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A concept mapping study on organic food consumers in Shanghai, China

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Abstract

Despite some similarities with developed countries, however, the growth of organic market in China seems to follow a different path. Thus, important questions are how Chinese urban consumers perceive organic food, and what are the main concepts associated to the organic attribute.

We aimed at representing in graphic form the network of mental associations with the organic concept. We used an adapted version of the "Brand concept mapping" method to acquire, process, and draw individual concept networks perceived by 50 organic food consumers in Shanghai. We then analyzed the data using network and cluster analysis to create aggregated maps for two distinct groups of consumers.

Similarly to their peers in developed countries, Chinese consumers perceive organic food as healthy, safe and expensive. However, organic is not necessarily synonymous with natural product in China, also due to a translation of the term that conveys the idea of a "technology advanced" product. Organic overlaps with the green food label in terms of image and positioning in the market, since they are easily associated and often confused. The two groups we identified show clear differences in the way the organic concept is associated to other concepts and features.

The study provides useful information for practitioners: marketers of organic products in China should invest in communication to emphasize the differences with Green Food products and they should consider the possibility of segmenting organic consumers; Chinese policy makers should consider implementing information campaigns aimed at achieving a better understanding of the features of these quality labels among consumers. For researchers, the study confirms that the BCM method is effective and its integration with network and cluster analysis improves the interpretation of individual and aggregated maps.

Research paper

Keywords: consumer perception; concept maps; network analysis; cluster analysis; qualitative research; China; organic food

1. Introduction

The development of the organic market in China is in its early phase. The implementation of the national standard supported organic farming growth, and currently China is the country with the fourth largest area of certified organic land in the world, although the share (0.37%) of agricultural land under organic farming is still very small (Willer & Lernoud, 2016). However, despite organic farming in China increased dramatically, it is largely an export-oriented industry (Taylor, 2008).

Chinese culture differs significantly from western and other Asian cultures, so consumers have different values and a different perception of product attributes (Del Giudice, Caracciolo, Cicia, Grunert, & Krystallis, 2012; Huliyeti, Marchesini, & Canavari, 2008); for this reason, similar purchasing behaviors may underline different motivations from those that might be expected by western observers. Studying directly the issue of organic perception in China is also important for the unique situation of the market. Although growing fast, the organic market in China is still a niche, and it has not reached a mature identity (the domestic market share of organic food was less than 0.4% in 2007, and reached an estimated 1% share in 2012). Moreover, its shape is still affected by the continuous food crises and scandals that strike the country (not to mention the problem of fraud, which remains an ever-present concern in China, with companies falsely advertising pesticide-treated produce as organic), hence the changes it is undergoing in the mind of consumers are worth monitoring. These matters of fact erode the enforcement capacity and consumer confidence towards local productions, both of which are essential for a functional organic certification system. Food safety is therefore an ever-present concern for a large share of consumers in China (Wang, De Steur, Gellynck, & Verbeke, 2014; Wu, Wang, Zhu, Hu, & Wang, 2016; Wu, Yin, Xu, & Zhu, 2014; Wu, Zhong, Shan, & Qin, 2013). Finally, the value-added and quality food market in China is also characterized by the presence of certifications that are present only in this country, and that “compete” with organic in terms of market positioning and image (i.e., the

Chinese Green Food label). Perrea et al. (2014) analyzed Green food in China using a hierarchical values-attitudes model and they show that Green food is actually perceived by consumers as safer to consume, and that a positive perception of both food safety and environmental friendliness is linked to technology. Other "safe food" labels and their interaction with organic food have been studied by Liu et al. (2013), who highlighted consumers' limited knowledge and low recognition of the relevant labels.

Therefore, the growth of the organic food market in the China's emerging economy seems to follow a different path of development compared to countries where the organic industry is now well established. In the latter countries, organic farming and organic food were initially popular among consumers mainly motivated by ethical and environment-related concerns, which later became more and more popular among mainstream consumers. In this situation, it is reasonable to assume that motivations, beliefs and attitudes of Chinese consumers may differ from those of consumers in developed countries. Thus, it is important to explore how Chinese urban consumers perceive the organic attribute for food and what are the main concepts associated with purchasing and consuming these products.

While a large number and variety of studies on organic consumers in Europe, USA and Australia and extensive reviews are available (Aertsens, Verbeke, Mondelaers, & Van Huylenbroeck, 2009; Aschemann-Witzel & Zielke, 2015; Dimitri & Dettmann, 2012; Hemmerling, Hamm, & Spiller, 2015; Schleenbecker & Hamm, 2013; Yiridoe, Bonti-Ankomah, & Martin, 2005), comparatively little is known on consumer's perception of organic foods in Asia (Bayaah & Juhdi, 2010; Canavari & Wongprawmas, 2012; Darby, Batte, Ernst, & Roe, 2008; Lombardi et al., 2010; Moen, 1997; Nelson, 1991; Roitner-Schobesberger, Darnhofer, Somsook, & Vogl, 2008), and not much information is also available for China from the existing literature.

Some of the available papers summarize the stages of development of the Chinese organic and green food industry in China, describing production bases, market conditions, international trade, and certification systems (Lu, 2002; Marchesini, Huliyeti, & Spadoni, 2010; Sheng, Shen,

Qiao, Yu, & Fan, 2009; Xie, Li, & Yi, 2011). These authors largely agree that the growth of organic food consumption is due to the growing affluence of Chinese consumers, a rapid development of living standards, an expanding community of foreigners, and to increasing concern on food safety.

Other works focus on organic farming, considering mainly issues related to production and rural development (Giovannucci, 2005; Oelofse et al., 2010; Thiers, 2002).

