

The effectiveness of negative labelling as a tool to increase sustainable consumer choice



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Preface

This thesis is written as part of the MSc specialization Consumer Studies at Wageningen University. I enrolled in this programme two years ago after completing the BSc programme in Health and Society. Conducting my own scientific research project gave me the opportunity to combine and show the skills I have acquired over the past years.

I would like to thank Ynte van Dam for his supervision. I always enjoyed our meetings, during which he provided me with valuable insights for my research, and encouraged me to share and discuss my ideas with him. I also thank Erica van Herpen for her input for this thesis and access to her panel.

Although my thesis cannot entirely explain *why* negative labelling works, it sure shows *that* it works. I hope that this information will be used in practice to guide consumers to make more sustainable choices. Furthermore, since my study leaves some questions unanswered, I hope that someone will apply my recommendations in future research.

Martine Timmer

Wageningen, April 2013

Summary

Introduction: With respect to eco-labelling, consumers usually face choices between products without labels and ecological products awarded with eco-labels. Nevertheless, people attach more information to negative information compared to positive information when making choices. In guiding consumers to making sustainable choices, it could therefore be more effective to provide products that have a lot of environmental impact throughout their life-cycle with negative labels instead of providing products with a little environmental impact with positive labels.

Problem definition: Even though negative labelling can theoretically be expected to be more effective than positive labelling, it remains unclear what psychological mechanisms cause this effect.

Aim: To examine which factors and processes contribute to the effectiveness of negative labelling. The aim is to find out *why* negative labelling could be more effective compared to positive labelling, and under what circumstances.

Method: For this study, a post-test-only control group design is chosen. Data are collected by an electronic survey. Participants (N=231) are divided into four groups. It is measured whether one-sided positive labelling, one-sided negative labelling, two-sided labelling, and no labelling (control group) lead to different product choices with respect to sustainability of everyday groceries. Attention is paid to differences between the four groups with respect to the time needed to make a choice, norms, values, ethical orientation, environmental paradigm and regulatory focus. Additionally, it is measured what choices the respondents in the different conditions make when having to choose between a relatively cheap product with a negative label, a product without a label at a moderate price and a relatively expensive product with a positive label.

Results: The results of this study show that usage of negative labels (in one-sided negative labelling or two-sided labelling) leads to more sustainable choices than one-sided positive labelling when only two products are presented to consumers. The results could not be confirmed in case three products with negative, positive, or no labels were presented. Furthermore, the data suggest that more consumers are prevention focussed than promotion focussed. However, since the scales for regulatory focus could not be validated for the three experimental groups, it could not be tested if regulatory fit caused the effectiveness of negative labelling.

Discussion: Even though the results do not show that negative labelling is more effective than positive labelling for *all* products and for decisions including three products (positive, negative, neutral), they support the notion that negative labelling is more effective than positive labelling. However, this study lacks explanatory value of *why* negative labelling is more effective than positive labelling in guiding behaviour towards sustainable choices. A possible explanation was found in regulatory fit, but the scale to measure the respondents regulatory focus could not be validated. It is therefore recommended to invest effort in the development of a valid and reliable scale to measure regulatory focus and to take into account that regulatory focus can be influenced by situational factors.

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Appendix G: Bar charts average scores for product preferences, per condition

1. Introduction

In order to quickly provide consumers with information on the environmental friendliness of the products in a store, products can be provided with an eco-label (Hussain, 2000). This eco-label shows consumers in a glance that the product has a reduced environmental impact throughout the life-cycle, compared to other products (EU Ecolabel, 2012). A variety of labels exists, and many companies are willing to pay a premium which will allow them to add an acknowledged eco-label to their product.

All eco-labels that are currently applied emphasize the positive quality attributes of the product; if a product meets the norms for 'environmental friendliness', a one-sided positive message is attached to it. This message may persuade consumer to choose the specific product over other product variants. However, if the product does not meet this norms, it does not get any label and remains neutral.

Nevertheless, people attach more importance to negative information in decision making compared to positive information (Kahneman and Tversky, 1979). So, in order to stimulate consumers to choose the products variants with relative low environmental impact, it could be more effective to provide products that have a lot of environmental impact throughout their life-cycle with a negative label compared to providing products that have a reduced environmental impact with a positive label. Negative labelling could either be a one-sided labelling strategy that replaces one-sided positive labelling, or it could be a supplement to positive labelling. When both positive and negative labels will be applied, this will be referred to as two-sided labelling.

One domain in which negative labelling is used in multiple countries including the European Union, is that of genetically modified organisms (Crespi & Marette, 2003). In many of these countries, a one-sided labelling system is used, in which products receive the label 'does contain genetically modified organisms' or no label. Although the label emphasizes a negative attribute of the product, laws and regulations make companies put the label on their product; in all these countries that apply negative labelling, providing products that have been produced with the help of genetically modified organisms with a label is mandatory.

Companies may not be willing to put a negative label on their product voluntarily. However, mandatory negative labelling will leave them no choice. Furthermore, this may encourage them to change the procedures they apply in producing their output. Research has shown that a potential 'healthy choice tick' is a strong incentive for companies to adjust their products and make them healthier (Young and Swinburn, 2002). This may also apply to environmental friendliness, especially when a negative label can be avoided.

Researchers have already aimed to measure the effect of negative labelling compared to the effect of positive labelling. Grankvist et al. (2004) conducted a study in which respondents were exposed to various product pairs, and for each product pair given the task to choose the product of their preference. Next to information about product attributes such as price, country of origin and expiry date, the products contained a label as well. In each product pair, one product was provided with a yellow (neutral) label. The other product was provided with either a green, red, or yellow label, indicating that this product would have much better/much worse/average environmental consequences compared to other products of the same taxonomic product category. The study

revealed that the information about environmental outcomes influenced the product preference. Furthermore, the respondents with the an intermediate interest in environmental issues were more affected by the negative label compared to the positive label, but respondents with a strong interest in environmental issues were equally affected by the positive and negative labels (Grankvist et al. 2004).

In another study addressing negative labelling, the effect of labelling products as contributing less than average (green), average (yellow) or more than average (black) to carbon emission was measured (Vanclay et al., 2011). The colour black (instead of red) for the negative label was chosen because it was expected to symbolize carbon. For a three-month period, 37 products from 5 different product lines in an Australian supermarket were labelled, and sales were monitored. The results showed a minor change in purchase pattern; the sales of the products with black labels decreased by 6%, and the sales of the products with green labels increased with 4%. Although the change was minor, results were in the predicted direction (Vanclay et al., 2011).

1.1 Problem definition

Even though both studies supported the larger effectiveness of the negative label as opposed to the positive label, it remains unclear which psychological mechanisms exactly cause the behavioural change among consumers. For example, the previous mentioned results could be mainly due to the use of traffic-light colours for the labels, which raises a positive association with the green label and a negative association with the red/black label, independent of knowledge of meaning of the label. Moreover, there could be differences between consumers which influence the effectiveness of the different labelling strategies. Next to that, the underlying psychological mechanisms of product preference could be different depending on whether one-sided (a negative label compared to no label) or two-sided (a negative label compared to a positive label) labelling is applied. Furthermore, adding additional information to a product may cause an additional approach-avoidance conflict. It is unclear to what extent this conflict is of influence on consumer choice.

1.2 Aim of the study

In this thesis, it will be examined which factors and processes contribute to the effectiveness of negative labelling. The aim is to find out why negative labelling could be more effective compared to positive labelling, and under what circumstances. The findings will be of relevance for academic and political implications. They will provide insight in how consumers respond to negative labels compared to how they respond to the positive labels that are currently used. If negative labelling turns out to result in more sustainable consumer choices than positive labelling, it could be considered to embed negative labelling in the current policy with respect to labelling of consumer products.

A few restrictions will be imposed. First, this study will be limited to the effectiveness of labelling of products in relation to environmental impact throughout the life-cycle, including organic products. Even though some theories and results might be applicable to other types of choices that could be influenced by labels (e.g. health-related choices) no explicit attention will be paid to these types of choices, because other psychological processes may be involved here as well. Second, the theories and research design will be applied to products that can be categorized as 'everyday groceries',

which are typically low-involvement products. They are often selected based on a habitual routine (Hoyer, 1984). Adding a negative label to one of these products is expected to function as a motivational stimulus to break the routine.

1.3 Structure of the report

In this report, a research proposal addressing the problem statement will be outlined. In chapter 2, the theoretical background of negative labelling and related determinants to consumer choice will be discussed. This theoretical background will serve as a basis for the hypotheses and research methodology, which will be elaborated in respectively chapter 3 and 4. The results of the study will be given in chapter 5, and interpreted and discussed in chapter 6. Finally, chapter 7 includes a conclusion of the present study.

2. Theoretical background

In this chapter, the theoretical background of the underlying mechanisms of the effectiveness of labelling will be discussed. At first, attention will be paid to factors influencing the effectiveness of eco-labelling in general (paragraph 2.1). After that, attention will be paid to psychological processes that may contribute to the effectiveness of eco-labelling (paragraph 2.2 – 2.5). Topics that will be addressed are prospect theory, motivational conflicts and the effectiveness of the traffic-light labelling system. If possible, a distinction will be drawn between positive and negative labels.

2.1 Influencing consumer choice by using eco-labels

Everyday groceries are chosen based on decisions with low-involvement. This means that the consumer does not engage in high levels of active processing when responding to a marketing stimulus (Kotler & Keller, 2008), resulting in repetitive purchase decisions based on habitual behaviour (Hoyer, 1984). Changing habitual behaviour is a process of three phases (Lewin, 1958). The first phase is *'unfreezing'* the behaviour. This could be very difficult, because people are not always open to change. Once the habitual routine is broken, it can be *moved* to another level. During this phase, the consumer performs a new behaviour, which is incorporated as a weak habit. In the third phase, the new behaviour turns into habitual behaviour and it *freezes* again. Unfreezing behaviour is unlikely to happen without a stimulus. Adding a label to a product (either negative, neutral or positive) could be such a stimulus, giving the consumer additional information about the product attributes. If this new information does not fit the preferences of the consumer, the extent to which he is likely to change the routine increases.

2.1.1 Requirements for the effectiveness of labels

For a label to be effective in a way as is intended, a few conditions have to be met. First, the label will only help the consumer to reach his goal if the consumer has some environmental concerns and *'desires environmental-friendly products'* (Thøgersen, 1998, as cited by Thøgersen, 2000). Since consumers seem to be increasingly concerned about the environmental consequences of the products they buy, use and dispose, the label could be of great relevance for many consumers.

Second, the consumer has to note the label in the retail environment, which is often characterized by an information overload. If the consumer is too distracted, he may fail to pay attention to the label (Jacoby, 1984). In this way, the presence of the label will have no influence in the buying decision process. The perceived importance of the eco-information predicts for a large extent whether or not the label will be noticed, and there with the expected buying behaviour (Teisl et al., 2008).

Third, the consumer has to know, recognize and understand the label. This is often not the case (e.g. Lindberg, 1998, as cited by Thøgersen, 2000; Morris, Hastak & Mazis, 1995). Especially in low-involvement products, consumers do not always elaborate on all products attributes -such as the meaning of the label that is attached to it-, and they often base their choices on the perceptions or associations they have of a certain product, independent of whether they are right or wrong (Petty & Cacioppo, 1986).

Fourth, and finally, consumers have to trust that the label is only awarded to products that deserve it. The most important requirement with respect to trust in environmental labels, is that the label is awarded by a public or independent authority, a neutral third party (Thøgersen, 2000). Many studies

have shown that consumers are very skeptical towards green product claims (Peatty, 1995). For example, they incorrectly think that companies put the logo on their product as an excuse to charge a higher product price. Skepticism towards organic labels may prevent consumers from buying organic food products (Janssen and Hamm, 2012). It is therefore very important to communicate what a label represents and to remove ambiguities among consumers (Hussain, 2000; Janssen & Hamm, 2012).

Thøgersen (2000) developed a model to describe the relations between the different psychological determinants predicting the decision to buy eco-labelled products, as is shown in Figure 1. His study among consumers in five European countries confirmed the relations that were proposed in the model.

