results may be affected by the methodologies used, including the need to separate people living in polluted areas from those working for polluting industries (Freudenburg, 2007). For example, the findings from a study conducted by Freudenburg (2007) show that people in agriculture express higher levels of concern about the environment than other rural persons in the same communities.

However, the results of the survey performed by Opinion (2020) for Vinmonopolet, showed that on average people living in Oslo are more concerned about environmental sustainability than people living in other more rural areas. When asked to rate on a 1-5 scale how important is eco-sustainability when shopping for alcohol, 37% of respondents living in Oslo gave a score of 4, corresponding to “Important”, the highest percentage compared to the other points in the scale. This figure was not as high in the ratings of people from the other areas of Norway: only roughly 20% of them gave a score of 4 in the same question, mostly giving ratings of 3, 2 or 1.

H1.4.4: The probability that residents in Oslo will use the environmental filter is higher than for the inhabitants of other areas of Norway.

6.1.5. Customer Segment

The customer segment also greatly influences the attitudes and behaviors towards sustainability, as the specific characteristics of each category determine what the group values and looks for when choosing a product. These, in turn, should influence the probability of using the filter.

A study conducted on behalf of Vinmonopolet highlighted that the Dedicated segment was the most responsive to environmental concerns (Opinion AS, 2021). This group gave the highest rates to the following elements, when asked how important they were on a 1-5 scale: the product has a climate smart packaging, it is labelled as environmentally friendly, and it can be recycled (Opinion AS, 2021). As such, it is expected that the wine choice of people belonging to the Dedicated group will be rather affected by the introduction of the filter.

Conversely, the Conscious category gave those three sustainability factors the lowest importance, valuing the most the following elements: the product is in a glass bottle, it is traditional, it feels solid and robust, it signals quality, and it gives a sense of exclusivity (Opinion AS, 2021). Thus, the Conscious group will likely be the least impacted by the new filter.

When asked to rate these latter five elements, the Price-focused segment gave them the least importance (Opinion AS, 2021). They have shown to look for a compromise between quality and eco-sustainability, provided that the price was affordable (Opinion AS, 2021). For this group, sustainability will always be a secondary attribute with respect to price. The new filter could stimulate their curiosity, but they will likely not be so greatly affected by its introduction.

Finally, the survey highlighted that the Searchers were evaluating positively the previously mentioned sustainability-related elements – the product has a climate smart packaging, it is labelled as environmentally friendly, and it can be recycled – but not as much as the Dedicated (Opinion AS, 2021). Therefore, this category may be positively influenced by the introduction of the sustainability filter, as it is always open to try something new and rely on simplification strategies to satisfy their needs. These environmentally smart options may be seen as an affordable novelty. However, this segment is searching for a compromise between quality and sustainability (Opinion AS, 2021). Therefore, they will not be influenced by the introduction of the new filter as much as The Dedicated.

H1.5: Segment membership will drive level of engagement with the filters, with Dedicated members most likely to engage, then Searchers, Price-focused, and finally Conscious.

6.2. Part 2: Effects of Filter Use

The use of the sustainability filter results in changes in decision-making and perceptions of wines.

6.2.1. CO_2 Weight per Liter of Selected Wine

The filter's scale is a translation of CO_2 weight figures, which is meant to simplify the interpretation of footprint to a comparative format. The nudge is designed to encourage purchase of wines in the lowest footprint categories. Hence, those who are inclined to interact with it as a part of their attribute evaluations will likely choose more environmentally responsible options. The Use of the Sustainability Filter should lower the impact in the overall CO_2 emissions per Liter of Wine.

H2.1: Wines selected by filter users will have a lowered level of CO_2 per Liter.

6.2.2. Importance of Environmental Footprint Attribute in Selection

"Environmental Footprint" is an attribute competing with a high number of others for the attention of buyers. By measuring the importance of all attributes and then focusing on the amount of importance that the environmental footprint has on the decision, it is possible to determine the overall weight of the footprint on the decision to select a particular wine.

H2.2: The attribute "Environmental Footprint" will be considered more important to filter users.

The focus on the environmental footprint created by the new filter should then lead to the selection of wines with lower CO_2 emissions per liter, depending on the importance of eco-sustainability when buying wine. If consumers take it into high consideration, by using the new filter they will tend to decrease the total CO_2 emissions by choosing rather eco-friendly products, and vice versa.

H2.3: Increased importance of the "Environmental Footprint" attribute will have a mediating effect on choices of wine, resulting in the selection of wines with lower CO_2 per Liter.

6.2.3. Perceived Sustainability of Choice

"Perceived Sustainability of Choice" focuses on the respondent's evaluation of whether they would describe their chosen wine as sustainable. Without focusing on specific elements of sustainability, responses give an indication of the filter's ability to influence the overall perception of wines' sustainability, as defined by the respondent. After using the filter, purchases should be evaluated as more sustainable, given that the filter should also result in lower footprint choices.

H3: Respondents who use the environmental filter will have higher beliefs that their choice was sustainable than those who do not use it.

6.2.4. Reflective Opinion of Choice

Given that many users will be forming feelings and attitudes about their purchase after they choose, measuring these feelings after choice will give an accurate representation of how people evaluate their selection in terms of their own attitudes and satisfaction, and how they believed their choice may be perceived by others. Based on the literature, sustainable decisions can result in the "warm-glow" effect, where making a sustainable choice results in positive emotions (Onwezen et al., 2013). Being that normative believes are moderating the filter's use, sustainable choices should also result in more positive evaluations of choice acceptance of others.

H4: People who used the environmental filter will have a more positive opinion of their purchase than those who do not use it.

7. Methodology

In this chapter, the methods used to answer the research question of this study will be presented, including research design, research strategy, sampling, experimental design, data collection, data analysis, tests for research quality, and ethics.

7.1. Research Design

A research design is the general structure of the study used to answer the research question (Saunders, Lewis & Thornhill, 2019). The purpose of this study is to test how the implementation of a new environmental filter will influence the choice of consumers in terms of sustainability. Since the overall methodological choice should derive from the research question, this study uses an explanatory research design to establish and explain causal relationships between variables (Saunders et al., 2019). Moreover, the research design is mono method, cross-sectional, and quantitative, as there is a single data collection technique, gathering information only at one point of time, where results will be analyzed using quantitative procedures (Saunders et al., 2019).

7.2. Research Strategy

The research strategy used in this study is an experiment. This is considered the optimal solution for explanatory research because its purpose is to study the probability of a change in an independent variable causing a change in another dependent variable (Saunders et al., 2019).

More specifically, it is a real choice experiment conducted in a controlled environment, allowing greater control over some aspects of the research process such as the sample selection and the context within which the experiment occurs (Saunders et al., 2019). While this improves its internal validity, namely the extent to which the findings can be attributed to the manipulations rather than flaws in the research design, the disadvantage of not having a field-based experiment is that the generalizability of the findings to a real setting, external validity, is reduced (Saunders et al., 2019). Issues regarding validity and reliability will be discussed in detail in Section 7.7.

The experimental approach is a between-subjects design, where participants belong to either the experimental groups, manipulation 1 or manipulation 2, or the control group, but no more than one (Saunders et al., 2019). The dependent variables are connected to the respondent's actual choice of wine in the experiment, measured after the manipulation of the independent variable, the Filter, so that a pre-test and post-test comparison can be made among the experimental groups and the control (Saunders et al., 2019). The set-up of the experiment will be further described in Section 7.4.

Furthermore, the experiment is followed by a self-completed questionnaire. This strategy tends to be used for explanatory research and it is useful to collect data investigating possible reasons for relationships between variables (Saunders et al., 2019). The aim of this survey is to understand why participants choose the selected wine, also to profile them into segments. The survey strategy allows a good control over the process of collecting data, which can then be analyzed quantitatively using descriptive and inferential statistics (Saunders et al., 2019). Moreover, when analyzing the collected information, answers from a survey are standardized, providing easily comparable data (Michaelidou & Dibb, 2006). Furthermore, when filling self-completed questionnaires, respondents are less likely to answer to please the researchers or because they believe certain responses are more socially desirable (Dillman, Smyth & Christian, 2014). Finally, since the topic of this study is generally easy to understand and observing non-verbal communication is not necessary, a self-completed survey is arguably sufficient to collect data (Visser, Krosnick & Lavrakas, 2000).

A disadvantage of using a self-completed questionnaire as the data collection method is that researchers have only one chance to gather information and cannot interact with respondents, thus being unable to potentially provide clarifications (Iacobucci & Churchill, 2010). As a result, ensuring that participants understand the measures correctly is crucial. To address this issue, each measure is

formulated with a simple language and its wording was taken or adapted from previous research dealing with similar topics (Saunders et al., 2019). Moreover, measures were also checked within the context for which they were written, rather than in abstract terms, to ensure that they could be clearly understood in the experimental context (Saunders et al., 2019). Furthermore, two measures, formulated in slightly different ways, are used every time to measure each concept. When analyzing the resulting dataset, comparing the responses among the alternative forms of the same question can give an idea of the reliability of the questionnaire and provide an indication of whether respondents understood the question (Saunders et al., 2019). Since the survey became quite long, only two "check measures" are used for each factor instead of three, as it is often the case in existing literature. This was done to minimize the mental fatigue generated by having to complete a longer questionnaire (Saunders et al., 2019).

Another disadvantage of self-completed surveys is that participants may contaminate their responses, therefore reducing data's reliability (Saunders et al., 2019). This is particularly likely when the questionnaire has been incentivized (Saunders et al., 2019). When participants have insufficient knowledge or experience, they may provide uninformed responses by deliberately guessing the answer or discussing it with others (Saunders et al., 2019). However, it is unlikely that in this survey respondents will not know what to answer, because no previous knowledge or experience is necessary to respond, and they will just be asked subjective questions.

Details about the survey used in this study will be provided in Section 7.4.5.

7.3. Sampling

The sample used to run the experiment and survey consisted of 450 people: 150 for the control group, 150 for the first manipulation and 150 for the second manipulation. The sampling procedure was executed by Norstat Norge, a company providing panel consumers. The requested sample consisted of wine drinkers of any ages (18+), genders, education levels and locations across Norway. Norstat was able to exclude people that reported drinking wine less than two times per year.

The company guaranteed random sampling of participants and their random assignment to the three groups. Random assignment is used to avoid systematic differences between those assigned to the treatment conditions and those assigned to the control group (Fricker, 2008). The randomness helps controlling selection biases as it excludes systematic differences as rival explanations (Fricker, 2008).

Using Norstat also guaranteed to avoid a nonresponse error, namely a low response rate once the sample was picked, and consequently allowed to obtain a large-enough pool of participants to make

valid inferences about how consumers would react to the introduction of the new filter (Fricker, 2008). Furthermore, being able to reach lots of respondents is likely to generate representative findings (Saunders et al., 2019).

7.4. Experimental design

Both the experiment and the survey were internet-based; hence, response data was collected online. All parts of the study which were visible to respondents were written in Norwegian (bokmål).

7.4.1 Figma

The experiment was performed on Figma, an online platform where designers can create prototype versions of websites without coding or implementation on the live website. For the experimental environment in this study, the layout of Vinmonopolet's "Search Results" shopping page, and product pages were recreated based on the existing design prototype built by their design consultant, Bouvet Norge AS. The original prototype had no inventory, and no filter functionality. These features had to be purpose-built for this simulation. In the end, the simulation had reduced features with respect to the original site, due to the platform's inability to support a complex environment. Figma's limitations include issues associated with memory and loading time caused by integration of active filters. This limited the number of products which could be chosen, as well as the number of filters which could be implemented in the final environment.

7.4.2. Inventory Selection

Being that red wine is the popular on Vinmonopolet.no (Google Analytics - VMP Rapportering, 2021), 36 red wines were selected to appear in the shopping simulation. The inventory number was determined according to the limits of the platform, which would have crashed with a higher number of products being actively filtered. Additionally, a previous study has shown that making consumers decide among a selection of 30 items produced an overwhelming effect due to the abundance of choice (Iyengar & Lepper, 2000). For this study, 36 products were determined to be big enough to make consumers want to use the filters to narrow the selection while fitting within the limitations of Figma as a platform.

With this number finalized, the wines in the sample were selected based on certain selection criteria. The first objective was to maintain the same proportion of packaging types as clients would have normally had in a Vinmonopolet store. To do so, a medium-sized store was selected (Bergen

Storsenter) and the share of packaging types available in that store were calculated. With these proportions, the total inventory of 36 bottles was split as follows: 21 standard glass bottles of 75 cl were selected, as well as 6 light glass bottles of 75 cl, 5 bag-in-boxes of 300 cl, 1 plastic bottle of 75 cl, 1 plastic "pant" bottle of 75 cl, 1 pouch of 18,7 cl and 1 Tetra Pak of 75 cl.

Second, researchers prioritized the selection of wine products that are sold in both low and high footprint packaging, so that the only difference between them would be packaging type.

Third, wines were fairly distributed across the "taste and aroma" categories implemented by Vinmonopolet, for both the sustainable and unsustainable packaging options. This classification was retrieved from an existing filter available at Vinmonopolet.no, dividing red wines into groups, according to their characteristics. These are "Fresh and Fruity", "Tannic and Fruity", "Spiced and Sweet" and "Filling and Juicy".

Fourth, researchers picked wines from as many countries as possible, while also prioritizing Italy and France, as statistics provided by Vinmonopolet showed that Italian and French wines are the most searched for on the site (Google Analytics - VMP Rapportering, 2021).

Fifth, the sample included both very expensive, medium-priced and cheap glass bottles, to provide both exclusive and regular options in glass, the latter having prices in line with wines contained in sustainable packaging. Finally, this red wines' selection also comprised a few organic, vegan, natural and certified ethic products. A complete list of the chosen inventory can be found in Appendix 9, sorted as presented on Figma during the experiment.

7.4.3. Instructions to Participants

The selected sample received an email containing a clickable link, redirecting them to the simulation on Figma. In the email, they were thanked for their participation and informed that the study was a collaboration between Vinmonopolet and Norges Handelshøyskole. Then, they were asked to use a computer to complete both the simulated shopping experience and the survey, which were not mobile-friendly. After opening the link, instructions appeared on Figma before the simulation began.

Participants were given a predetermined scenario for purchasing wine, namely going on a short cabin trip with friends, where everyone agreed to bring their own alcohol. Standardizing the purchase situation for all respondents gave them freedom of choice while controlling for the situation that they were buying for. Moreover, allowing users to determine different self-selected scenarios wouldn't have likely been evenly distributed, making analysis of the effects of the filter more complicated. The cabin situation was chosen as it is socially visible, thus allowing social pressure to purchase green

products to potentially be a factor in the choice of the wine, compared to drinking some wine alone at home. Additionally, it was not a fancy social occasion where people may want to bring high-end wines contained only in glass.

Respondents were given a budget of 500 NOK. They were also asked to imagine that any budget they didn't use would go to the rest of their trip, just like a normal purchase situation. The budget was chosen so that all the products in the sample could be selected. Additionally, participants were given the possibility to purchase more than one bottle of the same wine, provided that the total expense would not exceed 500 NOK. This decision was taken with the aim of trying to even the differences in volume (and price) between the 300 cl bag-in-boxes and all the other 75 cl containers. However, participants would not be able to select multiple types of wine due to technical constraints. Finally, before being granted access to the simulation, they were informed that the website would have limited features; but the filters would be active. The complete instructions given to participants can be found in Figure 1 of Appendix 10.

7.4.4. Simulated Shopping Experience

After the instructions, participants accessed the starting page. The products were presented in 12 rows of 3 wines each, all visible on the same page by scrolling down. All the three groups had the filters "Taste and Aroma", "Country" and "Price" available for use on the left, with the addition of the "Environmental footprint" filter for manipulation 1 and 2. These filters were selected based on their high use among actual users on the website as discussed in Chapter 5. Moreover, in M1, the filter was closed by default, while in M2 it was open already. The starting pages of the three groups are illustrated in Figures 2, 3 and 4 of Appendix 10, respectively.

The sorting of the sample wines on the simulation's starting page was arbitrary. In general, all packaging types were mixed together. However, researchers tried to replicate the dispersion seen on Vinmonopolet.no, where the first wines presented were usually those contained in glass bottles. This choice was motivated by the intent to make the experiment as close as possible to the experience a user would have on the real website. Placing all the sustainable products on the top of the page might have pushed respondents too much towards choosing a green wine and therefore biased the results. Appendix 9 presents the inventory items in the same order as they were appearing on Figma.

By clicking on each product, respondents could access a page containing all the relevant information about that red wine. Examples of products' pages are provided in Appendix 10, one per packaging type. A "back" button was also added to bring participants back to their previous page, thus avoiding previously applied filters being removed after viewing a product. An example of how the webpage

would appear once filters were applied is provided in Figure 12 of Appendix 10. To select a product, participants had to click on “Buy”. Then, the cart would pop-up on the right, where they could specify the number of items they wanted to purchase within the given budget, as depicted in Figure 13 in Appendix 10. Once they clicked on “Check-out” they were automatically redirected to the survey.

7.4.5. Survey

The platform used for the questionnaire was Qualtrics. The complete list of questions used for this study is provided in Appendix 11. Here, the main elements of the survey are described, as well as the reasoning behind collecting them. The concepts measured with the questionnaire are the variables of the theoretical model, presented in Chapter 6 and based on existing literature, as well as other additional aspects that may provide a deeper understanding of the results.

This survey was structured to avoid leading questions. Therefore, the order with which the concepts are measured is not random. The first questions assess the dependent variables, the following group investigates the independent, and the last cluster examines the moderating variables. This question order was selected to avoid measures of dependent variables being influenced by answers of independent variables.

The survey consisted of closed questions. Most of the time, respondents had to rate something on a five-point Likert scale, an ordinal scale often used in marketing research (Chyung, Roberts, Swanson & Hankinson, 2017). Rating questions are usually employed to collect opinion data and they most frequently use the Likert-style rating (Saunders et al., 2019). One of the primary advantages of using a Likert scale for this study is its ability to effectively measure attitudes (Chyung et al., 2017). The possible responses to the attribute-rating questions were presented on a straight line, as research has shown that people are most likely to process the data when presented in this way (Dillman et al., 2014). Furthermore, the various statements all had the same order of response categories, to avoid confusing respondents (Dillman et al. 2014).

The questionnaire started with an automatically filled question restating the chosen wine and quantity participants selected in the shopping simulation. Respondents were instructed to advance to the other questions by clicking on the arrow in the corner. This step was necessary to register their choice, as Figma is unable to track users’ activity once they exit the platform. This automated process also allowed the survey to display the selected product’s information page above the question when respondents were asked to rate the importance of some characteristics in determining their choice. These attributes were the product’s perceived quality, visual appearance and weight, as well as its taste, origin, price, environmental footprint, volume and suitability for a specific food, the latter being

existing filers available on Vinmonopolet.no. The elements were chosen by researchers as the most relevant factors influencing the choice of wine for a cabin trip, and attributes displayed for each wine. The aim of this question was to compare the ratings of the various aspects between the control group and M1 or M2, or, more generally, between people who did not use the filter and those who did, to detect any changes in the perceived importance of the environmental footprint or the other variables.

The survey continued with questions assessing participants' attitudes towards the chosen wine, as well as three additional concepts measured to provide a potential alternative explanation in case attitudes towards sustainable products were found to be generally negative: choice satisfaction, perceived quality of alternatives, and anticipated regret. Questions about subjective norms and perceived sustainability of the selected wine were asked next.

Respondents had then to state whether they used the filters or not. Participants assigned to M1 and M2 had some additional questions regarding the use of the environmental filter specifically. They were asked to rate the usefulness of the new filer and the degree to which it affected their choice.

Then, participants were asked about their values and behaviors towards environmental sustainability. Normative beliefs about sustainability were the next concept measured by the questionnaire. Furthermore, respondents were asked whether they were concerned about the deterioration of a product contained in packaging options other than glass and whether they believed the type of packaging was a good proxy for the overall sustainability of a wine.

The following set of questions were investigating the personal traits distinguishing each customer segment, as descripted in Chapter 2. Therefore, participants' expertise about wine, need for variation, openness to experience and price sensitivity were measured in this section of the survey. The last cluster of questions were those collecting respondents' demographic information: age, gender, education level and place of residence. To allow for screening of responses to the survey, two more questions were added at the end of the questionnaire, "Have you purchased wine in the last year at Vinmonopolet?" and "Do you like red wine?" This was done to understand whether respondents are consumers of red wine in real life.

7.5. Data Collection

7.5.1. Data Types and Collection

The data required to conduct the final analysis of the experiment came from two sources and consists of three separate data types: wine data describing the characteristics of the chosen wine; factor-based survey data about the selected wine, values, or personality; and individual difference variables

describing respondents. Survey response data from Qualtrics contains the quantity and "Wine ID" number for the red wine each respondent selected, as well all factor-based and individual difference responses. To make use of the "Wine ID" number collected in the survey, the inventory data used to create the experiment was used as an index table, so that critical wine information could be correctly combined with the survey data.

The wine data which will be most used in analysis is the CO_2 value assigned to the selected wines in the "Environmental Footprint" filter. These numbers are continuous and are sourced from Vinmonopolet's own internal analysis (Rolf Erling Eriksen, personal communication, March 2021). The footprint data relating to the filters will also be used on a numeric scale from 1 to 4, with 1 representing lowest footprint wines and 4 representing highest footprint wines.

Remaining data produced by the survey in Qualtrics is relatively uniform thanks to the consistent choice of Likert-scale measures, as well as those using slider rankings, such as the "Attribute Importance" question block. Likert scale question produces quantitative results from 1-5, where 1 represents answers for "Totally disagree", and 5 represents "Totally Agree". As such, factor strength can be quantitatively described. Additionally, attribute importance evaluations were also kept on a 1-5 scale meaning that their data is also returned in a consistent format. Individual difference data is a mix of Likert scale questions to identify those belonging to known segments, and qualitative data related to respondents age, gender, location, and level of education.

7.5.2. Data Combination and Processing

The combination of all datasets required downloading each set of survey results in both number-only and full text forms to retrieve the Likert-scale and attribute data in numeric form and the individual difference data in written form. Given that the control and two manipulations were set up in their own surveys, this task had to be done 3 times in total to create the final response tables in excel. After all responses were combined into a single document, data about the wines each respondent chose were merged with the response table using the "VLookup" function in Microsoft excel, and the "Wine ID" number as the index key.

The only remaining processing to be done at an individual level before analysis could be done was segment analysis and placement. For all participants, their responses to measures related to Knowledge of Wine, Openness to Experience, Need for Variety, and Price Sensitivity, were scored as high, moderate, or low. By using the values Segment trait values found in Table 1 (Section 2.1.2), each respondent to their respective segments for further analysis in hypothesis testing. There were a few outliers who could not even broadly be fit into segment descriptions – namely those who scored

as “high” on all 4 factors, or those who scored “low” on all four factors. As will be shown in descriptive statistics, there are very few people who fit these descriptions, so they will be excluded from further segmentation analysis.

7.6. Data Analysis

In this chapter, the analytical methods used to uncover and explore the results of the experiment will be introduced, before discussing data collection and processing steps to prepare the data for analysis formal analysis. To understand the responses better, descriptive statistics about the individual differences of respondents themselves, the choices they made in the experimental environment, as well as their answers to the survey will be observed. With a better understanding of who participated and how they generally behaved, the hypotheses presented in Chapter 6 will be tested to see if they can be quantitatively supported.

7.6.1. Analytical Methods

To better understand the effectiveness of the nudge implementations on the attitudes and behaviors of respondents, results will be examined using graphic and statistical methods to identify relationships and test their significance. With the help of tools like Google Data Studio, a free online data visualization platform built by Google, the results can be visualized and interacted with to discover and understand results. After understanding responses and the potential interactions present in the data, statistical methods can be run to examine the significance of the relationships, or the confidence with which researchers believe that these results would be replicated if the study were run again under the same conditions.

7.6.1.1. Data Visualization

Data visualization is a process which makes quantitative results more easily interpretable and is particularly useful in the data cleaning and exploration process (Unwin, 2020). In the data visualization process, the choices made by consumers in terms of their wine selection based on the experimental group can easily be discovered and compared, in addition to other decisive factors such as whether they interacted with the new “Environmental Footprint” filter or not. While these visuals can be helpful for identification of macro trends in the data, such as the total response composition or the average response values for each question, they are not an efficient source for deeper examination of statistically significant relationships between variables, meaning that they should be

supplemented by additional examination using statistical methods. As such, visuals from the Google Data Studio will help describe results and demonstrate key findings which can be then tested for significance by statistical methods. Relevant pages of the full Google Data Studio Report can be found in Appendix 13.

7.6.1.2. Statistical Methods for Hypothesis Testing

To test the interactions between variables in the research model, regression, Analysis of Variance (ANOVA), Chi-squared testing, T-Testing, and Correlation analysis will be used to explore the validity of the hypotheses presented in Chapter 6.

Linear regression looks for statistical relationships between variables and fits a linear line to the relationship produced between them (Dalpiaz, 2016). This analysis produces a "slope" coefficient which is a representation of the amount of expected change in the dependent variable for each change in the independent variable.

In the context of this study, mediation effects can also be used to measure indirect relationships of variables which influence one another along a sequence or path (Fuchs, 2020).

ANOVA is an analytical process which compares the variances of two variables to look for explanations of the others variance (Dalpiaz, 2016). Combined with regression, it is used in these tests as a measure of the reliability of the regression model, and confirmation that the two variables are related, and can be linked to one another's variance.

Chi-squared testing can measure significance of interaction rates in A/B test settings, and is often used to measure significant differences between results in digital marketing and advertising tests (Shin, 2020). It requires a relational metric, in this case interaction rate, and A/B versions like the M1 and M2. Being that male/female groups are a naturally occurring A/B in the sample, it will also be applied to test the gender effects on interaction rate.

T-tests are conducted on two sets of the same continuous variable, that have been observed under different conditions (Spector, 2021). The test itself confirms if there has been a significant change between their means or not, based on that change in conditions. In this case, the data regarding CO_2 per Liter of the selected wines will be used to compare the mean changes between the users of the filter and the control.

Correlation coefficient analysis examines the relationships of response values with one another to deliver a metric which can be thought of as the strength of the relationship in terms of how closely they are correlated (Soetewey, 2020). The methods used in this study for correlation analysis produce

"r" values, which describe the strength of the effect that can be expected from this relationship. In this study, correlation will be used to examine effects of filter use on post-purchase attitudes and opinions of their selected product.

In all cases, probability statistics (p) are produced to measure the statistical confidence of the effect found. P-values are directly related to the statistical power of the analysis, which are directly influenced by the strength of an effect and the sample size that it was measured in (Walmsley & Brown, 2017). If differences in responses to a dependent variable are smaller, then a larger sample size is required to confirm that those effects are predictably different, whereas large effects can be confirmed with smaller sample sizes.

7.6.2. Descriptive Statistics

To best understand the data from this study, the respondents who generated the data across the three experimental groups will be described based on their demographic data and segmentation. Then the wine's chosen by these respondents, specifically the footprint and packaging types chosen by respondents, will be examined to look for differences between the Control, M1, and M2. Finally, there will be a summary of survey responses related to the theoretical model presented in Chapter 6.

7.6.2.1. Respondents and their Characteristics

7.6.2.1.1. Demographics

As stated in the sampling section, Norstat was tasked with inviting a representative random sample of 450 adult wine drinkers to participate in the study, split evenly across the three experimental groups. This meant representation on dimensions of age, gender, and location across Norway. In the tables below, the distributions for each of these characteristics in this study will be shown, with an additional column benchmarking them with sample distributions collected by Opinion in their most recent study conducted to represent the same audience (2021):

Age	Control	M1	M2	Total	% of Total	Opinion Benchmark
70+	42	38	48	128	28.44%	0.00%
60-69	41	41	37	119	26.44%	35.09%
50-59	31	39	37	97	21.56%	
40-49	17	16	15	48	10.67%	19.61%
30-39	11	12	6	29	6.44%	20.64%
18-29	8	14	7	29	6.44%	24.66%

Table 5 – Age Distribution by Study group

Looking firstly at age in Table 5, the respondents tended to be much older than average population figures show for Norway, with over 75% of respondents over the age of 50, and the two largest age groups being 60-69, and 70+. Looking at the most recent study conducted by Opinion, their group of respondents between 50 and 70 years old only represented 35% of all respondents, with the remaining 65% of responses coming from Norwegians between 18 and 49. Most significantly underrepresented in the study are young shoppers between 18 and 29, followed closely by those between 30 and 39. Additionally, there are uneven spreading of these age groups across studies, with M1 accounting for nearly half of all respondents under 29 years old, and M2 having the most skewed proportion of respondents over 70 years old accounting over 32% of responses in that group.

Gender	Control	M1	M2	Total	% of Total	Opinion Benchmark
Men	97	95	104	296	65.78%	43.05%
Women	52	54	46	152	33.78%	56.95%
Non-binary	1	1	0	2	0.44%	0.00%

Table 6 – Gender Distribution by Study group

The gender distribution in Table 6 shows that there is also a clear an underrepresentation of women, with only just over one third of respondents being female. Benchmark data from the Opinion study showed that 56% of respondents who reported buying wine at their last visit to the store were female. This results in an overrepresentation of male participants, who make up nearly all other responses, with only two respondents of non-binary gender. In terms of distribution, there is relative consistency between the control and M1, but even more pronounced skewing towards male respondents in M2, with 69.3% of responses in that experimental group coming from men.

Location	Control	M1	M2	Total	% of Total	Opinion Benchmark
Østlandet	54	61	48	163	36.22%	29.36%
Vestlandet	29	18	23	70	15.56%	19.27%
Oslo	20	22	24	66	14.67%	17.20%
Midt-Norge	20	24	20	64	14.22%	15.02%
Sørlandet ink. TeVe	16	14	14	44	9.78%	10.67%
Nord-Norge	11	11	21	43	9.56%	8.49%

Table 7 – Location Distribution by Study group

Location response shown in Table 7 is closest to the benchmark provided by the Opinion study, with similar proportions of participants from every part of the country, and only marginal variation from benchmark shares. In terms of distribution across groups, there were even response rates in many regions, except for a few cases in Østlandet, Vestlandet and Nord-Norge. In M1, increased responses from Østlandet came mainly from respondents in Vestlandet, which experienced a large decrease compared to the control. While both grew closer to the control in M2, they would not return those

amounts due to many responses from Nord-Norge, with M2 accounting for 49% of total responses for this study.

Education	Control	M1	M2	Total	% of Total
Bachelor	51	68	68	179	39.78%
High School	51	48	47	146	32.44%
Master	43	32	40	115	25.56%
Doctorate	5	2	3	10	2.22%

Table 8 – Age Distribution by Study group

Education distributions, shown in Table 8 are mostly likely skewed by the age of respondents, where the most common level of education for respondents over 60 years old was high school. This trend decreases with age in the response data, with bachelors-level education found to be the most common between 40 and 59, and masters-level education the most common among respondents between 18 and 39. Doctorates represent the only break in this trend, with all doctor-level educated participants in age groups over 50. As a result, the older average age of participants in the study accounts for the high volume of responses in lower education levels, making them not misrepresentative of the respondents, but possibly misrepresentative of the Vinmonopolet market because of age misrepresentation previously discussed.

7.6.2.1.2. Segmentation

Additionally, each respondent answered a set of questions meant to place them in the wine-buyer segments that Vinmonopolet created with Opinion last year. Table 9 shows distribution of respondents in segments:

Segment	Control	M1	M2	Total	% of Total
Searchers	73	73	76	222	49.33%
Dedicated	48	37	45	130	28.89%
Price-focused	9	22	14	45	10.00%
All Low	11	7	7	25	5.56%
Conscious	6	10	6	22	4.89%
All High	3	1	2	6	1.33%

Table 9 – Segment Distribution by Study group

The segments' distribution sheds light on one key element which may play into the limited ability of the group. The most common traits are high levels of openness, found in both the Searchers and Dedicated (79% of respondents), and a low wine knowledge (66% of wine respondents). This implies that there is high potential for sustainability values among respondents, but there may be interactions with other individual differences, particularly age and gender, possibly hindering progress.

Additionally, most wine drinkers have limited ability to select wine due to their lack of knowledge of the category.