Some previous works use quantitative methods based on consumer surveys to analyze consumers' attitudes and expectations (Loebnitz & Aschemann-Witzel, 2016; L. L. Zhou & Chen, 2007), purchase intentions (J. Chen, Lobo, & Rajendran, 2014; J. Chen & Lobo, 2012; McCarthy, Liu, & Chen, 2015; Thøgersen, de Barcellos, Perin, & Zhou, 2015; Thøgersen, Zhou, & Huang, 2015; Thøgersen & Zhou, 2012; Xie, Wang, Yang, Wang, & Zhang, 2015; Yin, Wu, Du, & Chen, 2010; Y. Zhou, Thøgersen, Ruan, & Huang, 2013), and willingness to pay (Wu et al., 2014). Results show a positive attitude towards, organic food, but findings regarding the relevant factors affecting consumer interest for organic food are mixed. Many papers agree that health and food safety concern plays a relevant role (McCarthy et al., 2015; Xie et al., 2015; Yin et al., 2010), and price is the most important factor hindering purchase (Loebnitz & Aschemann-Witzel, 2016; Xie et al., 2015; Yin et al., 2010). Intentions are found to be influenced also by income and other socio-demographic characteristics of consumers (J. Chen et al., 2014; Xie et al., 2015; Yin et al., 2010), and some papers find evidence of relevance of other aspects, such as environmental and ethical concern (McCarthy et al., 2015), certification and regulation, product quality, consumer lifestyles and values (J. Chen & Lobo, 2012; Y. Zhou et al., 2013), trust (Thøgersen, de Barcellos, et al., 2015; Thøgersen, Zhou, et al., 2015; Thøgersen & Zhou, 2012; Yin et al., 2010; Y. Zhou et al., 2013), knowledge and availability (Xie et al., 2015). Wu et al. (2014) find out that foreign certifications are preferred to the national ones.

We found only one qualitative paper by Sirieix et al. (2011) that contrast local and imported organic foods asking for opinions from 23 consumers in Shanghai, using open-ended questions together with projective techniques. They find out that local products are preferred to imported ones

(in contrast with Wu et al. (2014)) and they confirm that health concern is the primary reason for consuming organic products, while high price is the main barrier preventing purchase of organic products. Differently from what is commonly found analyzing motives of organic consumers in western countries, little relevance is assigned to altruistic motives and ethical aspects such as environment protection.

At the best of our knowledge, a study aimed at offering an in-depth exploration of Chinese consumers' perceptions of organic food is still missing, and with this research we aim to fill this gap.

Organic food products are highly-symbolic, and perceived mainly on the basis of credence attributes (Grolleau & Caswell, 2006; Wirth, Stanton, & Wiley, 2011). Extrinsic indicators (e. g. certification, labeling) and cues (e.g. brand name, packaging, price) convey search information. However, these information sources consumers depend on are external, since there is no ability to evaluate the quality through consumption, and purchase is driven by consumer's belief systems, that is a set of mutually supportive beliefs (Minton & Khale, 2014). Such belief systems encompasses product knowledge, as well as fundamental existential values, emotions, and ethics. According to Anderson (1983), these associations are organized in a network manner that is consistent with associative network models of memory. As psychological models, networks entail the assumption that concepts as well as their relations can be represented by a structure consisting of nodes (concepts) and links (relations). Strengths of relations are reflected by link weights, and the meaning of a concept is determined by its connections to other concepts (Schvaneveldt, Durso, & Dearholt, 1989). Networks can be used to represent heterogeneous sets of relations on concepts, which in this case we assume that the links have a semantic interpretation such as those found in semantic networks (Allan M. Collins & Loftus, 1975; Meyer & Schvaneveldt, 1976; Quillian, 1969). Networks of concepts can be graphically represented using concept maps, which are

graphical tools for organizing and representing knowledge (Novak & Cañas, 2008). These graphical representations offer the potential of identifying the structure of relationships among concepts, helping revealing patterns in data that may lead to fruitful interpretations (Schvaneveldt et al., 1989).

Several mapping techniques have been used on organic food consumers for the purpose of analyzing concept associations and links. For instance, multidimensional scaling (N.-H. Chen, Lee, & Huang, 2015; Thomas & Gunden, 2012), laddering associated to the means-end chain theory (Fotopoulos, Krystallis, & Ness, 2003; Lind, 2007; Naspetti & Zanoli, 2009; Zagata, 2014), means-end chain associated to the theory of planned behaviour (Grunert & Bech-Larsen, 2005). However, these studies required either a quantitative approach, which is based on pre-determined criteria and large samples, or a quite fatiguing in-depth interviewing approach based on the laddering method, which we found not suitable to poorly informed and mostly unaware Chinese organic consumers. Therefore, we decided to apply a recently developed technique called BCM-brand concept mapping (John, Loken, Kim, & Monga, 2006), which offered the advantage of a simplified interviewing method.

The content-wise objective of the current explorative study is therefore twofold:

(1) to explore Chinese urban consumers perception of organic food, and

(2) to highlight the main concepts associated to purchasing and consuming these products to draw conceptual maps allowing a clear representation of these associations.

To achieve these objectives, we adopted an exploratory approach and we set up a qualitative study aimed at understanding and representing in graphic form the network of mental associations that stems from the organic concept.

Thus, in addition to the content-wise objectives, we also have a methodological goal:

(3) to use the Brand Concept Map (BCM) technique (John et al., 2006), and to describe how it has been used, altered, and applied in this specific qualitative research framework, also using some convenient metrics measures offered by social network analysis methods and

(4) taking advantage of cluster analysis to discriminate between groups showing different properties of their aggregated maps.

The rest of this paper is structured as follows. In section 2 we shortly review the application of networks to concept mapping, in section 3 we describe the methods and data used in the study, in section 4 we present the results of our analysis and in the last section we discuss our results and we draw conclusions.

2. A short review of networks applied to memory organization

The first theories on knowledge as a result of a network of associations date back to the 1930s, when the behaviorists developed a model to interpret how people acquire, understand, and store language. According to the verbal behavior model, a word meaning is defined based on its placement in a network of associations. Early network models as a form of knowledge representation date back to the 1950s and 1960s (A.M. Collins & Quillian, 1969; Quillian, 1969; Skinner, 1957). According to such models, concepts are represented as nodes interconnected to other nodes within the semantic network. The links between information are qualitative and purposeful, and the nodes that are connected by these links have hierarchical relationships (Harley, 1995). Later, Collins and Loftus (1975) proposed another influential network model of information storage using the concept of spreading activation, assuming that properties can be represented several times in consumer memory and that information is not organized hierarchically.

Associative network models are well suited to studying consumer memory (Bettman, 1974; Calder & Gruder, 1989; Krishnan, 1996; Schmitt, Tavassoli, & Millard, 1993).

A map is an effective way to summarize complex data (Gengler, Klenosky, & Mulvey, 1995), helping identifying the most important brand associations and showing how these associations are connected. The connections revealed between attributes can provide a sense of what might happen if certain other attributes change. A graphical representation of a concept and its associations is called a concept map. A brand map is a concept map that identifies essential brand associations, but also conveys how these attributes are connected to the brand and to each other (John et al., 2006). Furthermore, brand maps are widely used in marketing studies to position brands on dimensions critical to consumer perceptions (e.g. to explore which brand is a market leader, relative strengths and weaknesses).

