



Deducing Food Preferences for Fronto-dementia Sufferers: What Might be Discovered Using Mind Genomics Thinking Incorporated into Artificial Intelligence

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Abstract

This paper presents a novel approach to understanding how to learn about food preferences of people who cannot communicate due to advanced FTD (Fronto-temporal dementia). The approach combines Mind Genomics discoveries of mind-sets in the world of everyday experience with the power of AI, artificial intelligence (Socrates as a Service). The paper shows how to present AI with the appropriate queries in the Mind Genomics platform (bimileap.com). The queries suggest to AI the existence of basic mind-sets for food preference, but do not specify the nature of such mind-sets. The queries allow the user to learn about different types of such preference mind-sets, as well as how to observe the behavior of FTD sufferers, and deduce their preference. The approach is presented as a new way to learn the practicalities of caring for patients, a way that can be customized to the user and to the issue being confronted and requiring a practical solution.

Keywords: Hallmark; FTD (Fronto-Temporal Dementia); Artificial Intelligence

Introduction

One of the hallmarks of 'today' is the increasing frequency of dementia, reported in the literature as well as in the popular press. Whereas a great deal of attention is paid to the progress made by researchers to understand the causes of dementia, and even what to do to forestall it, the more common issues of life with dementia are simply accepted. Yet, these problems are fascinating, even if they are the result of a tragic disease [6,7,17].

Food is an area that can help people with dementia stay connected and remember things about other people as the disease gets worse. A number of papers deal with the changes in the appreciation of food-related behavior. Some of this work is clearly clinically oriented, based, reporting on the nature of the behavioral changes from the point of view of science, documenting the changes [2,3,10]. The other part of the literature dealing with dementia, and especially FTD, Fronto-temporal dementia, deals with the responses of family and caregivers to the changing food behaviors. This literature is often interview-based, and anecdotal [4,5,9,11].

Interviews from caregivers who were helping the family at home give further insight on the changing 'food world' of the FTD sufferers. Stories from the caregivers in a qualitative study showed a clear pattern of decline: the first skill to go was shopping for food, then cooking, and finally eating would follow. Educating caregivers about how food processes may end up doing a great deal for both the FTD patient doing the 'eating' as well as the caregiver responsible for the food, from the first steps planning the shopping to buy the food to the last steps of helping the FTD patient enjoy the food [16].

The importance of understanding the preferences of a person suffering with FTD cannot be overestimated.

To get a sense of the relevance of eating, one need only look at the types of recent searches pertaining to front temporal dementia and eating.

- Frontotemporal dementia eating abnormalities
- Frontotemporal dementia eating behavior
- Frontotemporal dementia eating habits
- Daily living in frontotemporal dementia
- Frontotemporal dementia changes in appetite

When there is a way to understand what the FTD sufferer 'likes,' it becomes a more manageable task to give the sufferer the 'right foods.' The problem emerges when the person who is eating the food cannot communicate what they like. It's possible, of course, to give the non-rejected food anyway, simply because eventually the FTD sufferer will begin to starve, and eventually will eat. Anything which helps us to understand the person's preferences for food will allow the caregiver or the nurse to ensure that the FTD sufferer gets the right nutrition and enjoys a better quality of life.

Using AI and science to address the issue of helping an FTD sufferer 'enjoy eating'

This paper deals with the issue of food preferences in dementia, specifically addressing the simple, practical question: 'How do we understand the food tastes of people who can't talk to a nurse or food service worker anymore, usually because they have advanced dementia?' People suffering with advanced dementia often cannot show, talk about, or even hint at what they like to eat. Still, everyone who cares for someone with such dementia knows how important it is for them to eat well. How does the caregiver, especially one working with many patients in a facility, discover the food preferences of a patient with dementia?

The work presented in this paper comes from the effort to combine Mind Genomics thinking with AI, artificial intelligence, and of specific program, SCAS (Socrates as a Service). Mind Genomics is an emerging science which deals with the way we make decisions about the quotidian world, the world of the everyday.

Mind Genomics itself is an empirical science, relying upon the evaluation of 'vignettes' (mixtures of messages or phrases about a topic). From the pattern of reactions to the vignettes, Mind Genomics identifies which messages or phrases (also called elements) drive 'interest' or positive reactions. A continuing finding emerging from Mind Genomics studies with real, ordinary people, is that for virtually any topic, the ways people think about issues in that topic lead to so-called 'mind-sets.' These mind-sets are simply radically different ways of thinking about the specifics of the same topic. Responses to any topic show about two to three or sometimes four mind-sets suffice to cover most of the different ways people think about the topic [14,15].

