# Everyday life classification practices and technologies

## Applying domain-analysis to lay understandings of food, health, and eating

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### Abstract

**Purpose** – Through the application of domain-analytic principles, the purpose of this paper is to explore how participants' understandings of healthy eating are related to their grouping and classification of foods.

**Design/methodology/approach** – In total, 30 food-interested people were asked to (1) sort a series of 56 statements about food, health, and eating on a scale from "most disagree" to "most agree"; (2)complete an open card sort of 50 foods; and (3) classify these 50 foods on a scale from "most unhealthy" to "most healthy". Exercises (1) and (3) involved *Q*-methodology, which groups people who share similar understandings of a phenomenon.

**Findings** – Participants' understandings of healthy eating – revealed by the first *Q*-methodology exercise – were related to shared food priorities, values, and beliefs; these understandings were indirectly connected with food identities, which was not expected. This suggests that lay domain knowledge is difficult to capture and must involve other methodologies than those currently employed in domain-analytic research.

**Research limitations/implications** – Although a small sample of food-interested people were recruited, the purpose of this study was not to make generalized claims about perspectives on healthy eating, but to explore how domain knowledge is related to everyday organizational processes.

**Originality/value** – To "classify" in Library and Information Science (LIS) usually involves an engagement with formally established classification systems. In this paper the author suggests an alternative path for LIS scholars: the investigation of everyday life classification practices. Such an approach has value beyond the idiosyncratic, as the author discusses how these practices can inform LIS researchers' strategies for augmenting the messages provided by static classification technologies.

**Keywords** Classification, Health

**Paper type** Research paper

### Introduction

Classification, as a process, refers to the act of dividing objects or concepts into groups according to shared characteristics, attributes, properties, or qualities. No longer considered to be invisible, neutral tools, investigations of classifications are necessary to uncover the "moral, scientific, and esthetic" implications of these systems (Bowker and Star, 1999, p. 319). Library and Information Science (LIS) research on classification has primarily focused on the principles used to classify documents in order to aid information retrieval (Hjørland and Pedersen, 2005). Investigations of classification for information retrieval are often explicitly segmented from investigations of how people classify things. Jacob (2004), for example, suggests that the classification of items in a bibliographic classification system is an "orderly", "lawful", and "systematic" process, while people's personal classification (or categorization) practices are

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"flexible", "creative", and "nonbinding". This narrow focus has limited the scope of classification research in LIS. As Mai (2011) has discussed, "the meaning and usage of terms, classes, and categories are embedded in particular cultures and traditions and the separation between classification and categorization that Jacob advocates is difficult to maintain in practical terms" (p. 713). In this paper, I describe research that broadens the lens of inquiry by exploring everyday life classification technologies and practices. Specifically, I report findings from a study of how food-interested people group and classify foods as "healthy" or "unhealthy" in comparison with the organization of foods found in an influential, government-produced food guide.

Following from domain-analytic tenets, an important assumption guiding the research reported here is that classification technologies and practices (whether bibliographic or everyday life) are reflections of a larger domain, or larger "thought or discourse communities" (Hjørland and Albrechtsen, 1995, p. 400). The domain-analytic approach is particularly concerned with the development of knowledge organization systems from the "needs of a given group of users or a given ideal purpose" (Hjørland, 2008, p. 95). While, to date, domain analysis has been used primarily to describe information practices in the professional and academic realm (Robinson, 2009), it is also useful for exploring other types of knowledge organization practices, since it is concerned with how people (expert or non-expert) interact in knowledge domains[1]. Hartel (2003, 2010), for example, used domain analysis and serious leisure to examine the way that gourmet food hobbyists manage culinary information in their homes; Karamuftuoglu (2006) applied domain analysis to an investigation of everyday information arts, or works of art that use information as their primary medium of expression. One reason domain analysis has not been applied to everyday life classification practices is that these practices are perceived to be idiosyncratic (Mai, 2008) and descriptions of users' classificatory or searching practices are perceived to be unhelpful when considering how to build bibliographic knowledge organization systems (Hjørland, 2013). In this paper I suggest that investigations of everyday life classification practices may be useful for an alternative reason – to point to the limitations in messages provided by static everyday life classification technologies and to suggest ways to augment these systems.

*Everyday life classification processes and technologies*

For the purposes of this paper, everyday life classification technologies refer to static, non-neutral tools that order the world. They are "a set of boxes (metaphorical or literal) into which things can be put to then do some kind of work – bureaucratic or knowledge production" (Bowker and Star, 1999, p. 10). They can be embedded within an ecology of people, practices, technologies, and values (Nardi and O'Day, 1999) or function as mediators that transform the meaning of the elements they are supposed to carry (Wathen *et al.*, 2008). To understand everyday life classification processes, I have drawn on a sociological understanding of "boundary work", or "the conceptual distinctions individuals make in the course of their everyday lives, and how these distinctions can – and do – influence more durable and institutionalized social differences" (Pachucki *et al.*, 2007, p. 331). These everyday conceptual distinctions (i.e. symbolic boundaries) refer to how individuals "categorize objects, people, practices, and even time and space" (Lamont and Molnár, 2002, p. 168).

An example of formal but relatively static everyday life classification technologies are public health food guides (such as the USA's ChooseMyPlate.gov or the UK's Eatwell Plate). These guides are educational tools that attempt to translate the

information of both nutritional standards and guidelines into food advice for the population. In Canada, *Eating Well with Canada's Food Guide* (hereafter referred to as the *Food Guide*) recommends the amounts and types of foods that Canadians should consume to achieve nutritional health (Health Canada, 2007). Within the *Food Guide*, food items are assigned to a food group based on their nutritional profiles, as well as other "qualitative" factors, such as agricultural base, consumers' use of foods, and how foods have been traditionally classified (Katamay *et al.*, 2007). To provide guidance on the types of foods to choose from each food group in order to produce a "satisfactory" food intake pattern (that is, one that meets the nutritional requirements of most Canadians and reduces the risk of chronic diseases), Health Canada included additional messages for each food group in the 2007 version of the *Food Guide* (Katamay *et al.*, 2007). Examples of these messages are: "Eat at least one dark green and one orange vegetable each day"; "Make at least half of your grain products whole grain each day"; "Choose grain products that are lower in fat, sugar or salt"; and "Have meat alternatives such as beans, lentils and tofu often". The consistent theme of these messages is a focus on individual responsibility for choosing specific amounts (serving sizes and number of servings) of specific food items (e.g. green vegetables) that are prepared in a particular way (e.g. low in fat, salt, and sugar). In the study reported here, I explored how the messages about healthy eating embedded in the *Food Guide* resonate with or are replicated in food-related thought communities' personal classifications of food.