Because of the links to brand equity, it is essential for marketing managers to be aware of the nature and structure of associations for their brand (Henderson, Iacobucci, & Calder, 1998). A brand association network is a fundamental component of product image, it identifies its uniqueness and value to consumers, and suggests ways that the product can be leveraged in the marketplace (Aaker, 1996). Brand maps can help managers to understand how the brand is perceived by the consumer or by a segment, also how this perception corresponds to the brand positioning and thus how to adapt the integrated communication (Brandt, Pahud de Mortanges, Bluemelhuber, & van Riel, 2011).

Brand concept maps have first been analyzed in a qualitative manner with a focus on the individual perceptions in order to increase the likelihood that the full variety of brand associations in a respondent's memory will be evoked (Brandt *et al.*, 2011). More recently, several studies have included quantitative analyses of brand concept maps. Those studies captured the brand image using analytical measures (Henderson et al., 1998) or highlighted the brand's core identity using an aggregation procedure.

However, methodologies for producing brand maps have been slow to emerge (John et al., 2006). Many methods are available for eliciting brand associations from consumers, ranging from qualitative techniques, such as collages and focus groups, to quantitative methods, such as attribute

rating scales and brand personality inventories. Techniques such as multidimensional scaling are helpful in understanding how brands are viewed and what dimensions underlie within these perceptions, but these techniques do not identify brand association networks—that is, which associations are linked directly to the brand, which associations are indirectly linked to the brand through other associations, and which associations are grouped together (John et al., 2006).

Two different categories of techniques have been used to create brand maps: the first, called "consumer mapping", elicits brand maps directly from consumers who are asked to construct networks that show links between associations and the brand as well as links among associations; the second category of techniques, which we refer to as "analytical mapping", produces brand maps using analytical methods (e.g. network algorithms, measures of centrality, cohesion, position, density and structural equivalence) to uncover the network of brand associations (Henderson et al., 1998).

Although the BCM approach provides all the rules to build a network out of individual maps, it does not offer neither the theoretical basis nor the instruments to analyze the relationships among the elicited associations. Social network analysis (SNA) literature provides the proper framework for this study, being based on the assumption of the importance of relationships among interacting units, and thus encompasses theories, models, and applications that are expressed in terms of relational concepts or processes (Wasserman & Faust, 1994).

3. Methods and data

3.1. Mapping technique

Among qualitative consumer mapping techniques, only two emerged in the area of branding:

1) Zaltman's Metaphor Elicitation Technique (ZMET), which uses qualitative research techniques to identify key brand associations and in-depth interviews with respondents to detect the links between these brand associations (Zaltman & Coulter, 1995), and

2) the far less labor-intensive consumer mapping technique proposed by Deborah Roedder John, called Brand Concept Mapping (BCM) (John et al., 2006).

Compared to ZMET, BCM provides a more accessible and standardized method, based on a set of relatively straightforward rules for aggregating individual brand maps. The BCM method incorporates structure into the elicitation, mapping, and aggregation stages to provide a technique that is easier to administer and analyze (John et al., 2006). Interviewers need minimal training, respondents can complete the mapping procedure in a relatively short time (20 minutes) and prior consumer research can be often used in the elicitation stage. For such reasons, the BCM technique is very suitable for many data collection settings and relatively large samples, although associations that require more in-depth probing are unlikely to surface with this technique.

Some slight variations in the standard BCM procedure have been introduced in this study.

The BCM process was implemented in three stages:

1) Elicitation: The standard BCM technique is designed as a group interview that is aimed at identifying the salient associations for the brand from a small group of respondents. Given the exploratory nature of the survey, we designed the data collection as individual, face-to-face, semi-structured dialogues, with an aim of better identifying the unique and unexpected associations in consumers' minds that otherwise would have been less likely to emerge. In addition, instead of selecting a pool of pre-defined salient brand associations respondents should choose among, in order to avoid stereotypical responses we elicit associations directly from each respondent and let them use their own selection of associations for the following mapping stage. Being this study the first on the topic carried out in China with this methodology, the effectiveness of personal wording had a strong significance.

2) Mapping (data representation in a spatial structure). In the standard BCM respondents are asked to think about what they associate with the brand. The associations emerged in the elicitation stage are mounted onto cards. Then, respondents are asked to select the cards according to their personal viewpoint and connect them to the brand and to each other using different types of lines (single, double, or triple), so as to signal the strength of the associations. Since in this study the data were gathered using face-to-face interviews on the place of recruitment, spreading a card deck would have been both inconvenient and time consuming. Therefore, instead of using cards respondents were asked to construct a map from scratch using paper and pencil.

3) Aggregation (summarization of individual maps). Individual brand maps are combined to obtain a consensus map. Six aggregating measures need to be developed to build the consensus map: Frequency of mention, Number of interconnections, Frequency of first-order mentions, Ratio of first-order mentions, Type of interconnections and Type of line. The “frequency of mentions” and the “number of interconnections” signal whether the attribute is core in the consumers’ perception of the brand or not. The “frequency of first order mention”, “ratio of first order mentions” and “type of interconnections” show which of the core associations should be linked directly to the brand (Brandt et al., 2011). Finally, the “Type of line” signifies the strength of the relation between pairs of concepts. Once the information from each respondent map are coded into the six abovementioned measures, the individual maps can be aggregated in the BCM.

The standard procedure for aggregation was implemented in five stages.

i) Identifying the core attributes to place on the map. The associations that are included on at least 50% of the maps are kept, as well as those associations with borderline frequencies (45%–49%) whose number of interconnections was equal to or higher than that of other core associations. However, in our study we included in the consensus map 20% of the mentioned associations, together with those with borderline frequencies of 15%–19%.

ii) Determining which of the core associations should be directly linked to the central concept (product/brand/attribute). Usually, a pre-defined rate of super-ordinate connections to subordinate is

the threshold determining which core associations should be directly linked to the product. In our case we chose the threshold that offered the best visual output.

iii) Finding where to place the remaining associations on the map. In order to do so, a frequency count of how many different association links are present on one map, two maps, three maps, etc. is compiled. These frequencies are used to select which association links would be included in the consensus map, looking for a sharp increase in frequency counts on the graphs (inflection point). These associations need to be linked to at least one of the first-order brand associations.

iv) Incorporating non-core brand associations that are frequently linked to core associations, so as to make visible which other associations are likely to drive consumer perceptions of the core associations.

v) Deciding which type of link to use for each connection: the average strength used in all individual brand maps (rounded to the nearest integer) is calculated.

