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Research report

Construal levels of healthy eating. Exploring consumers' interpretation of health in the food context

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ABSTRACT

Although many studies consider health and food, little is known about consumers' actual interpretation of healthy eating. This study aims to explore, operationalise, and test consumers' interpretation of healthy eating by using insights from construal level theory. In this exploratory research three consecutive studies were executed, applying focus group (n = 35) and two quasi-experimental studies with, respectively 97 and 235 respondents. Respondents appeared to use different levels for their judgment of food products' healthiness. Thinking about healthy eating can take place at a concrete representation level (e.g. "*an apple contains vitamins*"), but also at an abstract representation level (e.g. "*it depends how much you eat*"). The main yield of this paper is the coding scheme with exemplary phrasings used by consumers for different representations of healthy eating. This study shows that healthy eating does not always mean the same for different individuals, it depends at least partly on the representation level they are reasoning from. Both in academic reasoning and public health interventions health and healthy eating are usually discussed as universal and univocal concepts. However, this paper argues that healthy eating is not as clear-cut for consumers, and is not understood and interpreted identically by everybody. This paper suggests to take this insight into account in both future research and in the design of any communication message on healthy eating.

Introduction

The concept of health presents us with a paradox in the food domain. Health is a hotly debated issue in this domain, receiving attention from food industry, government, and consumers alike. Previous consumer research has shown that health is among the most important motives for food choice (Steptoe, Pollard, & Wardle, 1995; Verbeke, 2008). Yet, the importance of health as a food-related issue goes along with a significant rise in the world-wide prevalence of overweight, obesity, and other affluent diseases such as diabetes and coronary heart disease (Delpeuch, Maire, Monnier, & Holdsworth, 2009; Popkin, 2009; WHO, 2003). Of course, these diseases have multi-factorial aetiologies, such as lack of physical exercise due to sedentary lifestyles, unhealthy eating habits, or financial restraints. Still it is striking that, despite all efforts in public health interventions and product development, and despite the importance consumers claim to attach to health, the health status of many people is decreasing. A further complication is the ongoing search for an unambiguous scientific definition of what constitutes healthy eating (Lobstein & Davies, 2009). Various nutritional studies with conflicting conclusions on the health effects of certain food products, e.g. red meat or dairy products, continue to be published (Givens, 2010). Public interest in healthy nutrition leads to wide-spread dissemination of these conflicting results, leaving consumers puzzled on what healthy food is and is not.

Consumers often indicate that health is an important motivator for food choice, as shown by studies into the competition of health with other values, such as sensory appeal (Givens, 2010; Lusk, 2011; Lusk & Briggeman, 2009; Roininen, Lähteenmäki, & Tuorila, 1999; Roininen et al., 2001; Steptoe et al., 1995). This stream of research has focused on identifying a set of stable food-related motives considered by consumers when buying and consuming food (Honkanen & Frewer, 2009; Lusk & Briggeman, 2009; Magnusson, Arvola, Hursti, Aberg, & Sjödén, 2003; Steptoe et al., 1995; Wandel & Bugge, 1997). A widely used research tool for this purpose is the Food Choice Questionnaire (FCQ), which originally distinguishes nine motivational dimensions of food choice: health, mood, convenience, sensory appeal, natural content, price, weight control, familiarity, and ethical concerns. Consumers face a trade-off between different values every time they make food choices. For example, concrete food-choice motives primarily operating on the short term like price and sensory appeal may overrule the more abstract choice motive of health at the time of purchase. Nevertheless, food studies generally show that health is among the most influential motives.

Differences between individuals in how important healthy eating is in their lives have also been subject of study. Maddock, Leek, and Foxall (1999) and Olsen (2003) use 'health involvement' or 'involvement in healthy eating' to evaluate the importance of

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healthy eating to individuals. Other authors (Bower, Saadat, & Whitten, 2003; Kähkönen, Tuorila, & Lawless, 1997; Sun, 2008; Tudoran, Olsen, & Dopico, 2009) measure 'health concern' to capture individual concerns about food and health-related issues. Differences in peoples' health consciousness for food were found by Schifferstein and Oude Ophuis (1998) and Sijtsema, Backus, Linnemann, and Jongen (2009). So, researchers have successfully shown that consumers generally value health in their food choices, and that there are individual differences in the extent to which they think health is important.

