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Why do we read the same nutrition labeling so differently?

A typology of reading heuristics based on food consumption goals

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ABSTRACT

While prior research has extensively studied nutrition labeling use and nutrition inference biases, less attention has been paid to consumer motivations to simplifying the reading of on-pack nutrition information. To address this gap, this study examines how food consumption goals affect consumer reading of nutrition labeling. On the basis of a qualitative study, eight food consumption goals impacting reading behaviors are identified and classified as 4 approaches to food intake: “compulsory”, “forbidden”, “hedonistic” and “utilitarian”. From this typology, we derive eight nutrition information reading heuristics impacting food choices. The findings highlight three specific inference biases – under-estimation, over-optimization and over-regulation biases – as well as physiological and psychological risks resulting from these heuristics. From a health policy perspective, the results stress the need to adapt the content of nutrition-awareness campaigns to the inference biases identified in this study.

Key words: heuristics, nutrition labeling, food consumption goals, inference biases.

According to the latest figures of the World Health Organization (WHO, Fact Sheet N°311, March

2013), obesity has nearly doubled over the last 30 years and concerns 500 million men and women worldwide. In 2008, 11% of adults aged 20 and over were obese, and 35% were overweight. Considered to be the scourge of the 21st century, the medical costs for problems linked to obesity and overweight are very high. In the US for instance, these annual costs were estimated at \$147 billion in 2008 (Finkelstein, Trogdon, Cohen, & Dietz, 2009).

In this critical context, government authorities recognize nutrition labeling to be one of the most promising tools to reduce information asymmetry and to fight unhealthy eating habits (Grunert, Bolton, & Raatz, 2012). For several decades now, many efforts have been made to provide innovative labeling formats in order to reduce information asymmetry and to help consumers be better informed in making food choices (Borgmeier & Westenhoefer, 2009; Feunekes, Gortemaker, Willems, Lion, & van den Kommer, 2008; Grunert, Wills, & Fernandez-Celemin, 2010; Hodgkins et al., 2012; Newman Howlett, & Burton, 2014).

However, recent studies have questioned the effectiveness of nutrition labeling in the improvement of food consumption behaviors. Several studies show that, in practice, consumers have little interest in nutrition labeling when they are under time pressure (Drichoutis, Lazaridis, & Nayga, 2006; van Herpen & van Trijp, 2011). Scholars also show that these same customers often stop to read this information when exposed to it accidentally rather than seeking it out deliberately (Grunert & Wills, 2007). Moreover, because of information overload, most consumers neither seek nor use all the information that is made available to them. Instead, they use *simplifying shortcuts - or heuristics* - to minimize judgment task difficulty (Andrews, Burton, & Kees, 2011; Aydinoglu & Krishna, 2011; Bettman, Luce, & Payne, 1998; Dhami & Harries, 2009; Scheibehenne, Miesler, & Todd, 2007; Schulte-Mecklenbeck, Sohn, de Bellis, Martin, & Hertwig, 2013; Wansink, Just, & Payne, 2009). While these heuristics do cut down decision making time, they also create biases which keep the consumer from being fully informed about his or her food choice.

In order to improve nutrition information reading efficiency, extensive work has been done on nutrition inference biases, that is to say, consumer misinterpretations and errors of judgment in the nutrition evaluation process (Andrews, Netemeyer, & Burton, 1998; Chandon & Wansink, 2007a; 2007b; Kozup, Creyer, & Burton, 2003; Oakes & Slotterback, 2005; Rozin, Ashmore, & Markwith, 1996; Scott, Nowlis, Mandel, & Morales, 2008; van Ittersum & Wansink, 2011; Wansink & Chandon, 2006). However, less attention has been given to *how consumer motivations impact on-pack nutrition information reading*, defined as the cognitive process of decoding symbols in order to construct or derive meaning (de Certeau, 1984). This lack of interest comes from the fact that scholars generally assume that consumers exhibit homogenous needs, attitudes and behaviors when exposed to nutritional information (Souiden, Ben Abdelaziz, & Fauconnier, 2013). In practice, food choices are guided both by multiple and conflicting goals (Aaker & Lee, 2001; Hausman, 2012; Stroebe, Mensink, Aarts, Schut, & Kruglanski, 2008) which determine what information consumers will look for and how they will interpret it. This diversified range of food goals pursued by consumers implies the existence of multiple strategies in the reading of nutrition information which need to be further explored by the literature. In this article, we address this gap by identifying the main reading strategies or *reading heuristics* used by consumers to reduce the amount of information they are exposed to, as well as the biases resulting from these simplifying procedures.

Firstly, we begin by reviewing the literature on consumer use of nutrition information. In this part, we point out why food consumption is a complex, decisional context (i.e. multiple objectives which lead consumers to select only part of the nutrition information which is processed during the evaluation of the products). Secondly, we present the findings of a qualitative study carried out on a sample of 23 consumers. Content analysis of the verbatim suggests that eight main reading heuristics are used by consumers to select and read on-pack nutrition information based on their food consumption goals. Thirdly, we identify three specific inference biases impacting food product

evaluation as well as potential psychological and physiological risks resulting from these reading strategies. To conclude, we discuss the need for targeted policies to improve the efficiency of nutrition labeling.

CONCEPTUAL BACKGROUND

Over the last ten years, nutritional on-pack information has become increasingly complex. In addition to the Nutritional Facts Panel, which provides information on the absolute amounts of energy value, fat, saturates, carbohydrate, sugars, proteins and salt included in the product per serving (Food and Drink Federation, 19 December 2013), as well as the list of ingredients, additional data are now provided on the Front Of Pack (FOP). More specifically, health and nutrition claims as well as simplified nutrition labeling systems (e.g. smart choice icons, stars, smileys, traffic light systems or health logos) add to consumer information overflow. In this context, many studies have been done to understand consumer use of nutrition labeling and its impact on food making decisions.

Consumer use of on-pack nutrition information: an overview

The literature on consumer use of nutrition labeling underlines that on-pack nutrition information has a positive impact on consumer behavior (Campos, Doxey, & Hammond, 2011; Cowburn & Stockley, 2005; Hieke & Taylor, 2012). More specifically, scholars stress that disclosure of nutrition information improves the attitude of consumers towards nutrition (Garretson & Burton, 2000; Kozup et al., 2003) and affect purchase intentions as well as product preferences (Mohr, Lichtenstein, & Janiszewski, 2012). Nutrition information also improves the effectiveness of weight loss diets (Drichoutis et al., 2006) and impact both the quantity of food intake and the choices made among the different product categories (Grunert et al., 2012). Therefore, when nutrition information is read, it can have a positive influence on choices and help consumers compose a balanced diet.

However, certain categories of consumers – such as women, consumers with higher education and working status, adults living with children, or those having a higher nutritional consciousness (Andrews et al., 2011; Bates, Burton, Howlett, & Huggins, 2009; Drichoutis et al., 2006; Hieke & Taylor, 2012; Keller, Landry, Olson, Velliquette, Burton, & Andrews, 1997) – are more inclined to use nutrition information than others. Moreover, recent studies indicate that illiterate or low literate individuals cannot or have a hard time reading or interpreting nutrition information and its digital symbols (Viswanathan, Hastak, & Gau, 2009). Scholars also point out that most consumers pay little attention to nutrition labeling when they are under time pressure (Drichoutis et al., 2006; Van Herpen & van Trijp, 2011). Finally, consumer interest in nutrition information on food packages also varies according to the situation, the product category and the time spent on shopping (Drichoutis et al., 2006; Grunert & Wills, 2007).