There are two segments of special users – those who score low on all placement criteria (All Low), and those who score high on all placement criteria (All High). While they may share some behaviors with other segments, it was not appropriate to classify them as members of any one group due to key differences, specifically in expected ability. For a detailed breakdown of average trait responses across groups, see Appendix 14.

7.6.2.2. User Behavior in Shopping Simulation

7.6.2.2.1. Filter Usage

After introducing the environmental filter to the shopping simulation, an essential part of the nudge's effectiveness is that individuals use it without being instructed to do so. Due to tracking limitations in the Figma prototype environment, this could not be measured automatically like it would be if it were tracked by Google Analytics. As a result, respondents had to self-report use of the filter in the survey. Figure 10 is a visual breakdown of reported use of the "Environenal Footprint" filter in Manipulation 1 and 2:

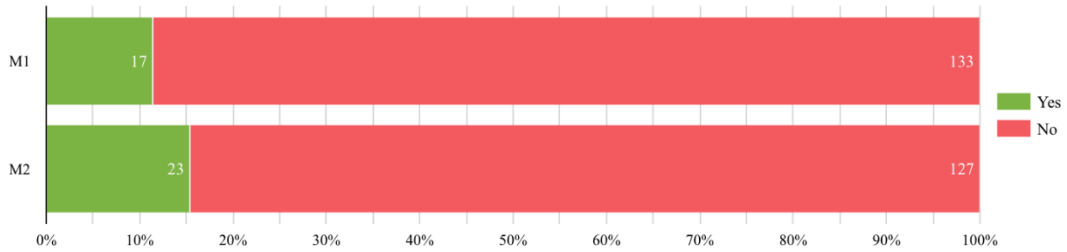


Figure 10: Filter Use by Experimental Group (Manipulations only)

The introduction of the filter, with a default setting of closed, resulted in an 11.33% interaction rate. By making the new filter visible to the user by default when they entered the shopping simulation, M2 saw a 35% increase in engagement compared to M1, resulting in a final engagement rate of 15.33% with the filter.

7.6.2.2.2. Wine Selection

The key dependent variable that this nudge aims to change is the CO_2 footprint of wines chosen by shoppers. Each option in the filters had a number of "footprints" associated with it which corresponded to the CO_2 weight (grams) per liter of the different types of wine packaging. Figure 11 gives a visual breakdown of the footprint selections by experimental group, displaying the footprint groupings, while Figure 12 breaks those groupings into packaging types:

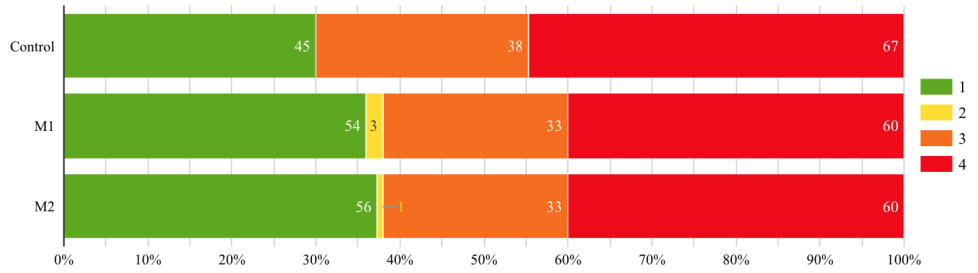


Figure 11: Footprint Distribution of Selected Wines by Experimental Group

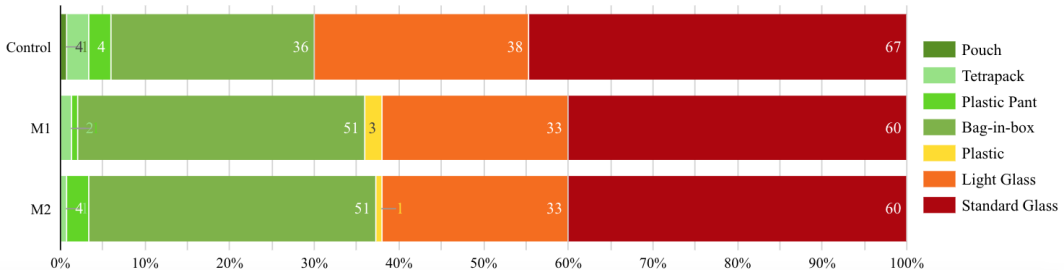


Figure 12: Packaging Distribution of Selected Wines by Experimental Group

Looking at the gross selection changes resulting from the introduction of the filter in M1 and M2, respondents selected away from heavy and light glass at the exact same rate in both manipulations, with an 10.45% reduction in Heavy glass selection, and an 13.16% reduction in light glass selection. Another consistency of the two manipulation groups the growth of "Bag-in-box" wine selection, which increased by 41.67% in both cases. Overall, the selection of other sustainable options in Footprint Level 1 went down after of the introduction of the filter, with the highest reduction coming in M1, dropping from 9 to 3, compared to the 5 in M2, where buyers who chose plastic pant bottles stayed the same as the control. Additionally, PET bottles selected in footprint level two were only observed in the manipulation groups.

On face value, this suggests that users who interacted with the filter made more sustainable choices in terms of wine packaging. By taking the same chart formatting and reorganizing the data by filter use, it is possible to investigate whether the filter was a contributing factor to driving this change. Figure 13 gives a breakdown of footprint categories selected based on filter use.

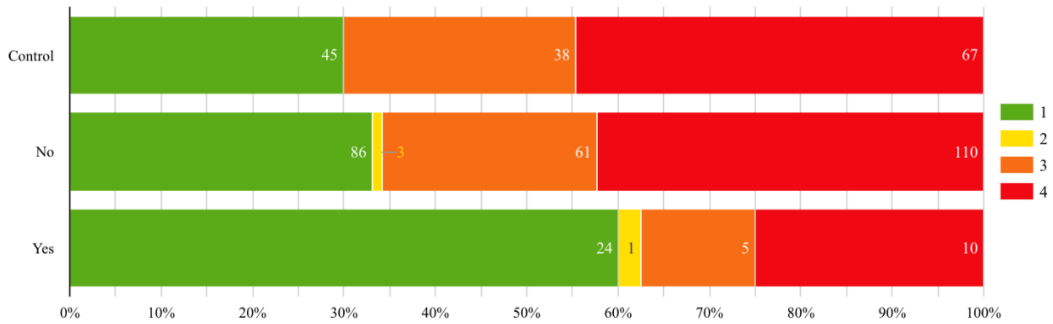


Figure 13: Footprint Distribution of Selected Wines by Filter Use (plus Control)

Compared to distributions for both the control and those in the manipulations who did not to use the filter, there are stark differences in wine selection, with 75% of wines coming from categories that Vinmonopolet considers to be "Environmentally Smart" options in their store today. Critically, 60% of filter users end up choosing wines in footprint level 1, which should result in a much lower mean value of CO_2 per liter.

Lastly regarding wine selection, the selection of 36 products were presented in the same order for every respondent, in 12 rows of 3 products each. When examining the top 10 most chosen wine across all studies, all three products placed the first row are present. In total, these three glass-bottled wines account for 99 of all responses, representing 22% of the total. In the Appendix 15, the wines chosen by respondents can be viewed, including the position they were shown in the store simulation, the name of the wine, the total number of times it was selected, and its packaging type and footprint level.

7.6.2.3. Survey Responses

After choosing a wine in the shopping simulation, the user was sent to a survey to ask them questions about their purchase decision. In this section, the survey will be broken down into two key question types: Attribute Evaluation and Post-purchase Evaluation. In each, the mean and standard deviations for relevant measures will be examined in each group.

7.6.2.3.1. Attribute Evaluation

The first question users were asked about the wine they selected was to rate each of these 9 attributes on a scale of 1 to 5 in terms of their importance to their choice. Table 10 displays the mean and standard deviations for these 9 variables across study groups.

	Control		**M1**		**M2**	
Attribute	Mean	Min	Mean	Min	Mean	Min
Taste	4.21	0.95	4.14	1.00	4.20	0.90
Quality	3.79	0.92	3.74	0.96	3.76	0.84
Price	3.28	1.14	3.43	1.05	3.47	1.10
Origin	2.86	1.32	2.72	1.31	3.01	1.31
Volume	2.83	1.40	2.98	1.43	2.95	1.41
Food	2.57	1.23	2.44	1.24	2.59	1.23
Environment	2.00	1.12	2.01	1.17	2.15	1.27
Design	1.93	1.14	2.01	1.12	1.90	1.03
Weight	1.72	1.12	1.73	1.03	1.87	1.17

Table 10 – Segment Distribution by Study group

Given that users had the opportunity to weigh the importance of certain attributes above others, but not in a structured rank-order, an "Attribute importance score" was created to represent the total

weight of a single attribute in the decision to select. This was calculated by taking the individual attribute score and dividing by the sum of all attribute scores. Figure 14 displays the average weight of importance of the various attributes when compared to one another based on their respective values.

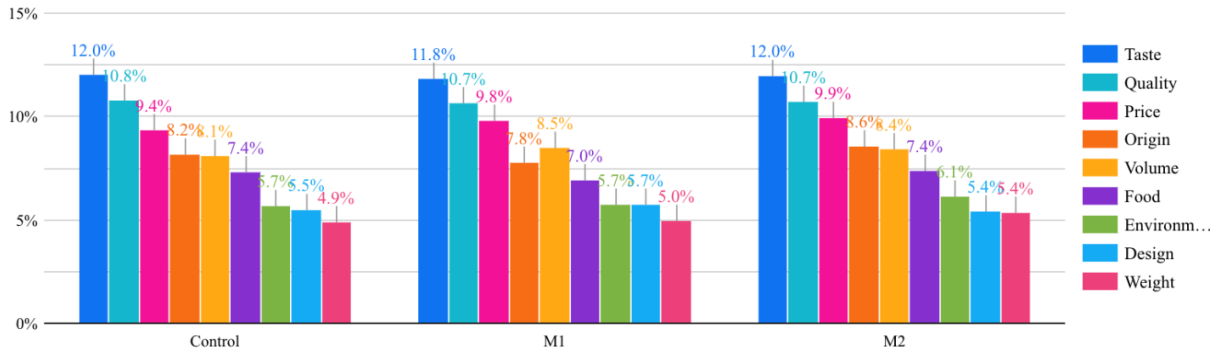


Figure 14: Attribute Importance in Selection by Experimental Group

Looking at the summary table and figure, there was a little effect on the importance of environment in M1, while M2 observed an overall increase compared to other attributes. Additionally, there was an increase in the standard deviation of environmental importance in both cases, signaling that there were more varied answers in parts of the response group, even if the mean did not shift drastically. Knowing that most users switched from glass to bag-in-box, it is also interesting to note that the importance of volume and price increased in both M1 and M2. Looking at the volume data in Table 10, there was high variation of importance of volume presumably due to this selection of bag-in-box.

7.6.2.3.2. Post-purchase Evaluation

After describing the factors which drove their choice, users were presented statements about their chosen wine for which they were asked to indicate to which degree they agree or disagree with. After the statements about their chosen wine, they were asked to answer some general questions about their choice, as well as some questions about their values and associations with sustainability, and finally their wine shopping behaviors. Appendix 12 gives a full breakdown of all questions, with their question text, standard mean and standard deviation by experimental group. Table 11 is a snippet examining factors of post-purchase opinion:

		Control		M1		M2	
Factor	**Measure**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Attitude	Jeg liker vinen jeg valgte.	4,06	0,75	4,08	0,74	3,98	0,79
	Jeg tror vinen jeg valgte vil stå til mine forventninger.	4,16	0,62	4,25	0,61	4,13	0,65
Choice Satisfaction	Jeg er fornøyd med mitt valg av vin.	4,11	0,70	4,21	0,64	4,13	0,71
	Dersom jeg hadde fått muligheten til å velge vin på nytt så ville jeg ikke ha valgt en annen vin.	2,55	0,98	2,39	0,98	2,55	0,97
Anticipated Regret	Jeg tror at jeg vil angre på mitt valg av vin.	1,85	0,77	1,77	0,74	1,92	0,78
	Jeg tror jeg kommer til å endre mening rundt vinvalget mitt.	2,17	0,88	2,09	0,82	2,17	0,85
Subjective Norms	De fleste av de menneskene jeg anser som viktige i mitt liv ville ha vært fornøyd med mitt valg av vin.	3,75	0,67	3,79	0,72	3,73	0,73
	De vennene jeg skal på den tenkte hytteturen med synes det vil være en god ide å kjøpe den vinen jeg valgte ut i nettbutikken.	3,80	0,63	3,81	0,70	3,81	0,76

Table 11 – Response Table for Post-purchase Opinions

In general, overall evaluations of wines are relatively unvaried across the studies, suggesting that opinions about attitudes and evaluations of choice are not very dependent on the addition of the filter. Not only are means for Attitude and Subjective norms relatively consistent across groups, but standard deviations are very low, showing that most responses cluster relatively close to this mean. This is also true for all questions which more closely examine these opinions, such as Choice Satisfaction, Anticipated Regret, where in general, most respondents answer these questions very similar across studies, regardless of their choice of wine. It is important to note that the second measure in Choice Satisfaction had high levels of variance and relatively low levels of consistency.

Across studies, there were meaningful changes across in Perceived Sustainability and Packaging as a Proxy for Sustainability. Table 12 gives the breakdown of those answers across studies:

		Control		M1		M2	
Factor	**Measure**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Percieved Sustainability	Jeg mener at mitt valg av vin var bærekraftig i lys av klimaendringene.	3,12	0,59	3,08	0,63	3,25	0,78
	Jeg tror vinen jeg valgte er miljøvennlig.	3,11	0,52	3,10	0,67	3,26	0,74
Packaging as Proxy for Sustainability	Jeg tror emballasjetypen er en god indikator på hvor bærekraftig den vinen er.	2,98	0,88	2,75	0,94	2,85	0,99
	Jeg tror emballasjen til en vin står for en betydelig del av vinens totale miljøavtrykk.	3,13	0,85	3,01	0,89	3,04	1,01

Table 12 – Response Table for Sustainability Evaluation

In both factors, respondents in the control answered to a stronger degree towards the middle of the Likert scale, with smaller deviations from the mean. In fact, the standard deviations of Perceived Sustainability around their means were the smallest measured in the study. In both experimental

groups, means changed, along with increases in standard deviations, meaning that users started taking more strong positions to these measures after the exposure to the new environmental filter.

7.6.3. Hypothesis Testing

All hypotheses were tested by applying the statistical methods discussed in Section 7.6.1.2. in R. All relevant R outputs can be viewed in Appendix 16.

7.6.3.1. Part I: Interaction with Filter

H1: The introduction of the filter will result in the filter's use, without requiring specific instructions to do so.

Based on what was observed in the descriptive statistics, 13.33% of respondents who had the opportunity to interact with the filter did so without direct instruction. As such, H1.1 is supported.

H1.1: Making the environmental filter visible by default will increase its interaction rate.

Given the results of 17/150 for M1, and 23/150 in M2 (where the filter was visible by default) an A/B test using a Pearson's Chi-Squared method can be conducted to test whether the performance of M2 is significantly better than of M1. Below are the key outputs values of the test:

χ^2 value = 0.72115
df = 1
p-value = 0.3958

The with p-value provided by the Chi-squared text was 0.3958, meaning that there is not enough confidence to reject the null hypotheses that these results could be randomly different. Despite being on the right track, H1.1 is not supported**.**

H1.2: The more respondents feel external pressure to make sustainable choices, the higher their interaction rate with the filter.

To test this hypothesis, a regression and ANOVA will be run, setting "Use of Filter" as the dependent variable, and the numeric values resulting from their responses to "Normative Beliefs about Sustainability" measure 2. This measure specifically asks about beliefs that are held by people close to the user. Figure 15 below displays of interaction rates by reported levels of normative beliefs, and Tables 13 and 14 show regression and ANOVA outputs for this relationship.

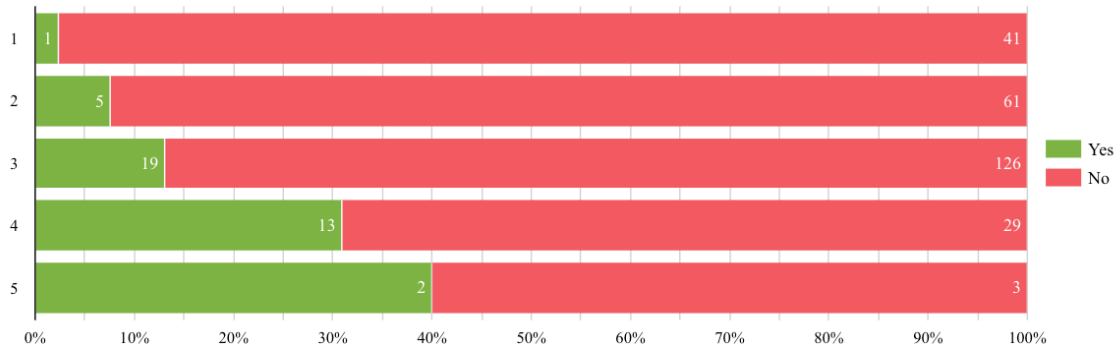


Figure 15: Interaction rate by Reported Normative Beliefs about Sustainability (1=Low, 5=High)

Regression Output	Result
Coefficient	0.08738
p-value	< 0.001 ***

Table 13 – Normative Beliefs Regression

ANOVA Output	Result
F-statistic	18.39
p-value	< 0.001 ***

Table 14 – Normative Beliefs ANOVA

Although the coefficient seems small, the relationship between these two is strong enough to achieve significance. It's important to note that Use of Filter is a binary metric of 1 when the filter is used, and 0 when it is not. As such, an incremental increase of +8.7% usage can be expected with each increasing level of normative beliefs felt. Thus, H1.2 is supported

H1.3: The more respondents value sustainability and try to be sustainable in their everyday life, the higher their interaction rate with the filter.

To test this hypothesis, a regression and ANOVA will be run, setting "Use of Filter" as the dependent variable, and the numeric values resulting from their responses to "Sustainable Values" measure 1. The Cronbach's alpha of measure 2 is quite low, suggesting that the question will not be a reliable metric to use in the study. Figure 16 displays of interaction rates by reported levels of sustainability values, and Tables 15 and 16 show regression and ANOVA outputs for this relationship.

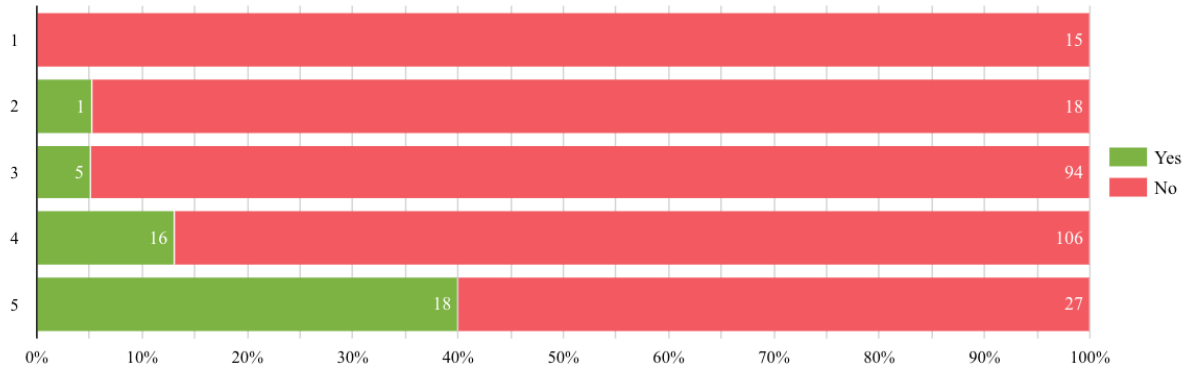


Figure 16: Interaction rate by Sustainability Values (1=Low, 5= High)

Regression Output	Result
Coefficient	0.10008
p-value	< 0.001 ***

Table 15 – Sustainability Values Regression

ANOVA Output	Result
F-statistic	27.5
p-value	< 0.001 ***

Table 16 – Sustainability Values ANOVA

These relationships are even more significant than those for normative beliefs, with higher coefficients and F-statistics, as well as even more significant p-values for both. Based on this analysis, stronger levels of environmental support on this scale will produce 10% increases with every step from 1 to 5. Therefore, H1.3 is supported.

H1.4.1: The interaction rate with the environmental footprint filter will be decreasing with age.

To test this hypothesis, a regression and ANOVA will be run, setting "Use of Filter" as the dependent variable, and the categorical values resulting from their responses to "Age". Figure 17 displays of interaction rates by age group, and Tables 17 and 18 show regression and ANOVA outputs for this relationship.

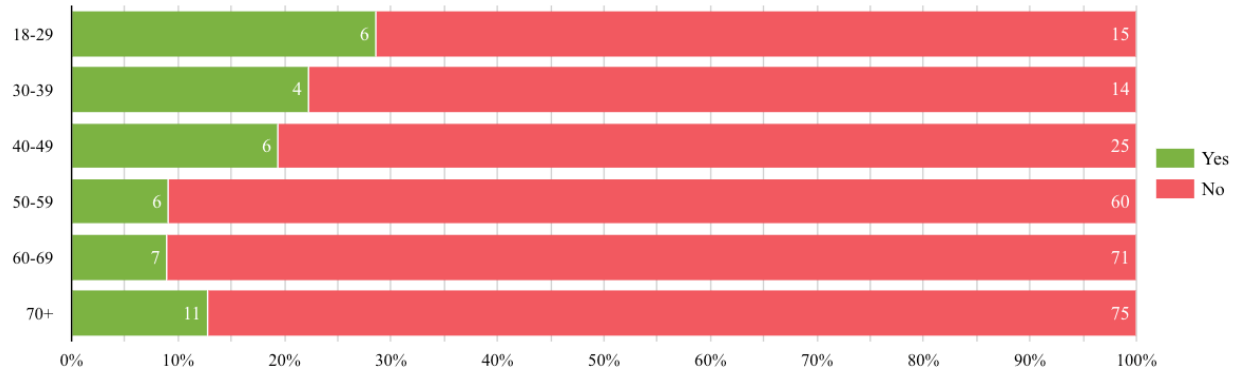


Figure 17: Interaction rate by Age

Age Group	Coefficient	p-value
18-29 (int.)	0.28571	< 0.001 ***
30-39	-0.06349	0.559515
40-49	-0.09217	0.335914
50-59	-0.19481	0.022257 *
60-69	-0.19597	0.019128 *
70+	-0.15781	0.056308

Table 17 – Age Regression

ANOVA Output	Result
F-statistic	1.768
p-value	0.119

Table 18 – Age ANOVA

This chart can be read as a comparison of the youngest age group – to all other age groups. Coefficients measure differences of each age group to the intercept, giving the size significance in change in engagement rate between each. Notably, there are significant drops in engagement among all groups above 50 years old. Between respondents 18-49, differences and sample sizes are small,

meaning statistic power to find a result is low. Overall, the ANOVA results summarize the findings succinctly, showing that there is no complete explanation for filter use based on age, although it is closer than some. H1.3 is partially supported.

H1.4.2: The interaction rate with the environmental filter will be higher among women than men.

Looking at differences by gender, there are stronger engagement rates among women in the study, with 17% of women using the filter while only 11.56% of men did the same, as seen in Figure 18.

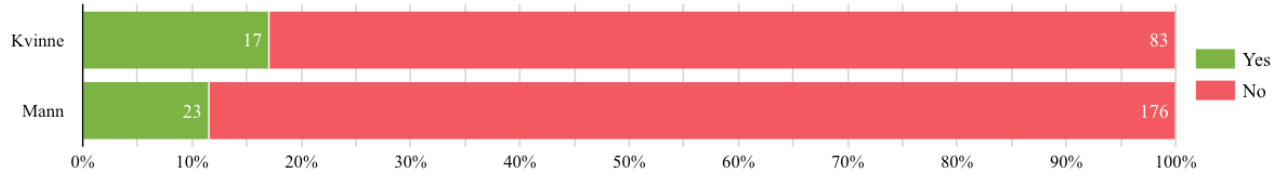


Figure 18: Interaction rate by Gender

The Chi-squared test can be employed find out whether this difference is significant:

$$\chi^2 \text{ value} = 1.2638$$
$$\text{df} = 1$$
$$\text{p-value} = 0.2609$$

While this test comes close to confirmation with a higher χ^2 and lower p-value than was achieved in H1.1 testing, it does not meet the confidence interval of 0.05. Thus, despite being directionally on the right track, H1.4.2 is not supported**.**

H1.4.3: The interaction rate with the environmental filter will increase with levels of education.

To test this hypothesis, a regression and ANOVA will be run, setting "Use of Filter" as the dependent variable, and the categorical values resulting from their responses to "Education". Figure 19 displays of interaction rates by education level, and Tables 19 and 20 show regression and ANOVA outputs for this relationship.

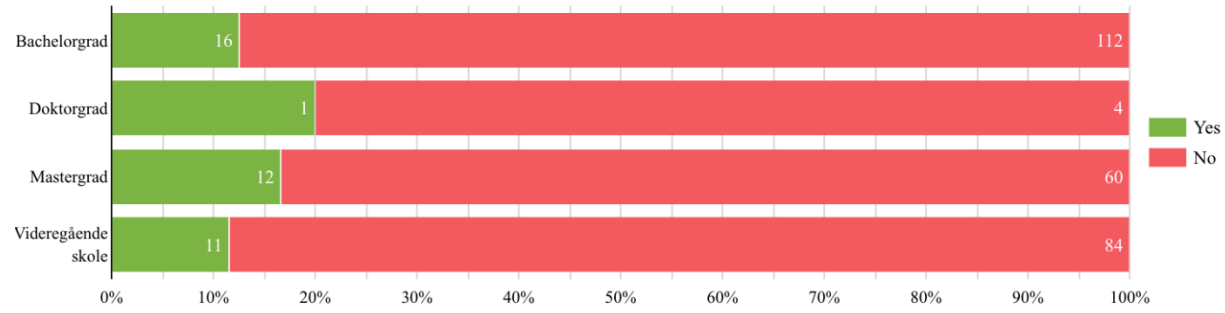


Figure 19: Interaction rate by Education

Education	Coefficient	p-value
High School (int.)	0.115789	0.00107 **
Bachelor	0.009211	0.84229
Master	0.050877	0.34118
Doctorate	0.084211	0.59141
Overall		0.7523

Table 19 – Education Regression

ANOVA Output	Result
F-statistic	0.401
p-value	0.752

Table 20 – Education ANOVA

While there are variations in the interaction rates that may be directionally in line with the hypothesis, the statistical power to confirm the relationship does not exist due to how close the rates are to one another. Overall, the ANOVA results deliver the lowest F-statistic yet, showing that H1.4.3 is not supported.

H1.4.4: The probability that residents in Oslo will use the environmental filter is higher than for the inhabitants of other areas of Norway.

To test this hypothesis, a regression and ANOVA will be run, setting "Use of Filter" as the dependent variable, and the categorical values resulting from their responses to "Location". Figure 20 displays of interaction rates by location and Tables 21 and 22 show regression and ANOVA outputs for this relationship.

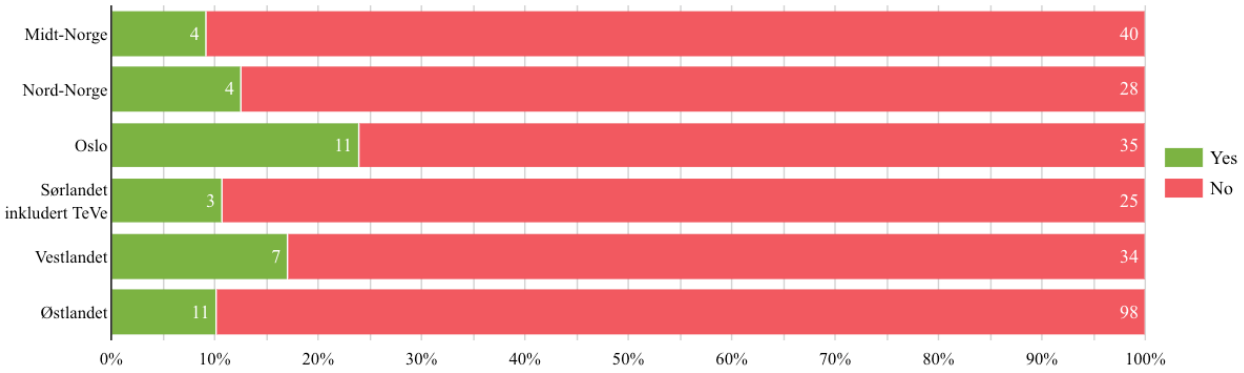


Figure 20: Interaction rates by Location

Location	Coefficient	p-value
Oslo (int.)	0.23913	< 0.001 ***
Vestlandet	-0.06840	0.3489
Nord-Norge	-0.11413	0.1452
Sørlandet + TeVe	-0.13199	0.1059
Midt-Norge	-0.14822	0.0393 *
Østlandet	-0.13821	0.0213 *
Overall		0.2368

Table 21 – Education Regression

ANOVA Output	Result
F-statistic	1.367
p-value	0.237

Table 22 – Education ANOVA

Based on this output, there is a significantly higher interaction with the filter from respondents in Oslo than those in Midt-Norge and Østlandet. While Oslo still has the highest rate above all other parts of the country, there is not enough statistical power to fully support this hypothesis. Therefore, H1.4.4 is partially supported.

H1.5: Segment membership will drive level of engagement with the filters, with Dedicated member most likely to engage, then Searchers, Price-focused and finally Conscious.

Looking at engagement rates by segment in Figure 21, there is not even directional support for this hypothesis, with users with Conscious buyers out-performing those in the Dedicated segment.

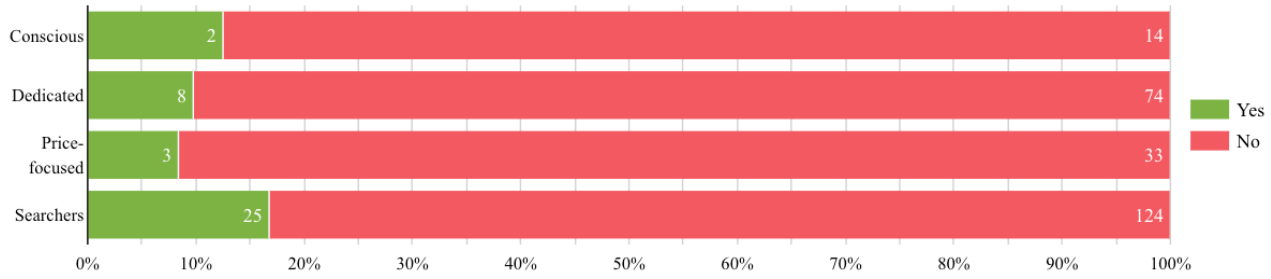


Figure 21: Interaction rates by Segment

Based on a lack of directional support, H1.5 is not supported.

7.6.3.2. Part II: Effect of the Filter

H2.1: Wines selected by filter users will have a lowered level CO_2 per Liter.

To test the effect of filter use, two T-tests on CO_2 Per Liter of chosen wines will be performed: Filter Users vs. Control, and Filter Users vs. Non-Users in Manipulations. Figure 22 below displays average CO_2 Weight based on filter use, and Tables 23 and 24 show the results of their T-tests.

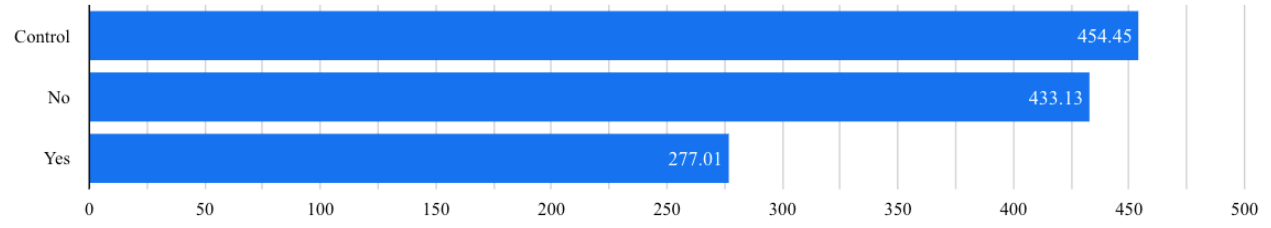


Figure 22: Avg. CO_2 Weight (Gram / Liter) of Selected Wines by Filter Use (plus Control)

Filter vs. Control

T-test	Result
t-value	3.4645
p-value	< 0.001 ***

Table 23 – T-test Compared to Control

Filter Users vs. Non-users

T-test	Result
t-value	3.1841
p-value	0.002442

Table 24 – T-test Compared to Non-users

In both cases, there are significant differences in the means, showing that the wines selected by using the filter will significantly reduce the mean value CO_2 per liter of bottles purchased. H2.1 is supported.

