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The relative importance of healthy food labels when shopping for groceries online

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Abstract

Healthy food labels are a widely used form of intervention that nudges consumers towards healthier choices. This study investigates the relative importance of healthy food labels on the consumers' online choice of grocery. A conjoint study (n=111) shows that price, brand, and country of origin had a relatively higher impact on choice than health food labels. However, it is important to note that consumers are not completely indifferent to the presence of a healthy food label and it increases chances of a product being chosen online. The results also demonstrate gender differences, as healthy food labels had a stronger impact on female consumers. Thus, opportunities exist to improve the impact of healthy food labels on food choice. It is evident that simply presenting healthy food labels on products is equally beneficial for consumers, manufacturers, and policymakers alike.

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1. Introduction

A global study by Nielsen [12] shows that the share of overweight or obese adults has increased by 28% the last 30 years. Among children, overweight and obesity has increased by as much as 47% in the same period. Despite efforts to change their lifestyles, many consumers make unfortunate choices when it comes to shopping for groceries. To help consumers with their healthy choices, governments worldwide have acknowledged the need for improved food policies [15]. For example, consumers' healthy food choices are influenced by regulating marketing of unhealthy food and limiting the establishment of fast food restaurants. Furthermore, pricing reforms to improve the relative price difference between healthy and unhealthy food, as well as a better system for labeling healthy foods are suggested to help consumers choose healthier food items.

As with the implementation of any policy, there are trade-offs to consider. By limiting and regulating marketing, pricing, taxing, and even the establishment of new fast food restaurants, the market will inevitably be affected, meaning that economical side effects must be considered in addition to potential uproar among opposers [15]. These type of health policies are somewhat forceful in their way of influencing healthy choice among consumers; they restrict exposure or access to unhealthy food.

Oppose to restrictions and limitations, healthy food labeling is closer to what may be considered as nudging, see [17]. The idea behind nudging is to alter consumers behavior in a preferred direction without restricting any options or making significant changes to their economic incentives [17]. Nudging aims to make life simpler, safer, or easier for people to navigate when making choices [16]. Research suggests that the different ways of labeling healthy food function as a nudge that leads to healthier choices, e.g. Hersey, Arsenault, Kosa, Muth and Wohlgenant [10]. Thus, it is of value to study the impact of healthy food labels relative to other important attributes when consumers are shopping for groceries.

As grocery shopping is to some extent moving from the physical to online stores [13], we chose to focus on promoting healthy food choices in an online situation. This gives the following research question: What is the relative impact of healthy food labels on consumer choice online compared to other important product attributes? This paper has four parts. First, it reviews the literature relevant to healthy food labels and its impact on consumer choice. Then the conjoint study method is presented. Next, results are summarized. The paper concludes with a discussion of theoretical and managerial implications and directions for further research.

2. Theoretical background

2.1. *What is a healthy food label?*

There are different policies in order to promote healthy food and increase the healthiness of consumer diets [15]. One of the simplest policies to implement are healthy food labels. Hersey, Arsenault, Kosa, Muth and Wohlgenant [10] conducted an extensive literature review on different types of healthy food labels, and categorized these labels on the use of text, color coding, display of guideline daily consumption percentage, and icons. Healthy food labels refer to what Hersey, Arsenault, Kosa, Muth and Wohlgenant [10] identified as single level summary icons. Single level summary icons are symbols, logos, or other signage added to the product packaging of healthy food products, and their intention is to inform consumers that the labeled product is healthy. In physical settings, healthy food labels like single level summary icons are printed on the package indicating healthiness. In an online setting, the healthy food labels may also be used at the retailer's website. In practice, healthy food labels are widely used in different parts of the world. The checkmark of the Choices Program (www.choicesprogramme.org) is a global initiative to label healthy foods. Some countries also have their own national healthy food labeling programs. In the Scandinavian

countries, the Keyhole symbol (www.nokkelhullsmerket.no) is widely used, and Finland uses the Heart symbol (www.sydanmerkki.fi) to label healthy options. These symbols are all related to a product category-specific level; products are typically labeled depending on how they compare to other products within the same category. For example, a breakfast cereal may only be labeled with a healthy food label if it is healthier than other breakfast cereals or similar products, and at the same time meets other specified nutrition criteria. Thus, the healthy food labels claim to be based on expert nutrition evaluations. Their primary goal is to make it easier for consumers to identify and choose healthy food both in the physical and online stores.