To promote the reading of on-pack nutrition information, the labeling format can be a highly effective tool (Hieke & Taylor, 2012). So far, no specific format has been clearly identified as having a stronger impact than others, research shows that FOP icons (e.g. traffic light systems or smart choice icons) enhance nutrition labeling understanding and may influence consumers to go towards products perceived as being healthy or as having good nutrient value (Andrews et al., 2011; Borgmeier & Westenhoeffer, 2009; Feunekes et al., 2008; Grunert et al., 2012; Newman et al., 2014). The size of the label, its colors, image reputation, and contents of the product on the package are all factors which catch the attention of the consumer and can lead him or her to read the nutrition information (Bialkova & van Trijp, 2010). On the whole, consumers require nutrition labels that are easy to use and which will enable them to be fully informed without being pressurized into following a specifically “prescribed” behavior (Grunert & Wills, 2007; Hieke & Taylor, 2012).

If research has therefore provided several insights on how to improve consumer nutrition labeling use, recent studies underline the importance of using “*a more holistic view of nutrition labeling*” (Hieke & Taylor, 2012, p.150); which means integrating into the analysis all of the nutrition information available on the packaging rather than only looking at selected variables. This integrative approach will allow a better grasp of the simplifying processes used by consumers to reduce the amount of nutrition information they are confronted with on the labeling.

How do consumers face the complexity of nutrition labeling? The key role of heuristics.

Food choice, as with any consumer decision-making, is the result of complex information processing which depends on individual cognitive capacity, context specificities, and the number of alternatives to be considered (Alba & Hutchinson, 1987; Tversky & Kahneman, 1981; Swait & Adamowicz, 2001; Wright, 1975). When individual cognitive capabilities are limited and the context is complex and/or temporal pressure is high, the individual will tend to use shortened information processing – or heuristics (Tversky & Kahneman, 1974; Payne, 1976) – in order to reduce the amount of information to process thus shortening the decision-making time (Bettman et al., 1998; Chen, Duckworth, & Chaiken, 1999; Dhimi & Harries, 2009; Tversky & Kahneman, 1974; Payne, 1976).

Because of nutrition information complexity and time pressure at the point of sales, most consumers do not seek to use all the information available on-pack for product evaluation and choice making and tend to go to shortened interpretation procedures of the available information (Andrews et al., 2011; Aydinoğlu & Krishna, 2011; Rozin et al. 1996; Scheibehenne et al., 2007; Schulte-Mecklenbeck et al., 2013; Wansink et al., 2009). These heuristics indeed shorten the time needed to evaluate and choose food products, however, they also create inference biases which keep consumers from reaching a more accurate diagnosis of the nutritive qualities of the products (Andrews *et al.*,

1998; Andrews et al., 1998; Chandon & Wansink, 2007a; 2007b; Howlett, Burton, Bates, & Huggins, 2009; Kozup et al., 2003; Oakes & Slotterback, 2005; Rozin et al., 1996; Scaife et al., 2006; Scott et al., 2008; van Ittersum & Wansink, 2011; Wansink & Chandon, 2006).

Two major inference biases are identified by the literature. First of all, the negative bias (or over-estimation bias) is an over-estimation of the negative factors contained in the product (e.g. fats or sugars), though low amounts are present in the product (Rozin et al., 1996; Rozin & Royzman, 2001). Over-estimation of negative factors contained in the product creates a negative halo over the entire product without taking positive factors into consideration, thus leading the individual to evaluate the product more negatively than it actually is. This type of bias comes from contagion effects and are offshoots of commonplace beliefs and stereotypical thinking regarding certain food product categories (Rozin et al., 1996; Oakes & Slotterback, 2005). Secondly, information processing can be tainted by an optimism bias (or under-estimation bias). Unlike the negative bias, the presence of positive factors in the product, such as vitamins or natural ingredients, can lead consumers to generalize this information without having considered the presence of negative factors. The product is then assessed as being of better nutritional value than it actually is (Scaife, Miles, & Harris, 2006). Scholars point out that the optimism bias comes from halo effects due to the deceptive size of a serving (Chandon & Wansink, 2007a; van Ittersum & Wansink, 2012) or due to marketing practices of brands (e.g. naming of the product, pricing, labeling) which can mislead consumers in their product assessments (Chandon & Wansink, 2012).

Though the literature has relatively well covered the nutrition evaluation bias, little work has been done to explore the impact of consumer motivations on the reading process (de Certeau, 1984) of nutrition information, before product evaluation. In practice, most consumers do not seek to use all the available information for product evaluation, in part because of information overload, but also because their nutrition diagnosis will be based on attributes consumers value most (Schulte-

Mecklenbeck et al., 2013), that is to say, selected information “*whichever option fulfilled their most important need*” (Sheibehenne et al. 2007, p. 585). Therefore, how on-pack nutrition information is read depends on the nutrition goals of the consumers which are both multiple and contradictory (Hausman, 2012).

Food choice guided by multiple and contradictory goals

Goals are defined as “representational structures that guide the system [or the individual] in its pursuits of an end state or a reference state” (Markman & Brendl, 2000, p.98). Goals are cognitive constructs but also motivational structures, that is to say, they set in motion a series of regulatory processes in order to initiate and maintain progress towards goal attainment (Kopetz, Kruglanski, Arens, Etkin, & Johnson, 2012).

In practice, food choices are guided by multiple goals (Rozin & Zellner, 1985; Steptoe, Pollard, & Wardle, 1995; Scheibehenne et al., 2007; Hausman, 2012). For most people, taste or sensory appeal seem to be the most important factors underlying food choices (Rozin & Zellner, 1985; Stafleu de Graff, Van Staveren & Schroots, 1995; Scheibehenne et al., 2007). Practical concerns, such as price and cost, or convenience of preparation and purchase, can also motivate food choices as well as more specific goals such as health, weight control, familiarity, mood improvement or stress reduction (Steptoe et al., 1995; Rozin & Zellner, 1985). Finally, ethical concerns about the food origin and packaging or the search for natural contents (for instance the absence of additives) are also important factors for specific categories of consumers (Steptoe et al., 1995; Rozin & Zellner, 1985).

While food consumption goals may be multiple, they imply a relatively small number of strategies to reach them and can be divided into two categories (Aaker & Lee, 2001): strategies to

maximize the presence of positive outcomes (termed promotion goals) and strategies to avoid negative outcomes (termed approach goals).

Since goals are numerous and incongruent, consumers are unable to optimize food consumption goals simultaneously (Hausman, 2012; Stroebe et al., 2008). Therefore, they set up priorities and try to reach their various goals the best they can through compromises and trade-offs between the different objectives, which give them choices based on limited criteria (Hausman, 2012; Scheibehenne et al., 2007; Schulte-Mecklenbeck, 2013). Alternative goals may also mean having to choose between incompatible valued end states such as pleasure (e.g. junk food eating) and health (Connell & Mayor, 2013). Once the priorities have been established, the criteria retained by the individual create a coherent goal system which will act as a guide in choosing food products. These goal systems are specific to each individual in so far as goal hierarchies are affected by factors such as age, gender, lifestyle, socioeconomic status, cultural background and education (Scheibehenne et al., 2007).

Food choices are thus guided by multiple, interconnected goals that motivate and structure information processing (Bettman et al., 1998). In spite of the major importance that these motivating factors have on food selection, little work has been done to explore their impact on nutrition information processing. In this article, we address this gap by exploring the impact of individual food consumption goals on nutrition information reading in a qualitative study, in order to identify the main *simplified reading strategies (or reading heuristics)* used by consumers to reduce the amount of information they are confronted with on the labeling.

RESEARCH DESIGN

The main objective of this study is to better understand the psychological processes underlying consumer reading of on-pack nutrition information, by exploring the link between food consumption goals and nutrition information processing. Based on a qualitative study, the following questions are explored:

- What are the consumer food consumption goals that impact the reading of on-pack nutrition information?
- What are the reading strategies - or heuristics - used for processing nutrition information and how are they shaped by the food consumption goals?
- What are the inference biases resulting from these reading heuristics?

