Alma Mater Studiorum – Università di Bologna

Scuola di dottorato in Scienze Agrarie

DOTTORATO DI RICERCA IN ECONOMIA E POLITICA AGRARIA E ALIMENTARE

Ciclo XXI

Settore scientifico disciplinare di afferenza: AGR/01- Economia ed Estimo Rurale

TITOLO TESI

Perceptual maps analysis for organic food consumers in China: a study on Shanghai consumers

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Esame finale anno 2009

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Abstract

Although in Europe and in the USA many studies focus on organic, little is known on the topic in China. This research provides an insight on Shanghai consumers' perception of organic, aiming at understanding and representing in graphic form the network of mental associations that stems from the organic concept. To acquire, process and aggregate the individual networks it was used the "Brand concept mapping" methodology (Roedder, Loken, Kim, & Monga, 2006), while the data analysis was carried out also using analytic procedures. The results achieved suggest that organic food is perceived as healthy, safe and costly. Although these attributes are pretty much consistent with the European perception, some relevant differences emerged. First, organic is not necessarily synonymous with natural product in China, also due to a poor translation of the term in the Chinese language that conveys the idea of a manufactured product. Secondly, the organic label has to deal with the competition with the green food label in terms of image and positioning on the market, since they are easily associated and often confused. "Environmental protection" also emerged as relevant association, while the ethical and social values were not mentioned. In conclusion, health care and security concerns are the factors that influence most the food consumption in China (many people are so concerned about food safety that they found it difficult to shop), and the associations "Safe", "Pure and natural", "without chemicals" and "healthy" have been identified as the best candidates for leveraging a sound image of organic food .

Quantunque in Europa e negli USA gli studi sul biologico siano molteplici, ben poco si sa sull'argomento in Cina. Il presente studio analizza la percezione del biologico da parte dei consumatori cinesi della città di Shanghai, puntando a comprendere e rappresentare in forma grafica la rete di associazione mentali che scaturisce dal concetto di biologico. Per acquisire, elaborare e aggregare le mappe concettuali individuali è stata utilizzata la metodologia denominata "Brand concept mapping" (Roedder et al., 2006), mentre l'analisi dei dati è stata condotta anche attraverso procedure analitiche. I risultati a cui lo studio ha condotto suggeriscono una percezione del biologico come prodotto salutare e sicuro, ma costoso. Sebbene questi attributi siano in linea con la visione Europea, sono emerse anche alcune differenze sostanziali. In primo luogo, in Cina biologico non è necessariamente sinonimo di prodotto naturale, anche per via della infelice traduzione del termine "biologico" in lingua cinese, che suggerisce l'idea di un prodotto industriale. In secondo luogo il biologico compete con il green food in termini di immagine e posizionamento sul mercato, in quanto i due marchi sono facilmente associati e confusi. L'aspetto di "tutela ambientale" è emerso come associazione di rilievo, mentre non sono stati menzionati i valori etici e sociali. Per concludere, la cura della salute e la sicurezza alimentare sono fattori chiave che influenzano maggiormente il consumo in Cina (molte persone sono così preoccupate per la salute da trovare difficile fare la spesa), e le associazioni "sicuro", "puro e naturale", "senza additivi" e "salutare" sono state individuate come candidati migliori per la promozione di un'immagine positiva del prodotto biologico.

Keywords: China, organic food, consumer perception, network

1. Introduction to the topic

1.1. About organic

Organic agriculture is an auto-sustainable system based on the use of natural products and processes, reducing in this way external inputs through the exclusion of fertilizers, pesticides and chemicals. However, the term “organic” is best thought of as referring not to the type of inputs used, but to the concept of the farm as an organism, in which all the components -the soil minerals, organic matter, micro organisms, insects, plants, animals and humans- interact to create a coherent, self-regulating and stable whole. Reliance on external inputs, whether chemical or organic, is reduced as far as possible (Lampkin, Foster, S., & Midmore, 1999).

Hence, according to (IFOAM) organic food brings along a multiple set of values:

- Environment concern: the organic product is obtained through environmental sustainable methods. The social costs are lower than the “conventional” agriculture. The impact of the organic agriculture on the environment is limited because no chemical pesticides and fertilizers are used (compost and green manure crops are cornerstones of an organic fertility management system as well as crop rotations, cover crops, grass waterways and filter strips): in this way the pollution of the water and the soil is avoided. Furthermore the organic agriculture increases the biodiversity.
- Nutritional aspects: no chemical products, dangerous for the men health and the environment, are used. Through the Organic method, special emphasis is given to the quality approach that lead the objectives of the production, instead of the pure maximum yield goals. This method forbids the use of the GMOs and the use of additives and artificial colouring.
- Information and transparency: the organic products give more information, especially through labels, concerning the methods of production, the tests done, the producers involved and the inspectors. All organic operations maintain records of their production and handling activities, and it is possible to trace all the operators involved in the production and even the plot of lands utilized (“from farm to folk”).
- The value of the guarantee: the organic production foresees a control system involving independent checking bodies, guaranteeing all the phases of production and the characteristics of the products.
- Ethical values: the organic agriculture promotes not just the sustainable development, but also a full set of ethic values: integrity, the idea to work with nature instead of pretending to control it, the spiritual need to connect with the earth, the understanding of life. This is the only way for the safeguard of the earth, to guarantee a good quality of the work of the operators, the respect of the animals during the breeding and the international cooperation through fair prices.

1.2. World's organic standards

The basic standards for organic production were first issued by the International Federation of Organic Agriculture Movements (IFOAM) in 1980. They have been the basis for numerous sets of private organic standards throughout the world, and they have strongly influenced Council Regulation (EEC) No 2092/91 on organic farming and the FAO's /WHO's Codex Alimentarius Guidelines for organic production.
The three major sets of organic standards are the EU standards, the US government's NOP (National Organic Program), and Japan's JAS (Japanese Agricultural Standard). These standards are non-equivalent and they don't recognize each other, and as a growing number of countries start to introduce national organic standards based on EU, NOP or JAS standards, this division between the three major trading groups is increasing (Heller, 2006).

1.2.1. EU organic standard

The Regulation CEE 2092/91 represents the prescriptive base of the EU regulation for "plant-based agricultural, not transformed products". It regulates labeling, standard production methods, control system, provisions relevant to organic food import from non-EU countries, products for the soil manuring and amending and phytosanitary products admitted for organic pest management. In august 1999, with the Reg. CEE 1804/1999, some regulations have been applied to production, labelling and control system of the main domestic animal species. Figure 1 shows the EU organic logo.

Figure 1 - EU logo

In 2007, the European Commission published a proposal for a new regulation on organic production, the Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labeling of organic products and repealing Regulation (EEC) No 2092/91 (EC, 2007). The regulation sets out a complete set of objectives, principles and basic rules for organic production, and include a new permanent import regime and a more consistent control regime:

- The use of the EU organic logo is mandatory, but it can be accompanied by national or private logos.
- The place where the products were farmed has to be indicated to inform consumers. Food will only be able to carry an organic logo if at least 95% of the ingredients are organic. But non-organic products will be entitled to indicate organic ingredients on the ingredients list only.
- It includes also synonyms like ecological, biological and the diminutives bio and eco

- The use of genetically modified organisms (GMOs) is prohibited. The limit for the accidental presence of GMOs apply to organic products is 0.9 %.
- There will be no changes in the list of authorized substances for organic farming.
- The new rules also create the basis for adding rules on organic aquaculture, wine, seaweed and yeasts.

1.2.2. NOP

Although the US Congress passed the “Organic Foods Production Act” (OFPA) in 1990, the National Organic Programme (NOP) was not published and approved until 2001. Any grower or handler who wants to sell organic products on the US market must be certified according to NOP by a USDA accredited certifier. The NOP logo is displayed in Figure 2.

Figure 2 - NOP organic logo

Some general issues, which distinguish NOP from other organic standards are:

- NOP gives high priority to the organic farm's or company's own responsibility, and focus on the procedures defined by the operator to assure the organic integrity as a first step of compliance with the standard.
- The term “conversion” does not exist in NOP.
- Other words (ecological etc.) are not regulated in the rule and therefore permitted to use.
- NOP requires "buffer zones" between organic and conventional fields, whenever there is a risk of contact with prohibited substances (pesticides, fertilizers).
- Strict rules for organic livestock production and treatment of animal manure; less detailed rules for livestock housing and living conditions than in the EU Regulation.
- Labeling requirements for multi-ingredient food products are somehow different from the EU Regulation and JAS. On the one hand, there is a “100% organic” category. On the other hand, even on products with less than 70% organic ingredients, reference can be made to “organic” for single ingredients on the information panel.
- Use of inputs, additives, aids, and ingredients is regulated by “The National List of Allowed and Prohibited Substances”.

- For all materials used in organic farming or food processing not only the active ingredient, but also all inert ingredients have to be qualified so that the certifier can assess compliance of such materials.

1.2.3. JAS

The Japanese Agricultural Standard for Organic Agricultural Products and Organic Agricultural Processed Products were published in 2000 and came into effect in April 2001. The Japanese Ministry of Agriculture (MAFF) is responsible for its implementation.

In November 2005 MAFF added livestock products, livestock processed products and livestock feeds. The JAS system involves the approval of certification bodies in Japan and overseas, much like the US system. Only operators certified by a JAS approved certifying body may apply the JAS organic label. Some differences between Organic JAS and the EU regulation and NOP Final Rule are:

- Unlike EU regulation and NOP, some substances are allowed, and some other are not;
- JAS puts the staff of an organic operation into the center of its attention, requiring an internal auditing system based on "Grading Management" to assure compliance with the standard. All Production managers and all grading staff must attend a JAS seminar, organized by an approved certification body, prior to inspection.
- Organic exports to Japan must be labeled with the JAS mark. The label is composted of the name of the certification body and the JAS logo (Figure 3).

Figure 3 - JAS organic logo

1.2.4. China's organic standard

In April 2005 the China National Organic Product Standard (CNOPS) came into force. After 20 years of development, defining the scope, normative standard, certification procedure, requirements for certification bodies, use of organic product certification seal, labeling as well as importation of organic food products to China are defined. The standards, Organic Products BG/T 19630-2005, were issued on January 1, 2005 and are effective on April 4, 2005. It consists of 4 sub standards (Part 1 Production GB/T 19630.1-2005, Part 2 Processing GB/T 19630.2-2005-4-22, Part 3 Labelling and marketing GB/T 19630.3-2005, and Part 4 Management system BG/T 19630.4-2005). The four parts can be used as a whole system but also separately for different activities. The roles of it are not only production and processing but also certification. The standards are developed based on the principles and requirements of IFOAM

Basic Standards for Organic Production and Processing. Besides, points from the Codex Alimentarius, EU Regulation 2092/91, NOP, etc, are also considered into it. In this context, China organic standards are compatible to those standards, for the purposes of standard harmonization internationally and promotion of world organic trade.

All products sold in China as organic and/or organic in conversion must be in compliance with the CNOPS. Figure 4 shows the logos in use for organic and converted organic products.

Figure 4 - China's organic logos

China Organic logo

China under conversion Organic Product logo

Organic products sold in the Chinese market are obliged to be correctly labeled as:

- Organic: certified organic ingredients in final products should be higher than 95%.
- Conversion to organic: ingredients certified as conversion to organic in final products should be higher than 95%.
- Made with organic ingredients: 70-95% of ingredients in final products are certified organic or conversion to organic. It can be defined as "made with organic ingredients" and the percentage of certified ingredients has to be shown on the package.
- Describe organic materials in ingredient table: the percentage of certified organic or conversion is less than 70%, it should not be named as organic mentioned above, but identify the certified materials in ingredient table.

Organic regulation in China is unique due to two government departments competing for natural food regulatory terrain. The State Environmental Protection Administration (SEPA) works with organic certification largely through the Organic Foods Development Center (OFDC) while the Ministry of Agriculture certifies green food, largely through the China Green Food Development Center (OFDC), of which some food is also certified organic.

1.3. Competing food product certifications in China

Aside from organic, in China there are two other levels of quality certifications intended to guarantee that food products are free of dangerous contaminants, "safe food" and "green food" (the logos are shown in Figure 5). Both standards specify tolerances for harmful materials in water, soil, and air as well as maximum residue limits for pesticide residues. Compliance to the standards is enforced by regular

testing of the production environment, and random testing of final products for residues (Calvin, Gale, Hu, & Lohmar, 2006).

Figure 5 - Chinese certification quality signs

Safe food

Green food

1.3.1. Safe food

Safe food (also translated as “pollution-free” or “no harm”) standard was introduced in 2002. It is more likely to be distributed to consumers because of its low price, and it is easier for farmers to produce because the standard is less strict. Although certified, safe food is neither popular nor perceived by consumers the same way as organic or green food (notwithstanding that most consumers do not understand the distinction between organic and green food rating-systems).

1.3.2. Green food

The Green Food Program was initiated in 1990 by the Ministry of Agriculture, and in 1991 the Green Food label was successfully registered as the first food certification in China. Its aims was to improve overall food quality in China, hence it was strongly promoted by the Chinese government. However, when exported green food is usually marketed as conventional and does not necessarily receive a premium price. There is a demand for green food in countries like Japan, primarily because green food is more likely to meet the basic import requirements of such developed markets in ways that China's non-certified exports may not (IFAD, 2005).

According to Lu (Lu, 2002), the milestones of development of the green food sector in China can be summed up as follows and described in 3 stages:

- (1990-1993) Initiation stage. The China Green Food Development Center (CGFDC) was established to organize and carry out the Green Food Project throughout the country. The quality testing and controlling agencies were established; the quality criteria and standards were made.
- (1994-1996) Rapid development stage. The second stage is characterized by a rapid increase of numbers of products, acreage and production. Green Food development became very important in local economic development.
- (1997 – present) Wide popularizing, marketing and internationalizing stage. The socialization of Green Food were incarnated through the four aspects: local governments pay attention to Green

Food development; consumers awareness of the Green Food has raised, also thanks to the media; new technologies have been developed for Green Food production, and world markets have expanded.

The popularity of the green food label is now well consolidated, especially in urban areas. Green food production is dominated by larger companies and farms, rather than small ones, and the retail sales make it one of the largest sectors in any country of the world (approximating the retail value of the United States' USD 12 billion organic market using wholesale/farm gate values).

Green food has two grades, the AA-Grade and the A-Grade:

1. The AA-Grade green food is comparable -but not the same as- organic. It is distinguished from the standard A-Grade green food by requiring traceability and the absence of any synthetic agro-chemicals. AA-Grade green food differs from organic products since it relies on product standards rather than process standards, hence it makes extensive use of modern test methodologies to ensure that the production environment and the characteristics of the final products meet its benchmarks. With more emphasis on initial field test and then only laboratory test of products, the field inspection of green food is not as traceable as organic which follows the whole production process of each crop down to individual farmers.
2. The inspection of standard A Grade green food relies more on the production and control records of green food enterprises while the inspection of AA-Grade green food products is reportedly similar to organic agriculture.

1.3.3. Comparison among China's food standards

The major difference between China's organic and green food / safe food standards are that latter have an end-product orientation born of consumer and government concerns for safe foods whereas organic farming historically developed more to meet farmers' needs. In this sense, rather than simply refraining from polluting the crops or environment, organic farmers employ active measures to seek to improve their soils and ecological environment. In this sense, organic production internalizes public benefits such as biodiversity and natural resource conservation by bundling both a product and an environmental service that are paid for by consumers whenever organic products are sold at a premium. This creates an undistorted market incentive for farmers to conserve public goods even if consumers might be less willing to pay for the public services independently. The other difference among organic, green food and safe food are shown in Table 1.

Table 1 - Comparison between green, organic and safe food

	Organic agricultural products	Green food (China)	Pollution free food
Product range	Edible agricultural food products, fibers, medicinal herbs and materials	Food products	Edible agricultural food products and processed goods
Designation and symbol	No mutual recognition of the standard all over the world (each country has its own label)	Unite designation and label registration in China mainland, Hong Kong and Japan	Countries, places and departments have different labels
Characteristics	Heavy stress on environment protection, particular stress on food security	Environment protection and food security (equal stress)	Food security, need for environment protection
History	Studied in the 40's, started in the 70's, the organic movement entered in its development phase in the 80's (in 1972 IFOAM is established; in 1991 the EU adopts the regulation 2092/91)	Launched in 1990 by Chinese Ministry of Agriculture In 1993 the Ministry of Agriculture issued "measures of supervision on green foods mark"	After the 80's a pilot project was launched. In 2001 the ministry of agriculture put forward the "Pollution free food action plan"
Goals	Return to natural	Acceptable environment, high food safety	Basic food safety
Product composition	Mainly raw food	70% processed, 30% raw food	Mainly raw food
Traceability	Traceable	AA-Grade is not as traceable as organic, A-Grade is not traceable	Non traceable
Product Price	at least +50% with regard to standard food	+10-20% with regard to standard food	No premium

1.4. Organic as credence attribute

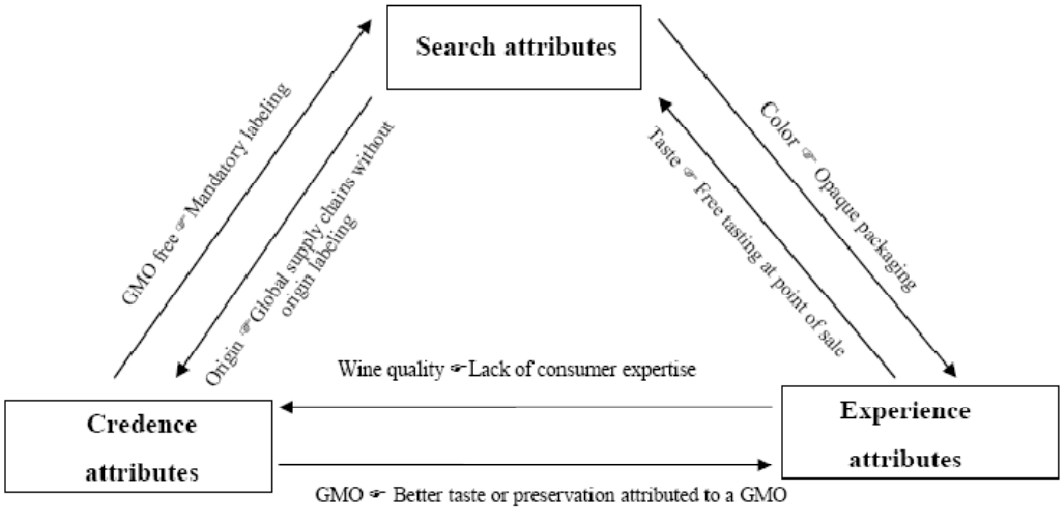
1.4.1. Food attributes

Consumers' perception of quality is influenced by the product's intrinsic attributes, as well as by extrinsic indicators and cues provided by the seller of the product. Intrinsic attributes relate to a broad array of attributes including food safety, nutrition, convenience, composition, and process attributes such as eco-friendliness (Caswell, Noelke, & Mojduszka, 2002). The information environment for different intrinsic attributes may be search, experience, or credence in nature (Akerlof, 1970; Darby & Karni, 1973; P. Nelson, 1970). In the case of search attributes consumers can learn about the quality level prior to purchase: this is a full information case, and there is no quality uncertainty given the possibility to inspect the product before buying. For both experience and credence attributes the information set that the consumer faces becomes important. Allowing for repeat purchases influences the experience attribute case, but in the case of credence attributes (e. g. the level of animal welfare for animal food), this repeat purchase assumption does not work since the consumer cannot judge quality even after consumption (Cho & Hooker, 2002). Extrinsic indicators (e. g. certification, labeling) and cues

(e.g. brand name, packaging, price) convey search information to the consumer since they are available prior to purchase (Steenkamp, 1989).

Organic is a credence attribute, while food safety is a combination of experience and credence attributes. The consumer's perception of quality is formed from a blend of information from these multiple sources (Grolleau & Caswell, 2005), as shown in Figure 6.

Figure 6 - Examples of Switching of Attributes Between Search, Experience, and Credence Categories



Source: (Grolleau & Caswell, 2005)

Hence, consumers depend heavily on firms' claims such as brands, labeling or advertising whenever food characteristics are not directly observable at a reasonable cost. In the case of credence attributes all the information sources consumers depend on are external, and since there is no ability to evaluate the quality through repeated consumption, purchase is explained by consumers belief systems. In this case, the purchasing driver is consumers beliefs about the quality of these information sources: if the information and verification cost is reasonable, credence attributes may become experience attributes (Cho & Hooker, 2002). Branding could be finally used to successful instill consumer confidence and satisfaction, using a combination of advertising, promotion and the repeated delivery of product with a consistent quality. When this strategy is successfully implemented, consumers associate the brand name with a product in a way that the two are synonymous, and both credence and experience attributes can become search attributes (Codron, Sterns, & Reardon, 2000).

Finally, even though credibility about credence attributes may be established through information campaigns, it has to be pointed out that consumers may also have difficulty in recognizing the attribute because of a lack of specific competence.