We wanted to use that thinking and combine it with artificial intelligence, AI. The plan was to 'inform SCAS' about the topic, tell

SCAS that there were a certain number of mind-sets but no other specification, and then request SCAS to list the mind-sets, explicate them, and then help the nurse or caregiver to learn the food preferences of the FTD sufferer. The simple questions posed to SCAS revolved around what practical steps should be taken about feeding the FTD patient based upon the SCAS output. SCAS has already been used with Mind Genomics to create questions and answers for the basic Mind Genomics experiments [12,19]. SCAS has also been used in a deeper fashion, as it is being used here, to provide AI with a deeper briefing [13].

The input 'briefing' to SCAS was the following

Frontotemporal dementia, or FTD, is an increasingly frequent form of dementia which robs its sufferers from the ability to speak and understand what is being said to them. Given this type of dementia, how does the nurse in a home or in a reminiscence ward discover the individual food preferences of a patient who cannot communicate but can eat?

Putting Mind Genomics thinking and AI to the 'practicality' test

The objective of this paper is to report on two studies which put to the test SCAS (AI) with Mind Genomics. The ongoing thinking focused around the nature of prompts to the interface section (Idea Coach), which 'instructed' the AI through SCAS. Could we develop a simple way to understand how to find out what foods were liked by FTD sufferers?

As the process and results show, with the advent of AI (here GPT3.5; 1), it becomes practical to invoke SCAS, viz., AI, as a 'coach'. The strategy for both studies was to provide as little information about the patient as we could, other than that the patient suffers from frontotemporal dementia and is unable to indicate her or his food preferences. Could we get AI to respond to this query and give suggestions of a teaching nature to the person? In other words, could AI become the teacher of the nurse or the food service person or the caregiver? The process had to be simple, available universally, instructive, and able to be modified. Everything in this paper can be done in 'parallel' with the same language, by the reader. at www.bimileap.com. The outcomes for the effort may differ from iteration to iteration, as the outcomes did here. Our goal here is simply to present how we did it, what we received, and perhaps discuss some of the implications.

Study 1: Inform SCAS (viz., AI) that there are only four mind-sets, request slogans and hints about how to teach the topic in a practical setting.

Table 1 shows the instructions for the first experiment, the first study. The objective is to have AI tell us about mind-sets of sensory preferences for people with frontotemporal dementia. In the introduction, we specified that there are four mindsets, but did not tell

the AI anything more. We ran the studies for several iterations, requesting it repeatedly. Each time, the Mind Genomics System platform returned to us a new set of mindsets. These iterations took about 15 to 20 seconds each. When we went through four itera-

tions, each iteration provided 1-3 mind-sets. After four iterations, six clearly different mind-sets emerge, as shown in the bottom of Table 1. The important thing to note is the simplicity of the results.

We understand that there are mind-sets of food preferences among our patients who have Fronto-temporal Dementia, but they cannot tell us what they like. We have to observe them.

Our nurse in charge must teach the other people in the food service to discover the food preference of each of our patients.

Please answer each question below for every mind-sets

1. What is the name of the mind-set?
2. What are six slogans to describe the food preferences for this mind-set, keeping in mind that the person with Fronto-temporal dementia can only respond, not talk?
3. How can the nurse teach others to discover the food preference of each patient suffering from Fronto-temporal dementia?

Mind-Set 1: Color-driven food preferences

Slogans: "Bright and vibrant", "Earthy tones", "Bold and colorful", "Soft and pastel", "Dark and rich", "Subtle shades"

Teaching method: Encourage staff to observe if the patient is more drawn to certain colors of food. Experiment with colorful plates and food presentation to see if it impacts their preference.

Mind-Set 2: Temperature-focused food preferences

Slogans: "Hot and steamy", "Cold and refreshing", "Warm and comforting", "Room temperature bliss", "Icy cool", "Mild warmth"

Teaching method: Have staff observe the patient's reaction to different temperatures of food. Offer a variety of temperatures to see which ones are preferred by the patient.

Mind-Set 3: Sweet Tooth

Slogans: "Sweet treats for a sweet soul," "Indulge in dessert delights," "Satisfy those sugar cravings," "Embrace the sweetness of life through food," "Desserts as a source of comfort and joy," "Let sweetness be the key to unlocking happiness."

Teaching method: The nurse can teach others by observing the patient's reaction to sugary foods such as cookies, cakes, or ice cream. If the patient's face lights up or they eagerly reach for the sweet treat, it indicates a preference for sugary foods. The nurse should also pay attention to non-verbal cues such as increased excitement or improved mood after consuming sweets. Additionally, incorporating a variety of sweet options during mealtimes and noting which ones the patient prefers can help identify their specific preferences. Experimenting with different textures and flavors of sweets can also help in determining the patient's favorite choices.