Data collection

23 semi-structured interviews of approximately one and a half hours were conducted with consumers aged between 21 and 67 from Paris, Lyon and Tours (France). The informants were recruited using several methods including personal contacts and snow ball sampling. Our sample was diverse with many characteristics such as age, occupation, education and marital status. An overview of informant profiles is presented in Table 1. The interviews were conducted by 3 researchers. The participants were interviewed in their home, or in a private office, and were assured of confidentiality so as to create a context in which the participants felt at ease and comfortable to discuss their experience and perceptions. Firstly, the discussion began by gathering general background information about the participants (age, occupation, marital status and sports habits). The interviewers then shifted to the topic of food asking general questions about food consumption, habits, and choice criteria. Thirdly, the interviewers encouraged the participants to share their perception of nutrition and the meaning they give to nutrition information available on-pack before discussing the impact of the information on their food selection. Lastly, they were asked how they process nutrition labeling. The participants

were then invited to describe their experience of food purchasing with an emphasis on nutrition labeling. During this phase of the interview, participants were also invited to comment on eight current food products which included a variety of formats for two categories of products: chocolate and readymade meals. All interviews were recorded and transcribed verbatim. Any identifying names or references were replaced by pseudonyms to ensure the anonymity of the informants.

Data analysis

This study used the grounded theory method of constant comparison to code the data (Glaser & Strauss, 1967; Strauss & Corbin, 1998). This technique is similar to the iterative approaches used by previous studies in consumer research (Decrop & Derbaix, 2010; Janda & Torcchia, 2001; Lee et al., 2008). The interview transcripts were considered as a single text, forming coherent patterns which reveal the informants' understanding of their experiences as food product consumers. Each interview transcript was therefore analyzed in the light of the whole or the totality of the interpretations given by the collective subject (Marion & Nairn, 2011). The interpretation then resulted from iterative movements back and forth between parts of each interview transcript and the entire body of data (Arnold & Fisher, 1994) in order to develop a holistic understanding of each interview transcript while noting similarities across the transcripts that were analyzed. Through this iterative process, the interview transcripts were analyzed and coded in four phases.

The researchers first read through the entire set of transcripts in an iterative manner to become familiar with the informants' experiences. A systematic coding of transcripts was then conducted focusing on the way consumers understand nutrition information and how they use it in their daily choice of food products. During this first phase, similar themes were collapsed together into higher-order conceptual constructs (Spiggle, 1994). Through this iterative process, reading behavior types

were identified as well as a set of factors affecting these behaviors (e.g. attitudes towards nutrition, food consumption goals, or situational variables affecting reading behaviors).

The second phase consisted in assigning the general themes to meaning categories (good/bad, pleasure/disgust, excess/control, compulsory/forbidden etc.) thereby identifying a meaning structure that organizes the main consumption goals identified in the participants' discourse. Through this analytical procedure, we designed two axes around which the consumption goals are organized: obedience vs. disobedience to nutrition rules and positive vs. negative or neutral approach to food. With this procedure, the food consumption goals affecting the reading behaviors were clarified and grouped as 4 approaches to food intake: "*compulsory*", "*forbidden*", "*hedonistic*" and "*utilitarian*".

The transcripts were then reanalyzed to identify holistic relationships among these meaning categories and the reported reading behaviors. The main reading heuristics of nutrition information were thus identified by analyzing the link between the food consumption goals and the reading behavior categories.

Finally, the extant literature was introduced to further inform and support the emergent themes. More specifically, the regulatory focus theory (Higgins, 1987 and 1997) as well as specific work on nutrition motivation to process nutrition information (Keller et al., 1997; Andrews et al., 2011) were included to make our presentation of the food consumption goals more accurate and to further clarify the psychological mechanisms affecting the reading of on pack nutrition information.

Through this iterative process, a conceptual framework regarding food consumption goals and their impact on nutrition information reading was developed. The findings are presented in the following section.

Table 1: Informant profiles

Names of participants	Age	Personal Information	Profession	Diet constraints (due to health problems or sports activities)
Anne	43	Married, 3 children	HR manager	Allergic to peanuts
Romuald	21	Single, lives in shared housing	Student	None
Carine	38	Married, 3 children	Teacher	None
Thomas	22	Single, lives in shared housing	Student	None
Sandrine	33	Married, 1 child	Customer consultant	None
Gwendoline	23	Single	Student	None
Jeanne	55	Married, 3 children	Government worker	None
Elodie	32	In a couple	Teacher	Companion overweight
Remi	25	Single, lives in shared housing	Communications manager	None
Julien	31	Single, lives alone	Unemployed	None
Nicolas	23	Single	IT engineer	None
Christiane	67	Married, 1 child	Retired	Diabetes : limits sugars
Christine	47	Married, 2 children	Accountant	None
Isabelle	36	Married, 3 children	Executive	None
Aline	32	Single	Buyer	Follows a low-fat/sugar protein rich diet to stay slim.
Anthony	21	Single, lives with parents	Student	None
Jérémy	38	Married, 3 children	Top executive	Running activity; diet adapted to sports performance.
Jean	34	In a couple	Engineer	Bodybuilding activity ; diet adapted to this activity
Julie	21	Single	Student	None
Dominique	60	Married	Retired	Cholesterol problem limits fats.
François	24	Single	Student	None
Mariem	30	Married	Teacher	None
Sandrine	42	Married, 4 children	Housewife	None

IDENTIFICATION OF READING HEURISTICS INVOLVED IN FOOD CHOICE

In the following section, we first present the main food consumption goals that drive food choices. Secondly, we analyze the impact of these consumption goals on how consumers read and select their nutrition information in order to make their food choices.

Classification of food consumption goals impacting the reading of nutrition labeling

Based on the participants' responses, food consumption goals are organized around two dimensions: 1) *consumer orientation* (promotion vs. prevention) and, 2) *consumer motivation* (to integrate specific nutrition rules as part of the food decision-making process (see figure 1).

Consumer orientation is based on the distinction between two ways of looking at food consumption potential outcome. On the one hand, some consumers take a positive stance towards food intake so as to attain positive outcomes such as good health, body well-being and/or pleasure: “*I am convinced that food is the best medication and comes first!*” (Sandrine), “*Chocolate is good fat, it’s antioxidants*” (Elodie), “*There are few pleasures in life and, for me, food is one of them*” (Christine). On the other hand, some consumers take a negative stance towards food consumption thus focusing on the potential negative outcomes such as weight gain, health risk, wasting time or financial expense: “*People who eat too much starch or fatty foods have weight problems*” (Gwendoline), “*People who eat too much meat are nervous*” (Remy), “*I don’t really enjoy [eating]... It is more of a utilitarian function*” (Baptiste). The positive and negative approaches to food are consistent with two types of orientations that guide consumer choices highlighted in the regulatory focus theory (Higgins, 1987; 1997) as *promotion* and *prevention* focus. Built on the hedonistic idea that people approach pleasure and avoid pain (Aaker & Lee, 2001), the theory distinguishes two major categories of desired goals impacting decisions (Aaker & Lee, 2001): those that relate to attaining positive outcomes (e.g. advancement, achievement and aspirations) termed *promotion goals*, and those that relate to avoiding negative outcomes (e.g. responsibilities, obligations, security) termed *prevention goals*. According to this theory, individuals with a promotion focus will regulate their food behaviors towards positive outcomes. They are said to have an *approach goal* (Higgins, 1987). On the other hand, prevention-oriented consumers will regulate their food intake away from negative outcomes. They are said to have an *avoidance goal* which guide their food product choices (Higgins, 1987).

These objectives (avoidance vs. approach goals) become more specific depending on the consumers' motivations to integrate specific nutrition rules into their decision making process, that is to say according their nutrition consciousness (Keller et al., 1997; Andrews et al., 2011). Based on the participants' responses, nutrition is perceived and approached mainly as a **prescription system**. For consumers, the purpose of this system is to provide them with a comprehensive “*body of prescriptions*” and “*recommendations*” for daily selection of food so that a healthy balanced diet can be set up. Yet consumers have varying approaches and attitudes towards this prescription system. First, some consumers will follow nutrition guidelines and integrate them to determine their daily food intake: “*I try to have a balanced meal by including 3 of the basic food groups*” (Elodie), “*Don't eat fats. Don't eat sugar [...] these are the two main principles I follow to have a balanced diet*” (Gwendoline), “*I'm careful to always include raw food or vegetables*” (Carine). Their decisions are based on a common denominator: **obedience to the prescription system**. On the other hand, some consumers keep a distance from or express doubts concerning this mass of prescriptions: “*I feel quite free, in fact, concerning nutrition*” (Isabelle), “*[about nutrition] I don't really look into it*” (Christine). For these consumers, nutrition rules are seen as guidelines that one does not necessarily have to follow which implies a position of **disobedience towards the existing food dogma**.

