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How Cognitive Maps May Help Understand Consumer Attitude?

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Introduction

At the beginning of this research, we had in mind the low consumption level of fruits and vegetables among French young people despite several months of intense exposure to health messages, such as "eat 5 portions of fruits and vegetables every day". Studies show that French young people have memorized the messages, but did not alter their eating habits. Our major hypothesis was that some "mental blocks" might be curbing fruit consumption, and removing them might increase consumption. Similarly we thought that some "mental levers" if well activated could increase fruit consumption. Identifying "mental blocks" and "mental levers" related to fruits became our research goal.

To achieve this objective, building the cognitive map of the fruit universe appears an appropriate method. In the process of constructing the map we discovered that we could also assess, although imperfectly, how people have formed their mental representation over the courses of the years.

1. Mapping "mental representations" : background and methodology

It is relatively uncontroversial that people subjectively perceive rather than objectively see the world: current information, prior knowledge, reasoning etc. affect their perception as well as the context they see. Then, contemporary cognitivism contends that the mental representations of things are key determinants of our behavior. Although representations are individual specific, main components can be shared by many and cognitive science aim to detect how they work, are formed and affect our decisions.
Specialists tell us that representations are stored into our memories under different forms depending on their content and their learning context. For example, fruits representations can be formed and transformed through personal experiences, which are usually divided into regular personal experiences and exceptional personal experiences. An everyday lunch at the school canteen is a regular personal experience, while the first lunch at the school canteen could be remembered as exceptional. Regular lunches at the canteen are stored in and recalled from our memory as "script" (schematic representation) in which details of a specific occurrence are forgotten. Whereas exceptional lunches at the canteen are stored differently; their details could be much more easily brought back. Memories do not store facts but their perceptions. And opinions formed later about these can't be retrieve independently of their storage, into webs of representations. Remembering first lunch at the canteen depends also on regular lunches memories; remembering regular lunches don't go without the first time at the canteen as a first sight impression. This is a caveat when doing researches in this area: speaking about one past event or one regular fact always refers to intricacies of personal mental representations. This highlights that, between two persons' mental representations, gaps do exist.

We believe that marketers should take these gaps into account and identify whether they have same views on reality than their target consumer. That's why brand marketing managers at a major biscuit company incidentally discovered that there was into their target population an insufficient linkage between the concept "biscuit" and the concept "cereal", while the associations between "biscuit" and "butter", "sugar" or "egg" were very strong. Building a strong linkage in the consumers' mind between "biscuit" and "cereal" (which itself possess a positive content) was key to the success of their new brand positioning.

Another example is about fruits consumption. While setting up polarized categories for a Implicit Attitude Test (IAT) a researcher discovered that many food categories, such as "Yogurt", were somehow associated with "Snacking", but fruits were not (Grall, 2008). This provides an interesting opportunity to increase fruits consumption by deliberately associating "Fruits" and "Snacking" for a TV advertising campaign.

In this research, we aim to explore what sort of tools and methods can be used to investigate inner representations, then making an application for fruits consumption.

A product such as "fruit" is linked to a concept "fruit/fruits" associated to various representations. One way to explore inner representations is to consider them on a map -- called a cognitive map[1]. Building a cognitive map needs a two step process:

1. People representations are first extracted with verbalization techniques
2. Found components are then drawn into a map.

These two steps must be iterated many times until a stable map is obtained.
A building block of the map is made of 3 items: a concept or construct is associated by a link to a second concept or construct. Links are of different type such as structural attributed or causal effect relationships. Vitamins are structurally linked to fruits because fruits are perceived as a good source of vitamins. Vitamins are associated to "vitality" trough a cause and effect mechanism.
Tversky and Gati (1978) found that comparisons between two components are usually asymmetric; for example, degree of similarity of items A and B, are different when comparing A to B and comparing B to A. This finding suggests that link between concepts should be assessed in bidirectional way to extract the essence of the relationship between them. This could also help researcher detect an intermediate item.
All links between components do not appear during the initial verbalization stage. The current map then serves as an intermediate tool to question the existence of possible interactions between constructs that have already been identified. As well, missing blocs can be detected.

