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An Explorative Study on Heuristic Effects of Healthy Food Labels in an Online Shopping Situation

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Abstract

This study focuses on the representativeness heuristic effects of healthy food labels on consumer choice of healthy food. A within-subject experiment was arranged to identify whether consumers rely on representativeness heuristics when making a series of choices of food. Determining whether healthy food labels bias their choice under these limitations was of particular interest. Results (n=30) showed that some participants tend to develop a representativeness heuristic for choice in a series of food choices. For some consumers, healthy food labels do, to some extent, cue them into making biased choices. These results reveal that some consumers do find comparing healthiness of products tedious and rely on representativeness heuristics when making a choice. However, the use of healthy food labels specifically as a cue is very limited when other objective cues such as nutrition information are readily available.

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1. Introduction

Consumers in the Western world are paying too little attention to or do not care enough about the nutritional values of the food they eat. Global research by Nielsen [1] found that half of us are actively trying to lose weight by opting for healthier food choices, yet the same study reports a worrying increase in overweight and obesity. The global share of overweight or obese adults has increased by 28% in the last 30 years. Among children, overweight and obesity have increased by as much as 47% [1]. Despite trying to change our lifestyles, a lot of us make poor decisions when it comes to choosing food that will help us remain healthy and prevent obesity-related diseases.

To combat the issues resulting from poor dietary decisions, governments worldwide have acknowledged the need for improved food policies [2]. In Australia, healthy food choices are promoted by regulating marketing of unhealthy food and limiting 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. 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 restaurants, the market will inevitably be affected, meaning economic side effects must be considered in addition to a potential uproar among opposers [2].

Some of the policies suggested in the study by Shill, Mavoa [2] are somewhat forceful in their way of influencing dietary decisions among consumers; they restrict exposure or access to unhealthy food. However, among these policies is the seemingly innocent act of labeling healthy food in a better way. As opposed to the restrictions and limitations, healthy food labeling is closer to what may be considered a cue [3]. The idea behind it is not forcefully to make healthy food a financially better choice for the consumer or hide unhealthy food. Instead, these labels are added to product packaging to draw some extra attention to the healthier food. Because the idea behind this policy is so different from the rest, it raises a lot of questions regarding its effects. Does adding a simple label to a product really change the behavior of consumers, causing them to choose a healthier diet? Hersey, Arsenault [4] suggests that different ways of labeling healthy food lead to healthier choices. An unexplored question is whether these labels lead consumers to choose a product without considering other nutrition information.

The representativeness heuristic is used when humans incorrectly estimate the probability of something belonging to a group or class [5]. This bias is typically caused by associations and stereotypes. When a person perceives something that matches his associations with or the stereotype of a certain group, he may rush to the conclusion that it belongs to the group without necessarily considering other contextually important information. There are, however, far more situations in which humans use the representativeness heuristic to simplify judgment and decision-making. Research in different disciplines has shown that the representativeness heuristic is applied in the contexts of consumer behavior [6], finance [7], mental healthcare [8], and medicine [9]. When it comes to healthy food labels, no research has specifically considered them in the context of representativeness heuristics. However, one could argue that the intention of a healthy food label is rooted in heuristics. Considering that the healthy food labels are implemented to make the choice of healthy food easier, policymakers are essentially hoping that healthy food labels will trigger a representativeness bias.

The physical and online shopping settings each have distinctive feature [10]. Buying groceries in a physical grocery store involves high travel costs and price and product search costs, and often has boundaries on shopping times, especially in countries with strong labor laws [11]. On the other hand, the physical shopping setting allows examination of the products, interpersonal communication and immediate fulfilment. An online shopping setting typically involves no travel, product carrying, or boundaries on shopping hours, offering greater accessibility to products, convenience, and time-saving [10]. Also, an online shopping setting decreases search costs, give easy access to price and product information, and facilitates product comparison. Investigating representativeness heuristic effects of healthy food labels on consumer choice is particularly interesting in an online shopping setting, where most of the product attribute information is organized and presented with a standard layout between different products.

2. Method

2.1. Participants

The sample for the experiment comprised 30 participants recruited from Kristiania University College. The sample included 16 males and 14 females ranging between 19 and 28 years old (mean 22.8 years old). None of the participants had any prior knowledge about the experiment. They were not offered any payment or incentives for participating.

2.2. Apparatus

A simulated shopping microworld was programmed in MediaLab™ [12] that presented the tasks and recorded data. The experiment was conducted in a lab with one computer. A standard mouse was used to make choices.