3.2. Network analysis

In this study, the following network measurements (Czepiel, 1974; Freeman, 1978) are calculated:

- Centrality (degree, betweenness, closeness) measures give indications of the importance of a node based on its location within a network relative to other nodes:
  - Degree centrality measures network activity. The degree of a node is defined as the number of other nodes that have a direct tie to that node.
  - Betweenness centrality reflects the extent to which a node lies between other nodes in the network and it is defined in terms of probabilities: since there is more than one possible path, it considers the probability of using a particular path.

276 – Closeness centrality focuses on how close a node is to other nodes. Closeness centrality
277 is typically thought to represent independence from the control of other nodes in a
278 network (Henderson et al., 1998). In the context of this work it measures how fast a
279 concept can be associated to others in the network.

280 • Cohesion (cliques). Cliques are sub-sets of a network in which the concepts are more
281 closely and intensely tied to one another than they are to other members of the network.
282 Cliques are hence very useful to identify significant groups of associations.

283 • Position (structural equivalence). Two nodes are said to be structurally equivalent if they
284 have the same relationships to all other nodes within that network. Structurally equivalent
285 nodes are substitutes, and substitutability can be diagnostic for brand parity effects.

286 • Network density is the proportion of the number of links present in a network compared to
287 the number of possible links (Scott, 1991). Density can be used to identify brand dilution (a
288 network that is very dense could indicate an unclear positioning and therefore dilute a
289 brand's equity) and brand confusion (high density reflects brand dilution, which is a
290 confusion in consumers' minds regarding the features associated with the brand).

291

292 *3.3. Identification of relations between maps and consumer profile through cluster analysis*

293 The maps and the consumer profiles as described by the data acquired with a questionnaire
294 and the maps drawn will be analyzed using cluster analysis to look for hidden structures that
295 connect the type of networks build by respondents to relevant determinants such as product
296 knowledge, purchasing behavior or the consumer socio demographic profile. Any finding in this
297 direction could allow identifying the behavioral and cognitive patterns of specific target groups,
298 thus improving the effectiveness of communication strategies on specific market segments.

299 Following Norušis (2011), since we used categorical variables we opted for the two-step
300 method implemented in the SPSS statistical package. Its algorithm is also able to automatically

select the most appropriate number of clusters (Chiu, Fang, Chen, Wang, & Jeris, 2001; Zhang, Ramakrishnan, & Livny, 1996). It is important to remind that cluster analysis discovers structures in data without explaining why they exist.

3.4. Data collection process

We aimed at exploring beliefs and perceptions that we considered as yet unknown, therefore the number of participants to be investigated is not pre-determined through a statistical method. We utilized the saturation sampling model, relying upon the researcher's judgement of when a satisfactory level of redundancy of the information collected has been reached (Byrne, 2001; Sandelowski, 1995; Trotter, 2012). This usually leads to a number of people interviewed that may vary, but usually is in the range of several tens. The main drawback of this approach is that the findings do not necessarily represent the target population and it is not possible to make statistical inference. However, although acknowledging the limitations above, it can be argued that our respondents could reflect common types of organic consumers in Shanghai.

Data collection was based on interactive interviewing, with respondents recruited on the spot and asked to answer a set of pre-determined questions, and to build verbally the perceptual map with the assistance of the researcher. Due to the possibility that the interview would be lengthy and demanding, and since it was not possible to provide an incentive to facilitate recruitment, no socio-demographic selection criteria were applied in selecting the respondents. Recruitment was performed purposively in several locations in Shanghai, and part of the interviews were carried out close to food specialty stores and supermarkets selling organic food products (located in the Xu Hui District), where it was more likely to intercept consumers who had some minimal awareness of organic food. Knowledge of organic products was tested during the interview. Altogether, out of more than 100 consumers intercepted, 50 sufficiently complete questionnaires have been collected, in the period from October 2008 to January 2009. All the interviews were carried out in the native

language of respondents (Chinese Mandarin). Each interview lasted for 15 to 30 minutes, with an average duration of 20-25 minutes. Respondents enjoyed a high degree of freedom in expressing their opinions about the topic, and any useful observation emerged during the discussion has been transcribed and reported in the researcher's notes.

To minimize interviewee's fatigue, given the efforts requested for the map building process, the associated questionnaire was kept very short (10 questions plus the map building section), and it was organized in 3 macro areas (English translation of the original Chinese Mandarin questionnaire is available In Annex 1):

- Map building section: core of the questionnaire, and the most demanding part in terms of time and attention. (questions 2 and 3);
- Understanding dimension: aimed at assessing the knowledge of organic food and frequency of purchasing (questions 1, 4, 5, 6);
- Personal dimension: aimed at collecting the 5 socio-demographic information on the respondent used in the map building process (questions 7 to 11);

INSERT ANNEX 1 - QUESTIONNAIRE

The level of knowledge was evaluated using a score that was calculated in two steps: the number of correct answers to question 5 provided an intermediate score (Table 1), while question 1 was used to adjust the intermediate score [1] and decided the final score. The Final score allowed us to classify respondents into three Knowledge Classes: ≤2 = "Poor"; 3-4 = "Intermediate"; ≥5 = "Thorough".

[1] The adjustment rate reflected the answer given to the open question, thus a completely unacceptable statement such as "organic food is made in laboratory using advanced genetic techniques" automatically determined a final "null" score.

INSERT TABLE 1 - CORRECT ANSWERS TO QUESTION 5 AND INTERMEDIATE KNOWLEDGE SCORE CALCULATION BASE

3.5. Sample description

Respondents were almost equally split between male and females. The majority of respondents were young and middle aged people, mostly students and working class laborers, with middle or low income and no kids under 15 years old in the household. The education level is almost equally split among three classes (university, high school, middle school or less). Table 2 shows the socio-demographic data of the sample. These characteristics are used as discriminants in drawing several combinations of aggregated BCM.

INSERT TABLE 2 – SUMMARY OF THE SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

One of the first non purely descriptive information that emerged from the data is the gap between the self-assessed knowledge of organic expressed by respondents, and the knowledge measured through the questionnaire. Over half of the respondents (27 out of 50) overrated their knowledge about the topic, while only a few (7) underrated it. Moreover, 20 out of 27 of the respondents that overrated their knowledge had a poor knowledge of organic, while 4 out of the 7 that underrated their knowledge actually scored high, showing a good knowledge of organic food (Table 2).