*Lay thought communities – perceptions of health, food, and eating*

Unlike expert understandings of a domain, which can potentially be understood through such techniques as bibliometrics (Hjørland, 2002), lay understandings of a domain cannot be easily mapped to a clear body of research or theory. Understandings of food and health are influenced by prevailing nutritional discourses (Ristovski-Slijepcevic *et al.*, 2007), as well as people's age (Patterson *et al.*, 2001), gender (Fagerli and Wandel, 1999; Patterson *et al.*, 2001; Rozin *et al.*, 1999), socioeconomic status (Coveney, 2005; Patterson *et al.*, 2001), and nationality or culture (Lappalainen *et al.*, 1998; Rozin *et al.*, 1999). For example, in a study of Canadians from different ethnocultural communities, Ristovski-Slijepcevic *et al.* (2007) found that participants' understandings of healthy eating were affected both by official nutritional guidelines, such as the *Food Guide,* as well as by cultural/traditional and complementary/ethical discourses. This body of research suggests that how people make sense of food/health relationships – and, in turn, their personal knowledge organization practices with respect to choosing, preparing, and eating foods – is likely to vary depending on their identification with different food-interested groups.

In this paper I focus on three groups that share a distinct perspective on healthy eating, specifically, gastronomists ("foodies"), vegans, and organic consumers. A foodie refers to "a person with a particular interest in food; a gourmet" (OED, 2001, n.p.)[2]. Johnston and Baumann (2009) suggest that while "not all foodies are gastronomes, foodie discourse is gastronomic, meaning that it involves a communicative public-sphere dimension specifying what foods and food trends are interesting, relevant, and high status for foodies" (p. 40). What is common in all of these discourses and personas is an interest in and love of food, a privileging of taste in food/eating-related choices, and a disavowal of eating for convenience. A vegan is someone whose dietary practices and food beliefs are motivated by ethical and/or health considerations (Fox and Ward, 2008; Hoffman *et al.*, 2013; Jabs *et al.*, 1998). Health-oriented vegans

may choose veganism for specific health outcomes, such as to cut out cholesterol, or because they perceive veganism to be a healthier dietary option. Ethically oriented vegans may perceive "modern" food practices, such as factory farming, to be unethical and unnecessarily cruel to animals. An organic consumer is one who may elect to purchase organic foods for ethical reasons (e.g. because of a concern about the environmental impact of certain farming practices), for personal health reasons, or because of their perceptions about product "quality" (Hughner *et al.*, 2007; Tregear *et al.*, 1994; Pearson *et al.*, 2007). In this study, I explored how the personal food/health classifications of people who self-identify with these different groups reflect different thought communities and analysed the extent to which these everyday life classifications coincide with the *Food Guide*'s system of organizing foods.

## Methods

Using snowball sampling I recruited participants who represented vegan, gastronomic, and organic viewpoints on food, health, and eating from a mid-sized city in southwestern Ontario. Recruitment posters were distributed to willing individuals and organizations that served the clientele of interest, including specialty food stores, local farmer's markets, and relevant Facebook pages. The 30 participants – ten vegans, ten foodies, and ten organic consumers – completed three exercises, two of which involved *Q*-methodology techniques.

*Q*-methodology is a systematic method of analysing subjective experience (McKeown and Thomas, 1988). In *Q*-methodology there is "no interest in estimating population statistics; rather, the aim is to sample the range and diversity of views expressed, not to make claims about the percentage of people expressing them" (Cross, 2005, p. 210). It "offers a means of identifying groups or "types" of persons who share similar attitudes towards a phenomenon" (Cross, 2005, p. 211). As such, the use of *Q*-methodology does not reveal individual participants' own discourses, but instead participants' shared "discourses", "representations", "configurations", or understandings of a viewpoint, which can be understood as "a comprehensive snapshot of the major viewpoints being expressed by [the] […] participant group" (Watts and Stenner, 2005, p. 85). In this study, *Q*-methodology was used to investigate participants' shared understanding of the domain of healthy eating and their classification of foods as healthy or unhealthy.

*Q*-methodology generally involves six sequential steps: the development of the research question; the development of a pool of potential statements to be sorted by participants (a concourse); the narrowing of this pool of statements to a final set of statements (a *Q*-set); the selection of participants (a *P*-set); the ranking of statements by participants on a quasi-normal distribution (e.g. −5 ("most disagree") to +5 ("most agree")) (a *Q*-sort); and factorial analysis of the *Q*-sort. These elements are discussed below, along with a card sort exercise (exercise two) that was used to investigate how participants grouped foods in relation to the *Food Guide*.

### *Exercise one – participants' understandings of healthy eating*

In this exercise, the concourse and *Q*-set were developed based on the methodology used by Carlson and Hyde (1984). I constructed a balanced design of four perspectives on healthy eating: healthy eating statements according to the *Food Guide*, and healthy eating statements according to foodies, vegans, and organic consumers. Government-produced food guide statements were collected from Canadian, American, and UK food guides[3].

Gastronomic, vegan, and organic healthy eating statements were collected from web sites of not-for-profit or charitable web sites, local newspapers, discussion groups, and relevant academic articles that claimed to represent the interests of each group. These methods resulted in a total concourse of more than 1,000 statements representing government food guides (234 statements), gastronomy (342 statements), veganism (425 statements), and organic consumers (162 statements).