Based on the two dimensions, *consumer orientation* and *consumer nutrition consciousness*, we distinguish four categories of food consumption goals termed “compulsory”, “forbidden”, “hedonistic” and “utilitarian” approaches to food intake.

The “compulsory” approach to food intake. This approach is based on a promotion focus towards food (i.e. food is considered as beneficial) and a wish to follow nutrition rules. In this frame of mind, the nutrition guidelines are mainly understood as indicating what *one must do* concerning food (or what is compulsory): “*you must have 3 milk products per day to stay healthy!*” (Sandrine), “*You must*

eat 5 fruits and vegetables per day, it's important" (Elodie). These consumers focus their attention on the nutrition rules necessary to determine what kind of food must be selected, *because it is absolutely essential to one's daily diet*. Hence, food is chosen for its active ingredients and for its capacity to reinforce body health. Bearing this in mind, two consumption goals emerge from the participants' responses. The first goal consists in actively looking for natural, non-processed products whose ingredients are seen as being naturally beneficial for the body: *"I tell myself that if I only choose simple[non-processed] food products, it [the diet] should naturally come out balanced"* (Carine), *"I always try to go for what is most healthy, in fact, for what is most natural"* (Elodie), *"[eating well], means knowing what one is eating, knowing what is on our plate and where it comes from"* (Jeanne). The second goal consists in looking for food as a source of fitness or muscular performance: *"[food], for me is like putting gas in a car"* (Jean), *"The body needs energy to burn"* (Baptiste), *"For me, food is 70% of the result"* (Jean). This "fitness" approach to food implies the consumption of food rich in proteins and complex carbohydrates as sources of energy and muscle building nutrients.

The forbidden approach to food intake. This approach is based on a prevention focus towards food (i.e. food contains risks and is potentially dangerous) and a wish to follow the existing food dogma. Nutrition is mainly approached as a set of rules which dictate what one must *never do* (what is forbidden): *"I try to avoid ready cooked meals because they aren't balanced"* (Anne), *"Chocolate makes you put on weight! One mustn't eat it"* (Aline), *"Salt clogs up the arteries, so I'm careful how I use it"* (Christine). This approach observes rules and regulations regarding daily food choices which are synonymous with rigor, discipline and control: *"Being careful how one eats is like a training program, it's a little like being in the army"*(Baptiste), *"Food [...], is something I have to control"* (Aline). The "forbidden" approach to food intake leads some consumers to perceiving food

as being potentially dangerous. As a result, food selection undergoes strict regulation of forbidden foods to control food intake so as to limit negative impact. In the “forbidden” approach, there are two purchasing goals followed by consumers hoping to maintain a healthy body. Consumers pursuing the first goal want to be slim and reduce fat content by rejecting all products having high sugar or fat content. Consumers pursuing the second goal are looking to avoid illness by rejecting food products with ingredients perceived as being health risks or provoking allergies.

The “hedonistic” approach to food intake. The “hedonistic” rationale is based on a promotion orientation (i.e. regulation for positive outcomes) while keeping a position of disobedience towards the existing food dogma. This consumption approach is based on denial about what is forbidden with the primary objective of authorizing oneself to enjoy food: *“I love eating so much that, to be true to myself, I deny myself nothing [...]. I put taste ahead of nutrition”* (Christine), *“I try to eat well and yet keep the pleasure of eating, but in the end, it’s the pleasure of eating that comes first”* (Julien). These consumers follow their desires and respond to personal needs even if it means breaking the nutrition rules and guidelines: *“I allow myself some goodies without feeling too guilty about it [...]. If you never allow yourself anything, life is not worth living!”* (Christine). Food, in this case, is seen as one of the great pleasures in life and even as an end in itself: *“For me, eating is a priority [...] because it gives me so much pleasure”* (Julien), *“Chocolate is a very important part of my life! [...] There are few pleasures in life and, for me, food is one of them”* (Christine). Again, two pleasure purchasing goals can be distinguished based on the participants’ responses. The first goal emphasizes the pleasure of relishing food, of finding the gourmet dish, of finding the ultimate tasting pleasure: *“As long as it tastes good in my mouth [it’s fine with me]”* (Rémi), *“I love gourmet food”* (Christine), *“For me, eating is a pleasure and it’s the taste that is the most important”* (Julien). The second goal is seeking pleasure coming from excess, abundance, and the pleasure of having eaten enough or feeling “full”: *“I like eating good things but especially if there is lots of it!”* (Hugo),

“Generally, let’s say I have eaten well when I’ve eaten a whole slab of pork ribs! [...] If I get up from the table, and I’m really not hungry anymore, and I feel like digesting on my sofa, I say to myself: I’ve eaten well” (Romuald).

The “utilitarian approach” to food intake. The “utilitarian” approach is based on a prevention focus (avoidance of negative outcomes) and a position of disobedience to existing nutritional rules. Following this approach, nutrition rules are perceived as optional or secondary: *“Though I am conscious of the risks of bad eating habits, that’s not enough for me to do to anything about it” (Anthony)*, *“I never look at vitamins, sodium and all that, I think I don’t really care” (Julie)*. These consumers feel that nutrition rules are not very important, do not need to be followed, and do not play a great role in their food selection. Food is perceived merely as a physical necessity or a way to confront daily problems: *“Eating well means eating enough” (Thomas)*, *“I eat because I’m hungry” (Romuald)*. Individuals having this point of view give little importance to food intake: *“I don’t think about the food I’m eating, I don’t think of it as being very important” (Anthony)*, *“I go eat what I find in the fridge [...] I don’t care too much what it is” (Christine)*. All food products are allowed *a priori* and chosen according to two distinct avoidance goals. First, some consumers search for financially accessible products, in order to minimize the costs associated with food intake: *“My first criteria is the price” (Nicolas)*, *“I try to get discount products because the rest is too expensive” (Christine)*. Second, some consumers search for the most practical product in terms of cooking and eating quickly in order to avoid wasting time: *“It has to be able to be eaten quickly [...] stuff that doesn’t require doing too much” (Christine)*, *“If I don’t feel like cooking, I buy that and I tell myself that it will be good and quickly done” (Carine)*.

Figure 1 synthesizes the 8 food consumption goals identified in this analysis. Based on these goals used as guidelines for food selection, we distinguish eight nutrition information reading

heuristics which correspond to eight ways of processing nutrition information available on food product packaging.