H2.2: The attribute "Environmental Footprint" will be considered more important to filter users.

H2.3: The increased importance of the "Environmental Footprint" attribute will have a mediating effect on choices of wine, resulting in the selection of wines with lower CO_2 per Liter.

Evaluation these two hypotheses requires mediated regression analysis, in order to compute the regression coefficients projected on each section of the path on the way to the dependent variable. As a reminder, Use of Filter is a binary variable, Attribute Importance is a percentage between 0 and 100% depending on the relative importance of Environment, and CO_2/Liter is a continuous metric attached to the chosen wine. Figure 23 breaks down the relationship, regression, and ANOVA results.

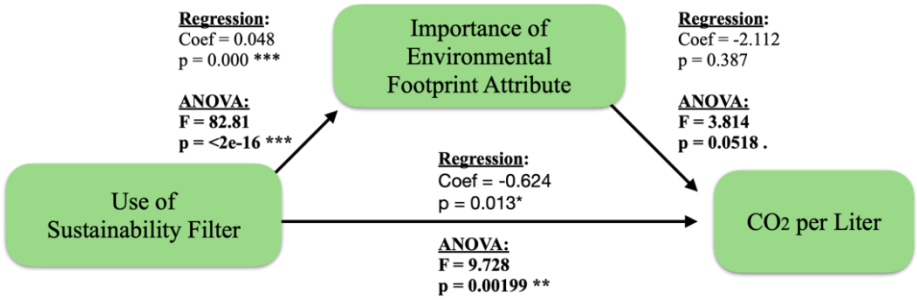


Figure 23: Mediation Model between Use of Filter, Attribute Importance of Sustainability, and CO_2 per Liter

Looking at the different relationships, although Use of Filter significantly increases the overall importance of Environmental footprint, it is not a good explainer for why people choose sustainable products, when considering all users in the manipulation group. This may be different if a smaller subset of data was examined, since many people chose bag-in-box without considering footprint a key attribute. Thus, H2.2 is supported, while H2.3 is not supported**.**

H3: Respondents who use the environmental filter will have higher beliefs that their choice was sustainable than those who do not use it.

To test this hypothesis, a regression and ANOVA will be run, setting "Perceived Sustainability" as the dependent variable, and the "Use of Filter" as the independent. Figure 24 below displays of mean values of both Perceived Sustainability broken down by filter use, and Tables 25 and 26 show regression and ANOVA outputs for this relationship.

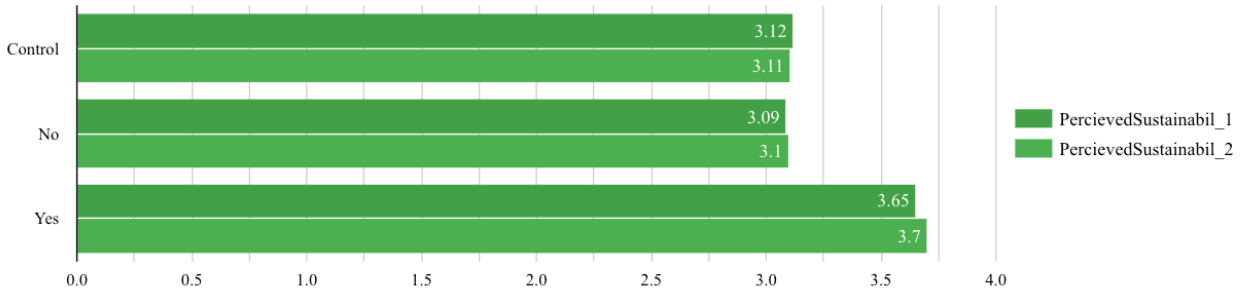


Figure 24: Perceived Sustainability by Filter Use (plus Control)

Regression Output	Result
Coef.	0.56154
p-value	< 0.001 ***

Table 25 – T-test Compared to Control

ANOVA Output	Result
F-statistic	23.26
p-value	< 0.001 ***

Table 26 – T-test Compared to Non-users

These outputs strongly support the significance of what can be observed in the chart, that users who chose wines using the Environmental Footprint filter perceive their wines to be generally more sustainable than those who do not. Therefore, H3 is supported.

H4: People who used the environmental filter will have a more positive opinion of their purchase than those who do not use it.

Looking at the overall changes in opinion resulting from use of the filter, it's most effective to examine correlation plots to see where relationships exist, and how strong they are. Figure 25 displays this plot with the following variables: Uof =Use of Filter, A=Attitude, CS = Choice Satisfaction, AR = Anticipated Regret, PEW=Packaging Effect on Wine, SN = Subjective Norms. In place of p-values, stars have been added to mark significant correlations.

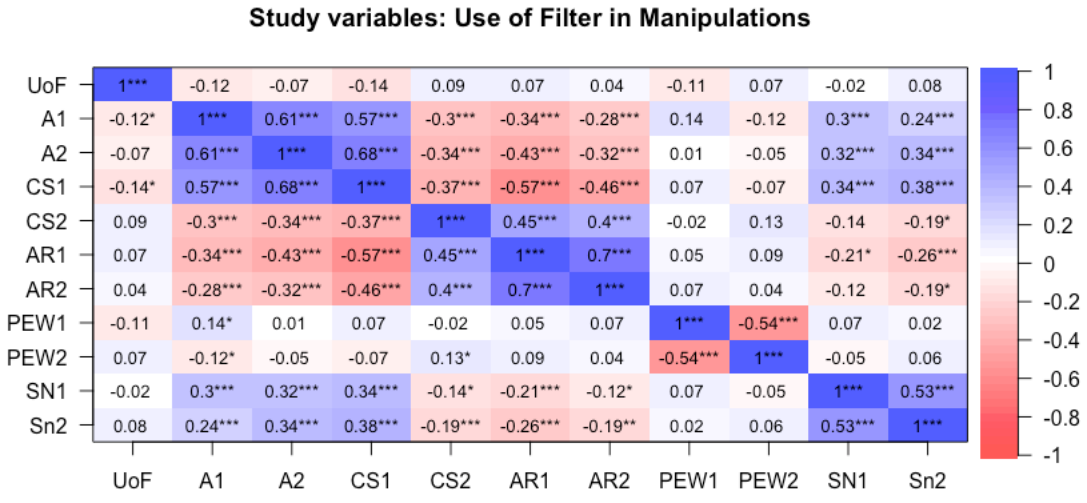


Figure 25: Correlation Matrix of Use of Filter with Reflective Opinion Factors

Looking at the correlation matrix, and specifically the left-hand column, the first thing that one must notice is the decrease in attitudes and increases in regret found by the choice. In fact, A1 and CS1 are significant, signaling that users' opinions about the wines they buy are lower than those who do not. It is important to note that none of these effects are strong enough to generate "negative" attitudes, or disagreement with the measures. Thus, H4 is not supported.

7.7. Quality of Research: Validity and Reliability

In quantitative research, validity and reliability are two measures of quality (Heale & Twycross, 2015). Validity concerns the appropriateness of the measures used and the accuracy in the analysis of results, internal validity, as well as the generalizability of the findings, external validity (Saunders et al., 2019). Reliability is the extent to which a study's findings will be consistent if the research is replicated (Saunders et al., 2019).

7.7.1 Validity

In an experiment, internal validity is determined when an intervention can be shown statistically to lead to an outcome rather than this outcome being caused by other variables acting simultaneously (Saunders et al., 2019). Setting up an experiment in an artificial environment gave researchers high control over the process and increased the probability that results were attributed to the manipulations rather than to other external factors (Saunders et al., 2019). Moreover, researchers investigated the interactions of possible mediating, moderating and confounding variables in existing literature and previous studies conducted on behalf of Vinmonopolet, with the aim of setting up a model and an experiment taking into account the most influential ones.

In relation to the survey, it is also relevant to check for content validity, namely the extent to which the questionnaire provides adequate coverage of the investigative questions (Saunders et al., 2019). To achieve content validity, researchers carefully defined the research through the reviewed literature as well as discussed, the structure of the survey and the suitability of the questions with two academic professors, receiving useful feedback and implementing the suggestions for improvement before the distribution.

Construct validity is also relevant in this case, being the extent to which a set of questions actually measures the presence of the construct intended to measure, such as attitude scales (Saunders et al., 2019). This was ensured by making the questions' lexicon and wording checked by two Norwegian native speakers, to minimize miscomprehensions.

The survey was also checked for convergent and divergent validity. Convergent validity is the overlap (the correlation) between the different scales, in this case being questions, used to measure the same construct (Saunders et al., 2019). The correlation coefficient between each question was computed with R and can be seen in Appendix 17. In general, questions measuring the same or similar concepts were found to have a high correlation coefficient, as expected, except for the two questions measuring Choice Satisfaction and Need for Variation. In both cases, the poor correlation was likely caused by the second statement asking to rate the opposite concept than the first, also being longer and more complex, therefore probably resulting in confusion among respondents. Discriminant validity occurs when different scales used to measure theoretically distinct constructs have a low or lack overlapping (Saunders et al., 2019). The correlation coefficient of questions measuring separate concepts was generally found to be low.

Finally, when collecting data aiming at predicting customers' future buying behaviors, it is also relevant to test criterion-related validity, also known as predictive validity, namely the extent to which the choice of wine in the experiment actually predicts customers' buying behaviors (Saunders et al., 2019). Given the limited time scope of this research, it is impossible for researchers to determine whether the responses obtained from this research made accurate predictions. If the new filter was implemented on Vinmonopolet.no, the data from the experiment could be compared to those obtained from the website and predictive validity could be computed through statistical analysis such as correlation (Saunders et al., 2019). However, given the non-representativeness of the participants of this experiment, skewed towards less sustainably-minded demographic groups in the study, testing on the actual website may see increased effects from those measured here.

External validity is the degree to which the findings obtained from a research are generalizable to other relevant contexts (Saunders et al., 2019). Setting up an experiment in a controlled environment is the best way to rule out alternative explanations, however, external validity is lower with this design than in field experiments (Saunders et al., 2019). In this study, what could limit the most the generalizability of the findings is the fictitious and pre-imposed purchase situation: participants may behave a bit differently when actually buying wine. Moreover, the skewness of the sample in favor of elderly people and males is another important limit to the generalizability of the results to the entire Norwegian population. Finally, even though the experiment was designed as similar as possible to the real website, some functionalities and filters were not available. Additionally, the inventory was very limited, thus people might not have liked the alternatives available in the sample. These elements further contribute to decrease the generalizability of the finding of this experiment to a possible application on the real website. Further implications of these aspects will be discussed in Chapter 9, research limitations.

7.7.2. Reliability

Reliability is the extent to which a study's findings will be consistent if the research is replicated (Saunders et al., 2019). There are different approaches to assess the reliability of a study. In this study researchers used "check questions" and verified internal consistency (Mitchell, 1996). The comparison of alternative forms of questions, as explained in Section 7.4, showed high levels of consistency between all the measured concepts, except for Sustainability Values. A possible explanation for this is that the wording of the second sentence might have presented sustainability as important in general, perhaps in terms of governmental or business policies, while the second could have been interpreted as something important in the individual's everyday life. Researchers also used a statistical measure to exactly compute the internal consistency of each set of questions, the Cronbach's alpha. Cronbach's alpha is the most appropriate consistency test for multi-question surveys involving Likert scales (Saunders et al., 2019). Appendix 18 shows the Cronbach's alpha values for each pair of rating questions. All of them have values above 0.7, indicating that the questions combined in the scale are internally consistent in their measurement (Saunders et al., 2019), except for the two sentences measuring Choice Satisfaction and Need for Variation, consistently with the issues found for these two concepts when analyzing convergent validity.

7.7.3 Pilot Testing

Pilot testing allows to obtain some assessment of the experiment's validity and the likely reliability of the data that will be collected (Saunders et al., 2019). A first informal pilot test of this study was performed on friends and family members. First, researchers ensured that respondents had no issues in understanding or answering the questions and followed all the instructions correctly (Fink, 2016). Then, participants were asked to give any comments, but they were also specifically asked about the correct functioning and the length of the entire process, the clarity of instructions, the presence of unclear or ambiguous questions, if any, and the attractiveness of the layout. This provided researchers with at least an idea of the survey's face validity, that is whether the questionnaire appears to make sense (Saunders et al., 2019).

Then, another formal pilot test was performed in collaboration with Norstat on a small group of people, around 15, with similar characteristics to the actual respondents, before the link to experiment was distributed to the entire sample. The responses gave researchers an idea of the reliability and suitability of the questions. Moreover, the pilot test was also to verify the well-functioning of the link sent by email, Figma's loading time and compatibility with various browsers and computers, as well as the links connecting Figma, Qualtrics and Norstat's website, the latter used at the end of the

experiment for the tracking of participants. Some respondents sent negative feedback, reporting difficulties in proceeding with the experiment in Figma. To mitigate this from further respondents, researchers made a modification to the first landing page to make it easier to understand and more user-friendly. This ensured that participants did not have technical issues and that researchers could register data correctly (Saunders et al., 2019). The information collected from this pilot test were used to undertake a preliminary analysis aimed at ensuring that the data collected enabled to answer the survey's investigative questions (Saunders et al., 2019).

7.8 Research Ethics

No ethical concerns were identified when conducting the research project. This assessment was justified by the investigated topic being generally considered as non-sensitive, as well as by the anonymity of participants guaranteed by Norstat. The researchers never interacted directly with the respondents and did not get their names nor contact information such as email addresses.

Unfortunately, it was not possible to properly debrief participants at the end, because they had to be automatically redirected to Norstat's website right after the survey, in order for the company to track the number of responses obtained and to guarantee respondents to get points for participation.

However, participants were informed in the initial email that their answers would contribute to a study investigating how to improve the user experience on Vinmonopolet.no. They were also told that, if they had further questions, they could contact Lars Jacob Tynes Pedersen at lars.pedersen@nhh.no.

8. Discussion of Results

In this chapter, the outcomes and interactions of the tested hypotheses will be synthesized into key findings which to inform the direction of the marketing and strategic choices made by Vinmonopolet.

8.1. Filter Use is Moderated by a Diverse Mix of Factors

Looking at the results of hypothesis testing in part one, interaction with this new filter will vary based on the individual buying wine, their age, whether they live in Oslo or in less populated regions of the country, and most importantly, the degree to which sustainability is something they value strongly and feel pressure to form buying decisions around.

Among the 450 respondents, 264 responded that they agree or strongly agree that they care about sustainability and climate change. Additionally, 196 of those 264 agreed or strongly agreed that they try to reduce their impact based on sustainably minded decisions while shopping.

Even though the respondent group skewed towards demographics who were less likely to interact with the filter – especially older people – the high value and importance of sustainability is something which will continue to motivate evaluations across consumer groups and increase filter interaction. Knowing that the youngest segment of consumers was the most likely to engage with the filter, these values can be projected to grow in the future.

Making this filter visible by default was not enough to significantly improve usage at this sample size. Nevertheless, given the that filter use is a confirmed driver of CO_2 reduction, strategies to promote and educate users about its presence should further improve interaction rates. Further strategies to improve use based on nudge and communication tactics will be discussed in the Marketing Implications section.

Consumer personality and segment groupings were not of high importance for filter interaction, which likely is related to experimental constraints; that there was no actual purchase decision to be made, and no reward of the actual chosen wine afterwards. All in all, risks associated with the choice were low, meaning that normal levels of involvement may not have been accurately simulated. More about the limitations of the experimental environment will be discussed later in Chapter 9.

These individual difference factors on filter use may also moderate the way in which people's evaluations and resulting behaviors change. With only 40 respondents using the filter in this study, the statistical power to test these impacts is not strong enough to prove significant differences in filter impacts. As such, future research should be directed towards the exploration of moderating effects on attribute evaluation resulting from filter use.

8.2. Filter Use Increases Selection of Low Footprint Wines

While the filter was always meant to encourage switching away from heavy glass wines, the amount of switching away from both heavy and light glass options to those in footprint level "1" drove the major decreases in average CO_2 per Liter that were observed after filter use. This shows that the evaluation of self-concept among those who used the filter is to minimize impact, not just to avoid the worst outcome of buying wines with highest impact levels.

8.2.1. Bag-in-box Sees Sharpest Selection Increase

Interestingly, but perhaps not surprisingly given their existing popularity as observed in the control, bag-in-box packaging options were the largest beneficiaries of the switching behavior caused by the filter. Wines in this packaging category have the lowest CO_2 per liter available, and they are already widely adopted by consumers for their lower price per liter, and higher volume. Interestingly, 47% of consumers who claimed not to care at all about sustainability at all bought bag-in-box with those two attributes listed as key drivers of choice. Looking at the attribute evaluations of those who selected bag-in-box wines, filter use results in environmental attributes jumping from the least important attribute in the control to the most important attribute, even more than volume and price. Figure 26 below breaks down these evaluations of bag-in-box attributes, comparing control, all manipulation responses with no filter use, and all manipulation responses who did use the filter.

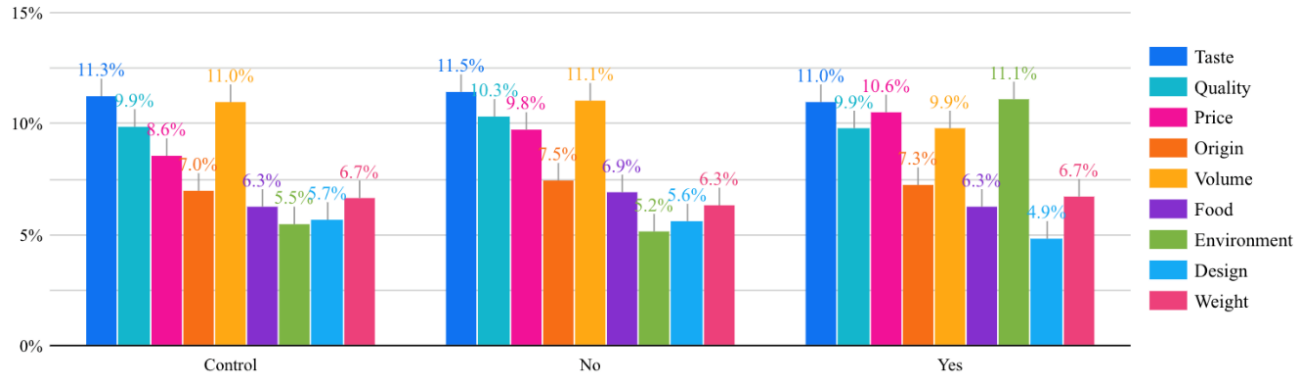


Figure 26: Bag-in-box, Attribute Importance Evaluations based on Filter Use (plus Control)

8.3. Order Volume of Wine Increases

With bag-in-box as the main packaging type selected as the result of filter use, examination of the impact this has on average volume selected can give indications of other social effects which may be the result switching behavior.

The budget constraints of 500 kr. allowed users to choose any product, at any quantity which they found suitable to the prompt of a weekend cabin trip with their friends. All packaging types were 75cL or under, whereas bag-in-box options are 3 L, making them equivalent to four bottles of wine. If a shopper was considering bottled wine priced over 250kr, they would only be able to select the one bottle, while bottles costing less than 125kr could be selected in quantities of up to 4.

Figure 27 below gives average volume selected by respondents in the control, those in manipulations who did not use the filter, and those who did:

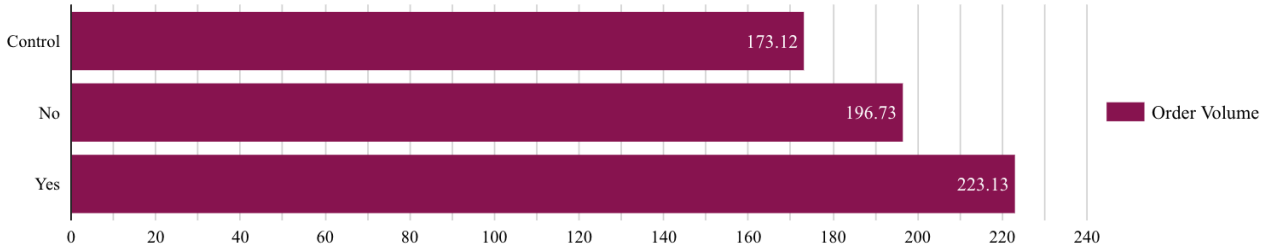


Figure 27: Average Order Volume by Filter Use (plus Control)

T-tests conducted comparing total volume between filter users and the control show significant differences in the means between the control and filter users ($p = 0.02978$). This increase in volume purchased due to bag-in-box selection introduces the finding that more sustainable choices may also lead buyers to buy more alcohol than they otherwise would. This effect is nearest described in the literature as the licensing effect, where choosing a sustainable option in one part of their life may make feel they have the "license" to make a decision which may be less sustainable or socially positive (Phipps et al., 2013). Price and Volume are also large factors at play in the selection of bag-in-box wines, since they have the lowest cost per liter of all packaging categories. By showing customers how much they reduce their footprint in addition to saving money at a higher volume, the indulgence of the extra volume becomes even easier to justify.

While buying bag-in-box wine is by no means taboo among Norwegian consumers, avoiding overindulgence in alcohol has long been a goal of Norwegian alcohol regulations, and a part of why Vinmonopolet was started in the first place (Folkehelseinstitutet, 2020). While this filter cannot be considered promotion of bag-in-box consumption, the low very low environmental footprint of bag-in-box wines allow them to benefit the most compared to other low-footprint packaging types. This is largely in part to its existing widespread adoption among Norwegian consumers, where in 2020, it was reported that bag-in-box sales account for over 50% of all wine sold (Vinmonopolet, 2021).

From another perspective, the 500 NOK budget given to all respondents may not reflect what a real consumer's budget for their regular wine shopping. Bag-in-box wines are cheap when comparing cost-per-liter, but due to their three-liter volume, they may not be within the budget of shoppers.

Additionally, this experimental environment was limited in its ability to let users choose multiple products, something which may have made it more reasonable to pick bag-in-box since variety was not an option to begin with. For those who have a high need for variety, the extra cost of lower volume packaging may be justifiable if they can try four different types of wine instead of having the equivalent volume in a single 3-liter container. Cart variety might also contain evidence of other licensing effects, where users who buy a product in low the footprint categories are more likely to buy high footprint options to supplement them. Alternatively, those who select a higher footprint

wine first may justify buying extra bottles of lower footprint wines, with the belief that at least their extra consumption has low impact. While this is better than buying two options with high footprint, it still may result in both higher volumes purchased, and possibly low reduction in CO_2 per order.

Ultimately, the licensing effects of this filter are a key issue resulting from this experiment. The results show that in this context, users allowed themselves to purchase more wine on average than they might have otherwise. As such, future research should be conducted to further explore these effects. To test the effect at a lower price point, this test could be run again with a different situational prompt and budget. With this, one could observe whether low-footprint packaging types would benefit in the same way that bag-in-box did in this study, and if the same effects of higher volume would be observed from other low-footprint packaging choices. Tests of the influence of the filter on cart variety will have to be run in a live website to give shoppers the ability to choose multiple products – this feature is not supported in the Figma prototype.

8.4. Opinions of Chosen Wine Weaken After Filter Use

While opinions do not become negative as a result of filter use, the negative correlations with attitude and satisfaction after filter-use signal that consumers do not experience the "warm-glow" effect as initially predicted. Alternatively, their worsening opinions of their chosen wine compared to the control may signal that they are experiencing liability effects resulting from their choice, particularly if they may have otherwise purchased a bottle in glass. Liability effects occur when consumers perceive that they are making a trade-off when choosing a sustainable product, and that it's functional qualities may be negatively impacted as a result (Luchs, Naylor, Irwin & Raghunathan, 2010).

When evaluating the products, attributes can be broken into "core" attributes and "peripheral" attributes (Skard, Jørgensen, & Pedersen, 2020). Core attributes are essential to the product belonging to the category, in this case, the liquid wine itself. Packaging, on the other hand, is a peripheral attribute, meaning that it is a part of the product, but does not change the way the contents were produced. These attributes are impacted differently depending on how they are judged by the consumer as either "strength-related", or "gentleness-related". Strength related attributes are common in products like home cleaning products, or antibacterial products like hand sanitizer. Gentle products are those which are usually associated with self-care, such as body lotions and shampoo.

Determining whether the core and peripheral attributes of a bottle of wine are strength- or gentleness-related is difficult to determine compared to products like household cleaners and personal care items. However, given that it is consumed, it can be inferred that gentleness of the core attributes are

important. Interestingly, focus groups and surveys from Opinion (2020;2021) in Norway show that people are reluctant to choose alternative packaging such as plastic, not because of its sustainability, but because of its effect on the quality and taste of the wine. This suggests both concern for the gentleness of the core attribute, as well as value for the strength that glass options provide.

In a study to examine the effects of green labelling and packaging changes on products in strength and gentleness categories, it was found that liability effects were present in judgements of strength-related categories, where both core and peripheral attributes had measured effects as a result of green-changes. Conversely, if the product category was "gentle", evaluations of core attributes benefitted from the new labelling. (Skard et al., 2020). If wine packaging were deemed to be a strength-related attribute, then this would be problematic, especially in cases where the packaging itself is being promoted for its specific sustainable properties.

It should be noted that this nudge is different from the manipulations conducted by Skard et al. in that it does not give users information about what makes individual products more sustainable, only that it's packaging category requires less carbon to produce than others. By focusing on the outcomes of footprint reduction for entire packaging categories instead of inherent product attributes of individual products, judgements may not be formed in the same way in relation to sustainability liability effects.

Ultimately, there is little learned about the liability effects experienced, if any, by users who are influenced to switch wines because of the filter. Being that negative with correlations with filter use are so weak, these measured effects are very small – with no significance found in relation to increased anticipated regret, even though the correction coefficient was positive. Investigating how users perceive the strength and gentleness of wine, and the effect of this filter on possible liability effects is another open topic for further research.

8.5. Overall CO_2 Footprint Increased

Looking at the overall CO_2 weight ordered by all respondents – multiplying weight of each product by quantity selected – overall CO_2 footprint can be calculated for each group. Figure 28 below gives an indication of CO_2 Footprint for each experimental group, broken out by the footprint categories.

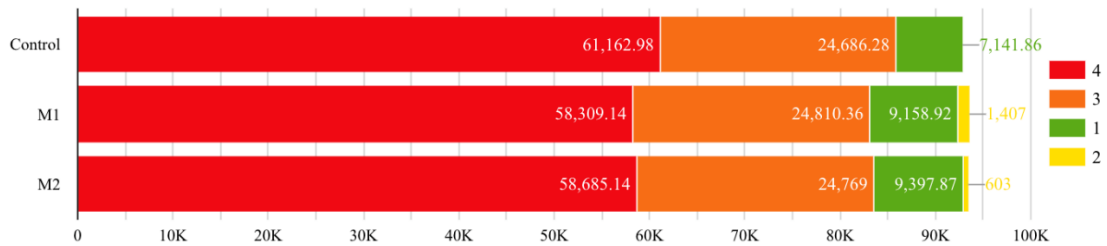


Figure 28: Total Carbon Weight (grams) by Experimental Group

Looking closer at this data, despite 10.45% reduction in heavy glass selection and an 13.16% of light glass selection, higher quantities meant that heavy glass footprint only was reduced by a maximum of 4.67% in study 1, while light glass footprint increased in both M1 and M2. Reflecting on the choices made by respondents, and that 22% of respondents chose the glass-bottled wine which appeared in the top row of the store, it is likely that laziness in responses due to long load times led many users to simply not interact. Interestingly, nearly the same number of respondents behaved this way in each study, with 32 in both the Control and M1, and 35 in M2. Figure 29 re-examines this same analysis, but controls for interaction by excluding wines in the top row.

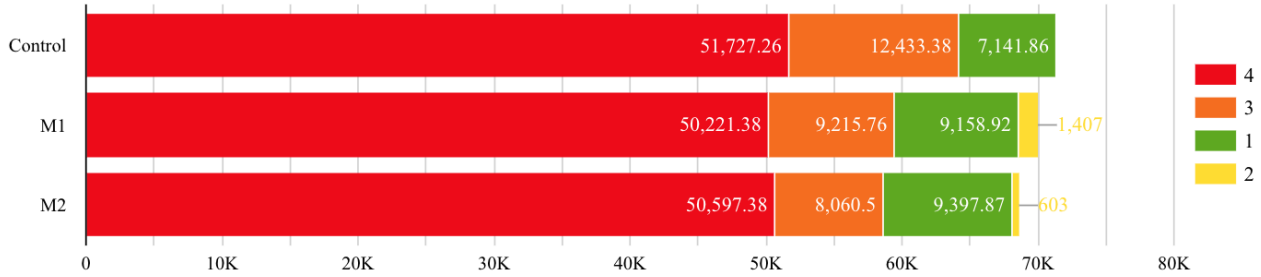


Figure 29:Total Carbon Weight (grams) by Experimental Group, Excluding Top Row

Re-examining these numbers, the expected decrease resulting from the filter appears. By controlling for engagement, the total carbon footprint decreased by 1.8% in M1 and 3.7% in M2.

9. Research Limitations

9.1. Limits of Figma

The first relevant limitation of this study is the relatively small inventory of 36 items. This very likely reduced the need for participants to use the available filters, possibly explaining why many respondents did not interact with them at all. The need for filtering is much higher on the real website, where consumers can choose from more than 11,000 different red wines. The reduced number of products used in the experiment was forced by the limits of Figma in terms of memory and loading time, along with the complexity and time-consuming activity of setting up active filters for a much higher number of products. Figma's main professional use is to build prototype designs for websites, and give examples of possible functionalities, not replicating real website functions. By attempting to replicate website functions in this experiment, the file size of the simulations increased significantly to a point where the prototype reached the maximum size supported and had to constantly be designed with file size in mind. The more complex the environment, the more memory and time to load required.

Furthermore, the platform's reduced capacity meant that some of the filters and functionalities available on Vinmonopolet.no could not be implemented in the experiment. More specifically, it was not possible to implement more than four filters. While the analysis from Google Analytics highlights that users are most likely to use a maximum of 4 filters, the presence of a reduced number of filtering options might have given a higher visibility to the environmental filter and an incentive to interact with it. This could have led to inflated findings resulting from the introduction of the new filter. Additionally, the functionalities of the prototype had to be greatly reduced from those which can be found on the actual website. For example, on Vinmonopolet.no customers can log in to the store with their own personal account. Once they access their profile, they can save wines they like as favorites and view them on a separate list. Over time, some shoppers with low need for variety might start picking wines directly from that list, instead of searching for new products in the initial page containing the entire available inventory. This could mean they generally avoid the filters when usually buying wine. In the experiment, however, participants did not have access to this function, therefore, there is a chance that some of the participants in this experiment used filters more than what they normally would.

Additionally, even with limited inventory, filters and functionalities, the platform took 1-2 minutes to load. This might have created high levels of impatience among respondents. The analysis of data has shown that 22% of participants selected one of the three wines from the first row. This could be a partial explanation for why so many participants did not use the filters at all.

Moreover, the environment in Figma was not suitable for interaction through mobile phones. To complete the experiment and survey, users were forced to use their computers. This may have led to participation differences and contributed to the skewed sample distribution among age groups, as younger respondents may have found it more convenient and less time-consuming to participate in studies on their smart phones.