2. Background

2.1. Background

2.1.1. China's agriculture

Arable land is a precious resource for China's agriculture. Most of the country is covered by mountains, deserts, or dry grasslands, all unsuitable to agriculture. By the end of 2005, China had approximately 122 million hectares of arable land, covering 13% of its territory; this amounted to 0.27 hectares per capita, less than 40% of the world per capita average, 1/8 the U.S. level, and one half the Indian level. Furthermore China's population has been growing by some 10 million people annually, and arable land is being lost to new construction, natural disasters and conversion of farmland to other purposes (e.g. lower-quality arable lands are used for forest or grassland replanting), not to mention the pollution and soil erosion problems that plague the remaining farmlands; an efficient agriculture policy is therefore a top priority for the country, for it directly affects national food security. Starting in the 1980s, Chinese government pushed the adoption of technologies that maintain high food production, so GMOs (genetically modified organism), fertilizers and pesticides have been widely used as a means to increase yields. China is today the world's biggest user, producer, and exporter of pesticides. Even if in early 2007 most of the highly toxic pesticides were banned, they left behind a legacy of contaminated farmland (Yang, 2007). The production boost came along with a major cost to the environment and consequently to human health. The turn towards organic was initially fuelled by growing problems with Chinese agricultural exports, with the European Union and Japan banning tea and other crops due to excessive pesticide residues. Moreover, Chinese consumers' attention towards food quality has increased remarkably over time, in part due to the impact of chemical inputs misuse on consumers health - according to the report "Pesticide residues a major threat to China's Ag exports" (Yang, 2007), 53,300 to 123,000 people are poisoned by pesticides every year)- in part due to the recent food crises and scandals (SARS, milk powder, fake soy sauce), which pointed out China's woeful food safety standards. Urban consumers' income growth, combined with food security concerns, raised the demand for quality food, safer production and processed foods, and attracted more and more attention from the media to this issue. The XI five-year plan (2006-2010) itself aims at constituting a "harmonious society" relying on advanced science and technology to realize high-quality and high-efficient development, and seeks sustainability, advocating higher life standards for human beings as a reaction to the past resource misuse.

2.1.2. Counterfeiting

Certification and labeling play a relevant role in both domestic and international markets, as they guarantee that the declared characteristics are effectively possessed by the product, thus reducing asymmetric information between producers and consumers. Obviously, the use of labels and certifications implies more costs, thus affecting the sales price, which becomes higher. Since credence attribute can't be tested, the credibility of quality claims is a key factor, and opportunistic behavior of the better informed party can quickly erode consumers' trust and jeopardize the entire system. In the

case of experience goods, reputation, efficient quality signaling, advertising, and government standards may help reducing adverse selection (Bagwell & Riordan, 1991; Kirmani & Rao, 2000; Klein & Leffler, 1981; P. Nelson, 1970); credence characteristics on the other hand pose a different problem because of the risk of cheating. Ensuring the credibility of credence attributes in the market may require the intervention of credible third parties, whether honest producers or governmental institutions. As for a brand, If successful implementing such a strategy, a credence attribute can be converted into a search attribute, and consumers can make successful selections based on reliable information (Grolleau & Caswell, 2005).

In China however, reliability and trust towards the authenticity of any claim is nearly impossible to obtain. The country is probably the biggest world market for counterfeited and fake goods, and every brand, label, certification or logo is under the risk of counterfeiting. Clearly food products do not make an exception. Counterfeiting in 2004 was estimated to account for approximately 8% of China's gross domestic product (Chow, 2004), and the number is not decreasing despite the attempts of the government to improve inspections, due to several barriers such as local protectionism and lack of adequate sanctions, that impede effective enforcement against counterfeiting.

2.1.3. China's organic market

In 2007 almost 31 million hectares were managed organically by at least 633,891 farms, with Organic Agriculture accounting for 1.8% of agricultural land worldwide (Paull, 2007). The countries with the largest organic areas under organic management were Australia (11.8 million hectares), Argentina (3.1 million hectares), China (2.3 million hectares) and the US (1.6 million hectares). China's third position is even more remarkable if we consider that in 2000 the country was in 45th position, and in 2006 it was in 2nd position; moreover, in the year 2005 / 2006, China added 12% to the world's organic area, accounting for 63% of the world's annual increase in organic land. China's organic farming however occupies only 0.1% of the total agriculture production, and 0.76% of the total arable land; by comparison, organic food makes up 3 to 5% of the overall agriculture products on the world food market, and organic arable land comprises 5 to 10% of the world arable land (Yang, 2007). In the mid 1990s, there was virtually no domestic market for organic food, and so the industry began as an export-only activity (Buckley, 2006). The domestic market share of organic food was less than 0.1% in 2007, much lower than the average level of 2% in the world; nevertheless, although small, the Chinese organic market is emerging, as proved by the enormous success of the green food, which experienced a 25% average annual growth rate through the 1990s. Besides, China's growing middle class is beginning to view organic food as safer and healthier, and stores in the major cities started offering organic fruits and vegetables, but also cosmetics.

However, China is currently in the difficult position of having to address environmental damages caused by past chemical misuse in agriculture and heavy pollution problems. According to the People's Republic of China's own evaluation (so it's likely that the following statistic is even more dramatic) two-thirds of the 338 cities for which air-quality data are available are considered polluted, acid rain falls on 30% of the country, and the vast majority of the population drink contaminated water (Geofight.com, 2009).

Moreover, the problem of fraud remains an ever-present concern in China with companies falsely advertising pesticide-treated produce as organic. Wal-Mart until recently was purchasing “organic” foods from a farm near Beijing that was later found to treat its vegetables with pesticides (Chi Chu, 2007). 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 almost two-thirds of the people in China (L. Wei, 2007).

Furthermore, the success of the green food movement has ironically acted as an impediment to further development of the organic market. “Everyone knows the green food label, but it has also caused confusion. If you go on the street, even in Beijing, and ask people whether organic food or green food is healthier for them, or which one is better for the environment, most people will tell you green food. In Chinese, green sounds better than organic, which most people haven't even heard of anyway” (Buckley, 2006). In Chinese language in fact the word "youji", which describe the organic concept, literally means "with technology"; in different situations the same wording may be used to define concepts opposite to organic: e.g. “youji huafei”, are chemical fertilizers.

In the quality food sector there is therefore a boomerang effect, in that some organic food sold to international food suppliers and distributors such as Wal-Mart and Carrefour return to be sold within their stores in China, where they are marketed as westernized, higher-quality, and usually more expensive goods. Notably, organic food sales have increased by 50% at Carrefour in China since last year as the country’s food safety weaknesses were exposed, underscoring the growing public demand for organics (Rein, 2007).

These developments align with growing demand for safe foods and point not only to the continued potential for exports, but also to new opportunities in intra-Asian trade and the potential for increased domestic markets. In view of the constantly growing demand for organic raw materials in the western industrial countries, China is developing into an important large-scale producer of raw organic goods, despite the lack of harmonization of standards and certification procedures between countries (Canavari & Cantore, 2007). This offers enormous potential and is developing rapidly with state support. The export turnover was already 350 million USD in 2005. The domestic market is also on the move, thanks to the growing demand for environmentally-friendly products, and offers considerable opportunities given the significant size of the population with significant disposable income (19% of Chinese population, almost 250 million people, earns more than 20,000 Euro per year); however, sales volumes are still quite modest (Hasimu, Marchesini, & Canavari, 2008a) due to:

- modest availability and selection in stores exacerbated by limited prominence;
- inconsistent supply from farmers;
- In China, over 60% of the provinces and cities, most of which are in the northern, middle and western parts of China, produce organic food. However, the distribution of organic food production facilities is rather imbalanced, for there is no organic food supply chain in certain provinces and cities. Besides, most of the organic food retailers are located in the urban areas, where food availability and sales have outpaced the growth of rural food supplies;
- Sometimes exorbitant prices: organic food products in china can cost up to 12 times more than the same products from conventional agriculture;

- poor consumer understanding of organics. The main impediment to further development of China's organic sector is in fact public awareness: many people want to buy healthy food, but they don't know where to find it or how to buy it, and many farmers have organic food, but they don't know how to market it.

Besides, since Europe and North America generating over 90 percent of sales, organic production is mainly export-geared. Before 1998, almost all organic food certification bodies were from developed countries, most of which came from the European Union, especially Germany. China's organic food exports make up less than 1% of the world organic food supply. China's major organic export products are tea, beans and rice, mainly produced in its coastal regions. The organic food export volumes and the range of the products are both limited, but growing. Between 2003 and 2005 China's organic food exports grew from 142 million USD to 350 million (Bezlova, 2006). Most of the organic food is raw farm produce, so Chinese producers earn comparatively low prices compared to international traders and processors. This matter of fact does not create incentives for establishing sustainable production systems. Unlike western countries, decisions to go organic are rarely the farmer's decision, but rather governmental in nature, showing the continued role of the Chinese government in setting economic agendas.

3. Motivations and objectives

3.1. Literature review

On the basis on what previously discussed, it emerges that the main reason behind the necessity to picture Chinese consumers' way of thinking about organic food in a network form is that the problem has never been addressed before.

The development of the organic market in China is in its early phase, while most studies focus on developed markets. Although there is a huge number of studies on organic consumers in Europe, USA and Australia (Bellows, Onyango, Diamond, & Hallman, 2008; Bonti-Ankomah & Yiridoe, 2006; Browne, Harris, Hofny-Collins, Pasiecznic, & Wallace, 2000; Chryssohoidis & Krystallis, 2005; Cicia, Del Giudice, Ramunno, & Tagliafierro, 2006; Davis, Titterington, & Cochrane, 1995; Grunert & Juhl, 1995; Lohr, 2001; Naspetti & Vairo, 2004; Naspetti & Zanoli, 2006; Roddy, Cowan, & Hutchinson, 1996; Thompson, 1998; Tregear, Dent, & McGregor, 1994; Yiridoe, Bonti-Ankomah, & Ralph, 2005; Zanoli, 2004), little is known on consumer's perception of organic foods in Asia (ACNielsen, 2005; Kim, Suwunnamek, & Toyoda, 2008; Moen, 1997; J. Nelson, 1991; Roitner-Schobesberger, Darnhofer, Somsook, & Vogl, 2008), and even less information is available for China (Baer, 2007; Lu, 2002; X. Wei & Yinchu, 2007; Zhang, 2005; Zhou & Chen, 2007).

Particularly relevant for this study is the article published by Roitner-Schobesberger, Darnhofer, Somsook, & Vogl, 2008, for it aimed at gathering exploratory data on consumer perception of organic foods in Bangkok, Thailand. Despite the differences in the approach (qualitative versus quantitative) and in the methodology (network design versus descriptive statistic), Roitner-Schobesberger's study provided in fact a useful framework of reference in designing the questionnaire and other aspects of the survey. The background was in fact very similar: consumers in Thailand are increasingly demanding safe foods, in response to food scares related to high levels of pesticide residues sometimes found on vegetables and fruits, and little is known on consumer perception of organic foods in the country.

A study focused on China worth mentioning is also "Consumer's Willingness to Pay for Organic Food in the Perspective of Meta-analysis" (X. Wei & Yinchu, 2007). According to Wei, it emerged that the reasons why organic vegetables are bought is that they are considered safer (42.9%), healthier and nutritional (27%) and environmentally friendly (2.5%) by consumers. However, the study focused on how much Chinese consumers are willing to pay for organic food, rather than on their perception of the concept, therefore it does not explore in depth most of the issue here faced.

It is therefore impossible to rely on previous studies to improve the knowledge on Chinese consumers' perception of organic, since none exists on the topic. The importance of studying directly the issue of organic perception in China is also relevant for the unique situation of the market:

- Although growing fast, the organic market in China is still a niche, and it hasn't reached a mature identity;
- its shape it's still affected by the continuous food crises and scandals that strike the country, and the changes it's undergoing in the mind of consumers are worth monitoring;

- Chinese quality food market is also unique due to the presence of certifications that are present only in China, and that "compete" with organic in terms of market positioning and image (e.g. green food);

3.1.1. Pilot study

In 2007, within the framework of the De-Gusto Bio project (a EU co-funded project aimed at promoting organic, typical and local EU foods in China), I carried out an explorative survey on Chinese consumers' perception of organic logos (European and Chinese) in the cities of Guangzhou, Hong Kong, Beijing and Shanghai. What emerged from the review of the questionnaires collected was not just a diffuse lack of knowledge of the meaning of organic, but also an extremely wide and colorful range of associations for organic concepts, that in most cases had nothing to do with organic or organic-related concepts.

3.2. Objectives

3.2.1. Mapping associations

The first objectives of this study is to uncover Chinese consumers' product associations with regards to organic food and show how they are linked to each other in the form of a network (individual perceptual map and aggregated consensus map). A map is an effective way to summarize complex data: numbers and ideas presented graphically are in fact more easily understood, remembered and integrated than when they are presented in narrative or tabular form (Gengler, Klenosky, & Mulvey, 1995). Creating a fuller picture is more beneficial than free association, rating scales, and collages by identifying the most important brand associations and showing how these associations are connected. Second, the connections revealed between attributes can provide a sense of what might happen if certain other attributes change (Loken & Deborah, 2006). The benefits of such an approach are even more evident in the case of unusual or unexpected associations, since they would require even more efforts to be conveyed. Chinese culture differs significantly from western and other Asian cultures, so consumers have different values and a different perception of product attributes (Hasimu, Marchesini, & Canavari, 2008b); for this reason similar purchasing behaviors may underline different motivations from those that might be expected by western observers. Building and analyzing a network provides much more information than descriptive statistics, thus improving the investigative capacity on the topic.

3.2.2. Raise the awareness about the positioning of organic products in China

Mapping the association evoked by organic products offers potential not only for understanding the "cognitive" positioning of such products, but also for developing effective marketing strategies: through positioning, marketers can in fact modify the identity of a product in the minds of consumers. Perceptual mapping shows the network of mental associations that stems from a central concept, thus measuring the symbolic positioning of the product. This technique, combined with other qualitative methodologies that provide insight or directly explore purchasing motivations (such as the means-end chain theory), can provide a very useful tool in the hands of advertising and communication managers.

Besides, organic products are highly-symbolic, and hence perceived mainly on the basis of "credence" attributes (e.g. label). It is therefore crucial for marketers to break through consumers purchasing barriers, and find a way to encourage a strong emotional involvement with the product, given the low involvement generally associated with food products (Zaichowsky, 1985).

3.2.3. Identify hidden relations between maps and profile

Another goal of the study is to observe the data acquired and look for hidden structures that connect the type of networks build by respondents to relevant determinants such as product knowledge, purchasing behavior or socio demographic profile. Any finding in this direction could allow identifying the behavioral and cognitive patterns of specific target groups, thus improving the effectiveness of communication strategies on specific market segments.

3.2.4. Testing the BCM methodology

The BCM has been identified as methodological point of reference for this work. Assessing to which extent it is accessible and reliable for marketing studies, and its validity for collecting, coding and presenting information on the target groups would be another important objective of the research, thus contributing with a feedback for further improvements in the area of brand measurement. It will be investigated also its advantages over other mapping techniques such as Zaltman's Metaphor Elicitation technique (ZMET) in terms of cost administration, training of the interviewers, standardization and application for different data settings and use on larger samples.

3.2.5. Network analysis

Although the BCM provides all the rules to build a good network out of individual maps, it does not offer neither the theoretical basis nor the instruments to analyze the relationships among the elicited associations. The social network analysis 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). The theory of networks however yield explanations not just for social phenomena, but for a wide variety of disciplines from psychology to economics (Borgatti, Mehra, Brass, & Labianca, 2009).

In the social network analysis the unit of analysis is not the individual, but the entity consisting of all of the individuals and the linkages among them (molecular rather atomistic view). The focus is therefore the relationships among the actors rather than their attributes, and the sense of interdependence among them. Other relevant hallmarks of such a perspective are also that the structure affects the outcomes, and the emergent effects (Wasserman & Faust, 1994). In this study the actors of the network are the associations elicited from the consumers (concepts) instead of individuals.

In order to obtain more information from the data, the networks produced through the BCM will be therefore analyzed using some convenient metrics measures offered by the social network analysis.

3.2.6. Acquiring insights on political implementation strategies

Exports remains the major reason for growth in the organic sector, with only limited distribution nationwide, while green food satisfies domestic demand for higher quality products. Organic agriculture is environmental friendly, sustainable and health-oriented, now strongly supported by the Chinese government. China's People Congress is in fact promoting the creation of organic zones around Beijing to cater to the growing market within the capital and to serve as a model for other cities. Given these premises, it is interesting to assess how much of the political intention expressed in the XI five-year plan is transferred to Chinese people in terms of awareness and knowledge, and how such information is assimilated by the addressees of the message.

3.2.7. Improving the overall knowledge on Chinese market

This study finally aims at improving the overall knowledge and understanding of Chinese organic and agro-food market through the answers of the respondents. Many issues affect consumers' perception at many levels, and many questions remain unanswered: how do consumers address the demand for safer food in a market continuously stroke by food scandals and where nothing seem to be authentic? Which barriers still prevent consumers from changing consumption habits? Acquiring information on these issues by registering the spontaneous comments or feedbacks directly by Chinese consumers' would also be sought.

4. Methodology

4.1. Knowledge as a network

4.1.1. First network models

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 (Skinner, 1957); Behaviorists however did not postulate any recourse either to internal physiological events or to hypothetical constructs to describe behavior, therefore their theories did not encompass neither meaning nor knowledge concepts (Harley, 1995).

One of the first network models as a form of knowledge representation was proposed for computers by Richard H. Richens in 1956, as an interlingua [1] for machine translation of natural languages; the same topic was investigated further by Quillian (Quillian, 1969), an artificial intelligence researcher interested in creating a program that could understand language. In 1969 Collins & Quillian elaborated a model where the meanings of words are embedded in networks of other meanings, hence knowledge is validated and acquired meaning through correlation with other knowledge (Collins & Quillian, 1969). According to such models, concepts are represented as nodes interconnected to other nodes within the semantic network; the nodes are activated when they are heard, causing information that is correlated to the concept to be primed. The links between information are qualitative and purposeful, and the nodes that are connected by these links have hierarchical relationships (Harley, 1995). These studies were developed in the 70's and 80's in the context of knowledge engineering for expert systems (computer programs that embody domain-specific knowledge, and that perform decision making, problem solving and design tasks at levels typical of human experts). Knowledge representation and theoretical conceptualizations of knowledge structure was developed also in the studies of scripts, prototypes [2], and schemata [3].

4.1.2. Network applied to memory organization

Anderson and Bower for example described an associative theory of human memory, embodied in a computer simulation that made a wide range of predictions about sentence memory and other verbal learning phenomena (Anderson & Bower, 1973). Collins and Loftus (Collins & 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. According to such model, when a person is reminded of a stimulus, activation of the node corresponding to that stimulus occurs. Activation then spreads to other nodes

[1] a language meant for communication between people from different nations who do not share a common native language

[2] A concept is a sort of scheme. An effective way of representing a concept is to retain only its most important properties. This group of “most important” properties of a concept is called prototype.

[3] A schema (pl. schemata), in psychology and cognitive science, is a mental structure that represents some aspect of the world.

from the stimulus node, with the degree of spreading dependent upon the distance from the stimulus node; memory retrieval of one item produces a spread of activation to those other items that are closely related (Henderson, Iacobucci, & Calder, 1998). A similar model for associative memory structures was proposed by Friendly (Friendly, 1979), who used a threshold on the proximities between nodes in free recall to determine which nodes to connect. Friendly's method does not require people to have explicit knowledge of network structures (Friendly, 1977, 1979). However, the use of a threshold showed some limits, in that it did not take the relative relations between nodes into account.

Over time other network models applied to memory organization were developed, as well as feature models in which concepts were represented in terms of a feature list (Smith, Shoben, & Rips, 1974). In order to test these models and to explore knowledge representation empirically, several existing psychometric scaling techniques were employed including hierarchical cluster analysis (Johnson, 1967), weighted free trees (Cunningham, 1978) and additive similarity trees (Sattath & Tversky, 1977); all of these methods require estimates of pairwise proximities and yield some form of tree structure corresponding to the data. The value of hierarchical cluster analysis lies in its potential for revealing the underlying categorical structure for a set of entities. However, one problem encountered in uses of cluster analysis stems from the necessity for clusters to be nested, which means that an entity can only belong to certain clusters (Schvaneveldt, Durso, & Dearholt, 1989). Additive clustering (Shepard & Arabie, 1979) allows overlapping clusters, so that an entity may belong to more than one cluster. The clusters are not necessarily nested, so that nonhierarchical structures can be revealed. Such a representation violates the constraints on a tree structure and thus corresponds to a general graph. The theory underlying additive clustering assumes that the entities have associated sets of features, and the clusters correspond to shared features among the entities. The value in the method lies in its ability to suggest these underlying features (Schvaneveldt et al., 1989). Multidimensional scaling too has been used as a model of the psychological representation of stimuli (Beals, Krantz, & Tversky, 1968; Shepard, 1962). Multidimensional scaling (MDS) is a special case of ordination. An MDS algorithm starts with a matrix of item–item similarities, then assigns a location of each item in a low-dimensional space, suitable for graphing or 3d visualization.

4.1.3. Specifically designed techniques

Other techniques were finally developed specifically for this purpose, such as Pathfinder network scaling (Schvaneveldt, 1990; Schvaneveldt, Dessel, & Durso, 1988; Schvaneveldt et al., 1989). Pathfinder networks are derived from proximities for pairs of entities, where proximities are associations or any other measure of the relationships among entities, and where the entities are often concepts of some sort, but they can be anything with a pattern of relationships. In the Pathfinder network, the entities correspond to the nodes of the generated network, and the links in the network are determined by the patterns of proximities. Pathfinder is tied to some fundamental concepts in graph theory. While spatial models have mathematical foundations in geometry, discrete models often derive from graph theory. As representations of mental structure, discrete models offer alternatives that are often closer to psychological theory (Schvaneveldt et al., 1988).

As psychological models, networks entail the assumption that concepts and 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 intensional meaning of a concept is determined by its connections to other concepts (Schvaneveldt et al., 1989). Networks can be used to model heterogeneous sets of relations on concepts, in which case we assume that the links have a semantic interpretation such as those found in semantic networks (Collins & Loftus, 1975; Meyer & Schvaneveldt, 1976; Quillian, 1969). Explicit network representations offer the potential of identifying structural aspects of conceptual representation that relate to memory organization, category structure, and other knowledge-based phenomena; less restrictive assumptions are required for using networks as a descriptive tool for analyzing proximity data. Networks offer one way among many for extracting and representing structure in proximities. The primary requirement for description is that network representations reveal patterns in data that lead to fruitful interpretations (Schvaneveldt et al., 1989).