1. Cognitivists refer to knowledge mechanisms, including effects of feelings, emotions, fears, etc. Unconscious brain mechanisms have to be explore as well as conscious ones.

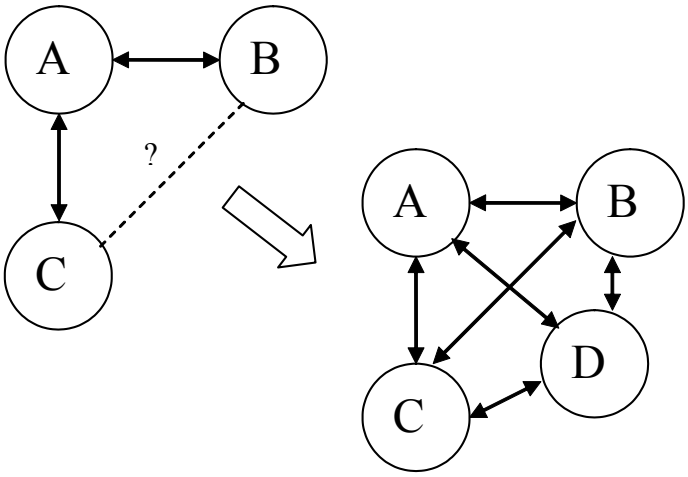

Figure 1. Questioning the intermediate maps

The base units of the maps are concepts (represented by circles, Figure 1), such as objects or ideas. Concepts often *frame* each other. For example, a "seat" is relatively independent of a "house". But a "roof" requires a "building". Then thinking of "roof" is generally extended by the representation of a building (although a "seat" is relatively independent of a "building"). Following Zaltman (2004), we then define "constructs" as combinations of concepts that make sense. While concepts can be natural (e.g., a dog) constructs are always human representation (e.g., *expansive*).
The same concept may be attached to several constructs: "Building" have different shape, size, etc, and can named as "house", "apartment building", "Tower", "movie theater" ; but they all have parts named in the same way (e.g., a "roof"). As a practical impact on our research, vigilance is required when using constructs, because researcher's own representations play necessarily a role in elaborating them. A construct just should relay a majority of the subjects' point of views.

Are individual representations similar or are they specific?

Answer to this question has critical practical implications: how many levers and blocks are shared by many consumers, and many by only a few?
Results of verbalization step show that some concepts are widely shared between subjects, while some are not. For example, the association "Fruit – Vitamins - Vitality" seems to be widely accepted among our target group, although "Vitality" has rather individual specific representations, i.e. the word "Vitality" encompasses a large range of autobiographic cases:

- Change of state: "awake", "afternoon boost"
- Increasing my potential: "charge my batteries", "reserve of energy for the day"
- Fighting the harsh conditions of winter (or work): "in winter our body is under attack by adverse weather conditions"

These changes are often substantiated by <u>personal</u> observations:

- On oneself : better looking skin
- On other : intellectual or physical prowess

Though we find a variety of autobiographic situations, "Vitality" is mainly a shared construct: people think of a common meaning that is close to "dynamism". Then, a practical implication is that a unique lever can be applied to increase the consumption of fruits in the population. When an advertisement claims "vitality", most people can activate a prior personal representation that goes in the sense of the message.
On the contrary, fruits are often considered as "too expansive" in different meanings[1]:

- "Affordability" : comparing price to revenue
- "Nourishing-Hearty food product" when related to satiety, spending for a fruit appears less attractive comparing to other food products ("more heavy").
- "small", quickly eaten
- estimating the "Labor content" of the fruit from tree to households
- "Heterogeneity" of prices among fruits categories
- General "Price increase"
- "Spoilage" of fruit, while it has been paid.