4. Results

4.1. Drawing the Brand Concept Maps

To produce individual and aggregated BCM the initial task of the analysis is to standardize the contents of the questionnaires, developing a set of summary codes that reflect the meaning of the words used by respondents to describe organic salient associations. The primary data were collected in Chinese language, so the Chinese lexicon was converted directly into English codes. Overall, 37 categories of meaning have been identified, as shown in Table 3.

INSERT TABLE 3 - ENGLISH CODES

The most relevant measures for organic associations used to produce the BCM according to the process previously described are shown in Table 4, while the aggregated BCM summarizing the whole group of respondents is displayed in Figure 1.

INSERT TABLE 4 - RELEVANT MEASURES FOR ORGANIC ASSOCIATIONS

INSERT FIGURE 1 - AGGREGATED BCM

4.2. Network analysis

Table 5 shows the measures of centrality.

In terms of degree centralities, the scores for healthy, expensive and safe are all above average. Healthy has a high level of activity compared with others in the network, which means that

it is the most central association in the network or, in other words, that it is in contact with most associations. Again, expensive is the most central concept in terms of betweenness.

In terms of closeness centrality, there is no big difference among the associations above mentioned, thus indicating that none of the associations displayed are more peripheral than the others.

INSERT TABLE 5 - CENTRALITY SCORES

Cohesion measure focuses on identifying subgroups within networks by studying the degree to which nodes are connected directly to each other by cohesive bonds. Groups are identified as "cliques" if every element (concept) is directly tied to every other element. Ten cliques were found, each one including 3 to 5 concepts, as shown in Table 6.

INSERT TABLE 6 - CLIQUES

In our study, structural equivalence allows measuring consumer perception of sameness amongst brands, that is, brand parity. Since the only other competing "brand" mentioned by respondents is Green Food, the value of structural equivalence between "organic" and "green food" was computed and it turned out to be 58.55%.

Finally, density was considered because it can be used to identify brand dilution (a network that is very dense could indicate an unclear positioning and therefore dilute a brand's equity) and brand confusion (high density reflects brand dilution, which is a confusion in consumers' minds regarding the features associated with the brand). The density of the network was found to be 21.48%.

4.3. Identification of clusters

In this study the space chosen for the distance calculation in the cluster analysis was a matrix (distance matrix), with the 50 respondents in the rows, and the associations elicited from them in the columns. Then, a 2-step cluster analysis was applied on these data. Clusters analysis allowed identifying 2 groups, one made of 34 respondents, and the other grouping 16 respondents, as shown in Figure 2 and Figure 3.

INSERT FIGURE 2 - AGGREGATED BCM FOR CLUSTER 1 – UNAWARE OCCASIONAL PURCHASERS

INSERT FIGURE 3 - AGGREGATED BCM FOR CLUSTER 2 – INFORMED PURCHASERS

The aggregated map built for Cluster 1 displays 6 core and 1 non-core associations, while the consensus map built for Cluster 2 displays 8 core associations and 2 non-core associations. The aggregated map for Cluster 1 and Cluster 2 are quite different in terms of both structure and composition of the associations.

Cluster 1 (UNAWARE OCCASIONAL PURCHASERS) aggregated network looks quite simple, and it conveys the idea that the respondents who built it shared a distorted perception of organic. This aspect is even clearer if we set the eyes on the aggregated matrix: even if the most negative associations -such as “hard to understand”, “pastry” or “dangerous”- are not displayed in the consensus map due to a low number of mentions, they are however grouped together in Cluster

1. The categories “expensive”, “high quality”, “nice packaging”, “technologically improved”, “hard to find” are peculiar of this group of respondents.

Cluster 2 (INFORMED PURCHASERS), instead, underlies a more positive and nature-oriented view of organic, reflecting the environment and social values emphasized by the organic production method (environment protection, use of no chemical pesticides and fertilizers, pure and natural product), as well as the nutritional aspects (safe and healthy food, no danger for human health and the environment). Besides, the consensus map created for Cluster 2 has a more complex structure, with more brand associations, and more interconnections between the associations. Finally, Cluster 2 displays stronger connections, definitely more consistent with aggregated map produced for the entire sample.

In order to tests the goodness of fit of the distributions for Cluster 1 and Cluster 2 a chi-square test it was performed: Cluster 1 differs from Cluster 2 for a different purchasing frequency (superior presence of respondents who never purchased organic products) and for the gender (higher rate of males to females).

To test the nomological validity the individual maps should be divided in two categories different in a predictable way. Cluster 1 and Cluster 2 group together respondents whose purchasing habits are significantly different (very close to matching with non-consumers and consumers), and whose socio-demographic profile suggests a higher education and better knowledge of organic. Cluster 1 includes some unlikely associations, while Cluster 2 does not include any “real” product-related negative association. Cluster 1 shows 6 core associations and underlies a negative “marketing” view of organic products, while Cluster 2 shows 8 core associations and includes most of the positive associations coded by the participants of the survey.

To conclude, in Cluster 2 respondents show more familiarity with the product, more knowledge and a more complex perceptual structure in terms of number of associations; Cluster 1 and Cluster 2 are expected to be different, and effectively they are, thus providing proof of the nomological validity.

Finally, in order to test the reliability of the aggregation, the individual maps were split in two halves, namely even and odds maps, and the aggregation procedure was repeated. The degree of consistency between the two split half maps is high (Pearson's contingency coefficient C=0.886321), thus confirming that the measure is reliable.

5. Discussion and conclusions

This study contributes in shedding light on how some Shanghai consumers' think about organic, identifying the main features of the organic attribute and how they are associated to each other in their minds.

At first, the analysis based on knowledge scores proves the importance to investigate thoroughly the real knowledge about the topic, and the usefulness to proceed with cross checks in order to produce reliable knowledge discriminants. It also shows a strong bias, probably related with the wish to please or be respected by the interviewer.

Considering the concepts emerged from exploration of consumer perception, "healthy" first, then "safe" and "expensive" are three core associations that outline best the image of organic shared by the survey participants. Attributes like "green food", "pure and natural", "tasty" and "poor choice of products and low availability" are also relevant, and therefore appear in the consensus map as core associations.

The health care and security concerns are clearly key factors that influence organic consumption and this is also confirmed by previous research. The food safety scandals that frequently stroke China in the last years impacted deeply on the public opinion, and played an important role in boosting organic and all certified food purchases, as witnessed by the success of the green food movement (McCarthy et al., 2015; Xie et al., 2015; Yin et al., 2010).