4.2. Networking models in marketing

4.2.1. Brand mapping

Most of those cognitive psychologists, quantitative psychologists and marketing researchers that have studied associative network models concluded that such network models seem well suited to studying consumer memory (Bettman, 1974; Calder & Gruder, 1989; Krishnan, 1996; Schmitt, Tavassoli, & Millard, 1993).

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 (Roedder et al., 2006). Brand associations can vary broadly, from physical product attributes to also include perceptions of people, places, and occasions that are evoked in conjunction with the brand. Some of these attributes are conscious, some are subconscious. This association network shows the brand's uniqueness and the unique value of the brand to consumers, and suggests ways that the brand's equity can be leveraged in the marketplace (Aaker, 1996). 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), as they provide a simple and highly intuitive representation of which characteristics are most associated with competitor brands. Such process provides valuable insights of the brand competiveness and positioning within the market arena. 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 et al., 1998). Ideally, managers should be able to produce brand maps containing the important brand associations and the links between these associations. It would help them understand how the brand is perceived by the consumer in general, or by segment, how this perception corresponds to the brand positioning and thus how to adapt the integrated communication (Brandt & Mortanges, 2006). Brand associations can also provide a basis for new products and brand extension. Revealing the network of strong, favorable and unique brand associations in consumer memory, and how they are configured, means understanding brand equity (Keller, 1993). Brand equity refers to the marketing effects or outcomes that accrue to a product with its brand name compared with those that would accrue if the same product did not have the brand name. In other words, it is the value of an immaterial asset (the brand). Concept maps have been applied to a variety of areas, mostly in educational and counseling research and social psychology,

for they allow large amounts of data to be simply represented in two [4] dimensional way, easy to interpret, visually appealing and helpful in identifying clear differences between concepts. The technique was consistently applied to marketing issues only in the '90s, with a focus first on the product and later on brands. MacKay used concept maps to portray differences in international product perceptions, and to account for the differences between consumers within each country (MacKay & Easley, 1996); Elliot, Swain and Wright applied concept mapping techniques to assist product resourcing decisions (Elliot, Swain, & Wright, 2003); concept maps were also used to address product design problems that arise during new product development process (Carbonara & Scozzi, 2006).

4.2.2. Consumer and analytical mapping

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 & Mortanges, 2006). More recently, several studies have included quantitative analyses of brand concept maps. Those studies capture the brand image using analytical measures (Henderson et al., 1998) or highlight the brand's core identity using an aggregation procedure.

However, methodologies for producing brand maps have been slow to emerge (Roedder 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 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 (Roedder 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).

4.3. Consumer mapping techniques

4.3.1. Overview

As stated above, concept maps are knowledge representation tools. Concept maps have been used since the 1980s in the physical sciences to elicit knowledge people possess about scientific concepts and how they are interrelated to one another (Novak & Gowin, 1984).

[4] three dimensional maps are also used, although two dimensional maps are the most popular as they are most easily understood and interpreted by clients

From the point of view of data collection, procedures for obtaining concept maps range from unstructured methods, in which respondents generate and develop their own concepts maps with few instructions (e.g. free association, free response), to structured methods, in which lists of concepts are provided and concept mapping proceeds with the aid of explicit instructions and through guidance (e.g. repertory grid, laddering). Ruiz-Primo showed a complete review of such procedures (M. A. Ruiz-Primo & Shavelson, 1996), while Åhlberg presented a review of the elements of an improved method of concept mapping from the viewpoint of research methodology (Åhlberg, 2004)

A concept map consists of:

- a task
- a response format
- a scoring system

Variation in tasks, response formats, and scoring systems may elicit different knowledge representations, posing construct-interpretation challenges. Moreover, different methods may tap different types of knowledge, for there is no single definitive procedure for applying each of the methods. Although a method and an associated procedure is specified for the hypothetical problem, there are most assuredly other methods and procedures that would also be reasonable (Maria Araceli Ruiz-Primo, Shavelson, & Schultz, 1997).

Among qualitative consumer mapping techniques, only two emerged in the area of branding: 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 the far less labor-intensive consumer mapping technique proposed by Deborah John Roedder called Brand Concept Mapping (BCM) (Roedder et al., 2006).

The process of using associative network models for the purposes of uncovering branding effects can be divided into three stages:

- data elicitation
- representation of data in a spatial structure
- network building through aggregation procedures

In the following sections a short description of these techniques is provided.

4.3.2. Zaltman's Metaphor Elicitation technique

ZMET is a research tool that uses visual and sensory image, assuming that 80% of the human communication is nonverbal. The ZMET is designed to "understand the cognitive structures, or mental models, that cause a feeling of personal relevance" (Christensen & Olson, 2002). During the elicitation phase, 15 to 25 participants are recruited and introduced to the topic. Participants are then given instructions to collect 12 pictures of images that convey their thoughts and feelings about the topic; 7-10 days later they are engaged in a two-hour personal interviews where they are asked to tell stories about the pictures in order to elicit constructs. The personal interview uses qualitative methods such as the repertory grid and laddering process to tap verbal constructs, as well as other techniques to elicit visual images. During the mapping stage the interviewer reviews all the constructs that have been elicited, and are asked to create a map illustrating the connections among important constructs. Finally,

during the aggregation stage, all of the materials acquired during the first two phases (e.g. interview transcripts, audiotapes, images, and interviewers' notes) are examined, codified and constructs are chosen in order to build the final map, regarding how frequently they are mentioned. The final map contains the chosen elements with arrows to represent links between constructs.

The main advantage of ZMET lies in the thoroughness of the procedures for eliciting brand associations, through multiple qualitative research techniques to tap verbal and nonverbal, conscious and unconscious aspects of consumer thinking. However, ZMET methodology has several drawbacks: respondents must be willing to devote a lot of time and interviewers require specialized training (e.g. cognitive neuroscience, psycholinguistics, semiotics). From an accessibility point of view the ZMET has limited use: it is very labor intensive, for it requires time-consuming reviews of interview materials, and has limited cross-use and flexibility across research settings, since it does not offer standardized procedures for aggregating individual maps into a consensus map, and the procedure for producing brand maps involve expert judgment. Eliciting brand associations in this manner is well suited to situations in which prior branding research is limited or in which deeper and unconscious aspects of a brand need to be better understood (Christensen & Olson, 2002). Joiner (Joiner, 1998) pointed out that compared to the ZMET, traditional concept mapping techniques are easier to administer, but they focus more on conscious evaluation.

4.4. BCM methodology

Compared with the ZMET, the Brand Concept Map technique (BCM) answers the need for a more accessible and standardized method than consumer mapping techniques for producing brand maps, and with a set of relatively straightforward rules for aggregating individual brand maps that do not require specialized statistical knowledge such in analytical mapping techniques. The BCM method incorporates structure into the elicitation, mapping, and aggregation stages to provide a technique that is easier to administer and analyze (Roedder 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 often be used in the elicitation stage. For such reasons, the BCM technique is very suitable for many data collection settings and large samples, although associations that require more in-depth probing are unlikely to surface with this technique.

The BCM is divided into three stages, elicitation, mapping and aggregation of the individual maps.

4.4.1. Elicitation

The elicitation stage consists in identifying the salient associations for the brand. The BCM is a mapping method that allows relying on past surveys to define the brand attributes, provided that the data used to identify salient associations are gathered from the same consumer population as the one being used in the mapping stage. In the case of this study, no prior consumer researches was found on the topic, aside from the previously mentioned unpublished work (see paragraph 3.1.1).

4.4.2. Mapping

During the second phase respondents are asked to think about what they associate with the brand. The associations emerged in the elicitation stage are mounted onto cards and respondents are asked to select and organize the cards according to their personal viewpoint. Respondents must connect the premade cards 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.

4.4.3. Aggregation

In the aggregation stage, individual brand maps are combined on the basis of a set of rules to obtain a consensus map for the brand (Roedder et al., 2006). 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 description of the BCM measure is shown in Table 2.

Table 2 - summary of six BCM measures

Measure	Description
1. Frequency of mention	number of times that a brand association occurs across maps
2. Number of interconnections	number of times that a brand association is connected to other brand associations.
3. Frequency of first-order mentions	count of the number of times that a brand association is directly linked to the brand across maps
4. Ratio of first-order mentions	percentage of times that a brand association is linked directly to the brand when it is included on a brand map.
5. Type of interconnections	indicates how frequently a brand association is placed above other associations (super-ordinate) or below other associations (subordinate) across maps
6. Type of line	type of line -single, double, or triple- connecting each association to the central item or to other associations in the consensus map

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 & Mortanges, 2006). 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 next step is the aggregation process. The standard procedure can be divided in five stages:

1. The first step aims at identifying the core attributes to place on the map. The associations that are included on at least 50% of the maps must be 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.

2. The second step is to determine which of the core associations should be directly linked to the central concept (product/brand). It must be selected as first-order associations those with ratios of first-order mentions to total mentions of at least 50%, with more super-ordinate than subordinate connections.
3. The third step involves 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;
4. In the fourth step we incorporate 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.
5. The final step is to decide which type of link to use for each connection: it is calculated the average strength used in all individual brand maps, and it was rounded to the nearest integer.

4.5. Application of the BCM to this study

In this study it was adopted the BCM technique (Roedder et al., 2006); however, given the very exploratory nature of the survey and some past experience in dealing with surveys in China (see paragraph 3.1.1), some slight variations in the standard procedure have been introduced. The design of this study thus reflects the learning acquired in interviewing Chinese people on a similar topic with a similar methodological tool.

First, the BCM technique is designed for small groups of respondents. In this study the interviews have been designed as individual, face-to-face, semi-structured dialogues instead of group interviews, so as to identify unique and unexpected associations in consumers' minds that otherwise would have been less likely to emerge (see paragraph 3.1.1).

4.5.1. Elicitation

In the elicitation stage, instead of selecting a pool of pre-defined salient brand associations respondents should choose among, it was decided to elicit associations directly from each respondent and let them use their own selection of association for the mapping stage. This way it was possible both to reduce the bias and to retain the exact wording used rather than pre made categories created by researchers. In fact, although the BCM focuses more on standardization to collect data compared with other techniques such as ZMET, in this study -being the first on the topic carried out in China with this methodology- the effectiveness of personal wording had a strong significance, so it was sought any mean for decreasing stereotypic responding. Open-ended questions not only encourage more meaningful answers, using directly the subject's own knowledge and feelings, but they also tend to be more objective, since bias may partially depend on the way in which multiple answers are sequenced and worded.

4.5.2. Mapping

To begin the mapping stage respondents must select the salient brand associations by picking the premade cards and build the concept map. However, since in this study the data was gathered on a one-to-one basis, spreading a card deck would have been both prohibitive and time consuming in most cases. So it was decided to vary the task demands in generating the concept maps, and instead of organizing cards respondents were asked to construct a map from scratch using paper and pencil, talking about the relation between concepts to describe the direction and strength of the links.

4.5.3. Aggregation

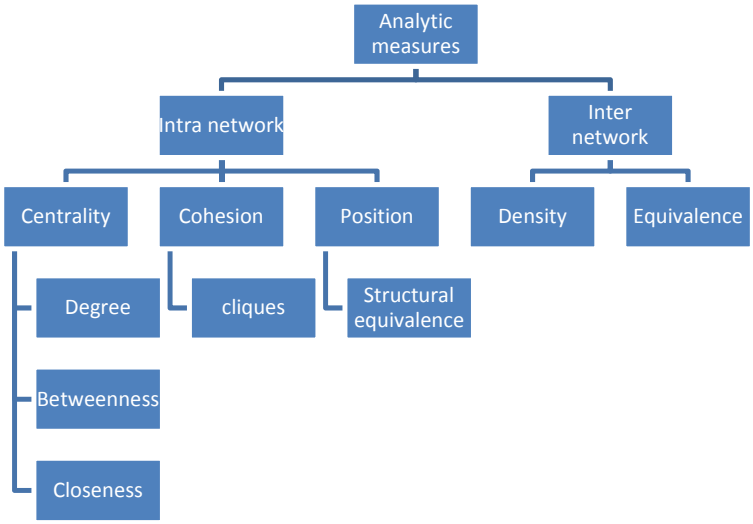
Individual brand maps are then combined to obtain an aggregated map. Frequencies are used to construct a consensus map, showing the most salient brand associations and their interconnections.
Finally some improvements have been foreseen in terms of graphic representation, by signaling the number of mentions through nodes size. By maximizing the "efficiency" of the figure it is in fact possible to reduce the "mental cost" to visual perception, and information can be decoded and compared with minimal effort, almost instantaneously (Bertin, 1983). The guidelines for the graphic enhancement used in this study are derived from Gengler's study of Hierarchical Value Maps in the means-end chain model (Gengler et al., 1995).

4.6. Network analysis

Network data can also be described and understood using a matrix. The rows of the array is the sequence of previously coded associations, the columns is the same set of associations; the result is a square matrix with a size reflecting the number of elements we want to map. Each cell of the array contains and describe the relationship between the coded associations: a "0" value would indicate that no relationship exists between the element in the row and the one in the column, any other value would indicate that such relationship exists, and it has been mentioned by as many respondents as it is the number indicated in the cell (a "4" value shows that 4 respondents have mentioned such a specific relationship). In our case the value of the main diagonal is meaningless, for it links an association with itself. Matrixes can represent both one-way and two-way relations (If the rows represent the source of directed ties, and the columns the targets, it's one way, if both row and column display the same relation it's two-way). In this study, we only considered two-way relations, as if the links connecting all the elements of the map were with double arrow ends. Annex 5 shows the matrix displaying all of the associations mentioned in this study.
Associative networks can be studied at different levels, and many metrics measures are available in the field of network analysis. Intra-network analyses are conducted at the node level, and deal with the properties of single associations by themselves, or relative to other nodes within the same network. On the other hand inter-network analyses measures allow comparing and grouping networks across respondents. Multiple individuals may be directly compared based on the similarity of their networks of product associations in terms of content or structure, which in turn allows for the identification of

market segments (Henderson et al., 1998). The most relevant network properties are displayed in Figure 7.

Figure 7 - Network properties



Source: (Henderson et al., 1998)

In this study the following network measurements will be calculated:

1. Centrality (degree, betweenness, closeness). Taken together these measures give a sense of which are the principal associations in a network.
2. Cohesion (cliques). Cliques are sub-sets of a network in which the concepts are more closely and intensely tied to one another than they are to other members of the network. Cliques are hence very useful to identify significant groups of associations.
3. Position (structural equivalence). Structurally equivalent nodes are substitutes, and substitutability can be diagnostic for brand parity effects. In our case it will be assessed only for green food.
4. Network density

5. Research design

5.1. Data collection process

The choice of research design must be appropriate to the subject under investigation. This study aims at acquiring an in-depth understanding of Shanghai consumers perceptions about organic food, and at providing insights on how such perception is likely to affect purchasing behavior. Given the exploratory and interpretative purposes, and given the necessity to provide a deep, rather than broad, set of knowledge about the phenomenon, the research will be based on a qualitative approach. The samples investigated will be small but focused, and even though the results will be graphed and displayed in statistical terms, it is important to point out that the findings may not necessarily be representative of the whole population in Shanghai. The first reason is that there is no way of knowing if the respondents interviewed are representative of the overall population. The second is that qualitative research attempts at shedding light on phenomena by studying a few cases in depth, and has not the claim to describe it with figures. Finally, in qualitative research the role of the researcher is a key, and the final report necessarily reflects his contribution in terms of interpretation, creativity and biases.

The tool chosen to collect the data was the questionnaire. There data collection method was the interactive interviewing, with respondents asked to answer a set of pre-determined questions, and to build verbally the perceptual map. Overall respondents enjoyed a high degree of freedom in expressing their opinions about the topic, and the researcher deliberately sought longer answers whenever possible. Any useful observation emerged during the discussion has been transcribed and reported.

The primary data was collected in Shanghai, the most populous city (about 20 million inhabitants) and the most important center of finance and trade in mainland China.

The sampling method was basically random, so as to reduce the biasing forces (each individual in the selected population has in fact an equal chance of being chosen). The interviews were carried out in public places located in different parts of the city, and no socio-demographic discriminating factors were applied in selecting the respondents. However, to produce a sample that represented also the viewpoint of organic food consumer, part of the interviews were carried out within specialized store and supermarkets. Finally, the questionnaire was pre-tested before distributing.

The interviews were conducted on a one-to-one base. Participants were told that they were participating in a consumer study conducted by a local and a foreign University (the Shanghai Jiao Tong University and the University of Bologna) and aimed at understanding the perception of Chinese consumers towards organic food.

Overall 50 questionnaires have been collected, from October 2008 to January 2009. All of the interviews were carried out in the native language of the respondents (Chinese Mandarin). Each interview lasted from 15 to 30 minutes, with an average duration of 20-25 minutes.

5.2. Questionnaire description

5.2.1. Structure of the questionnaire

To encourage a conversational, two-way communication and provide greater depth, I used a semi-structured questionnaire, containing both open-ended questions and questions with multiple-choice answers. A pre-defined set of questions was prepared beforehand so as to collect the basic information, while some of the questions were created during the interview, allowing both the interviewer and the respondents to probe for details or discuss issues. The choice to use a less stiff tool than the totally structured questionnaire was designed to put the respondents at ease as much as possible and to reduce biased responses (e.g. wish to please the questioner by answering what appears to be the right answers).

To minimize fatigue on the part of the people interviewed, given the efforts requested for the map building process, and given there was no incentive for answering the questions, the length of the survey was limited to 10 questions plus the map building section (overall 11 questions), organized in 3 macro areas:

- Map building section. This section was the core of the questionnaire;
- Understanding dimension, aimed at assessing the frequency of purchasing and knowledge of organic food. This section was designed to collect the 2 more important discriminants for the map building process, knowledge and experience;
- Personal dimension, aimed at collecting personal information about the respondents. This section was designed to collect the 5 socio-demographic discriminants used in the map building process;

In designing the questionnaire complex phrasing was avoided, and while introducing potentially sensitive topics -such as those aimed at evaluating personal knowledge- or during any phase of the interview also “socially undesirable" responses were verbally encouraged (depersonalization), so as to favor the surfacing of spontaneous considerations. In sequencing the questions the order was established so as to introduce the topic gradually, and during the discussion it was carefully avoided to provide any information that could increase the respondent’s chance of answering “right” to the questions that lied ahead. Considering that they are often perceived as threatening, demographic questions were placed at the end.

Figure 8 shows the English translation of the questionnaire (the original version in Chinese Mandarin language is reported in Annex 1).

Figure 8 - The semi-structured questionnaire

1. According to your opinion, what does it mean that a food is "organic"? What's the difference between organic and conventional food?
2. Which words (concept or adjectives) would you use to describe organic food?
3. Could you please express you feeling towards organic food in a scale 1 to 10? (with 1 equal to minim degree of appreciation, and 10 equal to the maximum)
4. Do you think you know the actual meaning of the word "organic food"?
   a) yes
   b) no
   c) I am not sure
5. Please answer to the following questions with "I agree", "I don't agree" or "I don't know"

   Organic foods are produced with "chemical fertilizers" [5]
   Organic food contains GMOs
   Organic and green food are the same
   Organic foods are inspected strictly
   Organic production methods aims at protecting the environment
6. How often do you buy organic food?
   a) More than once a week
   b) less than once a week
   c) never
7. Age
8. Sex
9. How many kids under 15 are present in your household?
10. Education
    a) Middle school or less
    b) High school
    c) University degree or more
11. Monthly income
    a) Less than 2.000 RMB
    b) 2.000-10.000 RMB
    c) More than 10.000 RMB

5.2.2. Questions grouping

The questions are grouped in the 3 abovementioned sections (see paragraph 5.2.1): map building (questions 2 and 3), understanding dimension (questions 1, 4, 5, 6) and personal dimension (questions 7 to 11).

The two questions that frame the core analysis of the respondent's perception towards organic foods are question N. 2 and N. 3. They were asked as close to the beginning as possible, for they represented the most demanding part in terms of time and attention.

[5] in the Chinese language chemical fertilizers are called *youji huafei* (有机化肥); *youji* (有机) however , it is the same word used to indicate the concept of organic food.

In question N. 2 participants were asked to mention all the concepts, adjective or thoughts that come into their mind upon thinking about organic. These associations were listed as the first order mentions. Respondents were then asked to think about each one of them, and mention other mental associations to organic food that such concepts evoked in the second instance. These associations were listed as second order mentions. The process went on as long as participants were able to add new items to the ladders. Once respondents could not go on any further, they were asked to describe how the salient associations mentioned so far were linked to each other; the researcher sketched the network on the paper according to their indications. The strength of the lines connecting the various associations (single, double or triple) was first assumed by the researcher during the elicitation and map building phases, based on the immediacy and directedness of the responses. At the end of the process the people interviewed were shown the sketch of the BCM, and they were asked to adjust it in case it did not reflect their thoughts (they were given instructions on how to do it, even though in many cases participants had already grasped the logic underlying the network design, and they didn't actually need real guidance, just a few hints).
In question N. 3 respondents were asked to indicate their feelings about organic food using a number between 1 ("extremely negative") and 10 ("extremely positive"). Respondents were encouraged to express their own opinions, whether positive or negative, and were told that the researchers were neither examining them, nor trying to promote organic food.

