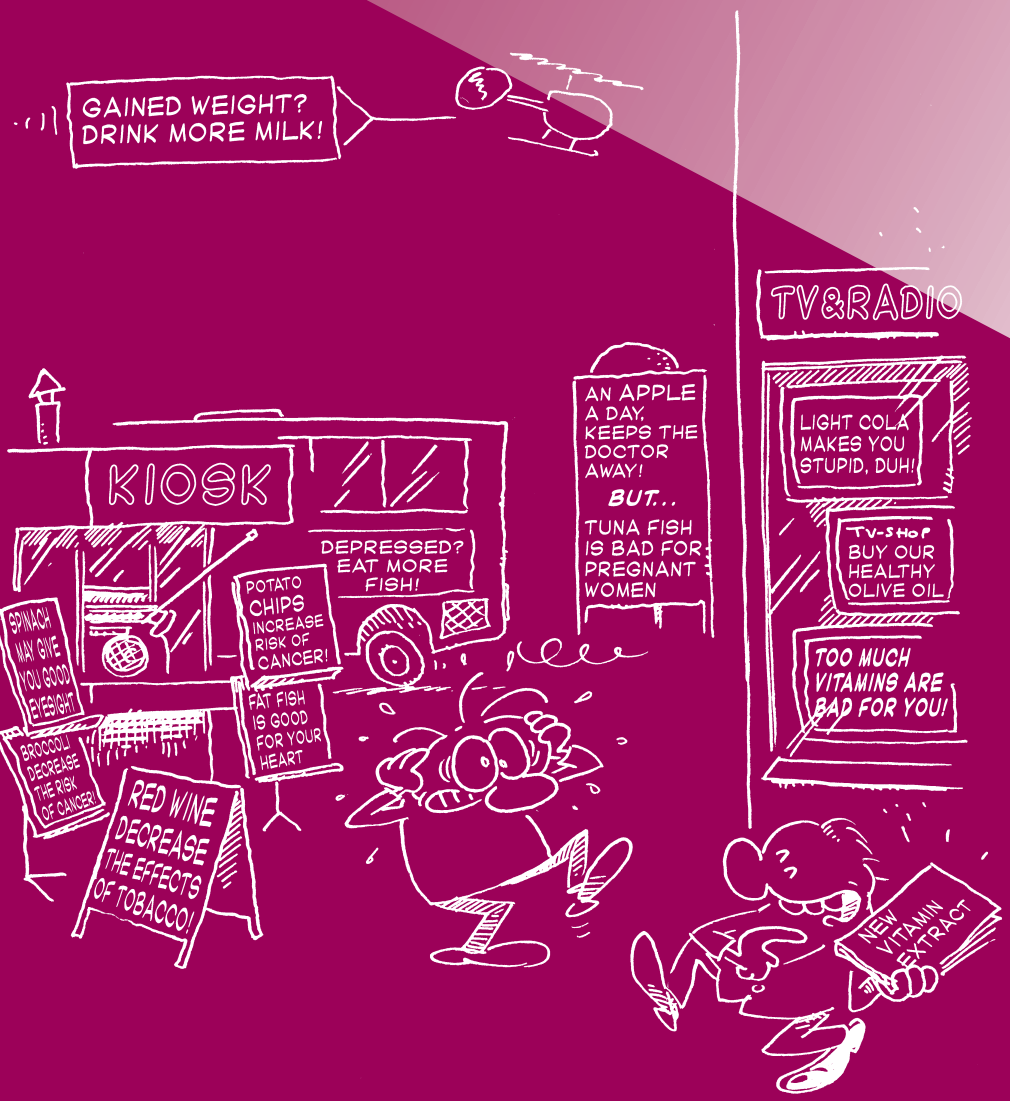
Kristina Eriksson-Backa

In Sickness and in Health

How Information and Knowledge Are Related to Health Behaviour



Kristina Eriksson-Backa

- born in Nagu 1972
- Master of Science in Information Studies from Åbo Akademi University (1999)
- enrolled as doctoral student at the Department of Information Studies at Åbo Akademi University since 1999
- conducted research within the project "Citizens, Health and the Changing Media Culture" at the Department of Information Studies, Åbo Akademi University 1999-2002. The project was carried out within the Media Culture Research Programme of the Academy of Finland
- Researcher at the Research Unit for the Sociology of Education (RUSE) at the University of Turku since 2003.

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It is said that a picture is worth a thousand words. Paul Söderholm has kindly taken time to comprise the basic idea of the thesis into one picture, the one on the cover. Thank you!

Last, but definitely not least, my husband Thomas, my whole family, and all my

friends: Thank you for being there! You are a safe basis to lean on and you provide an environment which is some kind of a resort to me, since it is very different from the research world.

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1. Introduction

In the spring of 2001, I often passed an advertisement on a billboard on my way to work. On the billboard there was a giant happy face, with a smile made of a cucumber, tomatoes forming the eyes, and hair made of lettuce. This face was accompanied by two words in Finnish: '*Terve taas*'. These words have a double meaning. The sentence can be translated as either 'Hello again' or 'Healthy again'. The picture could be interpreted as either an advertisement for domestic vegetables, which are becoming more common at this time of year (especially as the advertisement contained a logo associated with Finnish vegetables), or as general information connecting vegetables with health. In the latter case this is only one example of how it is very common to hear or read about relations between food and health in different kinds of media today. Such information might be found in the most unexpected places; in a satiric Finnish cartoon published in the local daily newspaper *Turun Sanomat* on November 29th 2002, the reader was confronted with two examples of health risks with food: dioxin in Baltic herring and Mad Cow Disease in beef. As we can see, health information can be of different kinds.

Rolinson (1998) defines health information as information somewhere on a continuum between health education and health promotion. Bob Michaël Fennis found three categories of health representations in the media: the representations were 'healthy' and about food or non-food products such as cosmetics or fitness products; representations were 'unhealthy' and about environmental factors such as ultraviolet rays, or fast foods, sweets and alcohol; and thirdly, representations of illness and disease (Fennis 1999, p. 29 ff.). Jane Elliott, on the other hand, found five profiles of health information in women's weekly magazines; 'items about specific diseases or conditions'; 'items reporting recent research'; 'items including advice about lifestyle'; 'items explicitly mentioning the National Health Service' and 'items giving details for obtaining further information' (Elliot 1994).

In 1990, Atkin and Arkin (1990) claimed that very little research had been made to assess the impact of health information on the public. Ten years later Rimer (2000) still requested evidence about the effects of health communication, as well as what different media people prefer. Although several mostly American and British studies concerning the impact of health messages (e.g., Byrd-Bredbenner & Grasso 2000; Chew et al. 2002; Chew, Palmer & Kim 1995; Guild & Lowe 1998; Gunasekera et al. 1996; Jenkins et al. 1999; Karpf 1988; O'Connor et al. 1999; Reger, Wootan & Booth-Butterfield 1999; Sligo & Jameson 2000; Verbeke, Viaene

& Guiot 1999; Wilson et al. 1996; Worden & Flynn 1996; Yanovitzky & Blitz 2000) and the preference of media information sources (e.g., Chew, Palmer & Kim 1995; de Almeida et al. 1997; Järvelä 1998, p. 41 f.; Lashuay et al. 2000; Marcella & Baxter 2000; Oakley et al. 1995; Rees & Bath 2000) have been conducted in recent years, the case in the Finnish context is meagre. Best known, perhaps, are reports from the studies surrounding the North Karelia-project, which began in the early 1970's and aimed at improving cardiovascular health by means of information from several sources (e.g., Karpf 1988, p. 223f.; Korhonen et al. 1998; Pietinen et al. 1996), Pauliina Aarva's dissertation concerning how viewers receive the messages of health posters (Aarva 1991), and an extensive study on nutritional information and information sources concerning all the member states of the European Union (de Almeida et al. 1997).

1.1 Aim of the study

This particular research aims at addressing the gap in research on relations between health information and health behaviour in the Finnish context. The thesis seeks to examine the relationship between the existing knowledge level in health matters among Finns, and the health behaviour and the preference for information sources on health related to nutrition. Most previous studies have only examined relations between health information and health knowledge, health information and health behaviour, or health knowledge and behaviours related to health. This study connects the three parts of health-related information, knowledge and behaviour, in order to see how they are interrelated. Since the study concentrates on how people use and seek information for everyday purposes instead of for work tasks, the study can be incorporated into the tradition of studying everyday life information seeking (Savolainen 1995a; Savolainen 1995b) within information science. The study is limited to three groups: pregnant women, persons with diabetes, and a control group consisting of "healthy" people.
This current study seeks answers to the following questions:

- Is there a relationship between the information sources a person uses and his existing knowledge on health and food, and if so, what is this relationship like?

1. What are the differences like in the levels of people's health knowledge?
2. Are differences in knowledge levels related to use of information from a certain information source?

3. Is the preference for a certain type of source correlated with high or low levels of health knowledge?
4. If knowledge is not related to information source, then what kinds of demographic factors lie behind differences in knowledge?

- Is there a relationship between received or acquired information and knowledge on nutrition and health and the health and eating behaviour of an individual, and if so, what is the relationship like?

1. Does the received or acquired information and the existing knowledge have some effect on health behaviour?
2. Does risk information about food or other health information lead to changes in health and eating behaviour?
3. If information and knowledge do not influence health behaviour, then what demographic factors do?

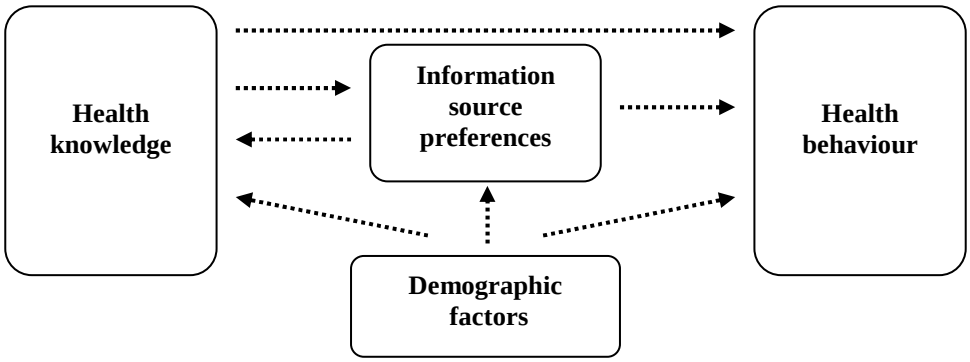

Figure 1. An illustration of the main variables of the study

The research questions are visualized in the illustration presented in figure 1. This illustration suggests that health knowledge has an influence on health behaviour, while source preference on the other hand affects both health knowledge and behaviour. Knowledge is also suggested as lying behind the preference for a certain source. Health knowledge and behaviour, as well as source preference, might furthermore be influenced by demographic factors.

1.2. Structure of the thesis

The thesis will be structured in the following way: In chapter 2 the concept of health is presented, as well as studies on relations between food and health and recommendations on healthy eating. Chapter 3 analyses the concept of knowledge and gives an overview of how knowledge is constructed and structured in the memory. Chapter 4 presents some studies that have been conducted on people concerning their knowledge of health and health risks. Chapter 5 then examines health behaviour and factors underlying certain behaviours are presented. Also in this chapter, knowledge and behaviour, and attitude and behaviour are presented. The concept of information and an overview of the cognitive viewpoint and its role within information science are presented in chapter 6. The following chapter, number 7, takes a closer look at information needs, especially needs related to health issues and the seeking of information. Chapter 8 looks at the concept of media, and the media's relation to the human being. This chapter looks at the existence and use of health information both in media and in other information sources. The influence of health information on knowledge and behaviour are examined. The theoretical part of the thesis is summarized in chapter 9. Chapter 10 presents the methodology used in the empirical study. Measures of knowledge – both the experimental type and the type used in survey studies – are presented. Chapter 11 then presents the results of the empirical study and chapter 12 finishes with a discussion that ties together the theoretical and the empirical parts of the thesis.

2. Health

2.1. The concept of health

The World Health Organization defines health in the following way: “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” (World Health Organization, no date)

Health can be proven if nothing abnormal can be registered. Health can also be subjective, that is, how a person experiences his/her health situation. Socially defined health is dependent on the social environment, a person is ill if he/she is not able to manage the usual social role, for instance, in going to work or in taking care of himself/herself (Bäckman 1991, pp. 13f.). Health programmes usually emphasize that health is influenced by four factors:

1. biological factors
2. environmental factors (physical and psychosocial)
3. lifestyle, and
4. health service systems (Bäckman 1991, p. 20)

But health is more than just the absence of sickness. Bäckman cites, for example, Antonovsky (1983) when he says that health and well-being can be understood as an ideal status of self-realisation, and to reach this the individual needs a constructive life power as well as flexibility to manage with different situations in life (Bäckman 1991, p. 155; Bäckman 1994, p. 12).

Katie Eriksson (1990, p. 9) uses two categories of health concepts; theoretical and practical. Of these two, the theoretical one can be seen as an ideal one (e.g., the aim of the activity of nursing research on a general and abstract level). The practical concept, on the other hand, is the description of health, which is used as a starting point for the nursing activity, the concept which leads the aims of health and medical care. Eriksson’s work *Hälsans idé* (The idea of health) is an extensive study of health from many different angles. Eriksson states that health is something natural in human beings; becoming unhealthy is a cause of having met obstacles and having tried to master these with more or less success (Eriksson 1990, p. 11).

Health is also a multidimensional concept. Health can be seen as a movement in three different dimensions: health as ”doing”, ”being” and ”becoming”. In the first dimension, health is

judged by external, often objective, criteria; health is related to behaviours such as living in a healthy way and avoiding things that could risk health. The second dimension is characterized by trying to experience well-being, some form of balance or harmony inside. The third dimension is raised from the assumption that a human being is not something complete, but is developing all the time. The human being is striving to cope with the circumstances of life. The human being does not exist on only one of these levels, but is constantly moving between the levels (Eriksson et al. 1995, pp. 12 ff.).

Health can furthermore be understood as a concept linked with a person's total way of life and expressing the relationship between his objectives and resources (holistic view of health). Some people define health by referring to the balance between aims and resources. Health can be applied to life in its entirety, and can be regarded as a state of normalcy or the absence of illness. Still, all do not equate health with non-illness (Häggman-Laitila & Kalkas 1988).

2.1.1. Experiential health knowledge

Häggman-Laitila and Åstedt-Kurki (1995) interviewed 160 Finnish adults on their understanding of health, and found two types of what they call experiential health knowledge: Institutional as well as individual health knowledge.

Institutional health knowledge can be knowledge about health as the normal state, knowledge about what "right" or "proper" health care is, knowledge about which factors can cause illness, knowledge about diseases that a person has observed in himself/herself, and knowledge about how to obtain help if necessary. Knowledge of health as normalcy contained information on, for example, blood pressure. If someone's blood pressure was within an acceptable limit, this indicated good health. Things that indicated a healthy person were also a lively appearance, good complexion, a well-proportioned body, and the absence of visible symptoms. Knowledge about proper health care was adopted in the form of directions on how to live in a healthy way and was centred on means and methods. Knowledge was to a large extent about healthy diets, alcohol and medical drug use. What physical activities are good for you was also considered. The knowledge about factors which could cause illness was fragmented, but the interviewees were familiar with some factors such as stress. Knowledge about receiving help was influenced by earlier experiences and the attitude towards asking for help was cautious. The interviewees wanted to be really ill before seeking medical help (Häggman-Laitila & Åstedt-Kurki 1995).

Individual health knowledge was expressed by knowledge about being healthy and feeling well, knowledge about being ill and not feeling well, and knowledge about how to produce well-being and about how to deal with not feeling well. Knowledge about being healthy and feeling well was based on a person's own experience of existence. If a person had no pain, was energetic enough to move about and to put himself/herself under physical stress and if he/she felt happy and had energy to go to work and to attend possible obligations towards others, the person knew he/she was healthy (cf. Bäckman 1991, p. 14). Knowledge about being ill and not feeling well was identified by tiredness and exhaustion, energy loss, and loss of appetite for life. Short-term conditions, such as influenza, were considered part of human existence. Knowledge about how to produce well-being included traditional healthy life habits as well as notions about the positive health effects of leisure activities, the discovery of the meaning of life, self-understanding, and an organised life (Häggman-Laitila & Åstedt-Kurki 1995).

2.2. The relationships between food and health

Several studies have shown the relationship between nutrition and health, or the risk of illness. Relationships, especially between food and cancer, have been found. High incidences of cancer in mice and experimentally induced neoplasm in animals can be prevented by nutritional factors. Experimental animals are protected against both genetically determined and intentionally induced cancer by diet. This may also lead to reduction in human cancer morbidity and mortality through the intake of appropriate nutrition (Boutwell 1988, pp. 85f.). Boutwell argues that there is evidence that if an individual maintains an energy balance that prevents greater amounts of energy being stored as fat, the risk of cancer is reduced considerably. Thus, the simplest and most effective way to lower the risk of cancer is to encourage the public in any possible way to control their energy balance and eliminate obesity (Boutwell 1988, p. 98).

Another study, reviewing different studies on risk factors associated with cancer and nutrition that have been made on humans and supported by animal studies, points to a possibility of manipulation of nutrients in our diet to make it a tool for prevention of cancer. The foods we eat are probably the most important risk factors and are very important when it comes to preventing cancer because diet is the one lifestyle over which we exercise control. By means of dietary control some types of cancer are preventable. The factors most likely to influence risk are: total calories, protein, fat, vitamin A and carotene, the lipotropic factors methionine and choline, and the minerals zinc and selenium (Newberne & Conner 1988, p. 121).

In Finland, it was found that consumption of milk seemed to be related to a higher risk of breast cancer while intake of poultry, monounsaturated fatty acids and vitamin E were related to lower risks among premenopausal women. Oil, milk, cheese, coffee and beta-carotene furthermore seemed to protect postmenopausal women from developing breast cancer, while butter and cream increased the risk of developing this type of cancer (Männistö et al. 1999).

The relationship between diet and heart disease has also been examined. Diet has an influence on the risk of atherosclerosis because it affects plasma lipid and lipoprotein concentrations, can raise the blood pressure, promote thrombogenesis and accelerate development of noninsulin-dependent diabetes mellitus. Diet can also cause obesity (Lapinleimu 1995, p. 18).

Many of the most important risk factors for coronary heart disease, including hyperlipidemia, obesity, hypertension and smoking, can be changed by a more thoughtful lifestyle (Niinikoski 1997, p. 13). Changes in diet already lead to a decrease in serum cholesterol concentrations. Dietary changes accompanied by a cessation in smoking, and also by better blood pressure control, lie behind much of the decrease in coronary heart disease mortality in Finland since the beginning of the 1970's (Pietinen et al. 1996).

2.3. Recommendations on healthy eating

The ”Western” diet contains high energy intake in comparison to low energy expenditure, a high intake of total and saturated fat, cholesterol and salt, and on the other hand, a low intake of carbohydrates and fibre. (Lagström 1999, p. 19). Finns have quite a high cholesterol level compared with other countries, and one reason for this might be the structure of fat in the food: it contains much saturated fat and cholesterol, but little mono- and polyunsaturated fat (Lapinleimu 1995, p. 97).

Common elements in the guidelines about a healthy lifestyle and diet include eating a variety of foods; consuming less fat; consuming more vegetables, fruits and grain products; being moderate in use of salt, sugar, and alcohol; increasing physical activity and maintaining a healthy weight (Girois et al. 2001). The Nordic countries have set guidelines for the composition of diets and the recommended intake of nutrients (Nordiska ministerrådet 1996). The guidelines give recommendations for the intake of fat, carbohydrates and protein. The recommendations also include reference values for the intake of energy, certain vitamins and minerals as well as the intake of sodium chloride. The recommendations are given separately

for adults, children older than 3 years and children under 3 years of age. According to the recommendations, the diet of an adult should not contain more than 30E% fat and 55 to 60E% carbohydrate. The protein intake should provide between 10 to 15E%. The current Finnish recommendations (Statens näringsdelegation 1998) are very similar to the Nordic nutrition recommendations. The food circle, the food pyramid and a food plate model are used to describe a recommended, balanced diet.

3. Knowledge

This thesis will take a cognitive viewpoint (see further in chapter 6.2), and thus the concepts of knowledge and knowledge structures will be presented closer.

3.1. The concept of knowledge

A simple definition of knowledge is that it is accumulation and integration of the information that has been given by a certain unit. (Meadow & Yuan 1997). In empiricism and rationalism, knowledge is considered as isolated facts or ideas. In pragmatic epistemology, knowledge is a collection of theories which are fulfilling some purpose for a living organism (Hjørland 2000). In constructionism, knowledge is considered as created during a dialogue between people. Knowledge is something that people do together instead of something that an individual possesses (Tuominen 2001, pp.18f; Tuominen & Savolainen 1997; Tuominen, Talja & Savolainen 2003).

In addition, Tengström argues that knowledge is linked to a living organism when he says that knowledge can only exist within a human being, not in books or computers. Knowledge can also be divided into four types:

- Everyday knowledge
- Professional knowledge
- Scientific knowledge and
- Artistic knowledge (Tengström 1987, p. 46).

In addition to these four types, Schrader (1984) also mentions philosophical knowledge, legal knowledge, religious knowledge, the qualitative knowledge produced by the arts, and knowledge of human social practices.

Krohn (1989, p. 25) said that knowledge is belief which is adequately grounded and in accord with the truth. Knowledge which is said to be true is called scientific knowledge (Christensen 1987, pp. 63f). This kind of knowledge is privileged, universal and neutral and is uninfluenced by social and cognitive processes (Ørom 2000).

Hoel (1980) calls knowledge the result of a process that takes place when an attentive, experiencing subject asks intelligent questions on some data that have caught its attention, and

passes reasonable judgements on the theories that have been formed by the answers to these questions. Because of this, knowledge is something subjective, which can only be acquired by repeating this process over and over again, either easily or laboriously. Others can help only by assembling data and clearing the way for insights to happen. Brookes (1980a) also talked about private, subjective knowledge, and he talked furthermore about a public knowledge. All of us have private knowledge, which embraces our personal view of our world, our social role and any specific expertise we may have acquired. An individual scientist's knowledge structure is private, but if he publishes what he knows, that published literature contains public knowledge. Patrick Wilson has previously talked about public knowledge in this sense, and he claimed that public knowledge does not need to be knowledge if knowledge is understood as the truth. Public knowledge might be the best available story, even though this story might later be replaced by new stories due to new findings (Wilson 1977, p. 6).

Schank and Abelson (1977, p. 37) recognized two classes of knowledge used in human understanding: general and specific. They say that the general knowledge is useful when a person needs to understand another person's actions. The actions can be interpreted simply because the other person has certain needs and lives in a world with certain methods of fulfilling those needs. The specific knowledge, on the other hand, is used when interpreting and participating in familiar events. Specific knowledge about a situation minimises the processing and wondering about events already well known.

Meadow and Yuan (1997) reflected on the structure of knowledge, and viewed it as segmented. We can have knowledge about specific subjects with only little in common, but on the other hand some knowledge underlays almost all other knowledge, such as: knowledge of one's primary natural language, knowledge of logic and knowledge of customs or society. Meadow and Yuan used the word "knowledge base" for the sum of knowledge a person or some other entity (animal, machine) has. As we can see, they do not follow the idea of knowledge as something existing only within a living organism (Hjørland, 2000), or a human being (Tengström 1987). Meadow and Yuan (1997) specified three categories of knowledge:

1. Knowledge about a topic (*information that*) (Fox 1983, p. 14)
2. Knowledge about how to do something (*knowledge how*) (Fox 1983, p. 14)
3. Knowledge about *how to find information.*

In this work, knowledge is understood as information that has been integrated into the existing knowledge base of a human being. A knowledge base is defined as the total sum of knowledge a person has. This knowledge helps the individual to manage in the surrounding world.

3.2. Knowledge structures

Knowledge structures can be understood as subjectively constructed representations of the objective world. These representations are stored in memory and work as tools of perception. They are, in other words, a way to organise the mess of visual data we have around us, by bringing models of what we think we see in front of us out from the memory (Cole 1994). Peter Ingwersen gives a more visual example. According to him knowledge structures may be seen as maps hanging from the ceiling in a classroom. Different maps may cover the same material, and they are ordered according to various overriding concepts. During a discussion, other maps may be pulled down if they are needed and even a complete change of maps may occur during conversation (Ingwersen 1982).

Brookes (1980b) thought of knowledge as a structure of concepts linked by their relations. Information, on the other hand, is a small part of such a structure. The structures are needed to subjectively interpret sense data from the outside world and transform it into information and to transform knowledge structures. These are of two kinds: objective maps, of the exosomatic stores of knowledge, and cognitive maps.

Knowledge structures are dealt with within many disciplines, and they have also been given many names, such as: semantic networks, frames, scripts, schemata, plans, productions, themes, memory organisation packages, mental models, cognitive models or cognitive structures (Todd 1997). Within so called schema theories, which have been used to explain how people tame the so called ”information tide” (Wicks & Drew 1991), the knowledge structures, called schemata, are units of knowledge containing knowledge itself as well as information on how to use this knowledge (Dochy & Bouwiens 1990). The knowledge structures work as both structures of knowledge organisation in the memory and as devices for organising sense data into coherence during perception (Cole 1994).

3.2.1. Definitions of schemata

A schema is a fundamental element that all information processing is dependent upon. (Dochy & Bouwiens 1990, p. 3). The schema construct is a convenient way to represent a subject's expectations about structure of both future and past events in the world or to represent patterns of events which are desirable and valued (Hastie 1981, p. 44). After a review of literature on schema theory, Wicks (1992) concludes that the term schema is an organized knowledge structure which is based on a subjective theory guiding a person in information processing. The first person to use the concept of schema was Sir Henry Head in the 1920's (cited by Bartlett 1977, p. 199), who suggested *schema* as the name of the standard against which all later changes in an attitude are measured before they enter the mind.

Some researchers (see e.g. Hastie 1981, p. 39) have defined the concept of schema as an abstract knowledge structure or an abstract description of a thing or an event. Others have a more concrete description of schemata; they call them data structures that represent the generic concepts that have been stored in memory and exist for the general concepts that lay behind concepts, situations, events and actions (Dochy & Bouwiens 1990, p. 3).

Reid Hastie included in the word schema "almost any of the abstract hypotheses, expectations, organising principles, frames, implicational molecules, scripts, plans or prototypes that have been proposed as abstract mental organising systems or memory structures" (Hastie 1981, p. 39). According to Hastie (1981, p. 41), a schema is an abstract and general structure which establishes relations between specific events or entities. These events or entities can be evaluated as either congruent or irrelevant, with reference to the schema. For any given topic, people have from none to many schemata upon which to draw, but it is suggested that only a few are used in information processing (Wicks 1992; Wicks & Drew 1991).

Schemata have furthermore been defined as the cognitive structures that exist in a part of the representation of a stimulus area that has been defined. Schemata contain general knowledge of the area and they also contain a specification of the relations between its attributes as well as specific examples of the area of stimulus. (Fiske & Taylor 1984, p. 140; Taylor & Crocker 1981, p. 91).

Lindeman summed up the concept of 'schema' in three points:

- Schemata are cognitive structures
- Schemata represent both general and specific knowledge in one unit
- Schemata influence cognitive processes (Lindeman 1984, p. 3)

3.2.2. Types of schemata

A schema can be roughly divided into *content schema* and *text schema*. Content schemata contain general or specific information about a given topic, whereas text schemata contain information on how to organise rhetoric. A special case of the content schema is the *event schema*, which is also known as a script. This schema contains information on stereotyped events or situations such as eating at a restaurant. These schemata are only eventually organised and specify the expected time order of events (Kitao 1989, p. 2).

Hastie (1981, pp. 40 f.) refers to three types of schemata: *central tendency schemata*, *template schemata* and *procedural schemata*. Some researchers have also called the central tendency schema a prototype schema. It can be defined as a member of a stimulus set located at the statistical centre of the distribution of the items in this set. The template schema, on the other hand, is a filing system useful for classifying, retaining, and co-ordinating sensory data that has been received. The third type, the procedural schema, is close to Bartlett's and Piaget's definitions. The former saw schemata as active organisations of past reactions or experiences, which have to be supposed to be operating in any organic response which is well adapted, while the latter thought that they are cognitive structures with references to classes of similar action sequences. These sequences have to be strong, bonded totalities, and in them the constituent behavioural elements are tightly interrelated.

Lindeman says that the concept of schema has become something of an umbrella containing an amount of hypothetical cognitive modules such as *scripts* and *stereotypes* (Lindeman 1984, p. 3). Werner, Rhodes and Partain (1998) divide the schemata into *frames* (expectations on the physical environment), *prototype*s and *stereotypes* (expectations on someone's personal characteristics) and *scripts* (expectations on typical or suitable sequences of an event).

Fiske and Taylor identify five types of so-called social schemata: 1) *person schemata* (people's understanding of the psychology of other individuals helps them to categorise others and to

remember behaviours which are schema-relevant); 2) *self-schemata* (general information about one's own psychology makes up a self-concept that guides the processing of information about the self); 3) *role schemata* (intergroup perception and stereotyping are affected by role schemata describing norms and behaviours which are suitable for broad social categories); 4) *event schemata* (prior knowledge of a sequence of events which are typical in standard social occasions helps to understand difficult information, helps remember relevant information, and helps infer missing consistent information), and 5) *content-free or procedural social schemata* (this schema is different from the others and only consists of rules for linking content; it guides information processing towards information which is schema-relevant) (Fiske & Taylor 1984, pp. 149ff.).

3.2.3. Schema structure and change

Schemata are well organized general knowledge structures and they contain slots for each component. A schema contains the association network of a concept; it has a hierarchical structure so that the most relevant information is highest up and the least relevant information is situated at the bottom (Kitao 1989, p. 2).

It is a tenet of schema theory that a schema grows in complexity and sophistication over time (Wicks & Drew 1991). Schemata may be expanded and refined when experiences challenge their accuracy and completeness. Major alterations or revisions of well-defined schemata because of a single discrepant item are, however, rather the exception than the rule (Wicks 1992).

Wicks (1992) draws parallels between a complex schema and the gold atom; they are both highly compact and hard to alter. Also Fiske and Taylor (1984, pp. 171, 177) and Crocker and colleagues (Crocker, Fiske & Taylor 1984) think that schemata resist change even though schemata and pieces of information are not compatible. Fiske and Taylor (1981, p. 177) say that people tend to make the data fit the schema rather than the other way around. The degree of discrepancy between the schema and the new information is important for the possibility of schema change. Too much discrepant information might, however, be rejected. Other characteristics associated with schema change are the ambiguity, the organization and the memorability of the information (Crocker, Fiske & Taylor 1984).

3.2.4. Use of schemata

Taylor and Crocker (1981, p. 90) question the use of the schema concept. They say that the processing of information involves scanning the environment, selecting items to attend to, taking in information about those items, and storing information for later consideration or using it for action. Within this process there is a great deal of selectivity, because it is impossible to note all the details in our environment. The selection of the information which is useful, and the efficient processing of it, is based on the perceiver's criteria of selection and guidelines for processing. These are formed by hypotheses about how the world works.

Hastie (1981, p. 45) presents a flowchart which shows schematic perception and memory information processing. According to this model people react to an event in one of two ways: Either they find an appropriate schema and assimilate the new information, or they accommodate the new information either by beginning a new schema or by accepting the new information as an exception to the rule.

The central function of a schema in comprehension and memory is to either construct means for interpretations or to integrate the meaning of a message. Furthermore, the function is to reconstruct the meaning of a message so that the content can be retrieved (Samuelsson 1993, p. 22). When a person comes in contact with something new such as an idea or a concept, a schema begins. This is the root of social learning (Wicks 1992).

According to the person's level of development, schemata can be used in different ways. Novices in a topical domain tend to rely on information which is consistent with a particular schema. Experts use both schema-discrepant and schema-consistent information (Fiske, Kinder & Larter 1983). On a more practical level schemata can be used in two ways. On the one hand, they are needed as guides in typical situations, for example, for a customer at a restaurant to know how to behave (see also Schank & Abelson 1977, p. 41), while on the other hand, to use another example, they can be used for understanding a text. In the latter example schemata helps the reader to add information which is not explicitly written in the text (Kitao 1989, p. 3).

Schemata also have other functions. They allow a perceiver to identify stimulus quickly, choose a suitable unit, fill in information which is missing from the stimulus configuration and choose a strategy for receiving further information. They can also help to solve problems or to

reach goals. Taylor and Crocker (1981) have noted that schemata:

- provide structure to experiences (a stimulus configuration is matched against a schema, and the elements in the configuration are ordered in a way that reflects the structure of that schema)
- aid in deciding which information shall be coded or retrieved from memory (imposing a schema on a stimulus configuration or encountering a configuration that matches a schema increases the recall of material especially relevant to the schema)
- affect the time it takes to process information, its flow time and the time it takes to solve problems (whether or not material relevant to the schema is processed faster than irrelevant material depends on the material's valence, centrality, evaluative consistency, novelty and implications)
- make it possible for the social perceiver to fill in data which is missing from an input stimulus configuration
- provide bases for problem solving
- provide a basis for evaluation of experiences (a schema represents a normative structure and a specific instance can be matched against it)
- provide a basis for anticipating the future, setting goals, making plans as well as developing behavioural routines to deal with them (they enable a perceiver to predict the future by specifying the likelihood of certain events or behaviours to occur) (Taylor & Crocker 1981, pp. 93 ff.).

An individual who posesses a well-defined schema in a particular topical domain is expected to have more success at recalling information accurately, to be more confident in making inferences and in grouping or clustering related concepts than a person with an ill-defined schema (Wicks 1992). It is also suggested that information is easier assimilated when a developed schema is available. A person is also expected to infer more from a set of information when possessing a well-defined schema on the topic. These persons have a greater knowledge base upon which to draw, and they may find it easier to find situations in their memory which serve as models for incoming information (Wicks 1992).

In their study on political information processing, Fiske, Kinder and Larter (1983) found that the prosessing depends on past experience. Individuals will thus vary enormously in both the availability of schemata and how the schemata are used.

3.2.5. Frames and scripts

Samuelsson (1993, p. 22) refers to previous research when he says that the term schema has no fixed operational definition while it leaves out specific knowledge about how people usually act and relate to objects which are familiar in different situations. In order to overcome this problem, there has been a focus on more distinctive classes of schemata such as *frames* (Minsky 1975), or *scripts* (Schank & Abelson 1977).

Minsky (1975, p. 212) defined a frame as "a data-structure for representing a stereotyped situation". This situation might be, for example, going to a birthday party. Each frame has information attached to it, and this information can be about how to use the frame or what you can expect to happen next. The information can also be useful if the expectations are not confirmed.

Schank and Abelson (1977, p. 41) define a script as "a structure that describes appropriate sequences of events in a particular context" and these scripts are said to be predetermined and stereotyped sequences of actions that define situations which are well known. Activities such as going to a restaurant often include stereotyped actions. Bower, Black and Turner (1979) tested students on their scripts of common activities such as going to a lecture, the doctor's or a restaurant, and they found considerable agreement in the way the students described these events.

4. Health knowledge

4.1. Knowledge of health risks

4.1.1. High levels of knowledge of health risks

Especially within health sciences it is common to study people's knowledge of different health issues, and the results show large variations. For example, studies on health risks show both high and low levels of knowledge, and the knowledge level is often due to demographic factors. Meischke et al. (2002) found that American women were quite knowledgeable about symptoms of heart attacks. Other studies confirm that women usually show a better knowledge than men of cardiovascular disease prevention as well as diet-related diseases, as do those with higher levels of education among both Americans and Swiss (Gans et al. 1999; Girois et al. 2001). Furthermore, British women were found to be much more confident about their knowledge of dietary recommendations and Finnish women were found to be more health conscious than men (Beardsworth et al. 2002; Urho et al.1994, pp. 10 ff.).

In a study conducted on about 15,000 Americans, factors related to a higher knowledge on heart disease included gender, education, higher age, speaking English at home, and being born in the USA (Gans et al. 1999). Country of origin also seems to be related to knowledge about the relationship between physical exercise and the risk of heart disease. Over 70% of the Danes, Finns, Dutch and Norwegians were aware of the relationship, while fewer than 40% in Belgium, Greece, Italy, and Poland knew this (Steptoe et al. 1997). Being a woman and being older is not always equal to better knowledge: Sixty-four percent of Finnish citizens were aware that a high cholesterol level could raise the risk of coronary heart disease, but doubters were more common among elderly people. The oldest respondents also had the greatest difficulties in answering if there was a relationship between diet and cancer, or not (Urho et al.1994, pp. 10 ff.). Youth can also have good knowledge. British teenagers, for example, showed considerable knowledge of cancer and they were especially aware of the risk of cancer caused by smoking (Bendelow, Williams & Oakley 1996b). Swiss men surprised the researchers by showing a knowledge of breast cancer that was equal to the women's knowledge. Men also had a more positive attitude towards mammography than women did (Chamot & Perneger 2002).

4.1.2. Low levels of knowledge of health risks

If some studies found the knowledge about cardiovascular diseases quite good, others showed inadequate knowledge. Factors related to stroke risks are not well known among Americans, and the most worrying thing is that the knowledge is lowest among those who would most benefit from a better knowledge of it; that is, those who have an increased risk of a stroke – people over 75 years of age, men and blacks, and even those who already have had a stroke (Kattapong et al. 1998; Pancioli et al. 1998). The same thing seems to be true with knowledge of osteoporosis; those who need to know the most about the risk of osteoporosis and its prevention – women – might need to start preventive healthy eating in their teen years. Yet these women often have only little knowledge of the disease (Davis 1999; Ribeiro, Blakeley & Laryea 2000). Girois et al. (2001), furthermore, found that people who were overweight were not more knowledgeable about diet and health issues. Prevention of heart disease should also be started early on, but among young European adults the knowledge level about the relationship between exercise and the risk of heart disease was low – only slightly over half of the respondents knew about the relation (Steptoe et al. 1997).

Weak knowledge about different types of cancer and factors causing cancer has been shown both in the USA (Breslow et al. 1997; Phipps et al. 1999) and among the British (McCaffery, Wardle & Waller 2003). The majority of the respondents could not recognize risks factors for cancer (Breslow et al. 1997; McCaffery, Wardle & Waller 2003). In these studies, too, demographic factors were related to knowledge. In Britain the younger, less educated male respondents showed the least knowledge (McCaffery, Wardle & Waller 2003).

4.2. Dietary knowledge

Knowledge of the relation between food and health is of special interest to this study. Previous studies on the topic show both better and weaker knowledge. In a study conducted on about a thousand adults, in each of the 15 member states of the EU, most of the Finns defined healthy eating as including increased amounts of fruit and vegetables in the diet (56%), as well as the use of less fatty foods (49%). A balanced and varied diet was mentioned by 42% of the people (Margetts et al. 1997). Finns were quite aware of their need to change their eating habits, although only 17% agreed with the statement that they would not have to change their eating habits because they were already eating in a healthy way. This percentage was the lowest in the

whole of the EU (Kearney et al. 1997). Ninety-two percent of Finns thought that their own people should eat more fruit and vegetables. Eighty-nine percent thought they should cut down on high fat foods, while 71% thought that using less sugar would also be good (Kearney et al. 1997).

People in the Geneva area were fairly knowledgeable about the importance of avoiding salt (82% mentioned this issue), sugar (89%) and being overweight (86%), while the importance of cholesterol was mentioned by only slightly more than half of them. In an American sample the ratios were lower for salt (76%), sugar (76%) and being overweight (61%), but significantly higher for the cholesterol issue (70%) than among the Swiss (Girois et al. 2001). Buttriss (1997) found a high awareness of so-called buzzwords (for example cholesterol and fibre) among the British public, but this knowledge was not very deep. The knowledge of micronutrients, such as iron or calcium, was particularly insufficient. British school children, however, did show tremendously increased awareness of the importance of reducing the use of salt, compared to a study conducted four years earlier (North & Neale 1995).

In this thesis, the emphasis will be on food-related health knowledge. This knowledge is understood as health-related information integrated into the existing knowledge base of a person. The knowledge is limited to health issues and helps the individual to manage in health-related situations.

5. Health behaviour

5.1. Factors behind health behaviours

Behaviours which are generally assumed to be healthy include physical exercise, a moderate intake of alcohol and fat, and dental hygiene, while unhealthy behaviours are, for example, the use of drugs, sweets, alcohol and tobacco, as well as being under lots of psychological stress (Fennis 1999, p. 25). British teenagers considered exercise as the main factor good for their health and dieting the main factor which was bad for their health. By dieting they meant so-called "junk food" and sweets especially; smoking was also considered bad (Oakley et al. 1995; Bendelow, Williams & Oakley 1996b). Healthy eating, exercise, and non-smoking were main factors related to health also in other studies conducted in Britain and Finland (Aggleton et al. 1998; Urho et al. 1994, pp. 10 ff.). Behaviours including tobacco use, a poor diet, physical inactivity and alcohol abuse are actually the biggest cause of death in the USA (e.g., Reger, Wootan & Booth-Butterfield 1999).

It has been suggested that people's health behaviour is influenced by both individual attributes and the conditions they live under. Cohen, Scribner and Farley (2000) identified four categories of factors which are assumed to influence health behaviour:

1) Availability of products (protective or harmful), referring to accessibility of products associated with health outcomes, such as tobacco or high-fat foods or fruit and vegetables.
2) Physical structures which either increase or reduce opportunities for healthy behaviours, such as consumer products, buildings or neighbourhoods. Well-lit streets, for example, reduce opportunities for assault or injury; childproof medicine containers reduce the risk of poisoning for children.
3) Social structures and policies: laws or policies which require or prohibit behaviours, such as laws against selling alcohol to underage people.
4) Media and cultural messages. Culture and media messages refer to messages that people see or hear often, and which can either increase or decrease consumption – for example, of tobacco, alcohol or high-fat food.

These factors can all complement each other. The accessibility of harmful products can be reduced through social structures and the media can enhance the other structural factors when messages reinforce behaviours which are promoted by the other structural interventions (Cohen, Scribner & Farley 2000).

5.1.1. Health behaviour among diabetics

For some people health behaviour might be influenced by an illness. For people suffering from type 2 diabetes, certain types of health behaviour are crucial for maintaining well-being. For example, diabetics usually have an increased risk of cardiovascular disorders due to poor glycemic control, hypertension, lipid disorders, obesity and smoking. It is, therefore, important for diabetics to maintain normal weight, eat in a healthy manner, engage in physical activity and, if smoking, stop. Use of insulin might also be necessary. The most common behaviour among middle-aged American diabetics was a special diet (79,6%) and not smoking (76,6%). These behaviours were followed by engagement in physical activity (66%) and efforts to lose weight (58,4%). Women were more likely than men to report that they were on a special diet, tried to lose weight and did not engage in vigorous exercise. The study was conducted in two parts with a time span of four years (between 1992 and 1996), and showed that the behaviour of the respondents during this time had worsened (Notwehr & Stump 2000).

Having type 2 diabetes is not a guarantee that people will adopt healthy behaviour. A Finnish study on the health behaviour of both diabetics and a control group consisting of ordinary Finns showed that the behaviour of the diabetics did not conform to recommendations: they used less sugar than the control group, but type 2 diabetics were more likely to be smoking and using alcohol than those in the control group. Men suffering from type 2 diabetes were also less regular in their daily meals and less engaged in regular physical activities than the control group members, but were, however, more engaged in outdoor activities (Aalto, Uutela & Kangas 1996).

5.1.2. Pregnancy and its relation to health behaviour

In Finland, nurses and physicians are advised to encourage pregnant women to stop smoking, but over 20% of pregnant Finnish women still smoke, at least occasionally during their pregnancies (Jaakkola et al. 2001). Alcohol use during pregnancy is also generally prevalent at least in the beginning of the pregnancy (Halmesmäki 1987, p. 33). The use of tobacco and alcohol during pregnancy exists in other countries, too (Arnold et al. 2001; Pickett et al. 2002; Williams & Gloster 1999). Pregnancy does not guarantee healthy behaviour either.

5.1.3. Work related to health behaviour

The study by Boutelle et al. (2000), showed another factor influencing health behaviour: work. People who were more physically active were people with more sedentary jobs, who therefore did not get enough exercise at work (Boutelle et al. 2000). In Finland, heavy manual work is said to require heavy food, for salad is not perceived to give enough energy. Consequently, carpenters requested more meat and avoided vegetables, whereas engineers favoured vegetables, but also exercise, and were more concerned about their health (Roos, Prättälä & Koski 2001).

5.1.4. The social environment and its relations to health behaviour

Within social psychology, it is assumed that a person's own perceptions together with the environment direct social behaviour (Aalto 1999, p. 28). Social cognitive theory suggests that three things determine behaviour: the interaction of personal dimensions, the environment (especially the social) and also behaviour itself. The two main reasons for people changing their behaviour are the expected result (the belief that changing behaviour will lead to a desired result) and the expectation of self-efficacy (the belief in the possibility of successfully performing the behaviour at a needed level of competence). The most powerful source of learning and change is actually a person’s own experience. When people become more able to carry out some new behaviour, they also become more efficacious and such feelings motivate them more to perfect tasks or maybe even to attempt new ones (Bandura 1977; Clark & Janz 1992). A study among older Australians showed that physical activity was found to be related to health benefit, access to (for example) a recreation centre, high self-efficacy (confidence that exercise could take place in several situations), friends and family saying that exercise was good for their appearance, and the frequency of the social environment to exercise (Booth et al. 2000).

The social environment’s impact on behaviour was also found by Kurtz et al. (1996), who discovered that smoking among students was more common if the student had a parent who was smoking. Familial factors also influence vegetable consumption. Intake is lower in families where the parents do not eat vegetables or where vegetables or fruits are not available in the home (Baxter & Schröder 1997; Neumark-Sztainer et al. 2003). In 1994, smoking was more common among men from the lower social classes in Spain, but among women it was as usual among both advantaged and disadvantaged classes (Borrell et al. 2000). In the USA,

women living in predominantly working-class areas had a considerably higher prevalence of smoking during pregnancy, regardless too of their own social class (Pickett et al. 2002). In Britain, smoking was much more common among poor families and children living in more deprived socio-economic neighbourhoods were more likely to have tried smoking and to have had a diet which contained a lot of fat. Obesity was also more common in these children (Leather 1995; Wardle et al. 2003). Furthermore, being a student and engaged in social networks where alcohol use was prevalent have been shown to increase the drinking of alcohol (Dorsey, Scherer & Real 1999).