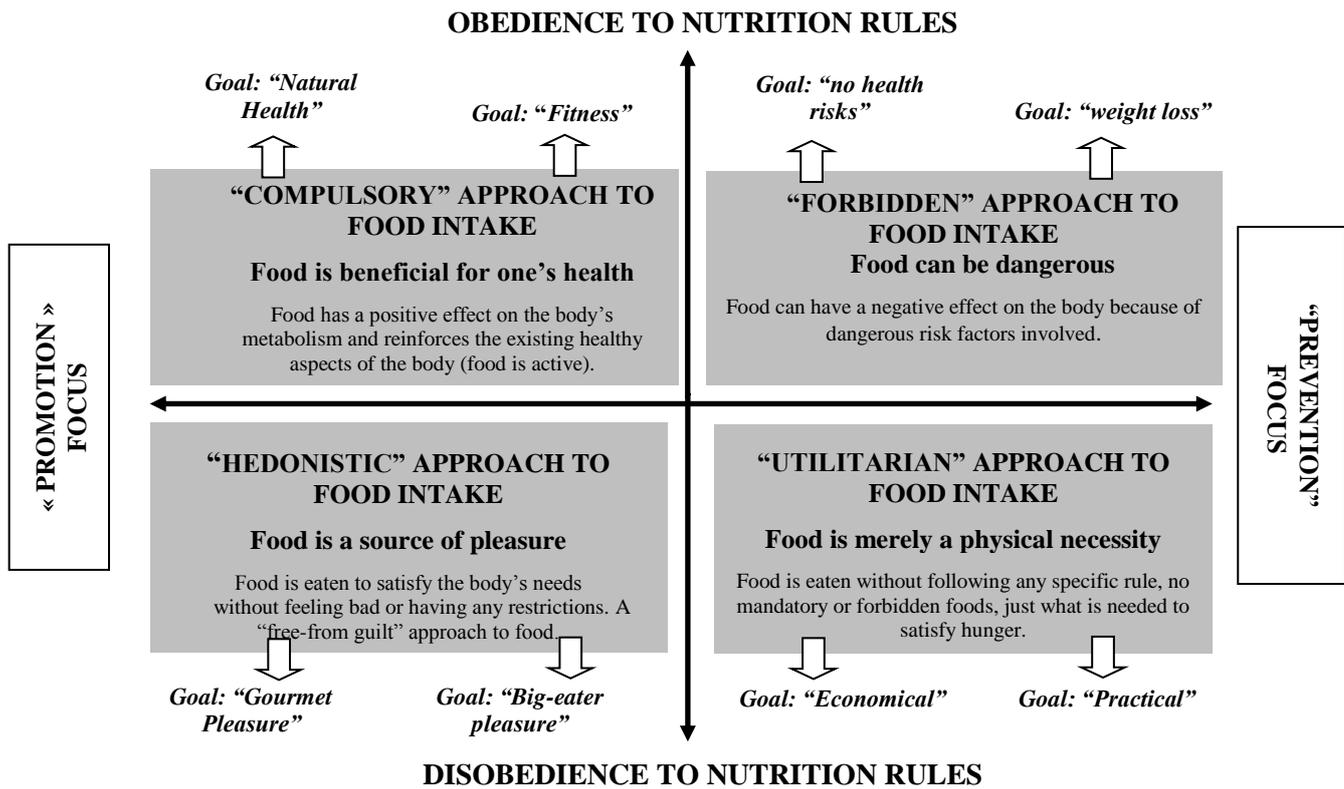


Figure 1. Food consumption goals affecting decision-making

Food product choice and on-pack nutrition information reading

“Optimization” heuristics. Consumers whose nutritional reasoning is based on a promotion focus and obedience to nutrition rules are highly focused on what *must* be contained in the product. Their decision will be based on an active search for nutrition information which makes their daily food and its beneficial effects *optimal* for a healthy body. Concerning this “optimization” process, two ways of processing information must be distinguished: one is qualitative, the other quantitative. When purchasing natural products, priority information in the search for non-processed food concerns the characteristics of the ingredients included in the recipe of the food product. The goods must be as natural as possible: *“For a tabouli... when there is bulgur wheat, red pepper, colza oil and mint, that’s very good! [...] On the labeling, I look to seek what comes closest to the original recipe”*

(*Elodie*). Consumers having this reasoning will be particularly attentive to the presence of chemical ingredients which, for them, calls for rejection of the product: “[*additives*] are added to food to give it more taste, more color, and in my opinion, it isn’t natural or necessary” (*Jeanne*). Generally, this consumer evaluation is based on the composition of the product which is the most tangible factor testifying to the quality of the nutrients in the food: “*When I eat, I want to know and see what I’m eating, because actually, proteins, fats, and sugars are invisible*” (*Elodie*). Moreover, the order in which the ingredients appear is of the utmost importance for these consumers as it reflects the proportions which compose the recipe. The length of the recipe will also be considered in order to avoid industrial excess: “*If the first ingredient is sugar, then I reject it since it does not correspond to my definition of chocolate [...]. It’s like for yogurt, which is something simple. If I see that the composition goes on for two pages, I say no!*” (*Elodie*). Their attention will go to the FOP information if there are labels testifying as to the quality of the composition (no coloring, no conservatives, no hydrogenated oil, no artificial flavoring, and no added sugar) or to labels describing the processing methods of the manufacturer or breeder, all of which are quick indicators of the natural characteristics of the product.

In fitness purchasing, the second optimization goal, food selection is based on calculating which product will be an optimal nutrition choice to reach a desired fitness or sports performance level. These consumers seek for information concerning quantities of carbohydrates (energy boosters) as well as protein content since their focus is on muscle development and maintenance: “[*I look at*] the quality of the protein, and the cost effectiveness of the quantity of protein” (*Jean*), “*The body needs carbohydrates to have energy!*” (*Baptiste*). Buying incentives for these consumers come in the form of messages such as “concentrated in...” or “high percentage of...” proteins. Products too rich in fats will be rejected in that they do not favor fitness or sports activities since they induce weight gain: “*Each kilo means additional minutes when you are jogging!*” (*Baptiste*).

“Regulation” heuristics. Consumers following the nutrition rules with a prevention focus have their sights set on what must absolutely not be contained in food so as to not upset a healthy balanced diet for the body. These consumers will make decisions based on nutrition information which allows them to regulate their food in order to fight against or avoid a clearly identified health risk. There are two purchasing rationales which, although both are based on regulation, do not seek the same nutrition information. One uses qualitative information concerning the ingredients, while the other uses quantitative information concerning the nutrients. Buying in order to avoid health risks involves a systematic checking of the potentially dangerous ingredients in order to preserve one’s health: *“If I see E406, I put it right back on the shelf because I’m allergic to it!” (Elodie), “I systematically look out for hydrogenated fats because they are very bad as they can be a cause of cancer” (Sandrine).* The manufacturing process may also be examined closely by these consumers since fine traces of allergy provoking ingredients may be noted on the labeling.

Those consumers concerned with weight loss need quantitative data on the nature of the product and a specific breakdown of the nutrients in the food in order to help them regulate their food intake: *“My ideal is 0% fats, 0% sugar [...] the less saturated fats and sugar amount there is, the better it is!” (Aline), “Regarding what is saturated [...]. I try to include the least I can” (Julie).* When buying “light” products, the consumer searches for those products which will best limit the risk of weight gain: *“low fat content’ doesn’t mean anything. I need quantified information...to compare” (Aline), “When I see 73g per 100 g, I tell myself that I mustn’t eat too much of it” (Gwendoline).* These consumers use abstract reasoning and have a dematerialized perception of food. They focus very specifically on information concerning calories (synonym for surplus energy stocked in the body) and on nutrients which could potentially generate weight gain such as carbohydrates (sugar) and fats which they strongly limit or see as forbidden: *“The first thing I look at are the calories, and*

then at what can make you gain weight like sugars and fats. I don't look at the rest" (Aline). Often they become experts in calorie count and in perfectly memorizing the characteristics of a product considered to be a risk in gaining weight: "I know the calorie count for all the hamburgers. I know which hamburger has the least..." (Aline). Product labels which claim "0%" on front packaging are especially appreciated as are those indicating low levels of unwanted ingredients. In addition, weight standards are generally preferred since they make it easier to make quantitative comparisons between products: "I look for the 100g. It's on nearly all the packages. That way, it's easier to compare" (Aline).