High price and inadequate product availability in stores also emerge as important associations. Despite the survey targeted some of the most affluent area of China within the most privileged spot

possible (organic specialized stores), price and availability turned out to be critical issues, confirming the findings of Xie et al. (2015). High price and low product availability, however, could be perceived as a signal of quality and high value of the product. The view that organic food is tasty also emerged, although sensory features are probably not the main motivation for purchase (Michelsen, Hamm, Wynen, & Roth, 1999).

The attributes discussed above are pretty much consistent with the perception of organic by western consumers. In the literature, organic purchases have been generally attributed to quality, health and environmental consciousness motives, as well as to specific product attributes such as nutrition value, taste, freshness, and price (Asioli et al., 2014; Chryssochoidis, 2000; Hemmerling et al., 2013; Reicks, Splett, & Fishman, 1997).

However, in line with the argument we put forward in the introduction that perception of organic food by Chinese consumers may show some peculiarities, some significant differences are immediately visible. The first difference deals with the coexistence of a competing food quality certification label. Organic and "Green food" are easily associated in the minds of the respondents, and like in previous studies (McCarthy et al., 2015) often confused, especially when it comes to associating to wellness and natural environment concepts: the cohesion measurements show that 3 over 10 cliques include green food as key element, and in only one case out of 4, organic is linked to “healthy” and “pure and natural” without being likened to “green food” too. The structural equivalence analysis highlights that “organic” and “green food” share almost 60% of the same ties, which means that over half of their ties are exactly the same. This finding is very important, since it points out an unexpectedly high degree of similarity between the two associative structures. Also the betweenness value implies a certain degree of node control of green food within the organic network, thus confirming once more the initial finding, as well as the findings of previous research (Liu et al., 2013; Perrea et al., 2014). Competition of the organic label with labels designating Integrated Production or Integrated Crop Management is not a new aspect (Canali, 2011; Govindasamy, DeCongelio, & Bhuyan, 2006; Kuhar & Juvancic, 2010; Scarpa et al., 2007).

However, it seems that in this case it is not just a matter of substitution between two different products providing similar benefits, but it is rather an overlapping of perception.

Finally, green food seems to hold more evocative power than organic in terms of nature-related associations, which is quite intuitive, given both the longer history of the green food movement, and the higher investments made in promotion.

In addition, it looks like in China organic is not necessarily synonymous with nature and traditional farming. Although some of the core attributes of the consensus map are consistent with the perception of organic as food produced without the use of conventional synthetic chemicals, the concept of organic is easily associated with modern and advanced technologies, GMOs, and futuristic production methods (e.g., food produced in laboratories), similarly to what Perrea et al. found for Green Food labeled products (Perrea et al., 2014). This is probably imputable to semantic reasons: in the Chinese language the word “youji” describes the concept of organic, but it literally means “with technology”; in some situations it is used to address organic food (“youji shipin”), but in other contexts the same word can be used to define manufactured products, and even products that are conceptually antithetic to organic, such as chemical fertilizers (“youji huafei”). Actually, while healthy, safe, and expensive are important features of organic food perceived also by “western” consumers, the focus on advanced technology is to be contrasted with the attribute “naturalness”, the latter being common among organic consumers around the world (Hemmerling, Canavari, & Spiller, 2016). This is not necessarily a negative aspect, since for Chinese consumers technology is associated to progress and future, rather than distance from a “natural” state. At the best of our knowledge, this perception is peculiar of Chinese consumers and this new finding may be of great significance in terms of communication strategies.

In contrast with some previous studies (McCarthy et al., 2015; Thøgersen & Zhou, 2012), but similarly to (Loebnitz & Aschemann-Witzel, 2016) no ethical concerns at all were mentioned by respondents, such as the support to organic farmers, fair trade or animal welfare. This matter of fact

reflects the early stage of development of the Chinese market, and the type of orientation of consumers towards organic food.

Two other associations mentioned by respondents also reflect the difference between Western and Chinese markets:

1) the role of the packaging, since food packaging in China is as important as the food itself, and sometimes even more, suggesting that adequate packaging is a key purchasing driver at least for unaware consumers, and the concerns for fake or counterfeited products;

2) the lack of trust (Sirieix et al., 2011; Yin et al., 2010), with a trust deficit that is enormous and growing, especially towards the local market.

The latter result confirms previous findings (Wu et al., 2014), while the former is novel and interesting.

Our study confirms that information and knowledge is crucial, as already pointed out by McCarthy et al. (2015). The consensus maps built for the two groups we identified, basically referable to as the "purchasers" and "occasional purchasers" shared only a few attributes, and suggested that latter had a more technological and less nature-oriented perception of organic and showed a less complex and less integrated aggregated associative structure, which is typical for non-experts (John et al., 2006, p. 559). Therefore, perhaps organic food marketing in China might need more segmentation and targeting, instead of an one-size-fits-it-all marketing communication.

The main limitation of our findings is that they are based on a small sample of organic consumers selected in the most affluent area in China, therefore cannot be generalized.

However, this study can provide some hints to the marketing managers interested in the positioning of organic products in China. The potential for growth are therefore very high, especially considering the high demand for safer food. Our study reveal that consumers quality perception of organic are mainly related to the health and safety aspects, as well as nutritional values. Organic product are also perceived as expensive (and as a matter of fact, they are).

572 However, “expensive” was not always meaning “not affordable” (negative attribute), sometimes it
573 has a positive meaning, for a high price is also a signal of high quality and high status.
574
575 Achieving a high status would allow organic food to be regarded as a luxury good, suitable to
576 be bought as a prestigious present. Giving food as a present is a common habit in China, and the
577 importance of gift giving in the Chinese culture strongly differs from the western world, especially
578 in the business environment. It is of utter importance to give prestigious gifts, for they represent the
579 respect and financial strength of the company, and for they operate as a way to attract a possible
580 future relationship. The gift reflects both the status of the donor and the respect towards the
581 receiver. A nice package is an essential component of a gift, and especially for the “unaware
582 occasional purchasers” cluster, the “packaging” aspect shows to be important, consistently with the
583 perception of a luxury good suitable to be purchased as a present. Unfortunately, none of the
584 abovementioned associations emerged and “modern and fashion”, although mentioned, did not
585 achieve the number of mentions necessary to be represented on the consensus map. This makes us
586 think that organic food, although recognized as quality food by most of the respondents, fall short to
587 be included in the pool of prestigious food gifts, contrarily to what happens, for example, to some
588 imported food products, such as French wines. Since the social status conveyed by the product
589 relies on the product notoriety, promotion plays a key role. Thus, it would be a good strategy for
590 sector operators to improve the synergy between the associations “Safe”, “Pure and natural”,
591 “without chemicals” and “healthy”, using concepts that imply or suggest prestige and a high social
592 status in marketing communication, so as to re-position organic food image and enlarge the target
593 market.
594 The main implication of the specific findings for marketers and practitioners of organic
595 products in China, however, is that they should pay attention to the risk that their products are not
596 perceived differently from Green Food products and farmers and food producers should carefully
597 consider which type of certification they should obtain and how to promote their product.