In Scotland, people living in more deprived areas had a more unhealthy diet (Ecob & Macintyre 2000). Several other studies confirm that one's socio-economic background is linked to the intake of fruits and vegetables in Britain and that those in higher social classes have a higher intake (Baxter & Schröder 1997; Leather 1995; Pollard et al. 2001; Wardle, Parmenter & Waller 2000; Wardle et al. 2003). A higher occupational class is furthermore linked to a lower intake of fat (Wardle, Parmenter & Waller 2000).

5.1.5. Gender as a factor behind health behaviour

Gender also seems to be related to health behaviours. Men have often been found to exercise more frequently than women (Beardsworth et al. 2002; Booth et al. 2000; Ecob & Macintyre 2000; Ralph, Seaman & Woods 1996; Steptoe et al. 1997), but sometimes it is the other way around, especially in the Nordic countries (Manderbacka, Lundberg & Martikainen 1999; Steptoe et al. 1997). Women usually show better behaviour also by drinking less alcohol (Beardsworth et al. 2002; Ecob & Macintyre 2000; Manderbacka, Lundberg & Martikainen 1999; Roos 1998, p. 30) and smoking less (Manderbacka, Lundberg & Martikainen 1999; Ecob & Macintyre 2000; Vakeflliu et al. 2002). This difference was shown already among British school children, where boys were found to have tried smoking significantly more than girls (Wardle et al. 2003). Another British study, however, did not find any differences among men and women concerning cigarette smoking (Beardsworth et al. 2002).

Gender differences are also found in eating habits: women usually eat in a more healthy way than men (e.g., Fraser et al. 2000; Manderbacka, Lundberg & Martikainen 1999; Reime et al. 2000; Roos 1998, p. 30; Signorielli & Lears 1992; Wardle, Parmenter & Waller 2000). Men are often found to eat more meat and fatty foods, whereas women are better at eating fruits and vegetables and less fatty foods (Beardsworth et al. 2002; Fraser et al. 2000; Manderbacka,

Lundberg & Martikainen 1999; Roos 1998, p. 30; Wardle, Parmenter & Waller 2000). Gender differences were found, too, in American school children, where boys reported having unhealthy eating habits more often than girls (Signorielli & Lears 1992; Misra & Aguillon 2001). High school boys also showed less interest in learning about healthy living than girls (Misra & Aguillon 2001).

Furthermore, British school girls reported being vegetarians more often than boys, and this gap was widened with increasing age (North & Neale 1995). A gender difference was also found among Belgian men and women in their reason for using light food products. The most important reason for the women was a willingness to control their weight, while men used light products because someone else in the family had bought them (Viaene & Gellynck 1997). British women were more likely than men to use diet foods and products advertised as being lower in salt or sugar (Ralph, Seaman & Woods 1996). Instead men were more likely to think of traditional foods as being the best nutrition than women were (Beardsworth et al. 2002). Chew, Palmer and Kim (1998) found that women had not only better food consumption habits, but also higher health motivation, and salience. Health motivation refers to a general predisposition towards health, such as if good health is valued, while salience characterises how closely an individual feels to a health condition (Chew et al 2002; Chew, Palmer & Kim 1998).

5.1.6. Age and its relation to health behaviour

Also age has been shown to influence healthy living and food behaviour. In Scotland, smoking was more common among older men than among younger, and more common among younger women than among older (Ecob & Macintyre 2000). The findings concerning age and food behaviour are somewhat contradictory. It has been shown that a higher age is related to eating more red meat and saturated bread spreads more frequently, as well as a smaller consumption of poultry and coffee (Fraser et al. 2000). Chew and colleagues (Chew et al. 2002; Chew, Palmer & Kim 1998) did, however, find that older persons were more likely to have good dietary habits because they were at higher risk for food-related diseases. A relation was also found between a higher age and having healthier eating habits among German metal workers. The age factor was explained by the younger respondents' preference for "junk food" (Reime et al. 2000). Younger people, furthermore, have been found to eat less fruit and vegetables and more fat (Wardle, Parmenter & Waller 2000). Buying diet foods was, however, most common among younger British respondents, both men and women (Ralph, Seaman & Woods 1996).

5.1.7. Education as a factor behind health behaviour

Better education might predict better behaviour. For example, it has been found that more highly educated people eat less meat, more salads, and less cakes and sweet food (Fraser et al. 2000). Better education was also found to be a factor behind a higher intake of fruits and vegetables (Pollard et al. 2001; Wardle, Parmenter & Waller 2000). Even a parent's education seems to matter: American high school students, whose parents were better educated, also showed better eating behaviour (Misra & Aguillon 2001). In addition to food behaviour, other health behaviours differ with education. In an American study, women with higher education – such as a college degree or higher – were significantly less likely to be smokers than women with a high school education or less (Watson et al. 2003). Furthermore, South Asian women in Canada with lower education were less eager to use Pap screening tests than were those with higher education (Gupta, Kumar & Stewart 2002). Other studies show no relations between education and behaviour, such as in the case of German metal workers. In this study too, however, a relation was found between both being older and being a woman and having healthier eating habits (Reime et al. 2000).

5.1.8. Health behaviour related to culture

Cultural differences seem to be related to health behaviours, too, as was found in a study conducted in 21 European countries. In the Nordic countries, and especially Finland and Sweden, as well as in Eastern Europe, the levels of physical exercise were high, while they were quite low in Portugal, Spain and Greece (Steptoe et al. 1997). In Albania smoking was much more common among male than female students. This is said to be due to religion, since smoking is socially unacceptable for women in Mediterranean Moslem countries (Vakeflliu et al. 2002).

Roininen et al. (2001) also found differences between countries concerning health and taste attitudes. Finnish consumers seem to be more interested in light products – that is, products low in fat or sugar – than those living in the UK and the Netherlands.

One factor influencing health behaviour was, according to Rosenstock (1974), perceived barriers. One example of this was the cultural barrier found in the study by Sligo and Jameson (2000), where taboos around the female reproductive system prohibited Pacific women in New Zealand from taking cervical cancer screenings. Lower acculturation – that is, adoption of

attitudes, values and behaviour of other cultures – was furthermore associated with lower levels of Pap screening among South Asian women in Canada. However, these women were not reporting discomfort or shyness as a barrier to taking the test, but this might be explained by the low levels of knowledge concerning what the test was about (Gupta, Kumar & Stewart 2002).

5.1.9. Knowledge as a factor behind health behaviour

Information is considered to influence health behaviour (Cohen, Scribner & Farley 2000; Janz & Becker 1984; Maiman & Becker 1974; Rosenstock 1974). Allen stated that when a person (or a group) has obtained adequate knowledge, perhaps by means of information seeking, the behaviour might be selected to maximize the probability of obtaining the best possible consequence of the action which has been chosen, or to minimize the possibility of the worst consequence (Allen 1997). Knowledge alone, however, does not guarantee change of behaviour (Rakowski et al. 1990; Barratt 2001).

Rimal (2000) showed that self-efficacy – the belief in one's own ability to make changes in behaviour – was an important factor for turning dietary knowledge into a certain food-related behaviour. Knowledge and behaviour were more correlated among those who increased their self-efficacy and less correlated among those with a decreased self-efficacy. Rimal claims that as long as an individual's perceived barriers against a healthy lifestyle are high, high knowledge will not lead to improved health behaviour. Smoking is a classic example of this.

5.1.9.1. Good knowledge, bad behaviour

Studies have shown that knowledge about the health risks associated with smoking does not influence smoking behaviour (Arnold et al. 2001; Sejr & Osler 2002). Among Danish student nurses, the knowledge of health risks with smoking was actually better among those who did smoke. Attending an education programme concerning the health consequences of smoking increased the students' knowledge and positive attitudes toward smoking prevention, but it did not affect their behaviour (Sejr & Osler 2002). Among 600 pregnant American women, significant differences in the knowledge about the effects of smoking and concern over the effects on the baby among women with different reading levels were found, but still the smoking practices did not vary by their ability to read. One of the most significant determinants for smoking was race: White women were smoking much more actively than African-

American women were (34% vs. 8%). Older, better educated, more literate and married white women smoked more often and more heavily than African-American women did (Arnold et al. 2001). Among indigenous people in Canada, the best knowledge about the risks of drinking alcohol or using drugs during pregnancy was found among the youngest respondents, who were also those using these substances the most. It might, however, be that the knowledge was acquired after the pregnancies (Williams & Gloster 1999).

Homeowners in Florida were tested for their knowledge of unhealthy radon gas, which can cause lung cancer. Almost all had heard about the gas. Seventy percent of the respondents knew that it increases the risk of lung cancer, but regardless 93% had not tested their home for radon. Some did not think that they had any radon problem, while others had not got around to checking it (Kennedy, Probart & Dorman 1991). British teenagers also knew fairly well what behaviours were unhealthy for them, but still they engaged in these, mainly because of habit and enjoyment (Bendelow, Williams & Oakley 1996b).

A somewhat different angle was presented by Kemper et al. (2002), who studied how health check-ups and feedback about current health over a span of 20 years, affected young adults' biological risk factors for chronic diseases. They found no strong relations between being given information about factors such as blood pressure or cholesterol and actual levels of these factors. It might, however, be that although the awareness raised through the given information had influenced the health behaviour among the studied persons, no effects were found due to the subjects still being only in their early 30's.

5.1.9.2. Low levels of knowledge, good behaviour

Knowledge about a health topic does not always lead to healthy behaviour. The opposite also might be the case: there might be lack of knowledge but not of behaviour. This has been shown in studies, which found that people participate in cancer screenings without adequate knowledge about cancer or what the screening is good for (Gupta, Kumar & Stewart 2002; Saint-Germain & Longman 1993). When Hispanic and Anglo women of over 50 years of age and living in the USA were studied about their knowledge of breast cancer and their attitudes and behaviours, it was found that the knowledge levels about breast cancer were somewhat the same in both groups of women, although the Hispanic women were somewhat less well-informed. In both groups, there was little knowledge of the risk of age and almost half of the women identified erroneous factors as being risks for this type of cancer. Naming ways of

detecting breast cancer was also difficult. Although less than 40% mentioned the mammogram, over 50% reported having had this kind of examination. This discrepancy might be explained by an overreported screening behaviour, but the subjects might also have had this test without knowing the reason for it. The respondents might also have forgotten the connection between the mammogram and breast cancer. Similar results were found concerning examinations made by a physician; fewer women reported knowing about this, than about having had an examination themselves (Saint-Germain & Longman 1993). Among South Asian women in Canada almost one-third of those who had taken a Pap test had done it without knowing that it was used to screen for cervical cancer (Gupta, Kumar & Stewart 2002).

Furthermore, Kinney et al. (2001) found that although knowledge about breast and ovarian cancer genetics was limited among African-Americans, there was a high interest in genetic testing. The majority of respondents wanted to discuss risk factors with health professionals and even a larger share wanted to take a genetic test, if available.

5.1.9.3. Low levels of knowledge, bad behaviour

Other studies show both lack of knowledge and bad health behaviour concerning cancer screenings. Lower knowledge levels in combination with a lower prevalence of screenings for both breast, cervical and colorectal cancer have been shown (Gupta, Kumar and Stewart 2002; Lagerlund et al. 2000; McCaffery, Wardle & Waller 2003). Lagerlund et al. (2000) found that womens' participation in mammography was determined by variables such as barriers (emotional or cost), benefits and worry. Connections were found between higher scores for barriers and not attending mammography, while higher scores for benefits and worry, on the other hand, correlated with attending this test.

5.1.9.4. Good levels of knowledge, good behaviour

Some studies, however, have also found relations between good knowledge and good behaviour or changes in behaviour. Higher levels of knowledge about breast cancer were correlated with higher rates of cancer detection among Korean women (Lee, Kim & Ham 2000). Albrecht, Higgins and Lebow (2000) found a relationship between pregnant adolescents quitting smoking and their knowledge of the effects of smoking. Among South African women, a greater knowledge of diarrhoea led to more positive attitudes towards hygiene, and consequently to more frequent hygienic behaviour patterns (Westaway & Viljoen 2000).

Knowledge concerning food and eating behaviours shows similar connections. In 1996, 155 Britons were asked about Bovine Spongiform Encephalopathy (BSE) and their knowledge was good. Of the participants, 147 were aware of this disease. Fifty-five percent of the 155 ordinary people interviewed and 57% of general practitioners thought that the disease could come from eating cow products. Almost half of those thinking that there could be a possibility of something being transmitted between cows and humans had reduced their beef consumption, compared with less than a third of those who were not really sure that a transmission of the disease was possible. Of those who did not believe that transmission was possible, none had reduced their beef consumption (Gunasekera et al. 1996). Higher knowledge levels on nutrition and a higher daily intake of fruit and vegetables have also been found. Also significant was the correlation between knowledge and fat intake. A higher knowledge level led to lower fat intake. People in the highest nutrition knowledge category were found to be 25 times more likely to eat in a healthy way than those in the lowest category, according to current recommendations (Wardle, Parmenter & Waller 2000).

Berg, Jonsson and Conner (2000) studied breakfast habits among Swedish school children, and found that those who had eaten high-fibre bread were more conscious of the fact that this bread contained fibres. This suggests a relationship between knowledge and behaviour. The mothers' level of nutritional knowledge also influenced the intake of fruit among British children aged 9-11 years (Gibson, Wardle & Watts 1998). However, knowledge is not always the strongest factor for certain behaviour. For Finnish homemakers, the wish to make tasty food – especially that which other family members liked and were familiar with – had a stronger impact on food choice than factual knowledge about nutrition (Palojoki 1997, p. 214).

5.1.10. Attitude related to health behaviour

Within health promotion, it has been usually thought that attitudes about a particular practice lead to a behaviour that fits the attitude (Bettinghaus 1986). Cardon, De Bourdeaudhuij and Clercq (2002) thought that a more positive attitude towards a programme promoting health can lead to a positive influence on changes in behaviour.

Contradictory results have been found concerning attitude and cancer screenings. More positive attitudes towards cancer were found to be associated with greater intentions to participate in colorectal cancer screening. The more the thought of cancer frightened someone

or an examination was perceived as embarrasing, the lower the intention to participate (McCaffery, Wardle & Waller 2003). Correlations between more positive attitudes towards breast cancer and mammography have also been found. This was only true for women who had a family history of breast cancer (Hailey, Carter & Burnett 2000). Lagerlund et al. (2000), however, found that women who worried most about developing breast cancer also attended screening more.

American youth, who found tanning less appealing and who perceived benefits from protecting themselves from the sun, were found to be more likely to avoid sun or to be engaged in sun-protection behaviours (Cokkinides et al 2001). In Bolivia, more positive attitudes were related to the initiation of the use of contraceptives (Valente & Saba 2001). In another study, male prostitutes in Australia who had more positive attitudes towards condoms, consequently used these more (Minichello, Mariño & Browne 2001).

Studies also show correlations between attitudes and eating behaviour. Those who were most positive towards healthy eating, more frequently consumed food reduced in fat (Roininen et al. 2001). The intake of fruit among British children was partly influenced by the mothers' attitudinal conviction that the risk of the children developing cancer decreased according to the increased intake of fruits and vegetables. The intake of vegetables and confectionary was, however, not related to the attitudes (Gibson, Wardle & Watts 1998). Among Swedish school children, consumption of milk and high-fibre bread was predicted from intentions, which were influenced by (among other things) attitudes (Berg, Jonsson & Conner 2000).

Health education has furthermore been found to lead to more positive attitudes towards smoking prevention, but not to significant changes in actual behaviour. Behaviour was also related to attitude in this way, that those who already smoked showed more negative attitudes (Sejr & Osler 2002).

5.1.11. The Health Belief Model

A model that can be closely linked to attitude is the Health Belief Model (HBM) (Maiman & Becker 1974; Janz & Becker 1984; Rosenstock 1974). According to this model, health behaviour is affected by:

a) Perceived susceptibility (for example, believing that you carry a certain gene and may transmit it).

b) Severity (an individual's views of the potential impact of learning that he is a carrier of that gene).
c) Perceived benefits (a personal evaluation of the benefit of taking a screening test).
d) Costs or barriers to action (for example, the impact on an individual of learning about being a carrier of some gene and how it affects his self-image and personal life).

Rosenstock (1974) furthermore talked about cues, which may be arranged to trigger responses. These cues could be reminders from health professionals or spot announcements in the mass media. Maiman and Becker (1974) and Janz and Becker (1984) draw a distinction between internal and external cues to action. The internal cues are, for example, perceptions of bodily states or symptoms, while the external cues include interpersonal interactions (advice from others), mass media communications (mass media campaigns or articles in newspapers or magazines), personal knowledge of someone affected by illness, or reminder postcards from health care providers. Two of these cues to action – information in the mass media and recommendation for mammography by another person, often a doctor – were found in a study on cancer screening knowledge and behaviour among Hispanic women in the USA (Saint-Germain & Longman 1993).

Savage and Clarke (2001) used the Health Belief Model (HBM) in order to find out which factors are associated with breast and cervical cancer screening behaviours among Australian women. They found that, among others, both perceived barriers and perceived benefits were associated with mammography and cervical smear test behaviour. Patel et al. (2001) instead studied American coal miners on their use of hearing protection devices and found that despite considerable knowledge, the strongly perceived severity of negative consequences and strongly perceived susceptibility to hearing loss, barriers kept the miners from using protective devices. Chew and colleagues (Chew, Palmer & Kim 1998; Chew et al. 2002) identified relevant factors of the HBM providing motivation for engagement in healthy eating and behaviour patterns.

The Health Belief Model also seems fairly popular in the Nordic countries. Anna-Mari Aalto and colleagues (Aalto & Kangas 1993; Aalto & Uutela 1997) studied aspects of behaviours and cognitions among Finnish diabetics using the Health Belief Model, among others. Anne Göransson (1999), on the other hand, used the model in her study on attitudes towards an eye disease and its treatment among Swedish parents of children with the disease. Another Swedish study to use the Health Belief Model, examined predictors of non-attendance at a

mammography programme and found that barriers prohibited attendance, while perceived benefits led to better attendance (Lagerlund et al. 2000).

5.1.11.1. Motivations for eating in a healthy manner or changing to a healthier eating behaviour

Motivation is said to predict whether certain behaviour will occur (Fiske & Taylor 1984, p. 5). Both Finnish and British health professionals considered a person's own illness to be the biggest motive in changing one's eating habits (Buttriss 1997; Urho et al. 1994, p. 25). Illness, apparently, is an important motivating factor among the public (Food Standards Agency Scotland 2002; Parmenter 2002; Salminen et al. 2002). Doctors' orders also seem to be an important motivating factor both for Finnish women, with either breast cancer or rheumatoid arthritis, and Belgians trying out a light product for the first time (Salminen et al. 2002; Urho et al. 1994, p. 25; Viane & Gellynck 1997). The third commonly mentioned factor is a wish to lose weight or not to gain more weight (Beardsworth et al. 2002; Buttriss 1997; Urho et al. 1994, p. 25; Viane & Gellynck 1997). A desire to improve health generally or prevent illnesses is fairly common, too (Buttriss 1997; Food Standard Agency Scotland 2002; Viane & Gellynck 1997). Finnish women with breast cancer or rheumatoid arthritis, changed their diet after being diagnosed, among others, with the hope of cure and the alleviating symptoms of nausea (Salminen et al. 2002). Belgians, furthermore, motivated their use of light food products with information obtained from books or magazines (Viane & Gellynck 1997).

5.1.11.2. Barriers related to eating and health behaviour

Several reasons for not changing behaviour – barriers, according to the Health Belief Model (Rosenstock 1974) – have been found. Cost was mentioned by Buttriss (1997) and Poikolainen (1989) as a barrier to changed health and eating behaviour. Price apparently also seemed important. An example of this is Australian students trying to switch to a diet containing more monounsaturated fatty acids (Jamison 1998). Belgians avoided low fat or sugar products because of price considerations, too (Viane & Gellynck 1997). A study on people in countries belonging to the European Union, stated that their main reason for not changing their eating habits was lack of time (this accounted for 24% of the total EU sample, consisting of over 14 000 people), especially among the younger and higher educated people. Other barriers which were frequently reported were unwillingness to give up favourite foods (23%) and lack of willpower (18%) (Lappalainen et al. 1997). British health professionals mainly claimed apathy,

followed by dietary conservatism and cost as chief barriers. The public, on the other hand, thought that lack of knowledge was the biggest obstacle, but here also cost, time, and dietary conservatism were considered barriers (Buttriss 1997).

In Scotland, three categories of barriers to healthy eating were found; functional, psychological and perceived. The *functional barriers* included, for example, confusion from messages in various media; the lack of skills to prepare healthy food; limited choice of healthy options in convenience foods; lack of knowledge on what foods are healthy; and a restricted availability of appetising, fresh products. The *psychological barriers* were beliefs that eating in an unhealthy way is okay if one is not ill or over-weight; beliefs that diet-related illness could not happen to oneself; pressures or desires to fit in with the food habits of others; beliefs that it is no use to eat in a healty way only on occasion and thus no use to do it at all, and laziness or lack of motivation. Thirdly, the *perceived barriers* included beliefs that eating in a healthy way is more expensive, that healthy food takes longer to prepare, and that healthy food is boring or tasteless (Food Standards Agency Scotland 2002).

A study on Pacific women in New Zealand showed that although they obtained information on cervical cancer screening, they were often unwilling to do the test because of cultural barriers, such as taboos around the female reproductive system (Sligo & Jameson 2000). For Vietnamese women in USA, the biggest reason for not taking tests on breast or cervical cancer was that their physician had not recommended these tests (Jenkins et al. 1999). Also Hispanic women were more likely to take such tests if they had access to health care (Zambrana et al. 1999).

American coal miners perceived both environmental and individual barriers as keeping them from using hearing protection devices. Environmental barriers were, for instance, economical (cost of medical visits), medical (the devices were thought to cause ear infections), technological (the devices were too uncomfortable), regulatory (there is no law that enforces use), and difficulties in hearing what other people say and, thus, to work together. Individual barriers, on the other hand, were perceived hearing ability (the devices limits the hearing), emotional experience (fear that the device would isolate you from the team), and perceived subjective norms (others do not use them either) (Patel et al. 2001).

5.1.11.3. Barriers to information on health and health behaviour

Poikolainen (1989) presented three reasons for people not changing health behaviour regardless of having received health education: Disadvantages caused by a healthy lifestyle, such as increased costs; the strength needed for change does not always exist, especially if you are alone trying to make changes; and health education might have been given in the wrong way, moralising and accusing. It is not only what one says, but how one does it, Poikolainen emphasizes; rewards are often better than punishment and friendliness is more effective than alarm. American women thought that if a message is supposed to be persuasive, it has to be one that gives positive emotional appeal instead of negative, frightening messages which, according to these women, would not work (Marshall, Smith & McKeon 1995).

Psychological barriers might make effective communication impossible. Health risks threatening a person's own health may raise anxiety levels so much that the person perceiving is at a high risk of failing to internalize the message (Pavlik et al. 1993). Sherman, Nelson and Steele (2000) tried to find out why health messages which are relevant for some people produce defensiveness and resistance to acceptance instead of leading to changes in health behaviour. They leaned on theories of self-evaluation and self-affirmation and conducted two studies: one comparing coffee-drinking and non-coffee-drinking female university students; the other one focused on sexually active college students. The women in the first study were asked to read an article about the relationship between caffeine intake and fibrocystic disease, which is a precursor to breast cancer, and then to complete an affirmation manipulation measuring their personal values. The result was that among coffee-drinking women self-affirmation reduced the defensive processing of the message. The women who affirmed also predicted greater reduction in their coffee-drinking.

In the second study, the participants – both men and women – first answered questions about their own concerns regarding the risk of HIV and then wrote an essay on either a central or unimportant value (affirmation manipulation). After this they watched an AIDS educational video and were then asked to answer questions about the video and also about themselves. The result showed a difference between the sexes, women tended to feel similar risks to the people in the video. The women who completed a self-affirmation saw greater risks than did non-affirmed women, and men were not at all affected by the affirmation. The affirmed participants also tended to engage in more AIDS-preventive behaviours such as buying condoms and taking

AIDS educational brochures. Both of these studies showed that a self-affirmation procedure increased the acceptance of health information that was potentially threathening to the person. The authors therefore conclude that health campaigns could profit from encouraging the target group to reflect on their central values because it might reduce defensiveness, because when the self-image is bolstered by other means, the health message can feel less threathening (Sherman, Nelson & Steele 2000).

Frenette (1999) used a sense-making approach (see further in chapter 7.1) when she studied how adolescents make sense of anti-smoking messages on television or radio, and found that they were perceived as either supportive, neutral or hindering with respect to the adolescents' ability to make sense about smoking. Messages were found to make more sense, for instance, when they were relevant to perceived problems and answered questions that the adolescents had. If the obstacles encountered by those attempting to quit smoking were not acknowledged or gaps were not attended to, the messages were termed neutral. If the adolescents in a message were portrayed in a way that was considered offensive, the making sense of the message could be hindered.

Problems with understanding information might also be a barrier to behaviour change. Klaidman (1991, p. 3) claimed that people do not always understand media messages, which can be confusing, and that is why they do not change their health behaviour. Goldberg (1992) agrees that these messages are confusing. She thinks that the diet-health message for the 1990's has become complex and that it is changing from the simple directives of previous decades due to new scientific evidence. Consumers today are not only more knowledgeable; they are also more confused. For the consumers, the result has been not only confusion but sometimes also rejection of reasonable recommendations.

College students were examined on how they understand popular press reports on health research results. The subjects read photocopies of newspaper and magazine articles reporting research findings on, for example, heart disease or breast cancer. They were then asked to answer a questionnaire which measured their understanding of the article's content, as well as their ability to recognise correct and incorrect application of the study results. Even after reading the articles, the number of incorrect answers was very high, between 38% and 44%. This study indicates that many readers actually do not properly understand media reports on health research (Yeaton, Smith & Rogers 1990).

Aspects that can cause problems in understanding information on nutrition may include the difficulty of terminology; theoretical knowledge versus practical knowledge about foods; traditional versus fashionable knowledge; popular myths and superficial awareness versus rigorous understanding; expert versus lay knowledge and knowledge of activities for which medical claims cannot be made (Abbott 1997). Berland et al. (2001) evaluated accessibility, quality and reading grade level of information about breast cancer, depression, obesity and childhood asthma on English- and Spanish-language Web sites, using 14 search engines. They found that all the sites in English and 86% of the ones in Spanish required at least high school level reading ability, and because of the high reading level they believe that consumers may have difficulties understanding information on health problems. Another study of the Internet, from the users' point of view, showed that Americans who had undergone cardiac surgery, were not satisfied with the readability of the medical information they found on the Internet. Most of them found it difficult to fully understand the information and only a few were able to retrieve the required specific information concerning treatments (Murero, D'Ancona & Karamanoukian 2001).

6. Information

6.1. The concept of information

Rafael Capurro and Birger Hjørland have recently presented an extensive study on the concept of information. They studied the meaning of the concept in several disciplines including natural sciences, humanities, social sciences, and, of course, information science (Capurro & Hjørland 2003). Wellisch (1972) studied definitions of the concept of information as being central to information science. He found the first definition in this sense as late as 1965, when a working group of a symposium on education for information science came to the conclusion that information is a category word, because there are many kinds of information. For the purposes of information science, information was defined by this group as "recorded marks". Later, different definitions occurred more frequently and information within information science has been variously considered as: a fundamental category such as matter; a property of matter; structure or organisation; the probability of the occurrence of an event; reduction in the degree of uncertainty in the state of knowledge; an event which takes place when a recipient encounters a text; data of value in decision-making; public, communicated scientific information and the message itself (Belkin 1978).

The word documentation was often used as the name of a profession and field of study until the American Documentation Institute changed its name to the American Society for Information Science in 1968. After this, other institutions have largely followed (Capurro & Hjørland 2003). The American Society for Information Science defined information as something that can be produced, stored, transformed and used. Thus, information is either physical things such as documents, or intangible things such as opinions or ideas (Hjørland 2000).

Michael Buckland (1991) presented similar ideas when he identified three principal uses of the word "information". These were information-as-process; information-as-knowledge and information-as-thing. The first two aspects of information are intangible, whereas information-as-thing and information processing are tangible. Meadow and Yuan (1997) presented four definitions, which can be seen as followers to Buckland's definitions. They said that information involves messages that exist but are not necessarily sent to, or received by, a given recipient (for example, books in a library which are unread, but yet deemed significant enough to be included in the collection), and this is related to Buckland's "information-as-thing".

Meadow and Yuan also note that information is a message that may be sent to a destination or received by a destination, but which is not evaluated or understood. In this case, the message is called to a user's attention, but it is not yet assimilated. When the authors define information as a message which is understood by the recipient and which changes the recipient's knowledge base, their definition is closely related to Buckland's "information-as-knowledge". The fourth definition by Meadow and Yuan was that information is the process of converting received messages, data, signs or signals into knowledge. Similarly Buckland presented this definition earlier, when he talked about "information-as-process".

Davenport and Prusak (1998, p. 3) followed previous researchers (e.g., Buckland 1991; Meadow & Yuan 1997), by defining information as a message, but they give it more importance than Meadow and Yuan when they argue that it has to have a meaning. The message has to have an impact on the receiver's judgement and it must inform; it is data that makes a difference (see also Antonovsky 1994). The message must also not be accidental. Ford (1980) uses the term 'information' when he means *intentionally transmitted communication*. 'Intention' is here precluding information in the sense of unconscious feedback from the environment, either natural or social. 'Transmitted' is used to distinguish communication from its effects on the receiver.

One of the meanings of information is presented by Wiio (1996, p. 22), who follows Wersig's definition from 1970 (cited by Wellisch 1972), when he says that information is something that reduces uncertainty (see also Cole 1993; Shannon & Weaver 1949; Wersig & Neveling 1975). This, on the other hand, has been called by Buckland (1991), a special case of "information-as-knowledge". Buckland said that information actually reduces uncertainty sometimes.

Brookes (1980a, p. 21) regarded information as anything that modifies a knowledge structure: "All information which modifies a knowledge structure is the result of an information process. The knower sees, hears, tastes, smells or feels something. Sometimes the information is consciously sought, sometimes information is imposed upon us, but any information we gain is the result of a *process* in which our neural system is activated by some source outside our brain".

As we have seen, information can be defined in several ways, and the concept itself is an aggregate of all kinds of historical connotations. The original meaning of the word

'information', in Latin, was the shaping of something, mostly something concrete, such as wood. Information can be used in the meaning of a choice or a structure. It can mean the content of a message or maybe the message in itself, or perhaps the transmission of that message, as we have seen above. Information is actually a relative concept. Always when something is known, there is a little information (Wiio 1996, p. 28). Capurro and Hjørland (2003) presented an overview of the history of the word, and they found that the roots are Latin, but the origins Greek. Wersig and Neveling (1975) counted six different major approaches to the use and understanding of the word information:

1. Structure approach (matter-oriented), which states that the structures of the world that may or may not be perceived are 'information'. It is thus independent as to whether it is being gathered by a human being or not.
2. Knowledge approach, which states that knowledge which is built up on the basis of perception of the structure of the World is 'information'.
3. Message approach, which equates 'information' with 'message'.
4. Meaning approach, which only accepts the meaning of a message as 'information'.
5. Effect approach (recipient-oriented), which places 'information' with the recipient instead of with the communicator and states that 'information' occurs only as a specific effect of a specific or unspecific process.
6. Process approach, which does not see 'information' as a component of a process but as a process itself.

The most important distinction between different definitions of the concept of information is – according to Capurro and Hjørland (2003) – that between information as an object or a thing and information as a subjective concept, as a sign. The latter means that information is depending on the interpretation of a cognitive agent.

In this thesis, information is defined as a message outside of an individual's knowledge base. The message has the potential to be incorporated in a person's mind.

6.2. The cognitive viewpoint

6.2.1. Definitions of cognition

The concept of cognition (lat. cognoscere, know) can be defined in a broad sense as knowing; how a person obtains, uses, remembers, mediates and develops knowledge (Hautamäki 1988.

p. 11). De Coster et al. (1977) used the word cognition in order to refer to some kinds of activities, including perception, memory storage, retrieval, encoding, decoding, analysing, combining, transforming and pattern completion.

The study of social cognition is concerned with how people make sense of other people and themselves (Fiske & Taylor 1984, p. 1). Social cognition, as an area of study, cut across various topics. The focus is on various cognitive elements such as attributions, feelings of control and schemata (Fiske & Taylor 1984, p. 18). Within social psychological theory the concept of social cognition has been important when studying factors that influence behaviour. Within this theory, the basic assumption is that the perception of a person, rather than objective matters of the environment, directs the person's social behaviour. Concepts such as knowledge, attributions, attitudes and beliefs aquired in the socialization process are central in the social cognitive approach to behaviour (Aalto 1999, p. 28).

Cognition, as defined above, together with motivation are important when it comes to understanding behaviour, as cognition leads to a person's own interpretation of the world. Without a clear sense of cognition, the behaviour of a person may be erratic and unpredictable. A person having incomplete or confused cognition about something new to him or her, will be unstable in behaviour. Understanding cognition helps to predict a person's behavioural tendencies and motivation predicts whether the behaviour will occur (Fiske & Taylor 1984, p. 5).

Cognitive processes shape cognitive elements (for example, schemata or attributions) as these elements are formed, used and modified over time (Fiske & Taylor 1984, p. 13). Allen (1991) calls them mental activities such as thinking, imagining, remembering, and problem solving. These processes are used when seeking and finding information through an information system. Cognitive behaviours which occur during a search can be examined and insights into cognitive processes can be provided. Specific cognitive processes can also be analysed to find their effects on information-seeking behaviour. When people use information systems, they learn and understand at least some of the acquired information. They also interpret what they learn on the basis of earlier knowledge in memory, and engage in solving problems and making decisions.

6.2.2. Research adopting the cognitive viewpoint in information science

Traditionally research in information science has focused on external behaviour such as contacts with sources and use of systems as indicators of needs, rather than on internal cognitions such as cognitive assessments (Dervin & Nilan 1986). In 1981, Tom Wilson said that a shift in the focus of research is needed. From the previous examination of information sources and systems used, the focus could shift towards an exploration of the role of information in the everyday life of a user (Wilson 1981). Before Wilson's suggestions, several publications proposed a cognitive view in information science in the mid-1970's (Belkin 1977; Brookes 1977; Harbo, Ingwersen & Timmerman 1977). A cognitive view means at its broadest noticing that cognitive processes occur for any communication system to operate, and that such processes are significant for information science (Belkin 1990). According to Marc De Mey, the central point of the cognitive view is "that any *processing of information*, whether perceptual or symbolic, is *mediated* by a system of categories or concepts which, for the information-processing device, are a *model* of his *world*" (De Mey 1977, pp. xvi-xvii).

Since the 1970's, the cognitive viewpoint has become a popular approach within the field of information science. Characteristic of this viewpoint is the assumption that there are conceptual structures, categories, or mental models in the mind of an individual (Tuominen & Savolainen 1997). While the cognitive viewpoint is comprised of several different disciplines or schools of thought, it can be applied in several ways. The theoretical assumptions are also continuously developing. In cognitive psychology, for example, the emphasis is on an individual's cognitive processes, such as the perceptual and judgmental processes, while the emphasis in cognitive anthropology is on cultural modes of interpretation (Talja 1997, note 1).

The cognitive approach has developed in two periods. Between 1977 and 1991, the view was user- and intermediary-oriented, while after 1992, it turned into a "holistic view of all the interactive communication processes that occur during information transfer" (Ingwersen 1999, p. 3).

Before 1992, the cognitive view within information science mostly meant being concerned with some kind of human communication system, with individuals within this system in their interactions with information, and with individuals and systems in relation to the information. The essence of the cognitive viewpoint was that it explicitly considered that the states – among

others – of knowledge and beliefs of humans (or information-processing devices) mediate or interact with what they receive, perceive or produce (Belkin 1990). Bertram Brookes is considered one of the first to take the cognitive view within information science, when in 1975 he presented his fundamental equation of information science $\Delta I = (S+\Delta S)-(S)$. In this equation (S) is a "knowledge structure" which is affected by some increment of information, (ΔI), which results in a modified knowledge structure, ($S+\Delta S$). The equation thus shows that information is something that changes a knowledge structure (Brookes 1975). The equation was later modified to $K[S] +\Delta I = K[S+\Delta S]$ where K[S] is the knowledge structure which is changed into a modified structure $[S+\Delta S]$ by information ΔI (Brookes 1980b). In this form the equation has also been applied in later works (Todd 1997; Todd, 1999a; Todd 1999b). Also Tom Wilson (1984) took a cognitive view when he focused on human information behaviour, and on the centrality of the concepts of "understanding" and "meaning" with regard to this viewpoint. By means of the cognitive approach, the need for a connection between the meanings of peoples' everyday lives and information possibly relevant for these lives is shown.

Peter Ingwersen used the cognitive viewpoint to investigate situations in libraries. Users' interactions with the organisation of the documents, negotiation processes between users and librarians, and librarians' search procedures were studied. Ingwersen supposed that a person has a repertoire of knowledge structures which are used, if necessary, when the person needs to understand, construct meaning or act in certain situations. Ingwersen tried to discover the effect of the knowledge structures and interactions among knowledge structures on how searches for information were conducted in the library (Ingwersen 1982). Ingwersen also applied the cognitive view in another study when he desired to describe and emphasize the possibilities of retrieval and the involved state of knowledge in the human-system interface in relation to operational online information retrieval (Ingwersen 1984).

Others who took a cognitive view in the 1980's were Nick Belkin and colleagues (Belkin, Oddy & Brooks 1982a; Belkin, Oddy & Brooks 1982b) who examined the issue of information retrieval and focused on the question of the nature of the knowledge which allows users of a system to successfully retrieve information. Later Belkin (1984) also used a cognitive viewpoint to analyse a human-human interaction in information systems.

The fundamental equation of information science that Bertram Brookes developed in 1975 and later modified, was also used in Ross Todd's (Todd 1997; Todd 1999a; Todd 1999b) research

on how girls interact with information about drugs. Todd's study explored some of the conceptual issues related to understanding cognitive information utilisation within the framework of the equation. Todd (1997) claimed that his study contributes to the development of a research technique from the perspective of information science that can be used for the representation of knowledge structures and for examining how these structures change when they are exposed to information.

According to Ingwersen (1992, p. 17), the cognitive viewpoint displays the following characteristics:

- Computers and alike processing devices are treated *as if* they are humans. The *limitations* of the former, in relation to information processing and cognition, are estimated.
- The viewpoint is an *individual view* because it regards each processing device as independent, consisting of its own 'system of categories and concepts'; each is his/its model of him/itself and his/its world.
- At the *actual event* of information processing this activity is mediated by the *actual state of knowledge* of the device, which is its actual knowledge structures, expectations, goals and so forth.
- The 'system of categories and concepts' or the world model is generated and determined by *individual cognition* in a *social context*.

Ingwersen emphasizes that the cognitive viewpoint must not be equated with cognitivism. The cognitive viewpoint investigates human mental behaviour, while cognitivism represents the opposite: "(all) human mental activities are carried out as if they are processed in computers" (Ingwersen 1992, p. 20).

The holistic, cognitive viewpoint includes both the information object and system facets of retrieval processes as well as users, and the socio-organisational environment (Ingwersen 1999). Ingwersen developed a cognitive theory for information retrieval interaction by combining theories of text retrieval (Ingwersen 1996). Pia Borlund used a cognitive viewpoint in her dissertation from the year 2000. The dissertation concerns the development of an alternative approach to the evaluation of interactive information retrieval systems and Borlund sees the proposed evaluation packages as anchored in the holistic nature of the cognitive viewpoint by being a hybrid of the two main approaches – the system-driven and the cognitive user-oriented approach (Borlund 2000, p. 170).

Birger Hjørland proposes another type of cognitive view: the socio-cognitive one. This view is interested in individual cognition, but approaches it from the social context instead of from an isolated mind (Hjørland 2002; see also Jacob & Shaw 1998).

Belkin (1990) stated that it seems that taking the cognitive viewpoint can lead to useful results in several areas which are of interest to information science. This viewpoint might integrate and relate work in different areas of information science to one another, thus providing the structure for a unified and effective science.

The current thesis takes a cognitive viewpoint, as it examines the relationship between information in different information sources, and people's knowledge in health matters. The used viewpoint is closer to the user-oriented view than to the holistic or the socio-cognitive one. The cognitive view was chosen since the emphasis of the study is on people's knowledge.

6.3. Relationships between knowledge and information

In his 'fundamental equation of information science' from 1975, which he slightly modified later, Bertram Brookes (Brookes 1975, Brookes 1977; Brookes 1980b) showed how information and knowledge are related. An existing state of knowledge is affected by some increment of information resulting in a new state of knowledge.

Brookes (1980a) said that knowledge and information are different because knowledge is cognitively structured. "Any bit of information in a knowledge structure is related cognitively through the structure to all other bits in the structure" (Brookes 1980a, p. 23). Knowledge is the basic substance in our knowing, and information is its manageable form (Ginman 1983, 12f.; Ginman 1987, p. 3). Knowledge is the basic intellectual resource which is extended, modified and updated through information, which is subsequently incorporated in the old layers of knowledge (Ginman 1987, p. 3).

The word information has a double meaning; it diminishes the receiver's uncertainty (see also Cole 1993; Shannon & Weaver 1949; Wersig & Neveling 1975) as well as increases the receiver's knowledge. To obtain information about something is easy, but to acquire information in the sense of potential knowledge is a complex, mental procedure. Information has to be transformed into knowledge (Tengström 1987, p. 45f.).

Hård af Segerstad (1983, p. 55) does not separate the two concepts – contrary to many others – but thinks that information is actually the same as knowledge. To inform someone is to share knowledge with him. The word information, according to Hård af Segerstad, is mostly used to describe active influence. Ingelstam (1987, p. 18), on the other hand, is of the opinion that it is necessary to distinguish between these two concepts: knowledge is information which has been modified, acquired and assimilated by the separate human being. Knowledge is information which has been given the chance to take root and mature.

In information, separate data structures are linked to each other in such a way that connections, interpretations and meanings are formed between them. Examples of these are statistical databases, telephone books or articles. Information becomes knowledge when a human being has processed it to make a part of his own knowledge structure. When knowledge is separated from its context it becomes information. Knowledge is, thus, information which has been processed by a human, and has been assimilated through learning (Holma et al. 1997, p. 9). Belkin (1977) also calls information an externalised form of knowledge. Molander stated that data and information could be produced, but not knowledge. Knowledge has to be acquired and taken responsibility of (Molander 1987, p. 91).

According to Davenport and Prusak (1998), knowledge derives from information through knowledge-creating activities within and between human beings. This transformation happens through methods beginning with the letter C:

- Comparison: how does information about this situation compare to other situations that we have known?
- Consequences: what implications does the information have for decisions and actions?
- Connections: how does this bit of knowledge relate to others?
- Conversation: what do other people think about this information? (Davenport & Prusak 1998, p. 6).

In this thesis, a distinction is made between knowledge and information. Knowledge is understood as information which has been assimilated into a person's mind, whereas information is a message outside of that person.

7. Information needs and seeking

7.1. Information needs

Tom Wilson summed up human needs in three categories:

- physiological needs (for example the need for food, water or shelter)
- affective needs (that are also called psychological or emotional needs, for example, the need for attainment or domination)
- cognitive needs (for example a need to plan or to learn skills)

These three categories are related, according to Wilson, so that the physiological needs can cause affective and/or cognitive needs, and the affective needs can give rise to cognitive needs. For example, failure to satisfy cognitive needs can result in affective needs. The attempt to satisfy these needs may lead to an information-seeking behaviour caused by the need itself or, for example, by the importance of satisfying the need. The risk of a penalty possibly caused by a lack of information, the availability of information sources, or perhaps costs are other reasons for seeking information (Wilson 1981). Nick Stevenson (1995, p. 198), in contrast, identified at least four different needs that were related to culture and communication:

1. The need for knowledge about the operation of expert cultures
2. The need for an understanding of the desires, demands and need interpretations of others who are distant in time and space
3. The need to understand ourselves as a social community
4. The need for aesthetic and non-instrumentally defined cultural experiences.

The need for information, as well as for its drivers – defined as any factors which lead to a person's perception of need – is one of the three elements of information behaviour, according to Wilson (1997). The other elements are the factors which affect the response to the perception of need, and the processes or actions which are involved in this response.

Since the late 1970's, Brenda Dervin has been advocating a sense-making approach. Using this approach, Dervin has described information needs and uses of people in several different contexts: blood donors, cancer patients, immigrants and so on (Dervin & Nilan 1986). In Dervin's opinion, an information-need situation can be defined as a situation where an individual's internal sense has "run out" and because of this new sense must be created. In Dervin's so-called model, which she labels situation-gap-use, a sense-maker is stopped in a

situation by a gap, either a question or a question set. Any available kind of help must then be used by the sense-maker to bridge this gap (Dervin 1992; Dervin & Nilan 1986). During sense-making, you might need to move through time and space until you either reach a certain point of satisfaction, or you run out of time, or perhaps something else catches your attention (Solomon 1997).

Nick Belkin (Belkin 1977; Belkin 1978; Belkin, Oddy & Brooks 1982a; Belkin, Oddy & Brooks 1982b) also talked about information need-situations, and he called them anomalous states of knowledge (ASK). Belkin's hypothesis was that an information need arises when a user recognizes an anomaly in his/her state of knowledge on something. The user can often not specify exactly what will be needed to resolve this anomaly (Belkin, Oddy & Brooks 1982a). Ford (1980) had an idea similar to Belkin about 'information need', when he called it an awareness of a state of 'not knowing'.