"Pleasure seeking" heuristics. Promotion oriented consumers who stand in disobedience to nutrition rules are relatively unconcerned with risks involving unbalanced products since their pursued goal is pleasure. Consumer involvement in nutritional information reading is relatively low compared with the previous profiles. Their decision making is based on two distinct approaches to the information available on the packaging. First, purchasing for gourmet eating involves satisfying the taste buds of the buyer and implies a fairly careful reading of information regarding ingredients to guarantee taste satisfaction and product quality: *"They are closely linked: the right ingredient makes the right taste" (Julien), "If I eat chocolate, it might as well be good chocolate with real sugar and nothing else" (Carine).* These gourmet eaters are particularly attentive to quality labels which have strong indicators for products known for excellence, fine taste and the origin of the product (e.g. the French "AOC"). They may quickly read through nutrition information (especially if it is condensed) to be assured of ingredient excellence which enhances the taste. They know that they may have to sacrifice nutritional quality and are thoroughly convinced that excellent tasting products are necessarily linked to a minimum amount of transgression: *"I think that a product without fat, is a product that has no taste" (Christine), "I think it's not possible to enjoy food by eating food which does not make you fat"*

(Julien). Nutrition information is thus read rapidly and has little to do with their decision making. In purchasing gourmet food, these consumers do consider the brand reputation which ensures continuity in terms of taste and excellence: *“When you buy a brand product, I find that the product has quality control or follow-up procedures, it always has the same taste”* (Christiane), *“I know from experience that if I eat a piece of Lindt chocolate, it far surpasses a piece of chocolate from Carrefour”* (Julien).

Having nearly the same rationale as the “gourmet pleasure” consumers, individuals *who buy food for the sole pleasure of eating emphasize quantity as a synonym for pleasure: “I look at the number of servings. I like it when it says “1 to 2 servings”; that means I’m going to have enough to eat!”* (Rémi), *“I like it when there is a lot of it...”* (Thomas). These big eaters hardly read information on nutrients since purchasing food products is done on impulse and their concern is to get what is wanted on the spur of the moment: *“For the cakes [I don’t look], it’s for the pure pleasure of eating. So it will be Mikado. I love it! I follow my impulse”* (Carine), *“What I see first? The meal itself; is it appetizing or not?”* (Anthony). Nutrition information has little impact on their choices, whereas the brand can be a guarantee of eating pleasure as well as the recipe which are the two main vectors of information for these consumers.

“Non-involvement” heuristics. Non-involved consumers (i.e. those disinterested in nutrition information and in following a prevention approach) hardly ever read nutrition information on the packaging since it is considered to be unimportant and even a waste of time in the food selection process: *“Already I spend one and a half hours shopping, plus I would have to read through all that!?”* (Anthony). This lack of interest could come from a lack of knowledge of the risks involved when making bad food choices: *“I don’t look at it because simple/complex carbohydrates/protein/saturated fats; I don’t know what that does to the body.”* (Christine), *“I don’t*

know enough to take a look at it [...]. If you don't know what it means, there's no use in looking at it" (Anthony). This attitude could also be the result of a denial of the risks linked to bad food habits and may be a way of resisting nutrition dogma: *"we can't know what's true in everything they're saying!" (Anthony), "In fact, calories don't mean a thing!" (Elodie).* Furthermore, rejecting or glossing over the risks may be explained by the fact that these consumers are generally young and have yet to face specific health problems which might motivate them to change their way of approaching nutrition one day. Two purchasing rationales emerge from these non-involved consumers. First, there is a discount purchasing rationale where the food selection is made by looking for the best price or for bulk amounts on sale: *"I go to 'Grand Frais' and systematically buy products on sale" (Christine).* Secondly, there is the practical rationale which seeks to have readymade manufactured meals or products which are quickly prepared, quickly eaten and have a long shelf life. When buying food, these consumers are quick to spot the brands or visual indicators of fast and practical preparation.

Figure 2 recapitulates the different types of **nutrition information reading strategies** used in food evaluation and selection. These heuristics are **information processing strategy** types. In practice, reading behaviors are expressed as reading orientations. A given consumer will have a *tendency* to choose specific kinds of food products according to a dominant reading rationale. Moreover, the interviews show that consumers sometimes go beyond their dominant goal orientation depending on various determining factors impacting food choices such as: **product category**, *"In this case, I am not only buying a product but wanting pleasure. Therefore, I'm not necessarily going to choose what's healthiest" (Carine),* **limited time** to make decisions, *"I am an active agent when I enter a store, except when it's really urgent" (Etienne),* **cooking for oneself or for guests**, *"We have two types of food: special food for special occasions when the children or friends are there, and*

simpler food when I'm alone with my wife” (Etienne) or **responding to a mood within a specific context**, “When I am alone, I eat as quickly as I can” (Remi).

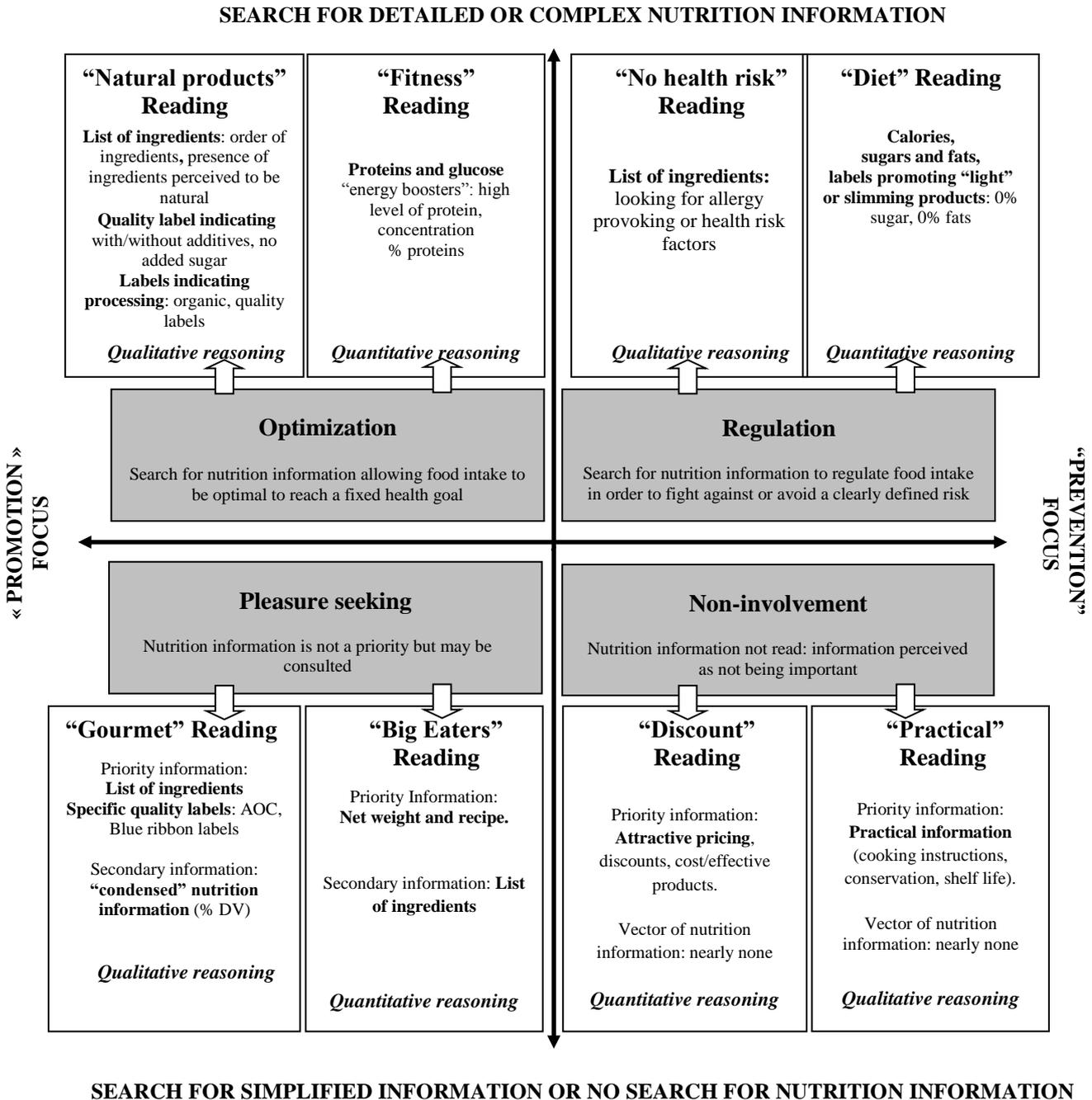


Figure 2. Food product selection process and main on-pack vectors of nutrition information

DISCUSSION AND IMPLICATIONS

Using the various types of on-pack nutrition information to evaluate a product's contribution to the construction of a daily diet is a complex and daunting task even for knowledgeable and motivated consumers (Burton, Garretson, & Velliquette, 1999). This article proposes a general framework which offers a better insight into the reasoning used by consumers when reading nutrition information. By identifying eight reading heuristics impacting food choices, we emphasize that there is not *one*, but *many* specific ways to read information depending on the food consumption goals set by individuals. This work has several implications for scholars, policymakers and managers.