The understanding dimension was explored through questions N. 1, 4, 5 (knowledge) and N. 6 (experience).
In question N. 1 the interviewed people were asked to provide a definition of organic food, or to state the difference between organic and conventional food. This open-ended question in most cases was asked without a proper introduction to the topic, so as to acquire a privileged insight of the respondents true information base; the length and thoroughness of the responses in fact provided important clues about the true understanding of the topic, and, most importantly, they allowed the immediate identification of unaware individuals.
Question N. 4 was designed to detect any mismatch between the perception respondents had about their understanding of the topic, and the level of understanding estimated trough the questionnaire.
In question N. 5 participants were asked to express their agreement to 5 statements by answering "I agree", "I don't agree" or "I don't know". This question, combined with Question N. 1, enabled assigning a knowledge score to the respondents and group them into 3 groups: thorough, intermediate and poor knowledge.
The knowledge score was calculated in two steps: the number of correct answers to question N. 5 provided an intermediate score, while question N. 1 was used to adjust the intermediate score[6] and decide the final score. Table 3 shows how the intermediate knowledge score was calculated, while Table 4 shows how the final score was used to assign respondents to one of the 3 knowledge clusters.

[6] 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.

Table 3 - Intermediate knowledge score calculation base *

Statement	correct answer	value **
Organic foods are produced with “chemical fertilizers”	false	-2 / +1
Organic food contains GMOs	false	-1 / +1
Organic and green food are the same	false	-1 / +1
Organic foods are inspected strictly	true	-1 / +1
Organic method aims at protecting the environment	true	-1 / +1

* “I don’t know” answers were evaluated 0 points

** the number on the left shows how many points were subtracted in case of wrong answer, the one on the right displays how many points were added in case of correct answer

Table 4 - Conversion of the final knowledge score into clusters

Final score*	Knowledge cluster
≤2	Poor
3-4	Intermediate
≥5	Thorough

Question N. 6 was used to rate purchasing frequency.

The personal dimension (questions from 7 to 11) was dedicated to collecting socio-demographic discriminants, that is:

1. Age
2. Gender
3. Presence of kids under 15 in the household
4. Education
5. Monthly income

In the processing of BCM, the people interviewed were described both altogether, or divided into homogeneous socio-demographic clusters of individuals who show similar brand perceptions. Overall seven discriminants were chosen, as summarized in Table 5.

Table 5 – Summary of the discriminants used in the BCM production

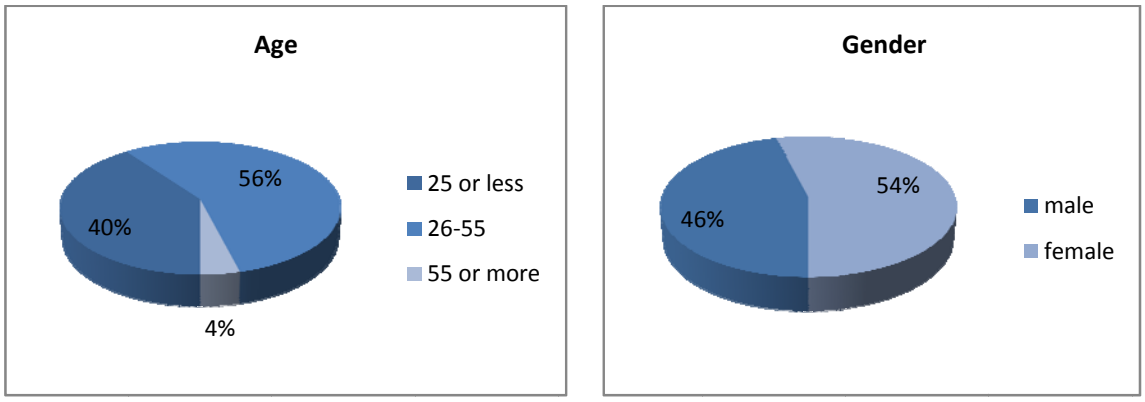
Discriminants	Clusters		
Knowledge	thorough	intermediate	poor
Frequency of purchase	frequent	occasional	none
Age	young	adult	old
Gender	male	female	
Presence of kids under 15 in the household	Yes	No	
Education	Higher education	High school	Lower education
Monthly income	<2.000 RMB	2000-10000 RMB	>10.000 RMB

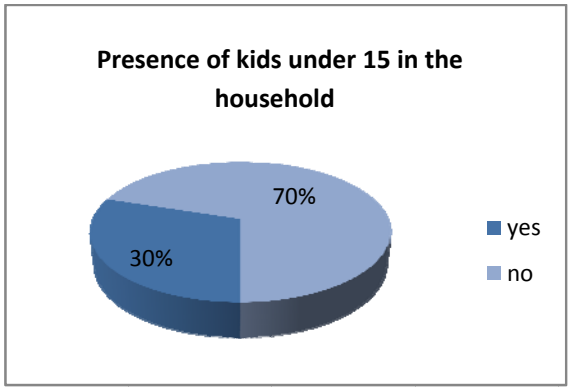
5.3. Characteristics of the sample

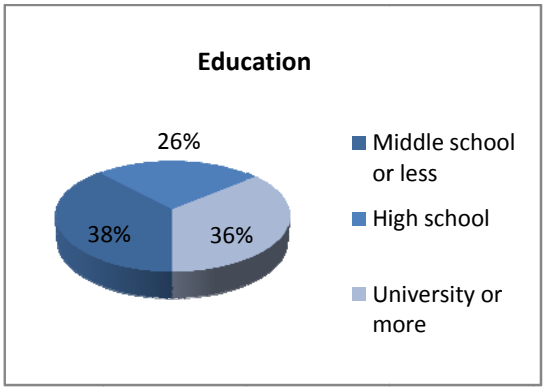
5.3.1. Description of the sample

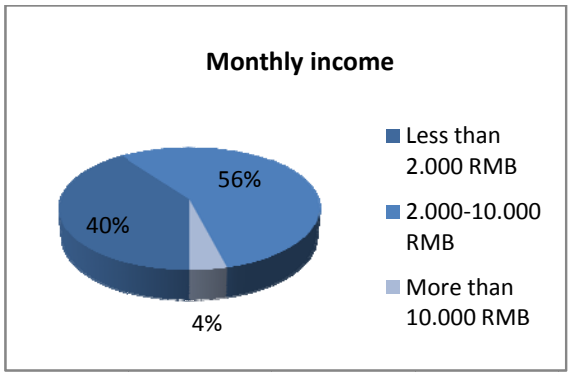
The majority of the respondents were young and middle age people, mostly students and working class laborers, with low income and no kids. Figure 9 describe the distribution of the people interviewed by age, gender, presence of kids in the household, education and monthly income. As noted before such data has no statistical validity in representing the target population of Shanghai consumers, and they have the sole purpose of providing an overview of the characteristics of the sample.

Figure 9 – Socio demographic profile of the respondents



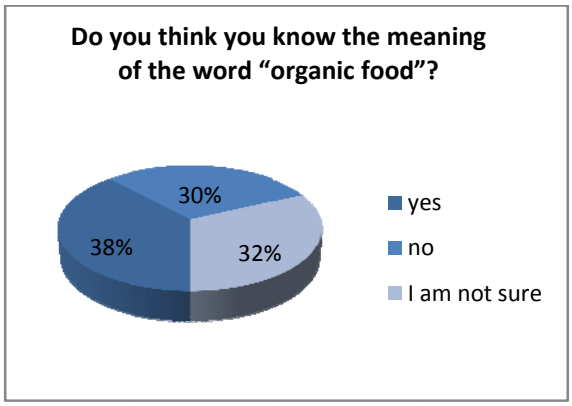


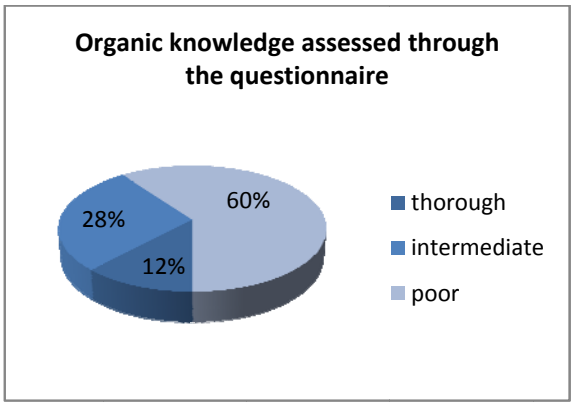




One of the first non purely descriptive information that emerged from the data is the gap between the self-assessed knowledge of organic expressed by respondents, and the knowledge measured through the questionnaire. Figure 10 shows the comparison between the results for the self-assessment and the measurements of the level of knowledge made through the questionnaire.

Figure 10 – Comparison between the self-assessed knowledge of organic and the measured knowledge





It is significant to point out that according to the standards defined in the previous paragraph, over half of the respondents (27) 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 had a thorough knowledge. Table 6 shows the distribution of respondents according to the levels of self-assessed and measured knowledge of organic.

This first analysis 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 foreign interviewer.

Table 6 – Distribution of the respondents according to the levels of self-assessed and measured knowledge of organic

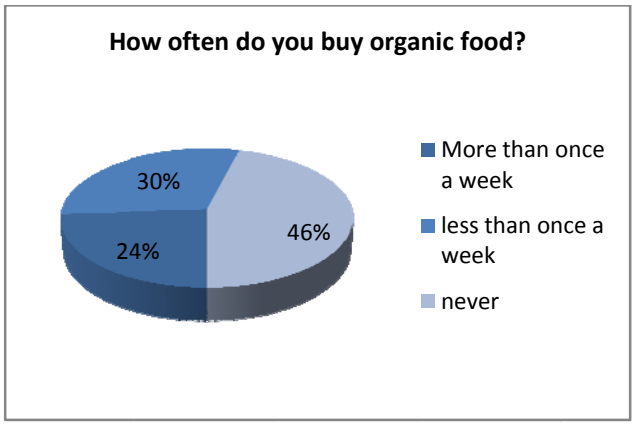
SELF ASSESSED KNOWLEDGE	MEASURED KNOWLEDGE		
	Poor	Intermediate	Thorough
Poor	10	3	2
Intermediate	10	4	2
Thorough	10	7	2

The average value for the feelings about organic food was found at 7,5 (in a scale with 1 equal to "extremely negative" and 10 equal to "extremely positive"). Again, 5 out of the 15 respondents who self-assessed their organic knowledge as poor expressed a feeling over the average value, and 1 of them mentioned a value over 9.

5.3.2. Sample grouping

Figure 11 shows the distribution of the respondents by organic food purchase frequency; this information, combined with the information concerning the knowledge of organic displayed in Figure 10 (also in consideration of the bias that could have flawed the purchasing frequency) allow us to conclude that over half of the respondents interviewed had no real knowledge or experience in organic food consumption.

Figure 11 - Distribution of the respondents by purchasing frequency



Since purchasing frequency plays an important role in terms of marketing, it was decided to show the socio demographic profile of the three purchasing frequency clusters (frequent purchasers of organic food, occasional purchasers and non purchasers). Table 7 displays the socio demographic profile of the respondents who never purchased organic food, Table 8 shows the socio demographic profile of the respondents with a occasional purchasing habit (less than once a week), while Table 9 shows the profile of the respondents with a high purchasing frequency (more than once a week). What emerges from the simple comparison of the three profiles is that the frequent purchaser cluster includes a higher rate of affluent females with kids than the other two clusters.

Table 7 - Profile of the respondents who never purchased organic (23 respondents)

Age	Gender	Kids under 15	Education	Monthly Income
<25: **10**	Male: **13**	Yes: **7**	Middle school or less: **7**	<2000 RMB: **9**
25-55: **12**	Female: **10**	No: **16**	High school: **6**	2000-10000RMB: **14**
>55: **1**			University or more: **10**	>10000 RMB: **0**

Table 8 - Profile of the respondents with a occasional purchasing habit (15 respondents)

Age	Gender	Kids under 15	Education	Monthly Income
<25: **7**	Male: **7**	Yes: **3**	Middle school or less: **8**	<2000 RMB: **8**
25-55: **8**	Female: **8**	No: **12**	High school: **2**	2000-10000RMB: **7**
>55: **0**			University or more: **5**	>10000 RMB: **0**

Table 9 - Socio demographic profile of the respondents with a high purchasing frequency (12 respondents)

Age	Gender	Kids under 15	Education	Monthly Income
<25: **3**	Male: **3**	Yes: **5**	Middle school or less: **4**	<2000 RMB: **3**
25-55: **8**	Female: **9**	No: **7**	High school: **5**	2000-10000RMB: **7**
>55: **1**			University or more: **3**	>10000 RMB: **2**

6. Data analysis

6.1. Individual map analysis

6.1.1. Data coding

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. A balance has to be achieved between the broadness of the categories of meaning and the thoroughness of the wording used: if the coding is too broad, too much meaning is lost, but if all separate words are given separate codes, it is likely that none of the relations between them and other elements would have high frequencies, so they would not appear in the aggregated BCM.

The primary data was collected in the Chinese language, so the Chinese lexicon was converted directly into English codes. Overall 37 categories of meaning have been identified, as summarized in Table 10. The complete list of codes can be found in Annex 2.

Table 10 - English codes

Cod	Category	cod	Category	cod	Category	cod	Category
1	Safe	11	Without Side Effects	21	Fruits And Vegetables (3)	31	Ugly Packaging
2	Pure And Natural	12	Cheap	22	High Production Costs	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 by chance the product is counterfeited.
(5) although the sense of the word might sound negative, the attribute could be also perceived positively, e.g. as signal of quality

Most of the associations are positive, few are negative or "neutral", thus implying that the image of organic products has more positive implications than negative.

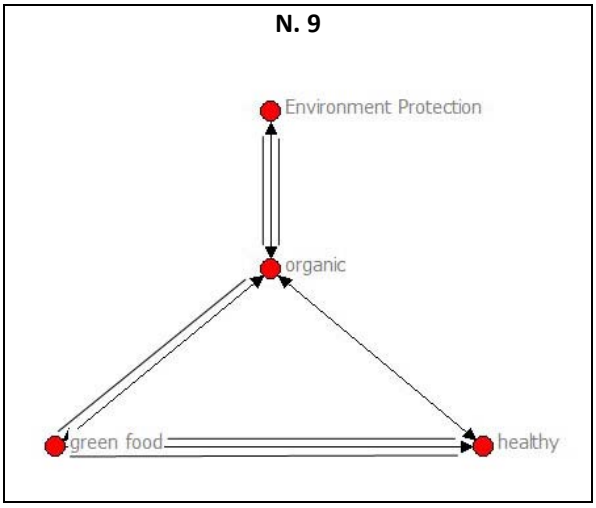
6.1.2. Individual maps analysis

In the following paragraph it will be examined how to aggregate the individual maps. However, since the approach chosen for this study is qualitative and the aim is not to draw conclusions about the target population, the basis for the analysis will be the individual maps. Individual maps reflect the complexity

and composition of respondents' mental association networks, thus providing insights on how they think about organic. The individual maps retrieved for organic food are very heterogeneous in size and shape, hence will both focus on the characteristics of single structures, and make comparisons between two or more respondents maps with regard to differences in their product perception. The complete list of all of the individual respondents' maps can be found in Annex 3.

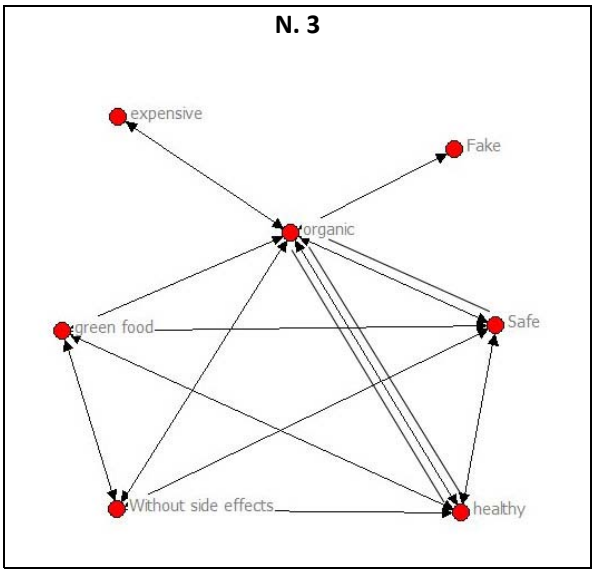
Map N. 9 for instance (see Figure 12), shows a double-line link "organic - green food", and a triple-line link "green food - healthy", while the direct connection "organic - healthy" is single line. This structure implies that even though the concept of "organic" relates to "healthy" in the mind of the respondent, the main path that leads to health goes through "green food", the most important competitor of the organic label. As far as it concerns the respondent that built the network, she was a young lady with a poor knowledge of organic, low income and lower education.

Figure 12 – individual map N.9



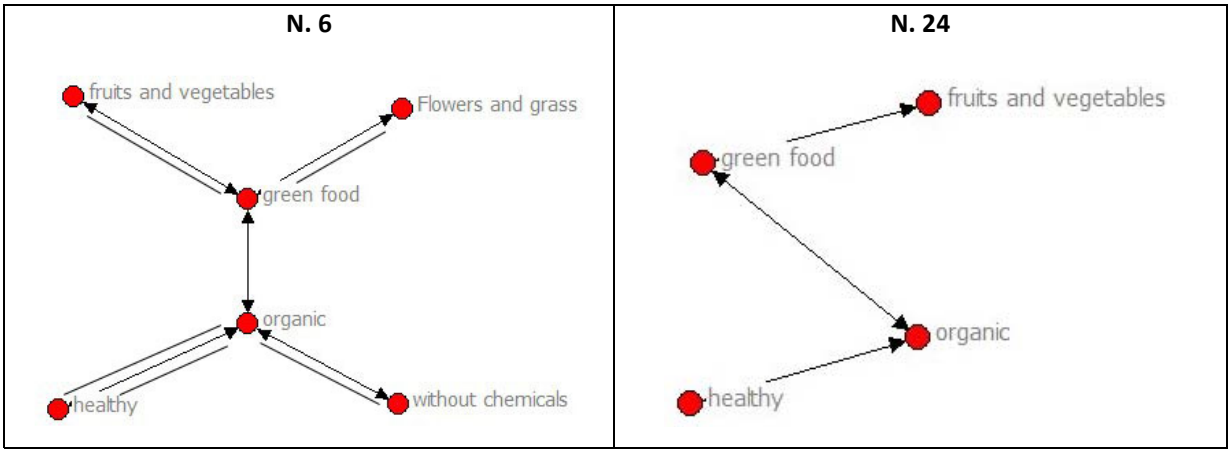
Map N. 3 (see Figure 13) was instead elicited from a middle class male with a thorough understanding of organic concept, and whose feeling towards organic was rated as 9.5 over 10. This network, aside from being one of the most complex ever produced by survey respondents, once again shows the concept of "green food" linked to the same set of associations "organic" is linked to, except with "expensive" and "fake" (here intended as the chance that the product is counterfeited), thus pointing out that "green food" and "organic" concepts might generate overlapping associative networks.

Figure 13 - individual map N.3



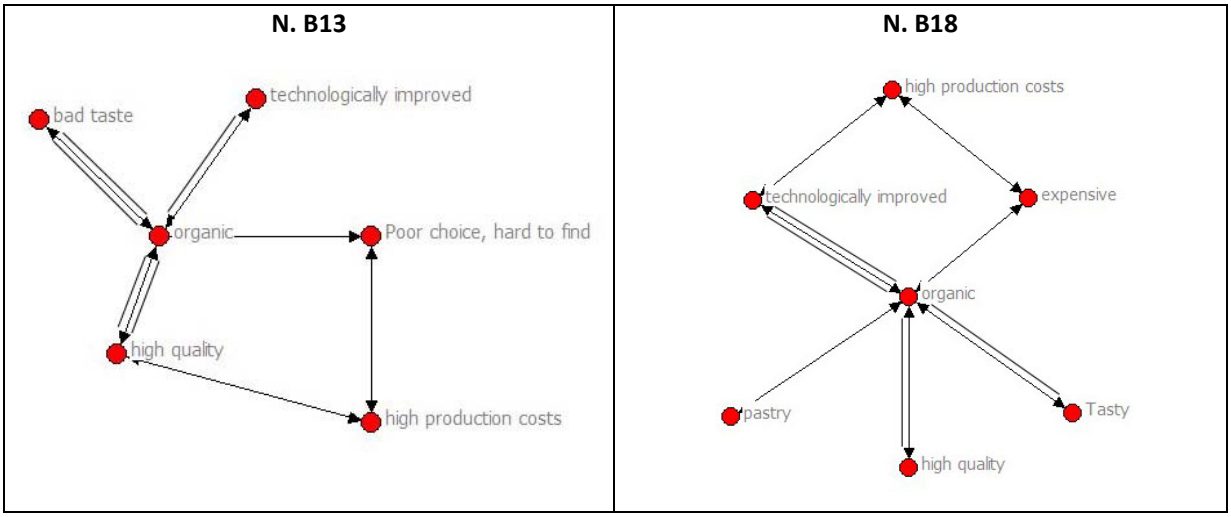
Another interesting consideration concerns the evocative power of organic and green food. The codes "fruit and vegetables" and "flowers and grass" include most of the vegetal and natural associations mentioned by survey participants (e.g. green meadows, trees, herbs etc.). Although such associations are linked to both "organic" and "green food" concepts across maps, they definitely seem more closely related to the latter, and sometimes they appear as prerogatives of green food only, as shown in Map N. 6 and 24 (see Figure 14). In both cases the respondents were young ladies with a poor knowledge of organic, low income and lower education. "Green food" in Chinese language is in fact translated literally, while the Chinese translation of "organic" is semantically closer to "technologically improved". It is therefore reasonable that "organic" leads to less-green and more-industrial sets of associations, and such aspects has to be assessed carefully while promoting the product image.