The approach has later developed from an individual view towards a social view which embraces groups. Bryce Allen (1997) noted that information needs may occur on either an individual or group level. Human behaviour is determined by both individual and situational influences. One perspective uses a cognitive model of information needs. This perspective is concerned with individual influences on the individual behaviour, and in particular how a person's knowledge structures influence behaviour. Because people's knowledge structures derive from past experiences (see chapter 3), they will experience different needs in identical situations, due to their different understanding of the situation. Unless past experiences have given a person the right knowledge structures, the person will not see what is happening in a completely new situation. When the perceived reality does not correspond to the experienced reality, a person may become aware of an anomaly in knowledge (Allen 1997).

7.2. Information seeking

Becoming aware of lack of knowledge – ASK's according to Belkin and situation gaps, according to Dervin – may lead to information seeking. David Ellis studied the information seeking patterns of social scientists and found six characteristics:

1. starting (activities which are characteristic of the initial search for information)
2. chaining (the seekers follow chains of citations or other referential connections between materials)

3. browsing (a semi-directed searching in a potentially interesting area)
4. differentiating (the use of differences between sources as filters on the nature and quality of the examined material)
5. monitoring (the maintenance of awareness of the developments in a field through monitoring particular sources)
6. extracting (working through a particular source systematically in order to locate interesting material) (Ellis 1989).

Carol Kuhlthau developed a more extensive model of what she called the Information Search Process (ISP). People have limited capacity for assimilating new information, and because of this they construct meaning by attending to things they already know. The task of the user in the ISP is forming meaning from information (Kuhlthau 1991). In the ISP model, the cognitive and the affective experiences which are common in the information seeking-process are considered together. The ISP contains six stages:

Stage 1: Initiation, where a person becomes aware of the lack of knowledge or understanding

Stage 2: Selection, where a general topic is identified, and the person becomes ready to begin the search

Stage 3: Exploration, when the person encounters inconsistent, incompatible information that increases the uncertainty

Stage 4: Formulation, where the person formes a focused perspective of the problem

Stage 5: Collection, when the useful information is gathered, and

Stage 6: Presentation, when the search is completed, and the person has a new understanding of the problem and can explain this to others (Kuhlthau 1991; Kuhlthau 1993, pp. 41ff.; Kuhlthau 1999).

Radecki and Jaccard (1995) examined the relationship between perceived knowledge and information search behaviour. Perceived knowledge was determined by variables such as actual knowledge, self-esteem, frames of reference and personal relevance. Actual knowledge, on the other hand, was defined as the knowledge demonstrated in a knowledge test. Self-esteem was determined by a person's attitudes towards himself. Frames of reference referred to percepts or beliefs about the knowledge that significant others in a person's life possess, and personal relevance involves a substantive area's perceived importance, as well as its influence on a person's beliefs and any related behaviours. Radecki and Jackard's study involved 105

undergraduate students along with another 23 subjects in a control group. The following data related to self-esteem, self-monitoring, personal relevance, frames of reference, social desirability and actual knowledge on nutrition and birth control was gathered for each of these subjects. Data regarding their perceived and specific perceived knowledge was also gathered. The subjects were then asked to conduct an information search task about nutrition or birth control using a computer-based search system. The subjects were randomly assigned to two groups, one of which was told that their search result would not be revealed; the other group was told that their knowledge would be evaluated according to the amount of retrieved information.

The results showed that higher levels of actual knowledge led to increased perceptions of knowledge about a topic, but with low or moderate correlation between perceived and actual knowledge. A significant negative relationship was both expected and found between perceived knowledge and information search, so that increased levels of perceived knowledge were associated with decreased levels of information search, and vice versa. This might have consequences for people overestimating their knowledge levels, while they are at greater risk for making decisions which are based on inadequate information (Radecki & Jaccard 1995).

Stress or coping with problems can motivate people to make sense of the world by engaging in information-seeking (using Dervin's sense-making theory). However, in some cases, for example, a threat such as a health problem, may lead either to attention towards the threat or to the avoidance of it. The consequent behaviour may thus be either searching for more information or avoiding acquiring it, because the person wants to ignore the situation (Wilson 1997, see also Pavlik et al. 1993). According to Tom Wilson, barriers to information-seeking may include the following:

- Personal characteristics (for example, cognitive dissonance and conflicting cognitions make people uncomfortable and to reduce this they either seek or reject information)
- Social/interpersonal (such as, for example, other peoples' attitudes)
- Environmental or situational (time or geography)
- Source credibility (accuracy or quality) (Wilson 1997).

Not only the seeking, but also the processing of information might be influenced by threats. Millar and Millar (1998) showed that anxiety about health increases the processing of messages on health-promoting behaviours, and decreases the processing of messages concerning disease-detection behaviours. With less anxiety the reaction is the opposite.

7.3. Finding information without active seeking

Within traditional information science research, information behaviour is often thought of as an active, problem-driven pursuit of information (Erdelez 1997). Tom Wilson included three elements in his general model of information behaviour:

- information need and its drivers (the factors giving rise to the perception of a need)
- factors which affect an individual's response to the perception of a need
- the processes or actions involved in that response (Wilson 1997).

So-called incidental information acquisition (Williamson 1997), or information encountering (Erdelez 1997), has been very much neglected, although Patrick Wilson already discussed the former in 1977. Wilson wrote:

We have friends, relatives, work associates and acquaintances to whom we talk regularly and with whom we exchange news and views. We have habits of reading and watching and listening to public vehicles of communication - newspapers, television, radio, magazines, and books.... Some, but not all, of them are primarily devoted to acquiring information...we can and do regularly gather information in the course of activities, some of which are mainly directed at that goal and some of which are mainly directed at other goals.... [Information] is also found where it is not specifically sought, as an accidental concomitant of other routine activities with other purposes or as a pure accident (Wilson 1977, p. 36).

Tom Wilson did, however, include passive attention and search already in the model he developed in 1995. This includes listening to the radio and watching television. Information seeking is not intended, but information might still be acquired (Wilson & Walsh 1996; Wilson, 2000).

Sanda Erdelez (1999) gives a possible explanation for the seeming lack of research interest in studying information encountering. Some methodological problems occur while studying information encountering. Because information encountering is unexpected, it is difficult to study under experimental conditions. The easiest way to conduct studies in this area might thus be to ask people to recall their information encountering experiences.

Although there has been little research aimed at studying unintentional information acquisition within the field of information science, some studies using this approach have been conducted. Kirsty Williamson studied the information needs and information-seeking behaviours of older adults, and was of the opinion that, concerning everyday life information we should talk about people "being informed" rather than "seeking information". Her respondents acquired information through active seeking when they had some perceived need for it, but they also obtained information without being aware of needing it, for example, through personal networks or the mass media (Williamson 1997; Williamson 1998).

Sanda Erdelez (1997) collected information-encountering experiences from academic students and employees of an academic institution. She explored the characteristics of information encountering according to four dimensions of encounter:

- the person encountering the information (the information user)
- the environment in which the information was encountered
- the encountered information, and
- the information need addressed with information that was encountered.

Erdelez expected many of her subjects to experience information encountering, and her findings supported this expectation. The subjects perceived their encountering very differently: some encountered information very often, others very seldom. The findings suggested that prior to encountering information, users could perform either information-related activities (information behaviour) or non-information activities. Information was often encountered when the users were in physical environments providing information (such as libraries), but also in environments not having information provision as their main function. The encountered information was either "problem-related" (result of planned seeking) or "interest-related", where previous seeking experience often did not exist. The encountered information was often used in some specific action or to address some more general need. The study showed that information encountering is an essential part of a person's activities in browsing and information seeking.

Another study explored information encountering in an electronic environment. Erdelez and Rioux (2000) studied 61 Web users in an academic environment. The Web is full of opportunities to accidentally discover some information that might be of interest to the Web user or others they know, and of the respondents in this study, almost one-third reported that they often discovered information meant for others. The Web was the most common place to do this.

7.4. Needs for health information

7.4.1. Information needs due to severe illness

Wilson (1997) stated that health problems may lead to experiencing information needs. A study conducted among patients in a British hospital showed unfulfilled information needs, and these were especially concerning their own care after leaving the hospital and the effects of drugs (Cameron et al. 1994).

Severe illness, in particular, raises information needs. According to Wilson and Walsh (1996), needs for information about cancer can either consist of cognitive needs, including obtaining more factual information about cancer prevention, detection and/or treatment, or affective needs. In the latter case, information which will help the patient or family deal with cancer from an emotional point of view is obtained. Several studies concerning the information needs of patients with cancer confirm that information needs are common when health and even life is threatened (Jenkins, Fallowfield & Saul 2001; Jones et al. 1999; Juvonen & Lauri 1994, p. 48; Leydon et al. 2000a; Leydon et al. 2000b; Meredith et al. 1996). The need persists even though information has been provided. Although 93% of Finnish patients with breast cancer had obtained information about their disease, over 60% stated that they required more information (Juvonen & Lauri 1994, p. 48). Other studies show an even higher number of patients who want more information or as much information as possible (Jenkins, Fallowfield & Saul 2001; Jones et al. 1999; Meredith et al. 1996). Women surviving breast cancer actually mentioned more education about cancer as one important way to improve services for cancer patients (Wilson, Andersen & Meischke 2000).

Finnish women with breast cancer desired information on the possible outcome of the disease and how the cancer affected their body (Juvonen & Lauri 1994, p. 48). Leydon and colleagues (Leydon et al. 2000a; Leydon et al. 2000b) interviewed 17 people with different types of

cancer. All the patients desired basic information about the diagnosis and treatment options, but the timing of the desire for information varied, as did the level of detail and content. In a study by Jones et al. (1999), the most common request was for information on the effects of treatment, prognosis and recovery (Jones et al. 1999). In another study, the most common request – by 98% of the respondents – was whether they had cancer or not (Jenkins, Fallowfield & Saul 2001). One-third of Finnish women with either breast cancer or rheumatoid arthritis expressed a need for more information on dietary factors related to their disease (Salminen et al. 2002).

Lynda M. Baker found that the majority of 95 Canadian women suffering from a chronic neurological disease, multiple sclerosis (MS), had previous knowledge about fatigue and the treatment of acute attacks related to their disease, yet 60 % perceived a need for more information about the disease. These women had access to many publications through the MS Society, but many of their questions were, due to their specific nature, not particularly answerable in print (Baker 1996). Among British people with MS, the needs for information were different at the time of diagnosis and during the course of the disease. At diagnosis, information about symptoms and treatments was needed, while the long-term information needs were divided into 'information about MS' and 'information that helps the person with MS to interact with the world around them'. The latter included information aimed at people other than the patient (Hepworth & Harrison 2003).

7.4.2. Needs for Information about food and health: the case of diabetics

One illness that might increase the need for information is diabetes. Diabetes mellitus is a metabolic disease which may cause chronic hyperglycaemia and disordered carbohydrate, lipid and protein metabolism if it is left untreated. It can also lead to the development of specific microvascular complications and non-specific macrovascular disease. Diabetes is caused by either a complete lack of insulin production leading to type 1 (insulin-dependent diabetes), or by an insufficient effect of it, causing type 2 (non-insulin-dependent diabetes). Type 1 diabetes is most common in young people whereas type 2 is mostly seen in people over 35 years of age (Aalto 1999, p. 2).

Some research results suggest a link between health behaviour and the development of diabetes. In a study by Ford and Mokdad (2001), conducted on almost 10,000 Americans, it

was found that there is a relationship between a higher intake of fruits and vegetables daily, and a decreased risk of developing diabetes. In this study, however, the reduction in risk was evident only among women. Furthermore, a higher intake of vitamin D has been shown to decrease the risk of type 1 diabetes in a Finnish study (Hyppönen et al. 2001). Type 2 diabetes can, in its early stages, be treated by changes in diet alone, and it is thus important for diabetics to know of the normal recommendations for healthy eating, including regular meals, a higher intake of complex carbohydrate and a lower intake of fat and salt. Having diabetes also calls for a cautious use of alcohol (Aalto 1999, pp. 2ff.). After diagnosis, health professionals usually provide information about a diet. In Finnish public hospitals, all diabetic children and adolescents are provided with dietary counselling and treatment by a team consisting of dieticians, paediatricians, specialized nurses, social workers and psychiatrists or psychologists (Pyörälä 2000, pp. 6f.).

7.4.3. Needs for information about health: the case of pregnant women

A woman planning a pregnancy actually needs to consider her diet in advance. Factors which can cause problems during pregnancy are, among others, anemia, abnormal weight, medical illness or unhealthy behaviours such as cigarette smoking and alcohol use (Kolasa & Weissmiller 1997). Smoking during pregnancy may increase the risk of the child developing diabetes and obesity (Montgomery & Ekbom 2002). On the other hand, alcohol use can lead to miscarriage (Halmesmäki 1987, p. 18-19) or harm the fetus through malformations, mental or developmental retardation or neurological abnormalities (Halmesmäki 1987, p. 20 ff.; Hankin 2002).

In order to prevent neural tube defects of the fetus, it has been especially recommended in several countries that there be a higher intake of foods containing high amounts of folic acid already before pregnancy (e.g. Wild et al. 1996; Kolasa & Weissmiller 1997; de Jong-van den Berg et al. 1998). During pregnancy, a balanced diet is more important than extra calories. Pregnant women often receive enough protein from their food, but their intake of fruits, vegetables and dairy products is often insufficient. Having a balanced diet usually makes supplements of vitamins or minerals unnecessary. During pregnancy, women should also be careful with certain kinds of food, because the risk of food-borne illnesses is increased (Kolasa & Weissmiller 1997).

Information about these factors is spread through several information channels. Information about the importance of using folic acid was spread, in the Netherlands (in 1995), mainly through the mass media. Only a few women reported having obtained their information from health professionals (de Jong-van den Berg et al. 1998). Some years later, the media were still the leading information sources, although the share of women having heard about folic acid from health professionals and also family and friends had increased (de Walle, Cornel & de Jong-van den Berg 2002). In Great Britain the Health Education Authority launched public information campaigns to increase the awareness of folic acid by the mid-1990's (Wild et al. 1996). There actually seems to be an urgent need for raising the awareness of a need for folic acid supplementation. As late as in 1998, a group of studied American women were only slightly aware of the folic acid recommendations despite having already undergone a pregnancy that was affected by a fetal neural tube defect (Callender et al. 2001). In the Netherlands, the media campaign in 1995 had, however, raised both awareness and use (de Walle, Cornel & de Jong-van den Berg 2002).

In Finland, health professionals give pregnant women information because legislation requires that pregnant women contact health care providers at an early stage of their pregnancy if they want to have maternity benefits. Thus, practically every pregnant woman in Finland today uses maternity services (Wrede 2001, p. 6). Maternity services include prenatal, childbirth and postnatal care (Wrede 2001, p. 4). Pia Ahonen found that when it comes to information about childbirth, pregnant women obtained information mostly from friends and women who had given birth earlier, labour preparation courses arranged by maternity care centres, and books and magazines about labour (Ahonen 2001, p. 67). An older American study also found that health care providers were most often used as an information source for pregnant women, followed by books and the media (Aaronson, Mural & Pfoutz 1988). Somali women living in the UK used either health professionals or informal contacts such as friends or neighbours as their information sources concerning maternity information, depending on the nature of their information needs and their access to health professionals (Davies & Bath 2002).

For those engaging in behaviours which may lead to health risks, pregnancy can cause an increased information need. Dervin, Harping and Foreman-Wernet (1999) interviewed pregnant, drug-addicted women, and found that the vast majority of these women experienced an intense desire to obtain more information about the well-being of their unborn babies sometime during their pregnancy. The kind of information the pregnant women desired was

more about if and how their drug use might have harmed the baby, than information against drug use during pregnancy.

7.4.4. Needs for information on health risks

Another type of threat is caused by a possible future health risk such as Bovine Spongiform Encephalopathy (BSE). Almost 60% of British citizens felt that they were actually very well informed about this matter, but still over 55% felt that the government was not doing enough to inform the public about BSE (Marcella & Baxter 2000). Griffith, Mathias and Price (1994) found that 57% of their respondents were dissatisfied with the amount of available information concerning food safety and hygiene.

British parents were examined on how frightening information about possible side-effects of a common childhood vaccine affected them. It was found that the health scares increased the parent's need for information especially concerning the decision as to whether or not they would have their children vaccinated (Guillaume & Bath 2003).

7.4.5. Needs for health information in different cultures

The perceived need of health information seems to depend on cultural factors. For example, in rural Malaysian villages, the need for health information was the fourth most mentioned topic following religious information, information on family bonding, and current affairs (ali Anwar & Supaat 1998). Rural women in Kenya, on the other hand, placed health information needs first: over 40% mentioned health information, out of which child-health information formed 30% and personal health information over 13% (Ngimwa, Ocholaa & Ojiambo 1997).

7.5. Health information seeking

It is generally considered that information seeking is one characteristic of a person who takes care of his or her health, and having adequate information plays a large role when it comes to adopting new health behaviours (Rakowski et al. 1990). Forty-seven percent of the EU members participating in a survey said they frequently seek information on healthy eating. The case was higher for women (54%) and for people in their middle ages (35-54 years), as well as for people with higher levels of education. Fifteen percent of those asked said they did not obtain any information on healthy eating. These were mostly older, less educated men who also

distrusted the information sources more than the average. The lowest numbers of people not receiving information was actually in Finland (1%) and Sweden (2%) (de Almeida et al. 1997).

Two information-seeking indices were used in the study by Rakowski et al. (1990) to explore connections between health information-seeking behaviour and other health- related practices. People were either called Information-Positive (people, for example, who "frequently" talked about health with family and friends) or Information-Negative (those who "seldom" or "rarely" discussed health issues). The only significant demographic variable found was gender; women were more likely to seek information than men among the group of Information-Positive, and less disinterested among the group of Information-Negative. More frequent information-seeking also predicted better health-related practices among the first group, while the result for the Information-Negative was the opposite. General medical, dental, or eye examinations were not related to information-seeking, while the self-examination of breasts and testicles were associated. Information-Positives gained higher scores than the Information-Negatives for taking some new action to benefit their health in the last six months. The authors concluded that although a person receives information, it does not necessarily lead to any change in health behaviour. Still, they think it is reasonable to hypothesize that a tendency to seek information would be accompanied by more positive health behaviour. However, it is also possible that preventive behaviour leads to more active information- seeking (Rakowski et al. 1990).

Griffin, Dunwoody and Neuwirth (1999) presented a model of risk information-seeking and processing, which can be related to preventive health behaviours. Seven factors were proposed to influence a person's risk information-seeking:

1) individual characteristics (for example, demographic factors)
2) perceived hazard characteristics (for example, a judgement of the potential for catastrophic outcome)
3) affective response to the risk
4) felt social pressures to possess relevant information
5) information sufficiency
6) one's personal capacity to learn, and
7) beliefs about the usefulness of information in various channels.

The researchers expected people who engaged in more effortful information-seeking to be more likely also to develop more stable (less changeable) cognitions, attitudes and behaviours related to health risks.

8. Information provision

8.1. The concept of the media

When we talk about the media, we think mostly of the mass media such as newspapers, radio and television. According to Altheide & Snow (1979, p. 11) the media should be defined as "any social or technological procedure or device that is used for the selection, transmission, and reception of information". This definition means that even territory, dwelling units, dress and fashion, language, clocks and calendars, dance and also other rituals should be considered as media, as every civilization has developed various types of media.

John Fiske said that a medium is basically a technical or physical mean of converting a message into a signal which in turn is capable of being transmitted along a channel. He also claims that a voice is a medium and that the technology of broadcasting is what constitutes the media of radio and television. Three main categories of media can be found:

1) Presentational media: voice, face, and body. These use the "natural" language of spoken words, expressions, gestures and so on. These require that a communicator is present. This communicator is then the medium. This type of medium is restricted to the here and now, and produces *acts* of communication.
2) Representational media are, for example, books, paintings, photographs, writing, architecture, interior decorating or gardening. Numerous forms of media use cultural and aesthetic conventions to create a "text" of some sort. These are representational and creative. They make a text that can record the media of category 1 (i.e., presentational media). This text can exist independently of the communicator. These types of media produce *works* of communications.
3) Mechanical media include the telephone, radio, television, and the fax machine. These transmit presentational and representational media, and the main distinction between categories 2 and 3 is that the media in category 3 use channels that engineering has created. They are, therefore, subject to greater technological constraints and are more affected by level A noise than those in category 2.

However, these categories do overlap each other and it is sometimes convenient to merge them into one (Fiske 1982, p. 18).

Cassata and Assante (1979, p. 9) also consider the media as communication channels. These channels might be magazines, television, newspapers, radio, movies or books. In the words of

Griffith, Mathias and Price (1994), mass media cover several formats such as posters, leaflets, newspapers, magazines, TV, radio and combinations of these.

These definitions are somewhat old-fashioned and need to be updated. Davenport, Higgins and Somerville (2000) talk about the "new media" when they refer to cable and satellite television, television services which are interactive, personal computers, CD-ROMs, e-mail, the Internet and the World Wide Web.

8.2. The media culture of today

Karl Erik Rosengren (1988, pp. 1ff.) used the broad definition of culture as a system of ideas manifesting itself in actions and artefacts. When culture flows from the macro level (a society) to micro level (an individual), this is called socialization. The importance of the mass media as the socializing agents has increased considerably, possibly because the media are able to provide both rich culture (that traditionally has been provided, for example, by the family) and theoretical culture (that has earlier been acquired from school, for example). The culture (that is, ideas) of the society today is to a large extent stored, reproduced, modified, mediated and distributed by the media, which also produce new cultures, as they also produce and put forward new ideas (Rosengren 1988, pp. 4f). The mass media culture could be regarded as the result of the process of weighing and sifting the raw material flowing into the media, resulting in pictures of reality that may deviate from the known reality (Rosengren 1988, p. 11). Altheide and Snow (1979, p.11) are on the same track when they say that the media culture in a broad sense refers to the character of institutions such as religion, politics or even sport, if they are developed through use of the media.

Nick Stevenson (1995, p. 3) summarizes what he means by "media cultures" in three points: 1) The first definition is close to that of Rosengren (1988) and Altheide and Snow (1979). In this definition the mass media transmit a great part of modern culture, whether it is music, stories about the private life of politicians or news from all over the world. 2) Secondly, theorists such as Habermas (1989) and Baudrillard (1993) build up a picture of the media on the basis of a wider analysis of modern cultural processes. 3) The third dimension is that there are histories of the intellectual exchange of those who have theorised about the media. Today new technologies increase rapidly and the mass media spread a variety of cultures over the globe. Media cultures are almost always present whether we stay at the place of our birth for the

duration of our lives or travel the world. The media, thus, provide a web that weaves together the world's cultures into what we call globalization (Stevenson 1995, p. 178).

Both Silverstone (1999, pp. 4, 143f.) and Malmberg (1999) seem to define media culture as the situation where different kinds of mass media have extended their influence into peoples' everyday lives. According to Malmberg (1999), the 20th century shows two turning points in the media culture: the time between the two world wars and the development that started at the beginning of the 1960's. In the first phase, movies and radio consolidated their position, and in the 1960's they were supplemented by television, the VCR, computers and multimedia. In recent years the information and communication technologies have developed both quantitatively and qualitatively, and the media culture has, according to Schröder (1999), become more visualized and immaterialized. Media culture is in a state of transition as the borders between, for example, local and global, author and audience, fact and fiction, verbal and visual are becoming increasingly blurred (Luukka 2003).

8.3. The media's impact on the human being

The entire study of mass communication leans on the premise that the media have an effect. Still, much doubt exists about the degree, incidence and kind of these effects. The media are efficient when they achieve a given aim. These effects can be divided into effects which are cognitive (which have to do with knowledge and opinion), effects which are affective (which relate to attitudes and feelings) and effects on behaviour (which relate to what people do to acquire information) (McQuail 1983, pp. 175ff.).

Effects can also be divided into intended and unintended as well as long-term and short-term effects. Comstock et al. (1978, cited by McQuail 1983) made a model of the television's effect on individual behaviour. According to this model, the process takes the form of a sequence that follows the initial act of "exposure" to a form of behaviour on television (TV act). This is the first and main input to learning or imitating the behaviour that is depicted. Other relevant inputs are the degree of excitement and arousal (TV arousal) as well as the degree to which alternative behaviours (TV alternatives) are depicted. Learning is likely to take place to a greater extent where there is more arousal and fewer kinds of behaviour (or more repetition). Two other conditions (inputs) have to do with the portrayal of consequences (TV perceived consequences) and the degree of reality (TV perceived reality). The more that positive consequences seem to exceed negative ones, and the more true to life the television behaviour

is, the more likely it is that learning (P TV act) takes place. All the inputs mentioned affect the probability of learning the action (the effect), but ultimately any resulting behaviour is conditional on there being an opportunity to put the act into practice. The most important condition is 'arousal', because without arousal there is no learning (In McQuail 1983, pp. 186 f.).

Already in the 1930's, there was an idea that the audience was passive and powerless and thus easily affected by the mass media (Karpf 1988, p. 221; McQuail 1983, p. 176). Some studies have confirmed this idea. For instance, there is evidence of a causal relationship between the media's coverage of the adverse effects of the contraceptive pill and the number of women who stopped its use (Karpf 1988, p. 221). Still, the mass media have long been considered a limited way in influencing people's behaviour. People's way of acting and deciding to behave in a certain way is based on many factors, not only knowledge that has been acquired through information in the media. An American study shows that although there are substantial direct media effects on drunken driving-related legislation and behaviour, the direct effect of the media on behaviour was not significant when the effect of legislation on behaviour was controlled. Future studies may thus benefit from considering the indirect impact of the mass media on the social and cultural environment that people live in (Yanovitzky & Bennett 1999).

Huston et al. (1997) used a schema-based theoretical approach for a media influence study where they studied how children's schemata of the world were affected by both documentary and fictive television programmes. They studied how television programmes affected children's understanding of a certain work group's role schemata. The study showed that the children actually acquired role schemata from the television and, thus, negative roles can be acquired from television.

The media and their influence have also been studied by a so-called cultivation analysis, developed by George Gerbner in the late 1960's. Three things were studied: 1) the institutional processes that underlie the production of media content; 2) images in media content, and 3) relationships between exposures to messages from the television and the beliefs and behaviours of the audience. The idea is that people who watch a lot of television differ from those who are light viewers. The cultivation theory assumes that light viewers are exposed to more varied information sources than are heavy viewers, who rely more on television (Morgan & Signorielli 1990).

8.4. Existence of health information in the media

At least one-fourth of all the articles in daily newspapers are in some way health-related, according to Atkin and Arkin (1990). Ryan, Dunwoody and Tankard (1991) studied magazines for scientists, popular science magazines, prestigious newspapers, news magazines and five large newspapers in Texas and Wisconsin for their reporting during one week after a Harvard report linking coffee consumption to pancreatic cancer was published. Out of 145 news stories, 45 contained reports on this topic. The state newspapers reported this story most often, followed by prestigious newspapers.

In local American television news the five most common topics were: crime, weather, accidents and disasters, human-interest stories and health stories. When health issues were covered, the majority (60%) were about causes and treatments of diseases, especially food-borne diseases and cancer, which constituted 15% and 12% respectively of all the issues covered. These were followed by reports on environmental/lifestyle health issues (diet and exercise), health care industry and insurance, legal health issues, HIV/AIDS and reproductive health and abortion issues (Kaiser Family Foundation 1998).

A study of health on Dutch television showed that most information containing health as well as illness was found in television commercials (Fennis 1999, p. 39). Fennis studied 60 hours of programmes on three Dutch public television networks and two commercial networks, and found a total of 389 representations of health. Of these, 41.4% were 'healthy' representations, 18.5% 'unhealthy' representations and 40.1% representations of illness and disease. Of the 'healthy' representations, 94.4 % were found in advertising, and of these, food was the most represented item followed by non-food products such as cosmetics, fitness products and so on. The 'unhealthy' representations were mostly found in advertisements (59.7%), as was also the case for representations of illness and disease (24.4%). Representations which were considered unhealthy were those on environmental factors such as ultra violet rays, fast foods, candy and alcohol. (Fennis 1999, pp. 29 ff.)

Another study of commercials on American television, in the years 1992 and 1998, showed that in 1992 more than 14 commercials per hour contained health information while in 1998 this number was up to 17. All medication advertisements contained explicit health information and most messages were about a product relieving symptoms. The most commonly advertised

medications in 1992 were cold, flu and headache remedies; in 1998 heartburn remedies joined the list. The largest category of advertisements, however, was for food and beverages. These comprised 28% of all advertisements in 1992. Fruits, vegetables and dairy products were rarely advertised, but instead protein-rich foods and grain products were well represented. Many of the foods in the grain group were high in fat or sugar – such as pastries – and foods belonging to a group of fats and sweets were frequently advertised (Byrd-Bredbenner & Grasso 2000). This seems to be the case in Britain as well. Suzi Leather (1995) found that in the UK very low sums of money were spent on advertising vegetables and fruits, compared to cereals, chocolates or even potato snacks. Still, health information has come to play a bigger part in advertisements in the last decade. In 1992, not all examined product categories contained health information, but in 1998 they did. It is thus claimed that nowadays health is used to sell everything (Byrd-Bredbenner & Grasso 2000).

Although the media contain large amounts of health information, they are still not used as much as possible according to some critics. Griffith, Mathias and Price (1994) expressed their dissatisfaction with the low use of the mass media as sources of information promoting food hygiene. They think that both television, printed magazines and cookery books could be much more utilised for promotional purposes.

8.5. Influence of health information

Finnegan, Viswanath and Hertog stated that: ”The media are powerful in their ability to expose vast numbers of people to stories, messages, and information about health and to build the public agenda for health promoting policies” (Finnegan, Viswanath & Hertog 1999, p. S50). Kim and Chern (1997) noted that it is generally accepted that information obtained from the news media is less effective than information acquired, for example, through personal interaction with a doctor. If the information is neutral, such as that obtained from a doctor, it also has a greater effect than non-neutral, non-personal and market oriented sources such as advertisements.

8.5.1. Influence on attitude

Guild and Lowe (1998) found that there is a difference in how a media message affects people’s attitudes. They investigated 134 school children (aged 13-17 years), who were divided into four groups, and who were asked to read news clippings from popular magazines. One

group read a negative message about alcohol (e.g. Alcohol can increase the risk of heart disease), and another group a positive message, such as ”Drinking alcohol can relieve stress”. One group read both positive and negative messages and one group did not read any news messages at all. The children were first asked to fill in a questionnaire and answer 13 statements about alcohol, drinking and health. Then, they read the messages and were asked immediately afterwards to answer the same statements again.

The result was that those who only received a negative message indicated to be significantly more negative in their rated attitudes toward alcohol. For example, before reading the messages, 27% agreed with the statement that drinking alcohol increases the risk of cancer, while 57% agreed after reading. Those who received only a positive message made more positive ratings afterwards; 24% agreed with the statement that moderate drinking is good for one’s health, but 58% agreed after the intervention. The groups that either received both kinds of messages or no messages at all did not show any significant mean changes. This study shows that attitudes may be immediately affected by either completely positive or completely negative messages (Guild & Lowe 1998).

Aggleton et al. (1998) found that current media stories, for example, about Mad Cow Disease and drug-related deaths made British children and youngsters concerned about health matters. In a Finnish study on health risks with food, 8% of the respondents answered that media reports on health risks make them very concered; 72% become concerned to some extent, and 15% said that they did not become concerned at all (Järvelä 1998, p. 40).

8.5.2. Influence on knowledge

Information also influences knowledge. Some studies show that information from media sources is good at enhancing knowledge on health or medical matters. O’Connor et al. (1999) found a relationship between medical information in a television drama and people’s knowledge about the topic. They examined people’s knowledge about the health risks of the drug paracetamol one week and 32 weeks after an episode in a British television drama where a person took an overdose of this drug (see also Hawton et al. 1999). The subjects were asked whether they had watched the relevant episode and were tested on their existing knowledge on topics associated with paracetamol. The study showed that non-viewers were more likely to either not respond at all or to state that they did not know. A week after the broadcast, 85% of the viewers and 45% of the non-viewers gave the correct answer to a question on whether

paracetamol had hepatotoxic effects. After 32 weeks, the knowledge had declined by 12% among the viewers and increased by 5% among the non-viewers. The high percentage of non-viewers who knew about the hepatotoxity can perhaps be explained by the extensive attention in the media. The conclusion is that medical messages in television programmes are likely to have an impact on people's knowledge.

The relation between a television programme and levels of nutrition knowledge was studied by Chew, Palmer and Kim (1995). Their longitudinal study was conducted in three stages. Before a certain informative and educational television programme on nutrition and health, called "Eat Smart", was broadcasted, a telephone interview survey was conducted. Within three days of the broadcast, another survey was conducted and the third interview was made almost half a year later. The result indicates that this programme was actually able to enhance knowledge about nutrition. A similar study, conducted some years later in Poland, also showed increased health knowledge through viewing a certain television programme series (Chew et al. 2002). Other health communication approaches have been shown to work well also. For example, Alcalay and Bell (1996) showed that a printed guide on health-related matters was able to enhance both knowledge and behaviour among poor Californian mothers with different ethnic backgrounds.

8.5.3. Type of information source in relation to health knowledge

The type of information source might matter when it comes to affecting knowledge. Several studies show relationships between the sources a person uses for acquiring health information and the existing knowledge of some health matter. The relationships between the use of print media and knowledge of cancer prevention approaches have been found to be stronger than the connection between relying on doctors and having heard about the matter. Respondents who relied on electronic media were least knowledgeable about all kinds of cancer screening. Those respondents who stated that they did not obtain information from anywhere, were also less likely to know about disease prevention. Women relying on information from family or friends were less likely to know about breast self-examination than those who mentioned doctors as their source of information (Meissner, Potosky & Convissor 1992). Pavlik et al. (1993) found that the more people were exposed to media information about heart health, the greater the understanding of causes and prevention of heart disease. Among people with HIV/AIDS, the use of the Internet was associated with better knowledge of the disease and its treatment (Kalichman et al 2002).

Media use, however, does not always enhance knowledge. Chinese adolescents in Hong Kong received most of their information about HIV/AIDS from media sources. There the mass media presented information in a way that could be misinterpreted and knowledge about the disease and ways in which it might be transmitted were, thus, vague among the adolescents (Davis et al. 1998). Too, American school children who watch a lot of television have been shown to have a weaker knowledge about healthy foods (Signorielli & Lears 1992; Signorielli & Staples 1997).

Health professionals, though, are not always the best source either. In the study by Pancioli et al. (1998), of those who most often cited doctors as their main source of information about strokes, people over 75 years and blacks, had less knowledge about the warning signs of a stroke and the risk factors than did others. It has also been found that health professionals are not always knowledgeable with nutritional advice, but are in need of improving their knowledge prior to giving dietary advice (Barrat 2001).

Sometimes a mix of sources works best. Studies show that acquiring information from multiple sources is associated with a better knowledge concerning heart attacks and antibiotic use for respiratory infections among Americans (Belongia et al. 2002; Meischke et al. 2002). Both interpersonal and so-called high-involvement information channels have been shown to be related to higher levels of actual and perceived knowledge about AIDS. High-involvement channels required more extensive cognitive processing and were, for example, newspapers, magazines, medical journals, brochures or fliers or pamphlets, and libraries; television and radio were called low-involvement channels. Interpersonal communication was due to discussing AIDS with someone (Engelberg, Flora & Nass 1995). Noll, Spitz and Pierro (2001), contrary to the others, did not find any relationship between the source used by parents to children with surgical diseases, and their knowledge about their children's medical status. Determinants for higher knowledge level were instead higher education and major operations on the children.

8.5.4. Information sources and their relations to health behaviour

Information seems to have influenced health behaviour among people. Kinnucan & Xiao (1997) found that during the past two decades the consumption of poultry in the USA has steadily increased, while beef consumption has decreased. According to their study, this was

mostly due to the increased amount of health information. It appears that already a small increase of the availability of health information has a larger impact on the consumption of meat than a small percentage lowering of relative prices.

8.5.4.1. Media sources

Different information sources seem to have different effects on health-related behaviour. One type of information source which seems to play an important role in changing people's health behaviours are the media. In a Swedish community half of the respondents had been influenced by the media to change their health habits – at least to some extent. Women and married/cohabiting couples had been influenced to a larger extent, while those who more urgently needed to change their behaviour to healthier habits – male manual workers – reported being least affected by media information (Brännström & Lindblad 1994). Chew et al. (2002) and Chew, Palmer and Kim (1998) found that viewing certain health-related television programmes improved health and nutrition behaviour.

Media sources are actually widely used for health promotion purposes and often have positive effects. Levy and Friend (2001) developed a computer simulation model, in order to examine how mass media campaigns aiming at controlling smoking rates influence both smoking rates and deaths caused by smoking. This model predicted that long-lasting media campaigns directed at all smokers might reduce the number of smokers and deaths. Several studies confirm that media sources are useful for promoting purposes. Printed media, such as magazines or comics, were used in an American information campaign in order to prevent high risk groups such as prostitutes or injecting drug users from acquiring HIV, with some positive results (Pulley et al. 1996). Television commercials, an information series broadcast as part of the evening news, and an information booklet were used to try to make American women with little education to think about stopping smoking. Of these, the information booklet seemed to be particularly effective in moving the women towards stopping (Freels et al. 1999). McDivitt, Zimicki and Hornik (1997) showed that a mass media campaign promoting vaccinations in the Philippines alone could change health behaviour, and that a combination with interpersonal channels was not needed in this case, although a combination is usually recommended. De Walle, Cornel and de Jong-van der Berg (2002) found that both awareness of and use of folic acid had increased in the Netherlands after a mass media campaign for the periconceptional use of folic acid started in 1995.

It has been found, furthermore, that a soap opera on television was effective in persuading people to take bone-marrow tests, in order to find suitable bone-marrow donors for people suffering from leukemia. The programme was especially effective if it was combined with a public service announcement. The message increased both the knowledge regarding bone-marrow testing, the intention to have the bone-marrow tested, and the behavioural responses that were related to the testing of bone-marrow (Klingle & Aune 1994).

Better eating behaviours have also been promoted successfully through media campaigns in the USA in the mid-90's. The idea was to make people to switch from high-fat milk to low-fat milk and information (paid advertising in newspapers and on TV and radio) about low-fat milk was spread in the media. The effects were measured within one community and the results were compared with the results from another town where a combination of paid advertising, public relations, and community-based programmes in schools, worksites and supermarkets were used. The campaign was designed to test whether mass media approaches (in the absence of other programming) were effective in changing people's habits on important dietary matter. The measures were conducted through pre- and post-intervention telephone surveys and by counting supermarket milk sales. The result was that the market share for low-fat milk increased from 29% to 46% within one month after the campaign, and half a year later it was still 42% of all milk sales. In the city of comparison the shares were 22, 21 and 23%. According to the telephone surveys of the people in the studied city, 34,1% of the high-fat milk drinkers switched to low-fat milk compared with 3,6% in the city of comparison. This result shows that some mass media approaches can be more effective than others in changing people's health behaviour (Reger, Wootan & Booth-Butterfield 1999).

This is not always the case, however. Jenkins et al. (1999) used the media to promote early detection of breast and cervical cancer among Vietnamese women who had emigrated to the USA. The campaign lasted for 24 months and contained messages about the importance of getting annual health check-ups in general, as well as the importance of taking breast and cervical cancer screening tests. The information was mediated through both print and electronic media; brochures, booklets, posters, articles in newspapers and videotapes broadcasted on television were used – all in the Vietnamese language. To evaluate the impact, telephone interviews were conducted both before and after the intervention. The result was that after the intervention the interviewees had greater odds of having heard of check-ups in general, Pap tests and clinical breast examinations (with the exception of mammograms). Also,

the odds of planning to have general check-ups, Pap tests, clinical breast examinations and mammograms in the next 12 months were significantly greater, but when it came to actual test receipt, the intervention only managed to promote general check-ups and Pap tests. In other words, the intervention did not have positive effects on promoting currency for any of the tests. The authors draw the conclusion that a media-based intervention alone could only perhaps lead to better consiousness, but not to behaviour change to any greater extent.

8.5.4.2. Health professionals

Sometimes health professionals are considered to be more influential than media sources. Griffin and Dunwoody (2000) found that the mass media and pamphlets sent to people were ineffective at changing behaviours, and suggested that interpersonal channels such as health professionals could be better at influencing. Gantz, Fitzmaurice and Yoo (1990) found that those who had been exposed to a campaign for seat belt use through the radio were more likely to use the seat belt than those hearing or seeing the messages elsewhere. The impact of the radio was explained through immediacy; hearing a message promoting seat belt use while sitting in the car might lead to use. The impact of messages through the media was not perceived, however, to be as effective as information received from interpersonal communication with health professionals from the work place or community groups.

Health professionals seem to be effective especially concerning cancer screening behaviour. Respondents citing doctors as their main source of information about cancer screening exams, were also more likely to have actually had one of the procedures done (Lee, Kim & Ham 2000; Meissner, Potosky & Convissor 1992). Frequent use of medical services, furthermore, seemed to be one of the strongest predictors for engaging in cancer screening behaviour according to Hiatt et al. (2001). Being asked by a physician about one's current health behaviour during a routine check-up also seemed to influence some behaviour. This was the case for losing weight and changing the intake of fat or fibre after being asked about one's diet. Questions concerning exercise or smoking did not, however, seem to affect these behaviours. The survey did not study, though, whether the physician only asked these questions, or whether he also gave the respondents some advice on these matters (Nawaz, Adams & Katz, 2000). A physician was the source which was perceived most likely to have an influence on American parents' decisions to having their children vaccinated against Lyme-disease (Barone et al. 2002).

8.5.4.3. Combinations of sources

Combinations of different types of information have also been suggested and have been shown to work well. Scherer and Juanillo (1992) think that health campaigns relying on media communication alone are not enough, but while mass media interventions combined with personal interaction have been more effective, they suggest that more interactive media might also have more effect.

Several studies confirm that combinations work the best. Yanovitzky and Blitz (2000) studied the importance of media coverage and physician advice on the decision of women over the age of 40 to obtain a mammogram. They found that although the advice that the women's physicians give is important for the decision-making, media coverage of mammography screening also plays a role, especially for women who do not have regular contact with a physician. They think that mass media and physician advice together could be useful to persuade individuals to follow preventive health behaviour.

In Finland, a successful mass media health campaign was launched in 1972. This so-called North Karelia project aimed at reducing heart disease rates. Articles about smoking were published in newspapers and nationwide anti-smoking series were run on television. In 1980 and 1982, television series encouraged viewers to stop smoking, take up exercise, and reduce fat, salt and sugar in their diets. Some positive results were actually found. Yet, the media were only one component in a broad campaign which drew on local authorities, voluntary organisations, the dairy industry and doctors and nurses; the campaign also included social support, self-help groups, environmental modifications and community organisation courses and seminars. Legislation, too, had some effect: In 1978, a law prohibited all sales promotions of tobacco, and also restricted marketing and smoking in public places (Karpf 1988, p. 223f). In a later study during 1989 to 1996, on the stopping of smoking in North Karelia, it was shown that weekly exposure to mass media health messages was significantly associated with attempts to stop smoking among men only. On the other hand, interpersonal health communication, or social influence, was significant in leading to attempts among both men and women to stop smoking. Interpersonal communication had a stronger impact than the mass media, but exposure to both had the strongest impact (Korhonen et al. 1998).

In another study concerning smoking among American school girls, the students received either a mass media intervention combined with a school programme, or only a school programme during a period of 4 years. The result was that weekly smoking among girls from the group which had had information from the media increased at a significantly lower rate than for girls in the school-only group (Worden & Flynn 1996).

Other information sources are also related to health behaviour. De Pietro and Clark (1984) found that adolescents using either peers or multiple-sources for information about sexuality and birth control were more engaged in health decision-making, while those who sought information about alcohol and tobacco at home were more engaged in decisions about their appropriate use than those using media or professionals as sources.

8.5.4.4. Information sources and their relations to unhealthier habits

Not all health-related information, though, leads to improvements in health behaviour. The effect can also be unhealthy habits. Byrd-Bredbenner and Grasso (2000) found that advertisements on American television often included health information, but that these messages were frequently incongruous with current health recommendations. For example, soft drinks were often advertised, but milk was almost never advertised. Consequently, soft drinks are consumed much more than milk. A couple of other American studies found significant relationships between more television viewing and poorer eating habits among children, their preferences for unhealthy foods, and their conceptions about which foods are unhealthy (Signorielli & Lears 1992; Signorielli & Staples 1997).

A couple of studies considered how the advertising of alcohol affects intake. In a study conducted on school children, it was found that the older the children became, the more appealing advertisements for alcoholic beverages became. Their identification with people in the advertisements also made the children want to be like those portrayed in the advertisements. The same result was shown for expectancies on the positive social effects surrounding drinking of alcohol. The expectancies were shown also to correlate with alcohol predrinking behaviour in that they predicted risky behaviour (Austin & Knaus 2000). Kohn and Smart (1984) let young men watch a football game on video, and in different test groups this broadcast contained either no advertisements for beer, nine beer commercials, or only the last four of the nine commercials. The subjects had, according to treatment group, either immediate

access to beer or access that was delayed by half an hour. The result was that moderate advertising did seem to lead to increased consumption, but the effect was brief and evanescent. The researchers are, thus, not very concerned about the effects of televised beer advertising, not even when the person watching television has immediate access to beer.

Platt (1978, cited by Karpf 1988 and Hawton et al.1999) did not find any significant relationship between a suicide attempt in a soap opera and people trying to copy this behaviour. In one episode a woman tried to commit suicide with sleeping pills and gin. Some doctors thought this would result in an increased number of women doing the same, but these studies showed no significant increase. The results from the study by Hawton et al. (1999), however, were not as encouraging. They studied the effects of a case of paracetamol overdose in a medical television drama by questioning self-poisoning patients about whether they had seen the mentioned episode, as well as gathering data on the numbers of self-poisoning patients taken into hospitals before and after the episode. The result was that the self-poisoning rates were 17% higher in the first week after the broadcast and 9% higher in the second week, but in the third week following the broadcast the rates were back to normal. The increase was also higher among women than men. In the case of poisoning by paracetamol, the increase was 19% in the first week and 23% in the second week. Of the patients who had seen the broadcast, 15% reported that the episode had influenced their decision to poison themselves. The increase was largest among younger people between 25 and 34 years of age, correlating to the age of the man who took the overdose in the episode. These findings strongly suggest that viewing the episode had influenced the choice of substance the patient took.