2.2. The impact of healthy food labels on consumer choice

Healthy food labels have been found to affect consumer choice in various ways. According to a literature review by Grunert and Wills [8], consumers are interested in nutrition information and understand the important link between the food they consume and their health. In general, consumers appreciate simple front-of-package information like healthy food labels, and they understand what these labels are trying to tell them. Another literature review by Hersey, Arsenault, Kosa, Muth and Wohlgenant [10] suggests that consumers evaluate information and make their choice faster when viewing healthy food labels as opposed to looking at nutrient specific information. In other words, consumers make use of the information the healthy food label is giving them allowing them to make a healthier choice with less effort. Research suggests that consumers whose choices of food are motivated by health, weight control, and product information, are more likely to choose products labeled with healthy food labels [14, 18, 19]. When motivated by hedonism in choice of food, consumers choose fewer products labeled with healthy food labels [19]. Furthermore, the use of healthy food labels in practice has been found to appeal more to women than to men [11, 18]. Women seemingly find healthy food labels more valuable and credible than men.

2.3. The role of healthy food label in this study

Judging by the literature presented in this chapter, there is reason to believe that healthy food labels influence online choice, consumption, and consequent diets of consumers. Particularly women seem to value healthy food labels in choice situations. Knowing that healthy food labels may appeal to some people more than others, this study will attempt to identify differences between groups of individuals when it comes to effects of healthy food labels on choice. Most importantly, women are expected to show a stronger response relative to their counterparts. Thus, the following propositions are suggested:

Proposition 1: Consumers will more likely choose a healthy food labeled product online over a product without a healthy food label.

Proposition 2: The relative importance of healthy food labels is higher for female consumers than for male consumers.

3. Method

Conjoint study is widely used in consumer research as it allows both researchers and marketers to determine which product qualities or attributes are the most important to the consumer [4–6]. A conjoint study involves presenting participants similar products that have a set of varying stimuli. Each stimulus varies between predefined levels, and all other stimuli that are not of interest in the analysis are kept constant. The goal of the conjoint study is to determine the relative importance of each stimulus, by requesting participants to give a response for different combinations of stimuli at their predefined levels [6].

3.1. Participants

A group of participants was recruited to participate in the study through social media sites such as Facebook and Reddit. The sample for the study comprised 111 participants. The sample included 79 men and 32 women. Ninety-four percent of participants were between the age of 18 and 38 years.

3.2. Apparatus

The conjoint study was carried out through an online survey, using the digital survey creation platform Google Forms. An online survey was preferred mostly due to the ease of distribution, both in terms of time and reach for participants.

3.3. Procedure

After the participants had voluntarily accepted to participate in the study, they were told that they are about to shop for groceries online, and that breakfast cereal is among the products they were planning to purchase. Participants were then told that they are about to be presented different purchase situations where they would be asked to estimate their likelihood of purchasing the product online. Only one purchase situation would be shown at a time, and participants were required to estimate their likelihood of purchasing the product before moving on to the next situation.

3.4. Design

A full-profile method in which each stimulus card was described separately was used to collect data. Healthy food labels were operationalized as being present or not (two levels). This is explained by the nature of healthy food labels as a binary stimulus [10]. The Keyhole symbol was used as healthy food label as it is widely used in Norway, where the study took place. To increase the ecological validity, we added three more stimuli; price, brand and country of origin.

Three price levels were considered ideal, as it allows varying between one relatively high, one average, and one relatively low price level. After investigating the price levels of breakfast cereals in Norway through online grocery retailers (www.meny.no and www.kolonial.no), the mean price for a box of breakfast cereal was found to be 39 NOK, with a standard deviation of 7 NOK. Thus, 46 NOK (relatively high), 39 NOK (average), and 32 NOK (relatively low) were estimated as reasonable price levels.

When deciding different brands to measure, it was of interest to avoid using multiple known brands. The reason being that participants would possibly recognize several of them, meaning brand preference effects would be a factor for choice. Instead, it was decided to use one known breakfast cereal brand (Kellogg's) and one unknown (fictional) brand, simply named "Grainy". Finally, country of origin was decided to vary between three levels, to include both a relatively culturally distant country and a relatively culturally close country, in addition to the participants' domestic country (Norway).