Despite these issues, Figma remained the best option to build up the simulation. Researchers were not allowed to test the new filter on the active website and did not possess the competencies or resources to code an online alternative. Moreover, the simulation needed to remain private from users searching on the web, while still being shareable online. Furthermore, the design consultants working with Vinmonopolet provided an existing prototype of the actual website, which they use to present how new stylistic changes would look before implementing them. However, this original prototype was not meant to be a replica of the full functions of the original website, but a visual representation of it. It encompassed the real site's main design framework, including the style, logo, buttons, etc., but it did not have inventory. Most importantly, the filters and many other functionalities were

inactive. Populating the simulation with the inventory and making the filters work involved programming every interaction and creating a new page for every combination of filters. This improper application of the platform as a replica of the real website led to the above-mentioned issues with the tool. However, memory and loading time would have been the same on other website prototyping platforms, as they use the same logics as Figma, which is considered one of the best in its category of prototyping tools.

9.2. Controlled Experimental Environment

Other important limits to the findings of this study are those derived from the controlled environment; the purchase situation, the given budget, and the recreated environment were all fictitious. Participants may evaluate their choice of wine differently when purchasing it for another occasion, such as a formal dinner or drinking alone at home. Moreover, because at the time of the experiment participants did not have a real need to buy wine, they probably chose with less discernment. Respondents lacked incentives to carefully select the wine they preferred also because they were not actually making a purchase. Furthermore, no real money was at stake. In absence of financial risks, people have lower motivation to put effort in the decision-making process (Hoyer et al., 2018). Therefore, it is likely that, in this case, participants did not act as they would have done in a real purchase situation. The fact that 22% of respondents selected one of the three wines in the first row provides further support to the hypothesis that respondents were more careless in their selection than they would have been when buying wine in real life.

9.3. Sample Representation

As shown in Section 7.6.2.1, the sample obtained for this study was not distributed proportionately across demographic groups. Therefore, it is not an accurate representation of the country. Most respondents belonged to the oldest age groups. This biased the presence of different levels of education, because over the last 70 years there has been a substantial increase of people pursuing a bachelor's degree, a master's degree or a PhD, reflecting a generational change. While it is difficult to know exactly why the study did not generate responses from younger participants, the fact that the study could only be completed on a computer and the slow initial loading time may have been enough to scare them away before even starting. Older participants, especially those above retirement age, may have had more time to complete the study, and were more likely to review their email on their computer instead of their phone.

In addition, two thirds of respondents were males. As explained by the literature presented in Section 6.1.4.2, females, as well as the other underrepresented sample groups were the most apt to use the filter. By limiting their presence, researchers registered lower levels of interaction than would be reasonable to expect from the implementation of the new filter on Vinmonopolet.no.

9.4. Participants' Wine Preferences

Despite being able to base the sample selection only on wine drinkers, the varying levels of wine consumption and preferences among respondents must be considered as a limitation, given that researchers forced participants to select a red wine in this scenario. Almost 10% of participants stated that they have not purchased wine in the last year. Moreover, around 9% of respondents claimed that they do not like red wine. Furthermore, among participants who normally like red wine, some of them might not have liked the red wines available in the sample. Researchers tried to mitigate the effects of the latter point by introducing a question about the perceived quality of alternatives. Only ten respondents in the entire sample evaluated the quality of the alternatives as poor, by giving it a rating of 1 or 2 out of 5.

10. Strategic Implications

10.1. Marketing Implications

Based on the findings of this study, recommended marketing changes are focused on the website itself. As such, they can be classified in four key focus areas: the implementation of the filter, continued development of the filter, possible tactics to improve the use on the live site, and tracking implementations to confirm the filter's use and its effects on real purchase behavior.

10.1.1. Recommended Implementation of Filter on Website

The arrangement of filters should be changed to add another attribute into the existing mix of filters, and Vinmonopolet should move largely unused filters to the "Other Options" folder to increase the focus on key attributes most consumers are concerned about. Such attributes include alcohol content and storage, which are utilized very little among the broad range of shoppers.

In this study, the environmental footprint filter was placed between "Country" and "Price" attributes, which are shown as highly used by most consumers today, as seen in Chapter 5. These filters are

currently right next to one another, as shown in Appendix 1. Positioning the new filter between them will improve exposure in the live website environment and increase the likelihood that users will activate the filter.

10.1.2. Continued Development of the Filter's Categorization Criteria

The classifications of this filter criteria are based exclusively on packaging footprints because that is currently the only data widely available and comparable between all products (Rolf Erling Eriksen, Personal communication, March 2021). As mentioned in the introduction, packaging accounts for over 40% of the carbon footprint of wine products, but the majority is derived from production methods and shipping. By continuing to evaluate the total footprints of each wine, Vinmonopolet can evolve the footprint classifications and criteria to be as holistic as possible, based on the available data for products sold.

The broad language chosen as the category of the filter – "Environmental Footprint" – allows for this classification to evolve as the sustainability audits add more elements. As illustrated by the results of the study, the filter use resulted in significant increases in shoppers' perceptions of overall sustainability. Knowing this, Vinmonopolet should consider the Environmental Footprint filter to be a tool which can help shape those perceptions and allow users to interact with the most up-to-date footprint information about the products they buy. At all times, the "Info" box provides the existing information evaluated and identifies wines fitting in to each category. This will allow high levels of transparency between Vinmonopolet and its customers, as well as educating them about the factors influencing overall impact in their choices.

10.1.3. Tactics to Improve Filter Use

While the filter performed very well at helping to reduce footprint among respondents, increasing its use will be essential to the scale its influence on behavior change.

10.1.3.2. Move "Info" Pop-up to Filter's Closed View

In both manipulations, the "info" pop up was only available to users who opened the filter, so they could see how the scale was evaluated. By moving this to the "closed" view of the filter, curious users may be able to interact with and learn about the filter categories without requiring that they click on the filter to open it.

10.1.3.3. Prompt Users to Use Filter

Prompting a user with the desired behavior, is a tactic identified in the “Habits” section of SHIFT to encourage sustainable behavior (White et al., 2019). In the case of the introduction of the sustainability filter, this could be as simple as a pop-up shown to all consumers when they arrive in the search results with a formal introduction to the filter, which they must close to start shopping. This should reduce cases where the filter goes unused simply because it is unnoticed.

This would only be necessary in the first weeks of introduction, and then can be removed until there are any major changes in footprint classification.

10.1.3.4. Combine with Eco-labeling

The information belonging to the most used filters on the website – country, price, and volume – is always visible on the product cards for each wine in the shopping results. This gives users an initial cue that wines they are seeing may or may not match their preferences and is likely a source of high interaction with that information.

In the context of the environmental footprint filter, displaying the footprint performance of wines on each product in the search results should generate high levels of attention to the filter. This would force exposure to the evaluation, making the challenges of self-concept, feelings of guilt, and loss-aversion even stronger, thus encouraging users to find the products fitting their idea of themselves.

Additionally, this would make the footprint scale visible to mobile users, which is an environment where all filters are hidden by default.

10.1.2. Testing for Effectiveness with Google Analytics

While the implementation of this filter would be tracked alongside other filters in the URL parameters, this systematic method of tracking presents challenges in measuring the filter’s effects in relation to more macro-level website performance metrics, as discussed in Chapter 5. To best track the use of the filter, Vinmonopolet should set up tag-based tracking of the filter itself and record the use of the filter as a “Goal” within Google Analytics. This will allow the team at Vinmonopolet to quickly see the total number of filter interactions and compare them side-by-side with the total number of users and website sessions who were exposed to it. With this information, interaction rate can be compared with this study to test whether the 13.33% interaction rate was inflated due to reduced filter options.

10.2. Political Implications

Before deciding whether to introduce the environmental filter, Vinmonopolet must consider the political implications that a potential increase of bag-in-box sales could provoke.

A Swedish study conducted by CAN (Centralförbundet för Alkohol- och Narkotikaupplysning) in 2014, suggested that bag-in-boxes boost wine consumption (Ekeroth, 2015). Since 1996, when bag-in-box wines were introduced at Systembolaget, the Swedish wine monopoly, wine sales have increased by 88%, translating over 18 years into a rise in the consumption of wine from 1.7 liters per inhabitant per year to 3.2 (Ekeroth, 2015). The "Monitorundersökningarna", monitor surveys where Swedes are regularly interviewed about their alcohol habits, show that 23% of wine buyers purchase bag-in-boxes (Ekeroth, 2015). According to CAN, these people drink twice as much wine as those who buy bottled wine, corresponding to three extra glasses per month (Systembolaget, n.d.). A bag-in-box seems to work like an impulse product: if people get more, they will drink it (Decanter, 2002).

Bag-in-box wine has been a point of scrutiny in Norwegian politics for a number of years, as its share of Norway's total wine sales is increasing over time (Decanter, 2002). In 2020, bag-in-boxes accounted for over 50% of Vinmonopolet's wine sales (Vinmonopolet, 2021). The Norwegian Christian Democrat party is particularly concerned about the consequences of the increased bag-in-box sales and it has proposed to ban the product (Decanter, 2002). Magne Aaroen, a Christian Democrat spokesman for liquor issues, stated that "the State should decide whether it's even right to sell wine in three-liter boxes" (Decanter, 2002).

At a 500 NOK budget, data from this experiment show a 41% increase in the selection of bag-in-box wines. Should this be replicated in a real purchase behavior, it would likely be significant enough to re-ignite the debate on the costs and benefits of this packaging type on alcohol use in Norway. The only new point in the discussion would be the knowledge that the selection of a bag-in-box wine requires 90 to 95% less CO_2 per Liter than glass (Vinmonopolet, n.d. b).

10.3. Implications for Suppliers

An increase in the selection of wines with low footprint packaging, could also have interesting implications for suppliers. If the demand for environmentally friendly packaging increases, those suppliers only using glass bottles may have a strong incentive to include some alternatives. This would also be convenient from a financial point of view since both production and transportation costs are lower for lighter packaging types.

However, wine producers are distributed all over the world and most of them are providing only few wines to Vinmonopolet. For some countries, such as Italy, bag-in-boxes are not very popular, as consumers value wine-making tradition much more than in Scandinavia, where quantity is a much more relevant attribute. Therefore, it may not be so convenient for them to start using new packaging types for the few products sold in Scandinavian markets. As such, it would be reasonable to start demanding for a wider variety of wines contained in bag-in boxes to the biggest suppliers and perhaps asking the smallest suppliers to produce wines in light glass or plastic, the two most similar alternatives to the traditional heavy glass.

This process should also be mediated by wholesalers. Vinmonopolet is currently supplied by 101 of them (Vinmonopolet, n.d. a). It can therefore be argued that there is a high competition level. Moreover, being the only wine buyer in Norway and supplying alcohol for the entire country, Vinmonopolet has certainly a great power to influence them. With this power, they could encourage wholesalers and producers to supply more sustainable options, giving incentives to those who are able to work with their suppliers to provide eco-sustainable packaging alternatives and disincentives those who primarily deal with traditional glass packaging. This may shift relationships with the wholesale network, as wholesalers adopting sustainable packaging options could significantly increase their market share in Norway.

11. Conclusion

Wine selection is a complex and multi-faceted buying decision which inspires varying degrees of engagement and involvement depending on the buyer. Due to the high number of attributes to evaluate and the diverse customer base, the inclusion of sustainability as an additional decision-making factor should be done carefully and thoughtfully to maximize its effect. Doing so would ensure that shoppers' sustainable values will result in sustainable choices in their wine selection.

The filter implemented in this study allows users to define the acceptable cutoffs for their footprint while shopping and then select wines which match them. Given the high levels of competition for attention among attributes in the existing webstore, it can be expected that this new filter's impact will be regulated by how often it is used by shoppers. While this will be partially moderated by individual differences among consumers, Vinmonopolet can employ tactics to increase awareness of the filter and encourage its use.

The results after filter's use in the context of this study showed that it is highly influential in the selection of wines in the lowest footprint categories, with bag-in-box packaging being the most

selected. While switching from glass to bag-in-box significantly reduces CO_2 emissions per liter, it also results in an increase in the quantity of wine purchased, raising concerns that licensing effects could be observable between the reduction in CO_2 and the increased volume.

Ultimately, Vinmonopolet's implementation of this filter and the possible implications it could have on wine buying behavior could produce shockwaves in the political conversation surrounding bag-in-box wines, as well as relations with wholesalers and suppliers.

Measuring the filter's effects after its implementation in the live shopping environment will be crucial to the confirmation of the findings from this study. By closely following the trends on filters' use in Google Analytics, as well as the resulting direct and indirect sales across packaging types, Vinmonopolet will be able to identify the magnitude of the environmental filter's effects, both in terms of CO_2 reduction and increases in volume purchased.

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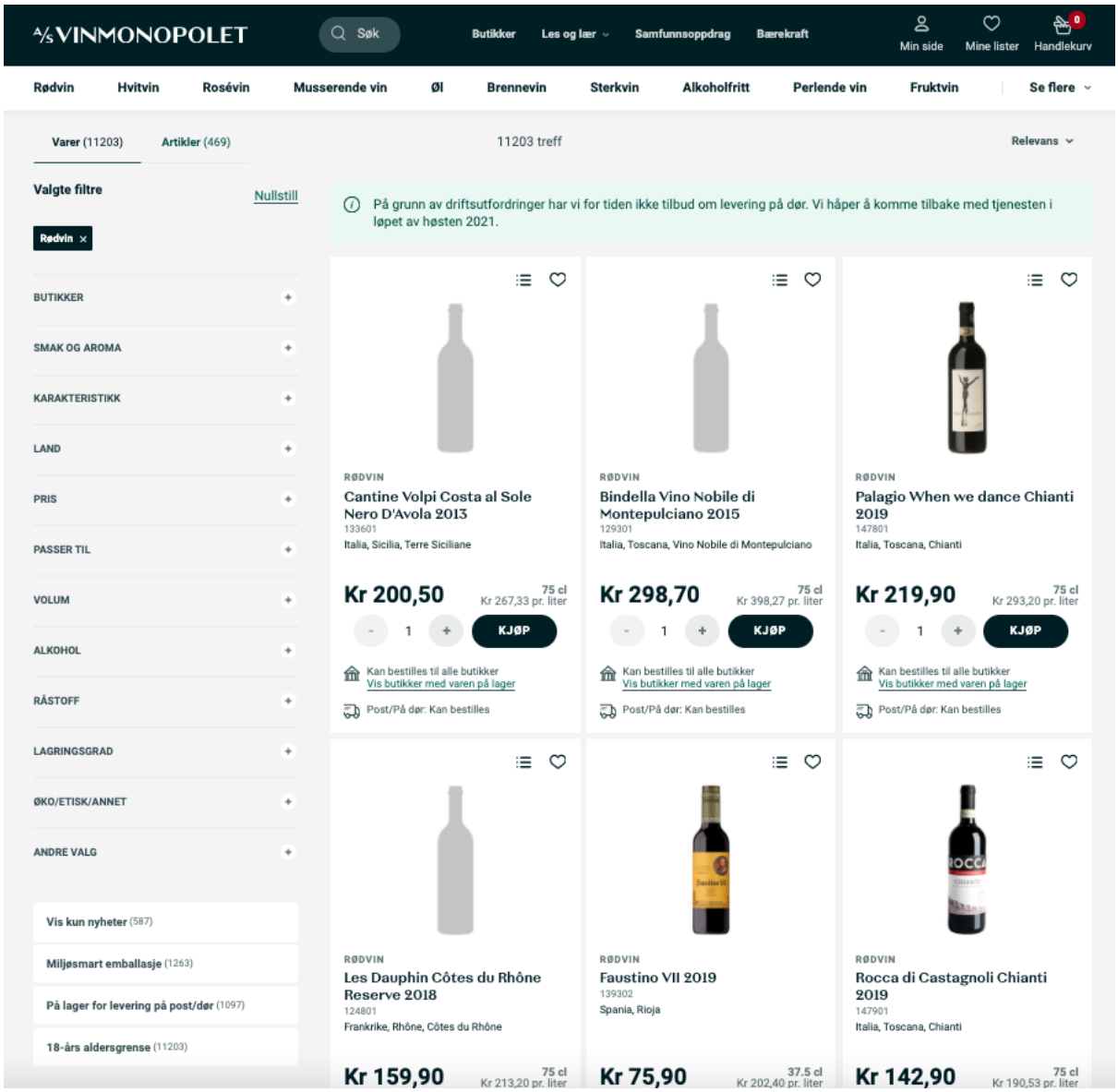
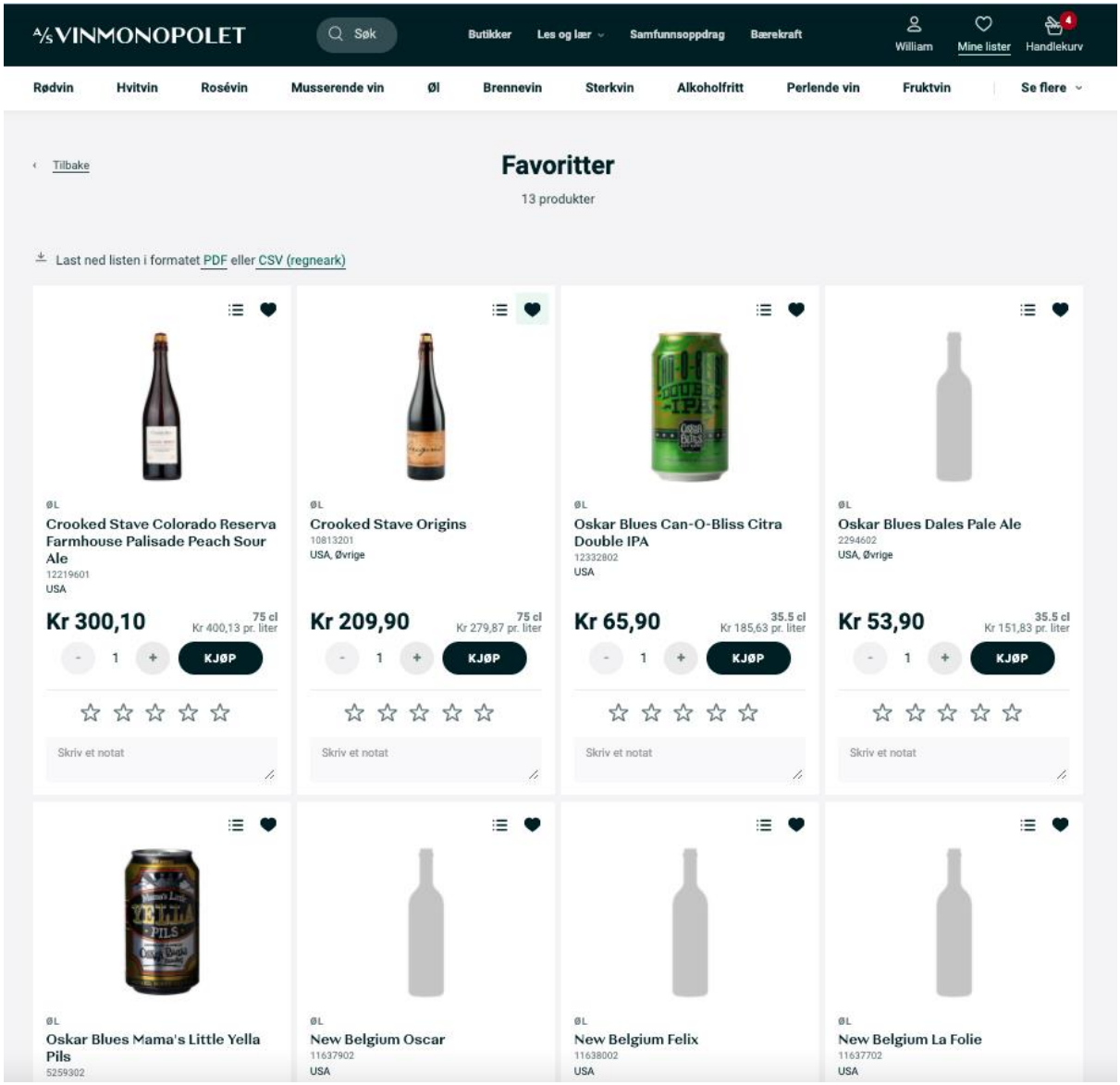
Appendix

1: Products' Results Page and Filters on Vinmonopolet.no



2: Favorites' Menu



3: Descriptions of Nudge Interventions

A – "CO_2 Efficient" Icon on Packaging Types

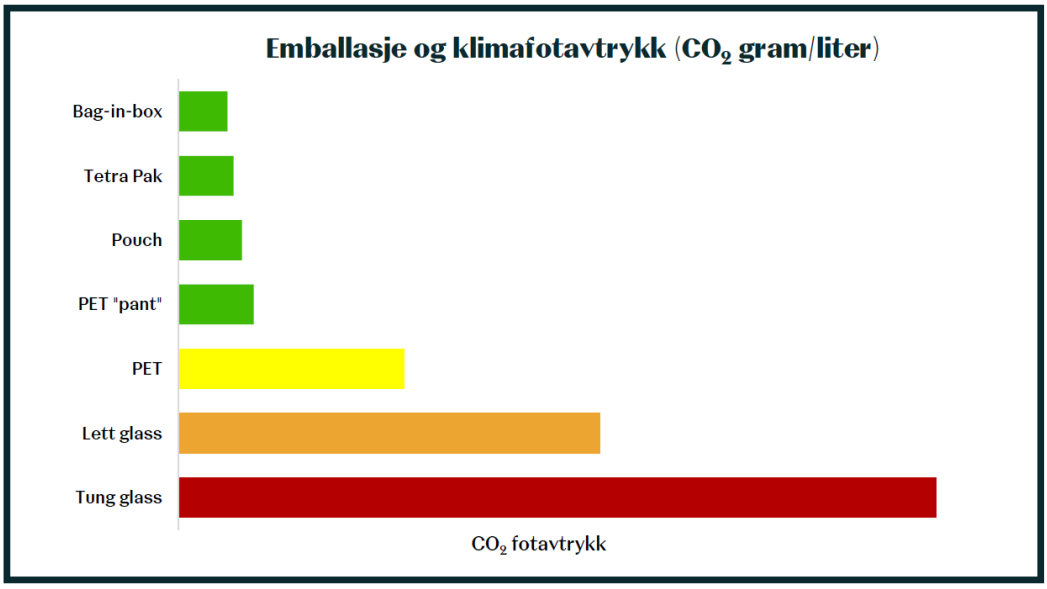
Vinmonopolet's current website already has a filter that allows consumers to choose what to buy according to the type of packaging. However, this filter is composed by some icons representing the different options (e.g., glass, plastic, can, etc.). As shown by the most recent data collected by Vinmonopolet, consumers do not usually know that plastic has a lower carbon emission than glass. However, if they did, many of them would be more willing to change their decision. Therefore, it is suggested to add an intuitive icon on the most sustainable types of packaging, showing that those packaging are more efficient in terms of CO_2 emissions. Potentially, this icon could also be added on the labels in store, replacing the existing ones, which, according to the above-mentioned research, consumers do not seem to understand very well. Some examples are provided below.

It is recommended to add this symbol as it will serve as peripheral cue for consumers, attracting unconsciously. Research has indeed shown that when the level of involvement in a decision is generally low, peripheral cues may be more important than detailed message arguments, allowing the receiver to develop favorable attitudes based on feelings rather than engaging in an extensive processing of the message (Belch & Belch, 2018).

B – "Carbon footprint" Rating Scale

To give shoppers a quick way to evaluate a wine's carbon footprint, it is suggested to implement a rating system indicating the carbon footprint of every product, placed on the products' page and possibly also on the shopping menu. Vinmonopolet data suggest that consumers would find most value from a scale, especially compared to more concrete measures such as listing actual carbon emissions. A scale helps shoppers to see not only the bottles that have a low footprint, but also those having an especially high impact. This nudge is a 1 to 4 negative scale, using footprint icons increasing in value when the carbon emissions are higher and changing its color according to the rating. Single footprint bottles will be given light green, scaling gradually up to four-footprint bottles in red, as shown below.

For those who are curious enough, this nudge is paired with an “information box” where consumers can find out what the scale is based on. By clicking on it, the chart shown below appears as a pop-up, comparing the emissions of the different types of packaging and allowing them to absorb some information appealing to their more processed evaluations of the wine.



C - Navigation Filter based on Carbon Emissions

A very important piece of the navigation and selection process on Vinmonopolet.no is built into filters that allow the user to narrow the wines based on their country, grape type, price, etc. For many buyers these heuristic shortcuts eliminate wines that do not match shopping criteria. Looking at the ability to filter for environmental friendliness on the current site, many of these functions are very deeply buried in “Other Options” filter. To give people a reminder of the impact of the wines they are considering and the ability to pick products based on their motivation to reduce their impact on the planet, this filter will allow the users to filter out wines which do not meet their environmental standard, based on the “carbon footprint” scale, detailed further in section A.

D - Default Swap of Heavy Glass for Lower-carbon Packaging

A very successful nudge strategy across use-cases is to change the default option for users when they click into a wine from the shopping page – in this case, changing the default packaging in the online

store from glass to plastic, where possible. This strategy has been proven effective in several studies of behavioral economics, showing that people tend to stick to the default option – choosing not to choose –, as it represents a natural reference point, the status quo. Since defaults do not require any effort by the decision maker, they can be a simple but powerful tool when there is inaction (Samson & Ramani, 2018). Therefore, setting defaults is an effective nudge when there is inertia or uncertainty in decision making (Samson, 2014).

Moreover, to strengthen the effect of this nudge, it is also suggested to graphically show an increased footprint on the page if the client decides to change the default option of packaging from plastic to glass. This could be done by adjusting the previously-explained rating system.

E - Impact Summary and Reconciliation at Checkout

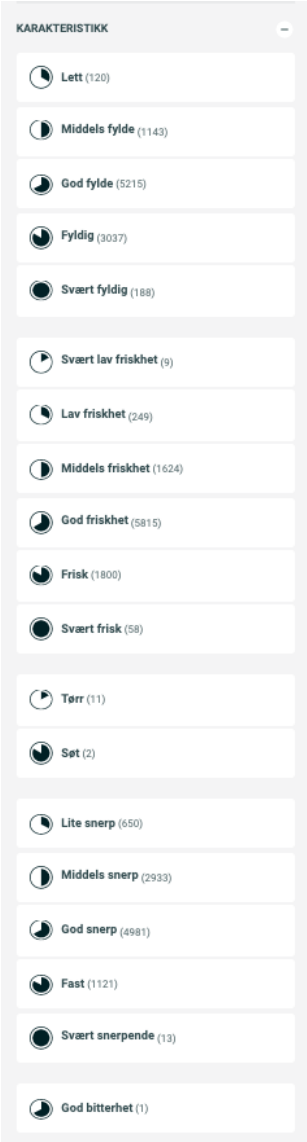
Given that every wine will be rated based on its impact, the "Cart" page should be a natural place to summarize the total impact of the selected wines, with either positive reinforcement for low-impact shoppers, or goal reminders to those shopping for the most carbon-intensive bottles. Given that all shoppers must first go to their "Cart" before continuing to checkout, this could be displayed as a part of the "Purchase Overview" section, where the checkout button is located.

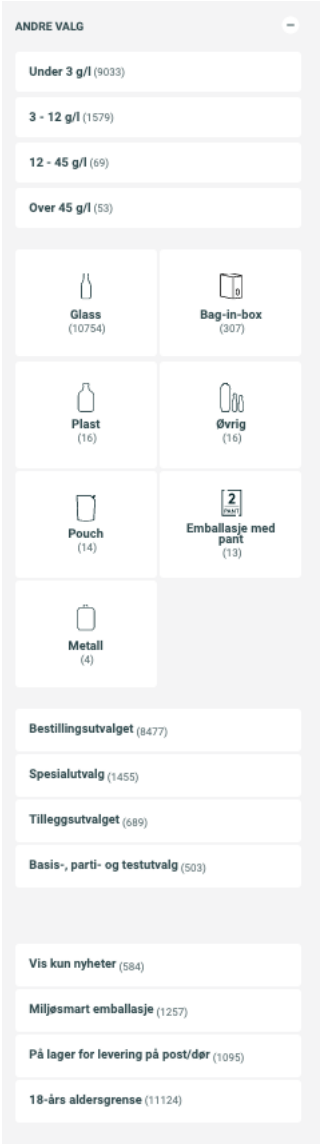
Those who purchase items with a low footprint can receive a thank you message from Vinmonopolet for contributing to the sustainability of the store. Conversely, those who consistently choose wines with heavy glass bottles and high footprints can be alerted in this space of their high carbon footprint and be given the option to either switch to alternative packaging, or to purchase carbon offsets.

4: Footprint Category Classification

Footprint Category	CO_2 Grams / Liter	Common Packaging
1	Under 100	Bag-in-Box, Tetra Pak, Pouch, PET w/ Pant
2	100-300	PET Plastic (no Pant)
3	300-600	Light Glass
4	Over 600	Heavy Glass

5: “Characteristics” and “Other Options” Filters





6: Introduction to Google Analytics

Google Analytics is a free tool available for anyone who owns or controls a website and would like to have baseline performance metrics about the website's audience, how it is acquiring traffic, how users are behaving, and how they are "converting" on the page. Conversion refers to taking a meaningful action, often towards becoming a customer, such as creating an account, adding an item to the cart, or ultimately making a purchase.

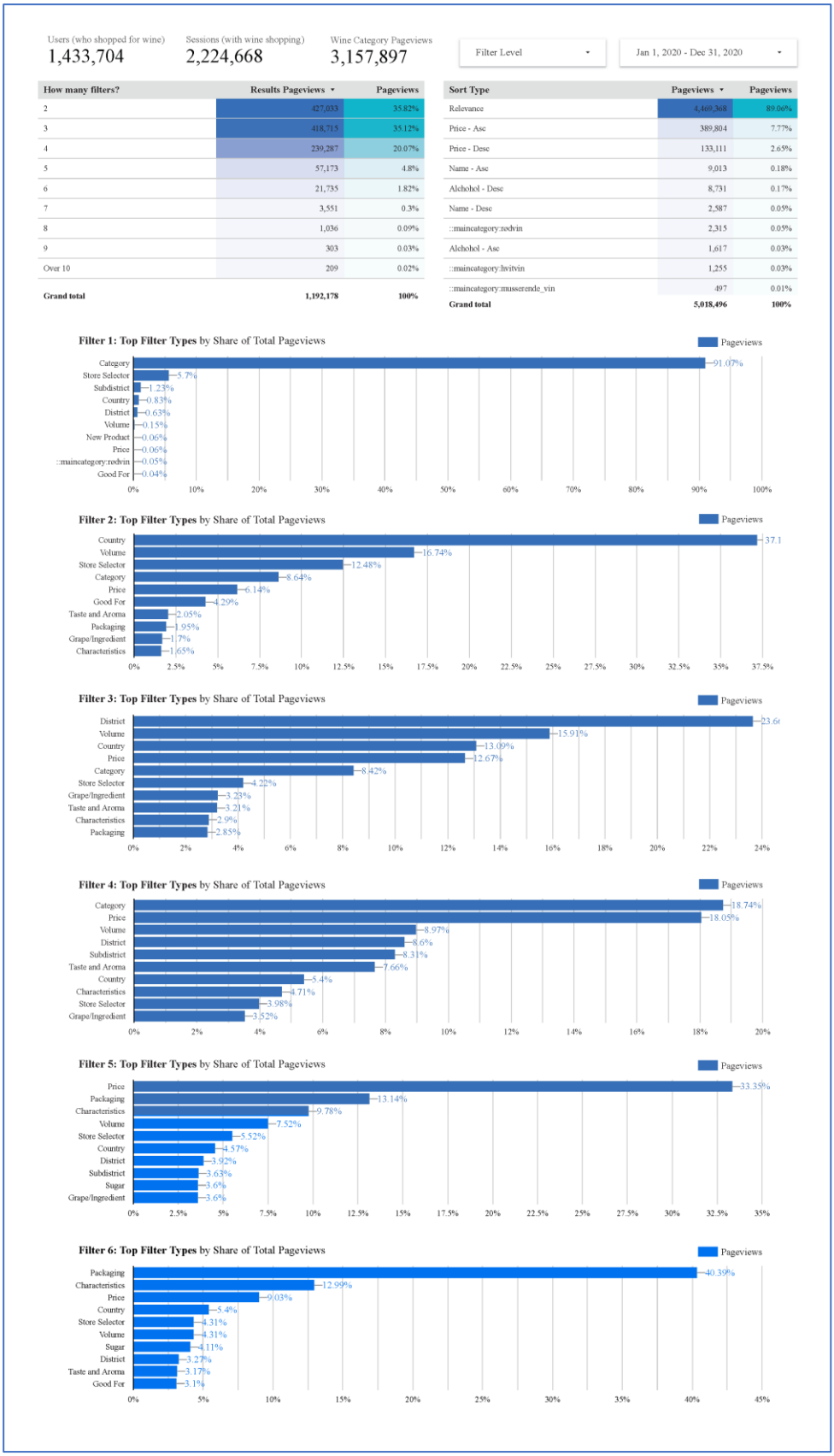
Without any extra setup after placing the "Universal Analytics" tracking code, Google Analytics will begin tracking all URLs' that belong to the web domain. As a part of this simple tracking of URLs, Google Analytics can record the so-called "sessions", which are the same as unique website visits. A session begins when a user visits a website and continues to other pages on that same website. The tracking can follow all "pageviews" belonging to each individual session, as well as the time spent on each page before navigating away. The session ends when the window is closed, the user navigates away to another site, or is inactive for 30 minutes. As a result, the typical summary metrics of a session include total pageviews, average pages per session, and the average duration of the session.