8.5.5. Type of information related to eating behaviour

Not only type of information source, but also type of information influences food behaviour. Unfavourable news, particularly, influences consumer decisions more strongly than favourable news. In Canada, increased awareness of the health effects of cholesterol had decreased the consumption of butter. The influence of negative information was four times more potent in influencing consumer behaviour than was positive information (Chang & Kinnucan 1991). In Belgium, the media played a large part in influencing the audience, when they broadcasted news about unhealthy food such as BSE-contaminated meat since 1996 and dioxin in meat in 1999. Belgian fresh meat consumption fell considerably during this period. The household consumption per capita of beef, pork and poultry fell 22%, 7% and 6% respectively during

1995-1998. (Verbeke, Viaene & Guiot 1999). The higher the level of attention towards media reports, the greater were the health consciousness and levels of concern about potential health hazards, and the decrease in meat consumption (Verbeke 2000).

In a study on the impact of media reports regarding BSE in the UK, 60 ordinary Londoners out of 155 (41%) and 14 general practitioners out of 21 (67%) had reduced their consumption of beef due to the risk of BSE. Among the general public the tendency was to avoid all beef products, but the general practitioners were more likely to be selective in their consumption. Fifty-nine persons had actually changed their eating behaviour before the reporting of BSE, due to media reports on, for example, salmonella and listeria in food (Gunasekera et al. 1996). When pregnant women in Britain were asked for their beef consumption before and after media reports on ten cases of Creutzfeld-Jakob disease in young people, it was shown that five weeks before the reportings, 36% of the women said that they had eaten beef at least once during the previous week. During the four weeks after the media reports, only 18% reported having eaten beef. In the fifth week, the rate was up to 23%. This suggests that the fall in beef consumption was short-lived. Either the public had identified the scientific uncertainty, or the behaviour of the public went back to usual behaviour after a short, initial reaction (Wilson et al. 1996). Short-lived reactions were also found in Sweden. When the Mad Cow Disease was big news in March 1996, people were much more concerned about British beef than they were one month later (Ljungberg 2001, p. 60). However, in April 1996, a much larger percentage reported that they had changed their buying habits concerning food items (Ljungberg 2001, p. 65).

8.6. Use of health information

8.6.1. Use of sources on health information

The preference for certain information sources or combinations of these, are assumed to be due to the sources meeting the information needs the people have. The preference for a certain source is, furthermore, not so much determined by demographic issues as by the present health situation (De Pietro & Clark 1984).

8.6.1.1. Media sources

Medical information in the media has not always been popular among doctors. A 30 year old study of American medical doctors showed that some of them felt the public should not have

access to certain medical material because they would not have the background to understand and evaluate it. Others thought that publishing medical news would be inconvenient for them because they would not want to keep abreast of it and be questioned about it by their patients (O'Keefe 1970). Another reason for not liking this kind of information could be that it might frighten people who have been diagnosed with some disease. Rees and Bath (2000) said that health care professionals actually discouraged women with breast cancer from paying attention to mass media sources containing information about the disease, because it might frighten or depress them. This seems to be the case also among Finnish doctors, who discourage heart patients from seeking too much information about heart conditions and surgery (Tuominen 2001, pp. 90f.). The media, however, are important as information sources. Karpf (1988, p. 220) noted that many researchers think of television as a major source of viewer's health information, which is second only to doctor's and dentist's and sometimes even overtakes them. Television and radio documentaries also rate fairly highly as trustworthy sources of health information.

A British study showed that when it came to current affairs (including health issues) which were considered the second most important issue together with the state of the education system, the media were the dominating information sources. Over 75% of the almost 900 respondents mentioned some kind of electronic or printed media as an information source. There were also differences in use according to age and social factors. The older age groups used more mass media in general, but television was more prevalent among younger people and manual and unskilled workers. Professionals and people holding managerial occupations, on the other hand, more commonly used newspapers (Marcella & Baxter 2000). Out of 155 Londoners, 134 reported that they had received their information about Bovine Spongiform Encephalopathy (BSE) from the media (Gunasekera et al. 1996). Rees and Bath (2000) reported a study, which was done in 1997, on the use of mass media information on breast cancer among thirty British women with breast cancer. They found that the women used a variety of mass media sources on this matter, including medical books and journals, leaflets from organisations which were cancer-related, videotapes, women's magazines and newspapers and television.

The mass media were also the main information sources about heart attacks among American women (Meischke et al. 2002) and the health hazards of tobacco among Albanian medical students (Vakeflliu et al. 2002). Health care providers and family and friends followed the

media as information sources among American women (Meischke et al. 2002). Among Albanian students, media sources surpassed both friends and family, and even their school education (Vakeflliu et al. 2002). Furthermore, adolescents in Hong Kong received most of their information about HIV/AIDS from the television and newspapers, followed by school. The least prevalent information source was health personnel and parents (Davis et al. 1998). American adults, and parents with children under 5 years of age, obtained most of their information about antibiotic-resistant infections from television and magazine articles. The Internet was still not common as a source in this study, conducted in 1999 (Belongia et al. 2002).

Finnish women with either breast cancer or rheumatoid arthritis obtained most of their information about how to change their diet from the mass media, friends or relatives, rather than from health professionals (Salminen et al. 2002). Studies conducted in Great Britain show that also Britons consider the media important as sources of information about food, nutrition and health (Abbott 1997; Buttriss 1997; Parmenter 2002)

Television plays one of the largest roles as a provider of health information. Among British youngsters the television and the media were generally the main source of information about cancer in the early 1990's. Television documentaries provided most of the information for middle class young people in rural and suburban areas, whereas soap operas were more important for young women and for those in inner city areas. Other reported sources were teachers, mothers and fathers, siblings, friends, grandparents, and health professionals (Bendelow, Williams & Oakley 1996a; Bendelow, Williams & Oakley 1996b; Oakley, et al. 1995). Television was also the main source for Americans concerning information on several health-related issues such as vaccinations (Lashuay et al. 2000), strokes (Pancioli et al. 1998), and preventing illness and maintaining good health. Particularly the younger and less educated learnt preventive health behaviour from television (O'Keefe, Boyd & Brown 1998).

In 1995-96, approximately 1000 adults from ages 15 years and up in every member state of the EU were asked about their sources of information on healthy eating. The result was that television/radio was the most used information source (29%), magazines and newspapers the second most used (27%) and health professionals the third most used (26%). Food packaging and relatives/friends stood at 22% each. Differences were found between areas: in northern Europe media sources were used more often than in southern Europe (de Almeida et al. 1997).

The media of print are sometimes the most prevalent sources of health information. British teenagers mostly preferred written sources such as leaflets, booklets and magazines as sources for health information (Rolinson 1998). In the early 1990's, over 50% of about 300 Americans reported using magazines as the main source of health information (Chew, Palmer & Kim 1995). Women's magazines were the number one source of information about menopause and health-related issues also among American women (Clinkingbeard et al 1999). Among elderly Americans, over 70% reported newspapers and magazines as regularly used sources of health information (Stoller et al. 1993). These sources were also mostly used in the study from 2000 by Licciardone, Smith-Barbaro and Coleridge (2001). In this study, too, the older respondents, as well as the women, more commonly used magazines, newspapers and television. In a Finnish study on consumers' opinions regarding health risks posed by food and food control, newspapers (82%) and television news as well as current affairs programmes (c. 75%) were most often mentioned as sources of information on health risks. (Järvelä 1998, pp. 41 f.)

The use of new media (e.g., the Internet) is becoming more common. A large American survey conducted at the turn of the century showed that 55% of the adults (over 18 years) going online use the Web to obtain information about health or medicine (Fox et al. 2000). Almost exactly the same ratio was found in another study conducted in 1998 (Pennbridge, Moya & Rodrigues 1999). Among younger people (15-24 years) the number of 'health seekers' was even higher – up to 75% – and, of these, 15% sought health information at least once a week (Kaiser Family Foundation 2001).

Swedes used the Internet about as much as the Americans. The Internet in 1999-2000 was still a small source of health information, compared to health professionals, for example (Garpenby & Husberg 2000, p. 17). For people with cardiac problems who want medical information, the Internet followed health professionals as a main source, according to interviews conducted in 2001. Better-educated patients use the Internet more often (Murero, D'Ancona & Karamanoukian 2001). In the USA, the Internet has surpassed radio as a source of health information, but it is still behind the medias of print and television, at the time of the report by Licciardone, Smith-Barbaro and Coleridge (2001).

8.6.1.2. Health professionals

Health professionals are preferred especially when medical information is required. Seventy-five percent of parents of Swedish children with eye problems obtained specific information at the opthamological clinic, while about 50% received information from friends or other acquaintances (Göransson 1999, p. 89). Seventy-seven percent of the parents of British children with diseases treated by surgery sought more medical information than was given by medical staff. Of these, 63% came from a general practitioner (Noll, Spitz & Pierro 2001). When it comes to cardiac patients wanting medical information, most turn to their family doctor, a cardiologist or a cardiac surgeon (Murero, D'Ancona & Karamanoukian 2001).

In a Canadian study, women obtained most of the information about osteoporosis from their physicians (47%) (Ribeiro, Blakeley & Laryea 2000). Californians, too, reported having used physicians as their most prevalent sources of health information, followed by family members and friends; newspapers/magazines and advice books had much lower rates (Pennbridge, Moya & Rodrigues 1999).

Among female Pacific immigrants to New Zealand, print and electronic media were overtaken by visits to health professionals, attending community group meetings and talking to friends. One reason for this was the lack of reading skills in English, but also the cultural emphasis on interpersonal communication (Sligo & Jameson 2000).

Welsh respondents said that they would most likely consult environmental health departments to obtain information about food safety and hygiene, followed by health professionals and health promotion units (Griffith, Mathias & Price 1994). British men were less likely than women to obtain information on nutrition from books or magazines, but were more likely to use a doctor as an information source. In this study, men and women regarded equally family, friends, radio, television and food packages as sources of nutritional information (Ralph, Seaman & Woods 1996). In another British study, health professionals were mainly used by women and less-educated people (Marcella & Baxter 2000).

8.6.1.3. Other sources

The media and health professionals are not always the most used information sources. American parents received most of their information about vaccinations against the tick-borne Lyme disease through a friend or an advertisement, whereas only a small percentage received information from a physician (Barone et al. 2002).

Filipinas in the United States used relatives and friends more as sources for information about menopause. Printed literature was much used too, while television was mentioned by only a few (Berg & Lipson 1999). Among Kenyan women, the mass media counted for only 10% of the answers, with friends, professionals and relatives being more prevalent sources (Ngimwa, Ocholaa & Ojiambo 1997).

Marshall, Smith and McKeon (1995) studied American women, some of whom were enrolled in a control programme for breast and cervical cancer. Both groups preferred one-to-one interpersonal information channels, such as family or friends or telephone calls from personnel working within the control programme. Those women, who were not enrolled in the programme, mentioned channels such as radio, television and newspapers as their second most preferred information channel. These mass media channels were not popular among those who were enrolled in the control programme. These respondents instead preferred flyers. Interpersonal contact with doctors was not suggested in either group of women.

Britons seem to obtain their information about how to eat in a healthy manner mainly at home. British school children mostly obtained their information on healthy eating from their parents (Aggleton et al. 1998), while British men largely reported family members as their most important source on knowledge about healthy eating. However, while family was important for almost 30% of the men, only slightly more than 10% of the women reported this source. For them, women's magazines were equally important (Beardsworth et al. 2002). Parents and school were considered the main sources of the basic knowledge of food and nutrition in another British study (Abbott 1997). Among young Finnish people, too, school was often mentioned as a source of information concerning health risks with food (Järvelä 1998, p. 41 f.).

8.6.2. Usefulness and reliability of information sources

Various studies reveal that the most used information source might not be considered the most useful or the most reliable. The British public received most of its information about food, nutrition and health from the media. The media were, however, not very much trusted, while health professionals on this matter were more highly trusted. Also, the usefulness of the information received from the media was questioned; although 57% said that they obtained information from television, this information was perceived useful by only 15% (Buttriss 1997). British adolescents, on the other hand, considered family, medical sources and schoolteachers the most trustworthy source in providing food safety information, while tabloid newspapers were considered the least trustworthy. Neither quality newspapers nor television news were regarded as very trustworthy (Coulson 2002). Californians, also, distrusted most newspapers and family members (Pennbridge, Moya & Rodrigues 1999).

Health professionals are often the most trusted source, according to several studies. American women relied more on the information about heart attacks given by health care providers, and found it most useful (Meischke et al. 2002). Also, Californians perceived doctors to be both the most useful and the most trusted (Pennbridge, Moya & Rodrigues 1999). African-American parents trusted doctors or nurses most on advice about immunizations (Lashuay et al. 2000). In the EU, health professionals were considered the most trustworthy concerning information on healthy eating (de Almeida et al. 1997). Canadian women found health professionals to be the most relevant source for health information – relevant meaning most useful and needed with respect to one's own health. After health professionals came books and Web sites. Health professionals were also ranked highest with respect to reliability, followed by books and pamphlets or fact sheets (Marton 2002). Concerning general information, professionals in some certain areas are also preferred, and oral information acquired from them perceived to be the most satisfying (Stefl-Mabry 2003).

Health professionals, however, are not necessarily superior sources. Concerning information about cancer screening examinations, almost 40% of over 20,000 respondents mentioned doctors as useful sources of information, while 22% mentioned magazines; 17% mentioned television and almost 16% mentioned newspapers. A gender difference did, however, occur;

men cited family and friends twice as often as women did, while the female respondents relied more on doctors and print media. There was also a difference between ethnical groups; blacks cited doctors more often than the other groups, while whites relied more on print media than blacks or Hispanics (Meissner, Potosky & Convissor 1992).

In another study, Canadian women obtained most of the information about osteoporosis from their physicians (47%), followed by media sources (37%), friends (25%) and relatives (20%). Only slightly over half of them, however, considered the information useful, but when asked what other information they desired, only a few answered and could not specify their requests (Ribeiro, Blakeley & Laryea 2000). Furthermore, over 70% of parents of children with diseases requiring surgery, who had read medical books or magazines as well as searched the Internet, were satisfied with the acquired information, compared to only slightly more than half of the parents who consulted a physician (Noll, Spitz & Pierro 2001).

A Finnish study on consumers' opinions regarding health risks posed by food and food control, showed that television news and current affairs programmes were the most reliable information sources, according to the majority of subjects. Advertisements were considered the least reliable source, and magazines and friends were considered less reliable (Järvelä 1998, p. 41 f.). In a study concerning all EU member states, television/radio was most trusted by Finns. Spaniards trusted this source less. Finns also trusted newspapers and magazines more than the average European did (de Almeida et al. 1997). Britons trust television programmes, even fictional programmes. An American medical drama was considered as a reliable source of knowledge (Davin 2003). These varying results may reflect differing standards of the credibility of television programming in different countries.

9. Essentials of the theoretical part

This chapter presents a summary of the main findings of the literature overview presented in chapters 2-8.

9.1. Health and health behaviour

Health is defined as a state of well-being which is physical, mental, and social. A person can be called healthy if no illness can be registered, but health can also be subjective, how one's own health situation is experienced. Physical health is much influenced by surrounding factors, such as what we eat. Several studies show relationships between diet and severe illness such as cancer and cardiovascular diseases. Because of this, guidelines about a healthy diet have been given. These guidelines include eating a variety of foods, consuming little fat, salt and sugar, and eating much in the way of vegetables and fruits.

In addition to a healthy diet, factors related to better health include behaviours such as the non-use of alcohol and tobacco, sufficient physical exercise, and avoidance of stress. Health behaviour is influenced by many different factors: illness or pregnancy, the social environment, work, gender, age or education. Cultural factors, also, might have an impact. Numerous studies have examined how knowledge is related to health behaviour. The relationship seems to vary. Sometimes people showing a good knowledge of how to live in a healthy manner still do not follow recommendations, while others who do not have very good knowledge still live in a healthy manner. Studies do, however, also find relationships between good levels of knowledge and good health-related behaviour.

Attitude has also been suggested in influencing behaviour; a more positive attitude is often linked to better health behaviour. Factors which either motivate a person, or perceived barriers, are important for certain behaviour. Numerous studies have found that illness, doctors' orders and weight problems motivate people to healthier eating. Factors that prevent people from eating in a more healthy way include the cost of healthy food, lack of time, dietary conservatism, and also lack of knowledge. Barriers to the existing information on healthy behaviour might also influence behaviour. These barriers might be psychological or cognitive – the information might be presented in a way that the receiver does not understand.

9.2. Health knowledge

Cognition refers to how a person obtains, remembers and develops knowledge. Within information science, it has been popular to use a cognitive view of study since the 1970's. The cognitive view has hence developed into a user-centered view, a holistic view, and a socio-cognitive view. At its broadest, a cognitive view means noticing that cognitive processes occur for any communication system.

Knowledge has been defined in several ways. A simple definition calls knowledge the integration of received information. Knowledge can be subjective, private (that is, within an individual) or something shared with others, and thus public. Knowledge is often perceived as something which can only exist within a living organism. Individual knowledge can be divided into structures. These knowledge structures are representations of the objective world, which are stored in memory and work as tools of perception. These structures have often been called schemata. These schemata are used while processing information. When facing new information an individual can either bring out an existing schema from memory to interpret the information, or, if no such schema exists, integrate the information as a new schema. Sometimes certain types of schemata called frames or scripts, can help an individual to manage in the surrounding world, by helping to know how to behave in certain situations.

Several studies have examined the knowledge of health issues among people. These studies show large variations in the existing knowledge, and these are often due to demographic factors. Women often show better knowledge of health than do men, and older people often have better knowledge than do younger people. The knowledge of relationships between food and health also seems to vary. People, however, are often aware of general dietary recommendations.

9.3. Health information

Information has been defined in many ways. It has often been divided into physical things such as documents, or intangible things such as opinions. It is also common to think of information as a message, often a message with some meaning for an individual. It has been stated that information and knowledge are related. Knowledge is said to be influenced by some new information and this leads to new knowledge. Knowledge is thought of as integrated information, while information is knowledge which has been separated from its context.

A human being has different needs and in order to satisfy these needs, the individual might engage in information seeking. The seeking of information is often said to be due to a recognised gap in one's existing knowledge. A belief that one's own knowledge is good has been shown to hinder information seeking. In some cases information is also not consciously sought for, but is passively received through different information channels. One situation that might increase the need for information related to health is illness. Severe illness especially increases information needs, according to several studies. Too, other changes in one's health situation, such as for example pregnancy, might increase information needs, as do threats of health risks.

The media are defined as anything that can transmit information. A voice, a book or a television is a medium. Mass media can have several formats, including print or electronic. As we live in an environment where several kinds of media are present, it is also assumed that these influence us. Following this assumption, health information from different kinds of media should influence people, and the media are actually much used for the purposes of health promotion. Several studies show that media information influences people's attitudes and knowledge. It seems as though the type of medium affects how much knowledge is influenced. The results vary: sometimes obtaining information from health professionals increases knowledge best, while other studies show that information from the news media is better at influencing knowledge.

Studies have also examined the relationships between information sources and people's health behaviour. Media sources seem to have influenced behaviour to some extent, but so also have

health professionals. Combinations of different types of sources seem to have the strongest impact according to several studies. Information sources, mainly media sources, might also influence behaviour for the worse. This is the case, for example, with advertisements for unhealthier food items.

It has been suggested that people prefer different information sources according to their present health situation. Studies have found that people prefer one of three types of health information sources: media sources, health professionals, or informal sources such as family or friends. Of the media sources, television often plays the largest role, but also the media of print (such as health-related magazines) is much used. In recent years the Internet has also grown more important. Health professionals are often preferred when medical information is needed. Although the media are much used as information sources, when it comes to trusting information, they are often surpassed by health professionals. The information received from health professionals is often perceived as being the most useful and the most reliable.

10. Method of the current thesis

The material and the methods used in the empirical study based on the previous research presented above, will be presented in the following chapter.

10.1. The respondents

The respondents consist of 50 Finns, 38 women (76%) and 12 men (24%), all born between 1959 and 1981 (at the time of the interview the mean age was 29.4 years of age and the median age 28.5 years), who belong to one of three different groups. Two groups consist of people who are expected to have a bigger than average interest in the relationship between food and health. In these two groups there are people with diabetes and pregnant women (see chapters 7.4.2 and 7.4.3 for motivations). The third group, the control group, consists of people in the same age group as the others, but who are not expected to have more than average interest in food and health. These people do not have diabetes, neither are they pregnant. Of the subjects, 18 (36%) are pregnant women, 17 (34%) are people with diabetes, and there are 15 people in the control group (30%). One woman is both pregnant and has diabetes[1], but because she is considered to have the identity of a diabetic rather than that of a pregnant woman, she has been included in the group of diabetics. Most respondents belong to the younger age groups, 44% are between 20-27 years of age, 46% are aged 28-35 and 10% are 36 years or older. As can be seen in table 1, most respondents have an education at university level, but almost as many have an upper secondary level of education.

Table 1. Education levels of the respondents

Education (latest degree)	**Number of respondents**	**%**
Comprehensive school (low level)	1	2%
Upper secondary school (medium level)	17	34%
Institute (medium level)	12	24%
Polytechnic (high level)	1	2%
University (high level)	19	38%

As can be seen from table 2, most respondents are doing some kind of office or service work. In this group several different types of employment can be found, from nursing and teaching to programming, or being a boss, psychologist or lawyer. The work places also vary, with

[1] In this case it is not pregnancy-related diabetes. The diagnosis had been made several years earlier.

representatives from both the public and the private sector. The students are mainly studying at a university (78%) or a polytechnic (17%).

Table 2. Occupations of the respondents

Employment	**Number of respondents**	**%**
Factory, mining, construction work	1	2%
Office or service work*	27	54%
Studies	18	36%
Housewife, parental leave	2	4%
Unemployed	2	4%

*includes e.g. research work, nursing, management, secretary work, cleaning work, teaching, lawyer work, information work, sales work, psychology work, computer programming

The parents of the subjects are also fairly highly educated; 34% of the fathers and 38% of the mothers have a university degree, and only 14% of the fathers and 12% of the mothers have the lowest, compulsory level of education. The majority of the parents are also employed within the sector of office or service work.

In the group of diabetics, most (41%) were diagnosed when they were between 19 and 26 years of age. Twenty-nine percent were between 1 and 9 years of age, and another 29% were between 10-18 years of age at the time of diagnosis. Most of the pregnant women (63%) are experiencing their first pregnancy. Five women are pregnant for the second time and the remaining two are expecting their third and fourth child.

10.1.1. Recruiting of the respondents

The subjects were recruited on a voluntary basis. During the winter of 2001, notices and leaflets were sent to all maternity care centres in the city of Turku. They were also sent to all laboratories in town dealing with diabetes tests (notices only), and to the local diabetes association. They were sent to the diabetes nurses at the local university hospital and the city hospital, and to the Student Health Care Centre in Turku. The recipients were requested to put the notice on the notice board and to hand out the leaflets to people visiting them in the near future. Notices were also put on discussion forums on the Web sites of two Finnish childcare magazines, of a Finnish web clinic (both diabetes and pregnancy discussion groups) and of the Finnish Diabetes Association (a discussion forum existing since March 2001). The study was briefly presented in the notices and leaflets, and those who became interested were asked to get in touch with the researcher (see Appendix 1). The researcher also paid a personal visit to a

meeting for young people with diabetes at the local Diabetes association, told them about the research, and handed out leaflets.

For the control group another method was used; colleagues and friends were asked to pick out someone they knew, and these people were then asked if they wanted to take part in the study. Using this snowball sampling-method (e.g., Sligo & Jameson 2000; Larsson 2000) also brought some more subjects belonging to the others groups. Most of the pregnant women (8) volunteered after seeing the notice in a discussion group on the Web; the rest came through the maternity care centres (also the pregnant woman with diabetes) or through colleagues or friends. Most of the people with diabetes were recruited through the local diabetes association (7 in all), four of them after the personal visit to the meeting. The rest were mostly found through colleagues and friends, and a couple also came through a notice at a laboratory and through a diabetes nurse. All the people interested were accepted for an interview and none of the volunteers were turned down.

10.2. Gathering of data

The subjects were all interviewed in person by the author. The interviews were conducted at a time that suited the interviewee, at a place of their choice. Most of the interviews (32) were conducted at the Department of Information Studies at Åbo Akademi University. Six people were interviewed at their own homes (or at the house of a close relative), eight at their work or study place, and four at a café. The interviews were conducted between January and July 2001, and 20 people (40%) answered the questionnaire in Swedish while 30 (60%) answered it in Finnish. People considering themselves bilingual were asked to answer the questions in the language they knew best, to avoid misunderstandings. The interview consisted of two parts. First, the respondents were asked to relate the advice they would give to someone about how to live a healthy day. This story was tape-recorded.

The other part was a structured interview, that is, it was conducted with the help of a questionnaire (e.g., Bell 2000, p. 120). The interviewer (i.e. the author) wrote down the answers given by the interviewees. This method was also used by Ginman (1983) and gives the interviewer an immediate insight into the answers, and can help to clear up misunderstandings; the interviewees can ask if they do not understand the question, and the interviewer can ask

what the respondent meant by their answers. The questionnaire was tested in a pilot study in May 2000. After this it was slightly shortened, but the main structure was left intact.

In order to guarantee the anonymity of the respondents, they were assigned a number by drawing a lot. This number was used to connect the oral part of the interview with the written one. Most interviews took approximately 70-75 minutes to complete, with some only lasting for 50 minutes, and some taking up to two hours. The questionnaire (see Appendix 2) consisted of both structured and open-ended questions, and covered six themes, which included the measuring of cognitive, affective and behavioural levels, suggested by Atkin and Arkin (1990). The themes are as follows:

- *demographic background information*. The questions concerned gender, age, language, education and occupation and also the education and occupation of the parents. For the people with diabetes, the year of diagnosis was also asked and the pregnant women were also asked about the number of pregnancies (see Appendix 2, questions 1-6).
- *interest in and need for health information*. Interest and information needs were measured by questions concerning the interest of the respondents in health information, how actively they sought such information and how selective they were. Their reasons for seeking information were also asked, and if they discussed health and food with others, and with how many people and why (see Appendix 2, questions 7-10, 16-18).
- *health information sources*. A list containing a total of 27 information sources was provided, and five questions asked about the respondents' use of and trust in these sources (see Appendix 2, questions 11-14, 27).
- *relations to and opinions on health information and healthy living* were measured by questions such as: if the provided health information is considered doubtful, if the respondents are satisfied with the provided information, if information makes them feel safe, and if threatening information influences them. In this part also an attitude-measuring question, consisting of a list of 30 statements about health information and healthy eating and living, was provided. Upon this the respondents had to decide (see Appendix 2, questions 15, 22, 24-26, 28, 39).
- *health behaviour*, where questions examined the respondents' tobacco and alcohol use, physical activity, food behaviour and possible changes in these. Questions also examined their belief in how well they could control their health and how well they took care of their health. Furthermore, did they follow recommendations, what was their experienced health

level, and perceived motives for and barriers to healthy eating? (see Appendix 2, questions 29-35, 39-42, 44).

- *knowledge about food and health*, consisting of different tests and knowledge questions, asking about perceived knowledge and measuring existing knowledge with questions such as “In which food items can iron be found?” or “What vitamin is good for what part of the human body?” (see Appendix 2, questions 20-21, 23, 36-38, 43, 45-48).

10.3. Limitations

The current study only examines people aged 20 to 42 years of age. The age limit ("about 20 to 40 years") was set to obtain a more homogenous group of people concerning age, and most women usually become pregnant between these ages. About 35 years and up is also often said to be the age when type 2 diabetes becomes more common, and this way the group of diabetics would mostly consist of people with type 1 diabetes. Possibly due to the voluntary recruiting method, the respondents are also better educated than the average person, and it is presumed that research made at a university also attracts people more familiar with the university world. Concerning gender, women dominate (38 women to 12 men), which is partly due to the fact that one target group consists entirely of women and, thus, comparisons between men and women require caution. It is a mix of a qualitative and quantitative study, and despite the small number of respondents, some statistical methods have been used in the analysis. The results show tendencies or patterns of behaviour, but they do not in general apply to a larger public.

10.4. Method

10.4.1. Measuring knowledge

10.4.1.1. Experimental schema measurement

Within research on schemata, there have been different approaches to measuring knowledge, or the actual existing knowledge structures or schemata. Approaches which are commonly used include recall tests (e.g., Bower, Black & Turner 1979; Meadowcroft & Reeves 1989), testing the ability of subjects to infer from a knowledge set (e.g., Fiske, Kinder & Larter 1983) and the clustering of related concepts (Roenker, Thompson & Brown 1971). Several measurements are often used to test the validity of the scores (Wicks 1992).

As most of the literature on schema measurement comes from social psychology – a largely experimental science – experimental techniques are more common than surveys. Most of the schema research tests individuals on some information or ”knowledge” that the experimenter has provided for them. The researcher can, thus, evaluate recall based upon the specifics of the provided information. The experimenters can present the subjects with a new message or new, surprising information and then ask them to answer some questions or make inferences about it in order to test what ‘stuck’ with the subjects (Wicks 1992)

Recall measurement

Within cognitive research, high recall of information is considered especially to be related to well-developed schemata, while it is believed that new information will either reinforce old knowledge or be ignored because it is not consistent with a developed schema (Wicks 1992). Bower, Black and Turner (1979) used a recall test to test if a so- called cultural uniformity also caused shared scripts (a type of schema). Students at a university were asked how they acted in certain situations, such as visiting a doctor or eating at a restaurant, and the results show that the patterns were similar among almost all the students. The researchers conclude that the social norms that people have learnt since childhood made the subjects give similar mental pictures of given events.

Meadowcroft and Reeves (1989) measured ”story schema” in children – defined as a hierarchical memory clustering representing prototypical story structure. They let the children see two children’s stories on videotape and then they gave them seven pictures which described the action in these videotapes. Firstly, the children were asked to sequence the pictures in the right order, then they were asked which of the pictures represented some important content in the story. On the basis of the answers the children were divided into high and low story schema groups. Using this division in further experiments showed that story schema development was linked to more efficient patterns, greater flexibility in attention allocation, and greater coordination between attention and memory processing.

Measuring inferential abilities

It is believed that inferential abilities show the presence and sophistication of schemata, because people draw on past experience when they need to fill in missing information (Wicks 1992). Fiske, Kinder and Larter (1983) tested their subjects’ inferential abilities. Some relative experts on political matters and some relative novices read about a country they knew little

about. Some of the people were told that the country's political orientation was communist, some that it was democratic, and some were not told about the political orientation at all. When asked about things which were not explicitly written in the text, (for example, whether it is easy or difficult to emigrate from the country), it was shown that information processing depended on the subjects' level of political sophistication: the experts inferred and recalled on the basis of inconsistent information by using labels to a greater extent than the novices. The inferences made by the novices were more consistent with the information they had been given (communist/democratic/neither).

Clustering of concepts

The third measurement technique concerns the clustering of concepts. Conceptual clustering is used to measure how people group concepts which are related (Wicks 1992). Roenker, Thompson & Brown (1971) formed the adjusted ratio of clustering (ARC), which indexes the deviation of the clustering of ideas from levels based on chance. Chance clustering gets the score of zero and perfect clustering the score of one.

10.4.1.2. Survey methods

Although survey methods are not normally employed within schema research, knowledge has often been measured by means of more traditional data-gathering methods within other research areas, especially those concerning health. Particular methods include 1) personal theme interviews or deep, qualitative interviews with the help of an interview schema (e.g., Häggman-Laitila & Åstedt-Kurki 1995; Saint-Germain & Longman 1993; Sligo & Jameson 2000); 2) personal interviews using questionnaires, either in the form of a group interview or individually (e.g., Arnold et al. 2001; Gans et al. 1999; Gibson, Wardle & Watts 1998; Katz et al. 1998; Kinney et al. 2001; Oakley et al. 1995; Radecki & Jaccard 1995; Williams & Gloster 1999); 3) telephone interviews with the help of questionnaires (e.g., Chew, Palmer & Kim 1995; Kinney et al. 2001) or, 4) questionnaires sent to the respondents by mail (e.g., Jallinoja & Aro 2000; Kennedy, Probart & Dorman 1991; O'Connor et al. 1999; Wardle, Parmenter & Waller 2000). A less common method is 5) an interview situation where children were asked to draw and write what they knew, in this case what they knew about cancer (Bendelow, Williams & Oakley, 1996a; Oakley et al. 1995).

The design of knowledge-testing questions is quite similar with different studies. Chew, Palmer and Kim (1995) interviewed people about knowledge, attitudes towards and behaviour

concerning food, health and information sources. The knowledge about food was tested with questions which were assigned points according to correctness. For example, Albrecht, Higgins and Lebow (2000), Kinney et al. (2001), Meischke et al. (2002), and Radecki and Jaccard (1995) used 'true' or 'false' questions when they respectively studied knowledge on the effects of smoking during pregnancy, knowledge on cancer gene testing, knowledge on heart attacks, and knowledge on nutrition and birth control. The questions or statements used by Jallinoja and Aro (2000), who in their study on knowledge of gene testing also included the alternative 'do not know', were similar. Gans et al. (1999), in studying knowledge on cardiovascular disease prevention, also used questions to be answered with a 'yes' or 'no'. Questions with multiple-choice answers were used by Katz et al. (1998) in testing the knowledge of kidney patients about their disease, and Radecki and Jaccard (1995), when testing nutrition and birth control knowledge.

10.4.2. The current study

Information source profiles of the 50 subjects were mapped out on the basis of different criteria, measured by five questions concerning their use of information sources (See questions 11-14 and 27 in Appendix 2). In the analysis, the answers of the respondents were transferred into points in a manner similar to that used in the pilot study (Ginman & Eriksson-Backa 2001). The higher the degree of the respondent's perception of the usefulness of information and their attentiveness towards information in a source or trust in the source, the higher the points assigned. The points for each source were then added up and grouped in one of four levels: low (1), medium low (2), medium-high (3), and high (4) points. If a respondent had skipped the answer for a source, this source was given no points.

Instead of using a qualitative grouping according to source preference, a cluster analysis was made on the respondents with reference to their source point level. A cluster analysis strives to group the examined individuals so that the differences between the individuals in one group are as small as possible concerning the examined variables, and as large as possible between the different groups, that is, the clusters (Toivonen 1999, p. 341). A cluster analysis was also made on the opinion-measuring question containing 30 statements about health information and healthy living, upon which the respondents had to decide (see Appendix 2, question 26). Also some chi-square analyses were conducted in order to test relationships between variables. The connections were considered significant if $p \leq .05$.

The questions which measure knowledge were also marked by point-giving systems. The first part of the interview – the healthy day story – which to some extent had the nature of a schema theoretical recall test, was judged in a manner inspired by, although not similar to, the methods used by Bower, Black and Turner (1979) and Meadowcroft and Reeves (1989). The number of so-called 'actions' (e.g., "eat vegetables", "exercise") were counted, and based on the number of actions, the terminology employed and shown expertise, the stories were judged as being either weak, mediocre/good or excellent. For example, a person who simply said that one should eat vegetables without further specification was considered to have a weak story, while a person explaining why one should eat vegetables and what they are good for and so on, was considered as having told an excellent story.

The tests in the questionnaire were divided into two parts: more general questions, structured in a manner close to that used in earlier knowledge tests, among others statements to be answered by "true" or "false" and multiple choice questions (e.g., Albrecht, Higgins & Lebow 2000; Gans et al. 1999; Jallinoja & Aro 2000; Katz et al. 1998; Kinney et al. 2001; Meischke et al. 2002; Radecki & Jaccard 1995) and questions where concepts were to be clustered, which were inspired by but not similar to the clustering technique used by Roenker, Thompson and Brown (1971). The tests measuring knowledge were judged by giving points for correct answers, and the points were added up. On the basis of the total score the respondents were assigned either low, medium or high knowledge points. The scale was adjusted with reference to the total scores of the respondents, so that 'high points' meant the highest achieved points, not the highest points possible.

11. Relations between health information, health knowledge and health behaviour

11.1. The source clusters

The cluster analysis that was made on the respondents with the aim of finding groupings of respondents with similar levels of information source points, was conducted by testing solutions with between two and six clusters. By following certain measures of the functionality of the groupings during analysis (Pseudo F and Cubic Clustering Criterion), it was found that the best solution was that with three clusters. These three clusters will thus be used as a basis for reporting the results of the empirical study.

Table 3. Mean points for each source in the clusters.
Point range is 0-4, where 0 is lowest, and 4 highest.

Cluster 1 (n=19) Professionals		**Cluster 2** (n=20) Popularized science		**Cluster 3** (n=11) Everyday information	
Source	**Mean points**	**Source**	**Mean points**	**Source**	**Mean points**
Doctors/health prof.	3.68	Health magazines	3.15	TV news	2.27
Official health info	1.89	Newspapers	2.05	Newspapers	2.27
Health magazine	1.84	Official health info	1.85	Family/friends	2.18
Newspapers	1.74	TV news	1.80	Doctors/health prof.	2.00
TV news	1.58	Doctors/health prof.	1.70	School	2.00
Family/friends	1.42	Family/friends	1.55	Official health info	1.82
TV documentaries	1.32	Documentaries	1.40	TV interviews	1.27
Medical books	1.32	School	1.40	General magazines	1.27
TV interviews	1.21	TV interviews	1.35	Discussion forums	1.27
Discussion forums	1.21	General magazines	1.35	Medical books	1.27
Web magazines	1.16	Cooking programmes	1.35	TV documentaries	1.18
School	1.16	Medical books	1.30	Health magazines	1.18
Sport programmes	1.11	Discussion forums	1.15	Internet unspecified	1.18
Pharmacy service	1.11	Sport programmes	1.10	Cooking programmes	1.18
Cooking programs	1.11	Web magazines	1.10	Sport programmes	1.09
TV commercials	1.05	TV commercials	1.05	TV commercials	1.09
General magazines	1.05	Paper commercials	1.05	Paper commercials	1.09
Paper commercials	1.00	Pharmacy service	1.05	Fiction	1.09
Web clinics	1.00	Web clinics	1.05	Web magazines	1.00
TV entertainment	1.00	Fiction	1.05	TV entertainment	1.00
Foreign series	1.00	TV entertainment	1.00	Foreign series	1.00
Domestic series	1.00	Foreign series	1.00	Domestic series	1.00
Web commercials	1.00	Domestic series	1.00	Web commercials	1.00
Fiction	1.00	Web commercials	1.00	Pharmacy service	1.00
Other sites	0.63	Other sites	0.95	Web clinics	1.00
Other sources	0.47	Internet unspecified	0.55	Other sources	0.82
Internet unspec.	0.26	Other sources	0.15	Other sites	0.64

In table 3, the mean points for each information source in each cluster are shown. In cluster 1 the 19 respondents clearly indicated that the source category “doctors/health professionals” were important, but also the sources “official health information” and “health magazines” were also fairly important. Twenty subjects fit into the second cluster. The respondents in this cluster seem to have a clear preference for health magazines, followed by newspapers and official health information. In cluster 3, containing 11 respondents, the mean points are fairly equal, with some higher points on news, on television and in the newspapers.

11.1.1. Demographic characteristics and information behaviour in cluster 1 (Professionalsí cluster)

Demographic background

The majority of the respondents in cluster 1 – almost two-thirds – are female, but this cluster also contains the largest share of male respondents. The respondents are also younger than in the other clusters and most belong to the lowest age group, which is aged 20-27 years. Almost two-thirds of the cluster members are diabetics, mainly diagnosed as grown-ups (over 18 years of age), and a slight majority are Finnish-speaking. The cluster is the lowest-educated one; the respondents mainly have an education on a medium level, meaning an upper secondary school or equivalent level. Most of the subjects are employed in office or service work, and one-third are students at a university or a polytechnic. The fathers of the respondents in the cluster are mainly educated at a medium level, that is, vocational school or its equivalent, while almost half of the mothers have a university degree. Office or service work is the dominating employment among the parents.

Information source profile

The respondents in cluster 1 are almost entirely relying on health professionals as sources of information. As can be seen in table 3, the respondents in this cluster gain the highest mean points, 3.68 out of a possible 4, on doctors or other health professionals, followed by official health information and health magazines, which, however, gain much lower mean points, 1.89 and 1.84 out of a possible 4. Thus, cluster 1 is called "the professionals' cluster"[2]. A closer analysis of the source points shows that ‘Doctors/health professionals’ is the only source category which obtains points at the highest level in this cluster; it gains high points from almost 70% of the subjects, and medium-high points from the rest. When other source

[2] This label is to be understood as a short-form for “users of health professionals as information sources”, not as referring to the cluster as if it was consisting of health professionals.

categories obtain higher points, these are also mostly related to medical expertise and professionalism: Official health information, health magazines, and medical books obtain medium-high points by the respondents. So do other sources, such as pharmacies, a diabetes-related employer, diabetes courses, brochures provided by a doctor, a nurse at a maternity care centre and lectures and courses at a university. General information providers, such as television news, newspapers (both printed and on the Web), general magazines, schools and family or friends, on the other hand, only obtain low or medium-low points in the professionals' cluster.

Interest, selectivity, seeking activity and reasons for seeking

Most of the respondents in the professionals' cluster are somewhat interested in and fairly active in seeking information concerning health and food. The cluster is also mostly a non-selective one, although over 40% of the respondents actually reported being very selective or somewhat selective when seeking health information, which is more than in the other clusters. The analysis of the differences between those who actually are very interested and those who are somewhat interested shows that the most interested are those in the oldest age group (36-42 years) and among people who have diabetes, diagnosed in the adult age (19-26 years). Among those in the 28-35 year age range, the control group members, and somewhat surprisingly, pregnant women expecting their first child, are in the main only somewhat interested.

Other factors linked to seeking activity seem to be age, health status and the age of diagnosis for diabetics. Being a very active seeker is more common among those who are also very interested, that is, the oldest respondents (36-42 years), and those who have been diagnosed with diabetes as adults. Interestingly, those who are pregnant for the second time seem to be more active health information seekers than those who are experiencing their first pregnancy. Those in the middle age group (28-35 years), the control group members, and those diabetics who have been diagnosed as children or adolescents are least active at seeking information. Interest and activity are, not surprisingly, related; those who are more interested are also more active seekers. The main reasons for seeking information are general interest and a chronic health problem which requires the intake of more information. Diabetics, not unexpectedly, give the latter reason only.

When it comes to selectivity, the female and the oldest respondents are the most non-selective ones as well as women who are pregnant for the first time. Too, age of diagnosis seems to

matter. Having been diagnosed as a child or as a teenager seems to be related to being less selective. When those who are more selective – that is, those aged 28-35 years of age and the diabetics diagnosed in adult age – were asked what kind of information they mostly looked for, the most common response was information concerning diabetes and fat and sugar. This answer is quite natural considering that the cluster members are mostly diabetics. Furthermore, one very selective respondent claimed to choose only reliable, examined information.

Discussion activity

In the professionals' cluster, slightly more than half of the respondents are active in discussing food and health with others. This cluster differs from the other two clusters by containing respondents who have most often discussed health matters with only one to three persons. The oldest respondents – those with a high level of education and those diabetics who were diagnosed in the 10-18 year age range – more actively discuss health matters, as do those who are very interested in health information. The relationship between high interest and frequent discussing is strong also in the chi-square analysis (χ^2=9.40, p=.052). Students, diabetics diagnosed in early childhood and, somewhat surprisingly, most of the pregnant women expecting their first child, discuss health matters less frequently. Discussing with no more than three people is most common among the youngest respondents who are often engaged in studies. Pregnant women, especially if pregnant for the second time, are also mostly discussing with fewer people than are the others. Those who discuss with more people are diabetics diagnosed in adolescence, the highly educated and those who belong to the oldest age group. Interestingly enough, sticking to only a few discussion partners does not seem to be related to interest or seeking activity, while most of those who do this are both very interested and very active seekers.

Reasons for discussion

The two main reasons for discussing health matters with other people are that the respondents want to inform others about what they have read or heard and that they like to discuss with other people. When the reason is to inform others, women, often pregnant women, mostly give this answer, although the diabetics, especially those diagnosed when adults, are also fairly eager to inform others. Other factors strongly related to wanting to inform others are being in the youngest age group, being Finnish-speaking, having a medium level of education, and being a student. Thinking that it is enjoyable to talk with others is most common in the control group and among pregnant women expecting their second child, though diabetics are less likely

to give this reason. The oldest cluster members and those with a high level of education are also more likely to answer in this way. These two main reasons are followed by respondents seeking others' comments and opinions. Not surprisingly, pregnant women, especially those pregnant for the first time, are most eager to want other's advice, as are those diabetics diagnosed in the age range 10-18 years.

Change in interest in case of diabetes or pregnancy

The respondents who have diabetes or who were pregnant at the time of the interview were asked if they experienced a change in their interest towards health information after diagnosis or when they realised that they were pregnant. All pregnant women and the majority of the diabetics which had been recently diagnosed answered that this was the case. The change mostly concerns the quantity of information required; the respondents want more information and new information, or they have become more attentive towards new information, especially information concerning pregnancy or diabetes. This is shown in the following quotes:

> *I want all the new information about things concerning diabetes* (man with diabetes, b. 1969)

> *Things concerning pregnancy are interesting me more* (pregnant woman, b. 1972)

> *[I] pay attention, if something new would have appeared. It changes all the time, [at the moment] for example sugar is allowed, [but] fat is forbidden* (man with diabetes, b. 1959)

Some respondents take more care of themselves and think more about what to eat:

> *You are more careful about eating when the well-being of two persons is at stake* (pregnant woman, b. 1977)

Summarizing the characteristics

The most typical characteristics for the professionals' cluster are:

- The respondents rely mainly on health professionals as sources of information.
- The share of male respondents is larger than in the other clusters and the cluster is the youngest and lowest educated one. Furthermore, most of the respondents have diabetes.