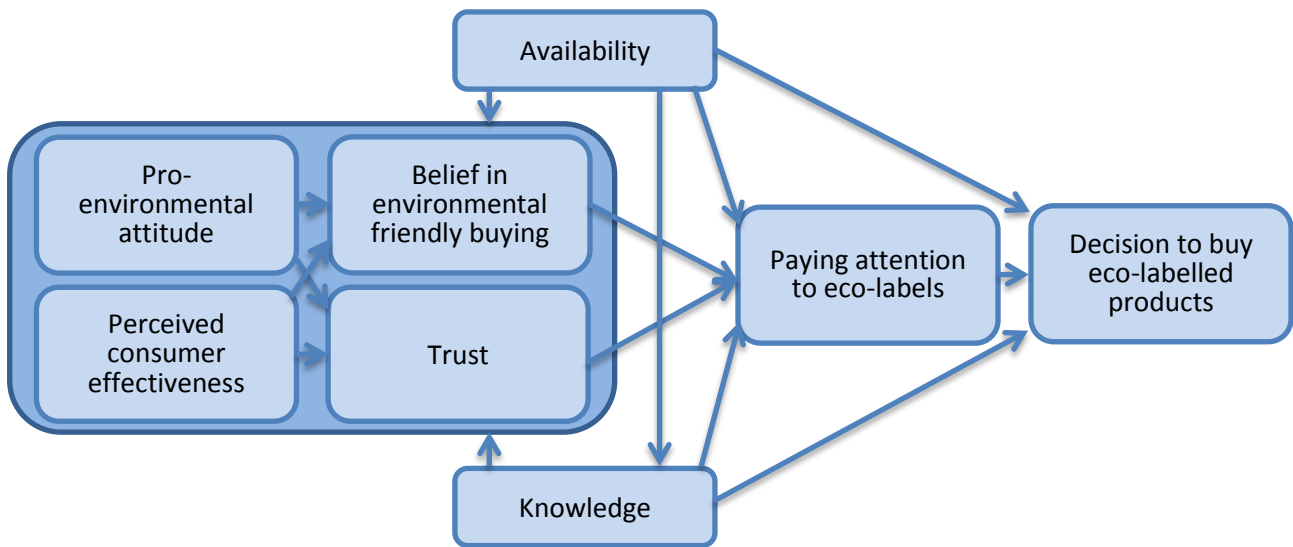


Figure 1: Predicting paying attention to eco-labels and the purchase of labelled products (Thøgersen, 2000).

The pro-environmental attitude, perceived consumer effectiveness, belief in environmental friendly buying, and trust can be classified as motivational factors for paying attention to eco-labels (Thøgersen, 2000). Their importance should not be underestimated; it seems that only when consumers have a specific reason to do so, they will look at labels on product packages (Rawson et al., 2008).

Additional literature research yielded concrete examples of beliefs consumers may have in relation to the decision to buy eco-labelled products, and barriers they may perceive to buy these products. They will be discussed below.

2.1.2 Consumer beliefs regarding eco-labelled products

The two main perceptions of organic products are that these products are more expensive and healthier compared to non-ecological products (Magnusson et al. 2001). Next to that, consumers perceive organic foods as safer than non-ecological products (Miles and Frewer, 2001). Moreover, they associate organic products with environmental concerns, since environmental concerns turned out to be a reason to choose organic food products (Grankvist & Biel, 2007). With respect to product taste, eco-labels may influence the expectations of and experiences with the product too. An experiment revealed that respondents rated the taste of organic-labelled tomatoes better than tomatoes without this label, even though the tomatoes were actually similar (Johansson et al., 1999).

A similar study found support for a hypothesis saying that (false) information that orange juice is eco- or fair trade labelled will result in more positive evaluations of the taste (Grankvist et al., 2007). Nevertheless, no significant difference could be proved in this study, due to a small sample size.

2.1.3 Barriers for purchasing eco-labelled products

In addition to (mis)perceptions consumers may have regarding eco-labels, they may also perceive barriers for purchasing eco-labelled products. These perceived barriers may result in the choice not to buy the eco-labelled product variant, independent of whether the label is paid attention to or not.

The two major barriers for purchasing organic foods are the limited availability of the organic foods, and the existing price difference between organic and non-organic foods (Magnusson et al., 2001). The latter was supported by a literature study (Grankvist et al., 2007) and study which showed a correlation between income and the propensity to buy and use organic foods (Torjusen et al., 2001). With respect to price differences, consumers seem to be willing to pay 5 to 10 per cent more of the 'regular' product price for organic foods (Magnusson et al., 2001).

Next, some theories in relation to eco-labelling and the impact of negative eco-labelling will be discussed. First, prospect theory will be addressed, because prospect theory clarifies why negative labelling has more impact than positive labelling, from a neutral point of reference.

2.2 Prospect theory

Prospect theory describes the non-linear relation between real expectations and outcomes and the subjective experience people may have (Kahneman & Tversky, 1979). According to prospect theory, people expect to experience more harm from losses than pleasure from gains, and the consequences of a certain choices are relative to a point of reference (see Figure 2).

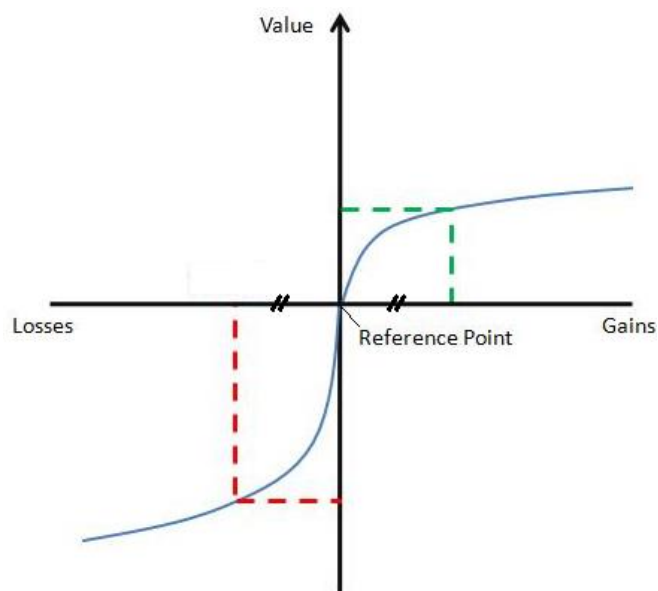


Figure 2: Value function for gains and losses (Kahneman & Tversky, 1979)

People overweight certain outcomes compared to probable outcomes, leading to risk aversion in choices involving sure gains and to risk seeking in choices involving sure losses (Kahneman & Tversky, 1979). For example, if people are given the option to choose between an 80% chance to win 4.000 (20% chance to win nothing) or 3.000 for sure, 80% of the people chooses the latter option (being

risk averse in a situation with a certain gain). However, if people are given the option to choose between a 80% chance to lose 4.000 (20% chance to lose nothing) or to lose 3.000 for sure, 92% of the people chooses the first option (being risk seeking in a situation with a certain loss).

2.2.1 The importance of framing

The way the choice is framed can also determine which option is preferred (Kahneman & Tversky, 1981). In their study, Kahneman and Tversky (1981) gave respondents the task to choose between programme A and B in case an unusual disease that was expected to kill 600 people would break out. In condition 1, programme A would save 200 people for sure, and programme B would have a 1/3 probability that all 600 people would be saved, and 2/3 probability that nobody would be saved. In condition 2, programme A would result in 400 people dying for sure, and programme B contained a 1/3 probability that nobody would die and a 2/3 probability that everybody would die. Even though both conditions actually presented the same dilemma, the majority of the respondents chose programme A in the first condition, and programme B in the second condition. By framing the choice in terms of saved versus lost lives, either risk avoiding or risk seeking behaviour was activated, resulting in different preferences.

2.2.2 Using prospect theory in consumer research

Even though a literature review showed that most authors support prospect theory (Edwards, 1996), it is debatable to what extent it has implications for consumer studies. For example, real choices often exist of two alternatives both including uncertainty (Levy & Levy, 2002)

Holmes et al. (2011) conducted a literature study regarding the use of prospect theory. They identified many challenges and opportunities for the use of prospect theory in scientific research. They emphasized that when using prospect theory, all four properties of the value function should be included; outcomes should be assessed relative to reference points, the value function is concave for gains and convex for losses, the value function is steeper for losses than for gains, and it incorporates diminishing sensitivity. The latter property of the function is important for the interpretation of data. The value function is nearly linear far from the reference point, so the relative importance of risk seeking behaviour and risk aversion is largest close to the reference point (Holmes et al., 2011).

2.2.3 Prospect theory in relation to food labelling

In relation to food labelling, prospect theory can explain why a negative label (e.g. “not environmental friendly”) would have more impact on a consumer choice than a positive label (e.g. “environmental friendly”) from a neutral point of reference; the red label is experienced as a larger loss compared to a neutral label/no label than the green label is experienced as a gain.

It should be noted that this mechanism is expected to apply only in *comparisons of products*. In common purchases, the loss is always monetary, and ending up with the product can be considered the gain. In this study, it is not about the choice between buying a product or not, but about the choice which product to buy; it is about trading-off positive and negative product attributes. Next to the environmental impact a product has, other product attributes play a role in purchase decisions as well. In the next paragraph, the role of approach-avoidance conflicts will be discussed.

2.3 Motivational conflicts in consumer choice processes

Many authors who write about the effect of eco-labelling on product choice (inexplicitly) include motivational conflicts in their research, often referring to the fact that eco-labelled products are

usually more expensive than non-ecological product variants, which is valued as a negative attribute of the product (e.g. Batte et al., 2007; Thøgersen, 2000; Vanclay et al., 2011). In this paragraph, motivational conflicts and their role in choice processes are discussed.

2.3.1 Motivational conflicts

Motivational conflicts emerge when a choice has to be made that cannot satisfy all wants of the consumer. Both approach motivation and avoidance motivation play a role. According to Elliot (2006)

'approach motivation may be defined as the energization of behaviour, or the direction of behaviour toward positive stimuli (objects, events, possibilities), whereas avoidance motivation may be defined as the energization of behaviour by, or the direction of behaviour away from, negative stimuli (objects, events, possibilities).'

Furthermore, approach motivation can both apply to responding to new positive stimuli as to maintaining to respond to existing positive stimuli, and that avoidance motivation can both apply to preventing to new negative stimuli as to maintaining to escape from negative stimuli (Elliot, 2006).

There are four types of motivational conflicts (Lewin, 1998). The first type is the *approach-approach conflict*. In an approach-approach conflict, a person faces a choice between two desirable alternatives. The conflict arises because of the choice that has to be made, letting go of one of the desired alternatives. Second, in an *avoidance-avoidance conflict*, a person faces a choice between two undesirable alternatives. This type of conflict is considered the most difficult type of conflict to solve (Miller, 1959). The third type of motivational conflicts is often discussed. It is the *approach-avoidance conflict*. Approach-avoidance conflicts refer to motivational conflicts guiding behaviour in opposite ways. A classic approach-avoidance conflict involves one object, event or possibility, which has both positive and negative valences. Fourth, in *multiple approach-avoidance conflicts*, a person has to make a choice between two (or more) alternatives, both containing positive and negative valences. For example, the choice between two products in the same product category, one awarded with an eco-label (positive valence) and sold at a high price (negative valence), and one with a negative label (negative valence), sold at a low price (positive valence).

Although consumers often have to deal with this latter type of conflict, the choices they have to make are often contemplated as approach-approach conflicts in which the attractive attributes of each product are emphasized. For example, the consumer wants the product with the eco-label *and* wants to pay a low price for the product. Adding a negative label to the product with the low price makes an intrinsic product attribute extrinsic and may therefore change how the choice is framed. The conflict changes from an approach-approach conflict to a multiple approach-avoidance conflict, in which both positive and negative product attributes should be traded-off.

2.3.2 Multiple approach-avoidance conflicts and framing of the choice

Eco-labelled products are often positively valued by consumers, because they are perceived to provide benefits that other products do not offer, for example with respect to the environment or health (Kuchler et al., 2000). However, they often have higher prices compared to non-ecological product variants, which is negatively valued (Batte et al., 2007). Below, it will be described how positive and negative labels can influence the eventual choice.

Imagine 2 products; product A with an eco-label and a price of €1,50, and product B, without any label and a price of €1,30. This is a situation a consumer could face in the current positive labelling system which is applied in many product categories. A switch from product A to product B can be considered a gain in monetary terms, and a loss in terms of sustainability. On the contrary, switching from purchasing product B to product A results in a loss in monetary terms, and a gain in terms of sustainability. Figure 3 outlines the situation.