In order to not exceed the maximum suggested statement total of 60 for the final *Q*-set, each of the four perspectives (*Food Guide*, vegan, organic consumer, foodie) was assigned statements to reflect seven distinct themes, with each theme repeated twice (using different statements), for a total of 56 statements (4 perspectives × 7 themes × 2 repeats). To select the final 56 statements, all statements were analysed using word frequency software to identify the most common terms used in each set[4]. The most frequent terms were used to inform the general themes of the *Q*-set (although effort was taken to not repeat themes in the vegan or gastronomy set that crossed over with the *Food Guide* set, such as "fat"). For example, the most frequent terms for the Canadian, American, and UK food guide web sites (after excluding stop words, such as "and", "or", "the", and common words, such as "food") were fat, fruit, vegetables, milk, juice, grain, serving, meat, children, and yogurt. The final seven themes for the *Food Guide* statement set were fat, fruits and vegetables, milk and alternatives, grains, meat and alternatives, variety and activity. The final 56 statements were printed onto cards and presented to participants in random order. Participants were asked to sort the list of 56 statements discussed above on a scale from "most disagree" to "most agree" (see Table I). After completing the *Q*-sort exercise, they were asked some follow-up questions to explain their sorting choices.

*Exercise two – participants' unique classification practices*

After completing exercise one, the participants were asked to complete a card sort. The purpose of this exercise was to understand participants' individual ways of sorting/organizing food items and to compare their organization of foods with that used in the *Food Guide*. From a list of more than 100 foods listed on the Health Canada (2012) web site, which houses information about the *Food Guide,* I eliminated all double-listed and comparable foods (e.g. green pepper and red pepper were combined to form "peppers"), as well as "combined foods" (e.g. pizza and casserole). From this narrowed list of 83 foods, I randomly selected eight foods from each of the five food groups (fruits, vegetables, meats and alternatives, dairy and alternatives, grains)[5] and ten from the unhealthy food group to comprise a final list of 50 foods, each of which was printed on a separate card. The study participants were asked to sort the 50 cards. The only instructions they were given were: not to sort all items into one pile; not to sort every item into its own pile (although some items could be grouped by themselves); and not to sort an item into more than one pile. Participants were asked to label their piles in a way that made sense to them and then asked follow-up questions about their sorting process.

**Table I.**
Score sheet for exercise one *Q*-sort – and statement (*S*) distribution

| Most disagree | | | | Neutral/ | Undecided | | | | Most agree |
|---|---|---|---|---|---|---|---|---|---|
| −5 | −4 | −3 | −2 | −1 | +1 | +2 | +3 | +4 | +5 |
| (2*S*) | (4*S*) | (5*S*) | (7*S*) | (10*S*) | (10*S*) | (7*S*) | (5*S*) | (4*S*) | (2*S*) |

*Exercise three – participants' classification of foods as "healthy" or "unhealthy"*
To investigate participants' classification of foods as "healthy" or "unhealthy" (compared with the classification of food healthiness in the *Food Guide*) they were asked to complete another *Q*-sort exercise in which they sorted the same 50 food cards used in exercise two according to perceived healthiness. They sorted each of the 50 foods using a score sheet with a distribution of − 5 ("most unhealthy") to +5 ("most healthy"). They were then asked follow-up questions about their sorting choices.

*Factorial analysis of exercises one and three*
Following the steps suggested by Donner (2001), participants' *Q*-sorts were analyzed using principle components factor analysis with varimax rotation. Determining the number of factors to extract involves a number of considerations, such as the strength of the factor (all eigenvalues above 1 are considered statistically significant), the number of participants who load cleanly onto one factor (as opposed to split across factors), and the amount of explained variance across all factors. Donner (2001) suggests that the "more a participant loads cleanly (disproportionately) onto a single factor, the better that factor represents that participant's sort – and subjective perspective on the issue at hand" (Donner, 2001, p. 32). Factor loadings can be as high as 1 (indicating perfect agreement with a factor), as low as −1 (indicating perfect disagreement with a factor), and the minimum loading onto a factor is about 0.50 (Donner, 2001). After choosing the ideal number of factors to extract, each factor is interpreted using *Q*-sort values of the factor, the normalized factor scores, and the distinguishing characteristics of each factor. The factor *Q*-sort values show how each factor group ranked each statement. In exercise one, study participants were able to sort the 56 *Q*-set statements about healthy eating on a scale from −5 ("most disagree") to +5 ("most agree") (see Table I); in exercise two, study participants were able to sort the 50 foods on a scale of −5 ("most unhealthy") to +5 ("most healthy"). These rankings were ordered using the normalized factor scores, where higher *z*-scores indicate statements that are of higher priority to the factor group. Distinguishing statements reflect statements that a factor group ranked significantly different from another factor group. A summary profile of each group was compiled with these elements to reveal, for exercise one, distinct perspectives on food, health, and eating, or distinct food "thought communities" and, for exercise three, distinct classifications of foods as healthy or unhealthy.

## Results

*Participant characteristics*
Thirty participants (23 females and seven males) took part in the study, ranging in age from 23 to 66 years (mean = 35.7 years, standard deviation = 10.6), with a median income range of $40,000-$60,000. On a rating scale of 1-7, 1 representing "not a food expert" and 7 representing a "food expert", most participants rated themselves a 6, indicating a high level of self-perceived food expertise (mode = 6, range = 3-7).

*Exercise one - food thought communities*
The purpose of the first *Q*-sort exercise was to assess, statistically, the extent to which vegans, foodies, and organic consumers shared common understandings of healthy eating. For this exercise a varimax rotation of four factors was determined to be ideal, as it resulted in the fewest number of participants being split between factors and

explained the greatest amount of variance (approximately 58 per cent) (see Table II)[6]. Analysis of the four factors involved participants' responses to their *Q*-sorts and distinguishing statements, or those statements that each factor ranked as significantly different from other factor groups. The four factors reflect distinct food "thought communities", including vegans who do not separate health from animal rights (Factor 1), participants who are committed to the idea of balanced health (these participants were omnivores whose responses reflect moderate agreement with the basic principles of the *Food Guide*) (Factor 2), participants whose idea of health is connected to eating and sharing foods in a community setting (Factor 3), and participants who are strongly committed to organic principles (Factor 4). Hereafter, I refer to these thought communities as "Ethical Veganism", "Balanced Health", "Community-Oriented", and "Committed Organic" (and I will no longer refer to the three initially recruited groups of ten vegans, ten organic consumers, and ten foodies).