- The respondents are fairly interested in health information and only fairly active at seeking information. They are also more selective than are the others.
- The respondents are fairly active at discussing health matters, but with fewer people than those in the other clusters.
- The main reason for discussing is a wish to inform others.

Table 4, furthermore, shows a summary of the demographic characteristics which are most typical for the cluster members which are engaged in each of the information-related behaviours that have been presented in this chapter. The order of the variables does not indicate any importance in the sense that demographic variables having stronger connections with a behaviour would be mentioned first .

Table 4. The demographic variables which are most typical for each behaviour in the professionals' cluster.

Professionals' cluster	
Most interested: - aged 36-42 years - diabetes diagnosed between 19-26 years	Least interested: - aged 28-35 years - control group member - pregnant - pregnant for the 1st time
Most active seeker: - aged 36-42 years - diabetes diagnosed between 19-26 years - pregnant for the 2nd time	Least active seeker: - aged 28-35 years - control group member - diabetes diagnosed between 1-9 years - diabetes diagnosed between 10-18 years
Most selective: - aged 28-35 years - diabetes diagnosed between 19-26 years	Least selective: - pregnant - pregnant for the 1st time - diabetes diagnosed between 10-18 years
Most active at discussing: - aged 36-42 years - highly educated - diabetes diagnosed between 10-18 years	Least active at discussing: - student - pregnant for the 1st time - diabetes diagnosed between 1-9 years
Discusses with 1-3 people: - aged 20-27 years - student - pregnant - pregnant for the 2nd time - diabetes diagnosed between 1-9 years - diabetes diagnosed between 19-26 years	Discusses with more than 4 people: - aged 36-42 years - high level of education - diabetes diagnosed between 10-18 years
Wants to inform during discussion: - woman - aged 20-27 years - pregnant - diabetes diagnosed between 19-26 years - Finnish-speaking - medium level of education - student	Thinks discussing is enjoyable: - aged 36-42 years - control group member - pregnant - pregnant for the 2nd time - high level of education
Wants others' comments: - pregnant - pregnant for the 1st time - diabetes diagnosed between 10-18 years	

11.1.2. Demographic characteristics and information behaviour in cluster 2 (Popularized science cluster)

Demographic background

Cluster 2 is the most female-dominated one; almost all respondents are women, and those aged 28-35 years are slightly more than those between 20-27 years. The respondents are slightly more often pregnant women (pregnant with their first child) than members of the control group. The cluster is also the most monolingual one; the vast majority are Finnish-speakers. The majority have a medium level of education from an upper secondary school or an institute, but only slightly fewer have a university degree. Half of the respondents are employed with office or service work, 40% are students and a small share are unemployed or on parental leave. Nearly all students study at a university. The parents mostly have a medium level of education. The next sizeable group usually have a university degree. Their main employment is with office and service work.

Information source profile

In cluster 2, the main information sources are such that mediate professional scientific information in a popularized form in, for example, magazines specializing on health and well-being. As shown in table 3, health magazines gain the highest mean points, 3.15, in cluster 2. Newspapers, official health information, television news and doctors follow, but with over one point lower mean scores. This cluster is thus called "the popularized science cluster". In this cluster, the respondents seem to rely solely on one type of source; according to the frequencies, only health magazines obtain high points, by over one-third of the cluster members. This source also gains medium-high points, by 45%. Newspapers, television news and official health information are other sources to obtain medium-high points. In addition, medical books, school and the category 'other sources' also obtains medium-high points by a small number of respondents. The other sources mentioned in this cluster are diabetes-related magazines and other publications. Health professionals are not held in high esteem in this cluster; about one-third give them low points and the rest give them medium-low points.

Interest, selectivity, seeking activity and reasons for seeking

In the popularized science cluster, the majority of respondents are only fairly interested in information on health and food, but since no one in this cluster is only slightly interested the cluster is more interested than the other two clusters are. Furthermore, as many as two-thirds of the cluster members say that they are very active at seeking information. This makes the

popularized science cluster the most active one. The vast majority of respondents in the popularized science cluster are also not selective at all. A closer look at the distinction between the very interested and the less interested respondents shows that those who are very interested are mainly highly educated women who have experienced at least one pregnancy before. It is quite surprising that those pregnant women who are expecting their first child are less interested than those having experienced a pregnancy before. Characteristics for those who are less interested are that they are in the youngest age group, belong to the control group, are Swedish-speaking, and students.

Respondents from the middle age group, who work in offices or do service work are the most active at seeking health information. Interestingly, it also seems that having been previously pregnant motivates not only a higher interest, but also a more active seeking behaviour than experiencing a first pregnancy. Being young and diabetic is related to seeking less actively. In the popularized science cluster as well, interest and seeking activity seem to be related, to some extent; the very active seekers are also very interested in the main. The primary reason for information seeking is actually general interest, and for some – mainly diabetics and pregnant women – the reasons are problems related to their well-being or health.

In this cluster, being a man and being Finnish-speaking seems related to not being selective, but being pregnant, especially for the first time, and/or having been diagnosed with diabetes in childhood are related to non-selectivity. No one in this cluster is very selective, but those who are fairly selective were also asked what kind of information they preferred. The answer was that they mainly looked for information about food which is healthy and which prevents illness, especially heart disease. They also sought information on food about special diets for diabetics, vegetarians or those who prefer biologically- grown food.

Discussion activity

The people in the popularized science cluster are the most active at discussing food- and health-related issues; the clear majority discuss food and health often, and no one answered that they never discuss these matters with others. Women with a high level of education, who were previously pregnant, are among those who discuss health information most often, while men and diabetics engage in discussion least often. Discussions are mostly held with up to six people. Pregnant women are those who mostly stick to less than three people, while diabetics are the ones who mostly discuss with 4-6 others.

Reasons for discussion

The main reason for discussion with others is that discussing is enjoyable, followed by this that respondents want to inform others and want others' comments about what they have read. Diabetics, especially, think it is nice to discuss with others, but also most women expecting their second child. Thinking this way is related to being in the youngest age group and being engaged in studies. Those in the youngest age group, the diabetics, and the highest educated, most often want to inform others. When it comes to wanting other peoples' comments, this seems to be common among the men in the cluster, as well as among people with diabetes diagnosed in early childhood. Other variables strongly related to wanting others' comments are having a high level of education and working in offices or with service work.

Change in interest in case of diabetes or pregnancy

Changes in health situation also seem to influence interest in and need for health information in the popularized science cluster, but not as much as in the other source clusters. About two-thirds of the people with diabetes experienced a change in their interest after being diagnosed; the pregnant women also experienced a greater need of health information after becoming aware of their pregnancies. Some Finnish-speaking pregnant women in the middle age group said that their interest had not changed. Interestingly, some of them were pregnant for the first time, but that did not seem to have had any influence. Also, the overall interest in health information among these women remained at a medium level. Like in the professionals' cluster, the major changes in the popularized science cluster are also related to quantity of information. The respondents have experienced an increased interest and attentiveness towards health information, followed by attentiveness towards pregnancy-related information. The following quotes show this:

> *[I] listen more carefully to information related to blood pressure and complications related to diabetes* (woman with diabetes, b. 1975)

> *[I] follow especially that [advice] related to pregnancy, childbirth or children's nutrition more. They are registered better than before* (pregnant woman, b. 1965)

Others are more careful about themselves and their babies. Another couple also think more about what they eat:

[You] follow [the information] more carefully than before, [you] are more concerned when you do not think only of yourself anymore. [You] avoid things that might be dangerous (pregnant woman, b. 1970)

[I am] interested in what might be harmful for the baby, for example the problems with cattle. [you] want to know what is animal-based when you do not eat meat, [such as] for example, gelatine (pregnant woman b. 1972)

Summarizing the characteristics

The most typical characteristics for the popularized science cluster are:

- The respondents mainly use health magazines as their information source.
- Nearly all respondents are women, often pregnant women.
- The respondents are mainly Finnish-speaking.
- The respondents are more interested in health information than those in the other clusters, and very active in seeking information.
- The cluster is most active at discussing health and food with others.
- Discussions are held because discussing is nice.

Table 5 also shows a summary of the demographic characteristics which are most typical for the cluster members engaged in each of the information-related behaviours presented in this chapter. The variables are not mentioned in any particular order.

Table 5. The demographic variables which are most typical for each behaviour in the popularized science cluster.

Popularized science cluster	
Most interested: - pregnant for the 2nd time or further - high level of education	Least interested: - aged 20-27 years - control group member - Swedish-speaking - student
Most active seeker: - aged 28-35 years - pregnant for the 2nd time or further - office/service work	Least active seeker: - aged 20-27 years - diabetic
Most selective: No clear profile	Least selective: - man - Finnish-speaking - pregnant - pregnant for the 1st time - diabetes diagnosed between 1-9 years
Most active at discussing: - pregnant - pregnant for the 2nd time or further - high level of education	Least active at discussing: - man - diabetic
Discusses with 1-3 people: - pregnant	Discusses with 4-6 people: - diabetic
Discusses with more than 6 people: No clear profile	Thinks discussion is enjoyable: - aged 20-27 years - diabetic - pregnant - pregnant for the 2nd time or further - student
Wants to inform during discussion: - aged 20-27 years - diabetic - high level of education	Wants others' comments: - man - diabetes diagnosed between 1-9 years - high level of education - office/service work

11.1.3. Demographic characteristics and information behaviour in cluster 3 (Everyday information cluster)

Demographic background

In cluster 3, almost three-quarters are women, and two-thirds are in the middle age group, being 28-35 years of age. The cluster is the oldest one in the sense that the percentage of respondents aged 20-27 years is much smaller than in the other clusters. A slightly larger percentage of the cluster members belong to the control group, than to the group of pregnant women. Little over half are Finnish-speaking and the cluster is the best educated one; over half of the respondents have a high education, mostly a university degree. As in the other clusters, most of the respondents work in offices; one-third consists of students, mostly studying at university, and the remaining one-tenth are unemployed. More fathers have a university degree than have a basic education. Of the mothers, as many have a basic level of education as have a high level. The majority of the parents are working in an office job or in service work.

Information source profile

The respondents in cluster 3 seem to live largely in an information environment consisting of everyday sources, such as the news media. As shown in table 3, the television news and newspapers are the primary sources in this cluster, hence it is labelled "the everyday information cluster". These source categories gain 2.27 mean points each, but they are closely followed by 'family and friends' with 2.18 points and 'doctors/health professionals' and 'school' with 2.0 points each. The frequency table shows that the most preferred sources in the everyday information cluster are quite informal; the television news, newspapers, and family or friends are among the only sources obtaining high points. Medium-high points are obtained by these sources and also doctors, schools, as well as information on the unspecified Internet and ‘other source’ category, including a nutrition therapist. The medical expertise which is highly ranked in cluster 1, has a very small role as an information source in cluster 3. The vast majority only rate this source category as low. All of the respondents have medium-low or low points on other health-directed sources such as official health information, health magazines and medical books. In addition, health services on the Web gain only low points also.

Interest, selectivity, seeking activity and reasons for seeking

The everyday information cluster is the one which is least interested in health information. The percentage of very interested respondents is much smaller than in the other two clusters, and

the share of uninterested respondents larger. According to the chi-square test, the relationship between little interest and the everyday information cluster is significant (χ^2=11.62, p=.02). The cluster members are also not very active at seeking health information; about two-thirds are only a little/somewhat active in seeking health information, which is more than in the other clusters. When actually seeking health information, however, the vast majority are not selective at all. A closer look at the most interested and the least interested respondents shows no clear profile among the very few respondents who are most interested. They are, however, very active health information seekers. The group of least interested, on the other hand, contains the majority of the men and those who do office or service work. The least interested are only either slightly active or not at all active in seeking health information.

An analysis of the very active respondents shows that the youngest and the most interested respondents are the most active. The male respondents (those in the middle age group, the control group members), those with a medium level of education and the Swedish-speaking respondents are only somewhat active. As in the other clusters, so also in this one: interest and activity are not unexpectedly related, the interest among the somewhat active seekers being only at a medium level. The majority of the respondents in the everyday information cluster seek information due to general interest, but a small percentage of them also have chronic or temporary health problems. Of those having a chronic problem, most (not surprisingly) have diabetes.

Non-selectivity seems related to gender, age, health status, language and education; women, the youngest respondents, pregnant women, Finnish-speaking respondents, and those with a medium level of education are the least selective ones. The small percentage of respondents who actually are selective, mainly care for information about what one should eat and something about a possible illness.

Discussion activity

The everyday information cluster is fairly uninterested in health information, and this seems to include discussion activity as well. The chi-square analysis also showed that the relationship between discussion frequency and source cluster is strong, although not significant (χ^2=14.53, p=.069). The everyday information cluster differs from the other clusters because it contains a larger number of inactive people who discuss. Gender, age, health status, and language seem to be related to interest in discussing food and health in this cluster. Discussion activity is highest

among those aged 20-27 years, and those belonging to the group of pregnant women (pregnant for the second time). The Finnish-speaking respondents are much more active at discussing than the Swedish speakers are, and men and those aged 28-35 years are also less active. No clear preference was found concerning the number of people to discuss with; equally many respondents discuss with less than three people as with 4-6 people and even more than six people. It seems, however, that those speaking Swedish prefer talking to 1-3 persons.

Reasons for discussion

Most of the respondents engage in discussion because they think that it is enjoyable to talk to others. The women particularly like to talk to others, as do all those in the youngest age group. Control group members were more eager to give this answer, as were the Finnish-speaking cluster members and those with a medium level of education. A slightly smaller percentage of respondents take the advantage of informing others during the discussion times. All of those informing others are women, mostly aged 20-27 years, Finnish-speakers and engaged in studies. Smaller percentages of the respondents – mainly control group members – want comments or advice, and some also want to make sure that they have understood the information correctly.

Change of interest in cases of diabetes or pregnancy

In the everyday information cluster, all but one of the diabetic respondents or pregnant women have experienced a change in their interest. As in the other clusters, becoming more attentive towards information about food and health is the main change; next comes caring and thinking more about what to do or eat, and wanting more information. This is illustrated by the following quotes:

> *[You are] much more interested about things when they concern yourself. I did not care before* (woman with diabetes, b. 1977)

> *I do not eat anything that might affect the future life of the child* (pregnant woman, b. 1961)

Summarizing the characteristics

Typical characteristics for the everyday information cluster are:

- The respondents mainly use the news media as their information sources.

- The cluster is the oldest (in terms of age) and the best educated.
- The respondents are slightly more often control group members than pregnant women.
- The respondents are less interested in health information and less active at seeking information than are those in the other clusters.
- The respondents are less active at discussing health matters with other people than those in the other clusters.

Table 6 provides a summary of the demographic characteristics which are most typical of the cluster members engaged in some information-related behaviour that has been presented in this chapter. The variables are mentioned in a random order.

Table 6. The demographic variables which are most typical for each behaviour in the everyday information cluster.

Everyday information cluster	
Most interested: No clear profile	Least interested: - man - office/service work
Most active seeker: - aged 20-27 years	Least active seeker: - man - aged 28-35 years - control group member - Swedish-speaking - medium level of education
Most selective: No clear profile	Least selective: - woman - aged 20-27 years - pregnant - Finnish-speaking - medium level of education
Most active at discussing: - aged 20-27 years - Finnish-speaking - pregnant for the 2nd time	Least active at discussing: - man - aged 28-35 years - Swedish-speaking
Discusses with 1-3 persons: - Swedish-speaking	Thinks discussing is enjoyable: - woman - aged 20-27 years - control group member - Finnish-speaking - medium level of education
Wants to inform during discussion: - woman - aged 20-27 years - Finnish-speaking - student	Wants the comments of others: - control group member

11.1.4 Summary

- The professionals' cluster contains respondents which rely almost entirely on health professionals. Doctors/health professionals are the only source category to obtain high points. The cluster also contains a larger percentage of male respondents than the other clusters. The cluster is also the youngest and the one with the lowest level of education. It consists mostly of diabetics.

- In the professionals' cluster, the respondents are fairly interested and active seekers. Most are also non-selective, although the number of selective respondents is larger than in the other clusters. The main reasons for seeking information are a general interest or a chronic health problem (usually diabetes). The cluster is quite active at discussing food and health matters with other people, but this is done with a smaller number of people than in the other clusters. The main reasons for discussion are a wish to inform others, and thinking that it is nice thing to discuss with others. Most of the diabetics and the pregnant women experienced a change in interest after diagnosis of diabetes or recognised pregnancy. The change led to wanting new information and more of it.

- The popularized science cluster members rely on popularized science such as health magazines. This was the only source to obtain high points. Health professionals are not in high esteem in this cluster. The cluster is the most female-dominated and Finnish-speaking one, and contains the largest number of pregnant women.

- The popularized science cluster is fairly interested in health information, and more interested than the other clusters. Furthermore, they are the most active at seeking such information. This cluster is also non-selective. The cluster members are also more active at discussing than those in the other clusters. Discussion is mostly done because it is enjoyable. This is followed by a desire to inform. Seeking is mainly done due to general interest. The interest has changed because of diabetes or pregnancy, but not as much as in the other clusters. The change has led to an increased interest and attentiveness.

- The everyday information cluster members live in an everyday information environment consisting mostly of the news media, while the medical expertise is rated low. This cluster is the oldest agewise, and has the best educated members; control group members form the largest health status group within this cluster.

- The everyday information cluster is least interested in and least active at seeking information. This cluster is also non-selective when actually seeking information, and it is done because of a general interest. This cluster is less active at discussing than the other two. When discussing happens, it is mostly due to liking the social element of discussion as in the popularized science cluster, together with a wish to inform as a secondary reason. In this cluster almost all diabetics and pregnant women have experienced a change in their interest, which has led to increased attentiveness towards relevant information.

11.2. Relations to and opinions on health information

The respondents' relations to and opinions on health information were measured by means of several questions, and from different angles. This part of the questionnaire includes questions about whether the respondents think the information in some sources is doubtful or contradictory; about whether they are satisfied with the received information; about whether they have been influenced by some media information; about whether the received information makes them feel safe; about whether they have been influenced by threatening information, and includes a list of 30 statements related to these matters (Appendix 2, questions 15, 22, 24-26, 28). This list of statements was used to examine patterns of attitudes towards health information and healthy living. Positive attitudes have shown to lead to better health and eating behaviours (e.g., Bettinghaus 1986; Cardon, De Bourdeaudhuij & Clercq 2002; Hailey, Carter & Burnett 2000; McCaffery, Wardle & Waller 2003; Minichello, Mariño & Browne 2001; Roininen et al. 2001). These patterns were determined by using a cluster analysis, and the clusters found are presented in the following section.

11.2.1. The attitude clusters

The cluster analysis conducted on the attitude-measuring question containing 30 statements (Appendix 2, question 26), resulted in three clusters of respondents.

Cluster 1 (Confident attitude)

Differing most from the other clusters is cluster 1, with respondents (n=22) who have a more positive attitude towards health information than the other respondents do; they think that the existing information is easy to understand, as can be illustrated by the fact that (as can be seen in table 7) they are more likely than those in the other clusters to agree with statements such as: ”You do not become confused by all the new information if you know what you want (foodwise) and stick to it” or ”Information in the media is provided in a way that is easy to grasp and understand”. They also disagree more with statements such as: ”The large amount of information that reaches us today from all over the world makes it more difficult to know what is really healthy” and ”Information about health and food is often filled with conflicts and is contradictory”. The respondents in cluster 1 also believe that their capability of managing the received information and to use it practically is much stronger than those in the other clusters, as they are strongly disagreeing with statements such as: "It is difficult to put the advice you receive about different food items into practical eating habits" or "It is difficult to know what is most healthy in the enormous supply at the food store". In cluster 1 the respondents are least worried about the amount of information. As can be seen in table 8 they disagree more strongly than the others with statements saying that there is too much information which concerns food and health or which is frightening.

Table 7. Mean points for statements on relations to information and the capability of managing information in the attitude clusters.
Point range is 1-5, 1= agrees strongly, 5= strongly disagrees.

STATEMENT	CLUS 1 (N=22)	CLUS 2 (N=20)	CLUS 3 (N=8)
1. Information about health and food is often filled with conflicts and/or is contradictory	3.5	2.2	2.25
2. Experts often change their opinion concerning what you should eat or avoid	2.95	2.15	1.88
6. It is difficult to put the advice you receive about different food items into practical eating habits	4.32	2.45	1.88
8. The large amount of information that reaches us today from all over the World makes it more difficult to know what is really healthy	3.23	2.2	2.75
20. You do not became confused by all the new information if you know what you want (foodwise) and stick to it	1.73	2.05	2.25
26. It is difficult to know what is most healthy in the enormous supply at the food store	3.95	3.25	2.13
27.It is important that people change their eating habits on the basis of new knowledge about the relations between food and health	2.23	2.45	2.25
29. Information through the media is provided in a way that is easy to grasp and understand	2.32	3.15	3.0

Table 9 shows the respondents' relations to healthy living. As can be seen in the table, the respondents in cluster 1 are those who are most positive towards eating and living in a healthy way. They are strongly disagreeing with statements such as: "The relationship between food and health is exaggerated" or "It has become more difficult to take responsibility for one's health". Compared to the other clusters the respondents disagree much more with statements saying (for example) that "Healthy food is expensive", "Healthy food is difficult to obtain" or "Cooking healthy food demands more effort". This suggests that they think it is fairly easy to eat right.

As shown in table 10, respondents in cluster 1 have a somewhat contradictory relation to foreign food and globalization. They, more than the others, agree that too little is known about health risks with foreign food, and they agree that globalization leads to bigger health risks. However, they also disagree (more than the others) with statements such as: "Global commercial interests are controlling the information we receive about healthy food and its effects on health to a larger extent" or "The politics also controlling the Finnish supplies of food are entirely in the hands of global actors and consortiums". In conclusion, the respondents in cluster 1 show a fairly strong confidence in their capability of managing information and to maintain a healthy life.

Cluster 2 (Careful attitude)

The respondents in cluster 2 (n=20) are mostly of the opinion that too much health information is provided in the media, and because it is often contradictory it makes it more difficult to know what really is good for one's health. This can be illustrated by – as shown in table 7 – the respondents' agreement with statements such as: "The large amount of information that reaches us today from all over the world makes it more difficult to know what is really healthy" or "Information concerning health and food is often filled with conflicts and/or is contradictory". They also disagree with this statement: "Information through the media is provided in such a way that is easy to grasp and understand".

As can be seen in table 8, the respondents in cluster 2 disagree with the statement that there is too much information about food and health, but they do think that there is too much frightening information both in the traditional and the modern media. When it comes to eating and living in a more healthy way the respondents in cluster 2 are somewhat negative and unsure, as they think that it has become more difficult to take care of one's own health, and as they also agree with the statement: "You have to know a fair bit about nutrition to be able to eat in a healthy manner". Those in the other clusters do not think the same, as table 9 shows. To some extent also the respondents think that eating in a more healthy way demands more money and effort.

Table 8. Mean points for statements on relations to the amount of information in the attitude clusters.
Point range is 1-5, 1= agrees strongly, 5= strongly disagrees.

STATEMENT	CLUS 1 (N=22)	CLUS 2 (N=20)	CLUS 3 (N=8)
3. There is too much sensational and frightening information about different food items in the traditional mass media	2.64	2.5	1.38
4. There is too much sensational and frightening information about different food items on the Internet	2.77	2.5	2.63
24. There is too much information about food and health	4.09	4.0	3.25
30.The media are effectively guarding health issues	3.0	2.8	2.63

Table 9. Mean points for statements related to the relations to healthy eating and a healthy lifestyle in the attitude clusters.
Point range is 1-5, 1= agrees strongly, 5= strongly disagrees.

STATEMENT	CLUS 1 (N=22)	CLUS 2 (N=20)	CLUS 3 (N=8)
5. The relationship between food and health is exaggerated	4.77	4.35	4.5
9. It has become more difficult to take responsibility for one's health	4.41	3.6	4.0
12. Healthy food is expensive	4.14	3.35	2.0
13. Healthy food tastes bad	4.77	4.65	4.13
14. The whole family seldom wants to eat healthy food	4.41	4.0	3.13
15. Healthy food is difficult to obtain	4.77	4.25	3.63
16. Cooking healthy food demands more effort	4.27	3.5	2.63
17. You become ill from "healthy" food	4.86	4.7	5.0
18. Healthy food is often of low quality	4.91	4.8	4.38
21. It is difficult to decisively influence one's own health	4.68	4.35	4.0
22. There are too many prejudices about food	2.73	2.3	3.13
28. You have to know a fair bit about nutrition to be able to eat in a more healthy manner	3.86	2.5	3.75

The respondents in cluster 2 are also fairly suspicious and insecure of foreign food, as they agree with the statement: "The politics controlling the Finnish supplies of food are entirely in the hands of global actors and consortiums". They also disagree with statements such as "Too little is known about health risks with foreign food" and "Global 'storms' around food and health (e.g. Mad Cow Disease) has little meaning for the Finnish citizen" more often than those in the other clusters, as seen in table 10. The respondents in this cluster are fairly insecure about their capability of managing information and healthy eating, compared to those in cluster 1.

Table 10. Mean points for statements related to the relations to foreign food and globalization in the attitude clusters.
Point range is 1-5, 1= strongly agree, 5= strongly disagree

STATEMENT	CLUS 1 (N=22)	CLUS 2 (N=20)	CLUS 3 (N=8)
7. Globalization has resulted in greater exposure to bigger health risks than before	2.09	2.55	1.63
10. Too little is known about health risks concerning foreign food	2.55	3.3	2.63
11. Foreign food is often subject to different controls concerning additives, hygiene and packaging than Finnish food	2.09	2.3	1.75
19. Global storms concerning food and health (e.g. Mad Cow Disease) have little meaning for the private Finnish citizen	3.5	3.75	3.25
23. Global commercial interests control the information we get about healthy food and their effects on health to a larger extent	2.64	2.35	1.75
25. The politics controlling the Finnish supplies of food are entirely in the hands of global actors and consortiums	3.18	2.65	2.88

Cluster 3 (Distrustful attitude)

The third cluster contains 8 respondents, who think that the information is difficult to understand and handle. As can be seen in table 7, members of cluster 3 agree with statements such as these: “Experts often change their opinion concerning what you should eat or avoid” or “It is difficult to put the advice you receive about different food items into practical eating habits” or “It is difficult to know what is most healthy in the enormous supply at the food store”. The respondents in cluster 3 are also more confused than the others by the variety of new and conflicting information.

In cluster 3, there is some trouble with the amount of information. The opinion that there is too much frightening information is strong, as is shown in table 8. More than the other clusters, these cluster members also think that there is too much information about food and health.

The perceived barriers to healthy eating distinguishes cluster 3 from the other clusters, when it comes to its relation to healthy living. As can be seen in table 9, the respondents agree that healthy food is expensive, and also to some extent that cooking healthy food means more work and that the rest of the family seldom wants healthy food. The respondents in cluster 3 also perceive more difficulties in obtaining healthy food than the others do.

Cluster 3 is the one which is most suspicious of foreign foods and globalization. In table 10, we can see that the respondents in cluster 3 agree with statements such as: “Globalization has resulted in a greater exposure to bigger health risks than before” and “Foreign food is often subject to different controls than Finnish food concerning additives, hygiene and packaging” and “Global commercial interests control the information we receive about healthy food and its effects on health to a larger extent”. Cluster 3, thus, seems to contain the respondents who are most distrustful and negative regarding information, globalization and healthy eating.

Following the presented attitudes, cluster 1 is hence referred to as the “confident cluster”, cluster 2 is called the “careful cluster” and cluster 3 the “distrustful cluster”. These attitude clusters will be included in the presentations of the information source clusters in the following chapters.

11.2.1.1. Summary

- Cluster 1, the confident cluster, contains respondents who are fairly confident in their ability to manage information and to maintain a healthy life.

- Cluster 2, the careful cluster, consists of people who are to some extent unsure about their capability of managing health information and who also are slightly unsure about healthy living and distrustful of foreign foods.

- Cluster 3, the distrustful cluster, contains people who are negative and most distrustful of information, globalization and healthy eating.

11.2.2. Opinions on health information in the professionalsí cluster

Attitudes towards health information and healthy lifestyle

When combining the attitude clusters presented in chapter 11.2.1 with the information source clusters, one finds that slightly more respondents in the professionals' cluster belong to the confident attitude cluster – where the respondents are confident in their ability to manage information and a healthy life – than to the careful cluster. The confident respondents are mainly diabetics diagnosed in the age range 10-18, and very interested in health information. Those in the oldest age group also strongly belong to this cluster. The relationship between being very interested and belonging to the confident cluster is strong in the chi-square analysis (χ^2=9.14, p=.058). Most of the rest are found in the careful cluster, whose respondents are less confident. Being careful is related to being between 28-35 years of age, and belonging to the control group. Only a small number of respondents are to be found in the distrustful cluster. They are mainly diabetics who were diagnosed in childhood.

Satisfaction with the provided information

Fractionally, more than half of the cluster members are satisfied with the information they are provided with, yet one-third are not satisfied, and the rest could not decide. The female respondents and those women pregnant for the second time, together with diabetics diagnosed during their teens, are the most satisfied. The ones who are not satisfied, mainly the men – those in the middle age group – and diabetics diagnosed in the age range 1-9 years, mostly want quality guarantees or information containing other things than those presented. The

quality guarantees are mostly thought to be information which is research-based, as shown by the following quotes:

> *[I want] professional knowledge, research information* (man with diabetes, b. 1969)

> *[I require] scientific, objective evidence* (pregnant woman, b. 1972)

To other content information which is desired are matters which interest the respondents personally:

> *[The information should be] directly aimed at the group (diabetics) so that you can follow it. Not the same shit you hear from other places. The information should be in such a form that you can also understand it, without strange terms* (man with diabetes, b. 1977)

Perceived feeling of safety

Members of the professionals' cluster feel safer as a result of the health information that they receive – safer than the members of other clusters. Over 70% of the respondents in this cluster answered that the information they receive gives them a feeling of safety. Finnish-speaking women, especially if pregnant for the second time, and diabetics diagnosed in adulthood, are among those who feel most safe. The most common reason for this is that the information they receive supports and confirms their existing knowledge and behaviour, and that it provides a basis for decisions, if they desire to change something. The following quote provides an example:

> *It gives confidence to your own actions and a basis if you want to make changes concerning nutritional matters* (man with diabetes, b. 1969)

It is important that the information helps them to understand what is healthy and what to prefer or avoid:

> *I learn new things, know how to take care of myself, eat right...* (woman with diabetes, b. 1975)

> *You can believe that a healthy babywill be born if you know what to avoid* (pregnant woman with diabetes, b. 1974)

Those who feel unsafe, due to new information, justify their answer by noting that more information is always needed; they do not believe that food alone affects health, and they think that information leads to unnecessary anxieties if the advice is not followed or if one finds that behaviour in the past might have been dangerous:

> *[I do not feel safe] because I do not follow [the information] well enough. You do not want to think about what you should do or how you should live all the time* (man with diabetes, b. 1977)

> *You obtain information on how you have done wrong things and how fatal it might be. I was in England in the 90's and ate beef* (pregnant woman, b. 1978)

Perceived influence of information

Almost two-thirds of the respondents in the professionals' cluster think that they have been influenced by some health-related information in the media. This is as large a share as in the everyday information cluster, but a much smaller one than in the popularized science cluster. Respondents aged 36-42 years, who belong to the group of women pregnant for the first time, are those most influenced, as are those diabetics diagnosed between 10-18 years of age. Information about poisons in food, especially dioxin in fish, or other things that cause risks during pregnancy have influenced the largest share of respondents, which is not surprising since pregnant women are most influenced. These risks are followed by other risk information such as that about BSE and genetically manipulated foods. Information about biologically grown food and about other health behaviour, such as smoking and physical exercise, has influenced a couple of respondents. The information has influenced pregnant women so that they avoid eating foods that might be harmful during their pregnancy:

> *I have avoided eating Baltic herring, and I am going to avoid it as much as possible to the end of my pregnancy* (pregnant woman with diabetes, b. 1974)

The information about BSE and genetically modified food has made some respondents more careful, preferring domestic meat and generally thinking about what they buy:

> *You check carefully what you buy. You want to avoid genetically modified products. It is not known what influence such products have in the future* (man with diabetes, b. 1959)

Others have been thinking, for example, about stopping smoking, or have changed their eating habits. The one-third who claim that they are not influenced by information, consist mostly of men and control group members. Concerning diabetics, it is interesting to note that those diagnosed at an older age are less influenced by information than those who were diagnosed earlier in life.

The professionals' cluster is most influenced by threatening information in the media. Almost three-quarters of the respondents think that they have been influenced. Feeling threatened seems to be more common among the men, the control group members and the first-time pregnant women, and students. When the respondents were asked to rank different kinds of threats, it was shown that physical threats to one’s health or well-being are perceived to be the most unpleasant by the vast majority, while threats to personality, relations and position are the least unpleasant. More than one-quarter of the respondents mostly dislike threats to what they know and believe in.

Opinion on information sources

The professionals' cluster is critical of information provided by certain information sources; the majority of the respondents are of the opinion that information in some information sources is both doubtful and contradictory. According to this cluster, the sources considered most doubtful are advertisements on television followed by advertisements in newspapers and magazines. Fictitious sources such as television series and works of fiction are also quite often considered doubtful. Printed advertisements surpass television commercials as sources perceived to contain contradictory information, and these in turn are followed by fictitious television series.

Summarizing the characteristics

The professionals' cluster shows the following characteristics:

- The respondents are more frequently found in the confident attitude cluster than in the careful attitude cluster.
- Members of this cluster are mostly satisfied with the received information about food and health.
- Because of new information, the respondents feel safer than those in the other clusters.
- The respondents are less influenced by information in the media than are those in the popularized science cluster, but are still more influenced by threatening information than those in the other clusters.
- The respondents are more critical than the other cluster members against some information sources.

Table 11 furthermore shows a summary of the demographic characteristics of the cluster members which are most typically linked to the opinions on and relations to health information presented in this chapter. The variables are mentioned in a random order.

Table 11. The demographic variables which are most typical for each of the opinions/relations in the professionals' cluster.

Professionals' cluster	
Being in the confident attitude cluster: - Aged 36-42 years - diabetes diagnosed between the years 10-18	Being in the careful attitude cluster: - aged 28-35 years - control group member
Being in the distrustful attitude cluster: - diabetes diagnosed between the years 1-9	
Most satisfied with information: - woman - pregnant for the 2nd time or further - diabetes diagnosed between the years 10-18	Least satisfied with information: - man - aged 28-35 years - diabetes diagnosed between the years 1-9
Feels most safe due to information: - woman - Finnish-speaking - pregnant - pregnant for the 2nd time - diabetes diagnosed between the years 19-26	Feels least safe due to information: No clear profile
Most influenced by media information: - aged 36-42 years - pregnant for the 1st time - diabetes diagnosed between the years 10-18	Least influenced by media information: - man - control group member
Most influenced by threatening information: - man - control group member - pregnant for the 1st time - student	Least influenced by threatening information: No clear profile

11.2.3. Opinions on health information in the popularized science cluster

Attitudes towards information and information sources

Putting the source clusters into the attitude clusters presented in chapter 11.2.1 shows that half of all the respondents in the popularized science cluster are found in the confident attitude cluster, which contains people who have the strongest confidence in their ability to manage health information and to live in a healthy way. Almost all the rest are in the careful cluster. Only a very small percentage of people belong to the distrustful cluster, in which the respondents think that there is both too much information and that eating in a healthy way is difficult. This makes the popularized science cluster the most confident one. Belonging to the confident cluster seems to be linked to being diabetic or having been previously pregnant, as well as having office or service work. The respondents in the careful cluster have no clear demographic profile.

Satisfaction with the received information

Half of the respondents in the popularized science cluster are satisfied with the information they receive. This is most common among the students, the diabetics and among the women who were pregnant for the second time or further, while women expecting their first child are among the one-third who are dissatisfied. The dissatisfied respondents mostly wish for quality guarantees, followed by more information and other content. The quality guarantees are mostly defined as something based on research:

> *[I] want more references to the research the information is taken from, so that I can check these myself* (pregnant woman, b. 1971)

A couple of respondents also wish that issues would be discussed from different angles, and that minor events would not make such big headlines. The other types of content asked for are either of personal interest, things concerning a vegetarian diet, or more general things about healthy eating.

Perceived feeling of safety

Only half of the cluster members think that the information they receive makes them feel safe. This cluster is, thus, the one that feels least safe. Feeling safe is nked to being a pregnant

woman and aged 28-35 years, while the diabetics and those in the youngest age group do not feel safer because of information. The most important reason for feeling safe is that the received information helps someone to know what is unhealthy and what to avoid. The second most important reason is that it helps someone to know what is healthy and what to prefer:

> *If you read some information somewhere you know what you should eat. If it says, for example, that carrots are poisonous you can avoid eating them* (pregnant woman b. 1980)

For a couple of respondents, the information confirmed that their present behaviour is right. Those who do not feel safe, on the other hand, claim that the information is insufficient, or you need to know more, or you do not always know if you can trust the information. The received information is also perceived as frightening:

> *Knowledge increases pain* (pregnant woman, b. 1971)

> *Too much information is bad; you become more hysterical* (pregnant woman, b. 1970)

For a couple of respondents, the information is perhaps useful, but it does not increase the feeling of safety. According to one person, it results in a bad conscience if recommendations are not followed.

Perceived influence of information

Three-quarters of the respondents had been influenced by some information in the media, which was more than in the other two clusters. Respondents from the middle age group, highly educated respondents, and control group members are among those most influenced. Quite interestingly, women expecting their first child are less influenced than those who were previously pregnant. Information about BSE, fat, and eating in a healthy manner are the most commonly mentioned topics that have had an influence on the respondents. The risk of BSE has made several respondents avoid or at least decrease their eating of meat or other animal products such as gelatine, while information about how vegetable fat is better than animal fat has led to an increased use of vegetable fat. Advice about eating correctly, on the other hand, has caused the respondents to think more about their eating habits. A couple of pregnant

women mentioned that they had been influenced by information about certain risks for pregnant women, such as listeria or too much A-vitamin in foods. As a result they are avoiding foods that could contain these:

> *I check that the meat I buy is Finnish; [I] avoid eating liver, also blue cheese* (pregnant woman, b. 1970)

Information on artificial ingredients and additives has influenced a couple of respondents, who now try to avoid these things. According to some respondents the information received has not influenced their behaviour, but has strengthened opinions that they have already had before. In one case, information about eating in a healthy way made the respondent very confused:

> *[It is] confusing. [You] do not know how to build your own diet so that it is balanced yet light* (woman in the control group, b. 1974)

Two-thirds of the subjects think they are influenced by threatening information. These are mainly women in the middle age group, who are engaged in studying. Those threats most commonly perceived as the worst are physical threats to one's health, looks and one's well-being. Those threats perceived as least terrible are those which seem to be to what one knows and believes in. Then follow threats to one's personality and relations.

Opinion on information sources

Almost half of the respondents in the popularized science cluster are of the opinion that information from some sources is both doubtful and contradictory. A quarter of the respondents consider it doubtful. These respondents cannot be clearly profiled. Some women, pregnant for the second time or further, consider some information contradictory. According to the this cluster, the most doubtful source is commercials in newspapers and magazines, followed by television commercials. Foreign and domestic television series and Web advertisements are often mentioned too. A couple of respondents consider works of fiction and informal sources such as discussion forums and family and friends as doubtful. Commercials on television surpass commercials in magazines and newspapers as containing contradictory information. These are followed by Web commercials in third place. In addition to this, a couple of respondents obtained contradictory information from discussion programmes on television and discussion forums on the Web, as well as from weekly magazines and family and friends.

Summarizing the characteristics

In the popularized science cluster, the respondents show the following characteristics:

- This cluster is the most confident one, with reference to the attitude clusters.
- The respondents feel less safe with new information than do those in the other clusters.
- The cluster is most influenced by media information.

Table 12 shows a summary of the demographic characteristics of the cluster members most typically related to the opinions on and relations to health information presented in this chapter. The variables are not mentioned in any particular order.

Table 12. The demographic variables which are most typical for each opinion/relation in the popularized science cluster.

Popularized science cluster	
Being in the confident attitude cluster: - diabetic - pregnant for the 2nd time or further - office/service work	Being in the careful attitude cluster: No clear profile
Most satisfied with information: - diabetic - pregnant for the 2nd time or further - student	Least satisfied with information: - pregnant for the 1st time
Feels most safe because of information: - pregnant - aged 28-35 years	Feels least safe because of information: - aged 20-27 years - diabetic
Most influenced by media information: - aged 28-35 years - control group member - pregnant for the 2nd time or further - highly educated	Least influenced by media information: No clear profile
Most influenced by threatening information: - woman - aged 28-35 years - student	Least influenced by threatening information: No clear profile
Considers information as only doubtful: No clear profile	Considers information as only contradictory: - pregnant for the 2nd time or further

11.2.4. Opinions on health information in the everyday information cluster

Attitudes towards information and information sources

When combining information source clusters and attitude clusters (presented in chapter 11.2.1), it was found that slightly more respondents in the everyday information cluster are found in the careful attitude cluster, where the respondents are somewhat more unsure about their capability of managing information and a healthy life than in the confident cluster. This makes the everyday information cluster the least confident one. Those in the confident cluster are all women, mainly aged 20-27 years. Being in the careful cluster is linked to being a man and being Finnish-speaking. These people are also fairly interested in health information.

Satisfaction with the received information

In the everyday information cluster, as many respondents are satisfied as are dissatisfied with the information provided. The percentage of satisfied respondents is smaller than in the other clusters, however. Respondents in the middle age group and the control group members are the most satisfied, while the youngest ones together with the men are the most dissatisfied. Interestingly, all the respondents who are dissatisfied are only mildly interested in health information. The majority are fairly active information seekers. As in the other clusters, those who are mostly dissatisfied want either quality guarantees or other content, and to some extent also, more information. This is surprising since none of the respondents who are dissatisfied, are very interested in health information. Sensationalism in reporting is something on which some people commented:

> *[I want] more facts, for example about BSE, [information that is] not so sensational* (pregnant woman, b. 1976)

Other types of information desired are of a more general nature: one respondent desired everything known about BSE to be thoroughly reported; another felt that the information should be more realistic, with examples from real situations.

Perceived feeling of safety

Almost two-thirds of the respondents answered that the information they obtained makes them feel safe. Feeling safe is most common among those from the youngest age group, the Finnish-

speaking, the highly educated, those in office work and the control group members. The most important reasons for feeling safe are that the obtained information helps in knowing what to avoid and that it confirms that their own behaviour and own thoughts are correct. In addition to knowing what to avoid, the information also helps to know what to do to stay healthy. Those who feel unsafe after receiving information are mainly Swedish-speaking. They think that the information is frightening and everything seems to be dangerous:

> *No matter what you eat, it contains additives, poisons, is carcinogenic and so on* (man in the control group, b. 1970)

Other respondents think that the received information is insufficient, or they are reluctant to believe the information; they do not think that the relationship between food and health is that strong, or they think that they already know enough.

Perceived influence of information

Almost two-thirds of the members of the everyday information cluster have been influenced by some information in the mass media. The most influenced are the male respondents from the middle age group, followed by pregnant women expecting their second child. Working in offices or with service work has also some connection to being more influenced by health information in the mass media. People only slightly or somewhat interested in health information are also influenced by information in the mass media. Apparently one does not need to be interested to be influenced. The most common influencing information concerns BSE, which led several peoples to avoid beef or, at least, to decrease their consumption of it and to prefer domestic meat instead:

> *I have decreased my intake of beef, and I always strive to choose domestic meat* (pregnant woman, b. 1973)

Other information, such as diet-related advice and information on tobacco or other health risks, has either made the respondents eat in a more healthy way or avoid things that could be dangerous. The youngest respondents – students – are those least influenced.

The everyday information cluster is least influenced by threatening information, with only slightly over half of the respondents thinking they are influenced. Being influenced is most

common among Finnish-speaking control group members, women who were previously pregnant and those doing office or service work. According to this cluster as well, the worst threat is the physical, meaning the threat to one's own health and well being. The least terrible threat is that to one's own personality and personal relations. The male respondents, the diabetics, and those expecting their first baby, are least influenced.

Opinions on information sources

The everyday information cluster is the least critical one in the sense that only one-third of its members think that some sources are both doubtful and contradictory. Those who think that information in some sources is only doubtful, and those who think it is both doubtful and contradictory are equal in numbers. Those who are highly educated and do office or service work think that information is only doubtful. A slightly smaller percentage alone, having no clear profile, considers the information contradictory. Commercials are considered the most doubtful, and, of these, advertisements on television are more doubtful than advertisements in newspapers or magazines and advertisements on the Web. Entertainment programmes on television, together with weekly magazines and magazines and books on health and well being, are considered doubtful by a couple of respondents each. The answers as to which sources are contradictory are varied; the only sources which are mentioned by more than one person are television news or radio, and commercials on television and on the Web. The fact that the news is mentioned is quite interesting, as those who obtain most of their information from this source also seem most critical of them.

Summarizing the characteristics

In the everyday information cluster, the following characteristics are found:

- The respondents are more often found in the careful attitude cluster than in the confident attitude cluster.
- The respondents are least satisfied with the received information on food and health.
- Most of the respondents have been influenced by media information, yet threatening information influences this cluster the least.
- This cluster is less critical towards certain information sources than those in the other clusters.

Table 13 shows a summary of the demographic characteristics of the cluster members, which are most typically related to the opinions on and relations to health information presented in this chapter. The variables are not mentioned in any particular order.

Table 13. The demographic variables which are typical for each opinion/relation in the everyday information cluster.