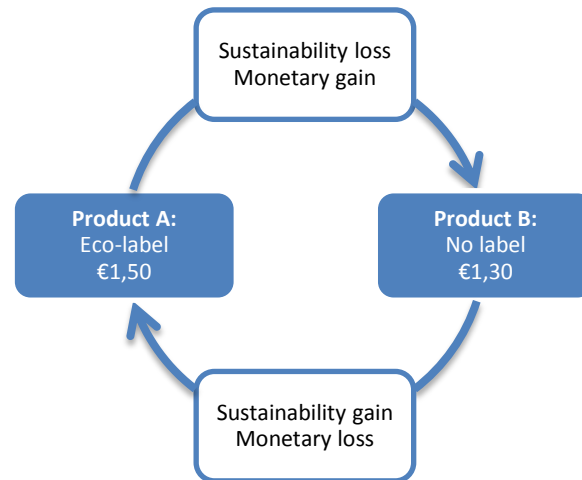


Figure 3: Example of multiple approach-avoidance conflicts in consumer choice making processes

Consumers can be expected to switch from product A to product B if the monetary gain is experienced as larger than the sustainability loss. However, since losses hurt more than gains give pleasure (Kahneman & Tversky, 1979), a switch from product A to B will only be considered if the monetary gain is relatively large. Similarly, a switch from product B to product A involves a monetary loss, and will therefore only occur if the sustainability gain is relatively large. Thus, in switching from product A to B, the difference in price of the two products should be large enough to compensate for the sustainability loss, or the sustainability loss should be experienced small in order to be compensated by the price difference. In switching from product B to A, the price difference between the two products should not be too high, (otherwise it will not be out weighted the sustainability gain), or the sustainability gain should be experienced large in order to compensate the price difference.

2.3.3 Guiding choice by increasing cognitive dissonance

Adding a negative label to product B could make a difference, since it will change the experienced changes in sustainability. Assuming that a consumers usually chooses product B, the new information that this product has a larger environmental impact than other products in the product category will change the balance between its attractiveness (the relatively low price) and its repulsiveness (the relatively large environmental impact). As a result, the consumer may experience a motivational conflict because he wants to buy the product at the low price, but not when it has a relative large environmental impact. This conflict is called cognitive dissonance (Festinger, 1957). If this cognitive dissonance is strong, it is experienced as unpleasant, and the consumer will have to take action in order to get rid of it.

Basically, the consumer has three options to do so. The first option is to run off, and to choose nor product A nor B. In this way, the consumer will not have to deal with the negative attributes from

any of the products, but this solution will not satisfy the goal of buying the product (Schwartz, 2004). A second option is to adapt the risk perception or outcome expectancy and to re-evaluate the options (Rabiau et al., 2006). In this case, the consumer changes his mind about the outcomes of a certain choice. For example, he reasons that the environmental consequences of product B are not that large compared to other products after all, and that product B still would be a reasonable choice. Another way to re-evaluate the outcomes is to evaluate them on a higher level. For instance, the consumer reasons that ‘nobody is perfect’, which justifies the choice for product B. It is also possible to find excuses for choosing product B on a lower level, in order to make this choice seem less worse than it is. For example ‘I do not eat as much as other people, so even if I choose product B, my environmental impact is lower than that of others.’ Third, if the balance between attractiveness and repulsiveness of product A and B is very strongly distorted, the consumer can choose to change his behaviour, switching to product A which takes away the negative feelings produced by the negative label of product B. Nevertheless, the higher price of product A should be worth taking away the cognitive dissonance, as will be discussed below.

Figure 4 shows this situation *compared to the previous situation and assuming fixed prices*. The negative label will increase the experienced sustainability loss when switching from product A to B. This switch will only occur if the monetary gain compensates the sustainability loss, and thus a larger monetary gain than in the situation without label on product B is needed to convince the consumer of switching products. If the prices remain the same, the consumer is more likely to switch from product A to B if product B does not have a label compared to when product B has a negative label. Adding a negative label to product B will thus prevent the consumers for whom the increased sustainability loss is not compensated by the price difference from switching.

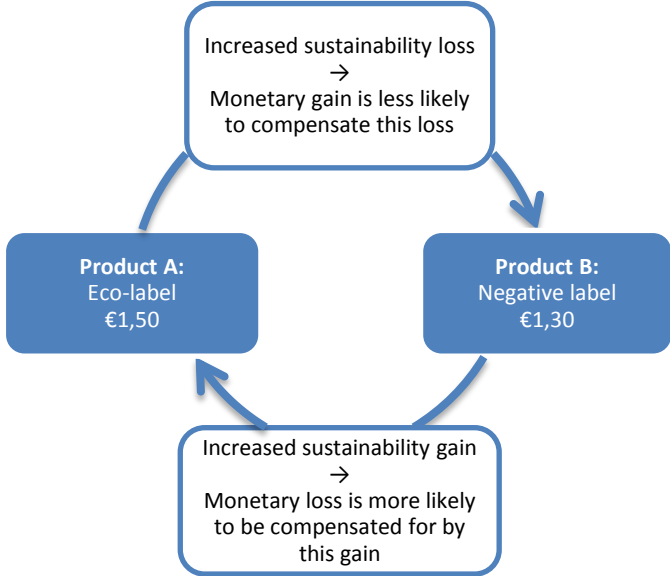


Figure 4: The effect of adding a negative label to product B compared to Figure 3.

Similarly, adding a negative label to product B will increase the experienced sustainability gain in switching from product B to A. Therefore, consumers may be willing to accept a higher monetary loss and thus be more willing to pay a higher price for product A than for product B. If the prices remain the same, the price difference is thus more likely to be compensated for if a negative label is added to product B. This will guide the consumer into the direction of choosing product A over B.

One important remark should be made with respect to the previous line of reasoning. The two given situations that are given as examples do not cover all options a consumer might face. Next to the choices between 1) products with positive labels and products without labels, and 2) products with positive labels and products with negative labels, consumers may also face choices between 3) products without labels and products with negative labels, or 4) products with positive labels, products without labels, and products with negative labels.

One question that remains unanswered is how the consumer perceives and judges the products without labels in the options 1 and 3, while this is of relevance for the choice. In option 1, the product without label can be perceived as doing an 'average' or 'higher than average' amount of harm to the environment. If the consumer assumes that the product has a higher than average environmental impact, he may mentally award it with a negative label, which increases the perceived environmental loss in choosing this product. Similarly, in option 3, the product without label can be perceived as doing an 'average' or 'lower than average' amount of harm to the environment. Again, the consumers' perception is of influence on the perceived sustainability gain in choosing the product without label compared to the product with the negative label.

2.3.4 Coping with approach-avoidance conflicts

So what will the consumer eventually do? In coping with approach-avoidance conflicts, avoidance of the entire conflict may initially seem an attractive option, because choosing requires cognitive effort (Schwarz, 2004; Roth & Cohen, 1986). Nevertheless, avoidance of the choice is only valuable for a limited period of time and has a disadvantage on the long run; if the consumer does not purchase any product, he will not satisfy his wants and needs. Moreover, since this study aims at choice processes with respect to low-involvement products, avoiding the conflict will probably not be necessary; the consequences of a 'wrong' (not optimal) choice are rather low.

The other option, -approaching the conflict- will initially generate cognitive dissonance (Festinger, 1957) and thus result in a negative emotion. This negative emotion is stronger in price-quality trade-offs including unfavorable quality-attributes and compared to price-quality trade-offs including favorable quality-attributes (Luce et al., 2000). Conflicting theories about the influence of the negative emotion on the decision process exist. One of the predictions is that the negative emotion will result in a negative mood, which will lead to analytic processing of information (Berkowitz, 2000). Contradictory, negative moods may encourage decision makers to base their choices on simplified processing, such as lexicographic decision strategies (choosing the alternative that scores best on the most important attribute) (Luce et al., 2000). They will sacrifice accuracy of the decision in order to minimize the cognitive load that is needed (Drolet & Luce, 2004).

Support was found for this latter theory in a study which showed that 'decision makers confronted with unfavorable (versus favorable) quality-attribute values [are] motivated to minimize the associated negative emotion by choosing the quality-maximizing alternative' (Luce et al., 2000). This can be explained by the fact that a quality attributes, such as environmental friendliness is more emotion-laden compared to an attribute such as price (Drolet & Luce, 2004). This means that the negative emotion produced by a negative label or a high price will be resolved by choosing the alternative with the positive label (or at least 'without the negative label'), product A in the example.

Thus, negative labels can be expected to have more influence on consumer choices compared to neutral labels or no labels, because they are expected to generate stronger negative emotions. If the

consumer bases his choice on the quality-maximizing shortcut, this will result in the purchase of the product with the positive label (product A). It can be questioned if the negative emotion generated by a neutral label or missing label (as opposed to a positive label) will generate an emotion strong enough for the consumer to base the choice on the quality-maximizing shortcut too.

2.4 Regulatory focus theory

In order to truly understand approach-avoidance conflicts, a person's regulatory focus should be taken into account (Higgins, 1997). This regulatory focus can either have a promotion focus – when a desired end-state is defined by aspirations and accomplishments- or a prevention focus – when a desired end-state is defined by responsibilities and safety (Higgins, 1997). In contrast to what one might assume, a promotion focus cannot always be directly linked to approach motivation and a prevention focus cannot always be directly linked to avoidance motivation. People in a promotion focus are sensitive to positive outcomes and affected by both the presence and absence of these outcomes, whereas people in a prevention focus are sensitive to negative outcomes and affected by both the presence and absence of these outcomes (Higgins, 1997). In this paragraph, it will be discussed how a consumers regulatory focus can influence his choices.

2.4.1 The importance of regulatory fit

Various studies have shown that a person's regulatory focus influences the strength of his approach and avoidance motivation and the eventual performance, depending on how a task is framed (e.g. Förster et al., 1998; Shah et al., 1998). They suggest that motivation and task performance are greater when the task and/or incentives are framed in a way that fit the performers regulatory focus. Moreover, regulatory focus is a moderator of emotional intensity relating to goal attainment (Higgins et al., 1997). People in a promotion focus experience stronger emotions in terms of cheerfulness and dejection when they respectively accomplish or fail a task, whereas people in a prevention focus experience stronger emotions in terms of quiescence-agitation when they respectively accomplish or fail a task. Many studies involving regulatory focus illustrate the notion that 'independent of outcomes from worth, people experience a regulatory fit when they use goal pursuit means that fit their regulatory orientation and this regulatory fit increases the value of what they are doing' (Higgins, 2000).

Both studies treating regulatory focus as a chronic individual characteristic and studies treating regulatory focus as a characteristic that can be temporarily induced support the strength or regulatory fit (e.g. Förster et al., 1998; Shah et al., 1998; Lockwood et al., 2002; Higgins et al., 2001). Moreover, various authors acknowledge regulatory focus *both* as a trait and a state. For example, Lockwood et al. (2002) state that 'although there are stable individual differences in dominant regulatory focus, one's current focus also depends on situational factors' and Higgins (2002) points out that 'momentary situations are also capable of temporarily inducing either promotion-focus or prevention-focus concerns'.

Nevertheless, not many studies have been conducted to measure the relative strength of chronic regulatory focus and regulatory focus framing. However, in one study, participants' chronic regulatory focus was considered an independent variable influencing how participants would perform on a task that was either framed in a promotion or a prevention focus (Shah et al., 1998).

The results showed that ‘differences in chronic regulatory focus moderate the effect of the regulatory focus framing of incentives on performance’ (Shah et al., 1998).

With respect to sustainable product choice, research has shown that ‘perceived sustainability practices of a company activate a prevention focus in consumers’ and that ‘consumers make prevention-focused inferences about the product of a sustainable company’ (Bullard & Manchandra, 2012). These results suggest that consumers are more sensitive to the presence and absence of negative outcomes compared to positive outcomes on the domain of sustainability, which indicates a stable prevention focus.

2.4.2 Regulatory fit and labelling

For environmental concerned buying of everyday groceries, regulatory focus theory means the following. If a person has a promotion focus towards the environment, he is concerned with improvement of the current situation with respect to products bought. In a labelling system which includes positive labels, this can be translated into action by promoting the purchases of positive-labelled products. In relation to avoiding and seeking the presence of positive outcomes, this means that either products with positive labels can be approached (approach motivation: ‘choosing this product is what I ideally should do’), or that products without positive labels could be avoided (avoidance motivation: ‘choosing this product is not what I ideally should do’). Similarly, if a person has a prevention focus towards the environment, he is concerned with protecting the environment from harm. In a labelling system which includes negative labels, this can be translated into action by preventing the purchase of negative-labelled products. With respect to seeking and avoiding the presence of negative outcomes, this means that either products without negative labels can be approached (approach motivation: ‘choosing this product is what I believe I should do’) or that products with negative labels should be avoided (avoidance motivation: ‘choosing this products is not what I believe I should do’). Table 1 gives an overview of the actions a consumer could take, depending on his regulatory focus and the type of motivation.

Table 1: Regulatory focus and approach-avoidance behaviour in buying everyday groceries.

	Promotion	Prevention
Approach	Approach products with positive labels	Approach products without negative labels
Avoidance	Avoid products without positive labels	Avoid products with negative labels

From Table 1, it becomes clear that positive labels are of relevance for consumers in a promotion focus, whereas negative labels are of relevance for consumers in a prevention focus. If the labelling system does not contain negative labels, the a consumers’ prevention focus *does not influence the choice*, because both approach and avoidance motivation will lead to a preference for products with a positive or neutral label, which are the only products sold.