Analysis of the *Q*-sort results (with the aid of participants' post-sort discussions about their responses to the exercise) revealed that most participants agreed with the gastronomic statements found in the *Q*-set; all participants in this study could therefore be considered "foodies". Most participants also disagreed quite strongly with statements drawn from the *Food Guide*. In fact, only the Balanced Health group (Factor 2) ranked *Food Guide* statements positively (and their rankings of these statements were only moderate). A summary of each group's perspective is described below, focusing on their distinguishing statements (found in parentheses) and corresponding comments that emerged during interviews with the participants (following the parentheses). In the interest of space, each statement is only associated with one participant comment; more examples are available from the author upon request.

*Factor 1: Ethical Veganism*. Eight participants defined Factor 1 ("Ethical Veganism"). Participants in this group emphasized the ethical reasons for their eating practices (20): "[T]he most important thing to me [is] the personal ethical reasons I have for how I choose to eat". Ethical values for participants' eating practices were related to animal rights or to not eating meat: "I never compromise about actual meat".

Vegans in this group also considered a healthy lifestyle to be intertwined with a diet free of animal products and often described the vegan lifestyle as healthier than a typical North American or meat-based diet (2, 4, 6, 36): "[I]t's clear that vegan diets are generally healthier and that people have less diseases". Vegans in this group were wary or undecided about the "four food groups" from the *Food Guide*, seeing them as sponsored by dairy and meat associations and inappropriate to their eating styles (30): "I really don't subscribe to the government sponsored food groups that are sponsored by other corporations". Two members of the Ethical Veganism group were health-oriented and the other six discussed how health (including the fat, sugar, and salt content of foods)

| Characteristic | | Factors (*F*) *F*1 | *F*2 | *F*3 | *F*4 |
|---|---|---|---|---|---|
| Number of participants defining the factor | | 8 | 9 | 6 | 5 |
| Explained variance (%) | | 18 | 14 | 14 | 12 |
| cumulative (%) | | | 32 | 46 | 58 |
| Correlations between discourses | F2 | 0.0173 | | | |
| | F3 | 0.1717 | 0.2745 | | |
| | F4 | 0.3595 | 0.3660 | 0.4068 | |

**Table II.** Exercise one *Q*-sort: number of factors and factor characteristics

was not a priority in their eating choices (17, 45): "I don't eat meat. I do eat meat alternatives once in a while, but the idea that they're low in fat or salt isn't really important to me". Although not significantly different from the other factor groups, participants in this group strongly disagreed with *Food Guide* statements that focused on consuming meat or milk, as they did not engage with these practices (35, 44): "[E]ating meat and drinking milk – [that's] just stuff – I have no interest in dealing with".

*Factor 2: Balanced Health*. Nine participants defined the Balanced Health group (Factor 2). Participants in this group were defined by their disagreement with vegan principles (see Table III for all statements). Participants disagreed with vegan principles for pragmatic, personal preference, health-related, or moral reasons (19, 39, 49): "I think there's a bad stigma about how meat's bad for you and I think it's good for you"; "when people say that you can't be healthy and eat animals, this just seems judgmental to me".

Among all the study participants, only those in the Balanced Health group agreed (and then only moderately) with the 14 *Food Guide* statements in the exercise one *Q*-set. In their discussions about the *Food Guide* statements with which they agreed, Balanced Health participants emphasized that healthiness is a "simple" matter of exercising and eating a variety of foods or a balanced diet (3, 30): "[T]o me this is just the simplest approach, eat a variety of foods, exercise – done". Participants in this group were conscious of how they and others ate, in terms of limiting unhealthy foods, which usually referred to processed foods that were high in saturated fats or salt (17, 33, 51): "I eat healthy foods, but it's a struggle for me not to eat unhealthy foods".

*Factor 3: Community-Oriented*. Factor 3 was defined by six participants. Participants in this group were strongly committed to an idea of community (see Table III) that involved sharing food (especially that which is produced locally) with family and friends (43): "[E]ating and sharing food is a wonderful thing to do in a community"; "eating local or eating organic is mostly a social choice". Two members of this group identified themselves as vegetarian and two others as vegan, but all members believed in the benefits of a plant-based diet: (42, 48): "I'm not a vegetarian or I'm not a vegetarian practitioner. Our diet at home is more plant-based and how I choose to prepare food or the recipes that stand out to me and the ones that I'm interested in are more plant-based".

Participants in this group strongly disagreed with some of the principles of the *Food Guide*. They were either unconcerned with the health benefits of foods (particularly, the fat or salt content of foods) or the health benefits of foods did not inform their eating decisions (10, 41): "I don't care very much about the health benefits of things"; "I don't disagree with the *[Food] Guide*, but I don't practice, I don't necessarily think I live by the *[Food] Guide*". Participants in this group especially disagreed with the idea of monitoring their diet through counting serving sizes (10, 41): "I think [feeling connected to my community] is more important to me than, say, rules about eating, or kind of like prescriptive statements about how one should eat or why one should eat a certain way"; "I don't really worry about the actual quantitative element [of eating], which is what I felt the *Food Guide* is based on".