To begin tracking more specific interactive behaviors, website administrators and analysts must manually set up their account to be customized to the specific interaction and conversion points on their website. Depending on the complexity of the website, as well as the Content Management System (CMS) behind it, this can be done using embedded integrations prebuilt into the software of the website's platform. This is the case for many webstores, where shopping performance data is sent automatically by the store, after the Google Analytics account is set up.

Nevertheless, small interactions and conversion points that are not directly related to sales must be tracked either manually or systematically. Manual tracking involves the placing of extra code on the website sending Google Analytics data when a certain event occurs. Google Tag Manager is a solution for this type of tracking and is used by nearly all companies who track their website with Google. Systematic tracking takes another approach, using the foundations of Google's URL tracking to support the data capture and storage. A typical use case for this is on-site web searches, for specific items and products. These types of interactions are recorded in the URL, instead of requiring other tracking, meaning that Google will record them automatically.

7: Google Data Studio: Use of Filters

Please use this link to view the active report and interact with the data provided below:
https://datastudio.google.com/reporting/a583e82a-25ba-46dd-9364-53a22bb0a218



Top Filter Combinations

Filter Level | Jan 1, 2020 - Dec 31, 2020

Filter-1	Filter-2	Filter-3	Filter-4	Filter-5	Filter-6	Pageviews	% of Total
Category	Country	-	-	-	-	113,564	9.62%
Category	Volume	-	-	-	-	97,204	8.23%
Subdistrict	Country	District	Category	-	-	58,366	4.94%
Category	Country	District	-	-	-	51,762	4.38%
Category	Store Selector	-	-	-	-	41,698	3.53%
Category	Price	-	-	-	-	36,059	3.05%
Category	Store Selector	Volume	-	-	-	29,846	2.53%
Category	Country	Price	-	-	-	29,320	2.48%
District	Country	Category	-	-	-	27,819	2.36%
Country	Category	-	-	-	-	27,061	2.29%
Category	Country	Volume	-	-	-	26,025	2.2%
Category	Country	District	Subdistrict	-	-	22,805	1.93%
Category	Volume	Country	-	-	-	16,601	1.41%
Category	Store Selector	Country	-	-	-	15,242	1.29%
Category	Packaging	-	-	-	-	14,644	1.24%
Category	Volume	Store Selector	-	-	-	13,807	1.17%
Category	Country	District	Price	-	-	13,662	1.16%
Category	Volume	Price	-	-	-	13,518	1.14%
Store Selector	Category	-	-	-	-	12,318	1.04%
Category	Good For	-	-	-	-	11,301	0.96%
Category	Country	Grape/Ingredient	-	-	-	11,037	0.93%
Store Selector	Good For	Category	Taste and Aroma	Price	Packaging	10,223	0.87%
Category	Characteristics	-	-	-	-	9,430	0.8%
Category	Subcategory	-	-	-	-	9,117	0.77%
Category	Price	Volume	-	-	-	8,976	0.76%
Category	Grape/Ingredient	-	-	-	-	8,880	0.75%
Category	Store Selector	Country	District	-	-	8,078	0.68%
Store Selector	Category	Country	-	-	-	7,594	0.64%
Store Selector	Category	Taste and Aroma	Price	Packaging	-	7,370	0.62%
Store Selector	Good For	Category	Taste and Aroma	Price	-	7,168	0.61%
Category	Store Selector	Price	-	-	-	6,970	0.59%
Store Selector	Category	Volume	-	-	-	6,944	0.59%
Category	Taste and Aroma	-	-	-	-	6,940	0.59%
Category	Price	Country	-	-	-	6,769	0.57%
Category	Country	District	Volume	-	-	6,765	0.57%
Category	Volume	Alcohol	-	-	-	6,653	0.56%
Store Selector	Category	Price	-	-	-	4,836	0.41%
Store Selector	Good For	Category	Price	-	-	4,487	0.38%
Category	Sugar	Packaging	-	-	-	4,371	0.37%
Category	Sugar	-	-	-	-	4,295	0.36%
Category	Country	Store Selector	-	-	-	4,069	0.34%
Category	Country	District	Grape/Ingredient	-	-	3,852	0.33%
Store Selector	Category	Country	District	-	-	3,611	0.31%
Category	New Product	-	-	-	-	3,575	0.3%
Store Selector	Category	Taste and Aroma	Price	-	-	3,552	0.3%
Category	Volume	Packaging	-	-	-	3,395	0.29%
Category	Country	Packaging	-	-	-	3,288	0.28%
Category	Alcohol	-	-	-	-	3,058	0.26%
Category	Aging and storage	-	-	-	-	3,025	0.26%
Category	Good For	Price	-	-	-	2,941	0.25%
Category	Country	Good For	-	-	-	2,811	0.24%
Category	Taste and Aroma	Price	-	-	-	2,803	0.24%
Category	Alcohol	Volume	-	-	-	2,753	0.23%
Category	Volume	Characteristics	-	-	-	2,652	0.22%
Category	Country	Volume	Price	-	-	2,582	0.22%
Category	Grape/Ingredient	Country	-	-	-	2,562	0.22%
					Grand total	**1,180,860**	**100%**

Top Filter Combinations - Selections Included

Filter Level | Jan 1, 2020 - Dec 31, 2020

	Search Term (Clean 2)	Pageviews ▾	Pageviews
1.	maincategory:rødvin:volumeranges:3 liter og over	33,166	2.81%
2.	maincategory:hvitvin:volumeranges:3 liter og over	23,989	2.03%
3.	maincategory:rødvin:maincountry:italia	11,033	0.93%
4.	maincategory:rødvin:emballasjetype:bag-in-box	7,660	0.65%
5.	maincategory:rødvin:price:100	6,830	0.58%
6.	maincategory:rødvin:volumeranges:75 - 99 cl	6,425	0.54%
7.	maincategory:rødvin:maincountry:spania	6,374	0.54%
8.	maincategory:rødvin:maincountry:portugal	5,827	0.49%
9.	maincategory:musserende_vin:volumeranges:75 - 99 cl	5,628	0.48%
10.	maincategory:musserende_vin:price:100	5,260	0.45%
11.	maincategory:rødvin:volumeranges:3 liter og over:price:300	5,102	0.43%
12.	maincategory:rødvin:maincountry:italia:volumeranges:3 liter og over	4,985	0.42%
13.	maincategory:rødvin:maincountry:libanon	4,938	0.42%
14.	maincategory:hvitvin:price:100	4,822	0.41%
15.	maincategory:rødvin:maincountry:frankrike	4,786	0.41%
16.	maincategory:hvitvin:emballasjetype:bag-in-box	4,336	0.37%
17.	maincategory:rødvin:maincountry:frankrike:maindistrict:frankrike_bordeaux	4,178	0.35%
18.	maincategory:hvitvin:maincountry:tyskland	4,002	0.34%
19.	maincategory:rødvin:maincountry:sør-afrika	3,896	0.33%
20.	maincategory:rødvin:maincountry:australia	3,800	0.32%
21.	maindistrict:italia_prosecco:maincountry:italia:maincategory:musserende_vin	3,717	0.31%
22.	maincategory:rødvin:maincountry:chile	3,710	0.31%
23.	maincategory:rødvin:volumeranges:3 liter og over:maincountry:italia	3,648	0.31%
24.	maincategory:rødvin:maincountry:argentina	3,602	0.31%
25.	maincategory:rødvin:maincountry:italia:price:100	3,489	0.3%
26.	mainsubdistrict:italia_piemonte_barolo:maincountry:italia:maindistrict:italia_piemonte:maincategory:rødvin	3,266	0.28%
	Grand total	**1,180,860**	**100%**

Filter Paths after Top filter Selections

	Red Wine, 3L Volume...	Pageviews ▾	Pageviews
1.	maincategory:rødvin:volumeranges:3 liter og over	33,166	42.31%
2.	maincategory:rødvin:volumeranges:3 liter og over:price:300	5,102	6.51%
3.	maincategory:rødvin:volumeranges:3 liter og over:maincountry:italia	3,648	4.65%
4.	maincategory:rødvin:volumeranges:3 liter og over:instock:true	1,610	2.05%
5.	maincategory:rødvin:volumeranges:3 liter og over:maincountry:spania	1,438	1.83%
6.	maincategory:rødvin:volumeranges:3 liter og over:emballasjetype:bag-in-box	1,347	1.72%
7.	maincategory:rødvin:volumeranges:3 liter og over:alcohol:11 - 18 %	1,155	1.47%
8.	maincategory:rødvin:volumeranges:3 liter og over:maincountry:frankrike	837	1.07%
9.	maincategory:rødvin:volumeranges:3 liter og over:miljoemballasje:true	792	1.01%
10.	maincategory:rødvin:volumeranges:3 liter og over:maincountry:australia	747	0.95%
11.	maincategory:rødvin:volumeranges:3 liter og over:maincountry:portugal	736	0.94%
12.	maincategory:rødvin:volumeranges:3 liter og over:sukker:under 3 g/l:emballasjetype:bag-in-box	669	0.85%
13.	maincategory:rødvin:volumeranges:3 liter og over:maincountry:usa	621	0.79%
14.	maincategory:rødvin:volumeranges:3 liter og over:maincountry:chile	602	0.77%
15.	maincategory:rødvin:volumeranges:3 liter og over:stylecategory:stil009	564	0.72%
	Grand total	**78,381**	**100%**

	Red Wine, 75 cl...	Pageviews ▾	Pageviews
1.	maincategory:rødvin:volumeranges:75 - 99 cl	6,425	41%
2.	maincategory:rødvin:volumeranges:75	576	3.68%
3.	maincategory:rødvin:volumeranges:75 - 99 cl:price:0	545	3.48%
4.	maincategory:rødvin:volumeranges:75 - 99 cl:alcohol:11 - 18 %	528	3.37%
5.	maincategory:rødvin:volumeranges:75 - 99 cl:price:100	497	3.17%
6.	maincategory:rødvin:volumeranges:75 - 99 cl:maincountry:italia	218	1.39%
7.	maincategory:rødvin:volumeranges:75 - 99 cl:maincountry:frankrike:maindistrict:frankrike_bordeaux	196	1.25%
8.	maincategory:rødvin:volumeranges:75 - 99 cl:maincountry:frankrike	178	1.14%
9.	maincategory:rødvin:volumeranges:75 - 99 cl:maincountry:spania	168	1.07%
10.	maincategory:rødvin:volumeranges:75:price:100	124	0.79%
11.	maincategory:rødvin:volumeranges:75 - 99 cl:availableinstores:111	114	0.73%
12.	maincategory:rødvin:volumeranges:75 - 99 cl:maincountry:portugal	104	0.66%
13.	maincategory:rødvin:volumeranges:75:price:0	97	0.62%
14.	maincategory:rødvin:volumeranges:75 - 99 cl:maincountry:chile	92	0.59%
15.	maincategory:rødvin:volumeranges:75 - 99 cl:availableinstores:283	84	0.54%
16.	maincategory:rødvin:volumeranges:75 - 99 cl:maincountry:usa	83	0.53%
	Grand total	**15,671**	**100%**

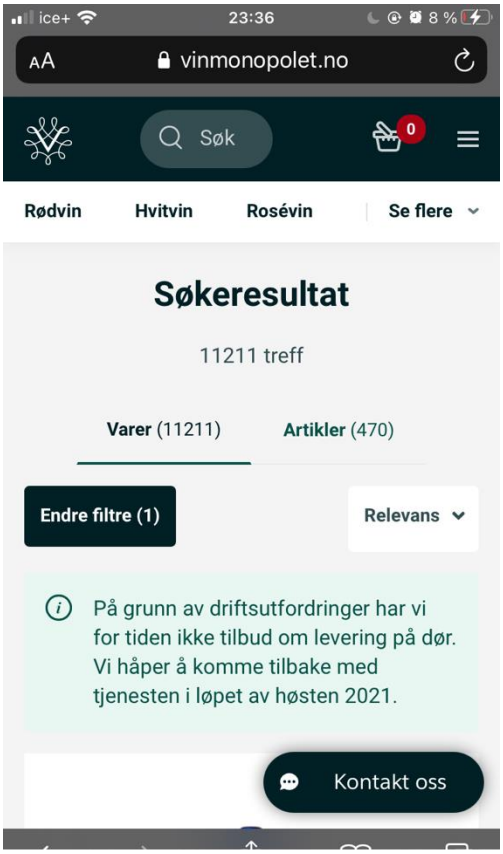
Top Filter Combinations - Filter paths (cont.)

Filter Level | Jan 1, 2020 - Dec 31, 2020

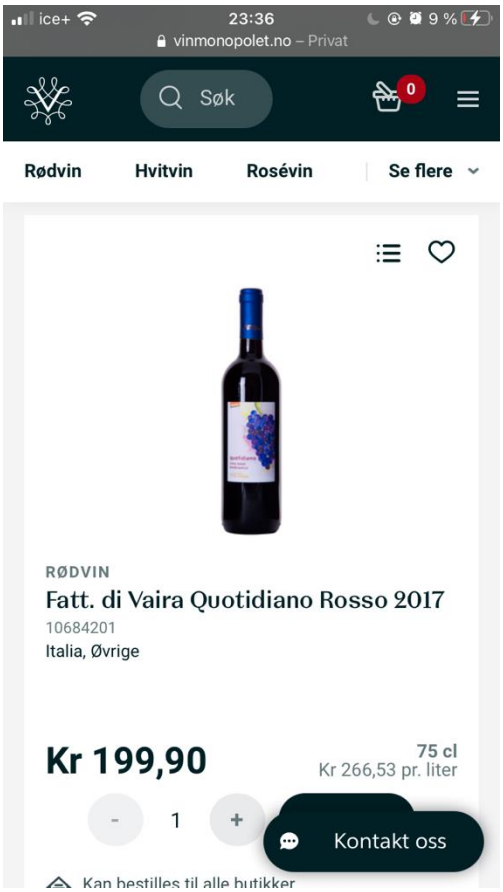
	Red Wine, Italy...	Pageviews ▾	Pageviews
1.	maincategory:rødvin:maincountry:italia	11,033	15.34%
2.	maincategory:rødvin:maincountry:italia:volumeranges:3 liter og over	4,985	6.93%
3.	maincategory:rødvin:maincountry:italia:price:100	3,489	4.85%
4.	maincategory:rødvin:maincountry:italia:price:150	1,950	2.71%
5.	maincategory:rødvin:maincountry:italia:maindistrict:italia_piemonte	1,671	2.32%
6.	maincategory:rødvin:maincountry:italia:maindistrict:italia_toscana	1,595	2.22%
7.	maincategory:rødvin:maincountry:italia:maindistrict:italia_sicilia	1,258	1.75%
8.	maincategory:rødvin:maincountry:italia:emballasjetype:bag-in-box	1,146	1.59%
9.	maincategory:rødvin:maincountry:italia:maindistrict:italia_piemonte:mainsubdistrict:italia_piemonte_barolo	1,069	1.49%
10.	maincategory:rødvin:maincountry:italia:maindistrict:italia_veneto	907	1.26%
11.	maincategory:rødvin:maincountry:italia:maindistrict:italia_toscana:mainsubdistrict:italia_toscana_chianti_classico	831	1.16%
12.	maincategory:rødvin:maincountry:italia:maindistrict:italia_sardinia	807	1.12%
13.	maincategory:rødvin:maincountry:italia:volumeranges:75 - 99 cl	770	1.07%
14.	maincategory:rødvin:maincountry:italia:maindistrict:italia_toscana:mainsubdistrict:italia_toscana_brunello_di_montalcino	688	0.96%
15.	maincategory:rødvin:maincountry:italia:volumeranges:3 liter og over:price:300	676	0.94%
16.	maincategory:rødvin:maincountry:italia:maindistrict:italia_puglia	655	0.91%
17.	maincategory:rødvin:maincountry:italia:maindistrict:italia_piemonte:mainsubdistrict:italia_piemonte_barbaresco	561	0.78%
18.	maincategory:rødvin:maincountry:italia:price:200	536	0.75%
19.	maincategory:rødvin:maincountry:italia:volumeranges:300	455	0.63%
20.	maincategory:rødvin:maincountry:italia:volumeranges:1 - 2,9 liter	394	0.55%
21.	maincategory:rødvin:maincountry:italia:maindistrict:italia_piemonte:volumeranges:3 liter og over	374	0.52%
22.	maincategory:rødvin:maincountry:italia:maindistrict:italia_toscana:mainsubdistrict:italia_toscana_bolgheri	364	0.51%
23.	maincategory:rødvin:maincountry:italia:maindistrict:italia_campania	338	0.47%
24.	maincategory:rødvin:maincountry:italia:maindistrict:italia_piemonte:price:150	319	0.44%
25.	maincategory:rødvin:maincountry:italia:maindistrict:italia_piemonte:mainsubdistrict:italia_piemonte_barbera_d'alba	316	0.44%
26.	maincategory:rødvin:maincountry:italia:price:100:volumeranges:75 - 99 cl	302	0.42%
	Grand total	**71,904**	**100%**

	Red Wine, 100kr...	Pageviews ▾	Pageviews
1.	maincategory:rødvin:price:100	6,830	42.25%
2.	maincategory:rødvin:price:100:maincountry:italia	1,070	6.62%
3.	maincategory:rødvin:price:100:volumeranges:75 - 99 cl	569	3.52%
4.	maincategory:rødvin:price:100:maincountry:spania	432	2.67%
5.	maincategory:rødvin:price:100:maincountry:frankrike	380	2.35%
6.	maincategory:rødvin:price:1000	374	2.31%
7.	maincategory:rødvin:price:100:maincountry:portugal	296	1.83%
8.	maincategory:rødvin:price:100:alcohol:11 - 18 %	255	1.58%
9.	maincategory:rødvin:price:100:maincountry:australia	189	1.17%
10.	maincategory:rødvin:price:100:maincountry:chile	186	1.15%
11.	maincategory:rødvin:price:100:stylecategory:stil008	124	0.77%
12.	maincategory:rødvin:price:100:stylecategory:stil001	121	0.75%
13.	maincategory:rødvin:price:100:fylde:9-10	116	0.72%
14.	availableinstores:228:maincategory:rødvin:price:100	109	0.67%
15.	maincategory:rødvin:price:100:isgoodfor:a	101	0.62%
	Grand total	**16,167**	**100%**

8: Mobile Webstore



Results' page: Displayed Filters



Results' page: Product View

9: Complete Inventory, Sorted as Presented in Experiment

Name	Packaging	Volume	Taste and Aroma	Country	Price	Other
Moillard Coteaux Bourguignons 2019	Light Glass	75 cl	Fresh and Fruity	France	120,90 NOK	/
Villalta Amarone della Valpolicella Classico 2017	Standard Glass	75 cl	Spiced and Sweet	Italy	349,90 NOK	Organic
Terramia Chianti	Light Glass	75 cl	Fresh and Fruity	Italy	149,90 NOK	/
Azul y Garanza Naturaleza Salvaje Garnacha 2019	Standard Glass	75 cl	Filling and Juicy	Spain	259,90 NOK	Organic, Natural Wine
Portada 2019	Standard Glass	75 cl	Spiced and Sweet	Portugal	104,90 NOK	/
Bousquet Malbec Merlot 2020	Light Glass	75 cl	Filling and Juicy	Argentina	119,90 NOK	Organic, Certified Ethic
Lovely Lilly Pinot Noir 2018	Standard Glass	75 cl	Fresh and Fruity	Germany	165,00 NOK	/
Louis Max Climats Pinot Noir Les Terres Froides	Bag-in-box	300 cl	Tannic and Fruity	France	459,90 NOK	/
Odfjell Armador Carmenere 2018	Standard Glass	75 cl	Tannic and Fruity	Chile	144,90 NOK	Organic, Vegan
Domìni Veneti Valpolicella Classico Superiore 2019	Standard Glass	75 cl	Spiced and Sweet	Italy	125,00 NOK	/
Lupi Reali Montepulciano d’Abruzzo 2019	Light Glass	75 cl	Filling and Juicy	Italy	114,90 NOK	Organic
L’Armangia Barbera d’Asti 2019	Standard Glass	75 cl	Fresh and Fruity	Italy	134,90 NOK	/
Bousquet Malbec Merlot 2020	Bag-in-box	300 cl	Filling and Juicy	Argentina	382,90 NOK	Organic, Certified Ethic
J.P. Chenet Cabernet Syrah 2019	Standard Glass	75 cl	Spiced and Sweet	France	117,90 NOK	/
Produttori dei Colli Barolo 2016	Light Glass	75 cl	Tannic and Fruity	Italy	245,00 NOK	/
Falling Feather Ruby Cabernet 2019	Standard Glass	75 cl	Spiced and Sweet	USA	125,90 NOK	/
Lupi Reali Montepulciano d’Abruzzo 2019	Bag-in-box	300 cl	Filling and Juicy	Italy	414,30 NOK	Organic

Pardon my French Cabernet Sauvignon	Plastic “Pant”	75 cl	Tannic and Fruity	France	120,90 NOK	/
Borgogno Dolcetto d’Alba 2019	Standard Glass	75 cl	Tannic and Fruity	Italy	222,90 NOK	/
Me Gusta Carmenere 2019	Plastic	75 cl	Tannic and Fruity	Chile	119,90 NOK	/
Brolio Chianti Classico 2017	Standard Glass	75 cl	Tannic and Fruity	Italy	175,00 NOK	/
Moillard Coteaux Bourguignons	Bag-in-box	300 cl	Fresh and Fruity	France	404,90 NOK	/
Lindeman’s Bin 45 Cabernet Sauvignon 2020	Standard Glass	75 cl	Tannic and Fruity	Australia	120,90 NOK	/
Terre del Barolo Biologico	Standard Glass	75 cl	Tannic and Fruity	Italy	339,00 NOK	Organic
Villa Cafaggio Chianti Classico 2016	Standard Glass	75 cl	Tannic and Fruity	Italy	200,00 NOK	/
Giacosa Fratelli Barbera d’Alba Bussie 2019	Light Glass	75 cl	Fresh and Fruity	Italy	166,90 NOK	/
Contino Reserva 2015	Standard Glass	75 cl	Filling and Juicy	Spain	309,90 NOK	/
Giovanni Rosso Barolo Serralunga 2016	Standard Glass	75 cl	Tannic and Fruity	Italy	399,90 NOK	/
J.P. Chenet Cabernet Syrah	Pouch	18,7 cl	Spiced and Sweet	France	46,90 NOK	/
Corte Giara Valpolicella Ripasso La Groletta 2018	Standard Glass	75 cl	Filling and Juicy	Italy	176,00 NOK	/
Falling Feather Ruby Cabernet 2019	Bag-in-box	300 cl	Spiced and Sweet	USA	414,90 NOK	/
Bruce Cabernet Franc 2017	Standard Glass	75 cl	Tannic and Fruity	South Africa	269,90 NOK	/
Louis Max Climats Pinot Noir Les Terres Froides	Standard Glass	75 cl	Fresh and Fruity	France	139,90 NOK	/
Palladino Barbera d’Alba Superiore 2018	Standard Glass	75 cl	Fresh and Fruity	Italy	179,00 NOK	/
b.io il Nero Sicilia Nero d’Avola	Standard Glass	75 cl	Filling and Juicy	Italy	164,90 NOK	Organic, Vegan
Vialade à Table Rouge 2019	Tetra Pak	75 cl	Fresh and Fruity	France	129,90 NOK	Organic

10: Shopping Simulation on Figma

Instructions to participants

Velkommen!

Se for deg at du skal kjøpe rødvin til å ha med på en hyttetur med venner. Du og vennene dine har bestemt at alle skal ha med sin egen drikke, og ditt **budsjett er på 500 kroner**. Ha i mente at pengene du ikke bruker på å kjøpe vin i nettbutikken er penger du hadde villet kunne spare som i en reell kjøpssituasjon.

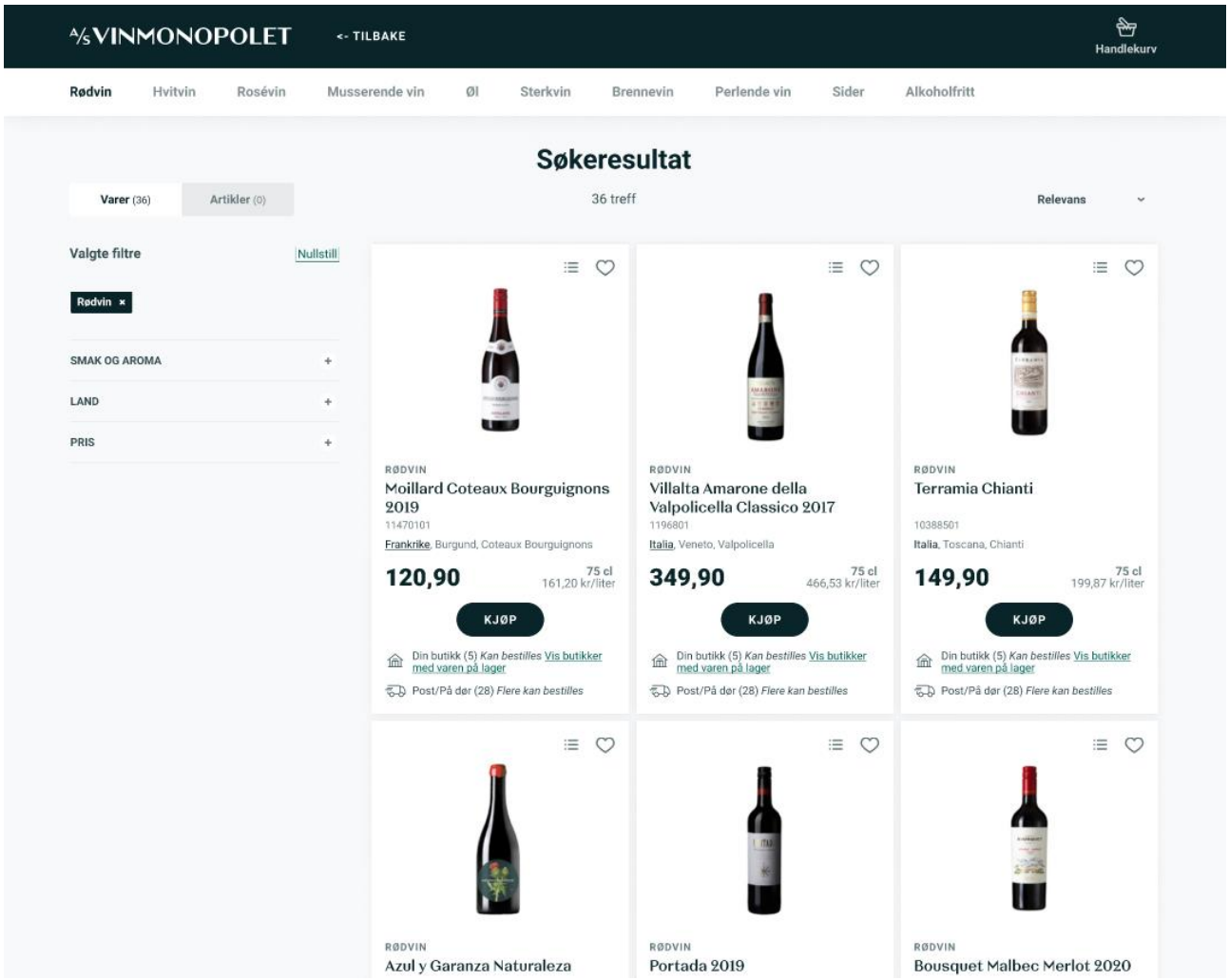
Denne nettsiden er en forenklet versjon av Vinmonopolets egen nettbutikk. Her er en kort oppsummering av hvilke funkskjoner du vil finne:

- **Filtrene på venstre side er aktivert** for at du enkelt skal kunne finne frem til viner som tilfredsstiller dine preferanser.
- Du kan trykke deg inn på hvert enkelt produkt for mer informasjon.
- Det vil **ikke være mulig å velge mer enn ett produkt** i nettbutikken, vær derfor vennlig og velg en rødvin som du ønsker å kjøpe for å ta med på den nevnte hytteturen.
- Dersom du skulle ønske å kjøpe fler av samme vin så er dette mulig ved å **spesifisere ønsket antall i handlekurven**, gitt at totalprisen for antallet viner er innenfor ditt budsjett på 500 kroner.

Når du har bestemt deg for hvilken vin du ønsker å kjøpe, klikker du på knappen som sier **«Kjøp»** ved siden av den aktuelle vinen, deretter bestemmer du hvor mange du vil kjøper, og så klikker du på knappen **«Gå til kassen»** i handlekurven. Når du trykker på knappen som sier «Gå til kassen» vil du bli videreført til spørreundersøkelsen.