When deciding which countries to include to measure the country of origin effect, information was gathered from online grocery retailers to make the choice situations as realistic as possible. It was quite evident that Germany is a country that Norwegian grocery retailers frequently import breakfast cereals from, which was then decided to be included as one of the stimulus levels. In addition, it was found that some breakfast cereals are imported from Poland, which may be considered a culturally more distant country to Norway than Germany [2]. Thus, Germany is regarded as the culturally close country and Poland the culturally distant country in this study, relatively speaking.

Stimuli and levels are presented in Table 1. Using IBMTM SPSS Statistics 24, a fractional factorial design resulted in 13 stimulus cards (including four hold-out cards). The scenario and an example of stimulus card is presented in the Appendix. Likelihood to purchase the product online (dependent variable) was measured by asking on a scale from 1 (very unlikely) to 7 (very likely). Once all purchase situations were answered, the participants were asked to answer demographical questions in the final section related to gender and age.

Table 1. Stimuli and levels considered in the study.

Stimuli	Levels
Health food label	1. No healthy food label 2. Healthy food label
Price	1. 46 NOK 2. 39 NOK 3. 32 NOK
Brand	1. “Grainy” 2. Kellogg’s
Country of origin	1. Poland 2. Germany 3. Norway

4. Results

Fifteen cases were removed due to equal values in RANK or SCORE. The analysis shows correlations between the observed and estimated preferences for likelihood to purchase online (Pearson’s $r = 0.989$, $p = 0.000$). The results show that price is considered the most important predictor for choice out of the four stimuli, accounting for 36.84 %. Country of origin comes second in importance, at 24.4 %, while brand makes up 21.75 % of the overall importance. Finally, healthy food label is the least important stimulus at 17.01 %.

Table 2 lists the utility estimates, in this case indicating likelihood of purchase online, for each level of the four stimuli. These results show that healthy food labels generate higher utility for a product than what the absence of healthy food labels does ($0.705 > 0.352$). In other words, healthy food labels increase the likelihood of the product being purchased online. For price, there is evidently a trend where a below average price generates higher utility than an average price, and an average price generates higher utility than an above average price ($0.502 > 0.051 > -0.553$). Furthermore, the utility estimate is higher for a known brand than what it is for an unknown brand ($1.007 > 0.503$). When it comes to country of origin, the domestic country has higher utility than a culturally close country, which again has a higher utility than a culturally distant country ($1.141 > 0.760 > 0.380$).

When analysing the difference between female and male participants, results show that female participants find the presence healthy food labels more important when estimating their likelihood of purchasing a product compared to male participants with an importance score of 21.66% and 15.10%, respectively. Females are less price sensitive than males with an importance score of 31.07% and 39.22%, respectively. However, females put some more emphasis on brand in their decision making with an importance score of 25.14% compared to 20.35%. There are not much differences between the genders when it comes to the importance of country of origin (22.14% for female participants, 25.33% for males).

Table 2. The impact of stimuli and levels on likelihood to purchase the product online.

Stimuli and levels	Likelihood to purchase	
	Impact estimate	Standard error
Health food label		
1. No healthy food label	0.352	0.113
2. Healthy food label	0.705	0.226
Price		
1. 46 NOK	-0.553	0.075
2. 39 NOK	0.051	0.075
3. 32 NOK	0.502	0.075
Brand		
1. “Grainy”	0.503	0.113
2. Kellogg’s	1.007	0.226
Country of origin		
1. Poland	0.380	0.065
2. Germany	0.760	0.131
3. Norway	1.141	0.196
(Constant)	1.082	0.256