*Factor 4: Committed Organic*. Five participants defined the Committed Organic group (Factor 4). While most participants in the other groups were not opposed to organic principles, participants in this group were strongly committed to them (see Table III). They acknowledge that many people regard the idea of organic food to be "trendy" and differentiate themselves by their interest in the nuances of small-scale agricultural production (40, 47): "I realize too that for a lot of people organic food is

| | Statement | *F*1 | *F*2 | *F*3 | *F*4 |
|---|---|---|---|---|---|
| 1 | I get together with like-minded people for the civilized and healthy enjoyment of food | 1 | 3 | 3 | −1 |
| 2 | Plant-based diets support good health at all stages of life and reduce the risk of heart disease | 5** | 1 | 1 | 1 |
| 3 | I balance my eating with daily physical activities | −3* | 2* | 1 | −1 |
| 4 | Plant-based diets are the healthiest of all, as they reduce the risk of a broad range of health concerns | 4** | −1 | −1 | −1 |
| 5 | Organic farming is better for the world than traditional farming | 2 | 1 | −2** | 2 |
| 6 | A varied plant-based diet, combined with adequate physical activity, is a sound basis for a healthy lifestyle | 4** | 3 | 2 | 2 |
| 7 | I celebrate food with a relaxed attitude and take my time to enjoy meals | 1 | 1 | 1 | −2** |
| 8 | Organic products have a more natural taste, a cleaner taste | −1 | 1 | −2 | 1 |
| 9 | Good food, made at home with care and love, is as important as healthy eating | −1* | 5 | 3 | 1* |
| 10 | I aim to make at least half of my grain products whole grain each day | 2 | 2 | −3** | −1** |
| 11 | Organic food can be more nutritious for you and your family. Put simply, organic food contains more of the good stuff we need – like vitamins and minerals – and less of the bad stuff that we don't – pesticides, additives, and drugs | 2 | 2 | −1** | 5** |
| 12 | The starting principle for health is to eat a wide variety of plant foods, including plenty of strongly coloured vegetables and fruits | 2 | 4 | 2 | 3 |
| 13 | I could never figure out why people would pay twice as much for inferior organic potatoes from far away than for better organically grown potatoes grown two hours away | 1 | −1 | 2** | −5** |
| 14 | When people say that folks can be healthy all their lives eating animals, I know they are not taking into account quality of human life, longevity, and causes of death | 4** | −4 | −4 | −3 |
| 15 | I believe that the use of genetically modified ingredients has no place in the production of safe and healthy food | 3 | −2 | −2 | 4 |
| 16 | Organic is healthier for farmers, it is also healthy for plants, for animals, and our health | 3 | 2 | 1 | 4 |
| 17 | I select lean meat and alternatives prepared with little or no added fat or salt | −5* | 3** | −4 | −4 |
| 18 | I try to eat the right number of calories for how active I am, so that I can balance the energy I consume with the energy I use | −2 | 1** | −3 | −2 |
| 19 | The regular consumption of animal products – even in lower quantities – poses serious health risks | 3** | −4** | −2 | −3 |
| 20 | A plant-based diet enables an equitable, ethical relationship between humans and other living creatures | 5** | −3** | 2 | 1 |
| 21 | Many people are foregoing traditional cooking practices in their kitchens and opting for faster, oftentimes unhealthy and high-calorie foods | 2 | 3 | −1 | −1 |
| 22 | I believe that a right understanding of good food is an essential part of personal contentment and health | 2 | −1 | −1 | 1 |
| 23 | There are lots of benefits of organic food over conventionally grown food, such as organic foods tastes great! | 1 | −1 | −1 | 2** |

(*continued*)

**Table III.**
Exercise one *Q*-sort: factor (F) *Q*-sort values for statements that were ranked on a scale from −5 ("most disagree") to +5 ("most agree")*

Table III.

| | Statement | *F*1 | *F*2 | *F*3 | *F*4 |
|---|---|---|---|---|---|
| 24 | I aim to have six to eight servings of grain products everyday | −3 | −3 | −4 | −4 |
| 25 | Consumption of fruits, vegetables, whole grains, and legumes (beans, peas, and lentils) is crucial to good health | 3 | 3 | 2 | 3 |
| 26 | Organic farming systems have been designed to produce food with care for human health, the environment, and animal welfare. The use of genetically engineered crops is not compatible with this aim | 1 | −1 | −2 | 5** |
| 27 | I believe that an intelligent approach to the pleasures and problems of the table offers far greater rewards than the mere satisfaction of appetite | −1 | −2* | 3** | 1 |
| 28 | I enjoy contrasting flavors and developing taste memories | −2 | −1 | 3** | 1 |
| 29 | I encourage preparation of enjoyable, healthy food, and the pleasures of eating with family and friends | 1** | 4 | 5 | 2 |
| 30 | I enjoy a variety of foods from the four food groups | −4** | 2** | 1 | −1 |
| 31 | Organic farming recognizes the direct connection between our health and the food we eat | −1 | −1 | 1 | 2 |
| 32 | Locally grown ingredients are the freshest | −2 | 4 | 3 | −1 |
| 33 | I choose products that contain less fat, saturated fat, trans fat, sugar, and sodium (salt) | −1* | 2** | −3 | −2 |
| 34 | I eat a wide range of foods to ensure that I'm getting a balanced diet and that my body is receiving all the nutrients it needs | 1 | 4 | 2 | −1 |
| 35 | I aim to have two to three servings of milk and alternatives everyday | −5 | −2** | −5 | −4 |
| 36 | When properly planned, a plant-based diet can be considerably healthier than the traditional North American diet | 4** | −1 | 1 | −2* |
| 37 | A good organic programme will provide balanced nutrition and much healthier plants over time | −1 | −1 | −1 | 3** |
| 38 | Food quality is important to me, especially a fresh and flavorsome seasonal diet that satisfies the senses | −1* | 5 | 4 | 2* |
| 39 | I feel at peace with myself due to eating a plant-based diet | 1 | −5** | 1 | −3** |
| 40 | Organic food production is the best choice for the health of consumers and producers, for the protection and enhancement of the environment, and for the sustainability of the food production system | 1 | −1 | 1 | 4** |
| 41 | I aim to have seven to ten servings of fruits or vegetables everyday | −1 | 1 | −3** | −1 |
| 42 | By mixing vegetables, fruit, pulses, cereals, and nuts, it's almost impossible to lack anything, and you don't have to pay special attention to your diet | −2 | −2 | 4** | −2 |
| 43 | Community-run markets are social meeting points, where local producers offer healthy and high quality food directly to consumers | −2* | 1 | 5** | 1 |
| 44 | I drink skim, 1% or 2% milk each day | −4 | −3** | −5 | −5 |
| 45 | I enjoy vegetables and fruit prepared with little or no added fat, sugar or salt | −4** | 1 | 1 | 1 |
| 46 | Some say it is cheaper to buy vegetables at the supermarket, but what about the nutrients? | −3 | −3 | −1 | −2 |