Jeg her lest veiledningen - >

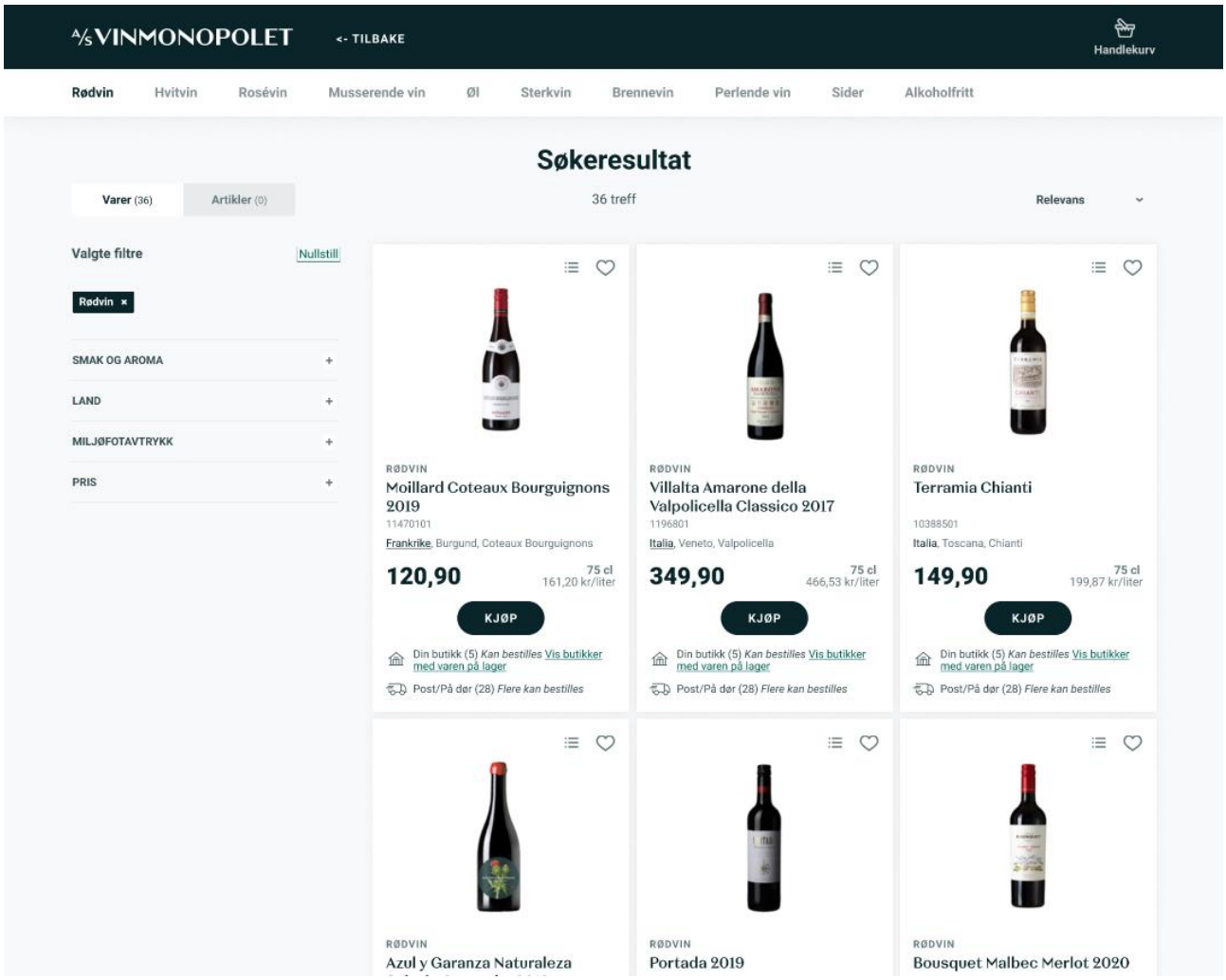
Control Group - Start Page



To view the live shopping experience for the Control group on your computer, please visit the following link:

https://www.figma.com/proto/7xNoVTgeonZUrRvgtovQ33/Vinmonopolet-FC?page-id=0%3A1&node-id=815%3A86&viewport=21036%2C16065%2C0.37400636076927185&scaling=scale-down-width&hide-ui=1

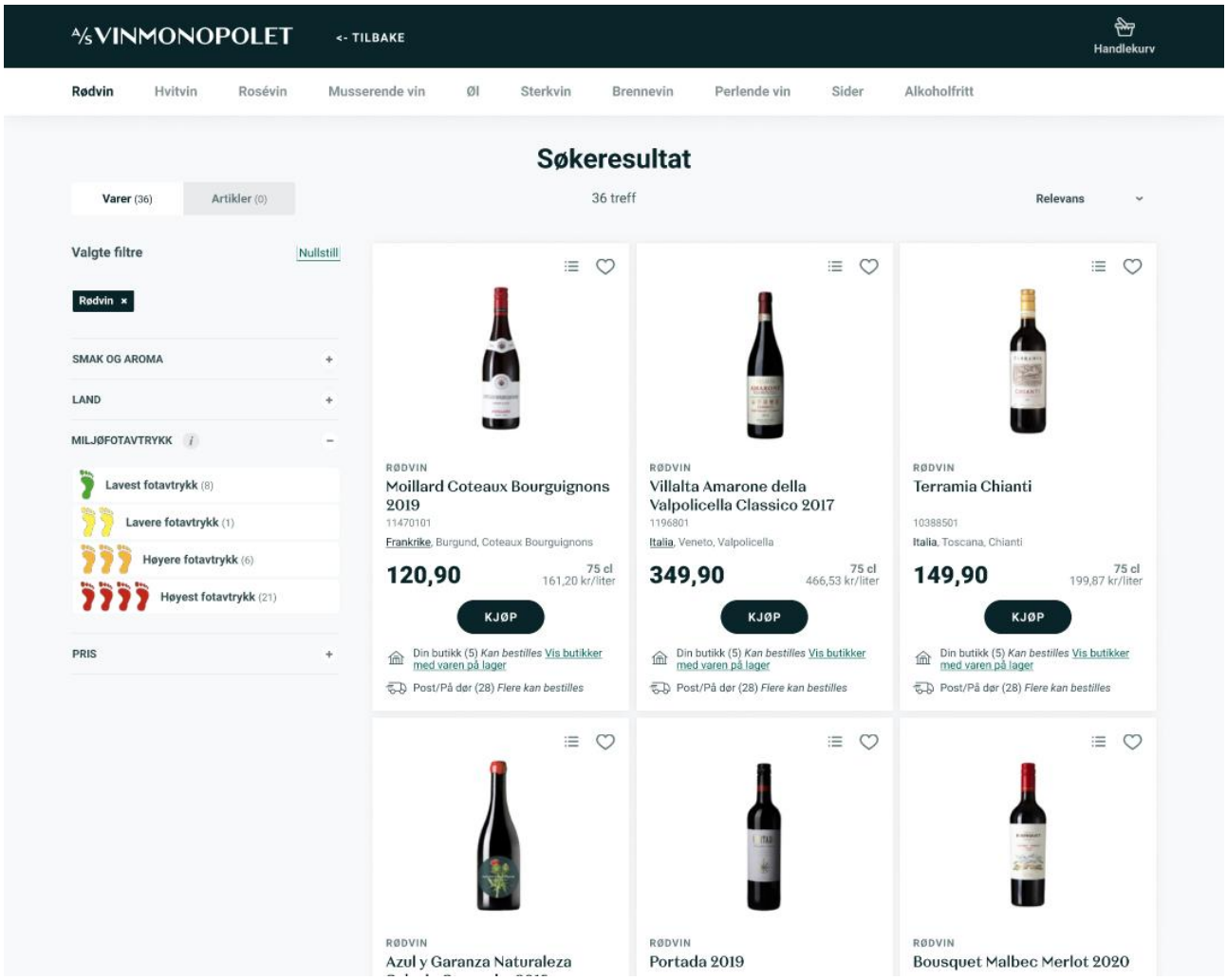
Manipulation 1 - Starting Page



To view the live shopping experience for Manipulation 1 on your computer, please visit the following link:

https://www.figma.com/proto/PmtcHnQYXetTSpJkhfAsC0/Vinmonopolet-FM1?page-id=0%3A1&node-id=751%3A132162&viewport=12471%2C9563%2C0.21749113500118256&scaling=scale-down-width&hide-ui=1

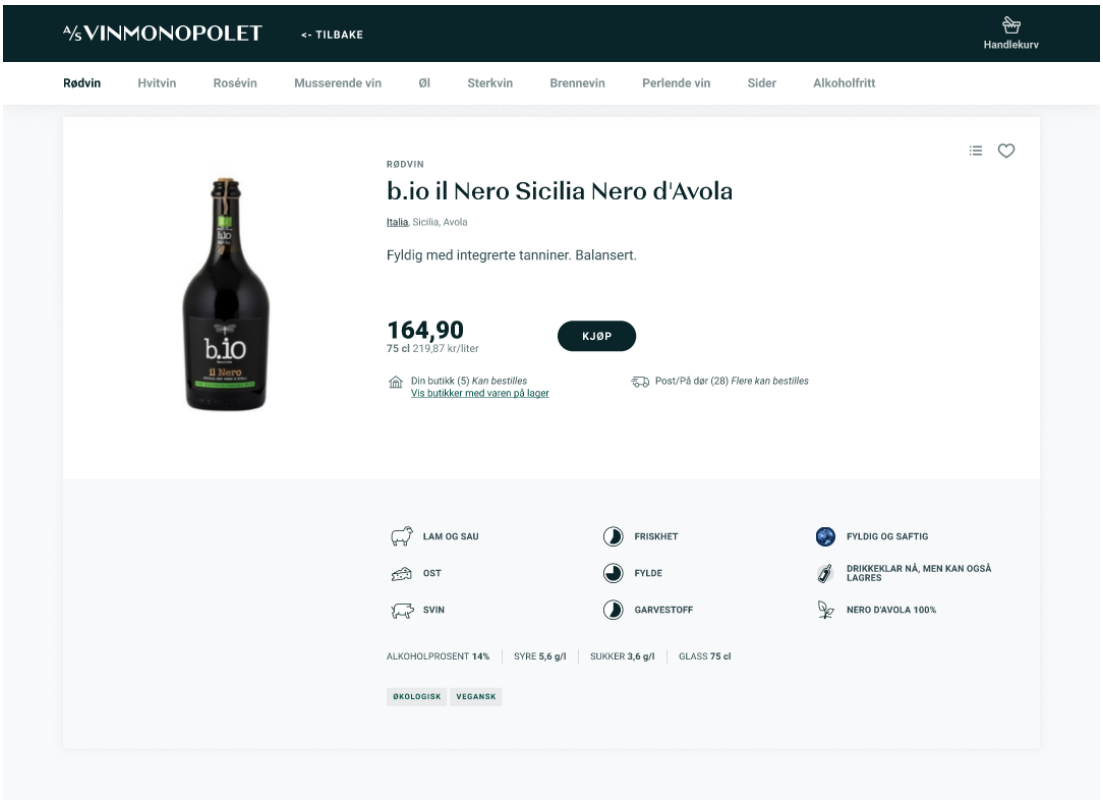
Manipulation 2 - Starting Page



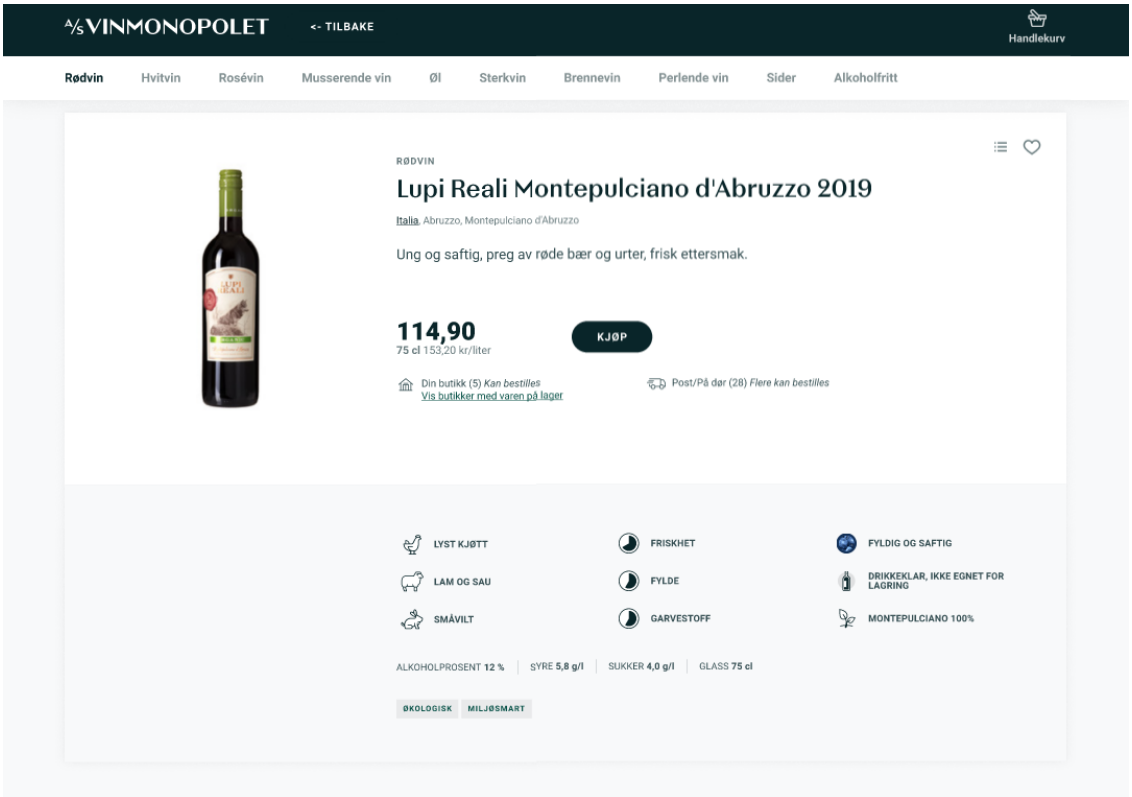
To view the live shopping experience for Manipulation 2 on your computer, please visit the following link:

https://www.figma.com/proto/ERbQI9mybXmtuDdftQlhEM/Vinmonopolet-FM2?page-id=0%3A1&node-id=806%3A51&viewport=11629%2C2907%2C0.20129962265491486&scaling=scale-down-width&hide-ui=1

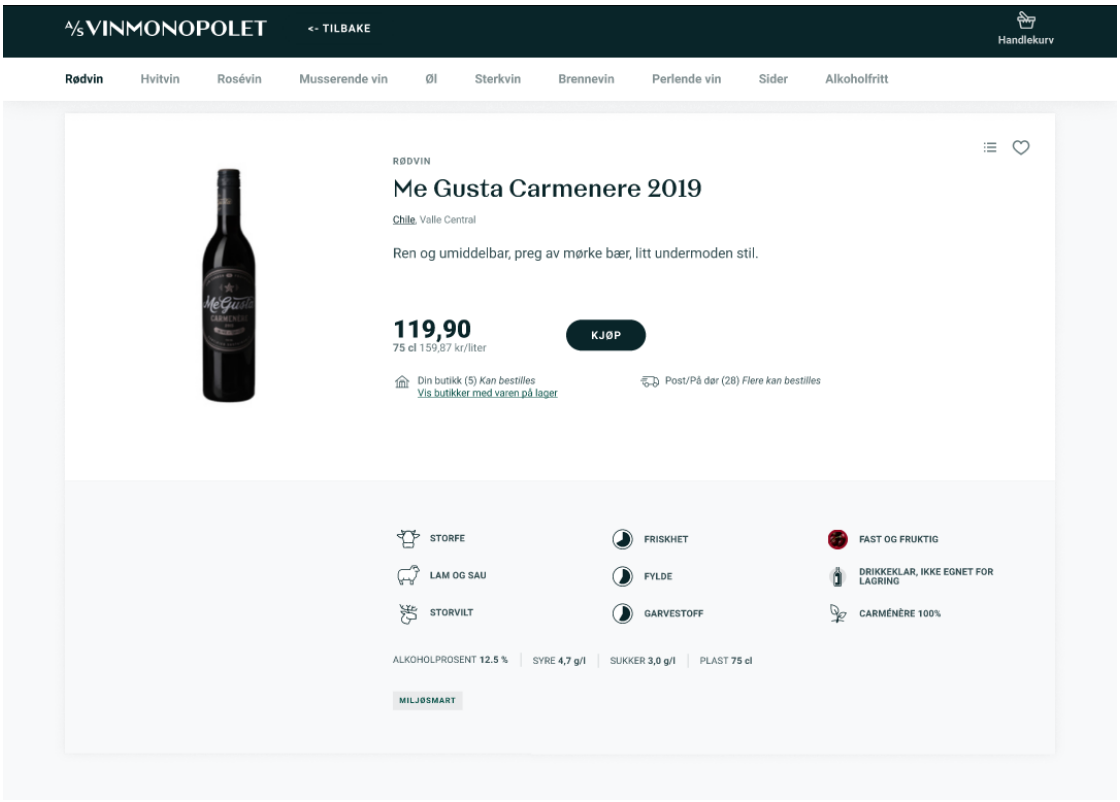
Example Product Page - Heavy Glass



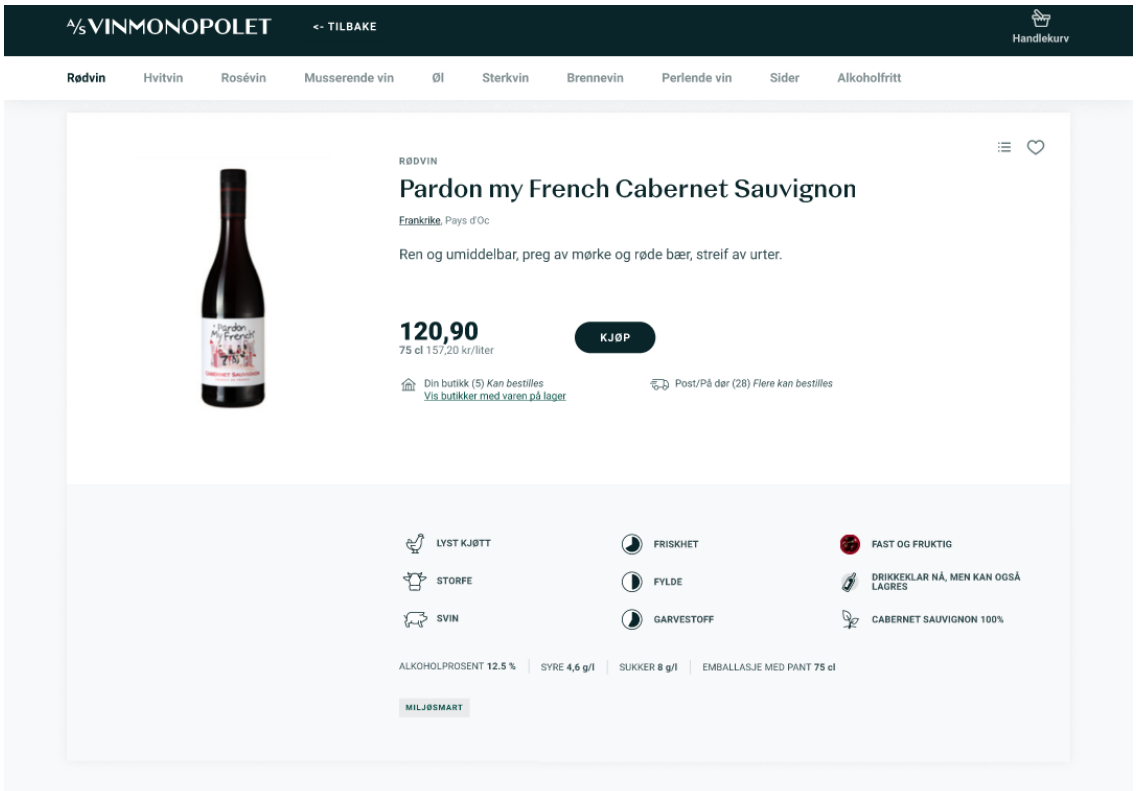
Example Product Page - Light Glass



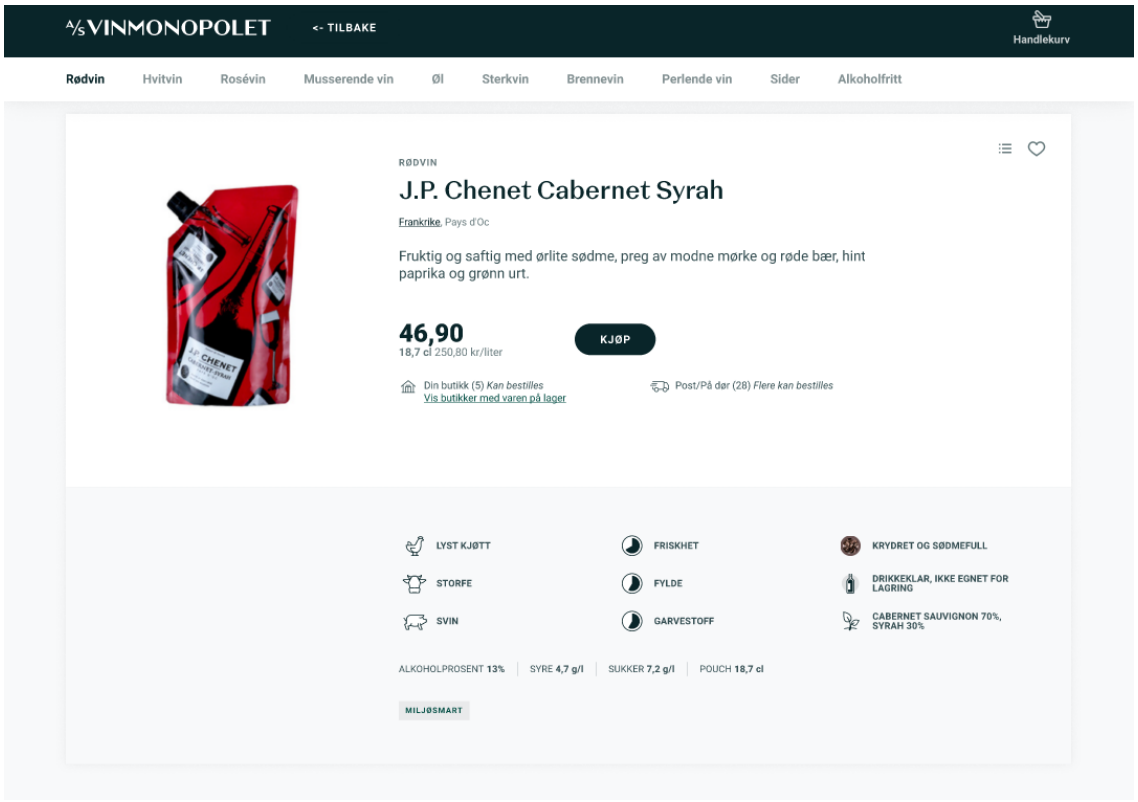
Example Product Page - Plastic



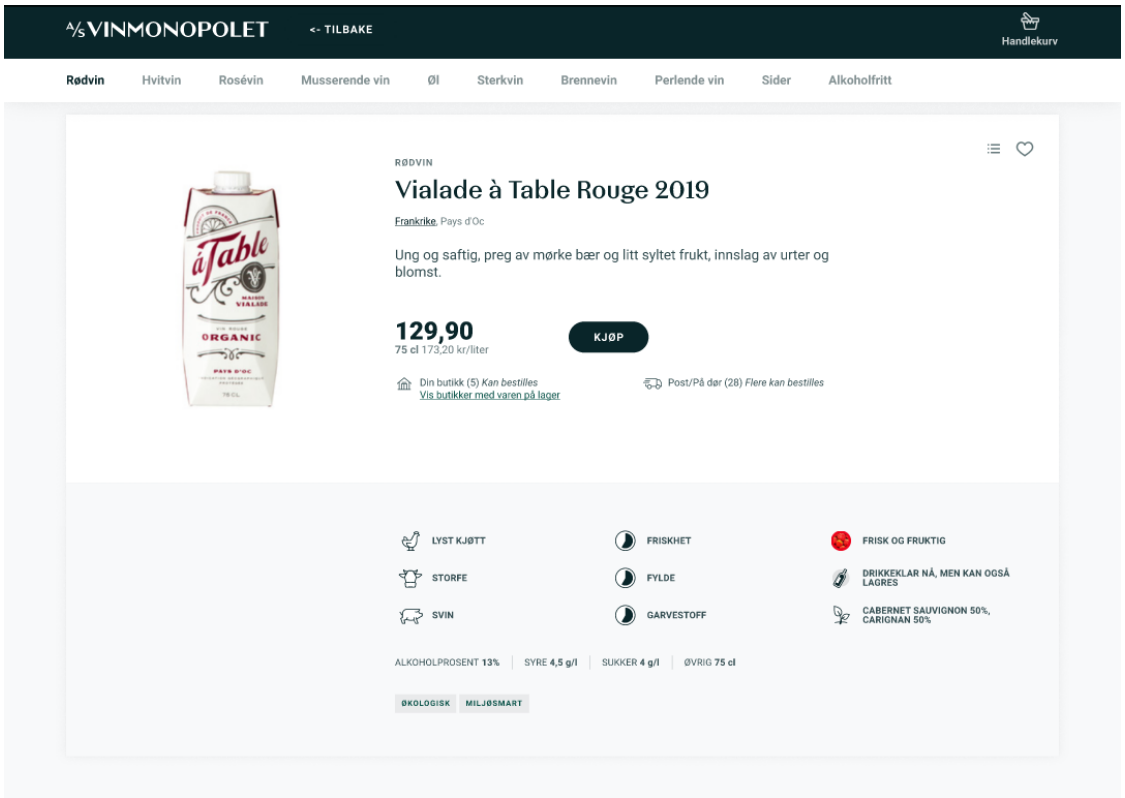
Example Product Page - Plastic “pant”



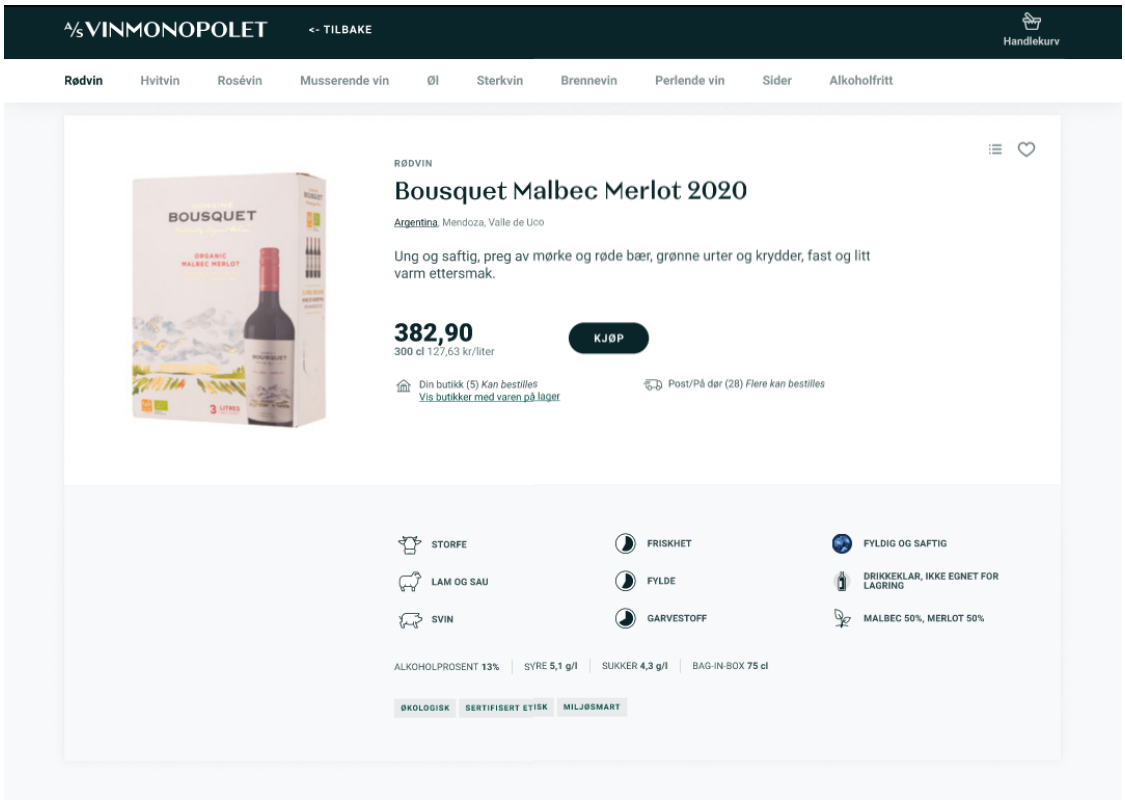
Example Product Page - Pouch



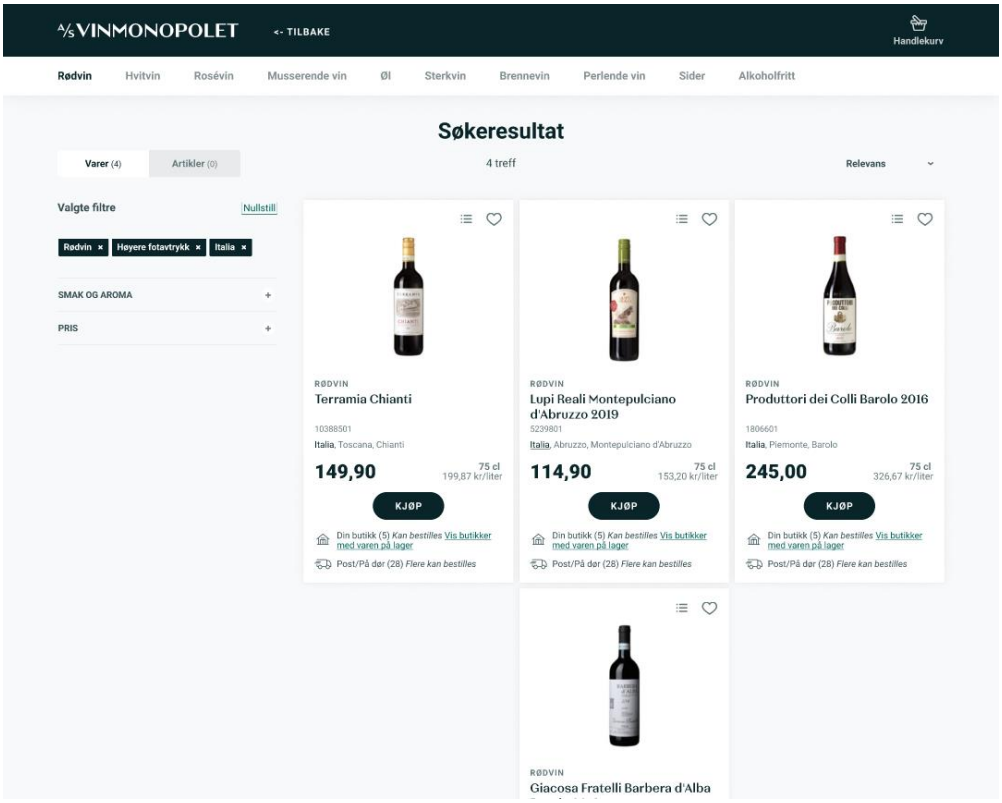
Example Product Page - Tetra Pak



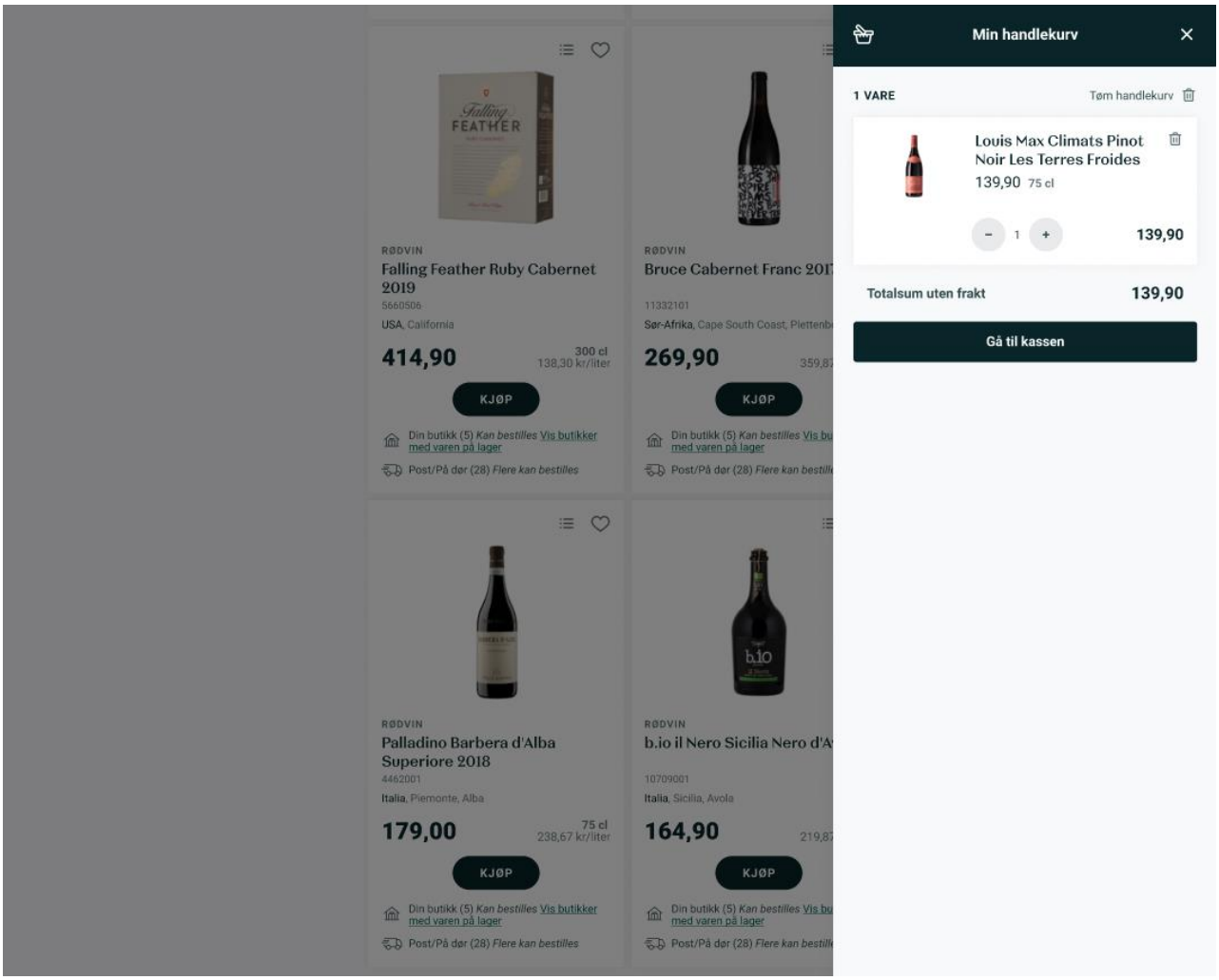
Example Product Page - Bag-in-box



Example of Filter Application



Example of Check-out



11: Complete Survey

Thank you for having bought …[number]… …[name of wine]…

Please click on the arrow in the corner to continue with the survey.