Figure 14 - individual map N.6, 24



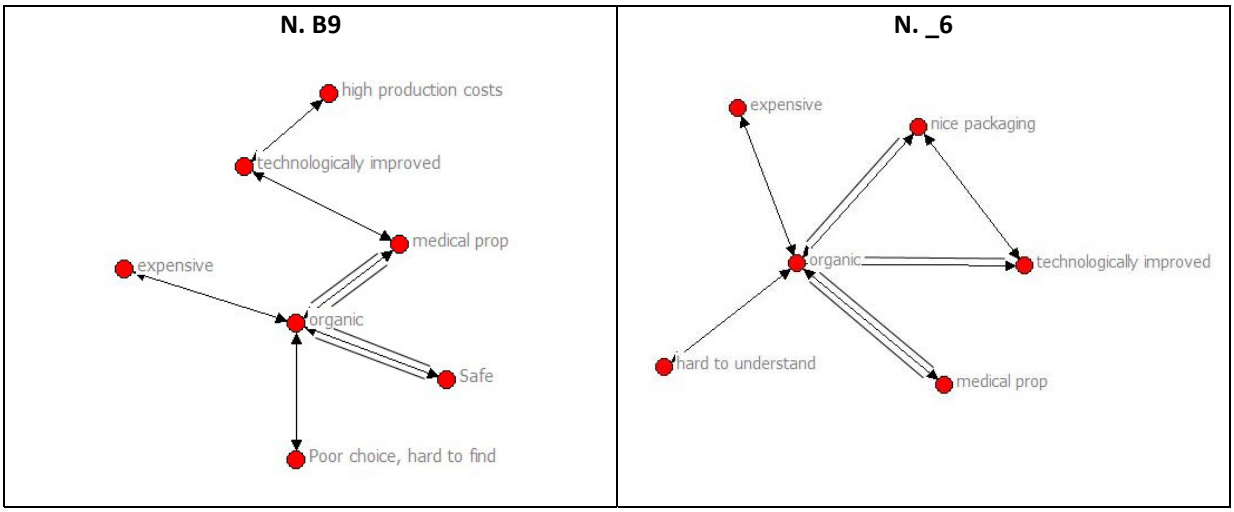
Two more maps that show a significant set of associations are displayed in Figure 15, that is to say "technologically improved", "high quality" and "high production costs". Although in the mind of many consumers the concept of "healthy" is not present, it is however somehow replaced by "high quality". These maps conveys the idea that organic, in the mind of some consumers, is a technological product with high performance standards, or in other words, a modern and no-necessarily-natural luxury good. Map N. B13 was created by a young male with a good understanding of organic, while map N.B18 was produced by a young better educated and more affluent female with a poor understanding of organic.

Figure 15 - individual map N.B13, B18



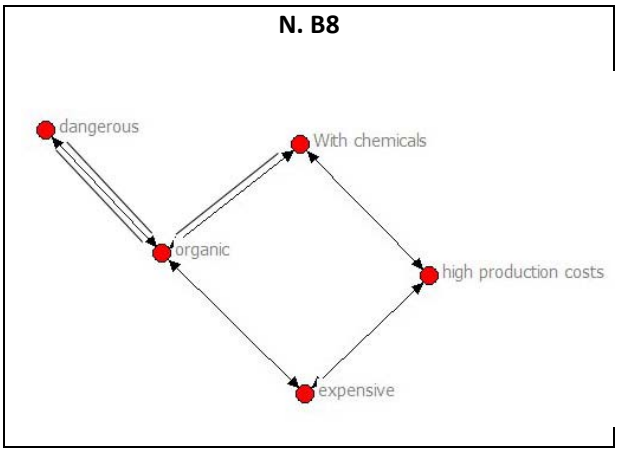
It's worth noting that from the point of view of Chinese consumers, the concepts of "healthy" and "medical properties" are closer than what we might think. The "healthy" attribute refer not just to the absence of disease, energy, strength and well being, but it also implies -to a different extent- an active role in protecting and improving the condition and appearance of the body, just like a medicine. For this reason, during the coding process it turned out to be difficult to assign some words to one group or to the other. It is however interesting to point out that the concept "medical properties" in 2 cases out of 3 has been associated with "technologically improved", as shown in Figure 16. This vision is however in line with the concept of organic as modern and technological, residue-free medicine-like product.

Figure 16 - individual map N. B9, _6



One final issue concerns the negative maps. Map N. B8 is one of the few map with only negative associations. It is clearly dominated by the idea that organic food is dangerous and far the opposite from chemical-free (Figure 17). Map N. B8 was built by a young male with lower income and education, and a poor understanding of organic.

Figure 17 - individual map N.B8



6.2. Maps aggregation

The aggregation process aims at summarizing the structures and meanings of individual respondents' networks of association. Although consensus maps allow the surfacing of interesting considerations about specific clusters of respondents, it has to be reminded that such a small a sample is not suitable to faithfully represent the population from which it is drawn, therefore no conclusions on the analyzed

individuals can be transferred to the population as a whole. The aggregation is used here to make the description of consumers with relatively similar perceptions easier.

6.2.1. Aggregation process

As described in paragraph 4.4.3, the BCM aggregation procedure can be divided in five stages.

The first step aims at identifying the core attributes to place on the map. Roedder's standard procedure suggests to retain for aggregation the associations included on at least 50% of the maps, as well as those with borderline frequencies (45%–49%) whose number of interconnections is equal to or higher than that of other core associations. However, the 50% threshold turned out to be too high: one of the aims of the study was in fact to keep as much of the original meaning of the word used by respondents as possible, so also the broadness of the categories of meaning was reduced. Since the pool of coded associations to choose among was pretty wide (see Table 10), even the most significant ones rarely exceeded a frequency of mentions of 25%, so it was decided to keep the associations present on 20% of the maps, and those with borderline frequencies of 15%–19%.

The second step was to determine which of the core associations should be directly linked to the product. It was selected as first-order associations those with ratios of first-order mentions to total mentions of at least 50%; due to a low incidence of secondary connections across respondents, the rate of super-ordinate connections to subordinate was not chosen as discriminating factor, contrary to what was proposed by Roedder. Table 11 shows the relevant measures for organic food associations that were retained for the aggregation process. The complete list of association measures can be found in Annex 4.

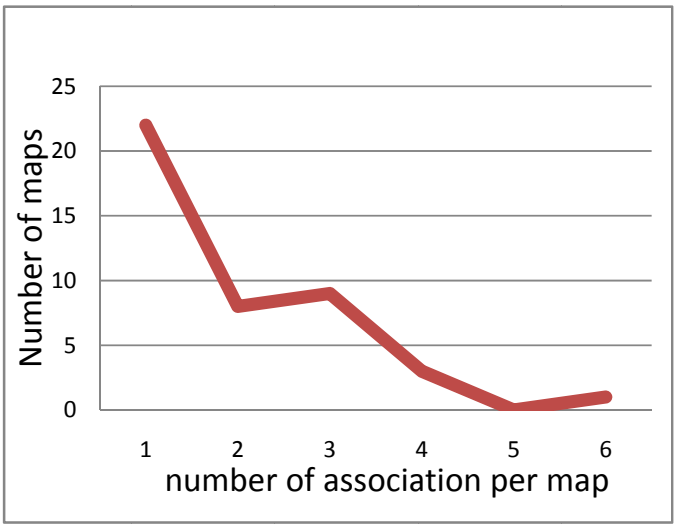
Table 11 – Relevant measures for organic associations

Association	frequency of mentions	Number of inter connections	frequency of first order mention	Ratio of first order mention	Super ordinate	Sub ordinate
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
fruits 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

The third step involved finding where to place the remaining associations on the map. Figure 18 displays the association links frequencies; as it is possible to see, the inflection point is not very clear. However,

since the goal was to produce a significant graphical representation of the respondents' mental association networks, it was chosen the threshold that offered the best visual output, that is 4.

Figure 18- Association links frequencies



Finally the relevant non-core brand associations linked to core associations were incorporated, and it was calculated the average strength of the links rounded to the nearest integer. Table 12 shows the in strength of the links used for the consensus map; the matrix showing the average strength of all the links is shown in Annex 10.

Table 12 - Links strength

Association	Number of links	Average strength
Organic - expensive	26	1,00
Expensive - high production costs	5	1,60
Organic - tasty	12	1,92
Organic- poor choice, hard to find	10	1,00
Organic- fruits and vegetables	7	1,29
Organic- green food	10	1,60
Green food- fruits and vegetables	4	1,25
Organic- safe	18	2,39
Organic- healthy	20	2,70
Safe- healthy	6	6,00
Organic- pure and natural	13	2,00
Organic- without side effects	6	2,17
Without side effects- healthy	6	1,00

The graphic representation of the network has been improved further by signaling the number of mentions through nodes size. The final result of the aggregation process is displayed in Figure 19.

Figure 19 - Aggregated BCM

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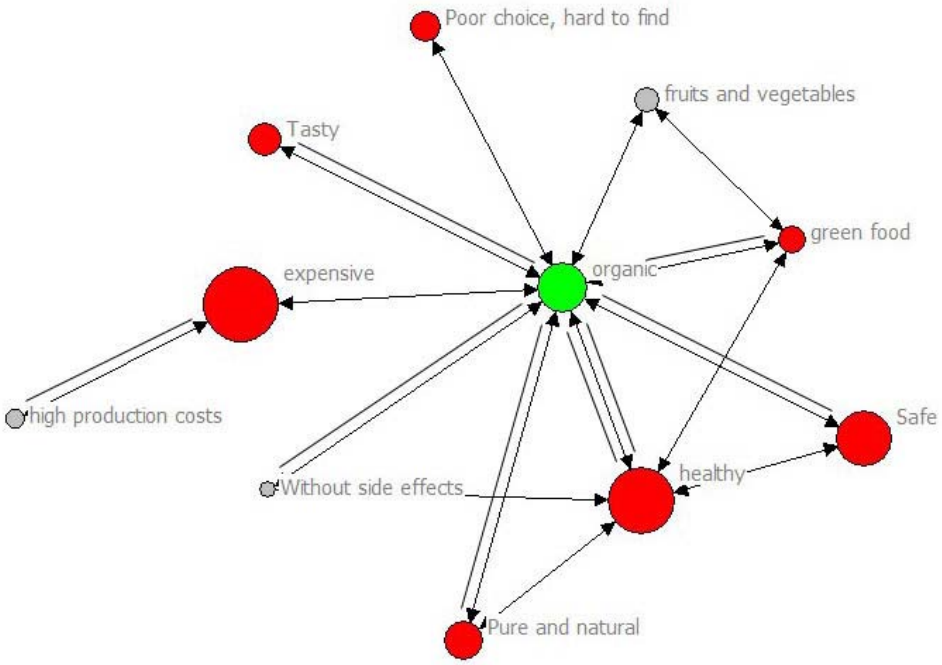


6.3. Network analysis

Both intra-network and inter-network measures were calculated by using the software UCINET 6 (Analytic Technologies) and Netdraw.

6.3.1. Centrality

Centrality measures give indications of the importance of a node based on its location within a network relative to other nodes. “Degree”, “Betweenness” and “Closeness” are all measures of centrality.

– 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 (Czepiel, 1974; Freeman, 1979). Degree centrality may also be known as the “geodesic distance”, and it is calculated as:

$$DegreeCentrality(p_k) = \sum_{i=1}^{n} a(p_i, p_k)$$

n = number of nodes in the network;

$a(p_i, p_k)$ = 1, if and only if pi and pk are connected by a link, otherwise it’s 0 (Henderson et al., 1998)

- Betweenness centrality reflects the extent to which a node lies between other nodes in the network; if a node is on many paths between other pairs of nodes, then it will have a high betweenness centrality index. Betweenness is defined in terms of probabilities: since there is more than one possible path, it considers the probability of using a particular path. Betweenness centrality is often thought of as a measure of control within a network: the more concepts depend on one specific key concept to make connections with others, the more power it has (Freeman, 1979). The formal equation for Freeman's betweenness centrality is:

  $$BetweennessCentrality(p_k) = \sum_{i}^{n} \sum_{j}^{n} b_{ij}(p_k)$$

  for all (i < j) ≠ k, and where

  $$b_{ij}(p_k) = \frac{g_{ij}(p_k)}{g_{ij}}$$

  where gij represents the number of geodesic paths from point i to point j and gij(pk) represents the number of geodesic paths from point i to point j that contain pk. A geodesic is defined to be the shortest path(s) between two pairs of nodes. Therefore, bij (pk) represents the probability that pk falls on a randomly selected geodesic connecting i and j (Henderson et al., 1998).
- Closeness centrality focuses on how close a node is to other nodes. It only takes into account the immediate ties that an actor has, rather than indirect ties to all others, thus limiting the use it might have as an index. It is defined as:

  $$ClosenessCentrality = \left[\sum_{i=1}^{g} d(p_i, p_k) \right]^{-1}$$

  where d(pi,pk) is the number of lines in the geodesic linking nodes i and k. Theoretically, closeness centrality is typically thought to represent independence from the control of other nodes in a network (Henderson et al., 1998).

In terms of degree centralities, the scores for:

- healthy
- expensive
- 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 the most central concept in terms of betweenness is:

- expensive

In terms of closeness centrality (that is how fast a concept can be associated to others in the network), there is no big difference among the associations above mentioned, thus indicating that none of the associations displayed are more peripheral than the others. Table 13 shows the measures of centrality.

Table 13 - 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
Fruits 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

6.3.2. Cohesion

Cohesion measures 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 elements. 10 cliques were found, each one including 3 to 5 concepts, as shown in Table 14.

Table 14 - 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	Fruits And Vegetables	Green food	
Clique 9	High Quality	High production costs	Expensive		
Clique 10	High production costs	Expensive	Poor choice, hard to find		

6.3.3. Position

The primary measure of position within a network is structural equivalence. Two nodes are said to be structurally equivalent if they have the same relationships to all other nodes within that network. Structural equivalence allows measuring the consumers perception of sameness amongst brands, that is the brand parity. Since the only other competing “brand” mentioned by respondents is green food, it was computed the value of structural equivalence between “organic” and “green food”. Such measure turned out to be 58.55%, 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.

6.3.4. Density

Density is the proportion of the number of links present in a network compared to the number of possible links (Scott, 1991; Knoke and Kuklinski, 1982). Network density is measured to be:

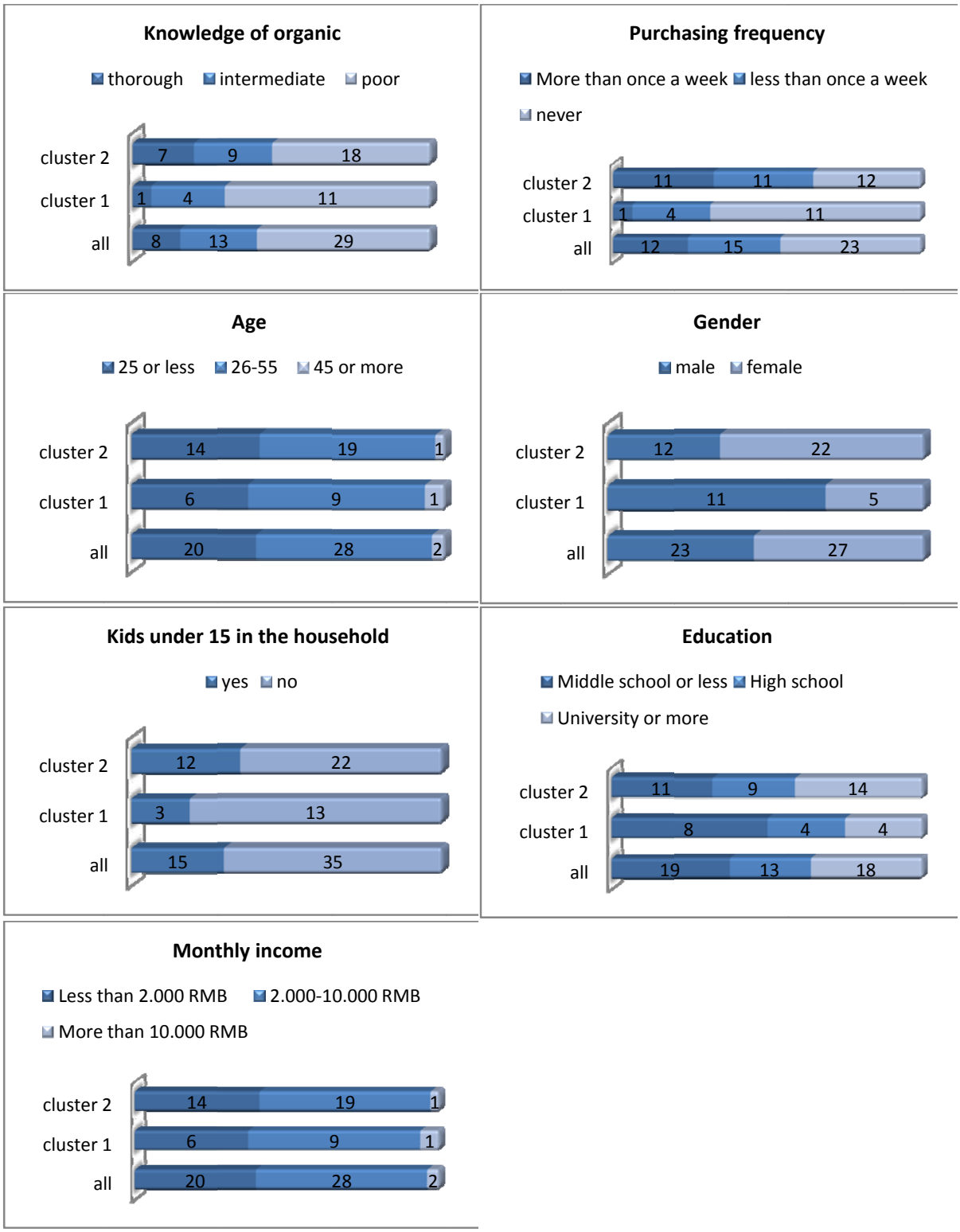
$$Density = \frac{1}{n(n-1)/2}$$

where 1 is the number of links present and, n is the number of nodes. Density 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 0.2148 (21,48%).

6.3.5. Cluster analysis

One research issue remains, discovering whether similarities in the composition of the associative structures of the networks correspond to similarities in the socio demographic profiles. The core of this study is the individual and aggregated networks, so it was decided to use such data as starting basis for identifying specific segments of respondents.
One of the techniques that allows extracting hidden patterns from data is the cluster analysis. The cluster analysis is the assignment of objects into groups (clusters) in a way that objects from the same cluster are more similar to each other than objects from different clusters. The similarity among objects is calculated for each pair of two elements on the base of distance measures, so that the distance between them is minimal if they belong to the same group and maximal otherwise. Clustering techniques hence require producing a space where distance calculation is possible, and choosing an algorithm to agglomerate data. It is important to remind that cluster analysis discovers structures in data without explaining why they exist.
In this study the space chosen for the distance calculation was a matrix (distance matrix), with the 50 respondents in the rows, and the associations elicited from them in the columns (the distance matrix is reported in Annex 15, while Annex 16 provide a detailed information about the clustering procedure). It was then chosen a 2-way cluster analysis.
Two clusters analysis allowed identifying 2 groups, one made of 34 respondents, and the other grouping 16 respondents. Figure 20 shows the socio demographic characteristics of the 2 clusters, as well as those of the whole population of respondents.

Figure 20 - Socio-demographic characteristics of the clusters



In order to tests the goodness of fit of the distributions for Cluster 1 and Cluster 2 for the data showed in Figure 20 it was performed chi-square test. The value is calculated as follows:

$$\chi^2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}$$

Where:

χ^2 = the test statistic that asymptotically approaches a χ^2 distribution.

O_i = an observed frequency;

E_i = an expected (theoretical) frequency, asserted by the null hypothesis;

n = the number of possible outcomes of each event.

Table 15 shows the result of the Chi-square test for goodness of fit. Basically 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)

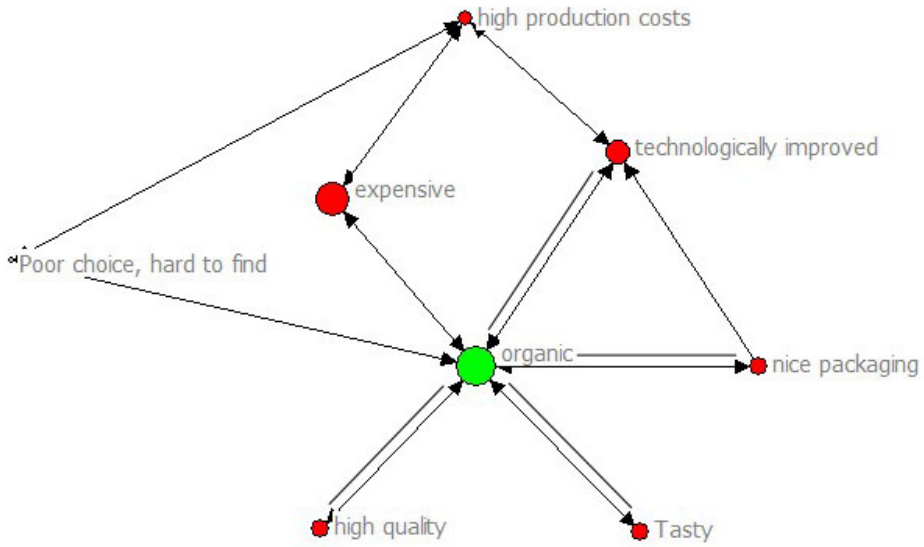
Table 15 - Chi-square values for Cluster 1 and Cluster 2

Variable	Chi square probability
Knowledge of organic	0,39
Purchasing frequency	0,05
Age	0,85
Gender	0,03
Presence of kids	0,23
Education	0,43
Monthly income	0,25

In the case of the aggregated maps for cluster 1 and cluster 2 the inflection point was found at 2 in both cases; however, in order to improve the readability and to balance the higher number of respondents, the cutoff was raised to 3 maps in the case of Cluster 2. It has to be noted that since the size of the nodes reflects the number of mentions, it's reasonable that the graphic elements of Cluster 1 are smaller.