Theoretical implications

Inference bias and public health risks. This research completes existing work on inference bias impacting food choices. More specifically, we put forth three inference biases impacting consumers decisions (figure 3) resulting from the reading heuristics. These inference biases not only lead each consumer profile to make less than optimal food choices concerning nutrition, they also create both physiological and psychological risks.

The first inference bias comes from the four reading heuristics motivated by “pleasure-seeking” and “non-involvement” orientations. In disobeying nutrition rules and ignoring on-pack nutrition information, these consumers underestimate the quantities and calories of food products. This “underestimation bias” or “optimistic bias” (Scaife et al., 2006), widely identified in the literature, can lead consumers to over-consume certain high calorie food products (Aydinoglu & Krishna, 2011; Coehlo do Vale, Pieters, & Zeelenberg, 2008; Mohr et al., 2012; Scott et al. 2008; Wansink & Chandon, 2006). These reading heuristics can also result in an underestimation of the consumption of health risk nutrients, especially if they are over consumed (e.g. salt, fats, sugars).

Thus, the underestimation bias reinforces consumers' physiological risks involving excess weight and obesity. Moreover, when food choices are motivated by "pleasure-seeking" goals at the expense of vital nutrients, they can create psychological dependency conditions such as bulimia.

The second inference bias comes from reading heuristics motivated by the respect for nutrition rules which are prohibitive. The search for low-calorie, low-sugar, low-fat content or products having low health risk factors can lead consumers to over-regulate their consumption of nutrients considered by the rules to be harmful. By overestimating the importance of these factors in products, these consumers will underestimate nutrients necessary for a balanced diet. This over-regulation bias of one or more elements considered harmful can create physiological risks due to dietary deficiencies. These consumers forget that a certain amount of "undesirable" nutrients must be included in their diet in order to stay healthy. In extreme cases, since prohibition creates anxiety, consumers can feel driven to focus on negative key factors in their reading of information. This can result in a sort of food paranoia such as lipophobia or anorexia, especially in young people since they do not have the necessary knowledge or expertise to have a global understanding of the complex challenges and stakes involved in nutrition.

Finally, a third inference bias comes from the "pro-natural" and "fitness" reading heuristics. The pro-natural strategy used in information processing leads consumers to favor a specific list of ingredients, quality labels and organic production in particular. While this reading heuristic shows a high degree of nutrition awareness, it can also lead consumers to under-estimate fat and sugar content, as well as salt content in products. Therefore, by over-optimizing the effects of nutrition factors considered to be positive, these consumers may under-estimate the excessive amounts of other nutrients. Furthermore, in choosing "natural" food, these consumers are assuming that it is healthy food. They are therefore more sensitive to health claims and may underestimate the calorie content they actually consume (Andrews et al., 1998; Chandon & Wansink, 2007a; Bone & Russo, 2009;

Finkelstein & Fishbach, 2010; Garretson & Burton, 2000; Grunert, Sholderer, & Rogeaux, 2010; Kozup et al., 2003). This reading heuristic, in extreme cases, can also lead consumers to underestimate bacteriological health risks associated with this kind of food selection. Similarly, an over-optimization of daily amounts of protein or energy could result in an excessive amount of protein with possible kidney damage to those individuals who follow a fitness reading strategy. Finally, over-optimization of food is also a source of anxiety and may psychologically make consumers more vulnerable to false health claims made by unethical manufacturers.

In the long term and beyond the immediate decision making process, these nutrition information inference biases create both physiological and psychological public health risks. By identifying risks coming from the three identified inference biases, our study emphasizes what current research may have overlooked: a balanced food diet can only be evaluated over a long period of time. Moreover, it must be pointed out that current studies, in focusing solely on the risks leading to obesity while ignoring over-regulation bias, are putting aside major public health issues such as the fight against anorexia, risks linked to food paranoia, and serious nutrition deficiencies due to weight loss diets.

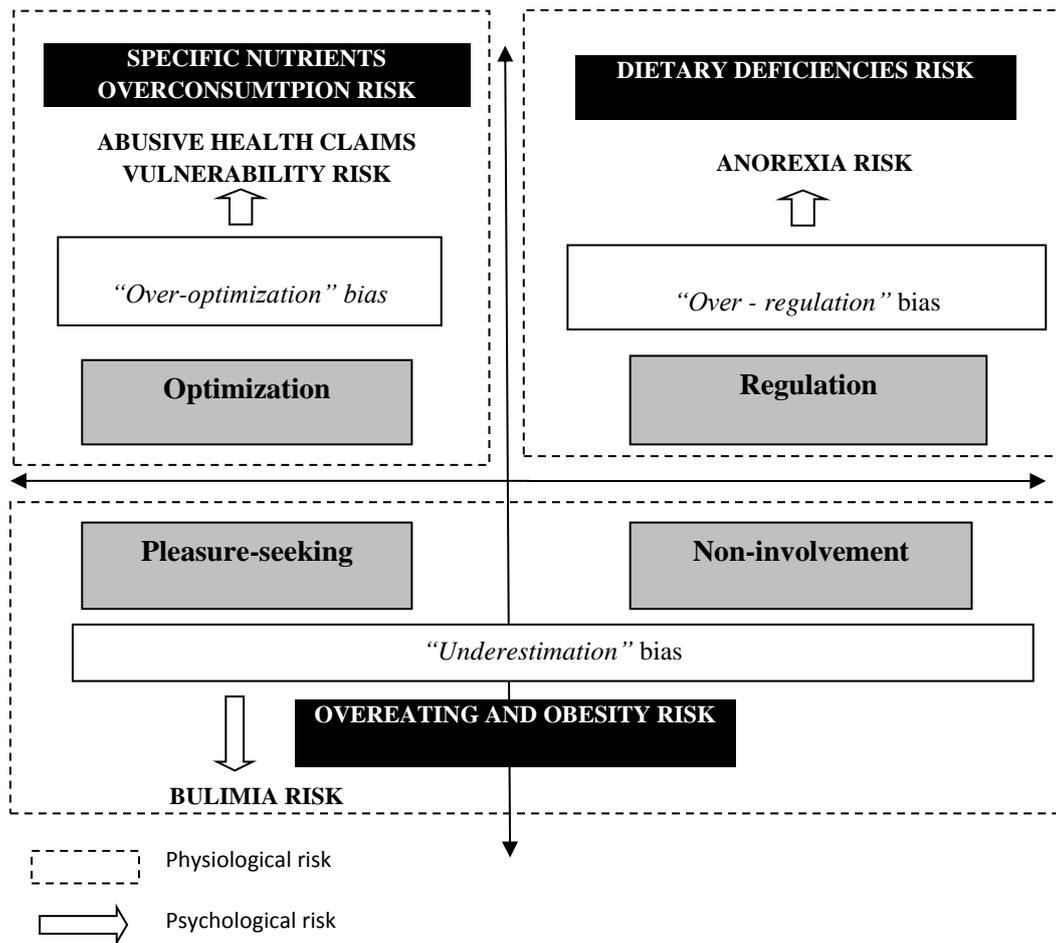


Figure 3. Inference biases and health risks generated by the reading heuristics

Nutritional motivations and new market segmentation. This research confirms the major role played by motivation in the processing of on-pack nutrition information. Though some consumers may know how to select and interpret available information correctly, this does not mean that they will feel motivated to read it or use it in their decisions concerning food product selection (Grunert et al., 2010; Bates et al., 2009). Consumers must be motivated, through personal goals or physician's recommendations, to examine the nutritional fact panel on food products (Grunert et al., 2010). Following this research, our work shows that the main motivation, often underestimated, is the food consumption goal which the consumer has set for himself. Therefore, more than the transparency of the nutrition information which is available, it is, above all, how this nutrition information is *relevant*

for consumers and how it *relates* to their individual nutrition objectives which is vital to the understanding of how consumers read the information (or not).