598 Another implication is that at least two distinct and quite different groups of customers may
599 exist in China, and a differentiated marketing strategy may be a sound option for further expanding
600 the organic food market. A quantitative segmentation study focused on consumer profiling should
601 be a useful follow-up of this study.
602
603 The main implication for Chinese policy makers is that they should consider implementing
604 information and consumer education campaigns (McCarthy et al., 2015) aimed at achieving a better
605 understanding of the features of the organic and Green food quality labels among consumers,
606 allowing them to make a more informed choice among products with different quality labels.
607
608 Regarding the method used in this study, we maintain that it could be very useful in exploring
609 consumer views and brand/concept associations in consumer mind. It is based on the adaptation of
610 an existing methodology for the creation of individual concept maps, with the purpose to make data
611 collection faster and easier to implement, still maintaining the ability to provide meaningful
612 information. The quantitative and graphical tools used to support data analysis is mainly aimed at
613 reducing subjectivity in aggregating the maps and, despite they are not strictly necessary, they
614 represent an useful aid to the analyst.
615 Possible directions to develop the method further could be the use of automatic classification
616 methods based on different clustering or latent class analysis techniques, which can help the
617 researcher to identify groups easily. It is important to note that the qualitative nature of this study
618 reflects in the sampling procedure and in the sample size; thus, the use of quantitative measures and
619 multivariate data analysis techniques does not change the nature of the study. However, in principle
620 it would be possible to design a quantitative survey based on the modified brand concept mapping
621 procedure we used in this study. This could represent an interesting alternative to mapping
622 techniques based on multidimensional scaling or correspondence analysis.
623

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Table 1 - Correct answers to question 5 and Intermediate knowledge score calculation base *

Statement	Correct answer	Partial score if respondent		
		is wrong	don't know	is right
Organic foods are produced with "synthetic chemical fertilizers"	false	-2	0	+1
Organic food contains GMOs	false	-1	0	+1
Organic and green food are the same	false	-1	0	+1
Organic foods are inspected strictly	true	-1	0	+1
Organic method aims at protecting the environment	true	-1	0	+1

* The Final score allowed us to classify respondents in Knowledge Classes: ⩽2 = Poor; 3-4 = Intermediate; ⩾5 = Thorough.

Table 2 – Summary of the socio-demographic characteristics of the sample

Discriminants				
Knowledge	– Classes	Thorough	Intermediate	Poor
	– *Self assessed, % of respondents*	*38%*	*32%*	*30%*
	– *Measured, % of respondents*	*12%*	*28%*	*60%*
Frequency of purchase	– Classes	More than once a week	Less than once a week	Never
	– *% of respondents*	*24%*	*30%*	*46%*
Age (years)	– Classes	25 or less	26-55	56 or more
	– % of respondents	*40%*	*56%*	*4%*
Gender	– Classes	Male	Female	
	– *% of respondents*	*46%*	*54%*	
Presence of kids under 15 in the household	– Classes	Yes	No	
	– *% of respondents*	*30%*	*70%*	
Education	– Classes	Higher education	High school	Lower education
	– *% of respondents*	36%	26%	38%
Monthly income	– Classes	<2.000 RMB	2000-10000 RMB	>10.000 RMB
	– *% of respondents*	*40%*	*56%*	*4%*

Table 3 – Coded categories translated in English

Cod	Category	cod	Category	cod	Category	cod	Category
1	Safe	11	Without side effects	21	Fruit and vegetables (3)	31	Ugly packaging
2	Pure and natural	12	Cheap	22	High production cost	32	Dangerous
3	Without chemicals	13	Flowers and grass	23	Ideal for kids and elders	33	Non fresh
4	Healthy	14	Don't fall ill	24	Technologically improved	34	With chemicals
5	Medical properties (1)	15	Tasty	25	Pastry	35	Hard to understand
6	Green food	16	Western food (2)	26	Unnatural	36	Deteriorate environment
7	Bright color	17	High quality	27	Bad Taste	37	Poor choice, hard to find
8	Modern and fashion	18	Nice packaging	28	Fake (4)		
9	Fresh	19	Clean	29	Expensive (5)		
10	Environment protection	20	Nutritional	30	Loss of faith		

(1) Also intended as cosmetic properties

(2) This code summarizes the concepts of European Union and imported food together

(3) This code includes all the various fruit and vegetables mentioned by respondents (e.g., tea leaves, spices, rice)

(4) Intended that the product may be counterfeit

(5) Although the sense of the word might sound negative, the attribute could be also perceived positively, e.g. as signal of quality

Table 4 – Relevant measures for concepts associated with the organic attribute

Concept	frequency of mentions[1]	Number of inter connections[2]	frequency of first order mention[3]	Ratio of first order mention[4]	Super ordinate[5]	Sub ordinate[5]
Safe	20	18	20	100%	5	0
Pure and natural	14	13	13	93%	2	2
Healthy	24	21	20	83%	1	2
Green food	10	15	10	100%	3	0
Without side effects	6	3	4	67%	0	3
Tasty	12	3	12	100%	0	0
Fruit and vegetables	9	6	7	78%	0	2
High production costs	7	13	0	0%	0	15
Expensive	27	11	27	100%	6	0
Poor choice, hard to find	11	5	10	91%	2	0

1. Frequency of mention: number of times that an association occurs across maps

2. Number of interconnections: number of times that an association is connected to other brand associations.

3. Frequency of first-order mentions: count of the number of times that an association is directly linked to the brand across maps

4. Ratio of first-order mentions: percentage of times that an association is linked directly to the brand when it is included on map.