Everyday information cluster	
Being in the confident attitude cluster: - aged 20-27 years	Being in the careful attitude cluster: - man - Finnish-speaking
Most satisfied with information: - aged 28-35 years - control group member	Least satisfied with information: - man - aged 20-27 years
Feels most safe as regards information: - aged 20-27 years - control group member - Finnish-speaking - high level of education	Feels least safe as regards information: - Swedish-speaking
Most influenced by media information: - man - aged 28-35 years - pregnant - pregnant for the 2nd time or further - office/service work - high level of education	Least influenced by media information: - aged 20-27 years - student
Most influenced by threatening information: - Finnish-speaking - control group member - office/service work - pregnant for the 2nd time or further	Least influenced by threatening information: - man - diabetic - pregnant for the 1st time
Considers information to be only doubtful: - high level of education - office/service work	Considers information to be only contradictory: No clear profile

11.2.5. Summary

- The respondents in the professionals' cluster are slightly more often found in the confident attitude cluster than in the careful cluster. Little more than half of the respondents are satisfied with the information that they receive on food and health, which makes this cluster the most satisfied one. Those who are dissatisfied, want quality guarantees and other content most of all. The members of the professionals' cluster feel safer (as regards information) than the others, when it confirms and supports their knowledge and behaviour. Together with those in the everyday information cluster, these respondents claim to be least influenced by media information. Risk information has influenced these respondents the most. However, this cluster has been most influenced by threatening information. The cluster is also more critical of information from certain sources, mainly advertisements on television and in the press.

- The popularized science cluster contains the largest share of respondents belonging to the confident attitude cluster. Half of the respondents are satisfied with the received information. Those who are not satisfied want, like those in the other clusters, quality guarantees that the information is, for example, research based. However, these respondents also want more information and more content. This cluster is the one feeling least safe due to receiving new information. Those respondents who feel safe say that they do this because the information helps them to know what to avoid and what to prefer. Feeling unsafe is, on the other hand, linked to a feeling that the information is insufficient, and that it is frightening and not always trustworthy. The respondents think that they are more influenced by information in the media than those in the other two clusters. Information concerning BSE, fat and healthy eating issues are the most influential. This cluster differs from the others by considering printed advertisements more doubtful than commercials on television.

- The everyday information cluster is the least confident and the one least satisfied. Once again, quality guarantees are sought mostly by the dissatisfied respondents. The cluster members, however, do feel quite safe with new information, when it both helps them to know what to avoid and also confirms their own behaviour. The majority of respondents have been influenced by media information, particularly concerning BSE, yet this cluster

is least influenced by threatening information. The cluster is, furthermore, least critical of some information sources. Here also, television advertisements are considered most doubtful. Finally, this is the only cluster which mentions news on television as providing contradictory information.

11.3. Knowledge and health behaviour

The respondents were asked about their perceived knowledge on food and health, and were tested on their existing knowledge (Appendix 2, questions 20-21, 23, 36-38, 43, 45-48). Existing knowledge was tested partly by asking the respondents to recall certain information they had read or heard about, partly by means of three knowledge question parts. Chi-square analyses between the source clusters and the three knowledge tests showed no stronger relations between the source cluster and the two first knowledge testing parts, although having low points in both test parts was most common in the professionals cluster and having medium or high points was most common in the popularized science cluster. A significant relationship was found, however, between the source clusters and the test in which the respondents were asked to indicate how to live in a healthy way through their healthy day story (χ^2=9.56, p=.048). Having a mediocre/good or excellent story was linked to being in the popularized science cluster, while having a weak story was most common in the everyday information cluster and almost as common in the professionals' cluster.

The respondents were asked about health and health behaviour by means of several different questions. They were questioned on how much they think they can control their health, how well they take care of their health, whether they follow recommendations on healthy eating, their perceived health level, and perceived motives for and barriers to changing their eating behaviour. They were also asked about their use of tobacco and alcohol, their engagement in physical exercise, their eating behaviour and possible recent changes in their eating and health behaviour (Appendix 2, questions 29-35, 39-42, 44).

11.3.1. Knowledge in the professionals' cluster

Perceived knowledge

The professionals' cluster members seem to have less confidence in their own knowledge than those of the other clusters. Although almost two-thirds of the respondents in the professionals' cluster think that their knowledge about food and health is good or excellent, this percentage is

smaller than in the other clusters. Those aged 36-42 years, those working in offices, people with diabetes (especially if diagnosed between 10-18 years of age), and the women expecting their first child are the most confident. Furthermore, those most interested believe that their knowledge is good. Interestingly, the majority of diabetics who were diagnosed as children, are those who think that their knowledge is only mediocre. The same goes for the control group members. Almost 70% of the respondents think that their knowledge is enough for their own needs. This is less than in the other two clusters. Pregnant, Finnish-speaking women and diabetics diagnosed in their adolescent years are those most convinced that their knowledge is enough, while those diabetics diagnosed when children and the male respondents are most unsure about their knowledge being sufficient.

Recall of certain information

Almost all respondents claimed to remember a specific article or some specific information that they have either read or heard. The information most seen or talked about is BSE, followed by other health risks such as dioxin in fish or listeria. A couple of respondents mentioned functional foods; the rest of the mentioned topics vary a lot, but most are about vitamins or other nutritive substances. Some answers only generally indicate what the topic was about. Others also explain in greater detail when something is good or bad:

> *The margarine Benecol is good against cholesterol* (man with diabetes, b. 1959)

> *[It was about] the uptake of iron, how vitamin C makes it easier, and also something about calcium* (pregnant woman, b. 1978)

The vast majority of respondents had either read about or seen the mentioned information in a newspaper or during the news on television. The next most often quoted sources were magazines, leaflets and family members.

Measured knowledge

One-fifth of the cluster members gained high points on the first part of the knowledge test, but over 40% had low points. This was the largest share of all the clusters. Those who obtained most of their health knowledge from health professionals, seemed to have the weakest knowledge concerning food and health. A closer look at those who gained low points shows

that this is most common among the oldest respondents and among the diabetics who were diagnosed in early childhood. Low points are also linked to being only fairly active at seeking health information. Those with high points could not be clearly profiled, but they are all Finnish-speaking and very active seekers of information. The chi-square analysis strongly showed too that those speaking Finnish are more knowledgeable than those speaking Swedish (χ^2= 5.84, p=.054).

In the second part of the test, only one-tenth of the respondents had high points, but almost half of them had medium points. Over 40%, however, had low points, which is a much larger percentage than in the other clusters, and the knowledge of members of this cluster is also weaker according to this test. Low points in the second part of the test is linked to being in the oldest age group, being in the control group, being Swedish-speaking and having been diagnosed with diabetes in early childhood. Those with high points are too few to be clearly profiled.

In the story part, over half of the respondents told a weak story. However, one-fifth also told an excellent story, a percentage which is higher than in the other clusters. Having told a weak story is related to being in the middle age group and having a high education. Most of the respondents with the weak stories are also only fairly interested and active in seeking health information. The respondents who told an excellent story show no clear profile.

Summarizing the characteristics

The respondents in the professionals' cluster show the following characteristics concerning knowledge:

- The cluster members are least confident in their existing knowledge.
- The respondents most often think that their knowledge is insufficient.
- The level of knowledge was the weakest in the detailed knowledge tests.

Table 14 provides a summary of the demographic characteristics of the cluster members, which are most typically linked to the beliefs and knowledge levels presented in this chapter. The variables are ordered randomly.

Table 14. The demographic variables which are most typical for each belief/knowledge level in the professionals' cluster.

Professionals' cluster	
Perceives knowledge to be good: - aged 36-42 years - diabetes diagnosed between the ages of 10-18 years - pregnant for the 1st time - office work	Perceives knowledge to be mediocre: - control group member - diabetes diagnosed between the ages of 1-9 years
Thinks knowledge is enough for own needs: - woman - pregnant - Finnish-speaking - diabetes diagnosed between the ages of 10-18 years	Does not think knowledge is sufficient: - man - diabetes diagnosed between the ages of 1-9 years
High points in knowledge test part 1: No clear profile	Low points in knowledge test part 1: - aged 36-42 years - diabetes diagnosed between the ages of 1-9 years
High points in knowledge test part 2: No clear profile	Low points in knowledge test part 2: - aged 36-42 years - control group member - Swedish-speaking - diabetes diagnosed between the ages of 1-9 years
Excellent story: No clear profile	Weak story: - aged 28-35 years - highly educated

11.3.2. Health behaviour in the professionals' cluster

Controlling and taking care of one's health

The members of the professionals' cluster are least confident in their ability to control their own health and to take care of themselves. Only about half of the respondents think they can control their own health well. Characteristics related to thinking that health can be controlled well include being in the oldest age group, and having diabetes diagnosed between the ages 10-18 or 19-26 years. Pregnant women (especially if pregnant for the first time), diabetics diagnosed in early childhood, and students think that health can only be controlled to some extent.

Of the respondents in the professionals' cluster, only slightly over 1/3 think they take very good care of their health. Believing that you take good care of your health is somewhat more common among those aged 28-35 years, and diabetics diagnosed in their teens or as adults. The men, the youngest respondents, those belonging to the control group, diabetics diagnosed as small children, students and those expecting their first child are among those taking only some care of their health.

Following recommendations

Almost two-thirds of the cluster members still often follow the recommendations they receive on what to eat, although they do not think that they take good care of their own health. This number is much larger than in the other clusters. Following recommendations is most common among the women, those in the youngest and oldest age groups, and those speaking Finnish. Women pregnant more than once and diabetics diagnosed in the 10-18 years age range are more eager to follow recommendations. With them, being very interested in health information is also related to following recommendations. Men and control group members seem to be the least eager to follow recommendations.

Perceived health

Over two-thirds of the cluster members perceive their present health situation to be good. The percentage of respondents who think that their health is only mediocre is, however, larger than in the other two clusters. Those in the middle age group, pregnant women who were previously pregnant, and diabetics diagnosed in the age 19-26 years, as well as highly educated respondents perceive their health as good. Thinking the opposite – that one's health situation is only mediocre – is most common among the oldest respondents and diabetics diagnosed as young children.

Current health and eating behaviour

The professionals' cluster members use tobacco products the most. One-fifth use tobacco, at least several times a week. No clear profile is found, but the smokers are mostly diabetics diagnosed between the ages of 10-18 years. The chi-square analysis also showed a significant relationship between health status group (diabetic/pregnant/control group) and tobacco use (χ^2=6.29, p=.043). Thus, diabetics are most inclined to smoke. A look at the knowledge levels of the smokers shows that they did not do very well in the first, more general knowledge part of the test in the questionnaire, but in the clustering part and in the story-telling they were fairly

good. A fairly good knowledge of how to live in a healthy manner still does not seem to prevent them smoking. Half of the smokers smoke very moderately, using on average under 4 cigarettes a day/time; the other half use over 10 cigarettes. Men, respondents aged 28-35 years, Finnish-speakers, and those working in offices smoke the least.

Three-quarters of the respondents in this cluster use alcohol, and they use it more often than in the other clusters; almost one-third use it on a weekly basis. Most use on average three or less restaurant doses of alcohol on each occasion, but quite a large proportion of these alcohol users use over six doses of alcohol. Larger amounts of alcohol are more common among the men, people with diabetes diagnosed in adulthood, Swedish-speakers and those who have a medium level of education. Those not using alcohol are all Finnish-speaking, pregnant women, most of them expecting their first child. The chi-square analysis showed also a strong relationship between being a woman and not using alcohol (χ^2=3.53, p=.06). There is a significant relationship between being pregnant (χ^2=30.74, p=.001) being Finnish speaking (χ^2=9.92, p=.002) and not using alcohol. The knowledge level among the alcohol non-users is fairly good concerning the knowledge test parts in the questionnaire, but their stories are mostly weak. The non-use of alcohol, however, does not seem to be related to one's level of knowledge, but rather to the other variables mentioned above.

The professionals' cluster is somewhat better at physical exercise than those in the other clusters; all but one respondent engaged in physical exercise. The number of daily exercisers, however, is smaller than in the other clusters. Men, respondents in the middle age group, control group members, Swedish-speakers, highly educated respondents, and diabetics diagnosed as children or grown-ups exercise only weekly. When they exercise, the cluster members are more persistent than the others; they use on average between one and one-and-a-half hours for this. The respondents in this group clearly prefer outdoor exercise such as walking, biking, jogging and different kinds of ball sports. Of the indoor activities, aerobics and fitness training are most common.

Well-being is the reason most mentioned for physical exercise; the respondents feel or want to feel good. The desire to get into shape or remain in shape is also a common reason, followed by thoughts that exercise is good for one's health. For the diabetics, it is necessary for controlling the blood sugar level. Some respondents think it is nice to exercise and that it improves your strength, helps control weight, and relieves stress. One young, pregnant woman

claims to be too lazy to exercise at all. She is also not very knowledgeable. Her knowledge is at a medium level in the two knowledge-testing parts in the questionnaire, and her story is weak.

All but one respondent in the professionals' cluster, a young pregnant woman with a fairly weak knowledge level, have rules of thumb for eating. The most common rules are avoiding fat, and eating regular meals, fruits and vegetables. Having moderate meals and checking the content of carbohydrates in the food are also often mentioned by diabetics. Having a varied diet, eating fibres, and avoiding salt and sugar or sweets are also mentioned. A couple of respondents also avoid meat. Rules mentioned by only one respondent each include: drinking water, using milk products, following the balanced diet chart, following a strict diet and eating what tastes good. Some of the rules of thumb in the professionals' clusters are as follows:

> *[I eat] varied foods, regularly; no unnecessary fat and salt* (pregnant woman, b. 1974)

> *[I try] to eat fruit at each meal; eat as little fat as possible. If you eat fat it has to be fluid (oils); avoid sweets* (woman with diabetes, b. 1974)
> *[I] eat enough but not too much* (man with diabetes, b. 1977)
> *I do not eat red meat at all; I'm counting carbohydrates* (woman with diabetes, b. 1981)

Changes in health and eating behaviour

Three-quarters of the respondents in the professionals' cluster have changed their health behaviour during the last year. The same number have changed their eating behaviour, and the respondents in this cluster have done this to a greater extent than those in the other clusters. Men have been more eager than women to change their health behaviour and change is more common among the control group or the pregnant women who are expecting their second child, than among diabetics. However, those diabetics who were most recently diagnosed have also been active at changing behaviours. Finnish-speakers, too, and office workers and those in the middle age group have modified their behaviour more, while the oldest respondents have changed their behaviour the least. The most common results of change are lessening the use of alcohol and exercising more. Stopping smoking comes next. Yet, the opposite is almost as common: the use of more alcohol and less exercise. One person has also started smoking again after several years of quitting. In some cases, the type of exercise has changed. Health issues,

followed by pregnancy and different family situations, are the most common reasons for improved health behaviour, as shown by the following quotes:

> *Orders from my wife-to-be* (man with diabetes, b. 1969, has stopped smoking)

> *Because of my first child, [I] have started to make different choices* (pregnant woman, b. 1975, has stopped smoking, uses less alcohol, has increased exercise)

Those who have started to smoke or use more alcohol can often not explain why. The reason for exercising less is explained by not having the motivation to exercise and irregular working hours.

Those who have changed their eating behaviour are mainly young, students, control group members or pregnant women (pregnant for the first time), or diabetics diagnosed when they were young children. On the other hand, those in the middle age group have not changed their eating style. The most common change in eating behaviours is to eat more vegetables or even to switch to a vegetarian diet. Avoiding fat, foods possibly containing health risks and sweets together with eating a more varied diet are other changes reported by several respondents. Trying to eat in a more healthy and regular way is mentioned occasionally, but sometimes the change has resulted in more irregular meals. The main reasons for changes in eating behaviours are pregnancy, a wish to be healthier, and weight control. Stomach problems, fear of BSE, and either liking or disliking certain foods are some of the other reasons. Lack of time is mentioned as a reason for eating more irregularly. Interestingly, knowledge is usually quite weak in all the knowledge tests among the minorities that have neither changed their behaviour nor their eating.

Perceived motivations for and barriers to changing eating behaviours

Not surprisingly, the vast majority of respondents think that a person has to become ill to make changes in his or her diet. Orders from doctors, weight loss and information provision are other commonly mentioned reasons:

> *If the doctor gives a diagnosis, that means that you have to change your eating habits; deteriorated state of health that leads to realising that you should change and if you want to lose weight* (woman with diabetes, b. 1975)

Referring to a doctor is quite natural, while health professionals are the most used and trusted information sources in this cluster. The major reason for not changing eating habits in this cluster is thought to be lack of motivation; people do not care to make changes. Old habits are also quite commonly used reasons, as is lack of knowledge, right ahead of laziness:

> *If the change is perceived as problematic, they do not know how to do it* (pregnant woman, b. 1975)

> *Stress, laziness, prejudices* (man with diabetes, b. 1959)

Summarizing the characteristics

In the professionals' cluster, the most typical characteristics concerning health behaviour are:

- The respondents are least confident in the possibility of their controlling their own health.
- The cluster members think that they take less care of their health than those in the other clusters.
- The respondents rate their health lower than do those in the other clusters.
- The respondents follow recommendations on eating more frequently than the others.
- The use of tobacco and alcohol is more frequent than in the other clusters.
- Exercise is reported more frequently than in the other clusters.
- The cluster has rules for eating more often than the other clusters.
- Most of the cluster members have changed their health and eating behaviours recently.

Table 15 shows which demographic characteristics of the cluster members are most typical for each belief and health behaviour variable. The variables are not ordered in any particular way.

Table 15. The demographic variables which are most typical for each belief/behaviour in the professionals' cluster.

Professionals' cluster	
Thinks health can be well controlled: - aged 36-42 years - diabetic - diabetes diagnosed in the age range 10-18 - diabetes diagnosed in the age range 19-26	Thinks health can be controlled to some extent: - pregnant - pregnant for the 1st time - diabetes diagnosed in the age range 1-9 - student
Takes good care of his/her health: - aged 28-35 years - diabetes diagnosed in the age range 10-18 - diabetes diagnosed in the age range 19-26	Takes only some care of his/her health: - man - aged 20-27 years - control group member - pregnant - pregnant for the 1st time - diabetes diagnosed in the age range 1-9 - student
Follows recommendations the most: - woman - aged 36-42 years - Finnish-speaking - pregnant - pregnant for the 2nd time - diabetes diagnosed in the age range 10-18	Follows recommendations the least: - man - control group member
Perceives health as being good: - aged 28-35 years - pregnant - pregnant for the 2nd time - diabetes diagnosed in the age range 19-26 - high level of education	Perceives health to be mediocre: - aged 36-42 years - diabetes diagnosed in the age range 1-9
Uses tobacco the most: No clear profile	Does not use tobacco: - man - aged 28-35 years - Finnish-speaking - Office/service work
Uses alcohol the most: - man - Swedish-speaking - diabetic - diabetes diagnosed in the age range 19-26 - medium level of education	Does not use alcohol: - Finnish-speaking - pregnant - pregnant for the 1st time
Exercises most: No clear profile	Exercises least: - man - aged 28-35 years - control group member - Swedish-speaking - high level of education - diabetes diagnosed in the age range 1-9 - diabetes diagnosed in the age range 19-26
Has changed behaviour: - man - aged 28-35 years - control group member - pregnant - pregnant for the 2nd time - diabetes diagnosed in the age range 19-26 - Finnish-speaking - office/service work	Has not changed behaviour: - aged 36-42 years
Has changed his/her eating behaviour: - aged 20-27 years - student - control group member - pregnant - pregnant for the 1st time - diabetes diagnosed in the age range 1-9	Has not changed his/her eating behaviour: - aged 28-35 years

11.3.3. Knowledge in the popularized science cluster

Perceived knowledge

The popularized science cluster members are most confident in their existing knowledge and in knowledge being sufficient for their own needs. Three-quarters of the respondents in the popularized science cluster think that their knowledge about food and health is good; the rest perceive it to be mediocre. The male respondents, those in the middle age group, the diabetics diagnosed when very young, the pregnant women, and those having higher education and doing office or service work are the most confident in their knowledge. Most of the Swedish-speaking respondents think that their knowledge is only at a mediocre level. Nearly all cluster members think that their existing knowledge is enough for their own needs.

Recalling of certain information

Eighty percent of the respondents in this cluster can remember some article or information they have heard or read about. This is less than in the other clusters. Those best at remembering some information are the women, those pregnant for the second time, those in the middle age group, the Finnish-speaking and those with a high level of education, working in offices. While most of the respondents in this cluster are pregnant women, it is not surprising that health risks with food, such as listeria (which can harm the fetus) and BSE are the most commonly mentioned, together with information about eating well and eating functional foods. The used source also follows the information source profile of the cluster; almost half of the respondents have seen the mentioned information in magazines or books on health and well-being. The second most-mentioned are brochures – often brochures pregnant women have received from the maternity care centre – followed by information or news on television. Newspapers take fourth place.

Measured knowledge

A slight majority of the respondents have medium-high points in the first part of the knowledge tests. One-fifth have high points and the remaining 25% have low points, meaning that this cluster has the smallest percentage of respondents with low points. Knowledge about food and health is best in this cluster. It has gained most of its knowledge from literature on science in popularized form. The control group members and the Swedish-speaking respondents are quite well represented in the group of those with low points. They are at the most only fairly interested in health information, but still fairly active at seeking such information. Those with

high points cannot be clearly profiled but, however, they are either somewhat interested in information or greatly interested, and mainly active at seeking such.

In the second part of the test, more than one-third have high points, and slightly more have medium-high points. The share of low points is smaller than in the other clusters, so the knowledge level is higher in this cluster for the second test also. Among those with low points, the strongest demographic characteristic is being a man. This finding is supported by the chi-square analysis, which shows that gender is significantly related to knowledge points (χ^2=6.36, p=.042). Their interest in health information is strong or fair, and most are actually very active seekers. High points are related to having diabetes and working in offices. The interest is strong or fair, and most are very active at seeking health information.

In the storytelling part, as many as two-thirds make a good or mediocre story, but only 15% could tell an excellent story, a share lower than in the other clusters. On the other hand, only one-fifth have a weak story, which is much less than in the other clusters. The popularized science cluster, thus, seems to have the best knowledge on how to live a healthy life. For the respondents with a weak story no clear demographic profile could be found. They are, however, either somewhat interested in or very interested in, and active at, seeking health information. Those who told an excellent story, are both very interested in and very active at seeking information concerning food and health.

Summarizing the characteristics

The following characteristics are typical for the popularized science cluster:

- The respondents are most confident in both their own knowledge, and that knowledge being enough for their own needs
- The respondents have greater difficulties in recalling some specific information than those in the other clusters have
- The cluster does best in all three knowledge testing parts

Table 16 shows a summary of the demographic characteristics of the cluster members, which are most typically linked to the beliefs and knowledge levels presented in this chapter. The variables are ordered randomly.

Table 16. The demographic variables which are most typical for each belief/knowledge level in the popularized science cluster.

Popularized science cluster	
Perceives their knowledge as good: - man - aged 28-35 years - diabetic - diabetes diagnosed between the years of 1-9 - pregnant - office/service work - highly educated	Perceives their knowledge as mediocre: - Swedish-speaking
Recalls information best: - aged 28-35 years - pregnant - pregnant for the 2nd time or further - Finnish-speaking - highly educated - office/service work	Recalls information least: - aged 20-27 years - medium level education - student
High points in knowledge test part 1: No clear profile	Low points in knowledge test part 1: - control group member - Swedish-speaking
High points in knowledge test part 2: - diabetic - office/service work	Low points in knowledge test part 2: - man
Excellent story: No clear profile	Weak story: No clear profile

11.3.4. Health behaviour in the popularized science cluster

Belief in the possibility of controlling health

The popularized science cluster is the most confident in believing that it is possible to control your own health. Seventy percent of the respondents in the popularized science cluster think that it is possible to control their health. The rest think that it is possible to some extent. The men, the youngest respondents, the control group members, the students, and those speaking Swedish are most inclined to believe in the possibility of controlling health themselves.

Taking care of one's health and perceived health

This cluster is also most convinced that it takes good care of its own health; this is claimed by about two-thirds of the cluster's members. The male respondents, the Finnish-speakers, the

pregnant women expecting their second child, and the highest educated, take most care of their health. The Swedish-speakers and the control group members, on the other hand, are the least interested in taking care of their health. Over 80% of the respondents perceive that their present health is good, which is more than in the other clusters. Of these, the men, those from the middle age group, the diabetics and pregnant women, the highly educated, those doing service work, and those speaking Finnish, are most positive about their health.

Following recommendations

A slight majority of respondents in the popularized science cluster only seldom follow the recommendations they receive about healthy eating. Men, diabetics (especially if diagnosed in early childhood), those with a medium level of education, and women who were previously pregnant are among those who are not so eager to follow recommendations. Following recommendations is, on the other hand, most common among the students, and also among those with a high level of education.

Current health and eating behaviour

The popularized science cluster, which shows the best knowledge of how to live in a healthy manner, also has the best health behaviour concerning tobacco and alcohol use. Only one-tenth of the cluster members uses tobacco. These have a fairly weak knowledge level, but when they do use cigarettes it is only a few times or more a week. Two-thirds of the cluster members use alcohol – much less than in the other clusters – and almost all use it only a few times during the month, or less. Three-quarters of the users drink three restaurant doses or less each time. The rest, all Swedish-speaking female students in the control group, use up to six doses at a time. The non-users are mainly pregnant women with a high level of education. They are also doing office work. All of them are Finnish-speaking. According to the chi-square analysis, being a woman is strongly related to the non-use of alcohol (χ^2=3.53, p=.06), while being Finnish-speaking (χ^2=9.92, p=.002), pregnant (χ^2=30.74, p=.001) and having a high level of education (χ^2=10.0, p=.007) and doing office work (χ^2=11.55, p=.02) are significantly related to this behaviour. Knowledge, on the other hand, does not seem to be related, and the knowledge level among non-users is fairly low. Although the majority of pregnant women do not use alcohol, as many as one-third of them admit that they do. They do, however, stick to very small quantities.

The popularized science cluster members are slightly less eager to exercise than are those in the other two clusters. However, as many as ninety percent of the respondents in the popularized science cluster are engaged in physical exercise, though the majority only exercise a couple of times a week or more seldomly. The men and the diabetics, especially those diagnosed in early childhood, are most eager for daily exercise. The majority of respondents are engaged in walking; for some it is a sort of everyday exercise while they walk the dog. The second most common types of exercise are aerobics and gymnastics, followed by biking, jogging and everyday exercise such as cleaning, working in the garden or mushroom picking. Fitness training and swimming are also fairly common. Ball games, badminton, yoga and Nordic walking (walking with sticks) are other forms of exercise mentioned by several respondents. Health issues are claimed to be the most common reason for exercising, followed by the fact that it makes one feel better. A wish to remain in shape and to have physical strength and psychological, is fairly common, as is the wish to control weight. A couple of respondents said that exercise is enjoyable, that it is important for controlling diabetes and that it is good for one's looks. Some have several reasons, as the following quote shows:

> *Because of refreshing of the mind, relaxation, well-being and health; it is nice; habits, [I] have done it since I was small* (pregnant woman, b. 1970)

Those who do not exercise are both pregnant women. Their knowledge level is weak except when it comes to storytelling, which shows that they actually do know how to live in a healthy way. On the other hand, their knowledge does not seem to be related to lack of exercise, as the respondents claim lack of time and high-risk pregnancy. These women do, however, engage in everyday exercise such as walking, but they do not perceive these activities to be exercise.

Rules of thumb for eating are least common in the popularized science cluster. In this cluster, three-quarters of the respondents in the popularized science cluster have rules of thumb. The men, the control group members and the diabetics, those speaking Swedish, and those who are students – most of these have rules. The remaining quarter, having no rules, consists of pregnant women with a mediocre knowledge level. Avoiding fat and eating grain or other foods with high levels of fibres are the most common rules, followed by eating a varied diet, eating fruits and vegetables, avoiding sweets and drinking much. Eating moderately and regularly is also mentioned by a couple of respondents, together with following the balanced diet chart:

We eat fruits and vegetables every day; strive to avoid sweet things (sweets, biscuits, lemonade); regular meals; use grain products every day, try to use whole corn products (pregnant woman, b. 1966)

Avoid fat and spicy food; try to avoid eating more than necessary; try to eat varied food; drink enough water; avoid eating chocolate and pastries too often (woman in the control group, b. 1976)

Changes in health and eating behaviour

Seventy percent of the respondents have changed their health behaviour during the last years, which is slightly less than in the other clusters. Ten percent less have changed their eating habits. Those who have changed their behaviour are mostly female, young, Swedish-speaking, control group members, and students with a medium level of education. Those who have not changed their behaviour show no clear profile. Using less alcohol, or none at all, is mentioned by almost half of the respondents in the popularized science cluster who have changed their behaviour. Also common among the respondents, is a decrease in the smoking of tobacco. Some respondents used substances less as a result of pregnancy, but more commonly the reason given included health, increased age, and the family situation:

Health reasons; changed life situation; you become older, are not out every weekend like when you were eighteen (woman in the control group, b. 1976, uses less alcohol, has stopped smoking)

Fear of illness, [I] did not feel well; less often in the pub, less need to get drunk when you become older; do not manage to have a hangover when the late mornings have disappeared because of the children; less time for oneself (woman in the control group, b. 1966, has stopped smoking, uses less alcohol, and exercises less)

Several respondents also become less engaged in physical exercise, mostly due to lack of time. For one respondent the increased distance to work made travel by bike no longer an option.

Changing ones eating habits is most common among men, the youngest respondents, the Swedish-speakers, the control group members and the diabetics. Women pregnant for the second time, though, have not changed their eating habits. Eating more vegetables or even switching to a vegetarian diet is the most common change among eating habits, followed by avoiding fat, eating a more varied diet and thinking more about the intake of protein. Health matters is the most common reason for change, followed by pregnancy and ethical values leading to the stopping of meat eating:

> *I think it is more healthy, more ecological, more ethical - you do not have to take part in killing animals - and it was fashionable* (woman in the control group, b. 1974, has switched to a vegetarian diet)

The level of knowledge of the respondents who have neither changed their eating nor their health behaviour, is mostly at a medium level.

Perceived motivations for and barriers to changing eating behaviours

As many as three-quarters of the respondents consider illness or health problems the main reasons for changes in their eating habits. A weight problem is the second most common reason, mentioned by one-third. Pregnancy, health matters, illness among someone you know, and newer and more plentiful information follow these reasons. The fact that pregnancy is mentioned is quite natural, since the majority of respondents in the cluster are pregnant women. Furthermore, a couple of respondents mention their family situations and the risk of illness (unless changes are made), as motivating factors. The following quote serves as an example:

> *Problems with health, being overweight, illness, pregnancy and if you have a family* (pregnant woman, b. 1970)

Habits are mentioned by half of the cluster members as the main reason for not making changes in ones diet. Laziness follows. Other reasons are prejudices and lack of motivation. Some respondents also consider lack of knowledge and lack of willingness to be barriers, together with a wish to enjoy food, which is not believed to be possible if ones diet is healthy.

Summarizing the characteristics

Typical for the popularized science cluster is:

- The respondent's belief that health can be controlled and that they take good care of their health.
- The respondents perceive their health to be better than do those in the other clusters.
- This cluster shows the best behaviour concerning tobacco and alcohol use.
- The cluster members have fewer rules of thumb for their eating than the others do.
- Health behaviours have changed less than in the other clusters.

Table 17 shows which demographic characteristics of the cluster members are most typical for each belief and health behaviour variable. The order of the variables is random.

Table 17. The demographic variables which are most typical for each belief/behaviour in the popularized science cluster.

Popularized science cluster	
Thinks that health can be greatly controlled: - man - Swedish-speaking - 20-27 years - control group member - student	Thinks health can be controlled to some extent: No clear profile
Takes good care of his/her health: - man - Finnish-speaking - pregnant - pregnant for the 2nd time or further - highly educated	Takes only some care of his/her health: - Swedish-speaking - control group member
Perceives own health as good: - man - aged 28-35 years - diabetic - pregnant - highly educated - office/service work - Finnish-speaking	Perceives own health as mediocre: No clear profile
Follows most of the recommendations: - high level of education - students	Does not follow recommendations: - man - diabetic - diabetes diagnosed between the years 1-9 - pregnant for the 2nd time - medium level of education
Uses tobacco: No clear profile	Does not use alcohol: - pregnant - Finnish-speaking - highly educated - office/service work
Exercises most often: - man - diabetic - diabetes diagnosed between the years 1-9	Does not exercise: No clear profile
Has rules for eating: - man - control group member - diabetic - Swedish-speaking - student	Has no rules for eating: - pregnant
Has changed his/her behaviour: - woman - aged 20-27 years - Swedish-speaking - control group member - medium level of education - student	Has not changed his/her behaviour: No clear profile
Has changed his/her eating behaviour: - man - aged 20-27 years - Swedish-speaking - control group member - diabetic	Has not changed his/her eating behaviour: - pregnant for the 2nd time or further

11.3.5. Knowledge in the everyday information cluster

Perceived knowledge

The respondents in the everyday information cluster show a somewhat complex confidence in their own knowledge. The vast majority of the respondents in the everyday information cluster think that their knowledge on food and health is good, and some respondents even think that their knowledge is excellent. Yet, a small percentage also considered their knowledge to be fairly low, and this answer does not exist at all in the other clusters. The women, the pregnant and diabetic respondents as well as the youngest; the Finnish-speaking, the medium educated, and the students are also most confident of their good knowledge. Almost three-quarters of the cluster members also think that their existing knowledge is enough for their needs. This belief is strongest among the women, the youngest respondents, the control group members, the Swedish-speaking, and the highly educated. Interestingly enough, the interest in health information is mainly only fair or low among these groups. If one believes that one already knows enough, perhaps one is not so interested in increasing one's knowledge. The men in the cluster, however, are those who are most convinced that their knowledge is insufficient.

Recalling of certain information

All respondents in the everyday information cluster could remember some article they had read or some information that they had obtained about food and health. A couple of respondents remembered BSE, while another couple mentioned something about functional foods and how they work:

> *It is good to eat rye bread; broccoli works against cancer* (woman in the control group, b. 1969)

> *Functional foods, for example milk that lowers blood pressure* (woman with diabetes, b. 1977)

The rest of the answers are scattered over baby food, obesity, eating right, and how some kinds of food could affect some kinds of health problems. As in the popularized science cluster, everyday information cluster members referred to the sources most common in the general information source profile of the cluster: the most common place to read or hear about food and health seems to be the daily newspaper, followed by weekly magazines and news on

television. The information is furthermore occasionally obtained from childcare magazines, health professionals, brochures, school, work places, commercials in magazines and discussion forums on the Web.

Measured knowledge

Over one-quarter of the respondents have high points in the first part of the knowledge-testing, which is a larger share than in the other clusters, but over one-third have low points, and as many again have obtained medium points. The knowledge is thus better than in the professionals' cluster, but worse than among those in the popularized science cluster. Low points seem most common among the men, and those working in offices or with service work. These respondents are not very interested in health information. Mostly persons belonging to the youngest age group achieve the high points. Being very active at seeking information seems to be related to having high points in this cluster.

In the second part of the test, over one-third of the cluster members have high points, and as many have medium points. The cluster is, thus, in the middle in this test. Gaining low points in this part of the test is mainly related to being only fairly/little interested in health information. Persons aged 20-27 years obtain the high points. Furthermore, in this part of the test a higher seeking activity seems to be to some extent related to higher points.

The storytelling is fairly weak in this cluster, which gains most of its knowledge from everyday information providers such as the news media. Only a small number of respondents came up with an excellent story, while almost two-thirds had a weak one. The everyday information cluster is thus the one with the weakest knowledge on how to live in a healthy manner. No large differences are found concerning gender or education, but there are differences when it comes to age, health status, language and occupation. A weak story is related to being aged 28-35 years, belonging to the control group, being Swedish-speaking and working in an office job. Furthermore, being only slightly interested and only fairly or not at all active in seeking information are related to a weak story. Those who told an excellent story are somewhat/much interested and active information seekers.

Summarizing the characteristics

In the everyday information cluster, the following characteristics are found:

- The confidence of the cluster members in their own knowledge varied.

- Most cluster members believe that their existing knowledge is sufficient.
- All respondents could recall some certain information concerning food and health.
- The respondents are at the medium level concerning the detailed knowledge tests, but show the weakest ability in telling a healthy day story.

Table 18 shows a summary of the demographic characteristics of the cluster members, which are most typically related to the beliefs and knowledge levels presented in this chapter. The variables are not mentioned in any particular order.

Table 18. The demographic variables which are most typical for each belief/knowledge level in the everyday information cluster.

Everyday information cluster	
Perceives knowledge as good/excellent: - woman - pregnant - diabetic - aged 20-27 years - Finnish-speaking - medium level of education - student	Perceives knowledge as lousy: No clear profile
Thinks knowledge is enough for his/her own needs: - woman - Swedish-speaking - aged 20-27 years - control group member - highly educated	Does not think knowledge is enough: - man
High points in knowledge test part 1: - aged 20-27 years	Low points in knowledge test part 1: - man - office/service work
High points in knowledge test part 2: - aged 20-27 years	Low points in knowledge test part 2: No clear profile
Excellent story: No clear profile	Weak story: - aged 28-35 years - control group member - Swedish-speaking - office/service work

11.3.6. Health behaviour in the everyday information cluster

Belief in the possibility of controlling health

Almost two-thirds of the respondents in the everyday information cluster think that it is possible to control your own health a lot. The women, especially if pregnant for the second time, the Swedish-speaking respondents and those with a high level of education working in office or service work are most confident on this matter, while the men are most pessimistic.

Taking care of one's health and perceived health

Although the majority think that it is possible to control their health, less than half actually take very good care of their own health. These are all young women, Finnish-speakers, most of whom are pregnant for the first time. For them interest and activity in seeking health information seems to be a strategy for taking good care of their health. Those not taking such good care of their health are the men, the control group members, the Swedish-speakers and those working in offices. Being little interested in and only fairly active at seeking information is related to taking little care for one's health. Although most are uninterested in taking care of their health, over 80% still perceive that their current health status is good. This is most common among the youngest, the women (especially those experiencing their first pregnancy) and the Finnish-speaking respondents. Swedish-speakers and those in the middle age group perceive their health as mediocre.

Following recommendations

The everyday information cluster, together with the popularized science cluster, is least interested in following recommendations. A slight majority of the cluster members seldom (if ever) follow the recommendations they receive on healthy eating. Those in the lowest age group, the best educated who work in offices, and surprisingly the pregnant women, especially those expecting their first child, are following recommendations less often than the men, the diabetics and the students. Among those who seldom follow recommendations, interest in health information is also quite weak.

Current health and eating behaviour

Only one of the respondents in the everyday information cluster uses tobacco products, and the use is quite frequent. Three-quarters of the cluster members use alcohol, but this mostly happens once a month or even less. Alcohol use is also quite moderate. The majority drink less

than three restaurant doses of alcohol at a time. Those who drink more are mostly from the youngest age group. Those who do not drink alcohol are all pregnant women, mainly pregnant for the first time. Being pregnant is significantly related to the non-use of alcohol (χ^2=30.74, p=.001). These women also did quite well in the knowledge tests.

Nearly all respondents exercise, but most only exercise a few times a week and the time of exercise is often shorter than in the other clusters. Pregnant, Finnish-speaking women from the middle age group, who have a high level of education, are those most eager to exercise. Swedish-speaking persons, those aged 28-35 years, and diabetics are, on the other hand, least eager to exercise often. Outdoor exercise is also preferred in the everyday information cluster. Walking, sometimes combined with something else such as walking the dog, is mentioned most often, followed by jogging and biking. Swimming is also fairly popular. Ball games, yoga, fitness training and badminton are occasionally mentioned. The most important reason for exercising is to gain and maintain strength, followed by feeling good, health matters, and exercise being fun. A couple of respondents mentioned that they want to stay in shape. Appearance and weight control are also mentioned occasionally. One respondent is into competitive sports, and for one the only reason is that it is necessary to walk to get anywhere. Lack of time and laziness are mentioned as reasons for not exercising.

Four-fifths of the respondents have rules of thumb for their eating habits. This is most common among the women, the youngest, the diabetic and the Swedish-speaking respondents, as well as among the students and those who are pregnant for the first time. Interestingly, most of those who are not interested in information on health and food, and all of those who are slightly interested, have rules for their habits of eating. Eating fruit and vegetables is mentioned most often, followed by eating fibres, often dark rye bread, and preparing the food oneself. Eating a variety of food and eating moderately and regularly are other rules mentioned by more than one respondent, as is avoiding fat and salt:

> *[I] always try to have something green on the plate; eat much dark bread. I do not use butter in cooking; use little salt* (man in the control group, b. 1967)

A couple of respondents stress the importance of eating breakfast:

> *You have to eat breakfast even if you do not feel like it, [and] also the other meals; to prepare as much as possible of the food yourself* (woman with diabetes, b. 1977)

Changes in health and eating behaviours

Among almost a quarter of the respondents, health behaviours have changed during the last years, but eating behaviours have changed only among slightly over one-third, which is considerably less than for the other clusters. It seems that women have been the most eager to change their health behaviour. Also control group members, pregnant women expecting their second child, those with a high level of education working in offices, and the Swedish-speaking respondents are those who have changed their behaviour more frequently. Men, on the other hand, have not changed their behaviour. Using less alcohol or not drinking at all is the most common change, followed by a decreased use of tobacco products. Pregnancy is often mentioned as a reason for this change. In one case the use of alcohol decreased after the respondent finished studies. Also illnesses and human relations have caused changes as the following quote shows:

> *[The change is due to] falling ill with diabetes; I met a man who has asthma* (woman with diabetes, b. 1977, has stopped smoking)

One person increased physical exercise due to a desire to stay healthy, but a couple of the respondents decreased their level of exercise due to self-reported laziness and lack of time. Those who did not change their behaviour, did fairly well in the detailed knowledge tests in the questionnaire, but did less well in the storytelling, suggesting that they do not know very well how to live in a healthy manner.

Changes in eating seem to be most common among the male respondents and those in the middle age group, while the women, the youngest respondents and the women pregnant for the first time are among those who have not changed their eating habits. Interestingly, eating has changed although most of those who changed their behaviour showed only low levels of knowledge as well as only fair or little interest and activity in seeking health information. Lack of information and knowledge has obviously not been a barrier for change towards healthier

eating in this cluster. Changes in eating behaviour varied: one respondent tried to eat in a more healthy way, another used more varied foods and more fibres, and a third had started eating more vegetables. Health issues are the reasons mentioned by more than one respondent:

> *I have become more conscious about things and their effects. Earlier they were not interesting me, but I have realised, that you should live with this body until the end* (pregnant woman, b. 1973)

One respondent thinks that his eating has deteriorated as he has started to eat too little, due to lack of time and laziness.

Perceived motivations for and barriers to changing eating behaviours

Respondents in the everyday information cluster are also mostly convinced that illness is the factor that motivates people to change their eating behaviours. Other important factors are a wish to stay healthy and to control weight. Models received from others together with received information and knowledge are further factors. Illness in someone you know, pregnancy, family relations, feelings of well-being, taste, earlier experience and quality of domestic foods are also mentioned occasionally:

> *[The change is due to] taste; model from somewhere; health; knowledge* (pregnant woman, b. 1961)

Laziness and lack of motivation are believed to be the main reasons for not changing one's eating habits; there is no interest, no health problems neither belief that the changes would protect them against illness. Habits are the second most common reason, followed by lack of willingness and lack of knowledge. Prejudices, taste, economical issues and lack of time and character are also mentioned occasionally.

Summarizing the characteristics

Concerning health behaviour, the everyday information cluster shows the following characteristics:

- Most of the respondents think it is possible to affect their own health, but a minority take good care of their health.
- Recommendations on healthy eating are not very much followed.

- Health behaviour is quite good.
- A majority of the respondents have rules for their eating habits.
- The majority of members in this cluster have changed their health behaviours. However, their eating habits have changed less than in the other clusters.

Table 19 shows which demographic characteristics of the cluster members are most typical for each belief and health behaviour variable. The demographic variables are ordered randomly.

Table 19. The demographic variables which are most typical for each belief/behaviour in the everyday information cluster.

Everyday information cluster	
Thinks health can be controlled well: - woman - pregnant - pregnant for the 2nd time - Swedish-speaking - highly educated - office/service work	Thinks health can be controlled to some extent: - man - medium level of education
Takes good care of his/her health: - aged 20-27 years - Finnish-speaking - pregnant - pregnant for the 1st time	Takes only some care of his/her health: - man - Swedish-speaking - control group member - office/service work
Perceives health to be good: - woman - aged 20-27 years - pregnant - pregnant for the 1st time - Finnish-speaking	Perceives health to be mediocre: - aged 28-35 years - Swedish-speaking
Follows recommendations most: - man - diabetic - student	Follows recommendations the least: - aged 20-27 years - pregnant - pregnant for the 1st time - highly educated - office/service work
Uses most alcohol: - aged 20-27 years	Uses no alcohol: - pregnant - pregnant for the 1st time
Exercises the most: - woman - aged 28-35 years - Finnish-speaking - pregnant - high level of education	Exercises the least: - aged 28-35 years - Swedish-speaking - diabetic
Has rules of thumb for eating habit: - woman - aged 20-27 years - Swedish-speaking - diabetic - pregnant for the 1st time - student	Has no rules of thumb for eating habit: No clear profile
Has changed behaviour: - woman - control group member - pregnant for the 2nd time - Swedish-speaking - high level of education - office/service work	Has not changed behaviour: - man
Has changed eating habits: - man - aged 28-35 years	Has not changed eating habits: - woman - aged 20-27 years - pregnant for the 1st time

11.3.7. Summary

- The professionals' cluster members show the least confidence in their own knowledge. They also think that their knowledge is insufficient for their own needs. They think this more often than members of the other clusters do. Still, nearly all can recall some health information, mostly concerning BSE or other health risks. This information was seen mainly in a newspaper. When it comes to measured knowledge this cluster actually did least well in the detailed tests, but when it came to the healthy day story it had the largest percentage of excellent stories.