Our study also differentiates itself from previous studies in that it emphasizes that consumers can't be homogenous in terms of food consumption goals and that these differences impact their processing of available on-pack nutrition information. Therefore, we invite future researchers to consider and integrate multiple types of reading strategies which are used by individuals to process nutrition labeling in order to provide a new food consumer segmentation.

Implications for policymakers and for food manufacturers. Beyond theoretical import, these findings have several implications not only concerning public policy but also for brands wishing to improve and affirm the nutritional quality of their food products and their positioning for a win-win exchange with their consumers.

Further to previous research (Moorman, 1998; Burton et al., 1999), this study points out that providing standardized nutrition information is not enough to change the consumer decision-making and food habits. To be effective, nutrition labeling must be read by the consumers. To promote reading of nutrition information, the content must be perceived as relevant and therefore adapted to the nutrition goals pursued by the consumers. Our research recommends that the messages of nutrition labeling be adapted to fit the marketing positioning of food products so as to give a coherent message which is in line with the specific goals pursued by the targeted consumers.

For instance, to support campaigns aimed at increasing the consumption of fruits and vegetables, public authorities could set up a labeling policy inciting some food manufacturers to highlight specific nutrition claims on the FOP in order to bring out the nutritional value of their products (such as "purées" or mashed fruit, stewed fruit, oven ready vegetable meals, canned fruit, etc.). These

nutritional claims would have to be adapted to the targeted readers of the product and their specific nutrition goals. For consumers who are aware of the stakes involved in nutrition (optimizers or regulators), our research strongly suggests adapting the message content to the consumer focus (preventive vs. promotion) in order to make it more relevant for the target audience. More specifically, to reach promotion-oriented consumers who pursue “natural health” or “fitness” goals, claims such as “vegetables are naturally rich in trace minerals and vitamins”, or “fruits give you energy”, could be tagged on products that are organically grown vegetable or fruit-based products. On the other hand, *prevention-oriented consumers* will be more sensitive to a campaign which promotes fruit and vegetable consumption as a way to “avoid weight gain” or as “a measure to prevent cardiovascular diseases”. Public authorities could encourage claims to be put on the FOP which would include “light” fruit or vegetable-based products marketed for individuals following a weight loss diet or products aimed at individuals following a specific health diet (to lower cholesterol levels, gluten-free diets, etc.) Specific information such as “fruits are gluten-free, they are essential to maintaining your health”, could also be tagged on stewed fruits marketed as “gluten-free” products.

Such messages, however, target consumers who are already aware of nutrition and of its importance in choosing their food products. More specific actions have to be considered for those who are uninterested in following nutritional measures, the pleasure seekers or non-involved consumers, whose food goals involve mainly “pleasure-seeking”, “financial”, or “practical” concerns. Our research emphasizes that information will have to be formulated in keeping with the different approaches to food when dealing with those consumers who show little interest in nutrition and the health stakes involved. For example, food manufacturers could add a message such as “vegetables are going to surprise your taste buds!” on the front of their products (highlighting premium quality fruits, vegetables produced locally, or a specific know-how suggesting excellent quality, the surprising variety of taste and ingredients) so as to reach out to the pleasure seeking consumers. As

an additional measure, government authorities could organize local events which would link “taste” with “nutrition” by using a simple tool such as a blind-test. Consumers would be invited to taste food products without seeing them and then rank them according to estimated nutritional quality. At the end of the test, the organizers would disclose the brand names along with simple nutrition information concerning calorie, salt, sugar and fat content. To target “discount” and “practical” oriented consumers, "Ready to Eat Fruits!" could be tagged on low cost stewed fruit, for example, to emphasize the practical aspect. This type of labeling could be developed alongside a specific contest designed for these consumers. They would be invited to collect nutrition information of products in big distribution outlets and exchange their “collected information booklet” for sales coupons in participating brand stores. A last suggestion for nutrition awareness campaigns would be to target the "practical" oriented consumer in order to guide them away from readymade meals. To undo their preconceived ideas concerning home cooking, easy-to-make menus and recipes for well balanced meals could be made available to them. Shopping lists could also be prepared with the ingredients necessary for these meals in order to save shopping time for these consumers.

In addition to the fight against obesity, a second vital public health issue would be to re-educate nutrition information readers who have a “regulation” reading orientation and a “forbidden fruits” mindset. This re-education is especially important for young women who may have a tendency towards anorexia or for people tempted by diets presented in the media which promise rapid weight loss through disassociated food diets. It is essential to remind them of the importance of eating pleasure and the value of a balanced diet which is rich and varied in its nutrients. The stakes involved here are high as this concerns very vulnerable segments of the population who are subject to nutritional deficiencies linked to their over-regulation of food. More generally, our findings confirm that the source of the paradigm for an awareness campaign must evolve away from the emphasis on

restraint and restrictions and towards a more positive, holistic understanding of the role of food in a person's overall well-being (Block et al., 2011). To forge this paradigm shift, the concept of "food well-being" introduced by Block et al., (2011) - defined as a positive psychological, physical, emotional and social relationship with food at both the individual and societal levels – seems to be a relevant approach.

These results also underline both the importance and limits of a single standardized format - the Nutritional Facts Panel - which is already subject to discussion in the literature. Moorman (1996) states specifically that the NLEA creates a nutritional-information environment that is more easily understood by less knowledgeable consumers. However, Li et al. (2000) found that differences in participants' nutrition evaluation were in fact accentuated by the new label. This work points out that, though standard formats of labeling may be useful, the help they offer in consumer decision making is limited. The standard format satisfies each profile *a minima*, without giving specific information required by each profile in order to guide his or her choice. The single format currently used in the US, ideal for "regulator-consumers", bases its nutrition message on factual data which pushes away non-initiated consumers who do not feel like wading through all the information. The advantage of this kind of format is having a limited number of statutory facts which leaves brands free to simplify or make information more complex, though room for maneuver is limited.

Lastly, the food industry or brand commitment to better nutrition can only happen if the available information is used by the consumers. It is with the targeted profile of the reader, not the profile of the eater, that nutrition messages must be formulated. Brands can use nutrition information as a strategic leverage in their positioning on the markets and reinforce strategies regarding customer

loyalty. However, if brands base their nutrition message on promises which are not backed up by real characteristics found in their products, they risk losing credibility. Such is the case, for example, concerning products which claim low sugar content and which continue to have high fat content. Likewise, a nutrition message which is partially ecological and only partially transparent when putting forth specific positive components while omitting other negative ones, could be considered as a “*nutritional washing*” strategy constituting a real threat to brand capital and customer capital.

Limitations and further research. Future research should be conducted to address the limitations of our study. First, though the size of the sampling is acceptable for a qualitative study ($n = 23$), the external validity of our results must be established. More specifically, it would be interesting to quantify the representativeness of the reading profiles types brought forth in this study on the scale of the French population and to verify whether the results could be generalized to other countries and cultures. Second, the impact of religious beliefs has not been taken into account in this study. Future research should explore the effects of rituals and religious prohibitions on nutrition rules which are applied, and the biases which are created. Lastly, it seems pertinent to study closely the weight-loss diets as a particular consumption context in which reading nutrition labels is a focal point. Subsequent studies could investigate the role of nutrition labeling in this specific context and study the impact of weight-loss diets on the attitude of consumers towards nutrition rules. This work would allow for a better understanding of the learning process and the problems involved when processing the concept of a “balanced nutritional diet” for these consumers. Such a study would thus bring to light the limits and risks implied in weight loss diets which concerns millions of people worldwide.

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