Assuming that a labelling system contains both positive, negative and neutral labels, both consumers with a promotion and a prevention focus will approve products with positive labels and reject products with negative labels. However, neutral products are only approved of by consumers with a prevention focus. So, in purchase decisions, consumers with a prevention focus are expected to

choose products with neutral labels (instead of positive labels) more often compared to consumers with a promotion focus.

Grankvist et al. (2004) assumed in their paper that highly environmental concerned consumers would have a promotion focus, and that people with intermediate environmental concerns would have a prevention focus. Nevertheless, it is debatable whether this assumption is correct. As said in the introduction, products can be provided with an eco-label if they have a *reduced* environmental impact throughout the life-cycle, compared to other products. This means that the product is *not as bad* as other products in the taxonomic product category, indicating a prevention focus. Only products that can be classified as *good* for the environment (improving the environment by being produced, used, and disposed) could theoretically be chosen based on a promotion focus. Since this is never the case, environmental concerned consumers may be strongly trained to avoid products that have a lot of environmental impact throughout the life-cycle, but not so much to approach products that can be considered 'good' for the environment, congruent with the study by Bullard & Manchandra (2012). This means they would act as is described in the bottom right corner of Table 1; preventing the environment from being harmed by avoiding products with negative label. This could explain why negative labels could be more effective in guiding sustainable product choice than positive labels.

2.5 The effectiveness of the traffic-light labelling system

The amount of impact a label has could be determined by the labelling-system that is used. Despite the fact that not much research has been done on the effect of traffic-light labelling systems as opposed to other labelling systems with respect to environmental impact in specific, it will be discussed next how this system can influence consumer choice.

2.5.1 Attention to labels

For a label to influence the consumer choice, an important requirement is that the label is noticed by the consumer. However, eye-tracking studies have shown that this is often not the case (Rawson et al., 2008; Van Herpen & Van Trijp, 2011). So far, only top-down factors have been discussed in relation to attention to labels. Top-down factors are internal factors, such as the involvement with the product and the motivation to achieve a certain goal (Pieters & Wedel, 2004). Next to top-down factors, bottom-up factors, influence the attention to the label as well (Pieters & Wedel, 2004). Examples of bottom-up factors are the type of label, the size of the label, and position on the pack. Additionally, a consistent labelling format within products versus multiple schemes on different types of products is perceived by consumers as being the easiest to use (Kelly et al., 2009). A consistent labelling format will increase the probability that the consumer recognizes the label, and therewith in a top-down way increase the attention for the label.

Research on top-down factors for attention to labels mainly focusses on attention to health-related labels. These labels are often rather complicated, because they have to contain information on multiple elements of the nutritional content to provide the consumer with sufficient information to assess the entire product. For example, when traffic-light tables are used, the product is awarded with either a red, yellow or green label for the amount of sugar, fat, and salt the product contains separately.

Although research on the domain of health shows that consumers prefer a detailed nutrition table to traffic-light tables or logos, these tables receive only little attention, especially under time pressure (Van Herpen & Van Trijp, 2011). Logos, which cover only one product attribute (e.g. 'not environmental friendly' or 'environmental friendly') in an uncompromising format, are used more frequently under time pressure (Van Herpen & Van Trijp, 2011). Processing the information that this type of label provides requires only a little effort from the consumer at the point of purchase, which makes the logo an attractive tool. For environmental labelling, this means that a traffic-light label could be a powerful way to guide behaviour, as long as it is provided in the format of a logo.

2.5.2 Changing the point of reference

An important characteristic of the traffic-labelling system is that it contains a negative label. The negative label changes the point of reference that a consumer uses. For example, in a traffic-light labelling system with positive (green), neutral (yellow) and negative (red) labels, a product with a yellow label may be perceived as having a different value compared to a product without a label in a labelling system with only green (positive) labels. Despite the fact that it is not labelled as a 'good' product, it is neither labelled as a 'bad' product, and therewith provides the consumer additional information compared to the latter system, in which this information is missing.

Furthermore, the traffic-light logos enable consumers to assess the environmental friendliness of a product compared to other products in the same category at a glance, *without actually consulting the labels on other product packages*. This is an advantage compared to other labelling systems. For example, in the Netherlands, a hallmark is applied to indicate how animal-friendly products such as eggs and meat are produced; the more stars, the better, with a maximum of three stars (Dierenbescherming, 2012). The outlines of all three stars are always visible, with the amount of stars the product is awarded with being coloured. If a consumer notes that a product is awarded with two out of three stars, it still remains unclear if this is better or worse than the product variants that are offered. For this information, other product packages have to be consulted as well.

Moreover, it is debatable whether or not a product awarded with one star should be assessed as a 'good' or as a 'bad' product. It did deserve one star, but missed out on the second and third star, so how much harm was actually done? Traffic-light labelling takes away this ambiguities and provides consumers with a comprehensive label that allows consumers to assess products separately.

2.5.3 Guiding choice by using traffic-light labels

From various studies, it turns out that the traffic-light labelling system is an helpful tool for consumers to distinguish the 'good' from the 'bad' products in a glance (e.g. Kelly et al., 2009; Lobstein & Davies, 2009; Roberto et al., 2012; Feunekes et al., 2008). Moreover, the majority of consumers assesses traffic-light labels as a useful tool (Drescher et al., 2011). However, research has shown that consumers do not always understand the meaning of a label thoroughly (Feunekes et al., 2008). For example, they may think that the label compares products across categories, instead of within one category.

Interestingly, a study in the United States showed unexpected findings with respect to changes in sales due to traffic-light labelling (Hallstein & Villas-Boas, 2009). For this study, sea food products in two stores were provided with green ('best choice'), yellow ('proceed with caution') or red ('worst choice') labels for a period of 4 weeks. The sales of products with green labels increased significantly, and the sales of the products with the yellow labels decreased significantly. However, no significant

in difference in sales of the products with the red labels was measured (Hallstein & Villas-Boas, 2009). The authors explain this by the assumption that the consumers may not had understand the meaning of the labels.

A positive label on a product can be misunderstood as well. With respect to health, a halo-effect has been identified as a non-desired effect of the label (Drescher et al., 2011). For example, when a product contains a positive label saying it does not contain any fat, consumers overall perceive this product very positive. The claim changes the consumers' perceptions of the appropriate serving size, and could in that way lead to overconsumption among overweight consumers (Wansink & Chaldon, 2006). If a halo-effect occurs as a result of positive environmental claims, a single claim may lead to extra consumption of the product. This may result in a larger net environmental impact compared to when the product has no positive environmental claim at all.

3. Hypotheses

The aim of this study is to find out why negative labelling could be more effective compared to positive labelling, and under what circumstances. Taken the previous theoretical background into account, some hypotheses are formulated.

First of all, it is assumed in this study that negative labelling is more effective in guiding consumers to make sustainable choices than positive labelling. This assumption will be checked empirically.

H1: In one-sided labelling, negative labels have a stronger impact in guiding consumers to make sustainable choices than positive labels, both compared to a neutral point of reference.

In addition to one-sided labelling, two-sided labelling will be included in this study. It is proposed that two-sided labelling is more effective than positive labelling, because two-sided labelling increases the perceived difference in environmental impact among both products.

H2: Two-sided labelling has a stronger impact in guiding consumers to make sustainable choices than one-sided positive labelling.

Based on the theoretical framework, it cannot be predicted how one-sided negative labelling could be ranked in effectiveness compared to one-sided positive labelling and two-sided labelling. On one hand, one-sided negative labelling could be less effective than two-sided labelling because the perceived difference in environmental impact among two products is smaller in case of negative labelling. On the other hand, one-sided negative labelling may be more effective than two-sided labelling because the smaller perceived difference in environmental impact among two products gives the consumer less guidance in product choice. It therefore requires more cognitive effort from the consumer to make a choice between a product with a negative label and a product with a neutral label, which could be the stimulus that 'unfreezes' habitual behaviour.

In this study, attention will be paid to the consumers' regulatory focus. Since research has suggested that consumers are more likely to have a prevention focus than a promotion focus regarding sustainability practices, this is expected to be reflected in this study.

H3: With respect to sustainability, consumers are more likely to think in a prevention focus than a promotion focus

As is outlined in Table 1, a relation between the type of label that is used and the regulatory focus is present. Positive labels are of relevance for people in a promotion focus and negative labels are of relevance for people in a prevention focus. Since regulatory fit will be considered an important predictor for the effectiveness of labelling, it is proposed that consumers who experience a fit between their regulatory focus and the type of labelling that is used will make their choice *more quickly* than consumers who do not experience this regulatory fit.

H4: Consumers who experience a fit between their regulatory focus and the type of labelling that is used will make quicker choices than consumers who experience a misfit between their regulatory focus and the type of labelling that is used.

Finally, it is suggested that regulatory focus determines whether or not 'neutral' products are accepted or rejected. Both consumers with a prevention focus and with a promotion focus will accept products with positive labels and reject products with negative labels, whereas products

without labels are only accepted by consumers with a prevention focus but rejected by consumers with a promotion focus. Hypotheses 5 is included to measure whether or not consumers act upon their regulatory focus.

H5: A promotion focus will result in the preference for products with positive labels, whereas a prevention focus will result in the preference for products with either positive or no labels. Both a prevention and a promotion focus will result in rejection of products with negative labels.

Although this latter hypothesis actually supports the notion that positive labelling (via activation of the promotion focus) leads to more sustainable consumer choices than negative labelling (via activation of the prevention focus), this hypothesis is included in the present study to check the assumption that regulatory focus influences actual choices.

4. Methodology

This chapter describes the research methodology that has been applied. Elements that will be addressed are the study design, the study participants and sample selection, the data collection methods, and the methods for data analysis.

4.1 Study design

For this study, a post-test-only control group design was chosen. Three experimental groups and one control group will be included. The study design excluded a pre-test, which prevented a possible pre-test effect. Because no pre-test will take place, it was not possible to check the quality of the randomisation. However, the demographic data derived from the respondents provided some insight on the composition of the sample and the quality of the randomisation.

The concepts that were studied are 1) the importance people attached to labels when given the task to choose among various alternatives, 2) the presence of a specific type of regulatory focus on the domain of sustainability, 3) the time people needed to make their choice -given a certain type of labelling and regulatory fit, and 4) the extent to which regulatory focus was reflected in product preference. Next to regulatory focus, norms, ethical orientation and environmental paradigm were measured to explain product choice. Furthermore, demographic data was collected for additional insights in the composition of the sample, and the quality of the randomisation.

4.2 Study participants and sample selection

The study population consisted of Dutch students at Wageningen University. Respondents were recruited via a panel of students who had agreed to be invited for online studies. Next to that, a convenience sample of students was taken in order to increase the number of respondents, and potentially the number of students in the panel. As a reward for participation, two gift vouchers of €10,00 each were raffled among the respondents.

It was chosen to limit the study population to students with a Dutch nationality to increase the reliability of the study. Non-Dutch students were expected to be less familiar with the products that were used in this study and the label –which originates from a Dutch foundation (Stichting Eco-keurmerk, 2013)-, and were therefore excluded from participation.

4.3 Data collection methods

This study aims to gain insight in consumer choice processes that consumers are mostly unaware of; the fact that losses (negative labels) have more impact than gains (positive labels) is something that consumers experience unconsciously. Consumers are therefore unlikely to be able to name the choice processes they go through. Thus, quantitative research was conducted in order to measure how people react to a certain type of labelling, using various indicators for the choice processes. By means of a between subject design, it was measured whether or not there were significant differences between groups of people exposed to different labelling systems. Data collection took place at a single point in time.

The quantitative data was collected via an online questionnaire, created with Qualtrics software. Appendix A includes a flow-chart of the questionnaire (which was distributed in Dutch). The online questionnaire enabled potential respondents to fill out the questionnaire where and when it suited them for a period of one week. Furthermore, the hyperlink that gave access to the questionnaire could easily be transferred to other students who might were willing to fill out the questionnaire. A supplementary advantage was that respondents could be entirely randomly assigned to one of the conditions, because randomisation was done electronically.

4.3.1 Procedure

Figure 5 gives an overview of the process the respondents went through. They will be explained in this paragraph.

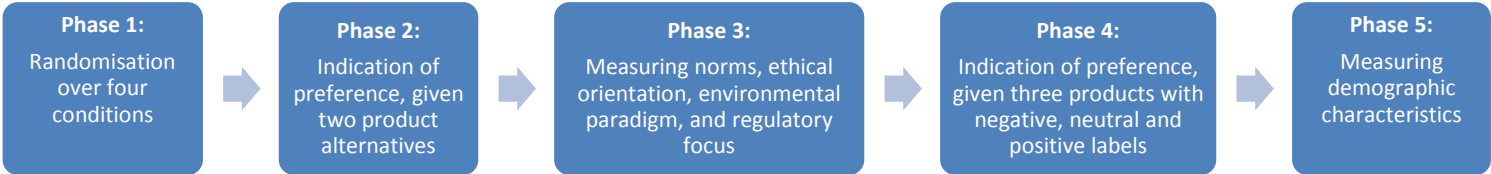


Figure 5: Overview of procedure.