Figure 21 shows the aggregated map for Cluster 1, Figure 22 shows the aggregated map for Cluster 2. The corresponding aggregated matrix can be found at Annex 6 (Cluster 1) and Annex 7 (Cluster 2), while the matrix displaying the average strength of the links can be found in Annex 11 (Cluster 1) and in Annex 12 (Cluster 2).

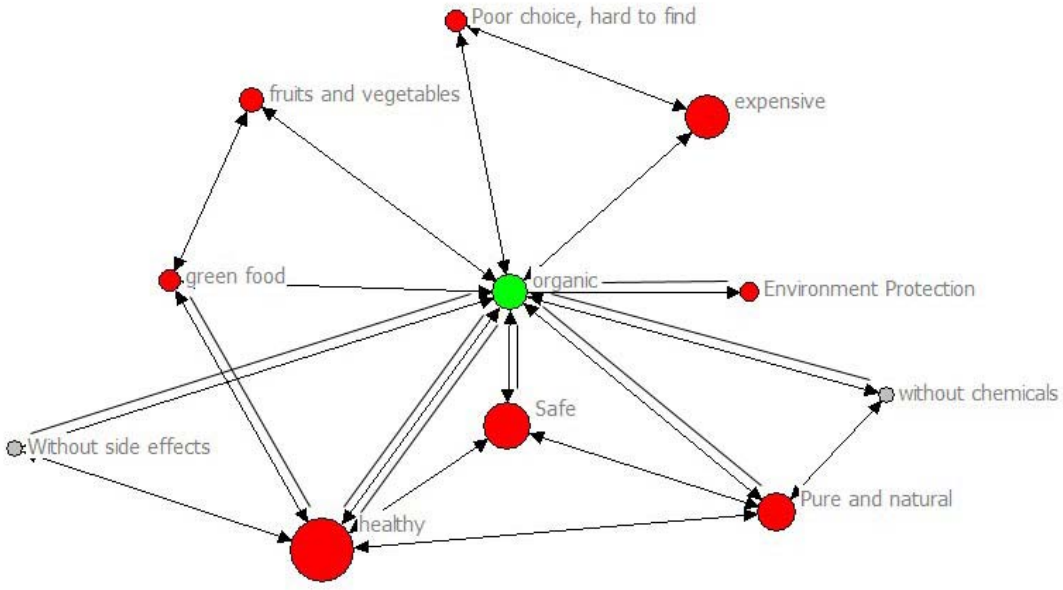
Figure 21 - Aggregated map for Cluster 1 (16 respondents, cutoff 2)



Core association

Relevant non-core association

Figure 22 - Aggregated map for Cluster 2 (34 respondents; cutoff 3)



ion

-core

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. This outcome is however somehow expected, since the clustering procedure was based on the composition of the networks in terms of associations.

Cluster 1 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 (Annex 6): 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.

Cluster 2 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.

6.4. Reliability

6.4.1. Nomological validity

The comparison between Figure 21 and Figure 22 supports the nomological validity of the data. In order 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. Besides, the structure of network of Cluster 2 is more complex than that of Cluster 1. “Experts typically have knowledge structures that are more complex and highly integrated, which would translate into more brand associations, more brand association links, stronger brand association links and greater hierarchical structure” (Roedder et al., 2006). 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.

It is important to underline that the small sample could have biased the consensus maps, and that the comparisons among consensus maps do not aim at supporting any statistical hypothesis about the target population.

6.4.2. Split-half reliability

In order to test the reliability, the individual maps were split in two halves, even and odds maps, and the aggregation procedure was repeated. Then the degree of the consistency between the 2 consensus maps was evaluated, to verify whether the measures are reliable.

The inflection point was found at 3 maps in both cases. Figure 23 shows the aggregated map of the odd individual maps, while Figure 24 shows the even half. The aggregated matrix for the slit-half reliability test are displayed in Annex 8 (odd maps) Annex 9 (even maps), while the line strength is reported in Annex 13 (odds maps) Annex 14 (even maps).

Figure 23 - Aggregated odd number maps (25 respondents; cutoff 3)

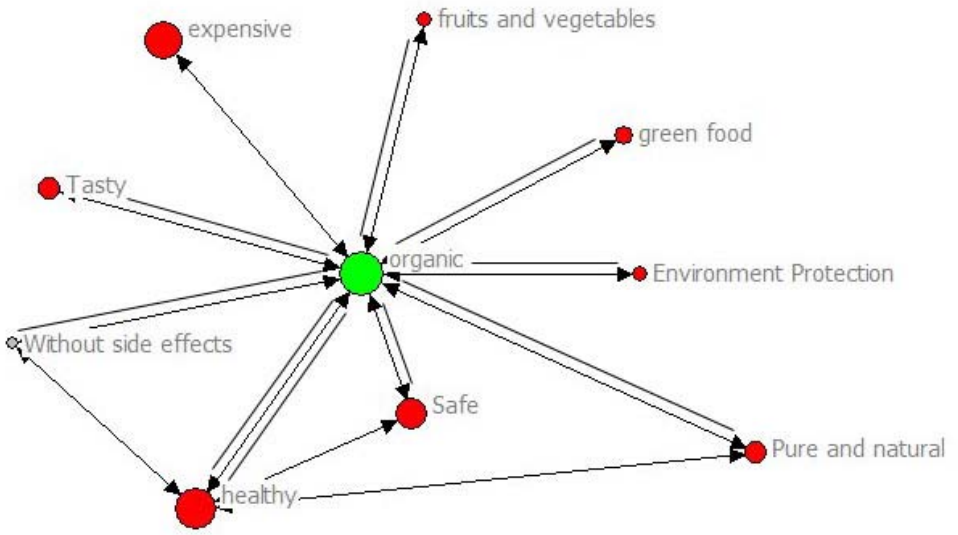


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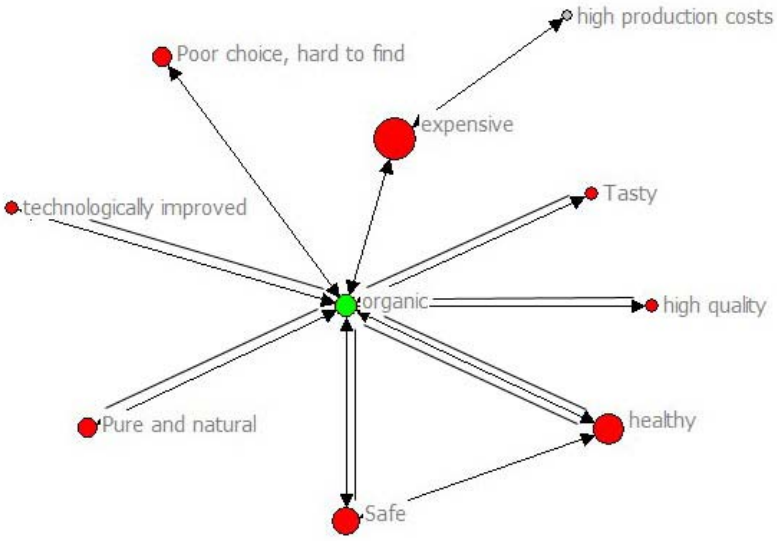
Figure 24 - Aggregated even number maps (25 respondents; cutoff 3)



Core association

Relevant non-core association

Both map have 8 core attributes, 5 of which are in common: safe, healthy, pure and natural, expensive and tasty. Besides, they show the same connection between safe and healthy. The strength of the links

is the same for all of the common associations. Even though the networks look pretty much consistent, one way of mathematically testing the degree of contingency between the two matrices is by using Pearson's contingency coefficient. Pearson's coefficient indicates whether the variables in the rows and columns are associated, that is to say the degree of independence between the two matrices. Pearson's coefficient ranges from 0 (no association) to 1 (maximum association).

The degree of consistency found between the two split half maps was high, C=0,886321, thus confirming that the measure is reliable.

7. Conclusions

The main objective of this study was to shed some light on how Shanghai consumers' think about organic, identifying the main features of the "organic" brand and how they are associated to each other.
"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 appeared in the consensus map as core associations.

The health care and security concerns are clearly key factors that influence organic consumption. 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. High price and inadequate product availability in stores also emerged as important associations, and this data is in line with the picture of the Chinese market put forward in the first chapter of this work. It is however meaningful to say that the survey targeted some of the most affluent area of China (Shanghai has China's highest GDP per capita, that is 56,733 RMB per year) within the most privileged spot possible (part of the interviews were conducted inside organic specialized stores), and nonetheless price and availability turned out to be critical issues. It's furthermore important to point out that high price and low product availability could be also perceived positively, e.g. as signal of quality and high value of the product.

The view that organic food is tasty also emerged, although so far -in Europe- there is no important sensory reasons which convince for a consumption of organic products (Michelsen, Hamm, Wynen, & Roth, 1999).

These attributes are pretty much consistent with the European perception of organic. In Europe the 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 (Browne et al., 2000; Chryssochoidis, 2000; Davis et al., 1995; Grunert & Juhl, 1995; Reicks, Splett, & Fishman, 1997; Roddy et al., 1996; Tregear et al., 1994; Worner & Meier-Ploeger, 1999; Zanoli, 1998).

However 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 often confused (almost one third of the participants of the survey agreed with the statement that organic and green food are the same), especially when it comes to associating to wellness and natural environment concepts. This consideration is also supported by analytic measures. The cohesion measurements show that 3 over 10 cliques include green food as key element, and in only one case over 4, organic is linked to "healthy" and "pure and natural" without being likened to "green food" too. The structural equivalence analysis evidences that "organic" and "green food" share almost 60% of the same ties, and the betweenness value too implies a certain degree of node control of green within the organic network, thus confirming once more the initial finding. Finally, the green food seems to hold more "evocative" power than organic in terms of green and nature-related associations, which is quite intuitive, given the longer history of the green food movement, the higher investments made in promotion, and the better translation of the green food name.

“Universally, fruit and vegetables are the most popular organic products. According to Organic Monitor, the category comprises a third of global revenues. Fresh produce like apples, oranges, carrots and potatoes are typical entry points for consumers buying organic products, it said. Their fresh nature appeals to consumers seeking healthy & nutritious foods” (Heller, 2006), thus explaining the relatively high frequency of mentions of the “fruit and vegetable” association.

Another important difference is that 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 technologies, GMOs, and futuristic production methods (e.g. food produced in laboratories). This is also 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”).

While environmental sensitivity emerged across survey participants, 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 Eastern markets: the role of the packaging, and the concerns for fake or counterfeited products.

China’s packaging market is the largest in the world, and food packaging is as important as the food itself, and sometimes even more. Simply transferring our perceptive model to the East is unlikely to work, and lead many foreign investors to underestimated this key factor and make mistakes. In China in fact not only does consumer purchasing behavior differ, but also the perception of what’s important in a product, and the attention devoted by respondents in stressing the importance of adequate packaging during the interviews indicated it as a key purchasing driver.

The second element is the lack of trust. The trust deficit is enormous and growing, especially towards the local market (a significant share of Chinese people think that food from developed markets are less risky), and many people are so concerned about food safety that they found it difficult to shop.

The cluster analysis also provided some interesting insights about the perceptive structure of two segments, basically referable to as the “purchasers” and “non-purchasers”, with the first cluster including more females and the second one grouping more males. The consensus maps built for the two clusters shared only a few attributes, and suggested that the non-purchasers cluster had a more technological and less nature-oriented perception of organic. Secondarily, the non-consumers cluster showed a less complex and less integrated aggregated associative structure, which is typical for non-experts, thus confirming the nomological validity of the data.

Another important goal of the research dealt with assessing the usefulness and viability of the BMC methodology. The BCM proved a valuable guidance in producing the individual maps, although it showed some limitations in handling several datasets and multiple aggregations. The major technical problem encountered was the impossibility to proceed to aggregation measurements without having to

produce at least 2 matrices for each individual map, one describing the associations present in the network, the other indicating the strength of the links. Although the creation of a single consensus map turned out to be relatively simple and accessible, repeating the process (e.g. for the cluster analysis and for the reliability measurements) required starting over every time, and the procedure proved so time consuming and the risk of biases so high, that it was deemed more convenient having recourse to data management software. Anyway, after building the databases, the methodology proved easy to use, and showed no significant drawbacks.

Some positive aspects of the BCM are the easiness in adjusting the standard procedure to methodological changes. In this study the approach adopted for the interviews was one-to-one, and the map building procedure was integrated into a larger framework aimed at acquiring as much information as possible from the respondents. Besides, the structure, complexity and composition of the individual maps acquired turned out to be different from what expected (fewer second- and third-order mentions and a higher number of associations kept so as to retain the respondents original wording); however, to produce meaningful graphical representations, it was sufficient to change the threshold values. Finally, no unexpected problems arose in improving the graphical representation of the consensus maps.

Overall the BCM proved a highly flexible tool and, in consideration of what previously stated, with the proper means it could be adjusted also for quantitative data collection and descriptive surveys. The only aspect to improve in this direction is how to minimize the influence of the interviewer, since the behavior of the researcher and the type of guidance provided heavily affect the outcomes, especially during the map building phase. Training the interviewers could however help reducing such influence, and thus standardize the data.

This study finally aims at providing some hints to the marketing managers interested in the positioning of organic products in China, therefore some attention will be devoted to identifying both non-visible associations and associations that have to be changed or leveraged in order to alter the organic “brand” image. Any learning in this direction is relevant, considering the role played by food in China. Food is a national obsession and an essential part of Chinese culture and social life. Major life events revolve around food and while the average Chinese is price conscious and conservative, little expense is spared for food related gifts, entertainment and events. The average Chinese spends more than 40% of disposable income on food and beverages, and this percentage is likely to increase. The potential for growth are therefore very high, especially considering the high demand for safer food.

First of all, the relatively low density measure of the networks suggests a low level of confusion in consumers' minds regarding the features associated with organic product. The vision of organic that most of the respondents seemed to share was that of a central concept surrounded by few but relevant (and not necessarily correct) associations; second-order associations were seldom mentioned, third-order associations were reported in a few cases only, and most of the network structures displayed few interconnections.

Centrality measurements allows uncovering the pivotal features of the product which are most core to the product category, or, in other words, what customers expect to receive from the purchase. Taken together, degree centrality, betweenness centrality and closeness centrality point to “healthy” and “expensive” as pivotal drivers, then “safe” and “green food”. The health and safety aspects reveal that

the nutritional values of organic and the emphasis-on-quality approach are caught by consumers, while the high price indicates that organic product are also perceived as costly (and as a matter of fact, they are). It is however worth noticing that even though in the mind of most of the respondents “expensive” was synonymous with not affordable (and so it was a negative attribute). For some, a high price was perceived positively, for it was a signal of high quality and high status.

Through the analysis of the cliques it was possible to uncover the product features that almost automatically lead the one to the other in the mind of consumers (because of the natural complementary nature which already exists in the consumers' minds), that is to say the best candidates for co-branding. “These naturally occurring groupings are simply elicited from consumers and leveraged by a manufacturer or groups of manufacturers for the benefit of all involved” (Henderson et al., 1998). The associations “Safe”, “Pure and natural”, “without chemicals” and “healthy” are those that respondents mentioned most, which indicates the importance of leveraging a sound image of organic food .

Regarding the other significant attributes, some mentioned the concept “modern and fashion”, but there was a complete lack of associations such as “prestige” or “suitable for a gift”. Giving food as a present is a common habit in China, and the importance of gift giving in the Chinese culture strongly differs from the western world, especially in the business environment. It is of utter importance to give prestigious gifts, for they represent the respect and financial strength of the company, and for they operate as a way to attract a possible future relationship. The gift reflects both the status of the donor and the respect towards the receiver. However, since the social status conveyed by the product relies on the product notoriety, promotion plays a key role. The fact that none of the abovementioned associations emerged, or that “modern and fashion” did not achieve the number of mentions necessary to be represented on the consensus map, makes us think that organic food, although recognized as quality food by most of the respondents, do not meet the standards to be included in the pool of prestigious food gifts, contrarily to what happens, for example, to some imported food products, such as French wines. Thus, it would be a good strategy for sector operators to improve the synergy between the associations “Safe”, “Pure and natural”, “without chemicals” and “healthy”, using concepts that imply or suggest prestige and a high social status in marketing communication, so as to re-position organic food image and enlarge the target market.

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Annex 1: Original version of the questionnaire in Chinese Mandarin language

1. 按照您的理解，什么是有机食品？它与普通食品之间的区别是什么？
2. 当您听到“有机食品”这个词，您首先想到的是什么？
3. 按十分之来打分你会给有机食品大多小分？
4. 是否知道“有机”这个词
    a. 是
    b. 不知道
    c. 不太知道
5. 用“不同意”、“同意”或者“不知道”来回答下列问题：

    因为施用了有机化肥所以才称之为有机产品

    有机产品含有转基因因素

    有机产品和绿色产品一样

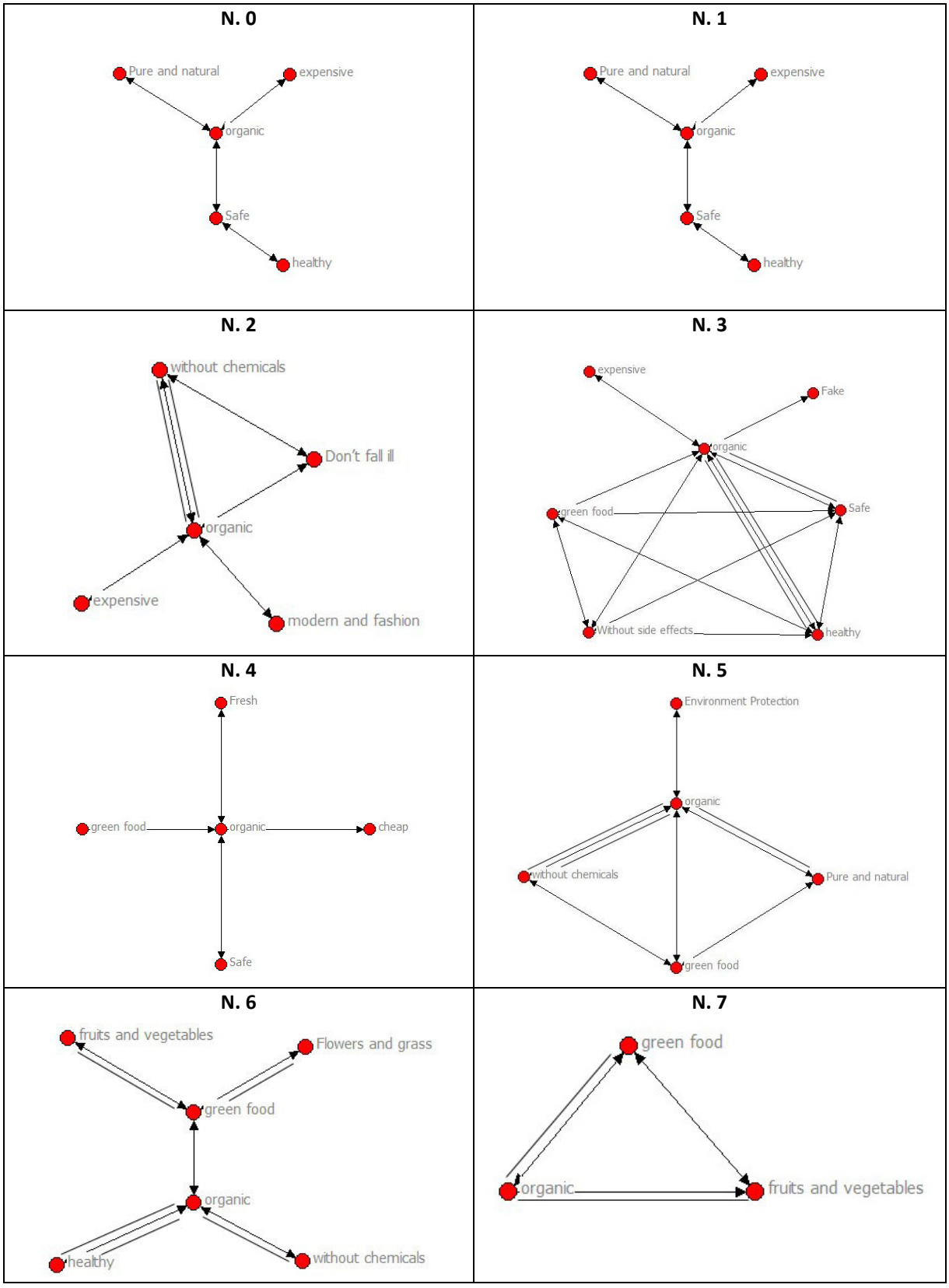
    有机农业生产方法是以保护环境为目的

    有机产品是经过严格检验检查
6. 购买有机食品的频率
    a. 每周一次以上
    b. 每周不到一次
    c. 从不购买
7. 年龄 _____
8. 性别 _____
9. 家庭成员中年龄在 15 周岁以下的人数 _____
10. 文化程度
    a. 初中以下文化程度
    b. 高中
    c. 大专或本科
11. 月收入
    a. 2 千元以下
    b. 2 千至一万元之间
    c. 一万元以上