However, to understand the value of health to consumers right, it is of utmost importance to know how consumers interpret the concept of health. Examining the literature in this area, a first distinction can be seen between the meaning of health in general, as in well-being, and health in the context of food. The interpretation of health in general may differ between individuals (Geeroms, Verbeke, & Kenhove, 2008a,b; Hughner & Kleine Schutz, 2004; Lindholm, 1997; Miller & Iris, 2002; Ogden, 2007). Health can be interpreted as merely the absence of disease by some people whereas for others it is a broader state of mental, physical, and social well-being. In a review paper, Hughner & Kleine Schutz, 2004 identified 18 themes that capture how people may think about health, among which "health is functional ability", "health is equilibrium", and "health depends upon mental attitude". Geeroms et al. (2008a,b) have identified distinct subgroups in how people give meaning to the concept of health, ranging from a focus on having energy personally to feeling responsible for the health of others. Despite differences in exact wording, these previous studies have in common that the identified interpretations of health vary in the level of specificity. The absence of disease, the ability to perform daily duties, and the focus on energy are specific and concrete, whereas a broad state of well-being, equilibrium, and social responsibility are general and abstract.

Diversity in interpretations has also been acknowledged in the specific context of healthy eating (Chapman & Beagan, 2003; Falk, Sobal, Bisogni, Connors, & Devine, 2001; Povey, Conner, Sparks, James, & Shepherd, 1998; Ristovski-Slijepcevic, Chapman, & Beagan, 2008; Santich, 1994). Again, the level of specificity appears to vary. Healthy eating can be discussed in either specific terms, proportions of protein, grains, vegetables, and carbohydrates that should be consumed (Keane & Willetts, 1996; Margetts, Martinez, Saba, Holm, & Kearny, 1997), or by using general terms such as a 'balanced' diet or eating 'proper meals' (Charles & Kerr, 1988) and variety (Margetts et al., 1997). When consumers are asked to evaluate the healthfulness of foods, the factors that influence the evaluation also vary in specificity. The factors range from very specific, such as fat content (Oakes & Slotterback, 2002) or sodium content (Lake et al., 2007), to more general, such as naturalness (Lake et al., 2007) or freshness (Oakes & Slotterback, 2002).

This review of the literature on the value and meaning of health in the context of food suggests that health can be represented in multiple ways. Consumers seem to interpret health at different levels of specificity, which may differ between individuals and products. These different levels of representation, specific or concrete vs. general or abstract, also lie at the basis of construal level theory (CLT). According to CLT, every event, activity, individual, or object can be perceived as either close or distant. This distinction in distance can be seen in many areas, for example in space (nearby or remote), time (soon or later), probability (likely or unlikely), or social (from the perspective of the individual or of an observer). People tend to represent differences in distance at different levels of abstraction. Close objects are represented at a lower level, whereas distant objects are likely to be classified at a higher level. A lower-level construal is concrete, relatively unstructured, contextualised, and contains subordinate and secondary features of the object. In contrast, a higher-level construal is abstract, schematic, decontextualised, and contains the essence of the object. Higher-level construals emphasise primary features of the objects and omit incidental features that may vary without actually changing the meaning of the object (Liberman & Trope, 2008). For example, a high-level construal of "watching TV" would be "being entertained", and a low-level construal of the same activity would be "sitting on the sofa, flipping channels" (Liberman & Trope, 1998).

CLT has been applied in many different fields; for example, the distinction between the two representation levels has been demonstrated for morality (Eyal, Liberman, & Trope, 2008), self-control (Fujita, Trope, Liberman, & Levin-Sagi, 2006), creativity (Förster, Friedman, & Liberman, 2004), and the attractiveness of products such as radio sets (Trope & Liberman, 2000). This principle has been demonstrated across various events, activities, and objects (Trope & Liberman, 2000). In 2007, the founders of CLT coined the idea of applying CLT to consumer choice, for example how to make better decisions, or how people construct choice sets (Liberman, Trope, & Wakslak, 2007). We know of only one study that tested the CLT principles in the specific context of healthy eating. Schmeichel and Vohs (2009) found that people were more in favour of an apple, as opposed to a candy bar, after an abstract construal was evoked, and vice versa. This finding suggests that indeed, construal level may influence associations of and preferences for certain food products.

Combining the literature on health representations with CLT leads us to hypothesise that healthy eating may be represented at a lower-construal level in specific terms like texture, caloric content, tastiness, or satiation. At a higher-construal level, healthy eating may be regarded in general terms of consumption frequency, compensation by other lifestyle factors, or a trade-off between multiple health indicators.

This study aims to explore, operationalise, and test the representation levels from CLT in the context of healthy eating. Thus far, research and public health interventions have often approached healthy eating as a generic concept, assuming that its meaning is clear to and interpreted the same way by everybody. This is rather an experts' point of view than a consumerś, whose interpretations of healthy eating may be diversified according to literature. Therefore, we take a two-step approach to investigate whether consumers represent healthy eating at different levels. First, we qualitatively assess the different representations people may have in study 1. We take an exploratory research approach to find out whether and how levels emerge spontaneously. The phrasings participants use form the basis of giving an interpretation to lower- and higher-level representations of healthy eating. Subsequently, study 2 quantitatively investigates whether and how the representations identified in study 1 vary between individuals and between products. Study 2 is preceded by a pilot study to fine-tune the research instrument.