First if all, informed consent was obtained at the beginning of the survey. Next, respondents were randomly assigned to one of four conditions (see Table 2). In all conditions, respondents were asked to indicate their preferences, given the choice between two alternatives in the same taxonomic product category. In the conditions 1, 2, and 3, the products differed in price and label; the alternative that had a relatively little environmental impact was more expensive than the alternative that had a relatively large environmental impact. In condition 4, the products only differed in price, but not in label.

Table 2: Overview of the different conditions in the study design.

Condition 1	Positive labelling; one product without a label and one product with a positive label.
Condition 2	Negative labelling; one product with a negative label and one product without a label.
Condition 3	Two-side labelling; one product with a negative label and one product with a positive label.
Condition 4	Control condition; two products without labels.

The positive label that was applied was the official eco-label from the Foundation EKO Quality mark (Stichting Eco-keurmerk, 2013). The negative label was a modification of the positive label; part of the quality mark was coloured in red and a red line crossed the word ‘eco’. Both labels are included in appendix B. A pre-test was conducted in order to find out if respondents would understand the meaning of the negative label. The label was presented to six people and they were asked what they would think the label meant if they would see it on the package of a product in a super market. All six people replied that they thought the label meant something ‘negative’. Five people thought that the label indicated that the product would not be organic or ecological, and one person thought that the label indicated that the product would not be recyclable.

In phase three, the respondents norms, ethical orientation, environmental paradigm and regulatory focus were measured. Respondents were asked to indicate to what extent they agreed with several statements.

In the fourth phase, respondents from all conditions were asked to indicate how likely they were to buy three products; a product with a negative label and a relatively low price, a product without a label and a moderate price, and a product with a positive label and a relatively high price.

Next, demographic characteristics –age and gender- of the respondents were measured in phase five. In this way, it could be checked whether or not these background variables could have been of influence on the answers in general, and on differences measured between the groups in the survey due to a possible low quality of randomisation.

Finally, respondents were redirected to another survey, where they could enter their e-mail address in case they wanted to have a chance of winning one of the gift vouchers. Next to that, they could tick a box if they wished to be invited to participate in electronic surveys more often. Because the e-mail addresses were collected in another survey, they could not be connected to the answers given on the other questions.

4.3.2 Measurements

In this study, several concepts were measured. In this paragraph, it will be described how this was operationalized. Measurements that will be discussed are the importance of sustainable product choice, norms, ethical orientation, environmental paradigm, and regulatory focus.

Importance of sustainable product choice

One of the attributes that was measured was the importance consumers attach to the sustainability of the products they buy. In phase two of the study, respondents were exposed to four product pairs and given the task to indicate the extent to which they were inclined to choose a certain product. In order to avoid social desirable answering as much as possible, the products did not only differ with respect to labelling, but also with respect to their price. In the multiple approach-avoidance conflicts the respondents faced, a trade-off between low pricing and high sustainability had to be made. The products that were included in the study were coffee, marmalade, milk and tomatoes. An overview of the products and corresponding prices is given in appendix C.

Respondents were given the task to indicate how likely they were to choose a certain product on a 9-point scale, ranging from 'Product A' to 'Product B'. The scale points were labelled as follows: 4-3-2-1-0-1-2-3-4. The four on the left meant that the respondent would definitely choose product A, whereas the four on the right meant that the respondent would definitely pick product B. A score of zero meant that the respondent did not have a preference for one product over the other. All other scores indicated that the respondent had a preference for either of the products, but that they would consider to a certain extent to choose the other product as well. This format provided a more nuanced overview of the importance respondents attach to sustainability in their product choices compared to an all-or-nothing format.

In phase four, the respondents were asked to indicate the extent to which they were likely to buy three products, differing in price and label. The 7-point scale ranged from 'never' to 'always', and all scale points were labelled. The product was fruit juice. Appendix D shows the options that were displayed.

Norms

For additional information about personal norms of the respondents, three items about norms were included in the survey (see Box 1). These items were derived from a thesis by a student from Wageningen University (Beukeboom, 2011), who based his items on scientific research by Vining and

Ebreo (1992). Respondents were asked to rate the extent to which they agreed with the statements. Again, a seven-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (7) was used.

Box 1: Items to measure norms

I feel a strong obligation to buy sustainable products
I would feel guilty if I would neglect to buy sustainable products
I am willing to put extra effort in buying sustainable products

Ethical orientation

In order to measure how responsible respondents assessed themselves with respect to their purchases, three items from the *ethical orientation regarding purchase intention scale* were included in the survey. This scale originally consists of seven items derived by scales from Brenton and Ten Hacken (2006) and Ozcaglar-Toulouse et al. (2006), but only three items were included in the present study to prevent the survey from becoming too extensive (see Box 2). A seven-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (7) was used.

Box 2: Items to measure ethical orientation

I particularly buy products that contribute to fair trade
I pay attention to the production process (environmental friendliness, working conditions) of the products that I buy
I pay attention to ethical marks (fair trade, Max Havelaar) that a product possesses

Environmental paradigm

Environmental paradigm was measured with the *New Environmental Paradigm scale* by Dunlap et al. (2000). Although the scale actually consists of fifteen items, only nine items were included in the survey, to prevent the survey from becoming too extensive (see Box 3). Moreover, a seven-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (7) instead of a five-point Likert scale –as was suggested by Dunlap et al. (2000)- was used, in order to avoid possible problems in comparing the scores respondents gave on the scales for ethical orientation, norms and regulatory focus with the scores they gave on the scale for environmental paradigm.

Box 3: Items to measure environmental paradigm

We are approaching the limit of the number of people the earth can support
Humans have the right to modify the natural environment to shift their needs
Humans will eventually learn enough about how nature works to be able to control it
Humans are severely abusing the environment
Plants and animals have as much right as humans to exist
The balance of nature is strong enough to cope with the impacts of modern industrial nations
The so-called 'ecological crisis' facing humankind has been greatly exaggerated
The balance of nature is very delicate and easily upset
If things continue on their present course, we will soon experience a major ecological catastrophe

Regulatory focus

The survey included six items to measure the respondents regulatory focus. No validated scale for regulatory focus on the domain of sustainability could be found in literature. However, research suggests that a domain specific regulatory focus scale shows considerable more relevant results than a general regulatory focus scale (Gomez et al., 2013). Therefore, six items from the

promotion/prevention scale by Lockwood et al. (2002) were selected and modified to make them domain specific. These six items included three sets of one prevention framed item and one promotion framed item (see Box 4). Respondents were asked to rate the extent to which they agreed with the statements on a seven-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (7).

Box 4: Items to measure regulatory focus

Items promotion scale

I often think about how I can achieve a better environment

When I go grocery shopping, my most important goal is to buy sustainable products

I am more oriented towards achieving a better environment than to avoiding environmental harm

Items prevention scale

I often worry that I do too much harm to the environment

When I go grocery shopping, my most important goal is to avoid unsustainable products

I am more oriented towards preventing environmental harm than to achieving a better environment

4.4 Method for data analysis

The data derived in the survey was transported to the statistical software programme SPSS for further analysis. In order to decide whether the hypotheses 1 and 2 were supported or rejected by the data, it was examined whether there were any significant differences in the scores given by the respondents based on the condition they were placed in. Attention was paid to the importance respondents attached to sustainable product choice, as well as the actual choices that were made. In order to determine whether hypotheses 3, 4, and 5 should be supported or rejected, respondents had to be classified as either prevention focused or promotion focused. Moreover, it was measured how much time it took the respondents to indicate their product preferences and whether or not there were significant differences between the amounts of time the respondents needed, depending on their regulatory fit.

5. Results

In this chapter, the results of the study are discussed, starting with the descriptive data of the respondents (paragraph 5.1) and the descriptive statistics of the measures (paragraph 5.2). After that, it will be discussed whether the hypotheses should be rejected or supported (paragraph 5.3).

5.1 Descriptive statistics respondents

The survey was started 245 times, but 14 responses were immediately deleted because too many answers were missing. Overall, the responses of 231 students of Wageningen University were included in the study. Of the 219 respondents who entered their gender, 83 were men and 136 were women. Up to 205 respondents entered their age at the end of the survey. They had an average age of 21.93 years ($SD=1.795$).

No significant differences between the groups of respondents in the different conditions were found, based on their gender ($F=1.309$, $p=0.272$) and age ($F=0.414$, $p=0.743$). However, the men that participated in the study were significantly older ($M=22.42$, $SD=2.152$) than the women that participated ($M=21.65$, $SD=1.499$; $t(113.960)=113.960$, $p=0.007$, equal variances not assumed).

5.2 Descriptive statistics measures

Three scales were included to measure the overall importance respondents attached to sustainability. They measured norms, ethical orientation and environmental paradigm. Next to that, regulatory focus was measured. Below, it will be discussed how the respondents scored on these scales.

5.2.1 Norms

Three items were included to measure norms. Respondents were asked to indicate the extent to which they agreed with the items on a 7-point scale, ranging from 'strongly disagree' to 'strongly agree'. Cronbach's alpha was 0.764 for the answers of all 224 respondents that completed the questions, which indicates an acceptable internal consistency of the scores.

Mean scores for the items measuring norms differed significantly between the respondents in the different conditions ($F=3.897$, $p=0.010$). The respondents in the one-sided positive condition scored on average lowest ($M=2.64$, $SD=1.161$, $SE=0.154$), followed by the respondents in the control condition ($M=3.16$, $SD=1.105$, $SE=0.152$), the respondents in the one-sided negative labelling condition ($M=3.27$, $SD=1.279$, $SE=0.168$) and the respondents in the two-sided labelling condition ($M=3.33$, $SD=1.219$, $SE=0.163$). Tukey post-hoc comparisons of the four groups showed that respondents in the one-sided positive labelling condition scored significantly lower than the respondents in the one-sided negative labelling condition ($p=0.027$) and the respondents in the two-sided labelling condition ($p=0.014$).

An univariate test showed that the differences in scores for norms between the experimental groups were dependent of the centred mean scores the respondents gave when they indicated their product preference ($F=106.647$, $p=0.000$), and not of manipulation ($F=1.600$, $p=0.205$) or the interaction between the manipulation and the centred mean scores for product preference ($F=0.560$, $p=0.572$).

5.2.2 Ethical orientation

Three items were included in the survey to measure ethical orientation. Just as for norms, respondents were asked to indicate the extent to which they agreed with the items on a 7-point scale, ranging from 'strongly disagree' to 'strongly agree'. Cronbach's alpha was 0.777 for the answers of all 224 respondents that completed the questions, which indicates an acceptable internal consistency of the scores.

No significant differences between the mean scores for the items measuring ethical orientation of the respondents in the different conditions were found ($F=1.750$, $p=0.158$). The sample mean was 3.41, the sample standard deviation was 1.258, and the sample standard error was 0.084.

5.2.3 Environmental paradigm

The survey contained nine items to measure environmental paradigm. Five of them (1, 4, 5, 8, and 9, see Appendix A) were formulated in a way that agreement represented pro-ecological worldview, and four of them (2, 3, 6, and 7, see Appendix A) were formulated in a way that disagreement represented a pro-ecological worldview. The latter group of items was converted so that agreement would represent a pro-ecological worldview for all items. Cronbach's alpha was 0.741 for the nine items together, which indicates an acceptable internal consistency of the scores.

The 15-item New Environmental Paradigm scale includes five factors, namely 'balance of nature', 'limits of growth', 'anti-anthropocentrism', 'anti-exemptionalism', and 'ecocrisis', with three items on each factor. In this study, the numbers of items on the factors 'balance of nature' and 'anti-anthropocentrism' was reduced to two, and the number of items on the factors 'limits of growth' and 'anti-exemptionalism' was reduced to one.

A factor-analyses showed that the remaining nine items loaded on only three factors with an eigenvalue larger than one. However, an analyses with varimax rotation and a *fixed number* of five factors confirmed the structure of the scale (see Appendix E). Nevertheless, due to the nature of this study and the fact that the internal consistency is acceptable, environmental paradigm will be considered a single measure.

No significant differences in the mean scores for environmental paradigm were measured between the groups ($F=1.080$, $p=0.359$). The sample mean was 4.81, the sample standard deviation was 0.852, and the sample standard error was 0.057.