----------New page----------

[Picture of chosen product's page]

How important were these criteria to your selection of this product? Please rate the following elements on a scale from 1 to 5 (1 = not important, 5 = very important):

- Perceived quality
- Visual appearance
- Taste
- Origin
- Price
- Environmental footprint
- Volume
- Suitable for a specific food
- Weight of the product

----------New page----------

Please indicate the degree of agreement or disagreement with the following statements (1 = completely disagree, 5 = completely agree).

[Concept measured: Attitudes towards Chosen Wine]

- I like the wine I chose.
- I believe the selected wine will adequately fulfil my needs.

[Concept measured: Choice Satisfaction]

- I am satisfied with my selection.
- If I could choose again, I would change my selection.

[Concept measured: Perceived Quality of Alternatives]

- The other wine alternatives were appealing to me.
- I think other options were close to ideal.

[Concept measured: Anticipated Regret]

- I will probably regret the choice I made.
- I believe I will change my mind about my selection.

----------New page----------

Please indicate the degree of agreement or disagreement with the following statements (1 = completely disagree, 5 = completely agree).

[Concept measured: Subjective Norms]

- Most people who are important to me would be satisfied with my choice of wine.
- My friends at the cabin think it would be a good idea to buy the wine I selected.

----------New page----------

Please indicate the degree of agreement or disagreement with the following statements (1 = completely disagree, 5 = completely agree).

[Concept measured: Perceived Sustainability]

- I believe I made an environmentally sustainable choice.
- I think the wine I selected is eco-friendly.

----------New page----------

Control group

- Did you use the filters? Yes; No

[If "Yes" was selected]

Please rate the importance of the elements presented in the following questions on a 1 to 5 scale (1 = not important, 5 = very important).

- Did you find the filters useful to select your chosen product?
- To what degree did the filters influence your selection?

Manipulation 1 and 2

- Did you use the filters? Yes; No

[If "Yes" was selected]

Please rate the importance of the elements presented in the following questions on a 1 to 5 scale (1 = not important, 5 = very important).

- Did you find the filters useful to select your chosen product?
- To what degree did the filters influence your selection?

- Did you use the environmental filter? Yes; No

[If "Yes" was selected]

Please rate the importance of the elements presented in the following questions on a 1 to 5 scale (1 = not important, 5 = very important).

- To what extent did you find the environmental filter useful to select the chosen product?
- To what degree did the environmental filter influence your selection?

----------New page----------

Please indicate the degree of agreement or disagreement with the following statements (1 = completely disagree, 5 = completely agree).

[Concept measured: Sustainable Values]

- I care about eco-sustainability.
- I perceive environmental protection as important.

[Concept measured: Sustainable Behaviors]

- I make sustainable choices in my everyday life.
- I try to contrast climate change with my consumption profile.

----------New page----------

Please indicate the degree of agreement or disagreement with the following statements (1 = completely disagree, 5 = completely agree).

[Concept measured: Normative Beliefs about Sustainability]

- I feel under social pressure to buy environmentally-friendly products.
- I feel most people who are important to me expect me to purchase eco-sustainable products.

----------New page----------

Please indicate the degree of agreement or disagreement with the following statements (1 = completely disagree, 5 = completely agree).

[Concept measured: Packaging Effect on Wine]

- I believe the type of packaging is a good indicator of the sustainability of a wine.
- I think packaging accounts for a consistent share of a wine's total environmental footprint.

[Concept measured: Packaging Proxy Sustainability]

- I am concerned that packaging options other than glass may affect the quality of wine.
- I do not think that the taste of wine changes throughout different packaging types.

----------New page----------

Please indicate the degree of agreement or disagreement with the following statements (1 = completely disagree, 5 = completely agree).

[Concept measured: Wine Expertise]

- I consider myself an expert when it comes to wine.
- I have a wide background knowledge about wine.

[Concept measured: Need for Variation]

- When purchasing wine over time, I have a strong need for variation.
- When purchasing wine over time, I tend to choose among a limited selection of products that I know I like.

[Concept measured: Openness to Experience]

- When purchasing wine over time, I am usually open to new products.
- When purchasing wine over time, I am usually glad to try something new.

[Concept measured: Price Sensitivity]

- When purchasing wine, I usually prioritize quality over price.
- When purchasing wine, price is one of the most important elements of evaluation for me, it is more relevant than quality.

----------New page----------

- How old are you? 18-29; 30-39; 40-49; 50-59; 60-69; 70+.
- What is your gender? Male; Female; Non-binary.
- What is your highest level of completed education? High school; Bachelor; Master; PhD.
- Where do you live? Nord-Norge; Midt-Norge; Vestlandet; Østlandet; Sørlandet (inkludert TeVe); Oslo.

----------New page----------

Have you purchased wine in the last year at Vinmonopolet? Yes; No.

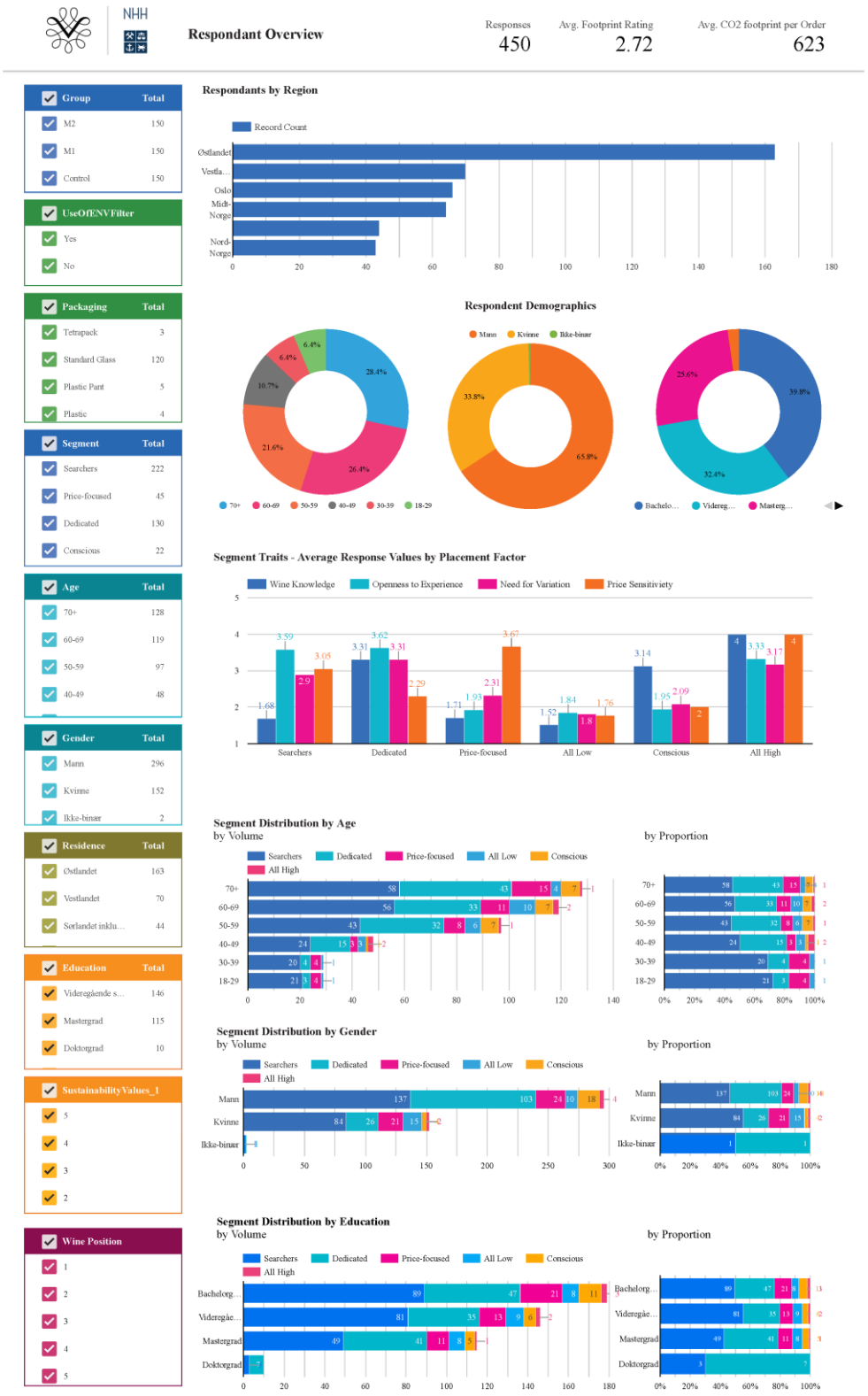
Do you like red wine? Yes; No.

12: Survey Results – All Questions by Factor

		Control		M1		M2	
Factor	**Measure**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Attitude	Jeg liker vinen jeg valgte.	4,06	0,75	4,08	0,74	3,98	0,79
	Jeg tror vinen jeg valgte vil stå til mine forventninger.	4,16	0,62	4,25	0,61	4,13	0,65
Choice Satisfaction	Jeg er fornøyd med mitt valg av vin.	4,11	0,70	4,21	0,64	4,13	0,71
	Dersom jeg hadde fått muligheten til å velge vin på nytt så ville jeg ikke ha valgt en annen vin.	2,55	0,98	2,39	0,98	2,55	0,97
Anticipated Regret	Jeg tror at jeg vil angre på mitt valg av vin.	1,85	0,77	1,77	0,74	1,92	0,78
	Jeg tror jeg kommer til å endre mening rundt vinvalget mitt.	2,17	0,88	2,09	0,82	2,17	0,85
Subjective Norms	De fleste av de menneskene jeg anser som viktige i mitt liv ville ha vært fornøyd med mitt valg av vin.	3,75	0,67	3,79	0,72	3,73	0,73
	De vennene jeg skal på den tenkte hytteturen med synes det vil være en god ide å kjøpe den vinen jeg valgte ut i nettbutikken.	3,80	0,63	3,81	0,70	3,81	0,76
Percieved Sustainability	Jeg mener at mitt valg av vin var bærekraftig i lys av klimaendringene.	3,12	0,59	3,08	0,63	3,25	0,78
	Jeg tror vinen jeg valgte er miljøvennlig.	3,11	0,52	3,10	0,67	3,26	0,74
Sustainability Values	Jeg bryr meg om bærekraft i lys av klimaendringene.	3,46	1,12	3,53	0,97	3,56	1,01
	Jeg anser miljøvern som viktig.	4,03	0,93	4,09	0,74	4,07	0,66
Sustainable Behaviors	Jeg tar bærekraftige valg i hverdagen.	3,48	0,87	3,48	0,83	3,46	0,81
	Jeg prøver å påvirke klimaendringene positivt gjennom bevisste valg i kjøpssituasjoner.	3,37	0,97	3,25	0,92	3,33	0,97
Normative Beliefs about Sustainability	Jeg føler et sosialt press mot å kjøpe miljøvennlige produkter.	2,57	0,99	2,49	1,07	2,35	0,99
	Jeg føler at de fleste av de menneskene jeg anser som viktige i mitt liv forventer at jeg skal kjøpe bærekraftige produkter.	2,67	0,94	2,67	0,94	2,49	0,96
Packaging as Proxy for Sustainability	Jeg tror emballasjetypen er en god indikator på hvor bærekraftig den vinen er.	2,98	0,88	2,75	0,94	2,85	0,99
	Jeg tror emballasjen til en vin står for en betydelig del av vinens totale miljøavtrykk.	3,13	0,85	3,01	0,89	3,04	1,01
Packaging Effect on Wine	Jeg er bekymret for at andre emballasjetyper enn glass kan påvirke kvaliteten på vin.	2,97	1,06	3,07	1,12	2,88	1,03
	Jeg tror ikke at ulike emballasjetyper påvirker smaken på vin (på ulike måter).	2,89	0,94	2,73	1,05	2,99	0,99
Wine Expertise	Jeg anser meg selv som en vinekspert.	2,13	0,82	2,05	0,87	2,09	0,87
	Jeg har bred kunnskap om vin.	2,29	0,88	2,17	0,97	2,29	1,02
Openness to Experience	Når jeg kjøper vin har jeg et stort behov for å variere hvilket produkt jeg velger fra gang til gang.	3,83	0,88	3,78	0,78	3,90	0,68
	Når jeg kjøper vin velger jeg en vin fra et (lite) utvalg viner jeg kjenner fra før, og som jeg vet jeg liker.	3,33	0,92	3,16	0,95	3,27	0,81
Need for Variation	Når jeg kjøper vin er jeg som regel åpen for å prøve nye produkter.	2,97	0,98	2,71	1,03	2,90	0,95
	Når jeg kjøper vin er jeg som regel glad for å prøve noe nytt fra gang til gang.	3,26	1,02	3,29	1,06	3,28	1,03
Price Sensitivity	Når jeg kjøper vin så tillegger jeg kvalitet mer vekt enn pris.	3,31	0,90	3,25	0,93	3,27	0,86
	Når jeg kjøper vin er prisen en av de viktigste kvalitetene som avgjør om jeg vil kjøpe den vinen eller ikke, det er viktigere enn kvaliteten på vinen.	2,72	1,04	2,90	1,05	2,73	0,92

13: Google Data Studio – Survey Results

Please use this link to view the active report and interact with the data provided below:
https://datastudio.google.com/reporting/2d4d9862-7fa9-4ce2-9c95-fe32b29d5dc4/page/2yzRB



NHH

Selected Wines and their Qualities

Responses	Avg. Footprint Rating	Avg. CO2 footprint per Order
450	2.72	623

Group	Total
M2	150
M1	150
Control	150

UseOfENVFilter
Yes
No

Packaging	Total
Tetrapack	3
Standard Glass	120
Plastic Pant	5
Plastic	4

Segment	Total
Searchers	222
Price-focused	45
Dedicated	130
Conscious	22

Age	Total
70+	128
60-69	119
50-59	97
40-49	48

Gender	Total
Mann	296
Kvinne	152
Ikke-binær	2

Residence	Total
Østlandet	163
Vestlandet	70
Sørlandet inklu…	44

Education	Total
Videregående s…	146
Mastergrad	115
Doktorgrad	10

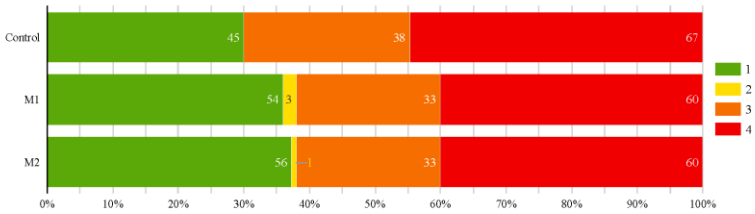
SustainabilityValues_1
5
4
3
2

Wine Position
1
2
3
4
5

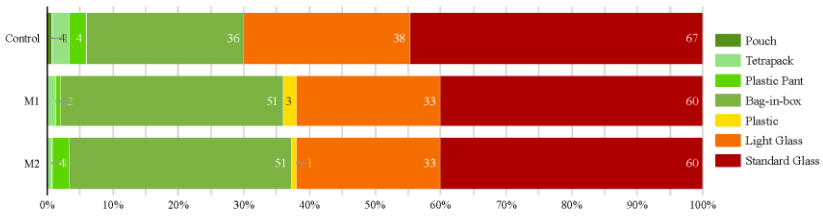
Top Wines Selected

Wine Position i…	Name	Packaging	Total	Footprint	Avg. Qua…
8	Louis Max Climats Pinot Noir Les Terres Froides (…	Bag-in-box	40	1	1
2	Villalta Amarone della Valpolicella Classico 2017	Standard Glass	38	4	1
31	Falling Feather Ruby Cabernet 2019 (Bag-in-box)	Bag-in-box	38	1	1
3	Terramia Chianti	Light Glass	37	3	1.92
15	Produttori dei Colli Barolo 2016	Light Glass	25	3	1.76
17	Lupi Reali Montepulciano d'Abruzzo 2019 (Bag-i…	Bag-in-box	25	1	1
1	Moillard Coteaux Bourguignons 2019	Light Glass	24	3	2.04
13	Bousquet Malbec Merlot 2020 (Bag-in-box)	Bag-in-box	21	1	1
10	Domini Veneti Valpolicella Classico Superiore 2019	Standard Glass	18	4	3
22	Moillard Coteaux Bourguignons	Bag-in-box	14	1	1
21	Brolio Chianti Classico 2017	Standard Glass	13	4	1.77

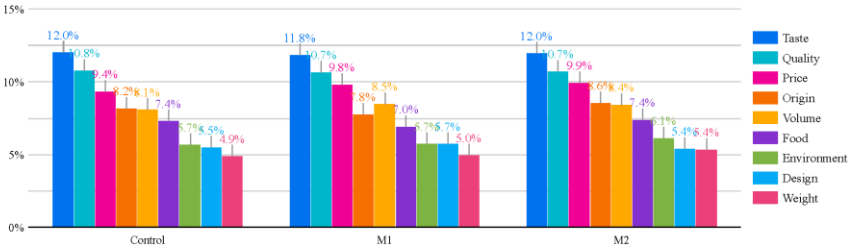
Share of Chosen wines by Footprint Classification



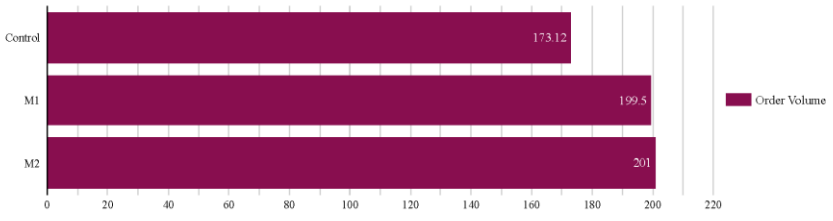
Share of Chosen wines by Packaging Type



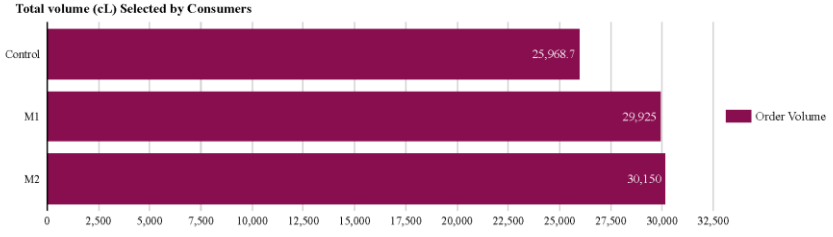
Attribute Importance by Experimental Group

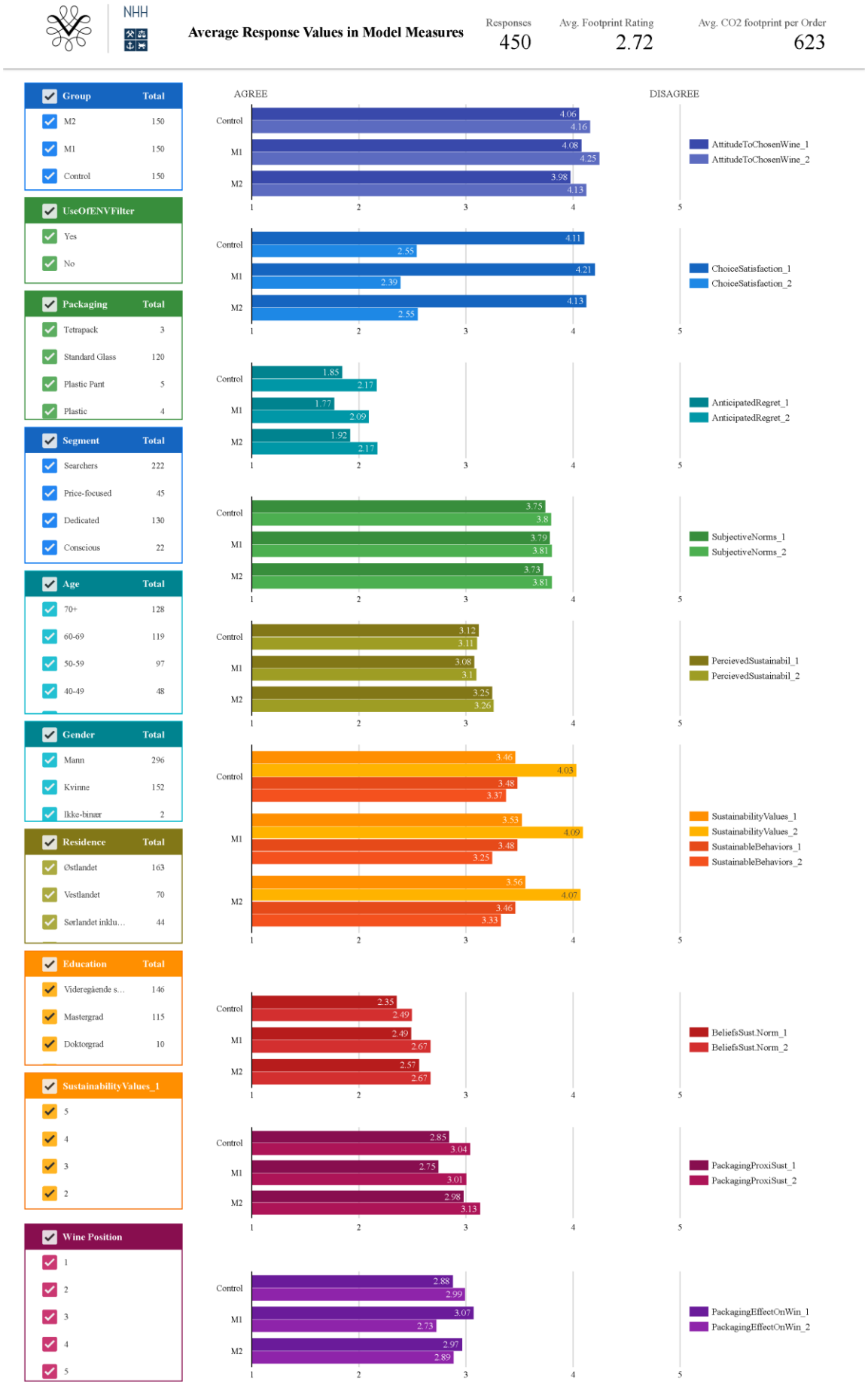


Average Order Volume Selected by Consumers



Total volume (cL) Selected by Consumers




NHH
Average Response Values in Model Measures
Responses
450
Avg. Footprint Rating
2.72
Avg. CO2 footprint per Order
623
Group Total
M2 150
M1 150
Control 150
UseOfENVFilter
Yes
No
Packaging Total
Tetrapack 3
Standard Glass 120
Plastic Pant 5
Plastic 4
Segment Total
Searchers 222
Price-focused 45
Dedicated 130
Conscious 22
Age Total
70+ 128
60-69 119
50-59 97
40-49 48
Gender Total
Mann 296
Kvinne 152
Ikke-binær 2
Residence Total
Østlandet 163
Vestlandet 70
Sørlandet inklu... 44
Education Total
Videregående s... 146
Mastergrad 115
Doktorgrad 10
SustainabilityValues_1
5
4
3
2
Wine Position
1
2
3
4
5
AGREE
DISAGREE
Control
M1
M2
4.06
4.16
4.08
4.25
3.98
4.13
AttitudeToChosenWine_1
AttitudeToChosenWine_2
4.11
2.55
4.21
2.39
4.13
2.55
ChoiceSatisfaction_1
ChoiceSatisfaction_2
1.85
2.17
1.77
2.09
1.92
2.17
AnticipatedRegret_1
AnticipatedRegret_2
3.75
3.8
3.79
3.81
3.73
3.81
SubjectiveNorms_1
SubjectiveNorms_2
3.12
3.11
3.08
3.1
3.25
3.26
PercievedSustainabil_1
PercievedSustainabil_2
3.46
4.03
3.48
3.37
3.53
4.09
3.48
3.25
3.56
4.07
3.46
3.33
SustainabilityValues_1
SustainabilityValues_2
SustainableBehaviors_1
SustainableBehaviors_2
2.35
2.49
2.49
2.67
2.57
2.67
BeliefsSust.Norm_1
BeliefsSust.Norm_2
2.85
3.04
2.75
3.01
2.98
3.13
PackagingProxiSust_1
PackagingProxiSust_2
2.88
2.99
3.07
2.73
2.97
2.89
PackagingEffectOnWin_1
PackagingEffectOnWin_2
1
2
3
4
5

NHH

Effects of Filter Use on Choice

Responses	Avg. Footprint Rating	Avg. CO2 footprint per Order
450	2.72	623

Group	Total
M2	150
M1	150
Control	150

UseOfENVFilter
Yes
No

Packaging	Total
Tetrapack	3
Standard Glass	120
Plastic Pant	5
Plastic	4

Segment	Total
Searchers	222
Price-focused	45
Dedicated	130
Conscious	22

Age	Total
70+	128
60-69	119
50-59	97
40-49	48

Gender	Total
Mann	296
Kvinne	152
Ikke-binær	2

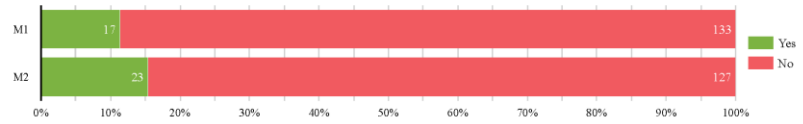
Residence	Total
Østlandet	163
Vestlandet	70
Sørlandet inklu…	44

Education	Total
Videregående s…	146
Mastergrad	115
Doktorgrad	10

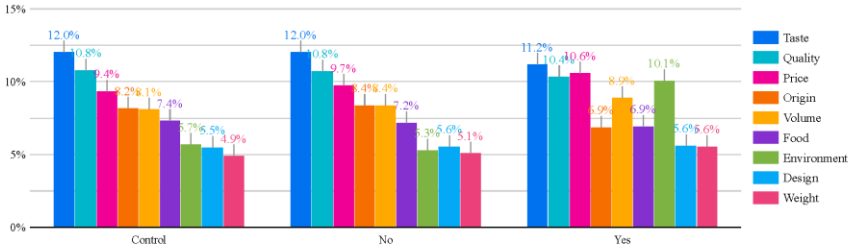
SustainabilityValues_1
5
4
3
2

Wine Position
1
2
3
4
5

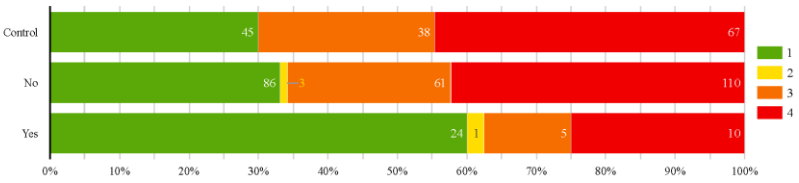
Footprint Filter Usage by Experimental Group



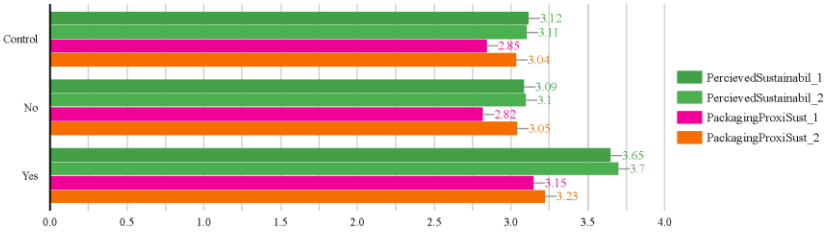
Attribute Importance broken down by Filter Use vs. Control



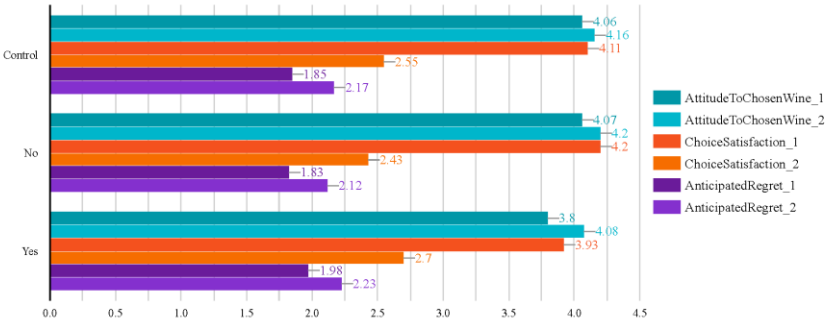
Footprint Choice based on Filter Use



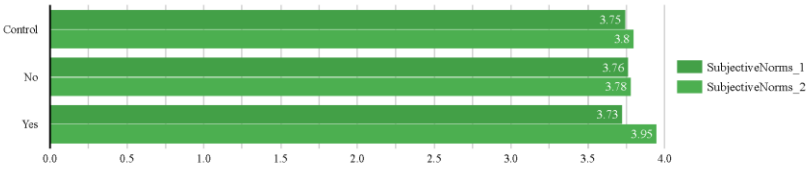
Percieved Sustainability based on Filter Use



Attitude about Chosen Wine based on Filter Use



Subjective Norms about Chosen Wine based on Filter Use



Differences in Filter Use based on Moderating Variables

Responses	Avg. Footprint Rating	Avg. CO2 footprint per Order
450	2.72	623

Group	Total
M2	150
M1	150
Control	150

UseOfENVFilter
Yes
No

Packaging	Total
Tetrapack	3
Standard Glass	120
Plastic Pant	5
Plastic	4

Segment	Total
Searchers	222
Price-focused	45
Dedicated	130
Conscious	22

Age	Total
70+	128
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Mann	296
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Ikke-binær	2

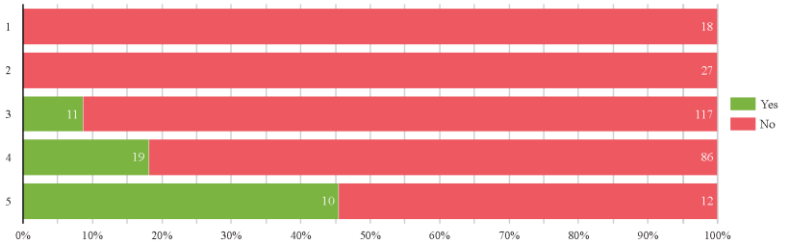
Residence	Total
Østlandet	163
Vestlandet	70
Sørlandet inklu…	44

Education	Total
Videregående s…	146
Mastergrad	115
Doktorgrad	10

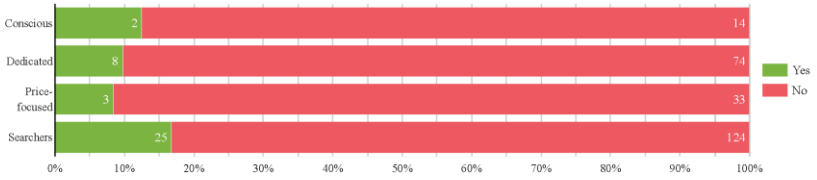
SustainabilityValues_1
5
4
3
2

Wine Position
1
2
3
4
5

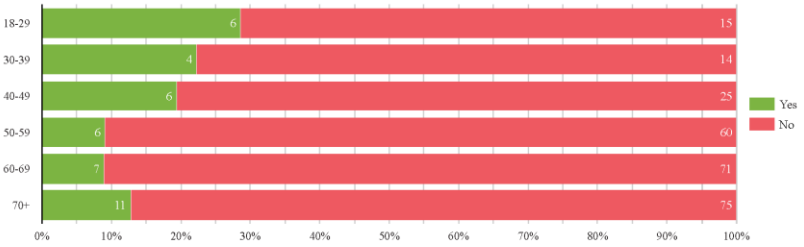
Proportion of Filter Usage **by Sustainability Valuse (1=Low, 5=High)**