Study 1: spontaneous representations of healthy eating

Introduction

An exploratory, qualitative study aimed to investigate whether different levels exist for consumers interpretations of healthy eating, and to identify the variables that consumers use to express these levels.

Method study 1: focus groups

Six focus group discussions with a total of 35 participants were held in the cities Amsterdam and Utrecht (the capital of The Netherlands and a centrally located city, respectively). The number of participants per focus group session was relatively low to provide for greater in depth discussion. Participants were recruited by

phone through a recruitment agency, and were excluded if they were following a diet or had a chronic bodyweight-related illness. Participants were recruited to represent variation in terms of gender, education, household composition, and age, resembling the general Dutch population. They received monetary compensation for participation.

In the 2-h discussion sessions an emphatically open approach was chosen, with a focus on participants' everyday lives, and with a minimum of directions for terminology used to describe healthy eating. Sessions were led by one of the authors assisted by a second researcher making notes of the discussion. The notes were complemented with the aid of the audio-recordings of the sessions, and subsequently subjected to thematic coding, with a focus on differences in representation levels.

Focus group guide

The focus group sessions started with a general introduction of participants and discussion leader to each other. Second, to stimulate engaged discussion, participants were asked to individually write down their favourite dish and snack. Third, each participant classified his or her favourite dish or snack as either healthy or unhealthy. Fourth, the individual classifications of foods and interpretations of healthiness were discussed in the group. The classification task itself was subordinate to the insights it yielded in terms of phrasings used to represent healthy eating.

Results and discussion study 1

The group discussion following the individual classification of foods on healthiness showed a rich variety of concepts, associations, and issues at different levels of abstraction. Generally participants started the discussion about one's favourite food with mentioning specific nutrients or ingredients with a healthy or unhealthy image, for example vitamins in fruit and fat in fish. For example about an apple was said: "An apple contains a lot of Vitamin C". The terminology was quite specific and this participant seemed to have one particular apple in mind. Foods containing large amounts of fat, sugar and salt were seen as unhealthy, whereas foods rich in vitamins and minerals, such as calcium and iron, were classified as healthy: "Broccoli contains vitamins, therefore it's healthy", "Chips are fatty, lie in the oil, do not contain a lot of potatoes", "The sugars in chocolate are unhealthy". Although referring to nutrients generally made the qualification easier, this was not always the case as exemplified by a discussion on fat: *R[1]1: "Fish contains good fats", R2: "Saturated fats are the good ones, right?", R3: "No, unsaturated is okay"*.

After mentioning nutrients or ingredients, participants started adding product-related issues, such as preparation method (e.g. frying), and production method (e.g. organic). For example, a participant stated: "*Stir-frying; by briefly preparing food in a hot pan, a lot is maintained, especially in the case of vegetables, it is delicious. All very briefly, the fresher the better!*". Production was included in the discussion for example as follows: "*It [an apple] is sprayed [with pesticides] though*".

Also, combinations of products and comparisons with similar products were included, for example: "It is especially the mayonnaise that makes it [Chips] very unhealthy", "The broccoli is good, the cheese sauce is bad", or: "Milk chocolate is much worse because it contains more fat. White is even worse, dark is the best."

The discussion became gradually more complex when participants started considering product categories (e.g.: "*An apple is fruit, and fruit is healthy*".), amount eaten (e.g. "*Chocolate is healthy in moderate quantities*"), eating patterns and lifestyles. Concerning lifestyle, participants argued that an unhealthy food product could suit well in a healthy lifestyle. This implies that participants did not only consider what is eaten but also the proportion and variety of the different nutrients, and the level of physical activity of the person who eats the food: "*A little fat is not bad, especially if you do sports as well*".

The group discussions showed that some food products seemed relatively easy to qualify, indicated by a fast qualification by each participant. Products that were classified quickly include chips, cream, peanut butter, white bread (unhealthy), vegetables, fruit, and fish (healthy). Other food products were more difficult to classify, like chocolate, cheese, milk and red meat. These products needed more time to be qualified, and participants took more criteria into consideration during the qualification process. One product in particular appeared to lead to much ambiguity with regard to its perceived healthiness: chocolate, also often mentioned as a favourite food product. "*Chocolate contains a substance that is good for your mood, but only in dark chocolate and that is too bitter for me, I don't like it. But that has to do with emotions only, not with health*".