- Respondents in the professionals' cluster also showed the least confidence in their ability to control their own health, and they also think that they do not take as good care of their own health as others do. Still this cluster follows received recommendations on healthy eating more than the others do. Their perceived health is weaker than in the other clusters, though. Tobacco and alcohol is used more frequently in this cluster than in the other clusters, but they do quite well in the part concerning exercise. These respondents mainly prefer outdoor exercise such as walking, biking or jogging. They exercise as they want to be well and in good shape, and because it is good for their health. For diabetics it is also necessary for the maintaining of controlled levels of blood sugar. Nearly all have rules of thumb for their eating habits; these consist of avoiding fat, eating regularly, and eating fruits and vegetables. For the diabetics, counting carbohydrates is important. The majority of respondents in this cluster have changed their health behaviour recently. Alcohol and tobacco use has decreased, and the amount of exercise has increased. This change is due to health issues, pregnancy and changes in one’s family situation. This cluster is also the one which has most frequently changed its eating behaviour towards consuming more vegetables and avoiding fat and foods that may contain health risks. Pregnancy, health wishes and weight control are the reasons most mentioned for this change. The perceived motivations for changing eating habits are illness, doctor's orders, the need for weight loss and the provision of information. Lack of motivation, old habits, lack of knowledge and laziness are factors which are perceived to be barriers to change.

- The members of the popularized science cluster are most confident in their own knowledge and that their knowledge is sufficient for their own needs. Still they do less well at recalling information than those in the other clusters. When they remembered

something, it was mainly about health risks concerned with food and eating. This cluster differs from the others by mentioning mostly information in health magazines and books and brochures, which on the other hand is in accordance with the general information profile of the cluster. The cluster is the most knowledgeable one; it manages best in all three knowledge tests.

- The popularized science cluster members are most confident also when it comes to believing that health can be controlled. They are also most confident in the fact that they take good care of themselves. Perceived health is also best in this cluster. However, it is not that good at following recommendations on healthy eating. When it comes to actual health behaviour such as the use of tobacco and alcohol, this cluster shows the best behaviour, but the members are slightly less eager to exercise than are the other cluster members. As in the other clusters, walking is the main form of exercise. The second main form of exercise is aerobics and gymnastics, unlike the other clusters. Health issues, feeling better and wishing to remain in shape are the main reasons for exercise. The cluster members are least frequent too in having rules of thumb for their eating habits. The main rules are avoiding fat, eating fibres, eating varied foods and eating vegetables and fruits. The behaviour of members has changed less in the popularized science cluster than in the other ones. However, mainly due to pregnancy, health reasons, increased age and changed family situation the use of alcohol and tobacco products has decreased or diminished among several respondents in this cluster. When eating has changed, these changes include eating more vegetables, a wider variety of foods and avoiding fat. Illness and health problems are believed to be the largest motivating factors for a change in eating, followed by weight problems, pregnancy, and health issues. Habits, laziness, prejudices, and lack of motivation, knowledge and willingness are barriers which might prohibit a change.

- In the everyday information cluster, the confidence of members in their own knowledge varies considerably. Some think their knowledge is excellent, while some think it is lousy. Most, however, do believe that their knowledge is sufficient for their needs. All of them could recall some information, mostly about BSE and functional foods. The most used information sources are those which the respondents remember best: newspapers, magazines and news on television. The knowledge shown in the knowledge tests puts the cluster in between the other two clusters concerning the detailed tests, but it was weakest at telling a healthy day story.

- Most of the respondents in the everyday information cluster think that it is possible to control their own health, but a minority take good care of their own health. However, health is perceived as good by most of the cluster members. The members of this cluster are not so good at following eating recommendations. Their health behaviour is fairly good, but these respondents exercise for somewhat shorter time periods than do the others. Their exercise is about the same as in the professionals' cluster – mainly conducted outdoors. The reasons for exercise are to gain and maintain strength and to feel good. It is also a matter of health and it is fun. Most have rules for their eating, including eating fruits, vegetables and fibres, as well as cooking the food themselves. In this cluster, the majority of people have changed their health behaviour, but here is also found the smallest percentage of respondents who have changed their eating habits. Due to pregnancy, finished studies, illness and family situations, the use of alcohol and tobacco has diminished. However, there has been an increase in exercise, and this is due to health reasons. Eating habits have become more healthy and varied, and food intake contains more fibres and vegetables. In this cluster, too, illness is thought to be the predominant motivator for changes in eating behaviours, followed by a wish to stay healthy, weight control, role models and information and knowledge. Laziness and lack of motivation are the largest obstacles, followed by habits.

12. Discussion

12.1. Aim of the research

The aim of this research was to examine possible relationships between the existing knowledge level in health matters, health behaviour and the preference for information sources on health related to nutrition. Studies on the use of and influence of health information are becoming evermore common, but so far few studies have been conducted in the Finnish context, and this study aims at addressing this gap.

The major research questions were:

- Is there a relationship between the information sources a person uses and his existing knowledge on health and food, and if so, what is this relationship like?

- Is there a relationship between received or acquired information and knowledge on nutrition and health and the health and eating behaviour of an individual, and if so, what is the relationship like?

12.2. The material

The material for the study consisted of interviews with 50 Finns, 38 women and 12 men, all born between 1959 and 1981. The study was limited to three groups of Finnish people: pregnant women, people with diabetes and a control group consisting of people who had neither diabetes, nor were pregnant. Of the subjects 18 were pregnant women, 17 were people with diabetes and 15 belonged to the control group. The subjects were recruited on a voluntary basis, through notices and leaflets sent to maternity care centres and diabetes associations as well as to health professionals dealing with diabetics. For recruiting of control group members, a snowball sampling technique was used. Colleagues and friends were asked to find suitable respondents.

12.3. Method

The respondents were interviewed in person by the author. The interview was structured, that is, it was conducted by using a questionnaire, but differing from the common use of

questionnaires the researcher asked the questions and wrote down the given answers herself. This technique gives the interviewer an immediate insight into the answers, and can help to clear out misunderstandings (Ginman 1983). The method also has other advantages. The first part of the interview consisted of asking the respondents to tell how to live in a healthy way during one day; that is, to construct a script about a healthy day. This story was tape-recorded, and several respondents showed a visible nervousness towards the tape recorder. When the answers to the questionnaire were written down, as opposed to being taped, the respondents were much calmer. On the other hand, using the questionnaire also had disadvantages. For example, the answers had to be shortened due to limited space and, to some extent, limited time. When the interviewer wrote down the answers – as opposed to the interviewee himself/herself – some changes might have occurred in the terminology used.

The questionnaire consisted of both closed and open-ended questions, covering six themes related to health information, health knowledge and health behaviour: demographic background information; interest in and need for health information; health information source use; relations to and opinions on health information and healthy living; health behaviour; and knowledge about food and health. Health knowledge was measured by using both techniques inspired by schema theoretical recall tests (e.g. Bower et al. 1979; Meadowcroft & Reeves 1989) and clustering of concepts (Roenker, Thompson & Brown 1971), as well as types of questions used in common surveys examining knowledge on different health issues (e.g.. Albrecht, Higgins & Lebow 2000; Katz et al. 1998; Kinney et al. 2001; Meischke et al. 2002; Radecki & Jaccard 1995).

Information source profiles of the respondents were mapped out by giving points according to frequency of use, perception of usefulness, attentiveness towards and trust in a source. Knowledge levels were also determined by giving points according to correctness. The material was mainly analysed qualitatively, but statistical methods such as cluster analysis and chi-square tests were used, to group respondents according to use of information source and to test connections between some variables.

12.4. The cognitive viewpoint

The cognitive viewpoint has become popular within the field of information science. Characteristic of this viewpoint is the assumption that there are conceptual structures,

categories or mental models in the mind of an individual (Tuominen & Savolainen 1997). The cognitive view includes being concerned with human communication systems, with individuals within this system in their interactions with information, and with one another in relation to the information (Belkin 1990). The current thesis took a cognitive viewpoint in its examination of the relationship between the attractiveness of information in different information sources and people's knowledge in health matters. The basic idea was that people have special knowledge structures or schemata containing knowledge related to health and nutrition. Knowledge structures work as both structures of knowledge organization in the memory and as devices for organising data that result in a coherent picture during perception (Cole 1994). An individual who possesses a well-defined schema on a particular topic is expected to have more success at recalling information accurately, to be more confident in making inferences and to be able to group or cluster related concepts more easily than a person with a schema which is ill-defined (Wicks 1992).

Meadow and Yuan (1997) claimed that it is not possible to segment a person's knowledge base in the way that you can identify what information or specific message has contributed to each 'piece' of knowledge. According to them, there is actually no meaning to 'piece of knowledge', because knowledge is a collective term. Because of this, it will probably never be possible to say exactly what impact a given message has on a given person's knowledge base (Meadow & Yuan 1997). Similar doubts were presented by Brookes (1980a). The purpose of this thesis, however, was not to use experimental methods to measure the influence of new information, which is popular in schema theoretical research (Wicks 1992). The idea was instead that people are influenced by the information environment which they live in, and that their knowledge level is different, not only due to the information source used, but also due to their interest in the information, their activity to acquire information, and their attitude towards the received information. Some methods inspired by schema theoretical research were, however, used in this work, in order to determine the knowledge levels of the respondents.

12.5. Information source clusters

A cluster analysis was conducted on the information sources, and it revealed three clusters with people preferring different types of information in their search for health information: the *professionals' cluster*, the *popularized science cluster*, and the *everyday information cluster*. The characteristics of the three clusters are arranged and compared in table 20.

Table 20. Comparisons of characteristics in the information source clusters.

	Professionals' cluster (n=19)	**Popularized science cluster (n=20)**	**Everyday information cluster (n=11)**
Source preference	Health professionals	Professional information in a popularized form	Daily news media
Health status group	Diabetics	More pregnant women than control group members	More control group members than pregnant women
Demographic characteristics	Largest share of men, youngest, least educated	Largest share of women, mostly Finnish-speaking	Oldest, best educated
Interested in health information	Medium (high)	Most	Least
Active in information seeking	Medium (high)	Most	Least
Reasons for seeking information	1. General interest 2. Chronic illness	General interest	General interest
Selective towards information	Most	Medium (low)	Least
Discussion activity	Medium	Most	Least
Number of discussion partners	1-3 people	1-6 people	No clear profile
Reasons for discussion	1. Informing others 2. Discussing is nice 3. Want the comments of others	1. Discussing is nice 2. Informing others 3. Want the comments of others	1. Discussing is nice 2. Informing others 3. Want the comments of others 4. Want to be sure that they have understood
Attitude towards health information and healthy living	More confident than careful	Most confident	More careful than confident
Satisfied with received information	Most	Medium	Least
Feel safe due to new information	Most	Least	Medium (high)
Influenced by media information	Much	Most	Much
Influenced by threatening information	Most	Medium (high)	Least
Critical against some information sources	Most	Medium	Least
Confident in own existing knowledge	Least	Most	Varying
Confident in knowledge being sufficient	Least	Most	Medium (high)
Ability to recall certain information	Medium (strong)	Weakest	Strongest
Measured knowledge in test 1	Lowest knowledge level	Highest knowledge level	Medium knowledge level
Measured knowledge in test 2	Lowest knowledge level	Highest knowledge level	Medium knowledge level
Knowledge measured through storytelling	Medium knowledge level	Highest knowledge level	Lowest knowledge level

(Table 20 continued)	**Professionals´ cluster**	**Popularized science cluster**	**Everyday information cluster**
Confident in the possibility of controlling one's own health	Least	Most	Medium (high)
Takes care of own health	Least	Most	Medium (low)
Perceived health	Worst	Best	Medium (high)
Follows recommendations on healthy eating	Most	Seldom	Seldom
Uses tobacco	Most	Least	Medium (low)
Usse alcohol	Most	Least	Medium
Exercises	Most	Least	Medium
Has rules for eating	Most	Least	Medium (high)
Has changed health behaviour	Most	Least	Medium (high)
Has changed eating behaviour	Most	Medium (high)	Least

These clusters show a remarkable resemblance to the three groups found already in the pilot study, although that was conducted on a much smaller population and the analysis was not made in exactly the same way. The following groups were found in the pilot study: 'the Doctor's group', which preferred information from medical expertise, 'the Documentary group', using popular science sources, and 'the News group', which consisted of people living in the world of the mass media (Ginman & Eriksson-Backa 2001). The professionals' cluster and the everyday information cluster furthermore show similarities with two user groups characterized by Huntington and colleagues. They found four groups of health information consumers, of which one is called the 'passive traditional information users'. In this group people rely mainly on health professionals, while those in the 'active traditional information users', tend to use newspapers, the television, and health books (Huntington et al. 2002). The popularized science cluster, on the other hand, reminds one most of the American women who received most of their information about menopause from women's magazines (Clinkingbeard et al. 1999).

Somewhat surprisingly, the everyday information cluster contained the least number of respondents, although numerous studies show that the news media are much used and preferred as information sources for general health issues (Chew, Palmer & Kim 1995; Marcella & Baxter 2000; O'Keefe, Boyd & Brown 1998; Rolinson 1998; Stoller et al. 1993), as well as for information about cancer (Bendelow, Williams & Oakley 1996a; Bendelow, Williams & Oakley 1996b; Oakley et al. 1995; Rees & Bath 2000; Saint-Germain & Longman 1993);

cardiovascular diseases (Meischke et al. 2002; Pancioli et al. 1998); BSE (Gunasekera et al. 1996); vaccinations (Lashuay et al 2000); respiratory infections (Belongia et al. 2002); risks from tobacco use (Vakeflliu et a. 2002); and HIV/AIDS (Davis et al. 1998). Also, when information about healthy eating (Buttriss 1997; de Almeida et al. 1997; Parmenter 2002) and information about health risks with food (Abbott 1997; Järvelä 1998, p. 41f.) is acquired, this is mainly through media sources.

One possible explanation is that most studies have been conducted on the general public, while this study mainly contained people from specified health groups. According to De Pietro and Clark (1984), the preference for a certain source is determined mostly by the present health situation, and also in this particular work sources seem to be preferred very much due to the current health status. It is furthermore possible that the method used to specify the three clusters, makes it impossible to directly compare the results with those of previous studies, as these studies have mostly been statistically based. Thirdly, it must not be forgotten that health-related magazines, which are preferred in the popularized science cluster, are also media sources. Together, the popularized science cluster and the everyday information cluster form a "media group", which contains considerably more respondents than the professionals' cluster does.

The low user ratings for the Internet as a source are surprising, too. This is true even though many of the pregnant women were recruited through discussion forums on the Web. The use was expected to be more frequent, as over half of the Finns use the Internet today (CyberAtlas 2003) and surveys show that more and more people use health information available on the Web (e.g., Fox et al. 2000; Pennbridge, Moya & Rodrigues 1999). The respondents in this study, however, seem to be closest to those in Sweden, where only 11% had used the Internet as a source for health information (Garpenby & Husberg 2000, p. 29). The Internet was little used and trusted compared to most other possible information sources (Garpenby & Husberg 2000, pp. 17 ff.).

12.6. Information behaviour

12.6.1. Interest and seeking activity

Parmenter (2002) said that those who are willing to participate in a study on food and health might have a larger interest in health issues than the average person. In this particular study this

does not seem to be the case, as fair or low interest in health information was found for a large proportion of the respondents, although all respondents were recruited on a voluntary basis.

The respondents in the professionals' cluster, which consists mainly of diabetics, are only fairly interested in and active at seeking health information. The interest is also fair in the popularized science cluster, which consists of slightly more pregnant women than control group members, although better than in the other clusters. Still, these respondents claim to be very active at seeking and they are active at discussing health information with others as well. The respondents in the everyday information cluster are least interested and also not as active at seeking information or at discussing health matters with others as are those in the other clusters. The everyday information cluster consists of slightly more control group members than of pregnant women. The clusters, thus, show both similarities to and differences from the groups found by Huntington et al. (2002). In their study, those who rely mostly on doctors tend to be more unwell and regular at visiting health professionals, but they are not actively seeking information. This is mainly the case also with most of the respondents in the professionals' cluster, among whom diabetes is a reason for visiting doctors or nurses. The cluster was also not very active at seeking information. For the everyday information cluster there is, however, a difference. The respondents are not very interested in health information, but in the study by Huntington et al. (2002), a higher interest in medical information was associated with using traditional news sources. In the current study, the respondents preferring the news media instead seem to be more passive information receivers who encounter information incidentally as opposed to intentionally (Erdelez 1997; Erdelez 1999; Williamson 1997; Williamson 1998; Wilson 2000; Wilson & Walsh 1996; see also Solomon 2002).

In the popularized science cluster, pregnant women are the most interested in health information, and also in the everyday information cluster women are more interested than the men in information on health and food. This study thus confirmed previous results related to gender differences in interest towards health information (Misra & Aguillon 2001; Roininen et al. 2001). Women usually seek more information, too (Pennbridge, Moya and Rodrigues 1999; Rakowski et al. 1990). In Iceland, women both sought more and accidentally found more health information than men did (Ágústa Pálsdóttir 2003).

Among all cluster members, general interest was the main reason for seeking health information. Among the diabetics, too, chronic illness was mentioned. Nicholas, Huntington

and Williams (2001) found that a significant proportion of visitors to a medical Web site cite general interest as the reason for the visit. They also found that being generally interested was related to being more interested in finding information on diet and healthy living, while those with a long standing illness were mostly interested in information on medicines, treatments and new medical research. Houston and Allison (2002) found similar results. Thus, general health information may not appeal to diabetics that much, which might explain why the interest in the professionals' cluster was only at a fair level.

In all clusters, a change in health situation had increased the interest in finding information. In all clusters, the control group members showed the least interest in health information. This confirms previous research connecting health problems to interest and information seeking (Parmenter 2002; Wilson 1997). Still, the interest in actually seeking more information is smaller among the diabetics than among the pregnant women in this study. These two groups are, on the other hand, not directly comparable. The diabetics might have been more active at seeking information shortly after diagnosis, but the interest has since decreased, while the pregnant women have mainly experienced a change in health situation very recently, and they are perhaps presently in a more active state of seeking due to this. Furthermore, this assumption seems to be supported by the fact that those diabetics who were diagnosed in adult age - and thus often more recently - show a larger interest and greater activity in seeking information than those who were diagnosed as children or as adolescents.

12.6.2. Opinions on and relations to health information

Concerning the pregnant women, it is interesting to note that most of them are found in either the popularized science cluster or the everyday information cluster, although they are probably well acquainted with health professionals through the maternity care services which are compulsory to attend (Wrede 2001, p. 6). In this case, they differ from their American counterparts, who used health providers as their main source of information (Aaronson, Mural & Pfoutz 1988). One possible explanation might be that the information needs are not properly met; health professionals might underestimate the actual knowledge of their patients and not provide enough information (Buttriss 1997). Numerous studies have shown that information needs are not properly fulfilled after having been in contact with health professionals. This is especially the case with people suffering from serious illnesses, but also others (Baker 1996; Cameron et al. 1994; Jenkins, Fallowfield & Saul 2001; Jones et al. 1999; Juvonen & Lauri 1994; Leydon et al. 2000a; Leydon et al. 2000b; Meredith et al. 1996; Oinas 1999; Salminen et al. 2002).

On the other hand, those who rely mostly on health professionals in this particular study claim to be more satisfied with the information they receive concerning food and health. Barzilai et al. (2001) found too that the counselling of health habits by a health professional did not diminish patient satisfaction. On the contrary, satisfaction was rather increased when the discussion was about the use of tobacco or the quitting of it. American women with cancer were generally very satisfied with the information they received from their doctor, but they were only fairly satisfied with information about related health problems (Bluman et al. 2001).

Those preferring the news media are the least satisfied. Still, almost half of the respondents in the professionals' cluster express a wish mainly for quality guarantees, and these guarantees are largely that the information be research-based. Some respondents also wished that the information would not be so sensationalized – that minor events would not make such big headlines. This finding corresponds with research on British parents, who were aware that some information is sensationalized; these parents indicated that they sought information in the form of medical research (Guillaume & Bath 2003).

Those in the professionals' cluster feel safer than do those in the other clusters, due to new information. The information is perceived as good when it confirms that someone's own thoughts and behaviour are correct. Those in the popularized science cluster, on the other hand, feel least safe. The information is perceived to be untrustworthy and frightening. Trust might be the key word explaining this difference. Health professionals are often perceived as most trustworthy, even if they are not always the most used sources (Buttriss 1997; de Almeida et al. 1997; Höglund, Maceviciute & Wilson 2003; Järvelä 1998, p. 41f.; Lashuay et al. 2000; Marton 2002; Meischke et al. 2002; Pennbridge, Moya & Rodriguez 1999). Some respondents think that knowing too much is not good for one's peace of mind. Avoiding information in order to ignore, for example, a health threat, is one way of responding to that threat (Wilson 1997; Pavlik et al. 1993).

In all clusters, most respondents are critical of information presented in advertisements, mainly on television or in print. This corresponds to findings from earlier studies, which show low levels of trust in advertisements (Garpenby & Husberg 2000, p. 19; Järvelä, 1998, p. 41 f).

12.7. Health knowledge

12.7.1. The relationship between information source and health knowledge

Those in the everyday information cluster could all recall some specific article or information about food and health, while those in the popularized science cluster were least good at this. In the everyday information cluster as well as in the professionals' cluster, new information had mainly been seen in newspapers, while those in the popularized science cluster referred to health magazines. This is in line with previous research (Brännström & Lindblad 1994; Buceta Facorro & DeFleur 1993). Furthermore, the ability to recall health information from television and printed newspapers and news magazines has been found to be higher than from an audio source. Information which is heard is not remembered as well, which might explain why those from the professionals' group mentioned newspapers rather than their main information source (Stauffer, Frost & Rybolt 1981). It has also been reported that those having obtained information about seat belt usage from magazines, had greatest difficulties in recalling elements from the messages (Gantz, Fitzmaurice & Yoo 1990). This could then be linked to the lower recalling abilities in the popularized science cluster, where health magazines were in frequent use.

Existing knowledge was tested by a knowledge test in three parts. First the respondents were asked to provide a 'script' for a healthy day; then they were asked to answer detailed questions in the questionnaire, and finally they were asked to cluster concepts. The respondents in the popularized science cluster showed the best knowledge in all three knowledge testing parts, while those in the professionals' cluster were weakest in the detailed tests. Those in the everyday information cluster did least well when they had to tell how to live in a healthy manner during one day. Some studies show that relying on health professionals is combined with less knowledge (Chew, Palmer & Kim 1995; Meissner, Potosky & Convissor 1992; Pancioli et al. 1998). Pavlik et al. (1993) found that the more people are exposed to media information about heart health, the greater the understanding of the causes and prevention of heart disease. While those in the popularized science cluster mainly relied on printed health magazines, this might be a factor explaining their better knowledge. Media information, however, does not always lead to better knowledge. Obtaining information about HIV/AIDS from media sources was associated with vague knowledge about the disease and ways in which

it might be prevented. This might be due to the mass media presenting information in a way that can be misinterpreted (Davis et al. 1998). This might then explain the finding of a lower level of knowledge in the everyday information cluster.

12.7.2. Information seeking in relation to health knowledge

The higher level of knowledge in the popularized science cluster might not be due only to source preference, but also to the fact that the respondents showed more activity in seeking information and in discussing health matters with others. Acquiring information from multiple sources was associated with a better knowledge of the symptoms of heart attack than low information acquisition was (Meischke et al. 2002).

Within information science, it is often stated that becoming aware of one's lack of knowledge leads to information seeking, and that the result of this seeking is a new understanding of a problem, or, in other words, new knowledge (Kuhlthau 1991; Kuhlthau 1993, p. 41ff.; Kuhlthau 1999). Bertram Brookes showed already in his 'fundamental equation of information science' that an existing state of knowledge is affected by some increment of information, resulting in a new state of knowledge (Brookes 1975; Brookes 1977; Brookes 1980b).

The popularized science cluster, which is most active at seeking information, is also the one which is most confident that present knowledge is both good and sufficient for present needs. Thus their reason for seeking information is not a recognized need for new information to enhance the knowledge. The theories of sense-making (Dervin 1992; Dervin & Nilan 1986) or anomalous states of knowledge (Belkin 1977; Belkin 1978; Belkin, Oddy & Brooks 1982a; Belkin, Oddy & Brooks 1982b) – which say that becoming aware of a lack of knowledge leads to information needs, and hence to information seeking (Wilson 1981; Wilson 1997) – do not fit very well in this current study. Radecki and Jaccard (1995), furthermore, showed statistically that better perceived knowledge was linked to less information seeking. Also, this study is not supported by the findings in this current work. This discrepancy is interesting and might need to be investigated further.

12.7.3. Demographics and their relations to health knowledge

Another reason for better health knowledge in the popularized science cluster might be demographic background. This cluster contains the largest share of women, and women were

found to do better in the knowledge tests than the men. That women show both better confidence in their own knowledge and better existing knowledge levels confirm the findings of previous studies (Beardsworth et al. 2002; Girois et al. 2001; Pancioli et al. 1998; Waller et al. 2002). Furthermore, men, younger people, and less educated respondents showed least knowledge on colorectal cancer and its risk factors in the British population studied by (McCaffery, Wardle & Waller 2003). Older age groups had higher knowledge scores than younger groups in the study by Gans et al. (1999), and higher education was correlated with better knowledge on diet-related diseases (Girois et al. 2001). These studies are, to some extent, supported by findings in this thesis. However, contrary results have also been found. In one study, education was linked to a better knowledge of cancer, but contrary to most other studies no significant correlation between gender and knowledge level was found. A trend for the male respondents to be more knowledgeable was also found (Stone & Siegel 1986).

In the popularized science cluster, the older respondents and the highly educated were better at recalling some specific information than those in the youngest age group with lower education levels. However, in the other two clusters the older respondents showed lower knowledge levels and told weaker stories. Looking at the demographic characteristics of the entire source clusters shows that the professionals' cluster is both the youngest and the lowest educated one. This could thus be a reason for the weaker knowledge level. On the other hand, the everyday information cluster is both the oldest and the best educated one, and still their knowledge level is weaker than that in the popularized science cluster. It seems that the strongest demographic factor behind a better knowledge level in the popularized science cluster is the female gender.

12.8. Health behaviour

12.8.1. Existing health behaviour

In the study by Manderbacka, Lundberg and Martikainen (1999), those with less healthy behaviour were most inclined to rate their health as poor. The professionals' cluster perceives their health to be mediocre more often than the other clusters do. Furthermore, the respondents in the professionals' cluster (which mainly consists of people with a diagnosed health problem, diabetes) are most eager to think that they do not take very good care of their health. Although the cluster shows the best behaviour with regard to physical exercise, behaviour concerning tobacco and alcohol use is not as good. The chi-square analysis showed significant relationships between having diabetes and using alcohol and tobacco. This is quite alarming,

since having diabetes calls for a cautious use of alcohol (Aalto 1999, p. 4) and smoking (Notwehr & Stump 2000). The result is, however, not entirely surprising, since previous studies have showed that having diabetes is not always a predictor of a good behaviour among Finnish type 2 diabetics. In this study, however, those with type 1 diabetes had considerably better behaviours than those with type 2 diabetes (Aalto, Uutela & Kangas 1996). Type 2 diabetes might result from an unhealthy lifestyle; this is not likely to be an issue in this particular study as the respondents had type 1 diabetes. The professionals' cluster was also one with the lowest level of education and it has been shown that lower education level can be related to a greater prevalence of smoking (Watson et al. 2003).

In the professionals' cluster and in the everyday information cluster, men reported taking less good care of their health than did women. Healthier behaviours and healthier eating among women has been found in other studies (Beardsworth et al. 2002; Fraser et al. 2000; Manderbacka, Lundberg & Martikainen 1999; Misra & Aguillon, 2001; Roos 1998, p. 30; Signorielli & Lears 1992; Wardle, Parmenter & Waller 2000). The professionals' cluster contains a larger share of men than the other clusters, and it is the cluster with the lowest education level, while the popularized science cluster is the most female-dominated and Finnish-speaking one, and it contains a large number of pregnant women. These factors actually may explain some of the behaviour. According to the chi- square analysis, being a woman is actually strongly related to not using alcohol. Previously it has been shown that men were more likely than women to use alcohol (Beardsworth et al. 2002; Ecob & Macintyre 2000). Language, health status, education and occupation are also significantly related to the non-use of alcohol in this study. Those who do not use alcohol are mainly Finnish-speaking, pregnant women with a high level of education, and those doing office or service work.

Despite the problem of lack of good health behaviour, the professionals' cluster follows the recommendations on healthy eating that they receive. This might also be due to the prevalence of diabetes in this cluster, a disease which requires certain eating habits in order to balance high or low levels of blood sugar (Aalto 1999, p. 4). Illness has been found to be a factor behind healthier eating (Parmenter 2002; Salminen et al. 2002). In the British context, men, people from lower socio-economic groups, and the elderly tend to ignore food advice most (Buttriss 1994). A closer look at the demographic background of the respondents in this thesis shows that men were less eager to follow recommendations in the professionals' cluster and in the popularized science cluster, but were among those eagerly following recommendations in

the everyday information cluster. The relationship between following recommendations and gender is not all or nothing as there seems to be other influences at work.

While this behaviour among the diabetics is a cause for worry, that of the pregnant women is a happier result. Those who had smoked, had usually changed their behaviour due to the pregnancy, and abstinence from alcohol was significantly related to being pregnant. This is good, since smoking during pregnancy may increase the risk of the child developing diabetes and obesity (Montgomery & Ekbom 2002), and alcohol use can lead to a miscarriage (Halmesmäki 1987, pp. 18f.) or a harming of the fetus, ending in malformations, growth retardation or neurological abnormalities (Halmesmäki 1987 pp. 20 ff.; Hankin 2002). Thus, the pregnant women in this study show more appropriate behaviour than that found among pregnant women in previous studies (Arnold et al. 2001; Halmesmäki 1987, p. 33; Jaakkola et al. 2001; Pickett et al. 2002; Williams & Gloster 1999).

In addition to pregnancy or health-related matters, several respondents said that their alcohol consumption or tobacco use had decreased due to increased age, changed family situations, and the finishing of their studies. That the social environment plays a role in influencing health and eating behaviour has been shown in previous studies (e.g., Kurtz et al. 1996; Neumark-Sztainer et al. 2003). Being a student, especially, often increases the drinking of alcohol (Dorsey, Scherer & Real 1999).

Women seemed most inclined to exercise, except for those in the popularized science cluster. The number of men in this cluster, however, was very small, and those women who did not exercise in this cluster still said that they engaged in so-called everyday exercise. These results therefore follow others showing that women were better at exercising than men in the Nordic countries (Manderbacka, Lundberg & Martikainen 1999; Steptoe et al. 1997).

12.8.2. Relations between information, health knowledge and health behaviour

Information has been considered to influence health behaviour (Cohen, Scribner & Farley 2000; Janz & Becker 1984; Maiman & Becker 1974; Rosenstock 1974). The respondents in the popularized science cluster were most inclined to think that some information in the media had influenced them, mostly in the way that their eating had changed. Information about health risks with food, such as BSE or poisons in food has led several respondents to avoid possibly

dangerous food items. Similar news has influenced people earlier (Gunasekera et al. 1996; Verbeke, Viaene & Guiot 1999). The respondents often emphasized that they would stick to Finnish meat in order to avoid BSE. The interviews were conducted during the beginning of 2001, while the first, and so far only, case of BSE in Finland was discovered in December 2001. Had the interviews been conducted shortly after that, the answers might have been different on this matter. The pregnant women often avoided foods that might harm the fetus, and this is in accordance with recommendations for pregnant women (Kolasa & Weissmiller 1997).

Rakowski et al. (1990) think that a tendency to seek information would be accompanied by more positive health behaviour. It is, however, also possible that a preventive behaviour leads to more active information seeking. Knaus, Pinkleton and Austin (2000) found that information seeking increased discussion and decreased risky behaviour. In this particular study, those who were more active information seekers – the members of the popularized science cluster – also showed better health behaviour concerning the use of alcohol and tobacco. Seeking activity, though, was not as strongly related to this behaviour as demographic factors were.

Knowledge was not the most important reason for a particular behaviour either. Although knowledge levels were best in the popularized science cluster, which also showed better behaviour in some respects, the knowledge among those not using alcohol, for example, was fairly low. Likewise, in the professionals' cluster, which had the lowest knowledge levels in the detailed knowledge tests, and also showed the highest use of cigarettes and alcohol, knowledge was not related to healthy behaviours. A fairly good level of knowledge did not prevent respondents from smoking or using alcohol. The reasons for this might be habit and enjoyment. For example, British teenagers knew fairly well what behaviours were unhealthy, but still they engaged in them (Bendelow, Williams & Oakley 1996b). Among Danish student nurses, knowledge about health risks with smoking was actually better among those who did smoke (Sejr & Osler 2002). Nayga (2001) showed, using an obesity equation, that knowledge is not related to the odds of a woman being obese. In other cases women were engaged in healthy behaviours without having adequate knowledge (Gupta, Kumar & Stewart 2002; Saint-Germain & Longman 1993).

Although the knowledge shown in the tests varied among the respondents, the vast majority still showed awareness of how to eat well. Most had rules of thumb for their eating, and the

rules are very much in accordance with current dietary recommendations (Statens näringsdelegation 1998). When the eating had changed, it was mostly towards a diet closer to these recommendations. An increased intake of vegetables, and a decrease in fat and sugar intake, has been visible in Finland since the 1970's (Pietinen et al. 1996). Parmenter (2002) found, that over one-third of the respondents perceived that they had reduced their intake of fat and sugar, and increased their intake of fruit and vegetables. When actual intake was measured, it was shown that the changes were significant concerning decreased use of fat and sugar, but the change of intake of fruits and vegetables was very small.

12.8.3. Attitudes in relation to health behaviour

The attitude may play a role especially when it comes to behaviour (Bettinghaus 1986). A more positive attitude towards health promotion might lead to better health behaviour (Cardon, De Bourdeaudhuij & De Clercq 2002). Having a more positive attitude towards healthy eating is also related to better eating (Roininen et al. 2001). Being confident in the ability to manage information was a factor influencing nutritional behaviour in the study by Chew, Palmer and Kim (1998).

A cluster analysis was conducted on statements measuring attitudes towards health information and healthy living. This analysis resulted in three different attitude clusters:

- a *confident cluster*, where the respondents are fairly confident in their ability to manage information and to maintain a healthy life;
- a *careful cluster*, where the people are to some extent unsure about their capability of managing health information, and who are also slightly unsure about healthy living and distrustful of foreign foods, and;
- a *distrustful cluster*, in which the people are most distrustful and negative against information, globalization and healthy eating.

Those in the confident attitude cluster seem to have the highest self-efficacy, that is, the belief in your own ability to conduct a certain behaviour (Bandura 1977; Booth et al. 2000; Clark & Janz 1992; Rimal 2000). They furthermore show attitudes which are close to those of the British respondents in the study by Beardsworth et al. (2002). They found that the vast majority agreed that information on healthy eating was widely available, and agreed that they feel

confident that they know how to eat in a healthy way. In this study, it is the respondents in the popularized science cluster who are most confident in their capability of managing information and healthy living. The respondents are indeed most confident that they can take good care of their health, too, and they also show the best health behaviour especially concerning tobacco and alcohol use. However, they have fewer rules for their eating habits than do the others.

The respondents in the everyday information cluster are most careful and think that they have more trouble with managing information and maintaining healthy behaviour. They also mainly think that they only take fair care of their health and seldom follow recommendations. Their actual behaviour, however, is not worse than those in the other clusters. On the contrary, their use of substances is better controlled than in the professionals' cluster, which regarding the attitude is close to the popularized science cluster as it has quite a large percentage of confident respondents. Thus, attitude does not seem to be too strong a factor influencing health behaviour in this study.

In the distrustful cluster, one of the characteristics is that the respondents agree that experts often change their opinion on what to eat or avoid. This makes them closest to the opinion of the Britons, of whom 70% agree to this statement (Barratt 2001; Buttriss 1997). Other characteristics for those in the distrustful cluster are that they have more difficulties than those in the other clusters when it comes to knowing what is really healthy to eat, and they think that healthy food is expensive. Among the British 36% became confused over what was supposed to be healthy, and 39% thought it was expensive to eat healthy food (Barratt 2001). In a Scottish survey, barriers to healthy eating included confusion in the messages, for example, in the media; lack of knowledge about what foods are healthy; a pressure or desire to fit in with the food habits of others; and beliefs that eating in a healthy manner is more expensive, and that healthy food takes longer to prepare (Food Standard Agency Scotland 2002). In the distrustful cluster the respondents were inclined to be positive towards similar statements, more than those in the other attitude clusters. Problems with understanding media messages, which may be confusing, might be a reason for not changing health behaviour and it also might affect future health decisions (Klaidman 1991, p. 3; Yeaton, Smith & Rogers 1990). As respondents in both the careful and the distrustful cluster showed more difficulties in understanding media information than did those in the confident cluster, these people may have greater difficulties in changing their behaviour.

12.8.4. Motivations for and barriers to behaviour change

The Health Belief Model (Rosenstock 1974) suggests that changes in health behaviour are due to motivations for and barriers to change. The respondents in this study are mostly convinced that factors that work as motivations for a change towards healthier eating are mainly illness or health problems, doctor's orders, need for weight loss/weight control, information provision and increased knowledge, pregnancy, wishes to stay healthy, and role models. Thus, the answers largely follow those found in previous studies. A person's own illness is often perceived to be the biggest motive for changing one's eating habits (Buttriss 1997; Food Standards Agency Scotland 2002; Parmenter 2002; Salminen et al. 2002; Urho et al. 1994, p. 25). Doctors' orders have also been considered important as motivating factors (Salminen et al. 2002; Urho et al. 1994, p. 25; Viane & Gellynck 1997). The third commonly mentioned factor is a wish to lose weight or not to gain more weight (Beardsworth et al. 2002; Buttriss 1997; Urho et al. 1994, p. 25; Viane & Gellynck 1997). Finally, a desire to improve health generally or to prevent illnesses is fairly common, too (Buttriss 1997; Food Standards Agency Scotland 2002; Viane & Gellynck 1997).

Concerning the respondents' own motivations to change their health and eating behaviours, these are in accordance with both motivating factors suggested by themselves and those found in the literature. Behaviour change was in this population mainly due to health issues or illness, pregnancy, changed family situations, increased age, and finishing studies. Pregnancy, health matters or problems, weight control, fear of BSE, liking or disliking of certain foods, and ethical values, on the other hand, led to changes in eating. Ethical values have been found to be important in influencing food choice especially concerning genetically modified food (Magnusson & Koivisto Hursti 2002). Pregnancy as a motivator was not found in previous studies, but it is in this study quite a natural outcome, considering that one sub-group consisted of pregnant women.

In this group of respondents, perceived barriers to changes included lack of motivation, old habits, lack of knowledge and willingness, and laziness. Differing from the results in some previous studies, they neither claim lack of time (Buttriss 1997; Lappalainen et al. 1997) nor the cost of healthy food (Buttriss 1997; Jamison 1998; Poikolainen 1989).

12.9. Conclusions

We shall now return to the research questions. The following answers can be given drawing from the results of the empirical study:

- **Is there a relationship between the information sources a person uses and his existing knowledge on health and food, and if so, what is this relationship like?**

It seems that there are variations in the knowledge levels of the respondents, and they are apparently related to the use of different information sources, but this is not the whole explanation. Knowledge is both influenced by interest, motivation and differences in health status.

The respondents in this study were found to differ in their preference for information sources for health information. One group preferred health professionals (the professionals' cluster), one relied largely on magazines specializing on health and well- being (the popularized science cluster), and the third group kept to the daily news media (the everyday information cluster). The preference for a certain source was much determined by one's present health status, which is either being diabetic, pregnant or belonging to the control group. The respondents, furthermore, showed differences in their levels of health knowledge. The measured knowledge was divided into three levels: low, medium and high. The popularized science cluster showed the highest level of knowledge in the three knowledge testing parts. The professionals' cluster, on the other hand, showed the weakest knowledge in the detailed knowledge tests, while the respondents in the everyday information cluster had the greatest difficulties in formulating a script for a healthy day. They were, however, best at recalling some specific information. It, thus, seems that there is a relationship between a preferred type of source and one's level of knowledge. Printed information is often remembered better than information heard from, for example, health professionals.

The source alone, however, does not explain the differences in knowledge levels, but there are also other related factors. Better knowledge seems to be due to a higher interest in information seeking and more communication with others, too. Some demographic factors – such as mainly being a woman – are also related to better knowledge. Furthermore, a higher age and a better education seem also, to some extent, to be linked to knowledge.

- **Is there a relationship between received or acquired information and knowledge on nutrition and health and the health and eating behaviour of an individual, and if so, what is the relationship like?**

In this study, those preferring health magazines as an information source – that is, the popularized science cluster – also used less alcohol and tobacco, while those preferring health professionals used more substances. It was also found that the popularized science cluster had been influenced the most by information, mainly by information about health risks with food, and that this had led to changes in eating behaviours. This cluster also showed the most activity in acquiring information. Information, however, was not a strong factor behind health behaviour in this study. Neither did knowledge have a strong influence, although the knowledge level was best in the cluster which showed the best behaviour. Those individuals showing the best behaviour did not always have the best knowledge, and those who showed less desirable health behaviour could still have shown a good knowledge level in the tests.

Attitudes towards health information and healthy living were also not strongly related to behaviour. The group with the most positive attitude – that is, those in the popularized science cluster – and the group with the most negative attitude – those relying on the news media as information sources – did not differ very much from each other on healthy behaviour. Furthermore, those relying on health professionals also had a more positive attitude, but still their behaviour was not excellent. Behaviour, according to this study, was more determined by demographic factors than by information and knowledge. Healthy behaviour might furthermore be due to one's health status. The strongest factors behind the non-use of alcohol were being a woman, being Finnish-speaking, being pregnant, having a high level of education, and doing service or office work. Illness, pregnancy, changes in family situation, increased age, health matters, and weight problems were among the most typical motivating factors for changes in health and eating among these respondents.

The results are visualized in the model in figure 2. This model is an extension of the image (figure 1) presented in chapter 1.1. The model shows that demographic factors lie behind health knowledge, preferences for certain information sources, information behaviour, and current health behaviour. The preference for an information source is related to certain levels of health knowledge, and there is also a relationship between information source and information behaviour. Information behaviour, largely the seeking of information, is also a factor

underlying health knowledge. Information sources, health knowledge and information behaviours are furthermore related to health behaviours, but only weakly.

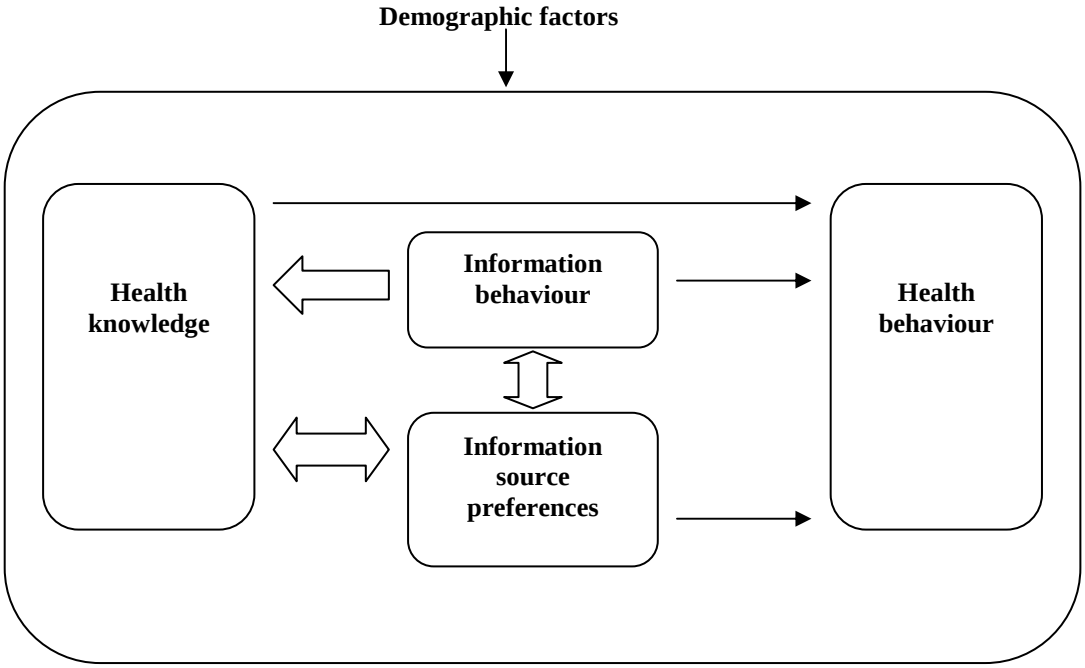

Figure 2. A model of how information is related to health knowledge and behaviour.

12.10. Applications of the results

In this study, relations were suggested between information source, information seeking and health knowledge, and to some extent also health behaviour. It seems that people best understand health information in a popularized form. Drawing people's attention to the existence of health information from different sources might enhance both the interest in and attitude towards such sources, and perhaps also increase their use. The ideal situation would be to enhance health behaviour by perhaps encouraging the increased use of popularized health information, which is informative, trustworthy, and understandable by the general public.

12.11. Suggestions for further research

Due to its mainly intensive, qualitative nature, this study was not intended to lead to general guidelines. However, the findings do seem applicable in a number of ways as they suggest

relations between the use of information sources and knowledge. In the future, it might be fruitful to use the same questionnaire in a quantitative study on a larger sample, and see if more typical patterns and stronger connections can be found.

Moreover, it would be of interest to examine in greater depth some of the findings in this study. One surprising finding was that information-seeking activity did not seem to be determined by a perceived anomaly in the existing knowledge. Those most confident in their own knowledge being sufficient, were also most engaged in acquiring new information. This is contradictory to the theories of information need, and it would be interesting to see what lies behind this. The popularized science cluster, whose members were most confident about their knowledge and most engaged in information seeking, seemed to be the most 'information literate' cluster. Thus, it could be useful to conduct further studies related to information literacy.

Another surprising finding was that little use was made of the Internet in this context. It would be interesting to conduct a study where groups of people with certain information needs could be encouraged to take more advantage of the large amount of information available on the Internet.