(*continued*)

| Statement | | *F*1 | *F*2 | *F*3 | *F*4 |
|---|---|---|---|---|---|
| 47 | No longer a passing trend or simply a niche market, organic food and farming are proving to be a viable alternative to the unhealthy, unsustainable, and unjust conventional food system | −1 | −2 | −1 | 4** |
| 48 | I often eat meat alternatives, such as beans, lentils, and tofu | −3 | −3 | 4* | 2* |
| 49 | I feel at peace with myself now that I consume a plant-based diet, and I think that has helped me health-wise as well | 2** | −5** | −1* | −3* |
| 50 | The argument that animal products are "healthy" doesn't hold water when pitted against a well-planned plant-based diet that has all the same nutrients and none of the disease-supporting properties | 3** | −4 | −3 | −2 |
| 51 | I limit foods and beverages high in calories, fat, sugar or salt | −3 | 2** | −4 | −3 |
| 52 | The fast pace of today's lifestyle and the pressures to move ahead have pushed many people out of the kitchen and over to the drive-through window | −2 | 1 | −1 | 1 |
| 53 | Organic is great for your well-being and the environment, is kind to animals and wildlife, and allows us make a big difference – simply through the way we shop | −1 | −2 | −2 | 3** |
| 54 | All nutrients, vitamins, and minerals are present in vegetable products in a very useful form, often much better than those in animal products | 1* | −3 | −2 | −1 |
| 55 | Organic agriculture is a production system that sustains the health of soils, ecosystems, and people | −2* | 1* | 3 | 2 |
| 56 | I'm interested in taste, not health | −4 | −4 | 2** | −4 |

***Notes:** Since participants were asked to rank all statements on a scale from −5 ("most disagree") to +5 ("most agree"), the +5 indicates that the participants in that factor on (weighted) average agreed most with that statement; a −5 indicates that the participants in that factor on (weighted) average disagreed most with that statement (rank-ordered at extreme left/right in Table I, respectively). Distinguishing statements (*$p < 0.05$; **$p < 0.01$) reflect statements that a factor group ranked significantly different from another factor group

**Table III.**

really trendy. So you don't really care where it came from or how it was grown but you like the label. I call them "Bobos", bourgeois bohemians"[7]. While participants in the other groups are likely to choose local products over organic products, participants in this group always preferred organic (although localness was also important): "[I]f I'm making a choice between something that is organic and far – I don't mean far, far, but, like, the States or in B.C. or something like that, versus buying non-organic, I would much rather purchase the organic one. Even if the non-organic was local". Participants in this group recognized that it would take time before organic agriculture was considered a priority by consumers (13): "[T]his is a socialized perspective and I think it's a matter of time before that perspective does change".

For these participants, health is about more than individual health and nutrition: "[T]he political and the social and the economic repercussions of small-scale independent agriculture [are] starving for attention [but this perspective] doesn't sell products [like] personal health and wellbeing". Here, health is linked to food production and planet sustainability, soil health, the absence of pesticides, and the community (including farmers) (11, 40): "[O]rganic food production under the right socioeconomic, political, and environmental circumstances is definitely the healthiest, [it is a] more progressive direction for a healthier planet, a healthier people, a healthier place to live".

*Exercise two – personal classification practices*

In this exercise the participants grouped the 50 food cards into labelled piles. The number of piles created ranged from five to 14 (with nine being the most frequent). Word frequency analysis revealed that the most frequently used pile labels were "fruit(s)" (20), "grain(s)" (18), "veg/veggies/vegetables" (17), "protein" (14), "I like" (13), "snack(s)" (10), "dairy" (eight), "meat(s)" (seven), "vegan" (seven), and "do not eat" (six). These pile labels indicate some consistency with the *Food Guide,* with important differences. Similar to the *Food Guide*, many participants created "veg/veggies/vegetables" (15 participants), "fruit(s)" (20 participants), "vegetables and fruits" (two participants), and/or "grain(s)" (18 participants) piles. The concept "dairy" (used by eight participants) was a preferred term for participants over the *Food Guide* label "milk and alternatives". Foods labelled by the *Food Guide* as "meats and alternatives" (beef, poultry, nuts, etc.) were the most contested. Vegan and vegetarian participants often categorized animal-based foods in this category as things they would "never eat". Non-vegan participants labelled animal-based foods as "protein(s)" (seven participants) or "meat(s)" (five participants), and plant-based foods as "protein(s)" (six participants). Foods described by the *Food Guide* as "foods to limit" (e.g. sports and energy drinks, gravy, pastries, cakes, nachos) were the most variously categorized by participants in terms of meal component ("desserts", "toppings", "condiments"), preparation method ("prepared"), physical characteristics ("processed"), and (health) values ("crap").

Participants within a specific "thought community" displayed similarities in their food organizational tendencies, with important differences. For example, all eight participants in the Ethical Veganism group created piles of foods that referred to their eating practices, including how they avoided foods that may contain animal products (e.g. "avoid", "eat only if […]"), preferred a vegan version of an animal product (e.g. "vegan version available"), and never ate fish or animal flesh (e.g. "never eat", "will not eat", "could not pay me to eat"). Two participants in this group also specifically labelled animal-based products as "dangerous" or "unhealthy". Five of the nine participants in the Balanced Health group referred directly to how the

"*Food Guide*" or "food groups" informed their food sorting processes. All nine members of this group created a pile for foods that they mentioned they would eat due to the health benefits (e.g. "healthy", "good for me") or would limit or avoid due to the lack of health benefit (e.g. "limit", "avoid", "processed"). Three of the six participants in the Community-Oriented group labelled their food piles in ways way that referred to eating with their family, friends, and community; eating within their local community; or eating for pleasure instead of health (e.g. "[partner] likes it", "I made it", "local", "jewels"). None of the five participants in the Committed Organic group labelled their foods according to their "organicness", presumably because they always purchase organic whenever possible[8].