"Sometimes you read that it's good, and sometimes that it's not so good. So it kind of fluctuates whether chocolate is good for you. They say it contains a substance that might be good for you, I'm not sure what for anymore, but many theories are contradictory".

The more complex the considerations, the more time participants needed for the qualification process, and all the more both concrete and abstract issues were mentioned. For example, participants asked each other for additional information about the specific nutrients, composition of the dishes, preparation and context before they classified: "*It makes a difference whether you eat it as a meal or as a snack. As a meal, chips are a little more fat than cooked potatoes, but if you eat chips as a snack than you eat extra in terms of quantity and calories. Then it is unhealthy because you eat it extra*". In addition, participants sought a way to reduce the perceived complexity of qualifying specific foods as either healthy or unhealthy by means of food-related rules of thumb. These were particularly used when the health value of certain nutrients or products was unclear or even contradictory. Examples included: Vitamins and minerals are more healthy than fat and sugar; Lean products are healthier than full-fat products; The overall evaluation is the final sum of unhealthy and healthy components; A self-prepared meal is healthier than a ready-to-eat meal; Foods perceived as non-essential are considered unhealthy (illustrated by: "*everything you eat extra, besides the main dishes, is unhealthy*"); healthy eating should be assessed over the course of a longer period of time; unhealthy eating one day can be compensated by healthy eating the next; physical activity (mostly sports) allows more occasional unhealthy choices. These rules of thumb covered different levels of abstraction.

Taken together these observations show that the healthiness of foods was represented in terms specifically related to the food itself, but also related to variety of the eating pattern and other lifestyle elements. This indicates that consumers' representation of healthy eating indeed takes place at different levels.

In summary, this exploratory study indicates that the qualification of healthy eating is a complex process involving different levels of abstraction varying from very specific food products and their nutrients to abstract and more general issues related to diet and lifestyle. The different levels of representing healthy eating seem to be expressed by the judgement of how healthy specific products are, and by the level of difficulty to make this judgement.

[1] R=Respondent

Study 2: testing different representation levels

Introduction

The results of study 1 indicate that people can represent healthy eating at a general, higher level, and a specific, lower level, in line with the principles of CLT. In study 2, we quantitatively explore how these representation levels exactly effectuate the interpretation of healthy eating. Based on study 1, we expect differences between representation level, but it is as yet unclear how these may manifest themselves. Differences may be expressed in characteristics of the individual (e.g. interest in health), evaluation of food (e.g. their healthfulness), or type of products (e.g. healthy vs. unhealthy products). These various forms are all included in study 2.

An *individual characteristic* that is likely to be related to people's representation level of healthy eating is their health consciousness. Use and understanding of nutrition information are affected by differences between people in interest in healthy eating (Grunert, Wills, & Fernandez-Celemin, 2010). Therefore, we expect people's health consciousness to be related to how they represent healthy eating.

Evaluative measures

How individuals represent healthy eating can be derived from the evaluation of food products, both in terms of (1) how healthy they think the products are, and (2) how difficult they find this judgement to make. This operationalisation is derived from the finding in study 1 that participants' classification of foods' healthiness varied heavily by the required time to come to a decision, number of arguments used, and contradiction in reasoning.

Type of products

Products can differ from each other in many respects, which may have consequences for the level at which they are most easily represented. Healthfulness is an important product property in the context of this study, but also ambiguity regarding healthfulness. Some products are indisputably healthy or unhealthy, whereas others continue to be accompanied by conflicting messages about their health value.

Study 1 helped to identify the phrasings consumers use for both the general and the specific representation level. Based on these phrasings, we developed a quantitative instrument to further explore the effect of representation level. To test and refine the instrument, a quantitative pilot study (2a) was conducted with undergraduate respondents, followed by a quantitative study with a sample representative for the Dutch population (2b).

Method study 2a: pilot questionnaire

Representation levels can be viewed as either states (temporary and impressionable conditions) (Liberman & Trope, 2008) or *traits* (stable and inert characteristics) (Vallacher & Wegner, 1987). In the context of CLT, representation levels have most often been operationalised as states, meaning that respondents were experimentally manipulated to reason at a certain representation level. Likewise, in our pilot study we stimulated respondents to consider foods at different representation levels by means of short texts written at different abstraction levels. Study 1 showed that, although there was a clear variety in the level of representation respondents used, there was no proof yet that these levels were strictly either high-level or low-level. Therefore, the short texts were written at multiple levels of representation, based on the results of study 1. These levels were, in ascending order of representation level, (1) nutrients, (2) product and (3) lifestyle, see Box 1.

Box 1. Introduction texts.