2.3. Procedure

Participants were recruited by the experimenter by asking if they would like to participate in a shopping experiment. They were then guided to the experiment room; a room with a single desk and computer. The room is relatively soundproof and located in a mostly quiet part of the building. After accepting the consent form, the participants were presented a hypothetical shopping situation: "Imagine that you are going to purchase food for a longer period (1-2 weeks). You have made a shopping list with all the products that you want to buy, and you have decided that you want to eat as healthy as possible as you are concerned with health issues. You are now entering the store and will have to make some choices. Although many of the products in the store are similar to each other, they are slightly different." After making sure the participant got started with the experiment, the experimenter left the room and waited outside for the subject to complete the experiment to avoid any distractions. Once the participants had made it through all 60 choices, they were asked a few control and demographic questions.

2.4. Design

A within-group design with a total of 60 choices was made. The first five choice situations had grocery products with healthy food labels. For the next 25 choices, every time an option was marked with a healthy food label, it would be the objectively healthier option. For the next 30 choices, most of the time that an option was marked with a healthy food label, it would *not* be the objectively healthier option. To avoid the potential perception of negative correlation between the healthy food label and healthiness among participants, three of the last 30 choice situations were correctly labeled.

The choice situations were designed using Microsoft PowerPoint™ (see an example in the Appendix). In the top middle of the slide, there was an image of the product and its name. Below this, the question text would read "which of these two options would you choose?". Participants would then see one table of nutritional information on the left, and an identical one with different nutritional values on the right, aligned with equal distance from the middle and edges of the screen. The nutritional tables were mostly accurate information from real products of the category, with occasional minor manipulation needed to ensure that one product is objectively healthier than the other. For options with a healthy food label, the label was placed in the top right corner of the nutritional information table. The healthy food label was, in this case, an arbitrary green heart, as it was of importance to make sure the participants had no prior knowledge of the label being used, but instead learn its meaning throughout the experiment.

3. Results

Two different kinds of data were collected (see Table 1), choices made and time spent. Spending less time per choice indicated a representativeness heuristic response.

Table 1. Results on choices made and time spent.

Participant	Share of correct choice	Share of incorrect choice	Mean time per choice (ms)	Relative difference in time between last 30 choices and first 30 choices	Relative difference in time between choices with healthy food label and choices without healthy food label
1	.952	0	6862	.421	1.047
2	.810	.333	2853	.700	.648
3	.952	.400	10481	.865	.887
4	.952	0	12454	.660	.994
5	1	0	14355	1.157	.624
6	.952	.200	10550	.741	.828
7	1	.200	5320	.953	.921
8	1	0	12454	.660	.902
9	.905	.333	4580	.576	.867
10	.667	.200	5650	.672	.760
11	.762	1	5949	.338	.663
12	1	0	9912	.823	.957
13	.619	.400	11316	.810	.841
14	.905	.133	5804	.983	.973
15	.952	.067	29913	.497	.912
16	1	0	20569	1.036	.875
17	1	0	7821	.592	.934
18	.952	0	10280	.980	.660
19	.857	.133	7907	.322	.892
20	1	0	5188	.869	.824
21	1	0	16340	.848	.723
22	.952	.200	9343	.866	.916
23	.952	.067	3672	.758	1.077
24	.810	0	6855	.617	.906
25	.810	0	13858	.402	.729
26	.952	.133	11765	.704	.664
27	.810	0	7051	.244	1.087
28	.905	.067	10751	1.091	1.006
29	.952	0	18037	.736	.926
30	.838	.353	7921	.704	.914

Column one in Table 1 shows the participant number. Column two shows the share of correctly placed healthy food labels chosen, where a number closer to 1 indicates a higher number of chosen options carrying a correctly placed healthy food label. The third column shows the share of incorrectly placed healthy food labels chosen, where a number closer to 1 indicates a higher number of chosen options carrying an incorrectly placed healthy food label. For example, when facing a choice situation with a correctly labeled option, Participant 14 (see Table 1) chose the labeled option 90.5% of the time. Column four shows the mean time per choice in milliseconds. Column five shows the difference in time spent making the last 30 choices relative to the first 30 choices. The lower this number is, the less time the

participants spent on the last 30 choices relative to the first 30. A relative difference of 1 indicates no difference in time spent. Finally, column six shows the difference in time spent making a choice where one of the options is labeled with a healthy food label, relative to making a choice where no option is labeled. Again, 1 indicates no difference, and a lower number indicates that the participant spent less time making a choice when one of the options was labeled with a healthy food label.

Table 1 shows that participants 2, 3, 6, 7, 9, 10, 11, 13, 22, and 30 had a higher share of incorrect choices, more relative difference in time between last 30 choices and first 30 choices, and/or more relative difference in time between choices with a healthy food label and choices without a healthy food label. The other participants (1, 4, 5, 8, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, and 29) had a lower score on one or more of the same parameters.