Marketers who would like to remove the "expansiveness" block by mentioning the labor content will only catch the attention of a few consumers and probably not the attention of people who associate "expansive" with "spoilage." Levers are different. Mental blocks linked to the opinion "too expansive", although having a single manifestation, cannot be merged into a simple construct and easily removed.

At first, we thought that a unique cognitive map for "fruits" should be the most instructive way to find mental blocks and levers in fruit consumption representations. Though, after verbalizations (step 1), the constructs we found referred to such a diversity of meanings that it became impossible to reasonably treat them as a whole. Then focusing on a single topic is a way to better visualize mental blocks and levers (see section 3 for a cognitive map about the impact of health messages).

Although, some constructs such as "expansiveness" have different precise rationale, there is a common idea, i.e. the perceived value is inferior to the price. What enters into the perceived value is however different between consumers.

2. What *more* consumers have to say about fruits?

According to cognitive sciences, thinking of a word activates step by step many others that are associated in one's mind. To build a cognitive map, we just interview people about the associations of ideas they have in mind when thinking of fruits, in the different circumstances of consumption (going shopping, choosing, eating, etc.)
To go beyond first impressions and superficial talks, Zaltman (2004) recommend performing semi-directive interviews. they are flexible enough to grasp personal links. No need of many interviews, nor representative samples: everyone has his/her own view, and we can't envisage a generalization, except by the means of "constructs" that require less quantity than quality of

1. But, when questioned about their rationale for the link between "Fruits" and "Expansiveness", only some subject can provide one; for others this is (or "should be") "common knowledge". W e believe that is partly due to a "social contamination", especially with the media acting as the vector of such messages.

personal information (especially on details about the construction of the representations).
We carried out 8 individual interviews[1] that lasted from 15 to 45 minutes, and a few 5 minutes informal talks with other persons. In practice, duration doesn't seem important in comparison of the progress of the interview because of two constraints. The interviewer has to be as neutral as possible and, in the same time, fairly stimulating in order to get details about personal opinions. Introducing our motives to the interviewees, we have to establish a climate of confidence, highlighting "it's not a quiz, it's just a way to share point of views" or any appropriate neutral formulation. Then people speak in their own name, and not only about what they heard or believed as a collective truth. Speeches generally finish in a natural way after having reviewed the most important topics according to the interviewee.
Afterwards, many respondents tell us that the interview was "fruitful" for them, because they generally didn't asked themselves about fruit consumption and discovered more deeply their own way of thinking their habits and decisions. In particular, someone said that during the interview he found a personal solution to eat more fruits (to him, preparation of fruits was annoying especially before eating it; then he could try another organization for preparation).
Three topics were most discussed.

1. Personal experiences with specific fruits are easily told (eating apples at office, orange juice during breakfast, "the" expected melon in summer, convenience of bananas when being outdoors, plum tree in the familial orchard, etc.) It's either particular events or habits, often related to childhood or opposed to, or to social examples. An atypical example is the experience of a young manager. Fruits usually eaten by many top-managers at his company were given a special status: they were the special key to enter the inner circle or the symbol of success. Eating fruit in public (like other members of the team) seems to be forbidden unless you were invited to do so.

2. Memories of exceptional or regular events often induce present attitudes toward fruits. For example, a fruit at the end of a meal may be seen as a nightmare. Some subjects mentioned that while they were young they often wanted to leave the family table but they were obliged to stay and eat fruits. Fruits are still symbol of their past "privation of liberty."

3. Proximity or not of specific fruits. When going shopping, people mainly don't want to make effort to find the specific fruit that will be a great pleasure for them to eat. They just buy fruits they find in their general store or just at a few steps from home.

When listening to these statements, a question came: is it just an instantaneous experience that may determine what sort of liking, disliking or expectation we have for a specific fruit? Asked about it, people say that their education played a great part in positive or negative representations they have for fruits – and education can here be the mere presence of a fruit basket filled in the kitchen. Not only a specific fruit, but fruits in general seem to enter in the universe of a person if it was first brought by a "good" hand[2]. This good hand is typically and originally mother Nature.
Fruits are, in the majority of interviews, related to their natural source before being an economic product (see appendices). Nature is a symbolic construct that can lead to many interpretations. These are generally shared as a collective meaning.