Annex 2: Chinese-English coding

cod	English code	Chinese lexicon						
1	Safe	没有害处的	对身体无害	放心	安全可靠	安全		
2	Pure and natural	纯自然	自然	纯天然	天然	农家肥		
3	without chemicals	没有任何附加成分	不加任何附加成分	无农药	无化学成分	无化肥	无污染	有害物少
4	healthy	健康	身体好	对身体有利	健康食品	保健品	长寿	
5	medical/cosmetic properties	有治疗作用	美容	有独特功能				
6	green food	绿色食品	绿色					
7	bright color	颜色鲜艳						
8	modern and fashion	时尚	时髦食品	现代化				
9	Fresh	新鲜						
10	Environment Protection	环保	生态	环保食品				
11	Without side effects	对人身体无害	无副作用	无毒无副作用	无负作用			
12	cheap	便宜						
13	Flowers and grass	花草	树木					
14	Don't fall ill	不得病						
15	Tasty	口味独特	口感好, 美味	口感好	口味真	好吃	原汁原味	口味真实
16	Western food	欧盟标准	西方食品	进口的				
17	high quality	高档	高质量	少才贵				
18	nice packaging	包装漂亮而且干净	美观	包装好看	包装豪华			
19	clean	不洗也可以吃						
20	nutritional	营养价值高	营养食品					
21	fruits and vegetables	主要是蔬菜	人参	茶叶	青菜	水果	大米	蔬菜
22	high production costs	成本高						
23	ideal for kids and elders	适合小孩子、老人吃	适合小孩子吃					
24	technologically improved	加工以及改良过的食品	高科技产品	药物性食品	高科技食品	高科技	科技产品	
25	pastry	糕点	糕点类产品					
26	non natural	溶解物	非天然					
27	bad taste	不好吃	口味不真					
28	Fake	真假难分	假冒	假冒的	假冒的多	假货		
29	expensive	价格高	贵					
30	lose faith	没有把握						
31	ugly packaging	外观难看	外表难堪					
32	dangerous	小孩不能吃的食品	不安全	有副作用				
33	non fresh	不新鲜						
34	With chemicals	含有有害物	有化学成分	有附加成分				
35	hard to understand	无法知道是否有负作用	难了解	神秘				
36	Deteriorate environment	污染环境						
37	Poor choice & Hard to find	市场上很难买到	难买到	难买	数量少	品种少	量少	

Annex 3: individual respondents' map



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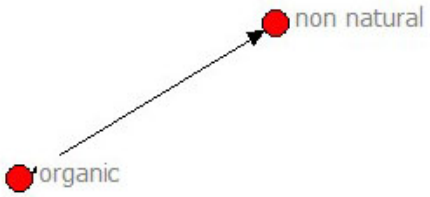

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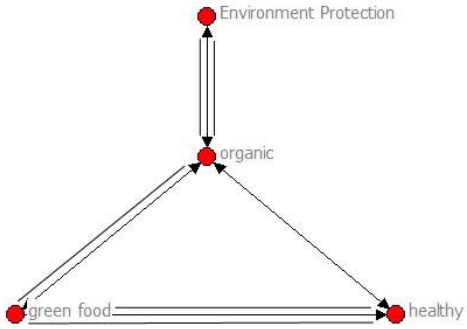

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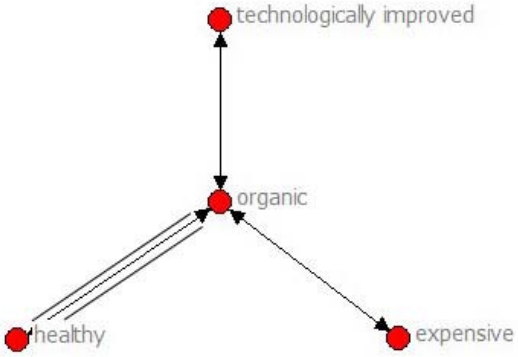

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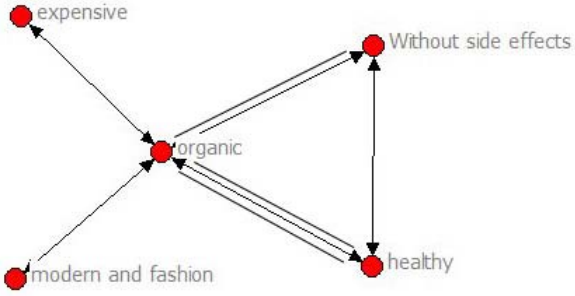

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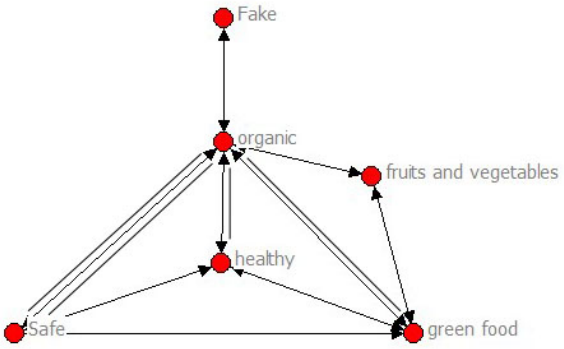

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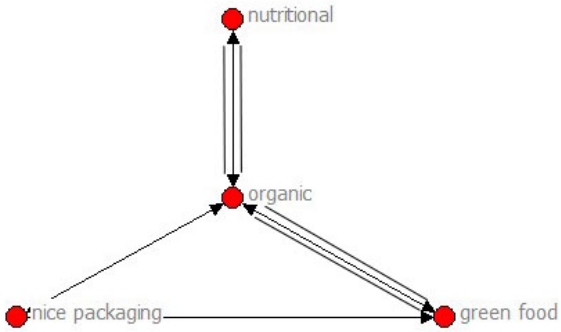

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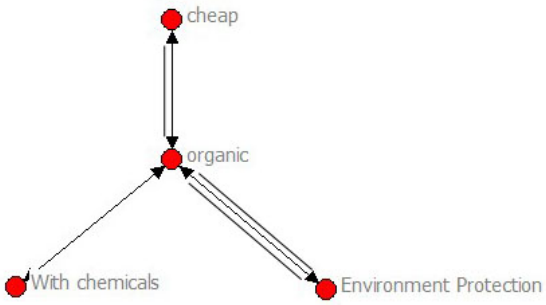

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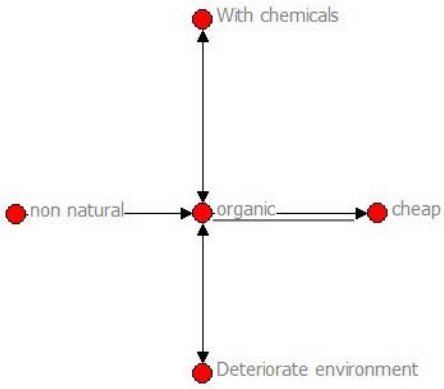

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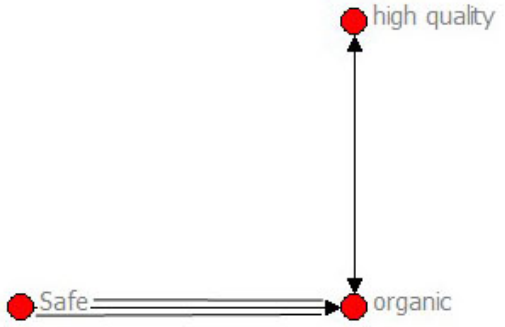

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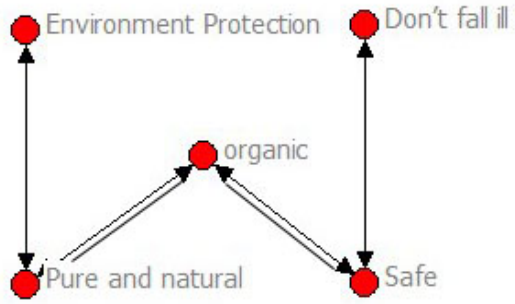

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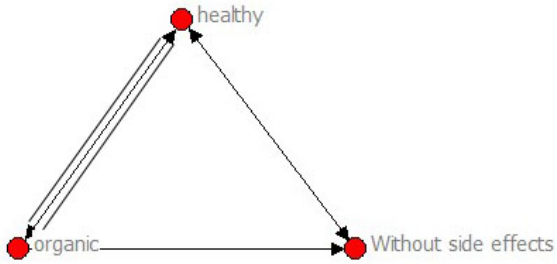

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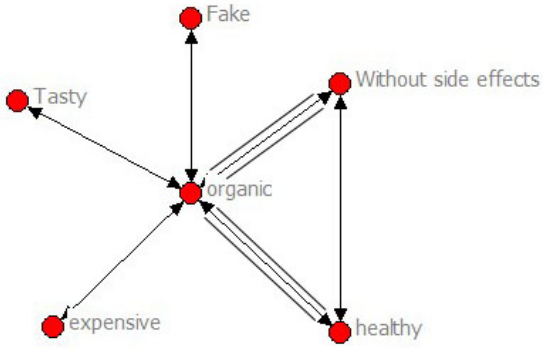

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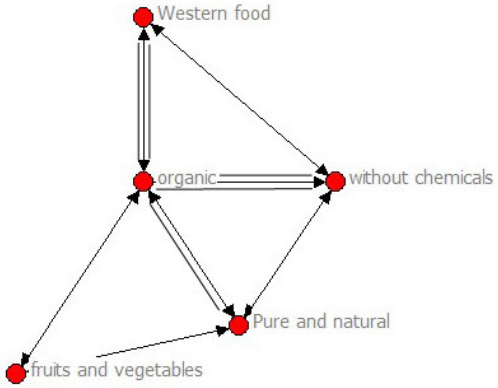

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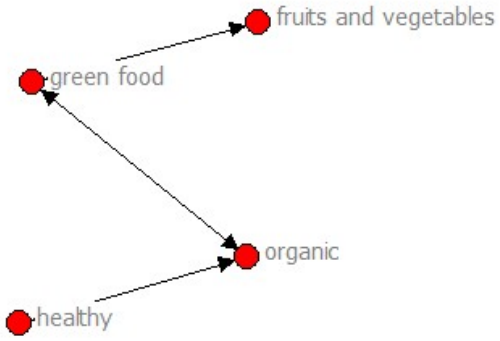

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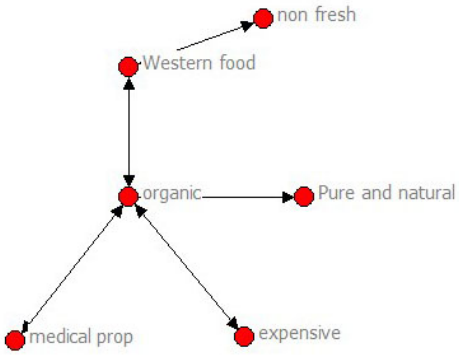

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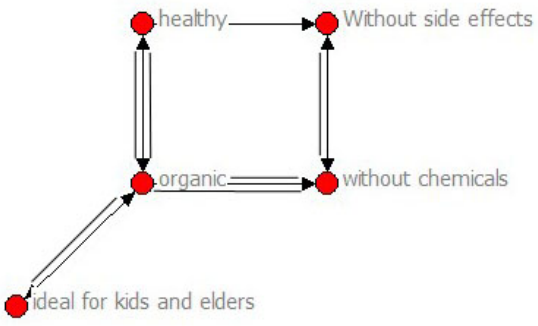
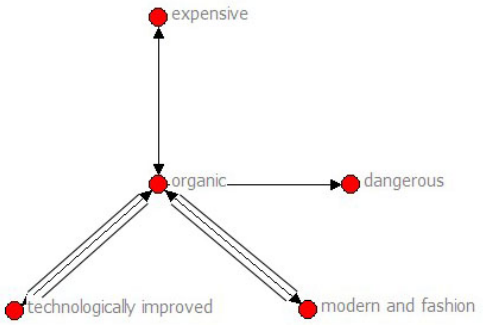
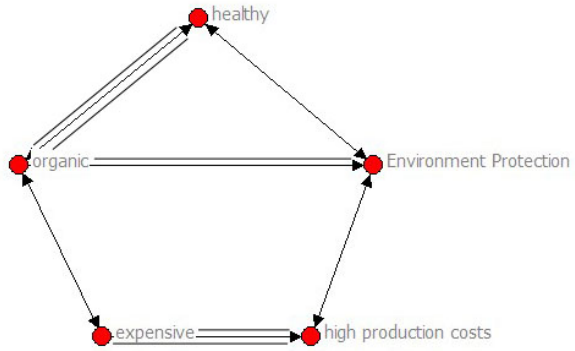