5.3.4 Regulatory focus with respect to sustainability

In the survey, three pairs of items were included to measure regulatory focus. They all consisted of two similar items, with one being promotion framed and one being prevention framed. To find out if the two factors 'promotion focus' and 'prevention focus' could indeed be distinguished based on the data derived in the survey, a factor analysis was run.

Since it was expected that respondents who scored high on one particular factor would score equally low on the other factor, orthogonal rotation (varimax) was applied. Table 3 shows that a two-dimensional structure of the scale was present, but the items loaded in a different pattern on the two factors than predicted.

Table 3: Factor loadings after varimax rotation for promotion and prevention scale and item characteristics

	Factor 1	Factor 2	Mean	Standard error	Standard deviation
Items promotion scale					
I often think about how I can achieve a better environment	0.716	0.209	4.20	0.106	1.592
When I go grocery shopping, my most important goal is to buy sustainable products	0.721	-0.050	2.21	0.071	1.060
I am more oriented towards achieving a better environment than to avoiding environmental harm	0.494	-0.529	3.53	0.084	1.263
Items prevention scale					
I often worry that I do too much harm to the environment	0.682	-0.016	3.35	0.103	1.534
When I go grocery shopping, my most important goal is to avoid unsustainable products	0.738	-0.151	2.12	0.073	1.089
I am more oriented towards preventing environmental harm than to achieving a better environment	0.322	0.839	4.10	0.092	1.380

Overall, four items loaded on one factor, and two items loaded on the other factor. Cronbach’s alpha for the items on the first factor is 0.694, and for the items on the second factor 0.060 -after recoding one of the items. Cronbach’s alpha for the predicted promotion and prevention framed items were respectively 0.485 and 0.374. These results show that the promotion and prevention scales could not be validated based on the data of this study.

For further analysis, it was examined whether scores and internal consistencies differed between the conditions. No significant differences between the groups were found on the mean scores for the items that were promotion framed ($F=0.563, p=0.640$) or on the mean scores for the items that were prevention framed ($F=1.390, p=0.247$). However, Cronbach’s alpha for the promotion framed items and for the prevention framed items was relatively high in the control group. Table 4 gives an overview of the findings.

Table 4. Characteristics and Cronbach’s alpha for items prevention focus and promotion focus, per condition.

Condition	Item characteristics promotion focus	Cronbach’s alpha promotion focus	Item characteristics prevention focus	Cronbach’s alpha prevention focus
1. One-sided positive labelling	M = 3.24 SD = 0.906 SE = 0.120 (N=57)	0.413	M = 3.08 SD = 0.866 SE = 0.115 (N=57)	0.376
2. One-sided negative labelling	M = 3.43 SD = 0.989 SE = 0.130 (N=58)	0.534	M = 3.20 SD = 0.930 SE = 0.122 (N=58)	0.309
3. Two-sided labelling	M = 3.33 SD = 0.861 SE = 0.115 (N=56)	0.422	M = 3.39 SD = 0.808 SE = 0.108 (N=56)	0.216
4. Control	M = 3.23 SD = 0.964 SE = 0.132 (N=53)	0.608	M = 3.10 SD = 0.971 SE = 0.133 (N=53)	0.561

Although Table 4 indicates a relatively high internal consistency for the items on the promotion focus scale and the prevention focus scale in the control condition, a factor analysis only including the control condition shows that the items load in a similar pattern on the two factors, as is presented in Table 5.

Table 5: Factor loadings after varimax rotation for promotion and prevention scale and item characteristics in condition 4.

	Factor 1	Factor 2	Mean	Standard error	Standard deviation
Items promotion scale					
I often think about how I can achieve a better environment	0.727	0.341	3.72	0.213	1.549
When I go grocery shopping, my most important goal is to buy sustainable products	0.855	0.049	2.28	0.138	1.007
I am more oriented towards achieving a better environment than to avoiding environmental harm	0.181	0.793	3.70	0.172	1.249
Items prevention scale					
I often worry that I do too much harm to the environment	0.694	0.342	3.09	0.193	1.404
When I go grocery shopping, my most important goal is to avoid unsustainable products	0.841	0.068	2.30	0.169	1.234
I am more oriented towards preventing environmental harm than to achieving a better environment	0.115	0.791	3.91	0.185	1.348

However, since Cronbach's alpha for both the promotion framed items and prevention framed items is acceptable, the control group will be included in further analyses regarding regulatory focus. The three experimental groups will be excluded.

5.3 Hypotheses testing

In the following part of this chapter, it will be examined whether or not the hypotheses are rejected or supported by the data derived in this study.

5.3.1 One-sided negative labelling vs. one-sided positive labelling

The first hypothesis of this study predicted that one-sided negative labelling would have a stronger impact in guiding consumers to make sustainable product choices than one-sided positive labelling, both compared to a neutral point of reference. In order to test whether this hypothesis should be rejected or supported, the scores the respondents in condition 1 and 2 gave in the first four questions of the survey were compared. Additionally, a new variable 'mean score' was created and computed by taking the mean of the scores that were given by the respondents. Although respondents indicated their preference on a scale with scale points labelled as 4-3-2-1-0-1-2-3-4, the answers were converted to scores from 1 to 9 in the output. A higher score represents a more sustainable choice. Table 6 shows the mean scores, standard deviations, and standard errors for product preferences of the respondents in the conditions 1, 2, and 3. Significant differences between the scores of the three groups are indicated.

Table 6: Mean scores and standard deviations for product preferences respondents conditions 1, 2 and 3.

Condition	Score coffee	Score marmalade	Score milk	Score tomatoes	Mean score
1. One-sided positive labelling	M = 3.03 ^b SD = 2.042 SE = 0.266 (N=59)	M = 3.49 ^b SD = 2.322 SE = 0.302 (N=59)	M = 3.35 SD = 2.427 SE = 0.313 (N=60)	M = 2.85 ^{a,b} SD = 2.138 SE = 0.276 (N=60)	M = 3.17^{a,b} SD = 1.900 SE = 0.245 (N=60)
2. One-sided negative labelling	M = 3.76 SD = 2.299 SE = 0.299 (N=59)	M = 4.19 SD = 2.508 SE = 0.327 (N=59)	M = 4.24 SD = 2.830 SE = 0.368 (N=59)	M = 4.08 ^a SD = 2.541 SE = 0.331 (N=59)	M = 4.07^a SD = 1.997 SE = 0.260 (N=59)
3. Two-sided labelling	M = 4.26 ^b SD = 2.424 SE = 0.321 (N=57)	M = 4.67 ^b SD = 2.552 SE = 0.338 (N=57)	M = 4.23 SD = 2.479 SE = 0.328 (N=57)	M = 4.07 ^b SD = 2.456 SE = 0.325 (N=57)	M = 4.31^b SD = 2.046 SE = 0.271 (N=57)

a = significant difference between condition 1 and 2

b = significant difference between condition 1 and 3

Tukey post-hoc comparisons of the three groups showed that respondents in the one-sided negative labelling condition gave on average significantly higher scores for their product preference ($M_2=4.07$) than respondents in the one-sided positive labelling condition ($M_1=3.17$; $p=0.040$), which supports hypothesis 1.

A closer look at the data showed that the differences in scores for the individual products were all in the predicted direction, but not always significant. Respondents in the one-sided negative labelling condition gave on average significantly higher scores for the tomatoes ($M_2=4.08$) than respondents in the one-sided positive labelling condition ($M_1=2.85$; $p=0.017$), but not for the coffee ($M_1=3.03$; $M_2=3.76$; $p=0.234$), marmalade ($M_1=3.49$; $M_2=4.19$; $p=0.339$), and milk ($M_1=3.35$; $M_2=4.24$; $p=0.186$).

5.3.2 Two-sided labelling vs. one-sided positive labelling

The second hypothesis of this study predicted that two-sided labelling would have a stronger impact in guiding consumers to make more sustainable product choices than one-sided positive labelling. In order to test this hypothesis, the scores respondents in condition 1 and 3 gave in the first four questions of the survey were compared.

Tukey post-hoc comparisons of the three groups showed that respondents in the two-sided labelling condition gave on average significantly higher scores for their product preference ($M_3=4.31$) than respondents in the one-sided positive labelling condition ($M_1=3.17$; $p=0.005$), supporting the second hypothesis.

Comparisons of the average scores given for the individual products by the respondents in the one-sided-negative labelling condition and the two-sided labelling condition showed that the scores differed significantly for the coffee ($M_1=3.03$; $M_3=4.26$; $p=0.010$), marmalade ($M_1=3.49$; $M_3=4.67$; $p=0.028$), and tomatoes ($M_1=2.85$; $M_3=4.07$; $p=0.020$), but not for the milk ($M_1=3.35$; $M_3=4.23$; $p=0.201$).

Based on the theoretical framework, it could not be predicted how one-sided negative labelling could be ranked in effectiveness compared to one-sided positive labelling and two-sided labelling. Tukey post-hoc comparisons of the three groups showed that on average, one-sided negative labelling resulted in significantly more sustainable choices than one-sided positive labelling ($p=0.040$). The mean scores of the respondents in the one-sided negative labelling condition and the two-sided labelling condition did not differ significantly ($p=0.893$). One-sided negative labelling can thus be ranked on the same level as two-sided labelling, resulting in more sustainable choices than one-sided positive labelling.

Additional analyses showed that the scores on the individual products between the groups differed significantly for the tomatoes, between the respondents in the one-sided positive labelling condition and the one-sided negative labelling condition ($p=0.017$). All other differences in scores between 1) the respondents in the one-sided positive labelling condition and the respondents in the one-sided negative labelling condition and 2) the respondents in the one-sided labelling condition and the respondents in the two-sided labelling condition were insignificant. Appendix F shows bar charts of the average scores for product preferences by respondents in conditions 1, 2, and 3.

In addition to the differences in scores between the groups, it was also examined whether the respondents in conditions with presence of negative labels more often choose the sustainable option than the respondents in the one-sided positive labelling condition. Appendix G shows bar charts of the frequencies that the options were chosen. Overall, the respondents preferred the products on

the left more often than the products on the right. However, respondents in the conditions that included negative labels preferred the eco-product more often than respondents in the one-sided negative labelling condition.

5.3.3 Regulatory focus with respect to sustainability

The third hypothesis of this study addressed regulatory focus. It predicted that with respect to sustainability, consumers are more likely to think in a prevention focus than in a promotion focus.

First, it was determined whether the respondents could be classified as predominantly promotion focussed or prevention focussed. In order to do so, the mean scores for the items on the promotion and prevention scales were computed, and centred around the mean. As a result, negative scores indicated that the respondent was less promotion or prevention focussed than the sample on average, whereas positive scores indicated that the respondent was more promotion or prevention focussed than the sample on average. Next, it was determined whether the respondents could be classified as predominantly promotion focussed or prevention focussed by distracting the centred mean score on the prevention items from the centred mean score on the promotion items. Resulting negative scores classified the respondents as prevention focussed, whereas positive scores classified the respondents as promotion focussed.

In the control group ($N=53$), scores for regulatory focus ranged from -1.45 to 2.22. The mean score was 0.0145 ($SD=0.687$, $SE=0.094$), which indicated that the respondents scored on average slightly higher on the promotion framed items than on the prevention framed items compared to the whole sample. However, 33 respondents had a negative score on the item regulatory focus, and could thus be classified as predominantly prevention focussed whereas 20 respondents had a positive score and were classified as predominately promotion focussed. This division is similar for the whole sample, of which 132 respondents could be classified as prevention focussed and 92 as promotion focussed. This suggests that regarding sustainability, the respondents were more likely to be prevention focussed than promotion focussed and thus supports hypothesis 3.

5.3.4 Regulatory fit and time to make a choice

Hypothesis 4 predicted that consumers with a regulatory fit between their regulatory focus and the labelling system that was used would make quicker choices than consumers with a regulatory misfit between their regulatory focus and the labelling system that was used. Respondents were considered to have a regulatory fit when they were predominantly promotion focussed and placed in the one-sided positive labelling condition, and when they were predominantly prevention focussed and when they were placed in the one-sided negative labelling condition. They were considered to have a regulatory misfit when they were predominantly promotion focussed and placed in the one-sided negative labelling condition, and when they were predominantly prevention focussed and placed in the one-sided positive labelling condition.

For each of the first four questions of the survey, it was measured how much time it took before the respondent made his first click on the page, his last click on the page, and the click for submitting the answer. It was also measured how often the respondent clicked before submitting the answer. For this study, the timing for the 'last click' was considered the time the respondent needed to make his choice. It should be noted however, that a possible click between the indication of the preference and submitting the answer could invalidate the results. Furthermore, all time registrations over a minute ($N=5$) were excluded from the analysis. No significant differences between the different

conditions were found with respect to the mean time to make a choice ($M=8.12$, $SD=3.768$, $SE=0.248$, $F=1.371$, $p=0.252$) or the individual products coffee ($F=1.125$, $p=0.340$), marmalade ($F=0.197$, $p=0.899$), milk ($F=0.770$, $p=0.512$) or tomatoes ($F=1.523$, $p=0.209$).