4. Discussion

Previous research on healthy food labels has primarily focused on whether they affect consumers' health perception, choice, or intention to purchase products carrying these labels [4]. This study aimed to explore consumers' response to healthy food labels. Thus, it was of interest to identify possible representativeness heuristic behavior among consumers, where consumers make choices of healthy food in an online shopping setting. As suggested by Stanovich and West [13], this would be expressed as fast decision making, biased on the perception of the healthy food labels, as opposed to thorough consideration and use of objective nutritional information. We identified two different groups of participants that behave differently from each other regarding choices made and time spent. As shown in Table 1, one-third of the participants chose more incorrectly labeled products than the other participants, indicating a behavior that is more biased towards the labels. The behavior of this group is different from the other participants' behavior since they spent less time toward the end of the experiment, indicating a heuristic response where they limit themselves to using one or a few cues as a heuristic for choice after gaining some experience.

Considering that the goal of the study was to determine whether healthy food labels work as a heuristic for healthy food choice in an online shopping setting, it was necessary to consider whether participants disregarded the objective nutritional information they were provided and instead chose a less healthy product carrying a healthy food label. Essentially, this means that these participants at least partly included the healthy food labels into their choice. However, the healthy food label is not consistently working as a strict bias; it may, at the very least, function as a cue that guides them towards the option with the healthy food label. Sometimes, they are cued, while at other times they take advantage of the fact that healthy food labels are liberty-preserving and instead choose the other option. For the other two-thirds of the participants, results from the experiment show that use of healthy the food label, specifically as a heuristic cue, is very limited when other objective cues such as nutrition information are available.

This study is not without limitations. Analysis of the results should be understood in light of the circumstance that participants were responding to a simulated grocery shopping scenario. However, a review by Camerer and Hogarth [14] of studies on differences between real rewards and hypothetical rewards concluded that methods involving hypothetical choices and those involving real consequences usually show qualitatively similar results. Moreover, laboratory experiments as a method for pursuing research have pros and cons, as demonstrated by the debate they have given rise to within the scientific community. As always, at their root, there is a trade-off—in this case, of complexity—between the uncontrollability of field studies, which generates problems of inference, and the controlled case of laboratory experiments, which are susceptible to weak external validity [15]. DiFonzo, Hantula [16] have contended that computer-simulated microworlds, which are similar to what has been used in the present study, offer a solution to this dilemma. According to DiFonzo, Hantula [16], microworlds offer the researcher a high degree of experimental control, thus incorporating the benefits of experimental effects due to experimental manipulation.

Despite its limitations, this study has experimentally explored consumers' response to healthy food labels when making choices online. The results show that one-third of the participants probably developed a heuristic response when making choices. The implication is that consumers should be aware that healthy food labels might bias their choice presented on the product or web site. Conversely, results show that for two-thirds of the participants, a healthy food label as a heuristic cue is very limited. This might be related to the online setting where most of the information is organized and presented with a standard layout between different products, which is not the case in a physical shopping setting [10]. A follow-up study could be to test whether there are different impacts of healthy food label in

an online shopping setting versus a physical shopping setting. Also, a follow-up study can improve the design of the experiment by, for example, expanding the numbers of choices.

5. Conclusion

This study aimed to explore consumers' response to healthy food labels through an experiment with 30 participants. The results show that some consumers do find comparing healthiness of products tedious and rely on representativeness heuristics when making a choice online. However, the use of healthy food labels specifically as a cue is very limited when other objective cues such as nutrition information are readily available. Policymakers and the retailing industry should attempt to standardize healthy food labels to increase reliability and improve its effectiveness as a cue, eliminating the consumer's need for nutrition comparisons between products.

Appendix

Example of choice situation that had products with a healthy food label:

Imagine that you are going to purchase food for a longer period (1-2 weeks). You have made a shopping list with all the products that you want to buy, and you have decided that you want to eat as healthy as possible as you are concerned with health issues. You are now entering the store and will have to make some choices. Although many of the products in the store are similar to each other, they are slightly different.

Spekeskinke

Hvilket av disse to alternativene vil du velge?

Næringsinnhold pr 100g	
Energi	768 kJ / 183 kcal
Fett	6,5 g
- Hvorav mettede fettsyrer	2 g
Karbohydrater	0 g
- Hvorav sukkerarter	0 g
Protein	31 g
Salt	6 g

Kjøp

Næringsinnhold pr 100g	
Energi	938 kJ / 223 kcal
Fett	10,6 g
- Hvorav mettede fettsyrer	5,1 g
Karbohydrater	0 g
- Hvorav sukkerarter	0 g
Protein	24 g
Salt	11 g

Kjøp

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