Condition 1: nutrient level

Everything we eat consists of small parts: vitamins, minerals, carbohydrates, fats, and proteins. Some serve as a 'building material' (calcium, for example), others serve as a 'fuel' (dextrose, for example).

Condition 2: product level

When you do grocery shopping, you buy your food in the form of separate products. Products include vegetables such as lettuce and beans, dairy products such as milk, butter, and custard, cereal products such as bread and rice, and sweets such as liquorice and bonbons.

Condition 3: lifestyle level

Lifestyle is something personal. It is about the way of living, what we do and how we stand in life. Lifestyle is expressed in, for example, jobs, shopping, sports, eating, smoking, travelling, or leisure.

In a paper–pencil task, respondents were instructed to read one of those short texts. They were equally and randomly assigned to a condition. Subsequently, they were asked to rate how healthy they thought each of five food products was on a 7-point scale for healthiness, ranging from "very unhealthy" to "very healthy" (similar to Ares, Giménez, & Gámbaro, 2008). They also had to indicate the perceived difficulty of this judgment (on a 7-point scale anchored "not difficult at all" and "very difficult"). The products were selected from study 1, where these were mentioned to be ambiguous concerning healthiness, namely chocolate, cheese, nasi (Asian rice dish), beef, and fruit yoghurt. The more ambiguous products were selected to stimulate respondents' contemplation and thereby enlarge potential representation level effects. To assess which representation level was activated by the text, respondents were then asked to list their thoughts during the questions about the food products. Next, they rated the eight items of the construct 'Health consciousness' (Roininen et al., 1999), on a 7-point Likert-type scale[2]. Lastly, respondents were asked for gender and age.

Originally, 105 respondents participated in the pilot study. Analysis of the thought-listing task resulted in the exclusion of eight people as their answers indicated they did not fill in the questionnaire seriously or were too wary of the research questions. The remaining 97 respondents had a mean age of 22.7 yr (SD = 5.6 yr), and 48.5% of them were male.

Results study 2a

Open answer coding

The answers to the thought-listing task were content-coded by two independent coders on representation level. The high vs. low level representation scheme appeared more applicable to the open answers than the three-level scheme due to unacceptable disagreement between the coders and low distinctive capacity. Exemplary phrases for coding as low representation level were: "*The*

[2] These items are (negative items that need to be recoded are marked with an "R"): I am very particular about the healthiness of food I eat; I always follow a healthy and balanced diet; It is important for me that my diet is low in fat; It is important for me that my daily diet contains a lot of vitamins and minerals; I eat what I like and I do not worry much about the healthiness of food (R); I do not avoid foods, even if they may raise my cholesterol (R); The healthiness of food has little impact on my food choices (R); The healthiness of snacks makes no difference to me (R).

Table 1
Mean scores on healthiness and difficulty to judge in study 2a, overall ($N = 97$).

Food product	Perceived healthiness	Difficulty to judge	Correlation
Chocolate	3.51 (1.27)	3.72 (1.67)	.30**
Cheese	4.28 (1.17)	3.69 (1.56)	−.23*
Beef	4.80 (1.16)	3.82 (1.49)	−.26**
Nasi	4.91 (1.06)	3.82 (1.58)	−.30**
Fruit yoghurt	5.02 (1.37)	3.30 (1.49)	−.34**

* Significant at $p < .05$.
** Significant at $p < .01$.

amount of bad fats and sugars in the product", "I could see the products before me", and "*I was thinking of the food items*".

Typical phrases for high representation level were: "I was thinking how disputable answers to this question always are; it depends how you prepare food", "How relative healthy food can be. Chocolate contains a lot of fat, but also components that can reduce depressions and therefore it can be healthy too.", and "What is the definition of healthy? Having a moderate and varied eating pattern is healthy I think".

The distribution of low vs. high representation level in the sample was 37 and 60, respectively. There was no coherence between the introduction text respondents were assigned to, and the level codes resulting from the thought-listing task ($\chi^2 = (df = 2, N = 97) = 1.32$; $p = .52$).

Overall judgment of food products

Chocolate was judged to be least (M = 3.51, SD = 1.27), and fruit yoghurt to be most healthy (M = 5.02, SD = 1.37) (see Table 1). There was little variation in the difficulty of judging the different food products, with fruit yoghurt being the easiest to judge (M = 3.30, SD = 1.49), and both nasi (M = 3.82, SD = 1.58) and beef (M = 3.82, SD = 1.49) being the hardest to judge. Perceived healthiness and the difficulty of judging that food's healthiness was correlated for all five food products. However, only for chocolate this correlation was positive, meaning that the more healthy people thought chocolate was, the more difficult they found it to make that judgment. This result confirms the great ambiguity people expressed in study 1 regarding chocolate's healthiness. For the other products the relationship was inverse, meaning: the unhealthier, the more difficult to judge (see Table 1).