Since the scales for measuring promotion focus and prevention focus could not be validated in the experimental conditions and the respondents in the control group could not be classified with respect to their regulatory fit, this hypothesis could not be tested.

5.3.5 Regulatory focus and product preference

Finally, hypothesis 5 was included to measure whether or not the respondents acted in accordance with their reported regulatory focus. The hypothesis predicted that both respondents with a prevention and a promotion focus would reject products with negative labels and accept products with positive labels, whereas products without labels would only be accepted by respondents with a prevention focus. In order to test this hypothesis, respondents were asked to rate how likely they were to buy three products; a product with a negative label and a relatively low price, a product without a label and a moderate price, and a product with a positive label and a relatively high price. The product that was chosen for this question was fruit juice. Answers could be given on a 7-point scale, ranging from 'never' to 'always'.

Overall scores for this question show that respondents rate their likeliness to buy the product highest for cheap juice with the negative label ($M=3.45$, $SD=1.655$, $SE=0.112$), followed by the neutral juice at the moderate price ($M=3.42$, $SD=1.321$, $SE=0.090$), and the rather expensive juice with the positive label ($M=2.63$, $SD=1.226$, $SE=0.1226$). For the control group in specific, the highest scores were given to the cheapest juice with the negative label ($M=3.70$, $SD=1.741$, $SE=0.246$), followed by the neutral juice at the moderate price ($M=3.43$, $SD=1.458$, $SE=0.208$), and the relatively expensive juice with the positive label ($M=2.62$, $SD=1.323$, $SE=0.187$). Figure 6 shows the mean scores of the respondents in the control group, classified by regulatory orientation.

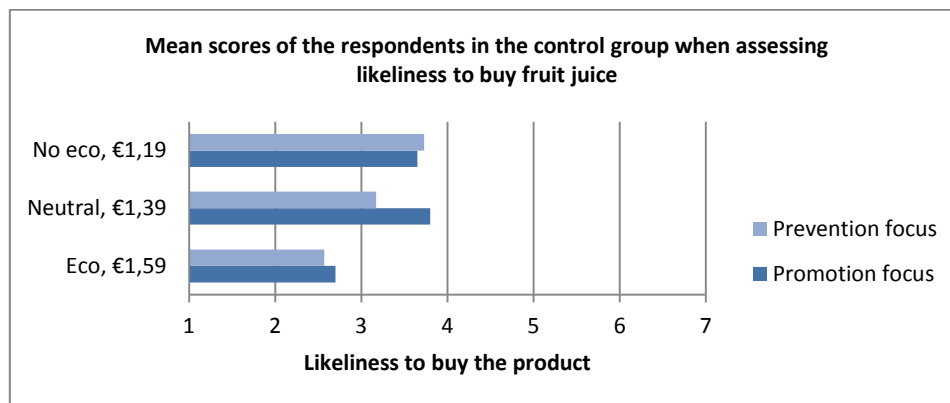


Figure 6: Mean scores of the respondents in the control group when assessing their likeliness to buy fruit juice.

It was predicted that the neutral product at the moderate price would be accepted by respondents with a prevention focus, but rejected by respondents with a promotion focus. An independent-sample T test showed that the self-reported likeliness to buy the product did not differ between the respondents with a prevention focus ($M=3.17$, $SD=1.466$, $SE=0.272$) and the respondents with a promotion focus ($M=3.80$, $SD=1.399$, $SE=0.313$; $t(47)=-1.500$, $p=0.140$).

It was also predicted that both a promotion focus and a prevention focus would result in acceptance of products with positive labels, and rejection of products with negative labels. To test this, paired-sample T tests were conducted in order to compare the scores for the positive labelled fruit juice and the negative labelled fruit juice. Significant differences in scores were found when all respondents of the control group were included ($t(49)=3.343$, $p=0.002$) and when only respondents with a prevention focus were included ($t(29)=2.670$, $p=0.012$), but not when only the respondents with a promotion focus were included ($t(19)=1.964$, $p=0.064$). More importantly, the significant differences that were found, were *in the opposite direction* than predicted. Neither of the results supported hypothesis 5.

6. Discussion

The aim of the present study was to find out why negative labelling could be more effective compared to positive labelling, and under what circumstances. In this chapter, the results will be interpreted and discussed, followed by a discussion of the study design, and recommendations.

6.1 Findings in relation to the hypotheses

In order to achieve the aim of the study, several hypotheses were formulated and tested. Below, the results will be interpreted and discussed.

6.1.1 The effectiveness of the labelling system

One-sided negative labelling and two-sided labelling turned out to result stronger and more frequent preferences for sustainable product alternatives instead of unsustainable alternatives. This is in accordance the predictions based on the theoretical framework.

The significant difference between the mean scores in the one-sided positive labelling condition and the one-sided labelling condition are mainly based on the significant difference between the scores for the tomatoes. Since the tomatoes were the only product in the study that were not packed and branded, respondents might have perceived the products to be different on more aspects than the label and the price. For example, they may have incorrectly inferred that the products also differed in quality. However, since respondents were asked to indicate their preference for either of the tomatoes *after* they were asked to indicate their preference for the packed and branded coffee, marmalade, and milk, it can be questioned whether this explanation is correct.

Despite of the fact that two-sided labelling (as opposed to one-sided positive labelling) resulted in stronger preferences for the sustainable alternatives for the individual products coffee, marmalade and tomatoes, no significant differences in scores were found for the milk. Since the price, price difference and mean scores of the two milk-variants were not notably deviant from the other sets of products, this suggests that the product itself had an effect on the scores. The effect of the labelling system thus depends on the product. Based on the present study, it cannot be decided how products –or product categories- differ with respect to the importance consumers attach to sustainability.

Although no significant differences between the various conditions were found based on age, gender, ethical orientation and environmental paradigm, the respondents in the one-sided positive labelling condition scored significantly lower on the scale for norms than the respondents in the other two experimental groups. The scores for norms were dependent on the mean scores given for the coffee, marmalade, milk and tomatoes, which were influenced by the manipulation. The results thus suggests that the scores for norms were influenced by the manipulation rather than by bad randomisation. Future research should take into account that norms are not as stable as other constructs such as ethical orientation and environmental paradigm.

6.1.2 Regulatory focus and regulatory fit as explanation

Regulatory fit was predicted to be important for the effectiveness of a labelling system. The majority of the respondents turned out to be prevention focussed with respect to sustainability. However, it

could not be determined whether regulatory fit explains the effectiveness of negative labelling. Moreover, when having to choose between three alternatives, the respondents did not act as can predicted based on regulatory focus theory.

The scales that were used to measure prevention focus and promotion focus –and therewith regulatory focus- could not be validated for the three experimental conditions and had a questionable internal consistency for the control group. As a result, the findings were of low validity and of only limited value. There are several factors that could have caused the low validity of the scales for prevention and promotion focus. First of all, the scales that were used in the present study were never validated in previous research, but were selected items from a general promotion/prevention scale by Lockwood et al. (2002), and adjusted to the domain of sustainability – as is suggested to give considerable more relevant results than a general scale (Gomez et al., 2013). Due to limited time for the study, the scales were not pre-tested. Second, since the control group is the only group for which the internal consistencies of the scales for prevention focus and promotion focus were considered acceptable for further analyses, the answers on the items might have been influenced by the manipulation. This suggests that regulatory focus could be primed and depends on situational factors, as is suggested in previous research (Lockwood et al., 2002; Higgins, 2002). For example, negative labels may have induced thoughts like ‘I should not buy this product’ and positive labels may have induced thoughts like ‘If I buy this product, I do good’. These thoughts may have interfered with the respondents chronic regulatory focus (as suggested in research by Shah et al., 1998), causing conflicting results. Nevertheless, the internal consistency of the answers given by the respondents in the control group remains debatable, and the items loaded in a different pattern than predicted in the factor analyses. In order to be able to make more valid judgements about the effect of regulatory focus and regulatory fit with respect to sustainability and labelling strategies, a scale for regulatory focus on this domain should be validated.

Hypothesis 3, which predicted that consumers were more likely to think in a prevention focus than in a promotion focus when it comes to sustainability, was supported by the data. This is in accordance with research by Bullard & Manchandra (2012). Although more respondents were classified as prevention focussed than promotion focussed, the mean score of the respondents in the control group for regulatory focus was slightly positive, indicating a promotion focus. Since many respondents scored approximately equally high on the prevention items and the promotion items, the value that can be attached to the classification is limited. Moreover, since the scores on the items measuring regulatory focus may have been influenced by the manipulation, it could be recommended to measure the respondents regulatory focus on the domain of sustainability before manipulation instead of after. Again, a validated scale for regulatory focus is needed to draw convincing conclusions on whether consumers are generally prevention focussed or promotion focus regarding sustainability.

6.1.3 Product preference in case of three products

In the last question of the survey, respondents in the control group gave significantly higher scores for the relatively cheap product with the negative label, compared to the relatively expensive juice with the positive label. This does not only reject hypothesis 5, but also the assumption that negative labels guide consumers to make more sustainable choices than positive labels do. It seems that choices were mainly based on the price of the product, with a strong preference for the lowest price.

Just as with the first products in the study, the product itself may have influenced the importance attached to the labels as well. Respondents may have reported to be most likely to buy the cheapest variant *if they had to choose one* because they actually would not like to buy fruit juice at all or because they would not like to buy this type of fruit juice because they prefer another brand or taste. Another explanation for the fact that the results conflicted with earlier findings is that respondents had to rate three product variants in the last question of the survey, whereas they had to choose between only two product variants in the first questions. The different framing of the choice also gives consumers a different anchor point to refer to. For example, consumers justify their choice for the neutral product instead of the product with the eco-label by reasoning that they could have chosen worse with respect to sustainability. It is also possible that they will report to be most likely to buy the relatively cheap no-eco product, because they reason that the product with the eco-label is too expensive compared to the other two variants, and that the neutral product is not that good either –since there is still one variant that is better-, which justifies the choice for the relatively cheap product with the no-eco label. Anyhow, the data of this study does not support that negative labels will guide consumers to make more sustainable choices than positive labels in case both products with negative labels, positive labels, and no labels are present.

6.2 Discussion of the study design

Below, the strengths and limitations of the present study are discussed. This gives additional insights in the foundation of the findings of this study.

6.2.1 Strengths of the study

The main strengths of the present study are the following. First of all, the number of respondents is considered large enough to draw reliable conclusions on differences between the various conditions. Moreover, the respondents were well divided over the various conditions with respect to their demographic characteristics age and gender, and with their ethical orientation and environmental paradigm. Furthermore, the scores the respondent gave to indicate their product preference in the first questions of the survey did not only provide insight in the product that was preferred by the respondent, but also the extent to which it was preferred. Since the effect of the labelling system turned out to depend on the product that was chosen, it is considered strength of the study that multiple products were included to measure the effectiveness in case two product variants were offered.

6.2.2 Limitations of the study design

Next to strengths, the study also had a number of limitations. As discussed, the scales for prevention focus and promotion focus could not be validated based on the results of the study, which is why only limited value can be attached to the results that related to regulatory focus. Furthermore, since only quantitative data collection was conducted, no insight was gained on the motivation of certain choices, which could be determined by other factors than the price and label of the product. Apart from the pre-test, no insight was gained in understanding of the labels and trust in the labels, and it was not measured if the respondents noted the labels they were exposed to. Moreover, as is common for social scientific research, answers might be biased by social desirability. Consumers may have reported to make more sustainable choices than they would actually make in a shopping environment. On top of that, since only self-reported answers as opposed to actual behaviour are measured, results might be different when negative labelling is applied in real buying situations.

Since data collection took place at a single point in time, no conclusions can be drawn on the extent to which the 'new behaviour' will be incorporated in the consumers shopping behaviour (Lewin, 1958). For the control group, the first questions of the survey may have caused some confusion, because the two products looked similar but were priced differently. However, the results show that most respondents gave low scores for all or almost all products, which suggests that they understood that the products only differed in price. Finally, the respondents represent only a small group of the Dutch population, and the external validity of the results is therefore limited.

6.3 Recommendations

Based on this study, a few recommendations can be given regarding negative labelling. They will be divided in recommendations related to the effectiveness of negative labelling and to future research.