5. Type of interconnections: indicates how frequently an association is placed above other associations (super-ordinate) or below other associations (subordinate) across maps

Table 5 - Centrality scores

Association	degree	Norm. degree	Degree share	betweenness	Node betweenness	Node closeness
Safe	24	2,495	0,079	0	0	3,541
Pure and natural	17	1,767	0,056	0	0	3,541
Healthy	40	4,158	0,132	3	0,45	3,551
Green food	18	1,871	0,060	0,5	0,075	3,544
Without side effects	12	1,247	0,040	0	0	3,541
Tasty	12	1,247	0,040	0	0	3,537
Fruit and vegetables	11	1,143	0,036	0	0	3,541
High production costs	5	0,52	0,017	0	0	3,514
Expensive	31	3,222	0,103	9	1,351	3,544
Poor choice, hard to find	10	1,04	0,033	0	0	3,537

Table 6 - cliques

Clique	Concept 1	Concept 2	Concept 3	Concept 4	Concept 5
Clique 1	Safe	Pure and natural	Without chemicals	Green food	Without side effects
Clique 2	Safe	Without chemicals	Don't fall ill		
Clique 3	Safe	Without chemicals	Western food		
Clique 4	Safe	Without chemicals	High quality		
Clique 5	Safe	Pure and natural	Healthy	Green food	Without side effects
Clique 6	Pure and natural	Healthy	Environment protection		
Clique 7	High quality	Nice packaging	Expensive		
Clique 8	Pure and natural	Healthy	Fruit and vegetables	Green food	
Clique 9	High quality	High production cost	Expensive		
Clique 10	High production cost	Expensive	Poor choice, hard to find		

Figure 1 - Aggregated BCM (50 respondents)

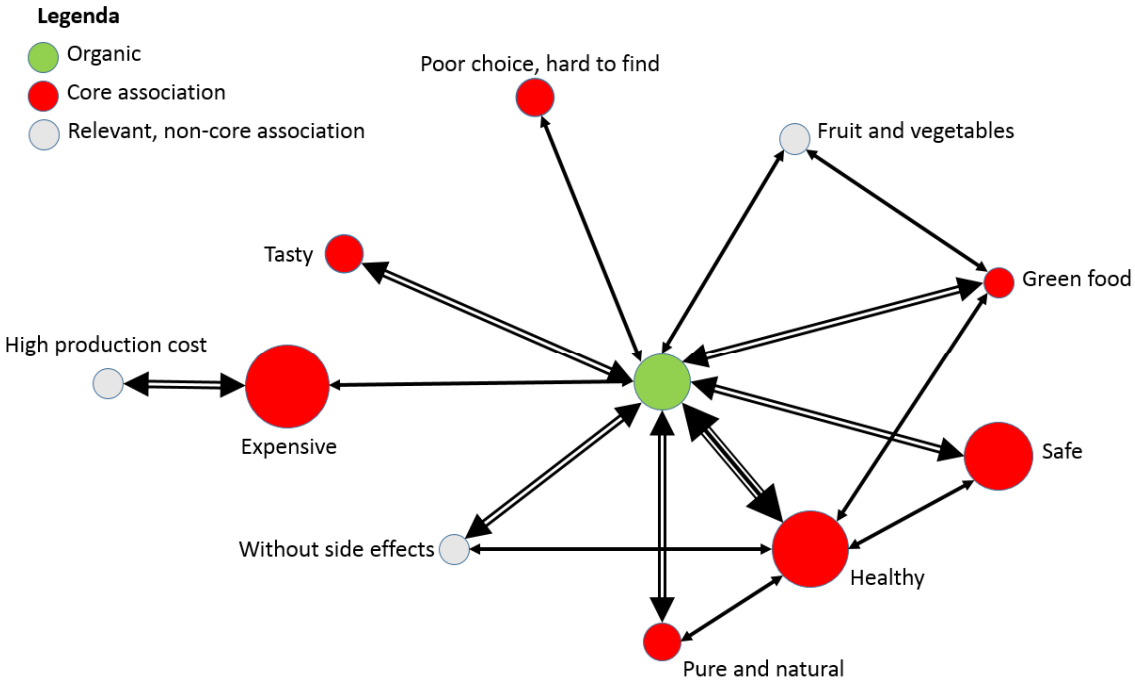

Figure 2 - Aggregated map for Cluster 1 (16 respondents, cutoff 2)

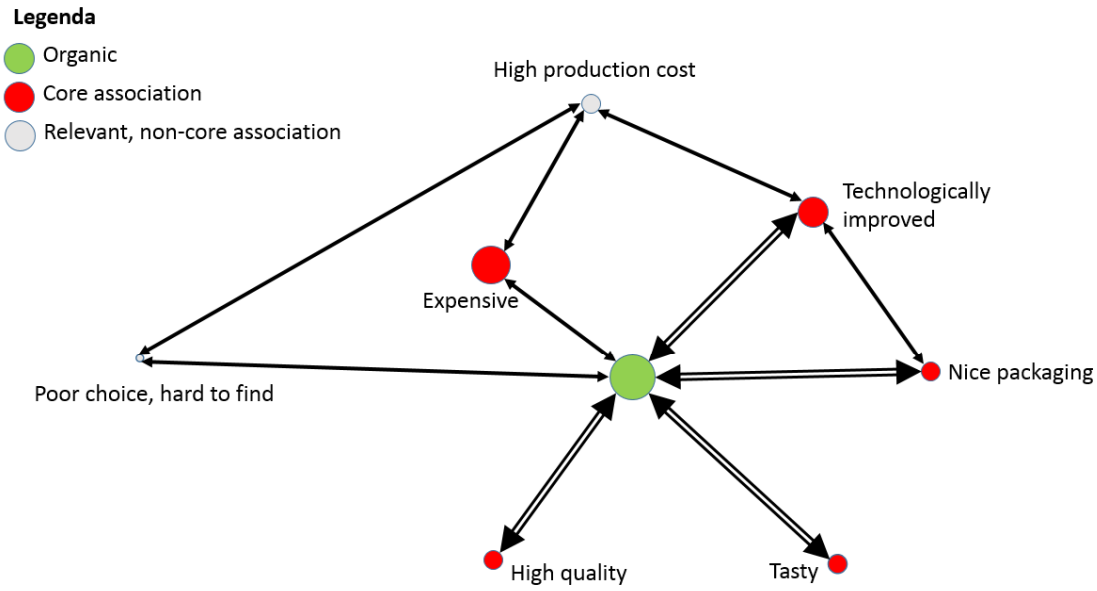

Figure 3 - Aggregated map for Cluster 2 (34 respondents; cutoff 3)