5. Discussion

Previous research has consistently found support for the use of healthy food labels to increase consumer choice of healthy food [10, 14, 18, 19]. The aim of this study was to consider the relative effect of healthy food labels in a consumer choice situation online. This would allow for a more detailed profile regarding the importance of healthy food labels in the mind of the consumers, compared to other relevant stimuli such as price, brand and country of origin. When it comes to the relative importance of healthy food labels, the research findings suggest that healthy food labels have a low relative importance for choice in general compared to price, brand and country of origin. This implies that the likelihood of a consumer purchasing a certain product online depends less on whether it has a healthy food label or not, and more on the other relevant variables. However, there is a relatively large difference in utility between a product carrying a healthy food label and a product not carrying it as shown in Table 2. This means that while it is not regarded as the most important stimulus by consumers, they are not indifferent to the presence of a healthy food label; it certainly makes the product more likely to be chosen. From this we conclude that the first proposition, consumers will more likely choose a healthy food labeled product online over a product without a healthy food label, was supported. Thus, it is worthwhile for manufacturers to consider producing in line with the requirements of healthy food labels when possible, as carrying them grants a competitive edge. However, in cases where doing so would result in increased cost, one cannot necessarily expect consumers to be willing to make up for that by paying a higher price; they are quite price sensitive as it turns out. Particularly established manufacturers with known brands will benefit from healthy food labels and may use them to create entry barriers for lesser known competitors. Policymakers may want to consider additional policies that could further incentivize the production and consumption of healthy food, alongside healthy food labels. For example, subsidizing food with healthy food labels may give manufacturers a stronger incentive to adapt and innovate, as their capability of keeping prices relatively low persists, while they can still meet the requirements of healthy food labels.

Gender differences were also identified. Despite a limited number of female participants, the results of the study show consistent preference profiles for both males and females. While males are more price sensitive, and find country of origin a little more important, females put far more emphasis on healthy food labels and brand. Hence, our second proposition, the relative importance of healthy food labels is higher for female consumers than for male consumers, is supported. Healthy food labels are still the least important stimulus, and price the most important stimulus among females, but the distribution of importance is far more even than what it is for male participants. This indicates that female consumers do in fact find it more important that a product carries a healthy food label compared to male consumers, which is consistent with the findings of Lahti-Koski, Helakorpi, Olli, Vartiainen and Puska [11] and Vyth,

Steenhuis, Mallant, Mol, Brug, Temminghoff, Feunekes, Jansen, Verhagen and Seidell [18]. This is potentially valuable information for both manufacturers and policymakers, as it highlights which demographics to target. Manufacturers may want to target female consumers when it comes to marketing products with healthy food labels online, as this demographic find them more important. Policymakers may want to inform and spread awareness particularly to male consumers online, as they may still need to be convinced that products with healthy food labels are a healthier choice.

Country of origin was surprisingly found to be ranked second in overall relative importance. It was expected to be less important than brand as earlier research suggests this to be the case [3]. While country of origin is not the main topic of interest in this paper, this study provides some contributions to our understanding of the impact of this stimulus. Country of origin was expected to have a linear preference profile based on cultural distance. The results are consistent with this expectation, as the utility estimates indicate that there is a domestic country bias, and that a culturally close country of origin is preferred over a culturally distant country of origin. This is in line with previous research on cultural distance affecting country of origin preferences [20].

The study has some limitations. Firstly, the small number of participants (n=111) categorize the study as an indication [9] of the relative importance of healthy food labels when shopping grocery online. Future studies should replicate this study with more participants, and especially numbers of females should be increased. Secondly, future studies should also have a more representative sample of a total population. Including some descriptive questions such as income, education, online grocery shopping, etc., will give a better profile of the participants. Thirdly, order effects occur when a list of stimuli cards are presented sequentially [1]. To solve this issue, stimuli cards should be randomized in a future study. Future studies could also examine other aspects that are relevant when buying groceries online. For example, the online context has the possibility to present dynamic and real-time information to the customers in addition to investigate the effectiveness of different type of healthy choice labels. This can be information about which healthy choice has been the most popular the past week. This is what Sunstein [16] define as subjective norm. Finally, Grewal, Roggeveen and Nordfält [7] highlight that technology and tools which facilitate consumer choices are one of the key areas that that will form the future of retailing. Thus, a future study could be to look at the impact of suggested healthy food labeled products based on desired calorie intake levels tracked by previous shopping behavior,

Appendix

Assume that you are going to shop groceries online and breakfast cereal is among the products you are planning to purchase. There are several breakfast cereals to choose. You are about to be presented for different purchase situations where you would be asked to evaluate the likelihood of purchasing the product online on a scale from 1-7.

Example of stimulus card:



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