6.3.1 Recommendations related to the effectiveness of negative labelling

As this study shows, negative labelling (one-sided negative labelling and two-sided labelling) leads to more sustainable choices than one-sided positive labelling. However, this effect is only demonstrated when a decision between two products has to be made. This study shows that negative labelling does not show to lead to more sustainable choices if three options differing in price and label are presented. If negative labelling will be implemented, it should thus be considered to label *all* products positive or negative, or to apply only negative labels to products that do not meet the norms for sustainability and leave the other products neutral.

Companies are unlikely to voluntarily put a negative label on their products if they do not meet the norms regarding sustainability. It should thus be considered to make negative labelling compulsory instead of voluntarily. Since research has shown that a potential 'healthy choice tick' is a strong incentive for companies to adjust their products and make them healthier (Young and Swinburn, 2002), the avoidance of a negative label can be an incentive to engage in sustainable practices.

6.3.2 Recommendations for future research

For future research regarding negative labelling, it is recommended to measure actual behaviour instead of self-reported preferences to determine if usage of negative labels is more effective than one-sided positive labelling in actual buying situations. Next to that, since negative labelling did not turn out to be effective for all products included in the study, it is recommended to conduct more research for additional insights in differences in effect between products and product categories. Furthermore, this study lacks explanatory value of *why* negative labelling is more effective than positive labelling in guiding behaviour towards sustainable choices. A possible explanation was found in regulatory fit, but the scale to measure the respondents prevention focus and promotion focus – and therewith regulatory focus and regulatory fit- could not be validated. For future studies, it is therefore recommended to invest effort in the development of a valid and reliable scale to measure the subjects regulatory focus. Moreover, since regulatory focus seemed to be temporarily induced by situational factors, as is suggested by previous research (Lockwood et al., 2002; Higgins, 2002), an explanation can also be sought-after in the strength of the priming of the consumer; priming a prevention focus may be more easily achieved than priming a promotion focus.

7. Conclusion

The aim of this study was to find out why negative labelling could be more effective compared to positive labelling, and under what circumstances. The results show that usage of negative labels – implemented as one-sided negative labelling or two-sided labelling- leads to more sustainable choices than one-sided positive labelling. Negative labelling could thus be an effective tool to increase sustainable consumer choice. However, the results are supported for the situations in which two product variants were presented, but not when three products varying in price and label are presented.

An explanation for the effectiveness of negative labelling was sought-after in regulatory focus and regulatory fit. It was reasoned that more consumers would be prevention focussed than promotion focused, and that negative labels as opposed to positive labels would therefore be more relevant for the majority of the consumers. Although the scales relating regulatory focus could not be validated, the results suggested that more consumers are prevention focussed than promotion focussed. It could not be tested if a regulatory fit lead to quicker consumer decisions than a regulatory misfit. When three products varying in price and label were presented, the majority of the respondents preferred the relative cheap product with the negative label to the other two products. Based on the results of this study, it cannot be determined whether this was due to the fact that three instead of two products were presented, or because negative labelling was not effective for *this* product.

Recommendations for future research therefore include to invest effort in the development of a valid and reliable scale to measure the subjects regulatory focus. With this scale, it can be determined if the effectiveness of negative labelling is related to the regulatory fit of the consumer. It should thereby be taken into account that regulatory focus may be temporarily induced by situational factors.

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Dit onderzoek gaat over hoe mensen producten kiezen. Je krijgt verschillende keuzen voorgelegd en wordt gevraagd om je voorkeur aan te geven. Ook zullen daar vragen over worden gesteld. Het invullen van de vragenlijst zal ongeveer 5 minuten duren. Onder de deelnemers worden 2 VVV-bonnen á €10,00 verloot. Deelname is alleen mogelijk als je studeert aan Wageningen University.

Voor het onderzoek is het belangrijk dat je alle vragen beantwoordt. Er zijn geen foute of slechte antwoorden; het is jouw mening die telt en van belang is. De data zal anoniem worden verwerkt en uitsluitend voor onderzoeksdoeleinden gebruikt worden. Je kunt je op ieder moment tijdens het onderzoek terugtrekken van deelname zonder verdere gevolgen. Voor antwoord op eventuele vragen kun je contact opnemen met Martine Timmer (martine.timmer@wur.nl)

Ik studeer aan Wageningen University en wil meedoen aan dit onderzoek

Je krijgt nu 4 sets van 2 producten te zien. Geef aan welk product jouw voorkeur heeft als je een van de producten zou kopen. De uitersten van de schaal geven aan dat je een duidelijke voorkeur hebt. Het midden betekent dat je geen voorkeur hebt.

Neutraal **Positief**
4 3 2 1 0 1 2 3 4

Koffie, pak 250 gram
Bosbessenjam, pot 300 gram
Melk, pak 1,5 liter
Tomaten, 4 stuks

Negatief **Neutraal**
4 3 2 1 0 1 2 3 4

Koffie, pak 250 gram
Bosbessenjam, pot 300 gram
Melk, pak 1,5 liter
Tomaten, 4 stuks

R

Negatief **Positief**
4 3 2 1 0 1 2 3 4

Koffie, pak 250 gram
Bosbessenjam, pot 300 gram
Melk, pak 1,5 liter
Tomaten, 4 stuks

Neutraal **Neutraal**
4 3 2 1 0 1 2 3 4

Koffie, pak 250 gram
Bosbessenjam, pot 300 gram
Melk, pak 1,5 liter
Tomaten, 4 stuks

In hoeverre ben je het eens met onderstaande stellingen? (Helemaal niet mee eens/mee oneens/een beetje mee oneens/neutral/een beetje mee eens/mee eens/heelmaal mee eens)

- Ik koop vooral producten die een bijdrage leveren aan een eerlijke handel
- Ik voel een sterke verplichting duurzaam te kopen
- Ik denk vaker aan hoe ik een beter milieu kan bereiken
- Ik let op de manier van productie (milieuvriendelijkheid, eerlijke arbeidsvoorwaarden) van de producten die ik koop
- Wanneer ik boodschappen doe, is mijn belangrijkste doel om producten die niet duurzaam zijn te vermijden
- Ik ben bereid om extra moeite te doen om duurzaam te kopen
- Ik ben meer gericht op het voorkómen van milieuschade dan op het bereiken van een beter milieu
- Ik maak me vaak zorgen dat ik veel schade aan het milieu toebreng
- Ik zou me schuldig voelen als ik verzuim duurzaam te kopen
- Ik let op ethische keurmerken (fair trade, Max Havelaar) die het product heeft
- Ik ben meer gericht op het bereiken van een beter milieu dan op het voorkómen van milieuschade
- Wanneer ik boodschappen doe, is mijn belangrijkste doel om duurzame producten te kopen

In hoeverre ben je het eens met onderstaande stellingen? (Helemaal niet mee eens/mee oneens/een beetje mee oneens/neutral/een beetje mee eens/mee eens/heelmaal mee eens)

- We bereiken bijna de grenzen van de hoeveelheid mensen die op aarde onderhouden kunnen worden
- Mensen hebben het recht om de natuurlijke omgeving te veranderen zodat hun eigen behoeften worden vervuld
- Mensen zullen uiteindelijk genoeg leren over de werking van de natuur, zodat zij in staat zullen zijn haar te beheersen
- De mens is het milieu ernstig aan het misbruiken
- Planten en dieren hebben evenveel recht om te bestaan als mensen
- De balans van de natuur is sterk genoeg om met de gevolgen van de moderne industrielanden om te gaan
- De klimaatcrisis die de mensheid boven het hoofd hangt, wordt sterk overdreven
- Het evenwicht van de natuur is erg gevoelig en gemakkelijk te verstoren
- Als alles doorgaat op de manier waarop het nu gaat, zullen we snel een enorme milieucatastrofe tegemoet gaan

Hoe waarschijnlijk is het dat je onderstaande producten zou kopen? (Zou ik nooit kopen/zelden/soms/regelmatig/vaak/meestal/Zou ik altijd kopen)

- Vruchtensap, pak 1,5 liter - €1,19 – No-eco
- Vruchtensap, pak 1,5 liter - €1,39 – Neutraal
- Vruchtensap, pak 1,5 liter - €1,59 – Eco

Wat is je geslacht?
Man/Vrouw

Wat is je leeftijd?
...

Einde van de vragenlijst

[Automatische doorverwijzing naar volgende vragenlijst]

Als je kans wilt maken op een van de VVV-binnen die worden verloot, kun je hier onder je WUR e-mailadres invullen. Dit e-mailadres kan niet gekoppeld worden aan de antwoorden die je hebt gegeven.

- ...
- Ik wil vaker per e-mail uitgenodigd worden om aan onderzoeken mee te doen

Appendix B: Labels that were used in the study

Positive label

The official eco-label from the Foundation
EKO Quality mark



Negative label

Modified eco-label from the Foundation
EKO Quality mark



Appendix C: Products and prices phase two

Coffee, package 250 grams

Low price: €2,29

High price: €2,69



Marmalade, jar 300 grams

Low price: €1,29

High price: €1,49



Milk, 1,5 liter

Low price: €1,19

High price: €1,39



Tomatoes, 4 pieces

Low price: €1,49

High price: €1,89



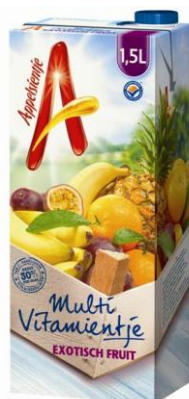
Appendix D: Product and prices phase four

Fruit juice, 1,5 liter

Price no-eco: €1,19

Price neutral: €1,39

Price eco: €1,59



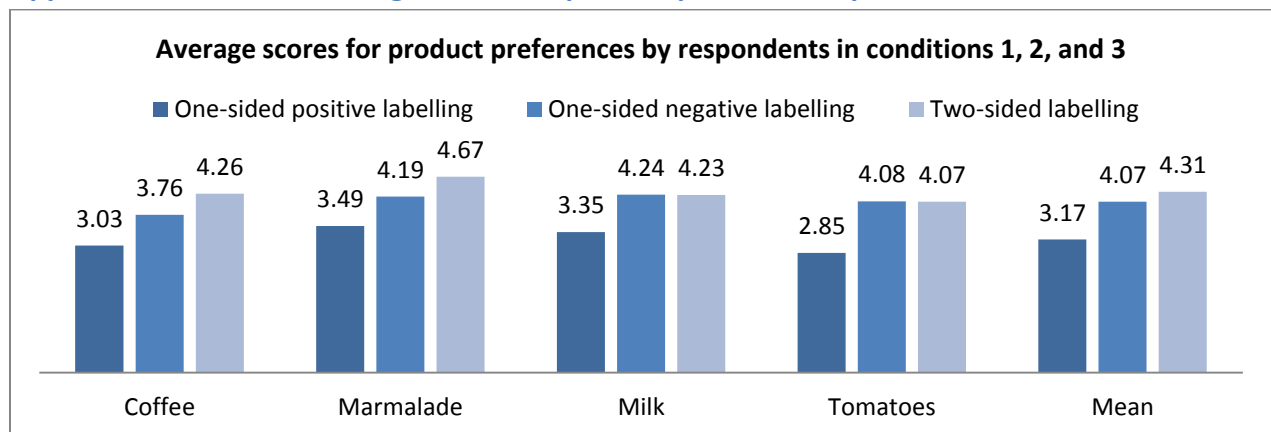
Appendix E: Principal component matrix with varimax rotation items NEP-scale

Rotated Component Matrix^a

	Component				
	Ecocrisis	Balance of nature	Anti-anthropocentrism	Anti-exemptionalism	Limits of growth
We bereiken bijna de grenzen van de hoeveelheid mensen die op de aarde onderhouden kunnen worden	.129	.038	.101	.060	.958
Mensen hebben het recht om de natuurlijke omgeving te veranderen zodat hun eigen behoeften worden vervuld	.263	-.156	.753	.362	-.045
Mensen zullen uiteindelijk genoeg leren over de werking van de natuur, zodat zij in staat zullen zijn haar te beheersen	.087	.191	.009	.908	.065
De mens is het milieu ernstig aan het misbruiken	.592	.413	.332	-.188	.079
Planten en dieren hebben evenveel recht om te bestaan als mens	-.010	.271	.819	-.210	.178
De balans van de natuur is sterk genoeg om met de gevolgen van de moderne industrielanden om te gaan	.543	.557	.126	.225	-.090
De klimaatcrisis die de mens boven het hoofd hangt, wordt sterk overdreven	.829	.028	.096	.217	.002
Het evenwicht van de natuur is erg gevoelig en gemakkelijk te verstoren	.183	.857	.042	.151	.083
Als alles doorgaat op de manier waarop het nu gaat, zullen we snel een enorme milieucatastrofe tegemoet gaan	.744	.281	-.009	-.035	.307

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.
 a. Rotation converged in 8 iterations.

Appendix F: Bar charts average scores for product preferences, per condition



Appendix G: Bar charts average scores for product preferences, per condition