*Exercise three – participants' classification of foods as "healthy" or "unhealthy"*

Following Donner's (2001) approach, analysis of this *Q*-sort exercise revealed only two factors with an eigenvalue above one. The first factor was defined by 29 participants (explaining 65 per cent of the variance), while the second factor was defined by only one participant (see Table IV). After reviewing the interview transcripts for the one participant, who ranked foods differently for this exercise, it was discovered that this participant mistakenly ranked the foods according to the frequency with which she ate the foods. This participant was therefore excluded from detailed discussion for this exercise. As such, there is only one factor defining this exercise, or one main way that the 29 participants sorted the 50 foods. Analysis of participants' rankings of the foods (between −5 ["most unhealthy"] and +5 ["most healthy"]) revealed that nearly all of them ranked vegetables (e.g. spinach, broccoli) and high-protein plant-based products (e.g. legumes, quinoa) as "most healthy" and processed foods (e.g. sports and energy drinks, prepackaged meats) as "most unhealthy".

Exercise three *Q*-sort: foods ordered according to the *z*-scores (not listed) and participants' ranking from "most healthy" (+5) to "most unhealthy" (−5): spinach (5), broccoli (5), legumes (4), quinoa (4), carrots (4), tomatoes (4), beets (3), peppers (3), nuts (3), squash (3), peaches (3), lemons (2), bananas (2), oats (2), kiwis (2), eggplant (2), melon (2), grapes (1), mushrooms (1), barley (1), rice (1), couscous (1), cereal (1), eggs (1), yogurt (1), soy (−1), potatoes (−1), fish (−1), bread (−1), pasta (−1), popcorn (−1), poultry (−1), shellfish (−1), milk (−2), cheese (−2), fruit juice (−2), salad dressing (−2), beef (−2), muffins (−2), gravy (−3), waffles (−3), puddings (−3), nachos (−3), ice cream (−3), cakes (−4), french fries (−4), pastries (−4), potato chips (−4), prepackaged meats (−5), sports and energy drinks (−5).

Although all the participants sorted the 50 foods in the same way, suggesting a shared understanding of which foods are "healthy" and "unhealthy", their interview responses reveal some different notions of "food healthiness" across the four groups. For example, when discussing how they ranked foods as healthy or unhealthy, all eight vegans commented on the health risks of meat and animal products (e.g. poultry, milk,

| Characteristic | | Factors (*F*) *F*1 | *F*2 |
|---|---|---|---|
| Number of participants defining the factor | | 29 | 1 |
| Explained variance (%) | | 65 | 11 |
| Cumulative (%) | | | 76 |
| Correlations between discourses | *F*2 | 0.5663 | |

**Table IV.** Exercise three *Q*-sort: number of factors and factor characteristics

beef, prepackaged meats, and fish): "I don't really want to even know about them [meat and animal products]. I know as a personal fact they're unhealthy for you. I just figure they should the lesser point of any scale". When discussing how they ranked foods as healthy or unhealthy, four of the nine participants in the Balanced Health group reported a visceral reaction to unhealthy foods, or how they felt repulsed or disgusted by them (e.g. cakes, prepackaged meats, and pastries): "I'm a little bit repulsed by food that's bad for me because it makes me feel bad". All six participants in the Community-Oriented group discussed the health benefits of cooking at home compared to consuming processed foods: "A lot of the [foods] were hard to [rank] because I was thinking cakes and stuff – I can produce what I consider some very healthy vegan cakes. But I just pictured cakes as the supermarket, general sugary cakes". Two of the five members of the Committed Organic group referred specifically to the importance of organic food production or how healthiness is related to food production in general: "[Y]ou could do unhealthy or healthy for the planet, in terms of the consumption or the production of the food". Unlike participants from the Balanced Health group who were repulsed by unhealthy foods, participants in this group were repulsed by bad food production practices, especially related to prepackaged meats and shellfish: "[P]repackaged meats are repulsive – they're full of nitrates and chemicals and the conditions they're made in are gross. Gross for people and gross for the animals. The labour in a lot of these plants is really horrible. It's hard to divorce that from the food".

## Discussion

The findings from this study reveal the complexities of knowledge organization within particular lay thought communities. Although participants were recruited according to their identification with one of three food-interest groups (vegans, organic consumers, and foodies) and it was expected that their understandings of healthy eating would correspond with these identities, the use of *Q*-methodology revealed four different "thought communities" (Ethical Veganism, Balanced Health, Community-Oriented, Committed Organic), whose understandings of healthy eating were closely related to shared values, beliefs, and priorities that were indirectly connected to shared food identities.

### *Everyday life classification technologies and practices*

The food values, beliefs, and priorities of all four thought communities – the Ethical Veganism, Balanced Health, Community-Oriented, and Committed Organic groups were reflected in their everyday life classification practices, a finding that supports the importance of considering why participants organize foods as they do. An influential motivator behind participants' card sorts was the *Food Guide*[9]. Given the emphasis in modern nutritional discourse on diseases of "lifestyle" (Drewnowski and Popkin, 1997), or the "aggregation of decisions by individuals which affect their health and over which they more or less have control" (Lalonde, 1981, p. 32), it appears at first glance the *Food Guide* adequately achieves its purpose. All the participants in this study were familiar with the *Food Guide*; the *Food Guide* was the primary factor influencing the grouping of some foods (primarily the fruits, vegetables, and grains); and all of the participants sorted foods as "healthy" or "unhealthy" in a manner consistent with the ways in which foods are organized in the *Food Guide*.