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1. ages of respondents : from 20 to 57; persons who regularly eat fruits or not.
2. that is to say fruits that are free? We suppose this link true but didn't get it explicitly during the interviews.

It should be interesting to collect those meanings and, if applicable, their influences on fruit consumption[1]. Here we just study proper senses of fruits and their associations, and especially in the health area, that is pointed by some nutritional messages.

3. Detecting some mental blocks and levers related to the performance of health messages

A major national nutritional message in France deal with fruits and vegetables consumption[2].

Fruits et légumes : au moins 5 par jour
À chaque repas et en cas de petits creux, Crus, cuits, nature ou préparés, Frais, surgelés ou en conserve.

Figure 2. Example of a French nutritional message that was largely spread

* "Fruits and vegetables: at least 5 (portions) every day"; at each meal or as a collation; all sort of preparations.
** Sometimes shorted as: "Eat 5 fruits and vegetables every day."

People now remember well this short sentence "Eat 5 fruits and vegetables every day", especially population who were exposed to TV advertisements (young people in particular). But according to many, although they know the message and believe it is true, they don't follow this as a personal rule! Why? During our interviews, we get some hints.
For one particular topic such as the health concern in fruit consumption, verbalizations can be summarized on one cognitive map. See it on next page. Below are comments about its construction.
According to the interviews, health messages may bring information about fruit contents, suggest their healthy power, or can be seen as a norm ("I should eat 5 fruits and vegetables every day"). It seems they affect 3 main parts of the fruit representation:

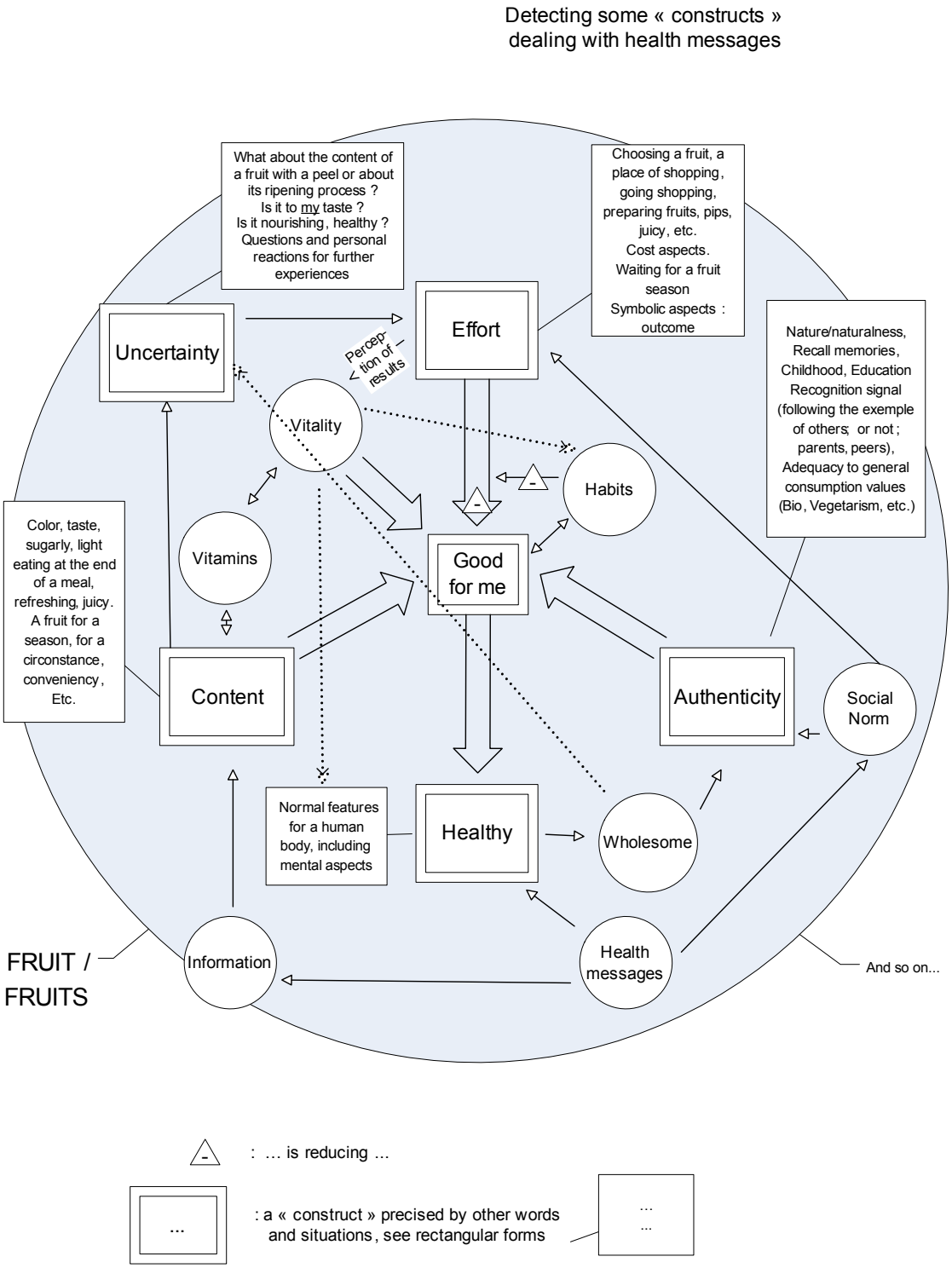
1/ the content of a fruit,

2/ authenticity of the product,

3/ efforts one has to make to follow the recommendation.

1. "Fruit" have also direct symbolic meanings that were pointed during interviews, especially fruit as "outcome" or "the icing on the cake" that is said in French : "the cherry on the cake".
2. In the national health and nutritional programme, « Programme National Nutrition Santé », since 2001.

A collective cognitive map for « FRUITS »



”Authenticity” (see the map for a description of this construct) seems to be strongly related to the “healthy” properties of the product. Though, interviewees base their consumptions decisions mostly on a personal definition of a healthy product, believing or not what they heard about it. On the cognitive map, we figure this script as an asymmetric link between “Good for me” (representing the consumption choice background particularly when a decision has to be taken) and the “healthy” concept. A product “Good for me” do mean “healthy” in most of cases (and

among other relations), whereas "healthy" means "Good for me" only if the product is also judged as "authentic" with personal values. Most interviewees that were used to eat fruits outlined that their habit was first due to *personal values*; then "luckily" conformed to nutritional recommendations. As the "healthy" concept that is transmitted by health messages may not be related to personal "weighted" views, in this case this concept is more likely to properly mean "wholesome" in the mind of consumers. According to this interpretation, a lever for public health authorities may be to underline guaranties of "wholesomeness" for fruits products.

Furthermore, "healthy" is to be distinguished from the perception of "vitality" and energy (in the sense of "feelings of dynamism") that comes mainly by fruit consumption experiences – particularly in regular consumption -- and/or by the interpretation of the content in "Vitamins". "Vitamins" seem to be the magic word for all fruits, although when asked about it, subjects say that mainly "oranges" and "kiwis" have vitamins (What about the other fruits?) Many persons don't know exactly what amount of vitamins (or energy) the other fruits contain. "And do you then eat mostly "oranges" and "kiwis" to get vitamins?" Answers are often: "no, I prefer to eat other fruits".

Cognitive sciences point many sorts of cognitive "bias" likely to appear in one's reasoning, or in one's verbalization. This constitutes one major limit of the verbalization method, but in the same time has a specific interest. Indeed, during the interviews, most of the subjects mentioned things that weren't consistent. We didn't point it explicitly to them during the interview, regarding the neutral position of the interviewer, but some of them realized it by themselves and tried to explain those dissonances. In most of the cases, inconsistency was based, according to the subjects, on "too vague" elements along their reasoning: "I don't know exactly", "I supposed it due to a personal view, but I didn't get any information about it".