Differences between representation levels

Respondents were provided with one of three introduction texts. For one specific product, cheese, there were differences between the respondents who read different introduction texts. People with the lifestyle introduction text evaluated cheese as healthier than those with the ingredient text, and found it easier to make that evaluation than those with the product text. After coding of the open answers, there was one marginal difference between respondents in the two different representation levels. Respondents thinking about healthy eating at a higher representation level were more health conscious than those at a lower representation level (4.48 vs. 4.10, respectively, $p = .086$) (see Table 2).

Table 2
Descriptives and mean scores on healthiness and difficulty to judge in study 2a, by representation level.

	Low ($N = 37$)	High ($N = 60$)
Gender (%male)	48.6	48.3
Health consciousness*	4.10 (1.14)	4.48 (.96)
Perceived healthiness		
Chocolate	3.54 (1.26)	3.48 (1.28)
Cheese	4.24 (1.26)	4.30 (1.12)
Nasi	4.84 (1.12)	4.95 (1.03)
Fruit yoghurt	4.84 (1.66)	5.13 (1.16)
Beef	4.86 (1.16)	4.77 (1.17)
Difficulty of judging healthiness		
Fruit yoghurt	3.30 (1.58)	3.30 (1.44)
Chocolate	3.46 (1.64)	3.88 (1.68)
Cheese	3.57 (1.64)	3.77 (1.51)
Nasi	3.73 (1.50)	3.88 (1.64)
Beef	3.97 (1.55)	3.73 (1.45)

* Means are marginally different from each other ($p < .10$).

Discussion study 2a

The aim of the pilot study was to develop and test a quantitative instrument for different representation levels of healthy eating, based on the results of the qualitative first study.

The results of the pilot yielded multiple insights. The coding of open answers seemed to confirm the existence of different ways to represent healthy eating. As evidenced by the lack of coherence between the introduction texts assigned and the actual representation level derived from the thought-listing task at the end of the questionnaire, respondents did not adopt the representation level from the text. There may be several reasons for this.

First, the effect of reading a short introduction text may not be strong enough to last throughout the questionnaire. Second, the thought-listing task was an overall question positioned at the end of the survey, which might have interfered with potential product effects. The set of products was selected from open elicitation in study 1, and a selection criterion was that they had to be perceived as ambiguous in terms of their health value. Judged by the open answers, these ambiguous products caused confusion among some of the respondents, particularly the assembled products (nasi, fruit yoghurt), which may have obscured the results.

Lastly, the pilot's sample consisted of undergraduate students, as this was the most time and cost efficient way to test the first version of the survey. The main study will be carried out with a sample representative for the Dutch population.

Method study 2b: main questionnaire

The questionnaire for the main study was adapted according to the conclusions from the pilot study, and was administered online. Respondents were approached by a recruitment agency, excluded if they indicated to never eat the food products included in the survey, and sampled on the basis of their age, sex, and education in order to arrive at a quota sample representative of the Dutch population. Based on the pilot study, we adapted the questionnaire for the main study by omitting the introduction texts, and instead operationalised the different representation levels by means of the phrasing of the items. For example, the low representation level operationalisation of 'Perceived healthiness' was "*How healthy do you think product X is?*". The high representation level counterpart of this question was "*How well do you think product X fits in a healthy lifestyle?*". This resulted in two different versions of the questionnaire, with the only difference being the phrasing of the items for 'perceived healthiness' and 'perceived difficulty of judging'[3]. Also, respondents were asked to list their thoughts for each product individually in the main study, rather than their overall thoughts at the end of the survey. They were randomly assigned to either the low or the high representation level version of the questionnaire. Due to the troublesome experiences with ambiguous products in the pilot, in this main study we made a new selection of products that were simple and varied in healthiness, namely chips (unhealthy), chocolate (ambiguous), and apple (healthy).

For each of the three products (chocolate, chips, apple, in random order), respondents were asked to rate perceived healthiness

[3] The entire questionnaires are available on request from the corresponding author.

on a 7-point scale anchored "very unhealthy" and "very healthy", followed by a thought-listing task. Then, they were asked to rate perceived difficulty of the judgment on a 7-point scale ranging from "not difficult at all" to "very difficult", again for all three products. In most studies using CLT, attractiveness of an option is used as the dependent variable (e.g. Liberman & Trope, 2008), so the attractiveness of the three products was added as a third evaluative measure (on a 7-point scale from "not attractive at all" to "very attractive"). Lastly, they rated the eight items of 'Health consciousness', on a 7-point Likert-type scale.