Some limitations in the *Food Guide* can be found, however, when it is considered from a design perspective, which is an important focus in domain-analytic research on

knowledge organization systems. As Mai (2010) discusses, the design of knowledge organization systems is "not merely a technical task; it is a task that involves making ontological statements about the world and the relations among entities in the world" (p. 635). In order for these systems to be trusted, designers and editors "must embrace the principle of transparency and explain their decisions and show the conceptual and philosophical foundations for their systems" (Mai, 2010, p. 639). This can involve an investigation of the "basis by which a classificationist includes or excludes concepts from an organizational scheme, or the semantic warrant" or "how classifications, as a document form, can present the chosen argument more or less persuasively to its audience" (Feinberg, 2010, p. 492). Feinberg (2010) suggests that classifications, as documents, can make an argument by using structural evidence, such as which categories are included and how they are arranged and related, as well as resource evidence, such as which resources are selected and how they are assigned to categories in the organizational scheme. From a design-oriented view, the *Food Guide* creators have done a good job of maintaining transparency about how the four food groups that comprise the *Food Guide* were created, although the groups are derived, in part, from earlier versions of the *Food Guide*, for which less information is available. The purpose of the *Food Guide* ("guiding food selection and promoting the nutritional health of Canadians"), its conceptual foundations (evidence-based, public health priorities), and its revision processes (the 2004 revision included the insights of health care professionals, educators, consumers, and stakeholders) are also explicitly stated. Nevertheless, a number of the lay participants in this study expressed a distrust of the *Food Guide*. For instance, participants in the Ethical Veganism group distrusted the *Food Guide* because of its connection to agricultural producers, such as the Dairy Council of Canada[10]; participants in the Community-Oriented group disagreed with what they viewed as the *Food Guide*'s prescriptive, quantitative food advice; and participants in the Committed Organic group disagreed with the *Food Guide*'s focus on individual health at the expense of a more systemic understanding of health, in particular the global benefits of small-scale agricultural production. While it is not feasible to design food guides that match every user's food beliefs and values, it is possible to consider ways of augmenting tools like the *Food Guide* to serve groups who share distinct food beliefs and values. For example, the Dietitians of Canada organization (2010) offers a link to the *Food Guide,* as well as some additional information for vegan food choices. Thinking of ways to augment everyday life classification systems is especially important when the purpose of the technology is to communicate a message, as is the case with many public health tools.

This study is limited in that it represents a small sample of food-interested eaters and only three types of food-interested groups were recruited (vegans, "foodies", and organic consumers). My intention here was not to provide an exhaustive exploration of diverse understandings of healthy eating, nor to represent the "average" perspective on healthy eating. Instead, through this study I hoped to add some "colour" and to provide some additional context to the scope of our understanding about healthy eating and everyday life classification practices. Also, while the *Q*-set statements strayed from a more traditional approach to developing health questionnaires (such as eliminating all double-barrelled references and ensuring questions do not confuse intention and behaviour), by following Carlson and Hyde's (1984) design (constructing a balanced design of each groups' perspective), the *Q*-set reflects the "messiness", or the contingent, partial, fluid nature of participants' everyday perspectives on food. This "messy" perspective was reflected in participants' use of both public health

nutritional messages and their own contingent food beliefs in their discussions about and organization of foods.

In spite of these limitations, this research suggests interesting avenues for LIS research. Since *Q*-methodology was developed as a method to study people's subjectivity "in relation to its enmeshment in the power dynamics of a shifting manifold of discursive practices" (Stenner *et al.*, 2008, p. 216) and domain-analytic research prioritizes an understanding of people within a sociocultural "domain", *Q*-methodology may have interesting applications for domain-analytic research, especially in terms of capturing complex lay attitudes towards different phenomena. This research also adds to LIS scholars' growing interest in culinary research (e.g. Hartel, 2010; Cox and Blake, 2011) and could be used in this field to contrast the organization of documents or discourses of food bloggers and narrower culinary specialties.

## Conclusion

The findings reported from this research suggest that if LIS researchers look beyond the (still important) goal of improving information retrieval, there are many other areas where LIS expertise in knowledge organization can be explored. In this study, I have applied domain-analytic principles to the investigation of lay domain knowledge. The results reveal that unlike expert knowledge (which can have a high level of agreement between members), lay domain knowledge is complex and requires different methodologies, such as *Q*-methodology, in order to fully understand it. The findings suggest that understanding everyday life classification practices is helpful for identifying some of the limitations of "fixed" knowledge organization systems, in terms of the communication of their core messages and the expertise they claim to translate for lay consumption. These insights can help us to think of ways to augment these systems to better meet the needs of diverse users.

### Notes

1. In this paper I will use "domain" to refer to "a sphere of thought or action" (OED, 2001). The sphere of thought that is examined in this paper is "healthy eating", which is an overlap of spheres of thought about food, health, and eating.
2. In the OED (2001, n.p.) it is noted that a foodie is "sometimes distinguished from 'gourmet' as implying a broad interest in all aspects of food procurement and preparation".
3. Although statements from all three sites were sampled, the final food guide statements were mostly Canadian-based statements.
4. Word frequency analysis software was provided by Tim Craven's freeware: http://publish.uwo.ca/~craven/freeware.htm.
5. *Eating Well with Canada's Food Guide* refers to the groupings of foods in its guide as "food groups".
6. The inclusion of five or more factors resulted in six to eight participants being split between factors; the inclusion of four factors only resulted in two participants being split between factors. While the inclusion of three factors resulted in only one person being split between factors, using this number of factors resulted in five participants who loaded weakly onto a factor (below 0.5). Using varimax rotation for four factors thus resulted in the exclusion of two participants from detailed discussion: one organically inclined participant, formerly a vegan, was split evenly between Factor 1 (Ethical Veganism) and Factor 4 (Committed-Organic). Another participant who believed strongly in the health benefits of

plant-based foods was split evenly between Factor 1 (Ethical Veganism) and Factor 2 (Balanced Health). A cumulative variance of 58 per cent is comparable to other studies that used *Q*-methodology to assess youth attitudes about health lifestyle (van Exel *et al.*, 2006) and food information and food assurance claims (Eden *et al.*, 2008).

7. "Bobos" is a reference to Brooks' (2000) book, *Bobos in paradise: The New Upper Class and How they Got There*.
8. A few of the participants in this group, while completing the card sort exercise, asked (while not being recorded), "these are all organic foods, right?".
9. Participants in the research by Blake *et al.* (2007) also sorted foods according to "nutritional or commercial classifications" (p. 505), but how important this category was to their participants is hard to discern.
10. Participants in the Ethical Veganism group also distrusted any food groups or food guide statements that combined plant-based foods with animal-based foods. For example, all strongly disagreed with the statement "I often eat meat alternatives, such as beans, lentils and tofu" in spite of the fact that they all ate these foods in practice.

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