All this recalls that when someone is encouraged to think freely about its personal attitude, as we did in a few minutes through the semi-directive interviews, it may induce a learning attitude (in the sense of updating information that is part of the mental representations). It suggests that some levers can simply and quickly be activated.

What levers could be activated and blocks could be removed?

First, links appearing on the map can be enhanced by action verbs: "making efforts", "having a habit", "searching for authenticity", "getting information", "hesitating because of uncertainty": these are actions that everyone do regularly. Marketers must take them into account and attend them. For example, take "uncertainty". This is a multi-facets construct. If we consider the uncertainty related to "tastiness", which seems to be a major concern, a retailer may allow tasting fruits before buying them; uncertainty for the consumer is therefore largely reduced. One interviewer has observed this practice on a local market. According to the seller offering slice of fruits is the best way to increase sales. Observations show that the seller does it for relatively high priced fruits.

Second, subjects seem to update easily their attitude toward fruits when new *valuable* information is provided. *Valuable* pieces of information are directly included into the subject current reasoning chains. If information is not directly incorporated in the current reasoning processes, then it tends to be discarded, although it can be considered on theoretical ground as valuable, e.g., to optimize satisfaction. But that each piece of information or the lack of information[1] can

1. For example, one subject considered the fact that bananas traveled a lot as a disturbance for her militant ideas about the environment, although she believes that banana is a convenient fruit and likes it. Does banana transport really pollute a lot the planet? Does it constitute objective facts and figures? She asked herself about it. The same about the ripe of banana that is, for her husband also interviewed, very likely to be unfinished at the moment of gathering. "Is it "biologically" a good thing or not?" was his personal question. Uncertainty about true information was for them an incentive not to eat certain products -- including bananas -- in case of risks for themselves or the planet!

have a positive or a negative impact on consumption! Informative messages must be well designed to fit into consumers' reasoning, even if the reasoning does not look rational. Their impacts must also be carefully tested. Changing consumers reasoning (e.g. relationship between vitamins content and vitality) or their value system (e.g. the importance of vitamins) seems to be more problematic than just updating their information base (e.g. the relative vitamins content of foods).

At this point, we do not know from the cognitive map if some levers are better than others. Cognitive maps are useful to identify levers and blocks, and to monitor cognitive "scripts" and "scenarios" that are commonly shared among the population. Grall (2008) found that "Fruits" were not associated to "Snacking" but they were rather associated with meals. Our interviews confirm Grall's findings. We believe that "Fruits" can be presented as a *healthy* alternative to traditional "snacks" because the cognitive map points their healthy, authentic attributes (e.g. we suspect yogurt have already reach this position among young French adult). Convenience and taste seems to be major blocks for this new positioning.

4. Conclusion

We have investigated whether cognitive maps can be elicited as a tool to help marketers in their goal to explore food consumption motivations, taking fruits as a showcase. a cognitive map is simply defined as a network of concepts, constructs and rules. They are built using verbalization techniques conducted during semi-directive interviews.

Although such results cannot be considered as sound scientific findings, they reveal interesting hypotheses about individual and collective representations of "fruits" in a simple and quick way. This method helps the researcher to catch rapidly part of the diversity of representations among a population or what is commonly taken as a truth. Mental blocks and levers can be identified for a specific topic such as health messages.

We found that auto-biographic events, regular (e.g., habits) or exceptional are very important in the making of our personal representations while knowledge provided by other sources seem to have only a few localized contributions to the whole map. We also discovered that the construct "good for me" is central to food consumption, and it is a combination made of different constructs. Health is not the first motive to eat fruits. We eat fruits for other reasons, and we are happy they are healthy products.

The interviews we made revealed additional mental blocks and levers, in relation to the constructs we didn't detailed in this presentation.-Further interviews could also point symbolic aspects of fruits and more unconscious associations.

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