Results study 2b

A total of 242 respondents participated in the main study, of which 7 were excluded as their thought-listing task results showed they did not take the study seriously. The data of the remaining 235 respondents (49.4% male, mean age of 44.9 yr (SD = 15.1 yr)) were analysed.

Open answer coding

The same two independent coders as in the pilot study coded the open answers per product ($3 * 235$). The coding scheme developed in the pilot study was applicable to the open answers, so each open answer was coded as low representation level, high representation level, or unclear. For chocolate, 111 respondents were thinking at a low representation level (e.g. "*how good it tastes*"), versus 105 at a high representation level (e.g. "*it depends how dark it is and how often you eat it*"). For chips, this distribution was 108 vs. 119, respectively, and for apple it was 99 vs. 125, respectively. For chips there was correspondence between the version of the questionnaire (low vs. high representation level) and the coding of the open answers (χ^2 (df = 2, N = 235) = 6.81; p = .033), for the other two products this was not the case (chocolate: χ^2 (df = 2, N = 235) = 1.21; p = .546, and apple: χ^2 (df = 2, N = 235) = .798; p = .671). This means that respondents adopted the representation level of the questionnaire only when they were evaluating chips.

Differences between representation levels

To investigate the effect of representation level on evaluation of food products, initial MANOVAs were carried out on the three evaluative measures (perceived healthiness, perceived difficulty, attractiveness), per product. These revealed two significant multivariate effects of representation level, for chocolate (Wilks' λ = .941, F(3212) = 4.433, p < .01), and for chips (Wilks' λ = .853, F(3223) = 12.803, p < .001). There was no significant multivariate effect on the evaluation of apple (Wilks' λ = .993, F(3220) = .518, p > .05). To investigate the locus of the representation level effect per product, univariate follow-up tests were conducted. As the evaluation of apple yielded no significant results, we will only report the univariate tests for chocolate and chips. A cross table comparing representation level -as indicated by the codes of open answers- for chocolate with representation level for chips, showed that there is an association between the type of representation level for the two products. Respondents exhibiting a low representation level when evaluating chocolate more often also exhibited a low representation level for chips, than a high representation level (χ^2 (df = 1, N = 209) = 14.83; p = 0.00). This finding suggests that representation level is not (entirely) product-specific, but is to some extent related to the individual. Therefore, we compared the evaluations of chocolate and fries, and the scores for health consciousness and time needed to complete the test between the group of respondents who exhibited a low representation level, and those who exhibited a high representation level. To make a clear distinction between the representation level groups, a third group was created that contains respondents who exhibited a low representation level for chocolate, but a high level for chips, or the other way around: the mixed group (see Table 3).

Respondents exhibiting high representation levels thought that chocolate and chips were healthier than those thinking at a low representation level. For chocolate, also the mixed group thought the product was healthier than respondents in the low representation group. For both products, it took people thinking at a high representation level longer to complete the test than those exhibiting a low representation level, and than those in the mixed group.

Discussion study 2b

The main study among a representative sample of the Dutch population showed that people can indeed think of healthiness of food products at different representation levels, and that these different ways of representation have consequences for the evaluation of these products. The relatively low number of open answers that were not clear in their representation level (8.1%, 3.4%, 4.7%, for chocolate, chips, apple, respectively) is an indication that the dichotomous coding scheme was indeed suitable. In all cases, people who exhibited a higher representation level needed more time to answer the questions in the survey, than those at a lower level. This may be an indication that they were either considering a larger number of arguments or were contemplating more in depth to evaluate the food products' healthiness and attractiveness. The type of product appeared to be of little importance for the effect of representation level on the evaluation of healthy eating as the direction of the findings was similar over the two products that yielded significant differences. Both the unhealthy product (chips) and the ambiguous product (chocolate) were judged to be healthier by people reasoning at a high representation

Table 3
Differences between representation levels in study 2b, per product.

	Low (n = 61)	Mixed (n = 77)	High (n = 71)
Chocolate			
Perceived healthiness	3.26 (1.39)[a]	3.86 (1.45)[b]	4.08 (1.38)[b]
Perceived difficulty of judging	2.75 (1.65)	2.51 (1.71)	2.38 (1.41)
Attractiveness	5.30 (1.32)	5.62 (1.45)	5.18 (1.42)
Chips			
Perceived healthiness	2.82 (1.39)[a]	3.22 (1.45)[ab]	3.46 (1.12)[b]
Perceived difficulty of judging	1.93 (1.14)	2.22 (1.43)	2.18 (1.44)
Attractiveness	4.89 (1.36)	5.21 (1.26)	4.99 (1.38)
Health consciousness	4.28 (1.03)	4.50 (1.17)	4.65 (1.04)
Time needed to complete test (min)	5.44 (3.48)[a]	5.23 (1.48)[a]	8.23 (8.25)[b]

*Means with unlike superscript letters were significantly different (p < .05), examined through Tukey's Honestly Significant Difference Test.

level than those at a low representation level. The manipulation of representation levels through the framing of the questions was more successful for chips than for the other products, judged by the correspondence between questionnaire version and open answer coding. Overall, it was still difficult to impose a representation level on respondents.