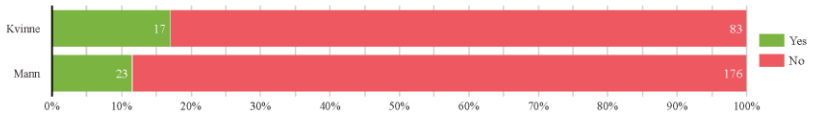
Proportion of Filter Usage **by Segment**



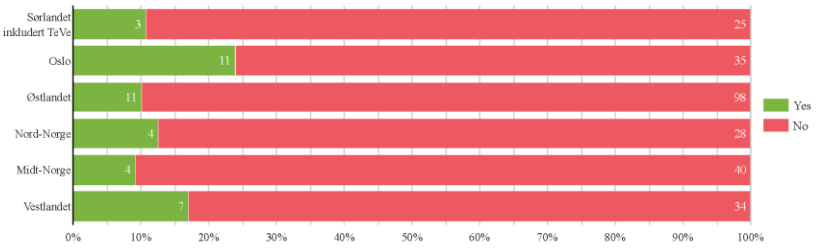
Proportion of Filter usage **by Age**



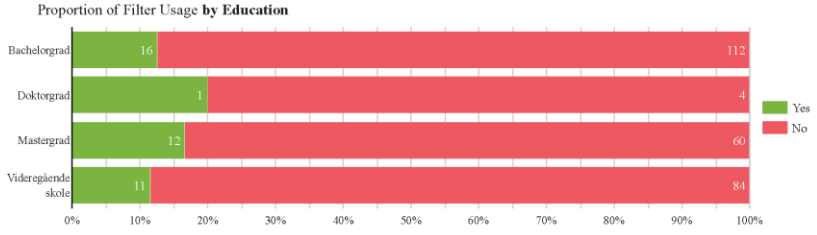
Proportion of Filter usage **by Gender**



Proportion of Filter Usage **by Location**



Proportion of Filter Usage **by Education**



NHH

Differences in Filter Use based on Moderating Variables

Responses	Avg. Footprint Rating	Avg. CO2 footprint per Order
450	2.72	623

Group	Total
M2	150
M1	150
Control	150

UseOfENVFilter
Yes
No

Packaging	Total
Tetrapack	3
Standard Glass	120
Plastic Pant	5
Plastic	4

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Gender	Total
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Kvinne	152
Ikke-binær	2

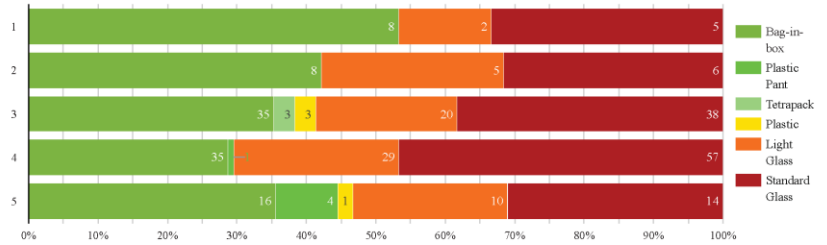
Residence	Total
Østlandet	163
Vestlandet	70
Sørlandet inklu…	44

Education	Total
Videregående s…	146
Mastergrad	115
Doktorgrad	10

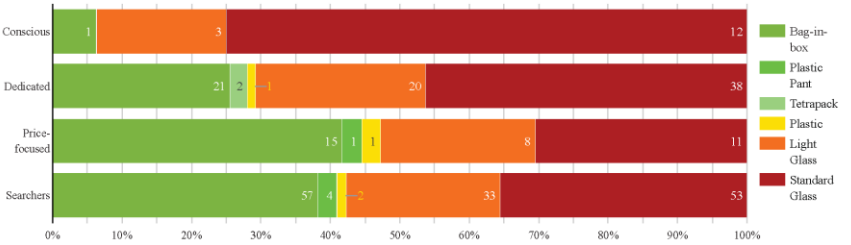
SustainabilityValues_1
5
4
3
2

Wine Position
1
2
3
4
5

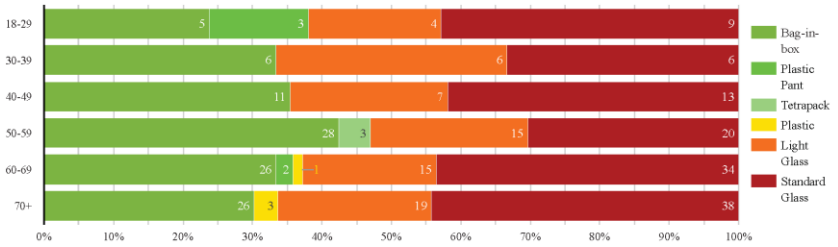
Footprint Proportions of Selected Wines **by Sustainability Valuse (1=Low, 5=High)**



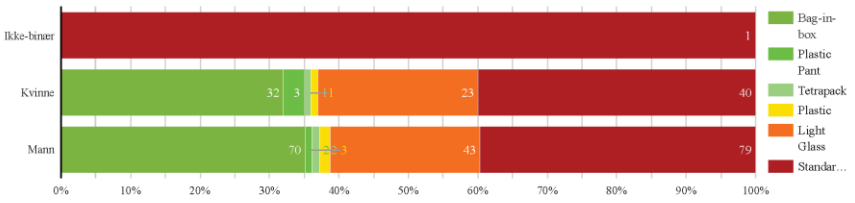
Footprint Proportions of Selected Wines **by Segment**



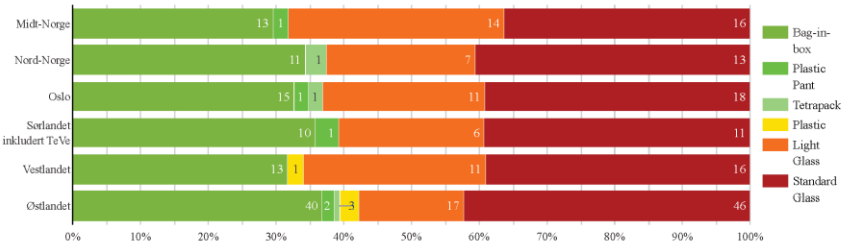
Footprint Proportions of Selected Wines **by Age**



Footprint Proportions of Selected Wines **by Gender**



Footprint Proportions of Selected Wines **by Location**



NHH

Responses	Avg. Footprint Rating	Avg. CO2 footprint per Order
450	2.72	623

Group	Total
M2	150
M1	150
Control	150

UseOfENVFilter
Yes
No

Packaging	Total
Tetrapack	3
Standard Glass	120
Plastic Pant	5
Plastic	4

Segment	Total
Searchers	222
Price-focused	45
Dedicated	130
Conscious	22

Age	Total
70+	128
60-69	119
50-59	97
40-49	48

Gender	Total
Mann	296
Kvinne	152
Ikke-binær	2

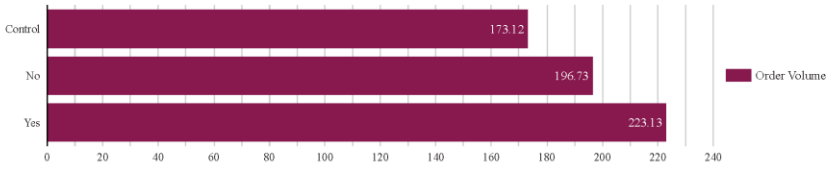
Residence	Total
Østlandet	163
Vestlandet	70
Sørlandet inklu…	44

Education	Total
Videregående s…	146
Mastergrad	115
Doktorgrad	10

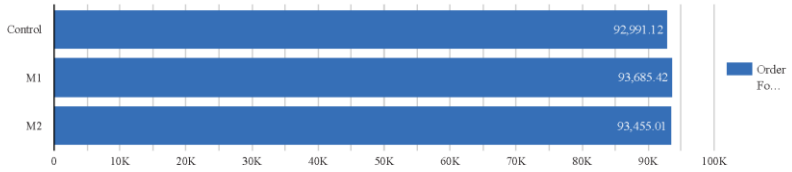
SustainabilityValues_1
5
4
3
2

Wine Position
1
2
3
4
5

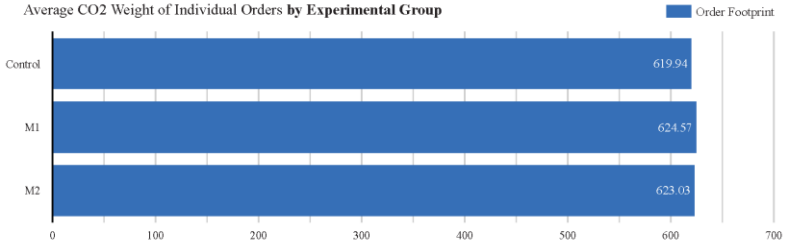
Average Order Volume (cl) based on Filter Use



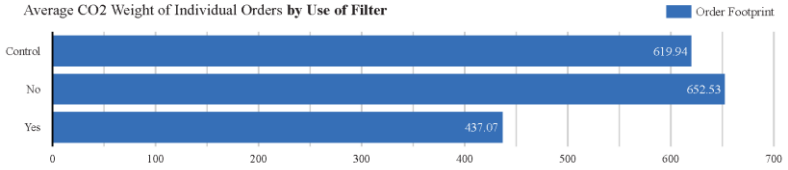
Total CO2 Weight (Grams) of All Orders **by Experimental Group**



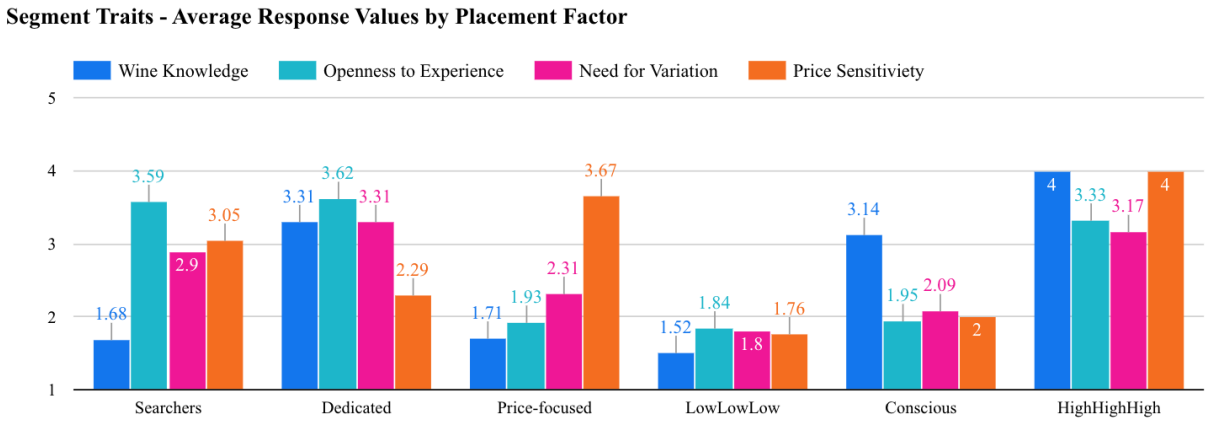
Average CO2 Weight of Individual Orders **by Experimental Group**



Average CO2 Weight of Individual Orders **by Use of Filter**



14: Segments' Personality and Placement Values



15: Most Selected Wines

Store Listing	Name	Packaging	Total	Footprint
8	Louis Max Climats Pinot Noir Les Terres Froides	Bag-in-box	40	1
2	Villalta Amarone della Valpolicella Classico 2017	Standard Glass	38	4
31	Falling Feather Ruby Cabernet 2019	Bag-in-box	38	1
3	Terramia Chianti	Light Glass	37	3
15	Produttori dei Colli Barolo 2016	Light Glass	25	3
17	Lupi Reali Montepulciano d'Abruzzo 2019	Bag-in-box	25	1
1	Moillard Coteaux Bourguignons 2019	Light Glass	24	3
13	Bousquet Malbec Merlot 2020	Bag-in-box	21	1
10	Domìni Veneti Valpolicella Classico Superiore 2019	Standard Glass	18	4
22	Moillard Coteaux Bourguignons	Bag-in-box	14	1

16: R Outputs for Hypothesis Testing

H1.1: Chi Squared Test - Default Visibility

```
> #AB test - Effect of default view on filter use
> FIR <- matrix(c(17, 23, 133, 127), nrow=2)
>
> chisq.test(FIR)

        Pearson's Chi-squared test with Yates' continuity correction

data:  FIR
X-squared = 0.72115, df = 1, p-value = 0.3958
```

H1.2: Regression and ANOVA, Filter's Use - Normative Beliefs about Sustainability

```
> fitUoF_NB <- lm(UseOfENVFilter ~ BeliefsSust.Norm_2, data = Manipulations)
> summary(fitUoF_NB)

Call:
lm(formula = UseOfENVFilter ~ BeliefsSust.Norm_2, data = Manipulations)

Residuals:
     Min       1Q   Median       3Q      Max
-0.33663 -0.16188 -0.16188  0.01288  1.01288

Coefficients:
                  Estimate Std. Error t value Pr(>|t|)
(Intercept)        -0.10026    0.05772  -1.737   0.0834 .
BeliefsSust.Norm_2  0.08738    0.02037   4.289 2.43e-05 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.331 on 298 degrees of freedom
Multiple R-squared:  0.05814,   Adjusted R-squared:  0.05498
F-statistic:  18.4 on 1 and 298 DF,  p-value: 2.428e-05

> aovUoF_NB <- aov(UseOfENVFilter ~ BeliefsSust.Norm_2, data = Manipulations)
> summary(aovUoF_NB)
                   Df Sum Sq Mean Sq F value   Pr(>F)
BeliefsSust.Norm_2   1   2.02  2.0155   18.39 2.43e-05 ***
Residuals          298  32.65  0.1096
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

H1.3: Regression and ANOVA, Filter's Use - Sustainability Values

```
> fitUse_SV <- lm(UseOfENVFilter ~ SustainabilityValues_1, data = Manipulations)
> summary(fitUse_SV)

Call:
lm(formula = UseOfENVFilter ~ SustainabilityValues_1, data = Manipulations)

Residuals:
     Min       1Q   Median       3Q      Max
-0.27911 -0.17904 -0.07896 -0.07896  1.02112

Coefficients:
                      Estimate Std. Error t value Pr(>|t|)
(Intercept)           -0.22128    0.07020  -3.152  0.00178 **
SustainabilityValues_1  0.10008    0.01908   5.244 2.98e-07 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.3263 on 298 degrees of freedom
Multiple R-squared:  0.08449,   Adjusted R-squared:  0.08142
F-statistic:  27.5 on 1 and 298 DF,  p-value: 2.981e-07

> aovUoF_SV <- aov(UseOfENVFilter ~ SustainabilityValues_1, data = Manipulations)
> summary(aovUoF_SV)
                       Df Sum Sq Mean Sq F value   Pr(>F)
SustainabilityValues_1   1   2.93  2.9290    27.5 2.98e-07 ***
Residuals              298  31.74  0.1065
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

H1.4.1: Regression and ANOVA, Filter's Use - Age

```
> fitUse_Age <- lm(UseOfENVFilter ~ Age, data = Manipulations)
> summary(fitUse_Age)

Call:
lm(formula = UseOfENVFilter ~ Age, data = Manipulations)

Residuals:
     Min       1Q   Median       3Q      Max
-0.28571 -0.12791 -0.09091 -0.08974  0.91026

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  0.28571    0.07383   3.870 0.000134 ***
Age30-39    -0.06349    0.10868  -0.584 0.559515
Age40-49    -0.09217    0.09562  -0.964 0.335914
Age50-59    -0.19481    0.08477  -2.298 0.022257 *
Age60-69    -0.19597    0.08318  -2.356 0.019128 *
Age70+      -0.15781    0.08235  -1.916 0.056308 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.3383 on 294 degrees of freedom
Multiple R-squared:  0.02919,   Adjusted R-squared:  0.01268
F-statistic: 1.768 on 5 and 294 DF,  p-value: 0.1194

> aovUse_Age <- aov(UseOfENVFilter ~ Age, data = Manipulations)
> summary(aovUse_Age)
             Df Sum Sq Mean Sq F value Pr(>F)
Age           5   1.01  0.2024   1.768  0.119
Residuals   294  33.65  0.1145
```

H1.4.2: Chi Squared, Filter's Use - Gender

```
> #Gender
> GIR <- matrix(c(17, 23, 83, 176), nrow=2)
>
> chisq.test(GIR)

        Pearson's Chi-squared test with Yates' continuity correction

data:  GIR
X-squared = 1.2638, df = 1, p-value = 0.2609
```

H1.4.3: Regression and ANOVA, Filter's Use - Education

```
> Manipulations$Education <- factor(Manipulations$Education, levels = c("Videregående skole", "Bachelor
grad", "Mastergrad", "Doktorgrad"))
> fitUse_Education <- lm(UseOfENVFilter ~ Education, data = Manipulations)
> summary(fitUse_Education)

Call:
lm(formula = UseOfENVFilter ~ Education, data = Manipulations)

Residuals:
    Min      1Q  Median      3Q     Max
-0.2000 -0.1250 -0.1250 -0.1158  0.8842

Coefficients:
                     Estimate Std. Error t value Pr(>|t|)
(Intercept)          0.115789   0.035040   3.304  0.00107 **
EducationBachelorgrad 0.009211   0.046250   0.199  0.84229
EducationMastergrad   0.050877   0.053365   0.953  0.34118
EducationDoktorgrad   0.084211   0.156705   0.537  0.59141
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.3415 on 296 degrees of freedom
Multiple R-squared:  0.004049,  Adjusted R-squared:  -0.006046
F-statistic: 0.4011 on 3 and 296 DF,  p-value: 0.7523

> aovUse_Education <- aov(UseOfENVFilter ~ Education, data = Manipulations)
> summary(aovUse_Education)
             Df Sum Sq Mean Sq F value Pr(>F)
Education     3   0.14 0.04678   0.401  0.752
Residuals   296  34.53 0.11664
```

H1.4.4: Regression and ANOVA, Filter's Use - Location

```
> Manipulations$Residence <- factor(Manipulations$Residence, levels = c("Oslo", "Vestlandet", "Nord-Nor
ge", "Sørlandet inkludert TeVe", "Midt-Norge", "Østlandet"))
> fitUse_Location <- lm(UseOfENVFilter ~ Residence, data = Manipulations)
> summary(fitUse_Location)

Call:
lm(formula = UseOfENVFilter ~ Residence, data = Manipulations)

Residuals:
     Min       1Q   Median       3Q      Max
-0.23913 -0.12500 -0.10092 -0.09091  0.90909

Coefficients:
                                Estimate Std. Error t value Pr(>|t|)
(Intercept)                      0.23913    0.05005   4.778  2.8e-06 ***
ResidenceVestlandet             -0.06840    0.07291  -0.938   0.3489
ResidenceNord-Norge             -0.11413    0.07814  -1.461   0.1452
ResidenceSørlandet inkludert TeVe -0.13199    0.08137  -1.622   0.1059
ResidenceMidt-Norge             -0.14822    0.07158  -2.071   0.0393 *
ResidenceØstlandet              -0.13821    0.05969  -2.316   0.0213 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.3395 on 294 degrees of freedom
Multiple R-squared:  0.02271,   Adjusted R-squared:  0.006092
F-statistic: 1.367 on 5 and 294 DF,  p-value: 0.2368

> aovUse_Location <- aov(UseOfENVFilter ~ Residence, data = Manipulations)
> summary(aovUse_Location)
             Df Sum Sq Mean Sq F value Pr(>F)
Residence     5   0.79  0.1575   1.367  0.237
Residuals   294  33.88  0.1152
```

H2.1: T-tests, Filter's Use - CO_2

```
> t.test(Control$CO2perLiter,FUsers$CO2perLiter)

        Welch Two Sample t-test

data:  Control$CO2perLiter and FUsers$CO2perLiter
t = 3.4645, df = 61.603, p-value = 0.0009729
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
  75.04455 279.83345
sample estimates:
mean of x mean of y
  454.446   277.007

> t.test(FNUsers$CO2perLiter,FUsers$CO2perLiter)

        Welch Two Sample t-test

data:  FNUsers$CO2perLiter and FUsers$CO2perLiter
t = 3.1841, df = 52.516, p-value = 0.002442
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
  57.75832 254.49629
sample estimates:
mean of x mean of y
 433.1343  277.0070
```

H2.2 and 2.3: Mediation Analysis, Filter's Use – Att. Importance, CO_2

```
> library(lavaan)
This is lavaan 0.6-8
lavaan is FREE software! Please report any bugs.

Attaching package: 'lavaan'

The following object is masked from 'package:psych':

    cor2cov

> #Manipulations
> model_Med_UoF <-
+   "
+   #regression models
+   AttImp_ENVIRONMENT ~ a*UseOfENVFilter
+   Footprint ~ b*AttImp_ENVIRONMENT + c*UseOfENVFilter
+   #Defined Parameters:
+   ie := a*b
+   de := c
+   "
> fitMed_UoF <- sem(model_Med_UoF,Manipulations)

> summary(fitMed_UoF)
lavaan 0.6-8 ended normally after 31 iterations

  Estimator                                         ML
  Optimization method                           NLMINB
  Number of model parameters                         5

  Number of observations                           300

Model Test User Model:

  Test statistic                                 0.000
  Degrees of freedom                                 0

Parameter Estimates:

  Standard errors                             Standard
  Information                                 Expected
  Information saturated (h1) model          Structured

Regressions:
                   Estimate  Std.Err  z-value  P(>|z|)
  AttImp_ENVIRONMENT ~
    UsOfENVFlt (a)    0.048    0.005    9.130    0.000
  Footprint ~
    AI_ENVIRON (b)   -2.112    2.441   -0.865    0.387
    UsOfENVFlt (c)   -0.624    0.250   -2.497    0.013


Variances:
                 Estimate  Std.Err  z-value  P(>|z|)
   .AI_ENVIRONMENT    0.001    0.000   12.247    0.000
   .Footprint         1.695    0.138   12.247    0.000

Defined Parameters:
                 Estimate  Std.Err  z-value  P(>|z|)
    ie              -0.101    0.117   -0.861    0.389
    de              -0.624    0.250   -2.497    0.013
```

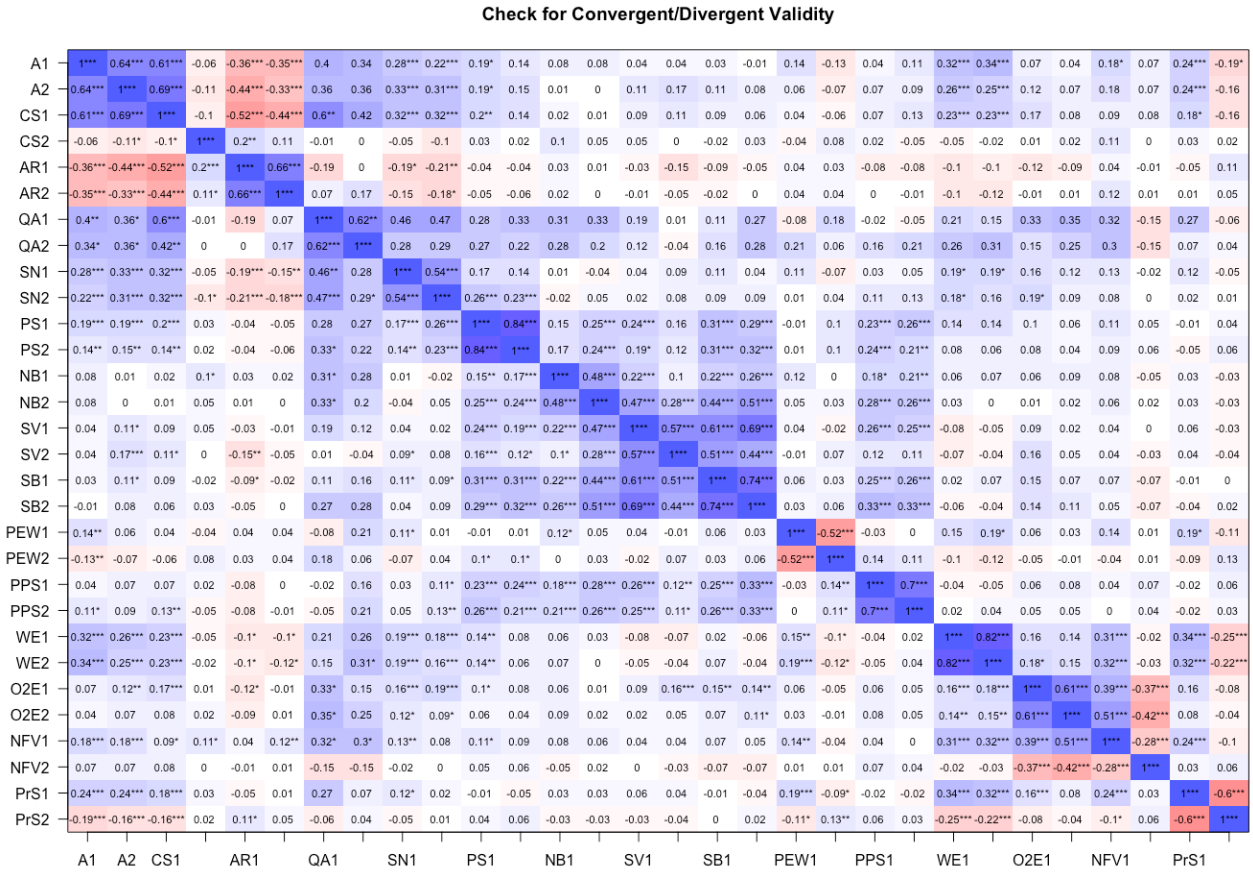
H3: Regression and ANOVA, Filter's Use - Perceived Sustainability

```
> fitPS_UoF <- lm(PercievedSustainabil_1 ~ UseOfENVFilter, data = Manipulations)
> summary(fitPS_UoF)

Call:
lm(formula = PercievedSustainabil_1 ~ UseOfENVFilter, data = Manipulations)

Residuals:
     Min       1Q   Median       3Q      Max
-2.08846 -0.08846 -0.08846 -0.08846  1.91154

Coefficients:
               Estimate Std. Error t value Pr(>|t|)
(Intercept)     3.08846    0.04252  72.639  < 2e-16 ***
UseOfENVFilter  0.56154    0.11644   4.823 2.26e-06 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.6856 on 298 degrees of freedom
Multiple R-squared:  0.07239,   Adjusted R-squared:  0.06928
F-statistic: 23.26 on 1 and 298 DF,  p-value: 2.264e-06

> aovPS_UoF <- aov(PercievedSustainabil_1 ~ UseOfENVFilter, data = Manipulations)
> summary(aovPS_UoF)
               Df Sum Sq Mean Sq F value   Pr(>F)
UseOfENVFilter   1  10.93   10.93   23.26 2.26e-06 ***
Residuals      298 140.07    0.47
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

H4: Correlation Analysis

```
> #manipulations, looking at the impact of filter use on variables
> model_PSdata <- Manipulations %>%
+   select(UseOfENVFilter,
+          PercievedSustainabil_1,
+          PercievedSustainabil_2,
+          PackagingProxiSust_1,
+          PackagingProxiSust_2,
+          AttitudeToChosenWine_1,
+          AttitudeToChosenWine_2,
+          ChoiceSatisfaction_1,
+          ChoiceSatisfaction_2,
+          AnticipatedRegret_1,
+          AnticipatedRegret_2,
+          PackagingEffectOnWin_1,
+          PackagingEffectOnWin_2,
+          SubjectiveNorms_1,
+          SubjectiveNorms_2)
> colnames(model_PSdata) <- c("UoF", "PS1","PS2","PPS1","PPS2",
+                             "A1","A2","CS1","CS2", "AR1","AR2","PEW1","PEW2",
+                             "SN1","Sn2")
> corPlot(model_PSdata, number=TRUE, upper=TRUE, diag=TRUE, stars = TRUE,
+         main="Study variables: Use of Filter in Manipulations")
```

17: Correlation Coefficients



A1 = Attitude towards Chosen Wine, question 1

A2 = Attitude towards Chosen Wine, question 2

CS1 = Choice Satisfaction, question 1

CS2 = Choice Satisfaction, question 2

AR1 = Anticipated Regret, question 1

AR2 = Anticipated Regret, question 2

QA1 = Perceived Quality of Alternatives, question 1

QA2 = Perceived Quality of Alternatives, question 2

SN1 = Subjective Norms, question 1

SN2 = Subjective Norms, question 2

PS1 = Perceived Sustainability, question 1

PS2 = Perceived Sustainability, question 2

NB1 = Normative Beliefs about Sustainability, question 1

NB2 = Normative Beliefs about Sustainability, question 2

SV1 = Sustainable Values, question 1

SV2 = Sustainable Values, question 2

SB1 = Sustainable Behaviors, question 1

SB2 = Sustainable Behaviors, question 2

PEW1 = Packaging Effect on Wine, question 1

PEW1 = Packaging Effect on Wine, question 2

PPS1 = Packaging proxy Sustainability, question 1

PPS2 = Packaging proxy Sustainability, question 2

WE1 = Wine Expertise, question 1

WE2 = Wine Expertise, question 2

O2E1 = Openness to Experience, question 1

O2E2 = Openness to Experience, question 2

NV1 = Need for Variation, question 1

NV2 = Need for Variation, question 2

PS1 = Price Sensitivity, question 1

PS2 = Price Sensitivity, question 2

18: Cronbach's Alpha by Factor

Concept (factor)	Measure (question)	Raw-alpha (combined)
Attitude	Jeg liker vinen jeg valgte.	0,8
	Jeg tror vinen jeg valgte vil stå til mine forventninger.	
Choice Satisfaction	Jeg er fornøyd med mitt valg av vin.	**0,2**
	Dersom jeg hadde fått muligheten til å velge vin på nytt så ville jeg ikke ha valgt en annen vin.	
Quality of Alternatives	De andre vinene i nettbutikken appellerte også til meg.	0,8
	Blant de vinene jeg ikke valgte i nettbutikken fantes det viner jeg anser som ideelle for meg.	
Anticipated Regret	Jeg tror at jeg vil angre på mitt valg av vin.	0,8
	Jeg tror jeg kommer til å endre mening rundt vinvalget mitt.	
Subjective Norms	De fleste av de menneskene jeg anser som viktige i mitt liv ville ha vært fornøyd med mitt valg av vin.	0,7
	De vennene jeg skal på den tenkte hytteturen med synes det vil være en god ide å kjøpe den vinen jeg valgte ut i nettbutikken.	
Perceived Sustainability	Jeg mener at mitt valg av vin var bærekraftig i lys av klimaendringene.	0,9
	Jeg tror vinen jeg valgte er miljøvennlig.	
Normative Beliefs about Sustainability	Jeg føler et sosialt press mot å kjøpe miljøvennlige produkter.	0,7
	Jeg føler at de fleste av de menneskene jeg anser som viktige i mitt liv forventer at jeg skal kjøpe bærekraftige produkter.	
Sustainability Values	Jeg bryr meg om bærekraft i lys av klimaendringene.	0,7
	Jeg anser miljøvern som viktig.	
Sustainable Behaviors	Jeg tar bærekraftige valg i hverdagen.	0,8
	Jeg prøver å påvirke klimaendringene positivt gjennom bevisste valg i kjøpssituasjoner.	
Wine Knowledge	Jeg anser meg selv som en vinekspert.	0,9
	Jeg har bred kunnskap om vin.	
Openness to Experience	Når jeg kjøper vin har jeg et stort behov for å variere hvilket produkt jeg velger fra gang til gang.	0,8
	Når jeg kjøper vin velger jeg en vin fra et (lite) utvalg viner jeg kjenner fra før, og som jeg vet jeg liker.	
Need for Variation	Når jeg kjøper vin er jeg som regel åpen for å prøve nye produkter.	**0,4**
	Når jeg kjøper vin er jeg som regel glad for å prøve noe nytt fra gang til gang.	
Price Sensitivity	Når jeg kjøper vin så tillegger jeg kvalitet mer vekt enn pris.	0,8
	Når jeg kjøper vin er prisen en av de viktigste kvalitetene som avgjør om jeg vil kjøpe den vinen eller ikke, det er viktigere enn kvaliteten på vinen.	