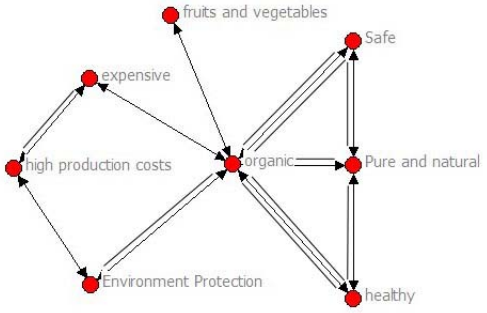
N. B2



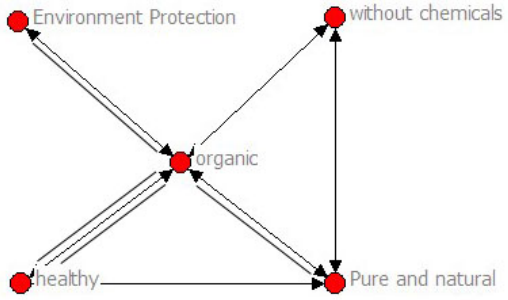
N. B3



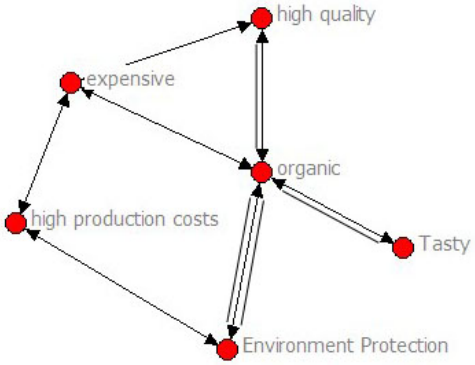
N. B4



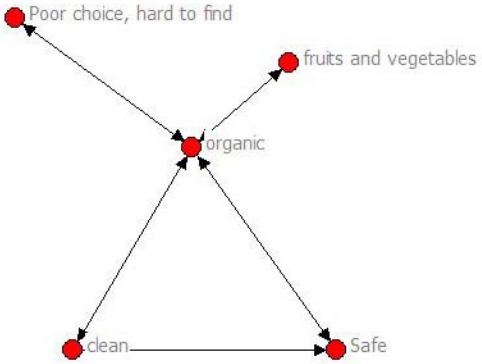
N. B5



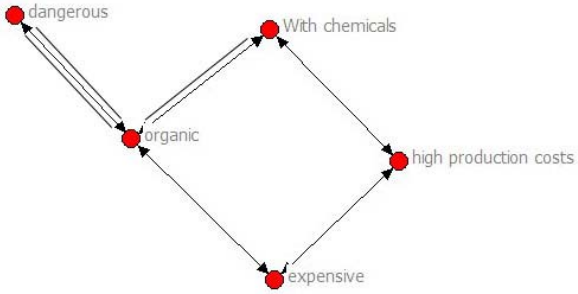
N. B6



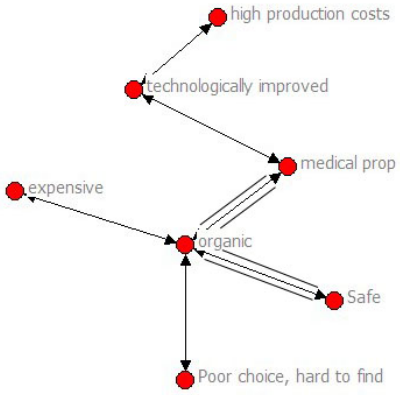
N. B7



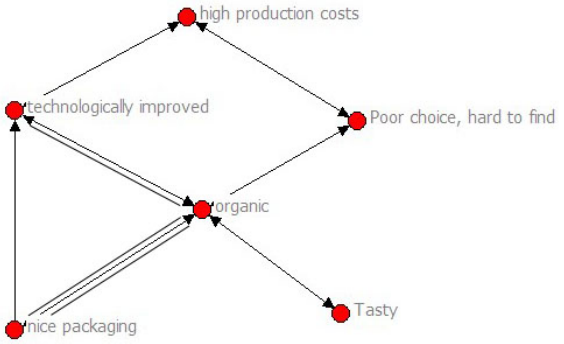
N. B8



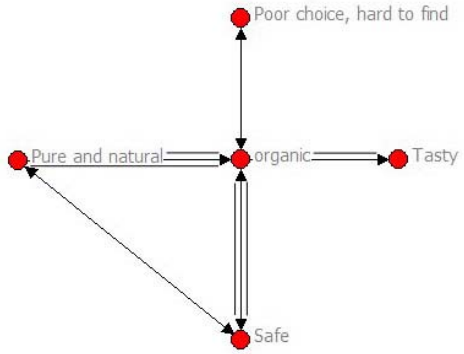
N. B9



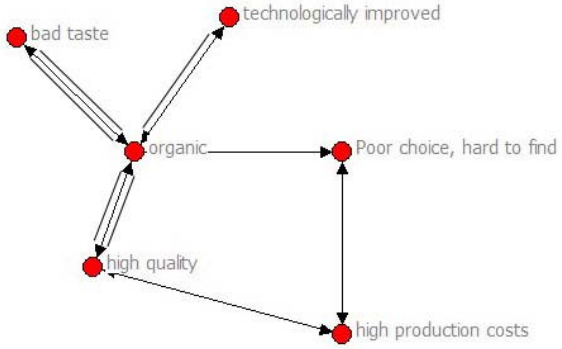
N. B11



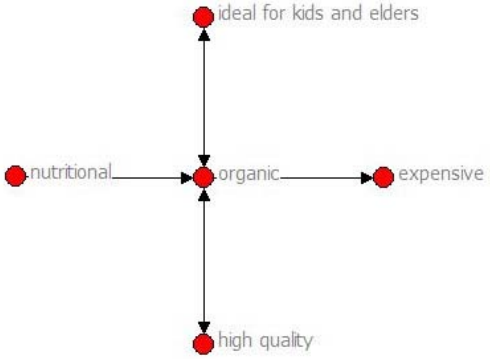
N. B12



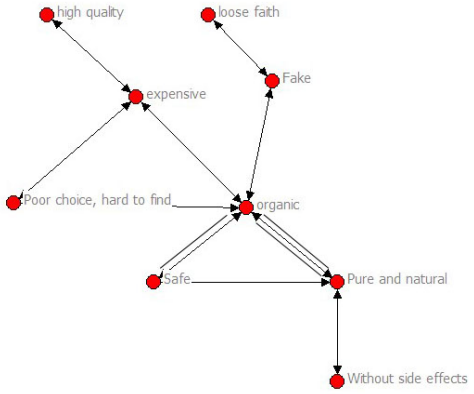
N. B13



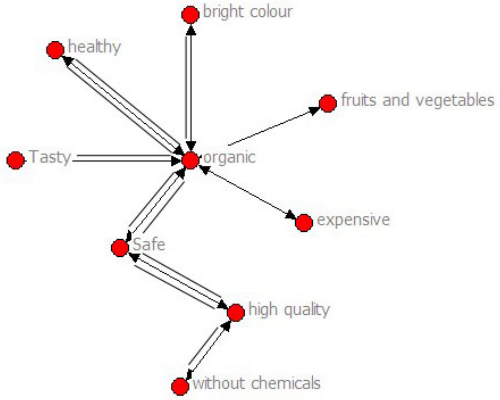
N. B14



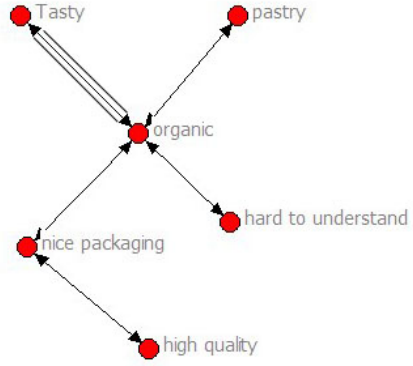
N. B15



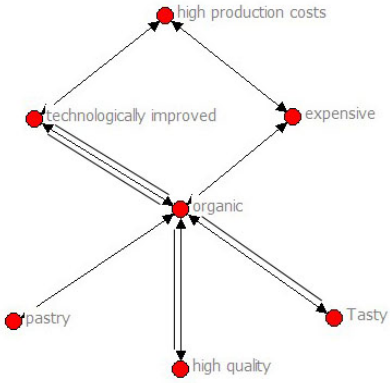
N. B16



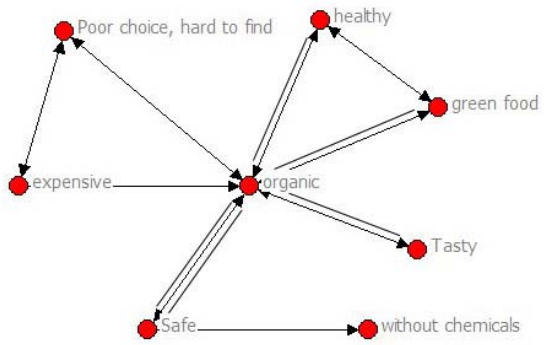
N. B17



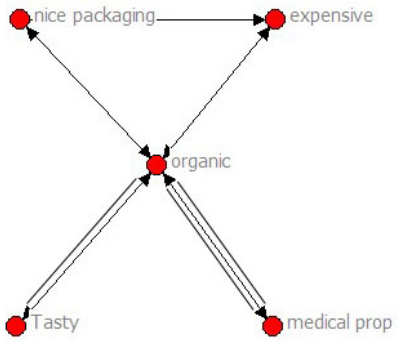
N. B18



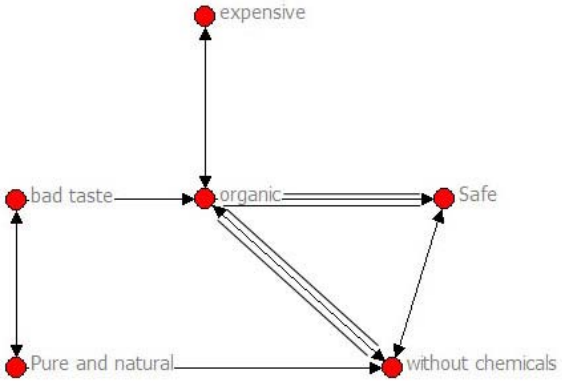
N. B19



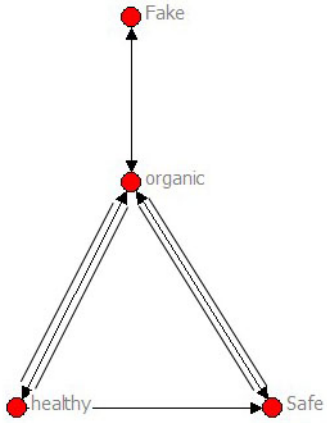
N. _1



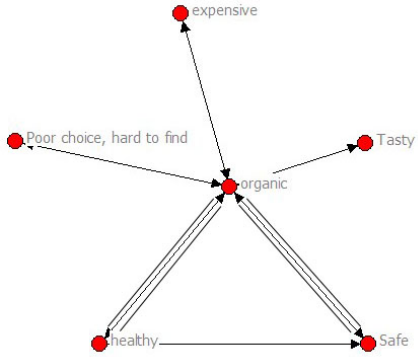
N. _2



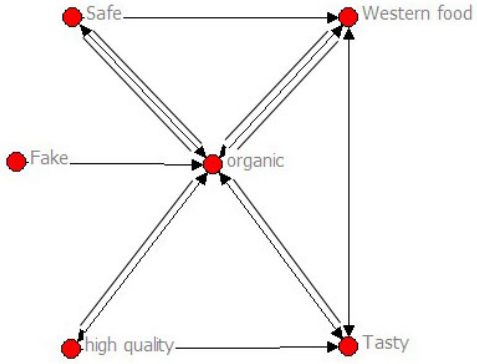
N. _3



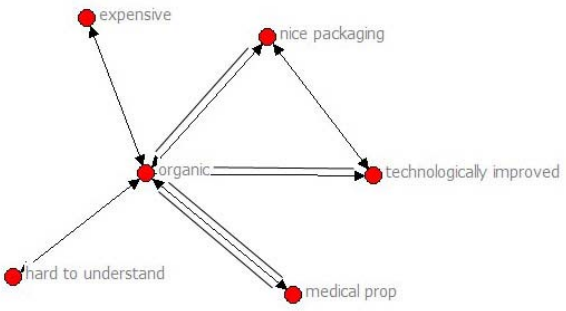
N. _4



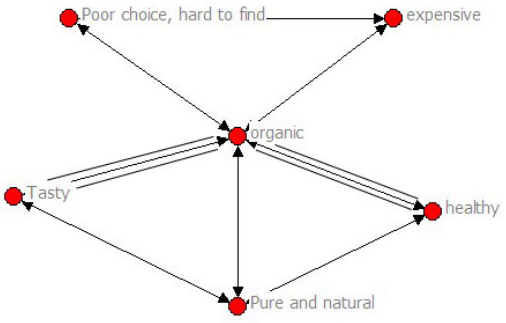
N. _5

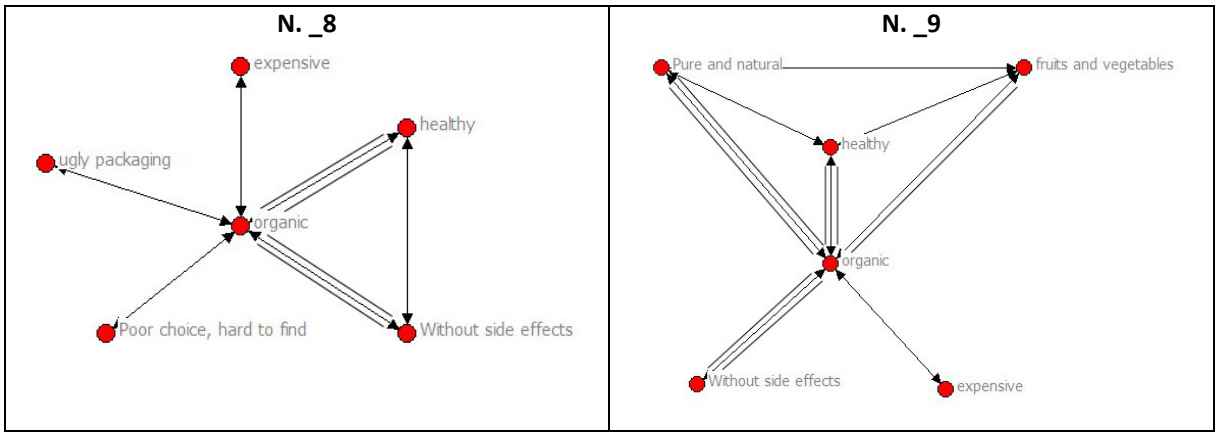


N. _6



N. _7




N. _8
expensive
healthy
ugly packaging
organic
Poor choice, hard to find
Without side effects
N. _9
Pure and natural
fruits and vegetables
healthy
organic
Without side effects
expensive

Annex 4: measures for organic associations

	frequency of mentions	Number of inter connections	frequency of first order mention	Ratio of first order mention	Super ordinate	Sub ordinate
Safe	20	18	20	100%	5	0
Pure and natural	14	13	13	93%	2	2
without chemicals	7	16	5	71%	2	2
healthy	24	21	20	83%	1	2
medical properties	3	0	3	100%	1	0
green food	10	15	10	100%	3	0
bright color	1	0	1	100%	0	0
modern and fashion	3	0	3	100%	0	0
Fresh	1	1	1	100%	0	0
Environment Protection	8	3	7	88%	3	1
Without side effects	6	3	4	67%	0	3
cheap	3	0	3	100%	0	0
Flowers and grass	2	2	0	0%	0	1
Don't fall ill	2	2	1	50%	0	1
Tasty	12	3	12	100%	0	0
Western food	3	4	3	100%	1	0
high quality	9	6	6	67%	2	3
nice packaging	6	5	5	83%	1	0
clean	1	1	1	100%	0	0
nutritional	2	0	2	100%	0	0
fruits and vegetables	9	6	7	78%	0	2
high production costs	7	13	0	0%	0	15
ideal for kids and elders	2	0	2	100%	0	0
technologically improved	8	4	7	88%	3	1
pastry	2	0	2	100%	0	0
non natural	2	0	2	100%	0	0
bad taste	2	0	2	100%	1	0
Fake	6	1	6	100%	1	0
expensive	27	11	27	100%	6	0
Loss of faith	1	1	0	0%	0	1
ugly packaging	2	0	2	100%	0	0
dangerous	4	1	4	100%	0	0
non fresh	1	1	0	0%	0	1
With chemicals	4	2	4	100%	1	0
hard to understand	3	0	2	67%	0	0
Deteriorate environment	1	0	1	100%	0	0
Poor choice & Hard to find	11	5	10	91%	2	0

Annex 5: aggregated matrix (50 respondents)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	org
1	0	3	2	6	0	2	0	0	0	0	1	0	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
2	3	0	3	4	0	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	13
3	2	3	0	0	0	1	0	0	0	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
4	6	4	0	0	0	4	0	0	0	1	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
6	2	1	1	4	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
10	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
11	1	1	1	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
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14	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
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16	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3
17	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	6
18	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	5
19	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
21	0	2	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
22	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	1	0	0	0	0	0	0	3	0	0	0	0	5	0	0	0	0	1	0	0	2	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
24	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
27	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	6
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	26
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
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33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	10
org	18	13	7	20	4	10	1	3	1	7	6	3	0	1	12	3	6	5	1	2	7	0	2	6	2	2	2	6	26	0	1	2	0	3	2	1	10	0

Annex 6: aggregated matrix, Cluster 1 (16 respondents)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	org
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	6
18	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	5
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	1	0	0	2	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
24	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
org	3	0	1	1	3	1	0	2	0	1	0	0	0	1	6	1	6	5	0	2	0	0	1	6	2	0	1	1	10	0	0	2	0	1	2	0	3	0

Annex 7: aggregated matrix, Cluster 2 (34 respondents)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	org
1	0	3	2	6	0	2	0	0	0	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
2	3	0	3	4	0	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	13
3	2	3	0	0	0	1	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
4	6	4	0	0	0	4	0	0	0	1	6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6	2	1	1	4	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
10	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
11	1	1	1	6	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
13	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
16	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
17	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	2	0	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
22	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
27	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	5
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	16
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	7
org	15	13	6	19	1	9	1	1	1	6	6	3	0	0	6	2	0	0	1	0	7	0	1	0	0	2	1	5	16	0	1	0	0	2	0	1	7	0

Annex 8: aggregated matrix, split half reliability test, odd maps (25 respondents)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	org
1	0	1	0	3	0	1	0	0	0	0	1	0	0	1	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
2	1	0	1	3	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
3	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4	3	3	0	0	0	2	0	0	0	1	4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
6	1	1	1	2	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
11	1	0	1	4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
17	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
18	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
19	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
21	0	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
22	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
24	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	12
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	4
org	9	7	3	12	2	6	1	1	0	4	4	1	0	0	7	1	3	2	1	2	4	0	2	1	1	1	0	4	12	0	0	0	0	1	0	1	4	0

Annex 9: aggregated matrix, split half reliability test, even maps (25 respondents)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	org
1	0	2	2	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
2	2	0	2	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	6
3	2	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
4	3	1	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
6	1	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
11	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
13	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
16	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	3
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	3
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
22	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	3	0	0	0	0	1	0	0	2	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
27	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	14
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	6
org	9	6	4	8	2	4	0	2	1	3	2	2	0	1	5	2	3	3	0	0	3	0	0	5	1	1	2	2	14	0	1	2	0	2	2	0	6	0

Annex 10: aggregated matrix, average links strength (50 respondents)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	org
1		1,3	1,0	1,0		1,0					1,0			1,0		1,0	3,0		1,0																			2,4
2	1,3		1,0	1,3		1,0				1,0	1,0				1,0						1,0					1,0												2,0
3	1,0	1,0				1,0					2,0			1,0		1,0	2,0																					2,6
4	1,0	1,3				1,5				1,0	1,0										1,0																	2,7
5																								1,0														2,5
6	1,0	1,0	1,0	1,5							1,0		2,0					1,0			1,3																	1,6
7																																						2,0
8																																						1,7
9																																						1,0
10		1,0		1,0																		1,0																2,3
11	1,0	1,0	2,0	1,0		1,0																																2,2
12																																						1,7
13						2,0																																
14	1,0		1,0																																			1,0
15		1,0														1,0	1,0																					1,9
16	1,0		1,0												1,0																		1,0					2,3
17	3,0		2,0												1,0			1,0				1,0						1,0									1,8
18						1,0											1,0							1,0					1,0									1,6
19	1,0																																					1,0
20																																						2,0
21		1,0		1,0		1,3																																1,3
22										1,0							1,0							1,0					1,6					1,0		1,0		
23																																						1,5
24					1,0													1,0				1,0																2,2
25																																						1,0
26																																						1,0
27		1,0																																				2,0
28																														1,0								1,0
29																	1,0	1,0				1,6														1,0	1,0
30																												1,0										
31																																						1,0
32																																						2,0
33																1,0																						
34																						1,0																1,3
35																																						1,0
36																																						1,0
37																						1,0							1,0									1,0
org	2,4	2,0	2,6	2,7	2,5	1,6	2,0	1,7	1,0	2,3	2,2	1,7		1,0	1,9	2,3	1,8	1,6	1,0	2,0	1,3		1,5	2,2	1,0	1,0	2,0	1,0	1,0		1,0	2,0		1,3	1,0	1,0	1,0	

Annex 11: aggregated matrix, Cluster 1 average links strength (16 respondents)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	org
1																1,0																						3,0
2																																						
3														1,0																								3,0
4																																						3,0
5																								1,0														3,0
6																		1,0																				3,0
7																																						
8																																						2,0
9																																						
10																						1,0																3,0
11																																						
12																																						
13																																						
14			1,0																																			1,0
15																1,0	1,0																					2,0
16	1,0														1,0																							3,0
17															1,0			1,0				1,0							1,0									1,8
18						1,0											1,0							1,0					1,0									1,6
19																																						
20																																						2,0
21																																						
22										1,0							1,0							1,0					1,0					1,0			1,0	
23																																						1,0
24					1,0													1,0				1,0																2,2
25																																						1,0
26																																						
27																																						3,0
28																																						1,0
29																	1,0	1,0				1,0																1,0
30																																						
31																																						
32																																						2,0
33																																						
34																						1,0																2,0
35																																						1,0
36																																						
37																						1,0																1,0
org	3,0		3,0	3,0	3,0	3,0		2,0		3,0				1,0	2,0	3,0	1,8	1,6		2,0			1,0	2,2	1,0		3,0	1,0	1,0			2,0		2,0	1,0		1,0	

Annex 12: aggregated matrix, Cluster 2 average links strength (34 respondents)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	org
1		1,3	1,0	1,0		1,0					1,0			1,0			3,0		1,0																			2,3
2	1,3		1,0	1,3		1,0				1,0	1,0				1,0						1,0						1,0											2,0
3	1,0	1,0				1,0					2,0					1,0	2,0																					2,5
4	1,0	1,3				1,5				1,0	1,0										1,0																	2,7
5																																						1,0
6	1,0	1,0	1,0	1,5							1,0		2,0								1,3																	1,4
7																																						2,0
8																																						1,0
9																																						1,0
10		1,0		1,0																		1,0																2,2
11	1,0	1,0	2,0	1,0		1,0																																2,2
12																																						1,7
13						2,0																																
14	1,0																																					
15		1,0																																				1,8
16			1,0																														1,0					2,0
17	3,0		2,0																										1,0									
18																																						
19	1,0																																					1,0
20																																						
21		1,0		1,0		1,3																																1,3
22										1,0																			2,5									
23																																						2,0
24																																						
25																																						
26																																						1,0
27		1,0																																				1,0
28																														1,0								1,0
29																	1,0					2,5															1,0	1,0
30																												1,0										
31																																						1,0
32																																						
33																1,0																						
34																																						1,0
35																																						
36																																						1,0
37																													1,0									1,0
org	2,3	2,0	2,5	2,7	1,0	1,4	2,0	1,0	1,0	2,2	2,2	1,7			1,8	2,0			1,0		1,3		2,0			1,0	1,0	1,0	1,0		1,0			1,0		1,0	1,0	

Annex 13: aggregated matrix, split-half reliability test, odd maps average links strength (25 respondents)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	org
1		1,0		1,0		1,0					1,0			1,0		1,0	3,0		1,0																			2,3
2	1,0		1,0	1,0		1,0				1,0					1,0						1,0																	2,0
3		1,0				1,0					2,0						2,0																					2,3
4	1,0	1,0				2,0				1,0	1,0										1,0																	2,7
5																								1,0														3,0
6	1,0	1,0	1,0	2,0							1,0							1,0			1,0																	1,7
7																																						2,0
8																																						1,0
9																																						
10		1,0		1,0																		1,0																2,0
11	1,0		2,0	1,0		1,0																																2,3
12																																						2,0
13																																						
14	1,0																																					
15		1,0														1,0	1,0																					2,0
16	1,0														1,0																							3,0
17	3,0		2,0												1,0																							1,7
18						1,0																							1,0									1,0
19	1,0																																					1,0
20																																						2,0
21		1,0		1,0		1,0																																1,5
22										1,0														1,0					2,0									
23																																						1,5
24					1,0																	1,0																3,0
25																																						1,0
26																																						1,0
27																																						
28																																						1,0
29																		1,0				2,0															1,0	1,0
30																																						
31																																						
32																																						
33																																						
34																																						1,0
35																																						
36																																						1,0
37																													1,0									1,0
org	2,3	2,0	2,3	2,7	3,0	1,7	2,0	1,0		2,0	2,3	2,0			2,0	3,0	1,7	1,0	1,0	2,0	1,5		1,5	3,0	1,0	1,0		1,0	1,0					1,0		1,0	1,0	

Annex 14: aggregated matrix, split-half reliability test, even maps average links strength (25 respondents)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	org
1		1,5	1,0	1,0		1,0																																2,4
2	1,5		1,0	2,0							1,0										1,0						1,0											2,0
3	1,0	1,0												1,0		1,0																						2,8
4	1,0	2,0				1,0					1,0																											2,8
5																																						2,0
6	1,0			1,0									2,0								1,5																	1,5
7																																						
8																																						2,0
9																																						1,0
10																						1,0																2,7
11		1,0		1,0																																		2,0
12																																						1,5
13						2,0																																
14			1,0																																			1,0
15																																						1,8
16			1,0																														1,0					2,0
17																		1,0				1,0							1,0									2,0
18																	1,0							1,0														2,0
19																																						
20																																						
21		1,0				1,5																																1,0
22										1,0							1,0							1,0					1,3					1,0			1,0	
23																																						
24																		1,0				1,0																2,0
25																																						1,0
26																																						1,0
27		1,0																																				2,0
28																														1,0								1,0
29																	1,0					1,3															1,0	1,0
30																												1,0										
31																																						1,0
32																																						2,0
33																1,0																						
34																						1,0																1,5
35																																						1,0
36																																						
37																						1,0							1,0									1,0
org	2,4	2,0	2,8	2,8	2,0	1,5		2,0	1,0	2,7	2,0	1,5		1,0	1,8	2,0	2,0	2,0			1,0			2,0	1,0	1,0	2,0	1,0	1,0		1,0	2,0		1,5	1,0		1,0	

Annex 15: distance matrix

Individual MAP	Safe	Pureandnatural	withoutchemicals	healthy	medicalproperties	greenfood	brightcolour	modernandfashion	Fresh	EnvironmentProtection	Withoutsideeffects	cheap	Flowersandgrass	Dontfallill	Tasty	Westernfood	highquality	nicepackaging	clean	nutritional	fruitsandvegetables	highproductioncosts	idealforkidsandelders	technologicallyimproved	pastry	nonnatural	badtaste	Fake	expensive	loosefaith	uglypackaging	dangerous	nonfresh	Withchemicals	hardtounderstand	Deteriorateenvironment	PoorchoiceHardtofind	Cluster (1 or 2)
0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**2**
1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**2**
2	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**1**
3	1	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	**2**
4	1	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
5	0	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
6	0	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
7	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**2**
9	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	**1**
11	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**2**
12	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**2**
13	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
14	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	**2**
15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	**2**
16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
17	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
18	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
19	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	**2**
20	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
24	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
B1	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
B2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	**1**
B3	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**2**
B4	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**2**
B5	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
B6	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**1**
B7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**2**

B8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	**1**
B9	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	**1**
B11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	**1**
B12	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	**2**
B13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	1	**1**
B14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**1**
B15	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	**2**
B16	1	0	1	1	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**2**
B17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	**1**
B18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	**1**
B19	1	0	1	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	**2**
_1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**1**
_2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	**2**
_3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**2**
_4	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	**2**
_5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	**1**
_6	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	0	**1**
_7	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	**2**
_8	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	**2**
_9	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**2**
43	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	**2**

Annex 16: Clustering description

Auto-Clustering

Number of clusters	Schwarz's Bayesian Criterion (BIC)	BIC Change(a)	Ratio of BIC Changes(b)	Ratio of Distance Measures(c)
1	1272.346			
2	1272.116	-.230	1.000	1.344
3	1308.996	36.880	-160.364	1.697
4	1390.168	81.172	-352.956	1.119
5	1478.096	87.928	-382.333	1.053
6	1568.887	90.791	-394.780	1.400
7	1675.105	106.218	-461.862	1.006
8	1781.569	106.464	-462.933	1.027
9	1889.052	107.483	-467.360	1.011
10	1996.942	107.890	-469.131	1.065
11	2107.067	110.125	-478.852	1.300
12	2225.192	118.124	-513.634	1.010
13	2343.577	118.385	-514.767	1.031
14	2462.743	119.166	-518.163	1.005
15	2582.034	119.291	-518.706	1.022

a The changes are from the previous number of clusters in the table.

b The ratios of changes are relative to the change for the two cluster solution.

c The ratios of distance measures are based on the current number of clusters against the previous number of clusters.

Cluster Distribution

Number of clusters	N	% of combined	% of total
Cluster 1	16	32.0%	32.0%
2	34	68.0%	68.0%
Combined	50	100.0%	100.0%
Total	50		100.0%

9. Acknowledgments

I would like to express my gratitude for his assistance and patience to my supervisor, prof. Maurizio Canavari, whose expertise and skill guided me in every aspect of this work, and under whose tutelage I had the chance to develop many skills in several research fields.

Many thanks goes out to Huliyeti Hasimu for helping me tuning my point of view with the Chinese one over these years, and for her fundamental contribution in improving my Chinese language skill.

I must also acknowledge prof. Yu Leng of the Shanghai Jiao Tong University for his suggestions, provision of materials, and for his availability in supporting my stay in China.

Finally, huge thanks go to my parents, for the support they provided me during my entire life; without their love and guidance I wouldn't be here today. A very special thank goes to my beloved brother, whose encouragements convinced me to finish this work in time despite the hard time I was undergoing, and to his girlfriend Karlynne, who patiently revised my work.