General discussion

Our exploratory empirical studies as well as the literature review presented in this paper clearly indicate that health is not a straightforward construct, and that it can be interpreted differently by individuals. This implies that health needs to be specified in order to understand its actual meaning for consumers. The present study operationalises insights from CLT as a first step on that particular road towards understanding health in a food context. This analysis yields useful insights for understanding health as an important value in consumer food choices, whereas actual food choices often do not reflect this importance, i.e. the paradox of health in nutrition. Addressing this gap between perception and behaviour, additionally, opens up a new route to better understand consumers in order to be more successful in public health interventions.

Three subsequent studies suggest that, indeed, consumers can interpret healthy eating at different levels of abstraction. They use different phrasings that vary in abstraction level when asked to evaluate the healthiness of food products. A concrete representation level is frequently indicated by seemingly having one specific product in mind. Phrasings at a low representation level often include sensory features (e.g., smell), whereas those at a high representation level include the wider context, or the eating pattern (e.g. amount eaten and consumption frequency). The evaluation itself is at least partly dependent on these abstraction levels. A meaningful example of this latter finding is that an unhealthy product like chips is judged to be less unhealthy if people are representing eating at an abstract level, rather than a concrete level, at the time of evaluation. Also, respondents reasoning from an abstract level needed more time to finish the questionnaire than those at a concrete level.

The main yield of this paper is the coding scheme with exemplary phrasings used by consumers for different representations of healthy eating. This instrument needs further development and testing, so it can be the basis for a quantitative construct to measure representation level in the present context.

Although its findings are promising, this study is still highly exploratory in nature and the results are by no means exhaustive. Therefore, we will highlight potential avenues for future research in this discussion section. First, there is no irrefutable proof that the number of representation levels is restricted to two. Although in both quantitative tests, the dichotomous coding scheme was very well suitable to the open answers, the fact that some open answers were too unclear to code as either concrete or abstract suggests that there may be a grey area in between the two extremes. Follow-up research should elaborate on the number of abstraction levels, and on whether these are mutually exclusive.

Another point of attention is the state or trait approach to representation levels. The results of both the pilot and the main quantitative study show that is difficult to impose any representation level onto individuals, which leads us to conclude that representation level is at least not an easily impressionable condition. Instead, it may be more tied up with an individual's personality, or perhaps indeed a trait that needs to be taken into account in any communication on healthy eating. This surmise is further supported by the finding that representation level was not clearly product dependent. Future research might want to study the exact nature of representation levels, for example whether people's preference for a certain level changes over different situations (e.g. time of the day, feelings of hunger or stress, or consecutive stages in the life course (Sobal, Bisogni, Devine, & Jastran, 2006)). As to the role of product type; it is clear that there are differences between products concerning their perceived healthiness, but how this relates to representation level needs further research attention. In addition, other motives for food choice, most notably sustainability issues that also are multi-faceted, may also benefit from exploring the existence of different representation levels.

The findings of this study may prove to be valuable for the effectiveness of public health interventions and successfulness of new product development. From previous research in the field of communication it is known that communication messages must fit in with people's actual frame of reference to be noticed and processed (e.g. Green & Kreuter, 2005). Having more insight in the determinants of how people interpret healthy eating will aid in aligning messages. When current educative measures are viewed in the light of representation levels, it seems to be the case that governmental bodies (such as the Nutrition Centre in The Netherlands) tend to take the level of lifestyle as the frame of their messages. For example, recent public health campaigns aimed at eating behaviour have focused on the balance between exercise and diet, and compensating days with a high caloric intake with days of eating less. In contrast, the food industry often takes a nutrient or product approach. This is best exemplified by nutrient claims on products (''contains 35% less fat''), and commercials focused on the benefits of an individual product. The results of this study and follow-up research could support both public and private parties in formulating their communication messages at the representation level they aim to be effective at.

All in all, both previous literature and our results strongly suggest to no longer treat health and healthy eating as universal concepts, understood identically by all individuals. The research presented in this paper may serve as a guidance for future studies aimed at discovering the true meaning and value of health for consumers.

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