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APPENDIX 1

Appendix 1 contains an example of the notices that were sent to the maternity care centres. The text is translated as:

"Wanted....about 20 to 40 year old pregnant women for participation in a research project conerning health information in the mass media. The project aims at a doctoral thesis. Participation includes a short interview and the answering of a questionnaire. The answers will be handled confidentially. The participant may choose the place and the time for the interview herself. For the occasion approximately one hour is needed.

Interested are requested to contact..... (phone number and e-mail address)"

ÅBO AKADEMI
UNIVERSITY

ETSITÄÄN...

....noin 20-40-vuotiaita raskaana olevia naisia jotka olisivat halukkaita osallistumaan väitöskirjaan tähtäävään tutkimusprojektiin, joka käsittelee tiedotusvälineissä esiintyvää terveysinformaatiota. Osallistumiseen kuuluu lyhyt haastattelu sekä kyselylomakkeeseen vastaaminen. Vastaukset käsitellään luottamuksellisesti. Haastattelupaikan ja –ajan osallistuja voi valita itse, ja aikaa tähän tilaisuuteen tulisi varata noin tunti.

Kiinnostuneita pyydetään ottamaan yhteyttä puhelimitse numeroon (02) 215 4862/Kristina Eriksson-Backa tai sähköpostitse osoitteeseen: kristina.eriksson-backa@abo.fi

– –

SÖKES...

...cirka 20-40 år gamla gravida kvinnor för deltagande i forskningsprojekt som behandlar hälsoinformation i massmedia. Projektet syftar till en doktorsavhandling. Deltagandet innebär en kort intervju samt besvarande av ett frågeformulär. Svaren behandlas konfidentiellt. Deltagaren får själv bestämma platsen och tidpunkten för intervjun och för tillfället bör reserveras cirka en timmes tid.

Intresserade ombedes ta kontakt per telefon till nummer (02) 215 4862/Kristina Eriksson-Backa eller per e-post till adressen: kristina.eriksson-backa@abo.fi

APPENDIX 2

Appendix 2 contains an English translation of the questionnaire used in this study, as well as the original questionnaire in Swedish.

No:_____

QUESTIONNAIRE ON INFORMATION_- HEALTH -_FOOD

Background information

1. Gender

1.1 o man
1.2 o woman

2. Birth year: 19_____

3. Education :
(latest grade)

3.1 o elementary school
3.2 o intermediate school
3.3 o comprehensive school
3.4 o upper secondary school
3.5 o vocational school
3.6 o institute
3.7 o polytechnic
3.8 o university/college

4. Main occupation:
(at the moment)

4.1 o farming, forestry, cattleraising, hostess
4.2 o factory or construction work, mining etc.
4.3 o office or service work, spiritual work
4.4 o studies or school attendance. Name type of educational institution using the alternatives in question 3 3:
_____
4.5 o housewife, at home with children, parental leave
4.6 o retired
4.7 o unempolyed

a) **What is your profession?**_____
b) **What type of organisation do you work in?** (do not mention the name, only e.g. size, branch etc.) _____

In the following, give the answer using the numbers in questions 3 and 4 above:

5. 5.1 Father's education: 3._____ **and main occupation:** 4._____
5.2 Mother's edication: 3._____ **and main occupation:** 4._____

Only for diabetics (a) or pregnant women (b), the others go to question **7**:

6. a) When was the diabetes diagnosed?_____
b) Which number of pregnancies is this?_____

7. Are you interested in information on the relationship between food and health?

7.1 o much
7.2 o quite much
7.3 o little
7.4 o not at all

8. How active are you when you obtain information on the relationship between food and health?

8.1 o I am actively obtaining as much information as possible
8.2 o I read, listen and seek when I have the possibility
8.3 o I read, listen and seek now and then
8.4 o I am not very interested and only read or hear something occasionally
8.5 o I am not at all interested in seeking such information. **Go to question 11**

9. How selective are you when you obtain information on the relationship between health and food? (Tick one of the following alternatives and mention in 9.1 or 9.2 also what kind of information you mean)

9.1 o I mostly care about information on the following aspects on food and health:
_____

9.2 o I only care about information on the following aspects on food and health:
_____

9.3 o I read (listen to, look at) everything (and anything) about health and food

9.4 o I do not know

10. If you obtain information about the relationship between food and health, why do you do it? (Tick all the relevant alternatives) :

10.1 o I am generally interested in these matters

10.2 o I have a certain problem that I want to know more about

a) o my problem is related to my general well-being

b) o my problem is related to chronic health problems

c) o my problem is related to temporary health problems

11. Tick the sources you have obtained information on health eating habits from. Tick the column that best shows how useful the information has been.

	VERY USFUL	SOME WHAT USEFUL	USE LESS	DO NOT KNOW
1. News on TV/radio				
2. Interviews and discussion programmes on TV/radio				
3. Other documentaries on TV/radio				
4. Entertainment programmes on TV/radio (what kinds of programs?)				
5. Sport programmes on TV/radio				
6. Cooking programmes on TV				
7. Foreign series on TV (what kinds of series?)				
8. Domestic series on TV(what kinds of series?)				
9. Commercials on TV				
10. Information in daily newspapers				
11. Information in magazines or books specialized on health or well-being				
12. Information in general weekly magazines				
13. Commercials in newspapers and magazines				
14. Internet				
- discussion forums				
- newspapers and magazines online				
- doctoral services, Web clinics				
- pharmacy services on the net				
- commercials on the net				
- other web sites, which?				
15. Health care centre or private doctor				
16. Medical books and encyclopaedias				
17. Fiction books (what kind of fiction?)				
18. Official health information, leaflets and campaigns				
19. School				
20. Family, relatives, friends, work or study mates				
21. Other source, which?				

12. Tick in the left columns how attentive you are towards things you read/see/hear in the following sources. Mention in the right column how reliable you think the sources are by using:
3=very reliable, 2=somewhat reliable, 1=unreliable, 0=do not know

VERY ATTENTIVE	SOMEWHAT ATTENTIVE	INATTENTIVE	DO NOT KNOW		Reliability
				1. News on TV/radio	
				2. Interviews and discussion programmes on TV/radio	
				3. Other documentaries on TV/radio	
				4. Entertainment programmes on TV/radio (what kinds of programs?)	
				5. Sport programmes on TV/radio	
				6. Cooking programmes on TV	
				7. Foreign series on TV (what kinds of series?)	
				8. Domestic series on TV(what kinds of series?)	
				9. Commercials on TV	
				10. Information in daily newspapers	
				11. Information in magazines or books specialized on health or well-being	
				12. Information in general weekly magazines	
				13. Commercials in newspapers and magazines	
				14. Internet	
				14.1 discussion forums	
				14.2 newspapers and magazines online	
				14.3 doctoral services, Web clinics	
				14.4 pharmacy services on the net	
				14.5 commercials on the net	
				14.6 other web sites, which?	
				15. Health care centre or private doctor	
				16. Medical books and encyclopaedias	
				17. Fiction books (what kind of fiction?)	
				18. Official health information, leaflets and campaigns	
				19. School	
				20. Family, relatives, friends, work or study mates	
				21. Other source, which?	

Refer in the following three questions to the sources above (question 12) using their number :

13. **Which of the three information sources mentioned do you use the most to acquire information about food and health?** (name the most used first)

_____

14. Which information has influenced your present health knowledge the most and from which sources have you got it? (Tick the right alternative and name the sources in order of importance. Use the numbers from the table in question 12 above)

14.1 o I know that it has been the following information and the following sources:

_____

_____

14.2 o I am not sure, but I think it has been the following information and sources:

_____

_____

a) Why have they been important?

_____

_____

14.3 o I do not know

15. Do you think that the knowing about the relationship between food and health is doubtful or often contradictory in some of the sources mentioned above? (give the most doubtful and contradictory first in 15.1 and 15.2)

15.1 o yes, doubtful are no:s._____
15.2 o yes, contradictory are no:s._____
15.3 o no
15.4 o do not know

16. Do you discuss the information you receive about the relationship between food and health with friends, workmates or relatives?

16.1 o I strive to do it always
16.2 o quite often
16.3 o sometimes
16.4 o seldom
16.5 o never (go to question **19**)

17. How many persons do you usually discuss with?

17.1 o 1-3 persons
17.2 o 4-6 persons
17.3 o more than 6 persons

18. Why do you discuss such information with friends and relatives?

18.1 o I want to inform them about what I have read or heard.
18.2 o their comments on and judgement about what I have read is important to me
18.3 o I want to make sure that I have interpreted the information correctly
18.4 o I want their comments on what the new knowledge might mean practically
18.5 o it is enjoyable to discuss with others
18.6 o other reason, which?_____

Only for diabetics or pregnant women, the others go to question **20**:

19. Has the diabetes/pregnancy changed your interest in information on food and health in mass media?
19.1 o yes
19.2 o no
19.3 o do not know

If **yes,** how?
_____
_____

20. On which level do you think that your knowledge about the relationship between food and health is?

20.1 o excellent
20.2 o good
20.3 o mediocre
20.4 o quite lousy
20.5 o lousy
20.6 o do not know

21. Do you think that your knowledge about health is sufficient for your own needs?
21.1 o yes
22.2 o no
22.3 o do not know

22. Does the information on food and health in the media correspond to your wishes?
22.1 o yes
22.2 o no
22.3 o do not know

If **no**, would you like
a) o more information
b) o less information
c) o quality guarantees.What kinds of?_____
d) o other type of content. What kind of?_____

23. Can you recall any specific article or information concerning the relationship between food and health that you have read, seen or heard about (the answer does not need to be exact, mention what you remember)

23.1 o yes
23.2 o no

If **yes**, what was it about?
_____
_____
_____

Where did you read or hear it?
_____

24. Has some certain information in mass media influenced your opinions or your behaviour in health matters?

24.1 o yes
24.2 o no

If **yes**, which? _____
_____
_____
How?_____
_____

25. Do you think that the information you receive concerning the relationship between food and health gives you a feeling of safety concerning your own health?

25.1 o yes. How?
_____
_____
25.2 o no.Why not? _____
_____
25.3 o do not know.

26. Tick the alternative that is closest to your own opinion

1 = totally agree, 2 = agree somewhat, 3 =do not know,

4 = disagree somewhat, 5 = totally disagree

STATEMENT	1	2	3	4	5
1. Information about health and food is often filled with conflicts and/or is contradictory					
2. Experts often change their opinion concerning what you should eat or avoid					
3. There is too much sensational and frightening information about different food items in the traditional mass media					
4. There is too much sensational and frigthening information about different food items on the Internet					
5. The relationship between food and health is exaggerated					
6. It is difficult to put the advice you receive about different food items into practical eating habits					
7. Globalisation has resulted in greater exposure to bigger health risks than before					
8. The large amount of information that reaches us today from all over the World makes it more difficult to know what is really healthy					
9. It has become more difficult to take responsibility for one's health					
10. Too little is known about health risks concerning foreign food					
11. Foreign food is often subject to different controls concerning additives, hygiene and packaging than Finnish food					
12. Healthy food is expensive					
13. Healthy food tastes bad					
14. The whole family seldom wants to eat healthy food					
15. Healthy food is difficult to obtain					
16. Cooking healthy food demands more effort					
17. You become ill from "healthy" food					
18. Healthy food is often of low quality					
19. Global storms concerning food and health (e.g. Mad Cow Disease) have little meaning for the private Finnish citizen					
20. You do not become confused by all new information if you know what you want (foodwise) and stick to it					
21. It is difficult to decisively influence one's own health					
22. There are too many prejudices about food					
23. Global commercial interests control the information we get about healthy food and their effects on health to a larger extent					
24. There is too much information about food and health					
25. The politics controlling the Finnish supplies of food are entirely in the hands of global actors and consortiums					
26. It is difficult to know what is most healthy in the enormous supply at the food store					
27.It is important that people change their eating habits on the basis of new knowledge about the relations between food and health					
28. You have to know a fair bit about nutrition to be able to eat in a healthy manner					
29. Information through the media is provided in a way that is easy to grasp and understand					
30.The media are effectively guarding health issues					

27. If you suddenly experienced a health problem that you would like to have more information about, where would you *first* turn to in order to find this information?

_____

_____

28. Are you influenced by information in the media that feels threatening?

28.1 o yes
28.2 o no
28.3 o do not know

If **yes**, which type of threat feels the worst? Rank the answers so that the most unpleasant is given number 1 and the least pleasant is given number 3.

a) _____ Ego threats (threats against your personality, relations, position)
b) _____ Knowledge threats (threats disturbing what you know and believe in)
c) _____ Physical threats (threats against your health, appearances and well-being)

29. How much do you think you can control your own health?

29.1 o much
29.2 o to some extent
29.3 o quite little
29.4 o not at all

30. How well do you care for your own health?

30.1 o very well
30.2 o to some extent
30.3 o quite lousy
30.4 o not at all

31. Do you use tobacco products?

31.1 o yes. What kind of products?_____
31.2 o no

If **yes**, how often?
a) o daily
b) o some times a week
c) o some times a month
d) o some times a year or more seldom

How much of the product do you usually use at these opportunities?
_____

32. Do you use alcohol?

32.1 o yes
32.2 o no

If **yes**, how often?
a) o daily
b) o some times a week
c) o some times a month
d) o some times a year or more seldom

How much do you usually drink at these opportunities? (amount of restaurant doses, 1 dose is 4 cl strong liquor, 33 cl medium strong beer or 12 cl wine) _____

33. Do you do physical exercise?

33.1 o yes. Why?
_____
_____
33.2 o no. Why not?
_____
_____

If **yes**, how often?
a) o daily
b) o some times a week
c) o some times a month
d) o some times a year or more seldom

For how long a time do you exercise at these opportunities?
_____
What kind of exercise do you do?
_____

34. Have any of the mentioned behaviours (use of tobacco or alcohol, exercise) changed during the last years?

34.1 o yes
34.2 o no
34.3 o do not know

If **yes**, which and how?
_____
_____

Why? _____
_____

35. Have you changed your eating habits during the last years?

35.1 o yes
35.2 o no
35.3 o do not know

if **yes,** how?
_____

_____

Why?_____

_____

_____

36.What kinds of food items contain:

1.Fibre: _____

2.Starch:_____

3.Calcium:_____

4.Iron:_____

5.Unsaturated fatty acids:_____

6.Natrium: _____

37. Which of the following concepts have you heard of concerning food and health? Which concepts' relations to health can you extensively explain to someone else? Tick only one column each.

	KNOW THE CONCEPT/ HAVE HEARD IT	CAN EXPLAIN WHAT IT MEANS	DO NOT KNOW WHAT IT MEANS
1.Polyunsaturated fatty acids			
2.Living food			
3.Organic food			
4.Functional food			
5.Cholesterol			
6.Saturated fatty acids			
7. Monounsaturated fatty acids			
8.Antioxidants			
9.Free radicals			
10.Calories			
11.Food triangle			
12.Essential fatty acids			
13.Amino acids			
14.Genetically manipulated food			
15.Fibres			
16.Proteins			
17.Balanced diet			
18. Carbohydrates			

38. Give the amount:

The amount of calcium in the following products	HIGH	MEDIUM	LOW	DO NOT KNOW
1.whole milk (old-fashioned, untreated milk)				
2.consumption milk				
3.light milk				
4."number 1" milk (contains 1% fat)				
5. skimmed milk				

39.How often do you follow the recommendations on what to eat that you read or hear about?

39.1 o always
39.2 o often
39.3 o sometimes
39.4 o never

40.Which factors do you think mainly motivate people to change their eating habits in a healhtier direction?

_____

_____

_____

41. Which obstacles do you think are the main resons for people not to change their eating habits in a healhtier direction?

_____

_____

_____

42. How do you perceive your health situation at the moment?

42.1 o good
42.2 o quite good
42.3 o mediocre
42.4 o quite bad
42.5 o bad
42.6 o do not know

43.Which of the following nutritive substances give energy and which give protection? Give the energy nutritives number 1 and the protective nutritives number 2

43.1_____ carbohydrates
43.2_____ fat
43.3_____ proteins
43.4 _____minerals
43.5 _____vitamins
43.6 _____water

44. Do you have rules of thumb for your eating?

44.1 o yes, the most important rules are:

_____

_____

_____

44.2 o no

45. Circle the right alternative

1.How much C-vitamin does an orange contain?	55 mg	75 mg	95 mg
2.How large part of the cardiovascular diseases are due to the diet?	10%	40%	70%
3. How large part of the cancer diseases are due to the diet?	30-40%	60-70%	90-100%
4.At what temperature should meat be prepared?	100ºC	200ºC	300ºC
5.How large a part of an adult consists of water?	30%	60%	90%
6.How much water is evaporated from an adult daily during normal circumstances?	2-3 l	5-6 l	8-9 l
7.How is "bad" cholesterol abbreviated?	ADL	HDL	LDL
8.How large a part of the entire calory intake should consist of fat?	c. 10%	c. 30%	c. 50%
9.How large a part of the diet should the carbohydrates form, if a person does sports or exercise a lot?	10-20%	50-60%	80-90%
10. How large a part of the diet should the proteins form, if a person does sports or exercises a lot?	12-15%	32-35%	52-55%
11.How many nutritive items that we cannot produce ourselves do we continuously need to feel well?	30	50	70
12.Which of these vitamins is fat-soluble?	A	B	C
13.How much water should you drink furing one hour when doing sports?	1 l	3 l	6 l

46. Answer if the statement is true or false

	True	False
1.You should choose food items from all the seven sectors of the diet balanced chart preferably to each meal		
2.Food made of intestines contains lots of iron		
3.Botulism is a lethal type of food poisoning		
4.I Our intake of sodium is generally too low		
5.The amount of sodium in our bodies is lowered when we sweat		
6.New findings have shown that the relationship between eggs and a high cholesterol level is exaggerated		
7.Cardiovascular diseases are no longer the largest cause of death in Finland		
8.It is okay to split the intake of vitamins, so that some are eaten in the morning and the rest later during the day		
9.Hemoglobin does not have any large role in the transportation of oxygen in the body		
10.Vitamin K is produced by bacteria in the colon		
11.Cancer is to as large an extent caused by wrong diet as by smoking		
12.It is good to eat before doing sports, to get energy		
13.Selenium is given to cattle in order to satisfy the need for selenium among Finns		
14.Too large an intake of fat-soluble vitamins can give toxic symptoms		
15.Falling ill with cardiovascular disease has no relationship with in which part of the body fat is stored		
16.The intake of energy and the frequency of exercise only has a small relationship from a health point of view.		
17.Finns eat more protein today than before		
18.Meat contains very little hidden fat		
19.Whole meal bread contains lots of vitamin B		
20.Vitamin E is important for the delvelopment of muscles		
21.The vitamins are dependent on minerals to work properly in the body		
22.Meat contains lots of minerals		
23.The negative effects of salt can be prohibited by a simultaneous intake of monounsaturated fatty acids.		
24.A high intake of food containing high levels of calcium lower the blood pressure		
25.We can produce most of the nutritive items our body needs ourselves		
26.Wholemeal products contain lots of magnesium		
27.The amounts of sodium and potassium in the food have no relationship from a health point of view		
28.Potatoes are good sources of potassium		
29.Children and adolescent seldom suffer from lack of iron		
30.Fish contain lots of iron		
31.Vitamin C eases the uptake of iron		
32.Lack of zinc can lead to disturbances in the sense of taste		
33.Lack of manganese is so far not described in the literature		
34.Chromium has no relationship with the glucose metabolism in the body		
35.When a food item is made lighter (light products) its level of protein is usually raising		
36.Fried meat has low fat contents: the meat does not absorb fat from the pan		
37.Sugar is included in the food triangle		
38.Normal boiling or frying increases the melting of protein which can thereafter be more easily utilized		

47. All the factors in colum 2 are influenced by some factor in column 1. Try to form as many pairs as possible (there can be more than one pair a row). Give the number of the pairs in column 3.

Column 1 **Influences**	**Column 2** **Influenced**	**Column 3** **Pair(s)**
1. Botulism	14. Less fat or carbohydrates	1-
2. Lack of selenium	15. Healing of wounds	2-
3. Iron	16. Lack of white blood cells	3-
4. Salt	17. Food poisoning	4-
5. Vitamin B	18. Heart muscle weakness	5-
6. Iodine	19. anemia	6-
7. Vitamin D	20. struma	7-
8. Zinc	21. Teeth and sceleton	8-
9. Lack of copper	22. sceleton	9-
10. To make products light	23. Red blood cells	10-
11. Vitamin K	24. lack of potassium	11-
12. Phosforus	25. blood coagulation	12-
13. Lack of calcium	26. ostheoporosis	13-

48. The substances in column 1 are found in some substances in column 2. Give the relevant pairs in column 3

Column 1	**Column 2**	**Column 3**
1. Calcium	9. carotene	1-
2. Fat	10. tomato ketchup	2-
3. Iron	11. table salt	3-
4. Vitamin C	12. liver	4-
5. Iron	13. Raw meat	5-
6. Sugar	14. milk	6-
7. Vitamin A	15. hemoglobin	7-
8. Sodium	16. Whole milk	8-

Thank you for answering the questionnaire!

Nr._____

ENKÄT OM INFORMATION_- HÄLSA -_FÖDA
Sätt vid samtliga frågor ett kryss vid rätt alternativ om inget annat anges.

Bakgrundsfrågor

2. Kön

1.1 o man
1.2 o kvinna

2. Födelseår: 19_____

3. Utbildning : (senaste examen)
3.1 o folk-/medborgarskola
3.2 o mellanskola
3.3 o grundskola
3.4 o gymnasium
3.5 o yrkesskola
3.6 o institut
3.7 o yrkeshögskola
3.8 o universitet/vetenskapshögskola

4.Huvudsaklig sysselsättning: (för närvarande)
4.1 o jord- och skogsbruk, boskapsskötsel, värdinna
4.2 o fabriks-, gruv-, byggnadsarbete el. motsv.
4.3 o kontors- eller servicearbete, andligt arbete
4.4 o studier eller skolgång. Ange typ av läroinrättning enligt alternativen i fråga 3:
_____
4.5 o hemmafru, hemmamamma el. -pappa, barnledig
4.6 o pensionär
4.7 o arbetslös

c) Vilket är ditt yrke?_____
d) Vid vilken typ av organisation arbetar du? (ange ej namnet, endast t.ex. storlek, bransch etc.) _____

Ange i det följande svaret med det rätta numret från frågorna 3 och 4 ovan:

5. 5.1 Fars utbildning: 3._____ **och huvudsakliga sysselsättning:** 4._____
5.2 Mors utbildning:3._____ **och huvudsakliga sysselsättning:** 4._____

Endast för diabetiker (a) eller gravida kvinnor (b), övriga går vidare till fråga **7**:

6. a) Vilket år diagnostiserades diabetesen?_____
b) Vilken i ordningen är graviditeten?_____

7. Är du intresserad av information om sambandet mellan hälsa och föda?

7.1 o mycket
7.2 o ganska mycket
7.3 o litet
7.4 o inte alls

8. Hur aktiv är du i din informationsanskaffning om sambandet mellan hälsa och föda?

8.1 o jag skaffar aktivt så mycket information som möjligt
8.2 o jag läser, lyssnar och söker i mån av möjlighet
8.3 o jag läser, lyssnar och söker då och då
8.4 o jag är inte speciellt intresserad och läser eller hör något enbart slumpmässigt
8.5 o jag är inte alls intresserad av att söka dylik information. **Gå till fråga 11**

9. Hur selektiv är du i din informationsanskaffning om sambandet mellan hälsa och föda? (Kryssa för ett av följande alternativ och ange i 9.1 eller 9.2 även de aspekter som avses)

9.1 o jag bryr mig främst om information om följande aspekter på hälsa och föda:
_____

9.2 o jag bryr mig enbart om information om följande aspekter på hälsa och föda:
_____

9.3 o jag läser (lyssnar till, tittar på) allt (och vad som helst) om hälsa och föda

9.4 o jag vet ej

10. Om du skaffar information om sambandet mellan hälsa och föda, varför gör du det? (kryssa för alla relevanta alternativ) :

10.1 o jag är allmänt intresserad av dylika frågor

10.2 o jag har ett speciellt problem som jag vill veta mer o m

a) o mitt problem är sammankopplat med mitt allmänna välbefinnande

b) o mitt problem hänför sig till kroniska hälsoproblem

c) o mitt problem hänför sig till tillfälliga hälsoproblem

11. Kryssa för de källor du fått information om hälsosamma matvanor ifrån. Kryssa i den kolumn som bäst anger hur nyttig informationen varit.

	MYCKET NYTTIG	NÅGOT NYTTIG	OAN-VÄND-BAR	VET EJ
1. Nyheter i TV/radio				
2. Intervjuer och diskussionsprogram i TV/radio				
3. Övriga dokumentärprogram i TV/radio				
4. Underhållningsprogram i TV/radio (vilket slags program?)				
5. Sportprogram i TV/radio				
6. Matlagningsprogram i TV				
7. Utländska serier i TV (vilket slags serier?)				
8. Inhemska serier i TV(vilket slags serier?)				
9. Reklam i TV				
10. Information i dagstidningar				
11. Information i veckotidningar eller böcker spec. på hälsa el. välmåga				
12. Information i veckotidningar av allmän typ				
13. Reklam i dagstidningar och veckopress				
14. Internet				
- diskussionsklubbar				
- tidskrifter och tidningar på nätet				
- läkartjänster, cyberkliniker				
- apotekstjänster på nätet				
- reklam på nätet				
- andra webbplatser,vilka?				
15. Hälsostationen eller min privata läkare				
16. Läkarböcker och uppslagsverk				
17. Skönlitteratur (vilket slags?)				
18. Officiell hälsoinformation, broschyrer och kampanjer				
19. Skolan				
20. Familj, släkt, vänner, arbets- eller studiekamrater				
21. Annan källa, vilken?				

12. Kryssa i de vänstra kolumnerna för hur uppmärksam du är på sådant du läser/ser/hör i följande källor. Ange i kolumnen till höger din uppfattning om källornas pålitlighet med:
3=mycket pålitlig, 2=medelmåttigt pålitlig, 1=opålitlig, 0=vet ej

MYCKET UPP-MÄRKSAM	MEDEL-MÅTTIGT UPP-MÄRKSAM	OUPP-MÄRKSAM	VET EJ		PÅLIT LIG-HET
				1. Nyheter i TV/radio	
				2. Intervjuer och diskussionsprogram i TV/radio	
				3. Övriga dokumentärprogram i TV/radio	
				4. Underhållningsprogram i TV/radio (vilket slags program?)	
				5. Sportprogram i TV/radio	
				6. Matlagningsprogram i TV	
				7. Utländska serier i TV (vilket slags serier?)	
				8 . Inhemska serier i TV (vilket slags serier?)	
				9. TV-reklam	
				10. Information i dagstidningar	
				11.Information i veckotidningar eller böcker specialiserade på hälsa el. välmåga	
				12. Information i veckotidningar av allmän typ	
				13 Reklam i dagstidningar och veckopress	
				14. Internet	
				14.1 -diskussionsklubbar	
				14.2 - tidskrifter och tidningar på nätet	
				14.3 -läkartjänster , cyberkliniker	
				14.4. -apotekstjänster på nätet	
				14.5. -reklam på nätet	
				14.6.- andra webbplatser på nätet, vilka?	
				15. Hälsostationen eller min privata läkare	
				16. Läkarböcker och uppslagsverk	
				17. Skönlitteratur (vilket slags?)	
				18. Officiell hälsoinformation, broschyrer och kampanjer	
				19. Skolan	
				20. Familj, släkt, vänner, arbetskamrater	
				21. annan källa, vilken?	

Hänvisa i de tre följande frågorna till ovanstående källor (ur fråga 12) med deras nummer :

13. **Vilka tre av ovanstående informationskällor använder du mest för att få kunskap om hälsa och föda ?** (ange den mest använda först)

_____

14. Vilken information har mest påverkat den hälsokunskap du har idag och ur vilka källor har du fått den? (Kryssa för rätt alternativ och ange på raderna under källorna i viktighetsordning. Använd numren från tabellen i fråga 12 ovan)

14.1 o jag vet att det varit följande information och källor:
_____
_____

14.2 o jag är ej säker, men jag tror att det varit följande information och källor:
_____
_____

a) Varför har de varit viktiga?
_____
_____

14.3 o jag vet ej

15. Anser du att kunnandet om sambandet mellan hälsa och föda hos någon (några) av ovanstående källor är tvivelaktig eller informationen ofta motstridig? (ange i 15.1 och 15.2 de mest tvivelaktiga och/eller motstridiga först)

15.1 o ja, tvivelaktig/a är nr._____
15.2 o ja, motstridig/a är nr._____
15.3 o nej
15.4 o vet ej

16. Brukar du diskutera den information du får om sambandet mellan hälsa och mat med vänner, arbetskamrater och/eller släktingar?

16.1 o jag strävar efter att alltid göra det
16.2 o rätt ofta
16.3 o ibland
16.4 o sällan
16.5 o aldrig (gå vidare till fråga **19**)

17. Hur många personer brukar du diskutera med?

17.1 o 1-3 personer
17.2 o 4-6 personer
17.3 o fler än 6 personer

18. Varför brukar du diskutera dylik information med vänner eller släktingar?

18.1 o jag vill informera dem om vad jag läst eller hört.
18.2 o deras kommentarer och bedömning av det jag läst är viktig för mej
18.3 o jag vill försäkra mej om att jag tolkat informationen rätt
18.4 o jag vill ha deras råd om vad den nya kunskapen kan betyda i praktiken
18.5 o det är trevligt att diskutera med varandra
18.6 o annan orsak, vilken?_____

Endast för diabetiker eller gravida kvinnor, övriga går vidare till fråga **20**:

19. Har diabetesen/graviditeten förändrat ditt intresse för information om hälsa och föda i massmedia?

19.1 o ja
19.2 o nej
19.3 o vet ej

Om **ja**, hur?
_____
_____

20. Hurdan tror du att din kunskap om sambandet mellan hälsa och näring är?

20.1 o utmärkt
20.2 o god
20.3 o medelmåttig
20.4 o rätt dålig
20.5 o dålig
20.6 o vet ej

21. Tycker du att din kunskap om hälsa är tillräcklig för dina egna behov?

21.1 o ja
22.2 o nej
22.3 o vet ej

22. Motsvarar mediernas information om hälsa och föda dina önskemål?

22.1 o ja
22.2 o nej
22.3 o vet ej

Om **nej**, skulle du vilja ha
e) o mera information
f) o mindre information
g) o kvalitetsgarantier.Hurdana?_____
h) o annat innehåll. Hurdant?_____

23.Kan du komma ihåg någon specifik artikel eller någon specifik information om sambandet mellan hälsa och föda, som du läst, sett eller hört om (svaret behöver ej vara exakt, ange vad du kommer ihåg)

23.1 o ja
23.2 o nej

Om **ja**, vad handlade den om?
_____
_____
_____

Var läste eller hörde du det?
_____

24. Har någon särskild information i massmedia påverkat dina åsikter eller ditt beteende i hälsofrågor?

24.1 o ja
24.2 o nej

Om **ja**, vilken? _____
_____
_____
Hur?_____
_____

25. Tycker du att den information om sambandet mellan hälsa och föda du får ger dig en känsla av trygghet gällande din egen hälsa?

25.1 o ja. Hur? _____
_____
25.2 o nej.Varför? _____
_____
25.3 o vet ej.

26. Kryssa för det alternativ som bäst avspeglar din åsikt

1 = helt av samma mening, 2 = dels av samma mening, 3 =vet ej,
4 = dels av olika mening, 5 = helt av olika mening

	1	2	3	4	5
1.Information om hälsa och föda i olika medier är ofta konfliktfylld/motsägelsefull					
2.Experter byter ofta mening om vad man bör äta eller låta bli att äta					
3.Det förekommer för mycket sensations- och skrämselinformation om olika födoämnen i våra traditionella massmedier					
4.Det förekommer för mycket sensations och skrämselinformation om olika födoämnen på Internet					
5.Sambandet mellan hälsa och föda är överdrivet					
6.Det är svårt att överföra de råd man får om olika födoämnen i reella matvanor					
7.Globaliseringen har medfört att vi idag är utsatta för större hälsorisker än förr					
8.Den stora informationsströmmen som idag når oss från hela världen gör det svårare att veta vad som faktiskt är hälsosamt					
9.Det har blivit svårare att ta ansvar för sin egen hälsa					
10.Man vet för litet om hälsorisker förenade med utländsk mat					
11.Utländsk mat har ofta en annorlunda kontroll för tillsatsämnen, hygien och förpackningar än den finska maten					
12.Hälsosam mat är dyr					
13.Hälsosam mat smakar illa					
14.Hela familjen vill sällan äta hälsosam mat					
15.Hälsosam mat är svår att få tag på					
16.Hälsosam mat är mera arbetsdryg att tillreda					
17.Man blir sjuk av "hälsosam" mat					
18.Hälsosam mat är ofta av dålig kvalitet					
19.Världsomfattande ”stormar” kring hälsa och föda (t.ex. galna ko-sjukan) har en rätt liten betydelse för den enskilde finske medborgaren					
20.Man blir inte förvirrad av all ny information om man vet vad man vill och skall hålla sig till i matväg					
21.Det är svårt att på ett avgörande sätt själv påverka sin hälsa					
22.Det finns för många fördomar om mat					
23.Världsomfattande kommersiella intressen styr i allt högre grad den information vi får om hälsosam mat och dess inverkan på hälsan					
24.Det finns för mycket information om mat och hälsa					
25.Den politik som styr även det finska utbudet av mat är helt i händerna på globala aktörer och konsortier (affärssammanslutningar)					
26.Det är svårt att veta vad som är hälsosammast i affärens enorma utbud					
27.Det är viktigt att människor förändrar sina matvanor på basis av ny kunskap om sambandet mellan hälsa och föda					
28.Det krävs att man kan rätt mycket näringslära för att kunna äta hälsosamt					
29.Information i medierna ges på ett sätt som är lätt att uppfatta och förstå					
30.Medierna bevakar hälsoområdet effektivt					

27. Om du plötsligt fick ett hälsoproblem som du ville få mera information om, vart skulle du *i första hand* vända dig för att få denna information?

_____

_____

_____

28. Blir du påverkad av information som känns hotfull i medierna?

28.1 o ja
28.2 o nej
28.3 o vet ej

Om **ja**, vilket slags hot är mest obehagligt för dig? Rangordna så att det mest obehagliga får siffran 1 och det minst obehagliga får siffran 3.

a) _____ Egohot (hot mot din personlighet,relationer, ställning,)
b) _____ Kunskapshot (hot som stör det du vet och tror på)
c) _____ Fysiska hot (hot mot din hälsa, ditt utseende och välbefinnande)

29. Hur mycket tror du att du kan kontrollera din egen hälsa?

29.1 o mycket
29.2 o i någon mån
29.3 o rätt litet
29.4 o inte alls

30. Hur väl tar du hand om din hälsa?

30.1 o mycket väl
30.2 o i någon mån
30.3 o rätt dåligt
30.4 o inte alls

31. Använder du tobaksprodukter?

31.1 o ja. Hurdana?_____
31.2 o nej

Om **ja**, hur ofta?
a) o dagligen
b) o några gånger/vecka
c) o några gånger per månad
d) o några gånger per år eller mer sällan

Hur mycket av produkten (antalet cigaretter, pipor, prisar) använder du vanligen vid dessa tillfällen? _____

32. Använder du alkohol?

32.1 o ja
32.2 o nej

Om **ja**, hur ofta?
a) o dagligen
b) o några gånger per vecka
c) o några gånger per månad
d) o några gånger per år eller mer sällan

Hur mycket dricker du vanligen vid dessa tillfällen? (antalet restaurangdoser, 1 dos motsvarar 4 cl starksprit, 33 cl mellanöl eller 12 cl vin) _____

33. Motionerar du?

33.1 o ja. Varför?
_____
_____
33.2 o nej. Varför inte?
_____
_____

Om **ja**, hur ofta?
a) o dagligen
b) o några gånger per vecka
c) o några gånger per månad
d) o några gånger per år eller mer sällan

Hur länge motionerar du vanligen per gång vid dessa tillfällen?
_____
Vilket slags motion är det frågan om?
_____

34. Har något av de ovanstående beteendena (tobaksanvändning, alkoholbruk, motion) ändrat under senare år?

34.1 o ja
34.2 o nej
34.3 o vet ej

Om **ja**, vilket/vilka och hur?
_____
_____

Varför? _____
_____

35. Har du förändrat dina matvanor under senare år?

35.1 o ja
35.2 o nej
35.3 o vet ej

om **ja,** hur?
_____

_____

Varför?_____

_____

_____

36.Vilket slags födoämnen innehåller:

1.Fiber: _____

2.Stärkelse:_____

3.Kalcium:_____

4.Järn:_____

5.Omättade
fettsyror:_____

6.Natrium: _____

37. Vilka av följande termer har du hört om i samband med hälsa och föda? Vilka termers samband med hälsa kan du utförande förklara för någon annan? Kryssa i endast en kolumn.

	KÄNNER TILL TERMEN/ HAR HÖRT TALAS OM TERMEN	KAN FÖRKLARA VAD TERMEN INNEBÄR	VET EJ VAD TERMEN INNEBÄR
1.Fleromättade fettsyror			
2.Levande föda			
3.Organisk föda			
4.Funktionell föda			
5.Kolesterol			
6.Mättade fettsyror			
7.Enkelomättade fettsyror			
8.Antioxidanter			
9.Fria radikaler			
10.Kalorier			
11.Kostpyramiden			
12.Essentiella fettsyror			
13.Aminosyror			
14.Genmanipulerad mat			
15.Fibrer			
16.Proteiner			
17.Balanserad kost			
18. Kolhydrater			

38. Ange halten:

KALCIUMHALTEN I FÖLJANDE PRODUKTER	HÖG	MEDEL	LÅG	VET EJ
1.helmjölk (gammaldags obehandlad mjölk)				
2.konsumtionsmjölk				
3.lättmjölk				
4.ettans mjölk				
5.fettfri mjölk				

39.Hur ofta följer du de rekommendationer om vad man bör äta som du läser och hör om?

39.1 o alltid
39.2 o ofta
39.3 o ibland
39.4 o aldrig

40.Vilka faktorer tror du främst motiverar människor att förändra sina matvanor i en hälsosammare riktning?

_____

_____

_____

41.Vilka hinder tror du att är de främsta orsakerna till att människor inte förändrar sina matvanor?

_____

_____

_____

42. Hur upplever du att ditt hälsotillstånd är just nu?

42.1 o gott
42.2 o relativt gott
42.3 o medelmåttigt
42.4 o relativt dåligt
42.5 o dåligt
42.6 o vet ej

43.Vilka av följande födoämnen ger energi (energifödoämnen) och vilka ger skydd (skyddsfödoämnen)? Ange nummer 1 för energifödoämnena och nummer 2 för skyddsfödoämnena.

43.1_____ kolhydrater
43.2_____ fett
43.3_____ proteiner
43.4 _____mineraler
43.5 _____vitaminer
43.6 _____vatten

44. Har du några tumregler för dina matvanor?

44.1 o ja, de viktigaste tumreglerna är:_____

_____

_____

_____

44.2 o nej

45. Ringa in rätt alternativ

1.Hur mycket C-vitamin innehåller en apelsin?	55 mg	75 mg	95 mg
2.Hur stor del av hjärt- och kärlsjukdomarna beror på den föda som äts?	10%	40%	70%
3.Hur stor del av cancersjukdomarna beror på den föda som äts?	30-40%	60-70%	90-100%
4.Vid vilken temperatur bör man steka kött?	100ºC	200ºC	300ºC
5.Hur stor del av en vuxen individ består av vatten?	30%	60%	90%
6.Hur mycket vatten avdunstar en vuxen individ dagligen under normala förhållanden?	2-3 l	5-6 l	8-9 l
7.Hur förkortas det ”dåliga” kolesterolet?	ADL	HDL	LDL
8.Hur stor del av hela kaloriintaget borde helhetsförbrukningen av fett vara?	c. 10%	c. 30%	c. 50%
9.Hur stor del av maten borde kolhydraterna minst utgöra om en person sportar eller rör sig mycket?	10-20%	50-60%	80-90%
10.Hur stor del av av dagens energiintag bör proteinerna utgöra för personer som sportar el. rör sig mycket?	12-15%	32-35%	52-55%
11.Hur många olika näringsämnen som vi inte kan producera själva behöver vi fortlöpande för att må bra?	30	50	70
12.Vilket av vitaminerna är fettlösligt?	A	B	C
13.Hur mycket vatten bör man dricka per timme i samband med idrott?	1 l	3 l	6 l

46. Kryssa för om påståendet är sant eller falskt

	Sant	Falskt
1.Man bör välja mat från alla sju sektorerna i kostcirkeln helst till varje måltid		
2.Det finns rikligt med järn i inälvsmat		
3.Botulism är en dödligt förlöpande matförgiftning		
4.I genomsnitt får vi i oss för litet natrium		
5.När vi svettas minskar vår kropps natriumreserver		
6.Nya rön har visat att sambandet mellan ägg och hög kolesterolhalt är överdrivet		
7.Hjärt- och kärlsjukdomarna är ej längre det finska folkets största dödsorsak		
8.Det går bra att dela sitt dagsbehov av vitaminer så att en del ätes på morgonen och en del senare under dagen		
9.Hemoglobinet har ingen nämnvärd andel i syretransporten i kroppen		
10.K-vitamin produceras av bakterierna i tjocktarmen		
11.Cancer förorsakas lika mycket av felaktiga matvanor som av rökning		
12.Det är bra att äta innan man börjar sporta så att man får energi		
13.Selen ges åt boskap för att tillfredsställa finländarnas selenbehov		
14.Alltför stort intag av fettlösliga vitaminer kan ge förgiftningsymptom		
15.Insjukningfrekvensen i hjärt- och kärlsjukdomar har inget samband med var i kroppen fettlagret bildas		
16.Energiintag och motionsfrekvens har enbart ett marginellt samband ur hälsosynpunkt		
17.Finländare äter mera protein idag än tidigare		
18.Det finns mycket lite lönnfett i kött		
19.Det finns rikligt med B-vitamin i fullkornsbröd		
20.E-vitamin är viktigt för uppbyggnad av musklerna		
21.Vitaminernas funktion i kroppen är beroende av mineraler		
22.Kött innehåller mycket mineraler		
23.Saltets negativa effekt kan förhindras genom ett samtidigt intag av fleromättade fettsyror		
24.Ett rikligt intag av kalciumrik mat sänker blodtrycket		
25.Vi kan själva producera de flesta näringsämnen som vår kropp behöver		
26.Magnesium finns i rikliga mängder i fullkornsprodukter		
27.Natrium- och kaliummängderna i vår mat har inget inbördes beroende ur hälsosynpunkt		
28.Potatis är en god kaliumkälla		
29.Barn och unga har sällan järnbrist		
30.Det finns rikligt med järn i fisk		
31.Kroppens upptagning av järn förbättras av C-vitamin		
32.Zinkbrist kan störa smaksinnet		
33.Manganbrist finns hittills ej beskriven i litteraturen		
34.Krom har ej samband med glukosmetabolismen (ämnesomsättningen) i kroppen		
35.När man "lättar" på ett livsmedel (light-produkter) stiger dess proteinhalt i allmänhet		
36.Stekt kött har låg fetthalt: kött suger ej upp fett ur pannan vid stekning		
37.Socker ingår som en beståndsdel i kostpyramiden		
38.Normal kokning, stekning eller annan värmebehandling ökar ofta proteinets smältbarhet, så att det kan utnyttjas bättre		

47. Samtliga faktorer i kolumn 2 påverkas av någon faktor i kolumn 1. Försök bilda så många par som möjligt (kan vara mer än ett par per rad). Ange parens nummer i kolumn 3.

Kolumn 1 **Påverkar**	**Kolumn 2** **Påverkas**	**Kolumn 3** **Par**
1. Botulism	14. fett- eller kolhydrathalten minskar	1-
2. Selenbrist	15. läkningen av sår	2-
3. Järn	16. brist på vita blodkroppar	3-
4. Salt	17. matförgiftning	4-
5. B-vitamin	18. hjärtmuskelsvaghet	5-
6. Jod	19. anemi	6-
7. D-vitamin	20. struma	7-
8. Zink	21. tänder och skelett	8-
9. Kopparbrist	22. skelettet	9-
10. Att "lätta"("light","kevyt") produkter	23. röda blodkroppar	10-
	24. kaliumbrist	11-
11. K-vitamin	25. blodets koagulering	12-
12. Fosfor	26. osteoporos	13-
13. Kalciumbrist		

48. Ämnena i kolumn 1 ingår i någon substans i kolumn 2. Ange de relevanta paren i kolumn 3

Kolumn 1	**Kolumn 2**	**Kolumn 3**
1. Kalcium	9. karoten	1-
2. Fett	10. ketchup	2-
3. Järn	11. bordssalt	3-
4. C-vitamin	12. lever	4-
5. Järn	13. rått kött	5-
6. Socker	14. mjölk	6-
7. A-vitamin	15. hemoglobin	7-
8. Natrium	16. helmjölk	8-

Tusen tack för att du fyllde i frågeformuläret!

It is commonplace to hear or read about connections between food and health in different kinds of media today. One day one hears that one thing is good to eat and the next that something else is dangerous and so on. The amount of health information is growing, and so is the amount of confusing health-related information. How do people interact with all this? The aim of this thesis is to examine the relationship between the existing level of knowledge in health matters, health behaviour and the preference for health information sources related to nutrition. Fifty Finnish people were involved in this research.

Three groups of people are studied: diabetics, pregnant women, and a control group. These people are found to differ in their preference for health information sources. The respondents are divided into three clusters according to source preference: 'the professionals' cluster', preferring information from health professionals; 'the popularized science cluster', mainly using information from sources including popularized science; and 'the everyday information cluster', using the daily news media.

The thesis shows that information source use and information behaviour are related to level of knowledge and, to some extent, also to the health and eating behaviours of the respondents.

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