Mind-Set 4: Savory Lover

Slogans: "Satisfy the savory cravings within," "Embrace the richness of savory delights," "Experience the comfort of savory meals," "Let savory flavors dance on the taste buds," "Indulge in the umami goodness of savory dishes," "Savor every bite of delicious savory foods."

Teaching method: The nurse can teach others by observing the patient's responses to savory foods such as meats, cheeses, or stews. If the patient shows excitement or eagerness when presented with savory options, it indicates a preference for these types of foods. Noting any changes in mood or behavior after consuming savory dishes can also provide insight into the patient's preferences.

<p>Experimenting with different cooking techniques and seasonings to enhance the savory flavors can help in identifying the patient's favorite choices. Encouraging the patient to participate in meal preparation and tasting sessions can also aid in discovering their preferred savory foods.</p> <p>Mind-Set 5 : Comfort Eater</p> <p>Slogans: "Food as a source of solace and comfort," "Find peace in every bite of comfort food," "Embrace the warmth of comforting meals," "Let food be a comforting hug for the soul," "Comforting dishes to soothe the spirit," "Discover the healing power of comfort foods."</p> <p>Teaching method: The nurse can teach others by observing the patient's behavior during mealtimes, noting any preferences for familiar and comforting foods such as soups, casseroles, or warm beverages. If the patient shows signs of relaxation, contentment, or improved mood after consuming comfort foods, it indicates a preference for these types of dishes. Encouraging the patient to reminisce about past food memories or favorite comfort meals can also help in identifying their preferences. Providing a variety of familiar and comforting foods on the menu and noting which ones the patient enjoys the most can aid in discovering their preferred choices. Creating a comforting and inviting environment during mealtimes can also enhance the patient's dining experience and preferences.</p> <p>Mind-Set 6: Texture Enthusiast</p> <p>Slogans: "Feel the joy of unique textures in every bite," "Texture-rich foods for a sensory experience," "Explore the world of textures through food," "Indulge in a variety of textures for a thrilling experience," "Let textures be the star of your dining experience," "Discover the beauty of textures in every dish."</p> <p>Teaching method: The nurse can teach others by observing the patient's responses to different textures in foods such as crunchy, smooth, chewy, or creamy. If the patient shows excitement, interest, or preference for specific textures, it indicates a preference for foods with those textures. Experimenting with a variety of textures in meals and noting the patient's reactions can help in identifying their preferred textures. Offering a range of foods with different textures and observing which ones the patient enjoys the most can aid in discovering their preferences. Creating texture-rich dishes that combine various textures can also enhance the patient's dining experience and preferences.</p>
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Table 1: Instructions to SCAS (AI) that there are four mind-sets of FTD suffers regarding sensory preferences for foods. Across four iterations of SCAS six clearly different mind-sets emerge.

Study 2: Expand the knowledge base to deal with food preferences of FTD patients.

The second study expanded the effort to learn more about understanding the food preferences of FTD patients. This time, SCAS was informed that there are four mind-sets among patients suffering from FTD. The request to SCAS was to answer 15 questions for each mind-set, these questions appearing in numbered order in the middle of Table 2. Three iterations of SCAS generated the four mind-sets shown at the bottom of Table 2. The set of 15 answers for each mind-set was summarized by QuilBott [8], to provide an easy-to-read briefing document that could be used for teaching those who work with FTD sufferers.

General suggestions

Food service staff can take specific steps to better understand and meet the food preferences of patients with Fronto-temporal dementia who fall into the four mind-sets. This includes observing their reactions to different foods, noting any non-verbal cues or gestures that indicate preferences, and engaging them in meal-related activities. Staff can offer a variety of dishes that cater to dif-

ferent taste profiles, textures, and flavors to accommodate diverse preferences. By creating a supportive and inviting dining environment, encouraging patient participation, and experimenting with culinary techniques, food service staff can successfully identify and cater to the individual food preferences of patients with Fronto-temporal dementia.

Comfort eater

- Creating a comforting dining environment can enhance the experience and preferences of a patient who is a comfort eater. Set the mood with soft lighting, soothing music, and familiar scents that evoke a sense of warmth and security. Use table settings and decor that are reminiscent of home or a favorite restaurant. Offer foods that are associated with comfort and emotional well-being to create a reassuring dining experience. By designing a cozy and inviting space, you can help comfort eater patients feel more at ease and open to exploring their food preferences.
- Familiarity with past food memories plays a significant role in identifying a patient's comfort food preferences. Consider

We understand that there are FOUR mind-sets of food preferences among our patients who have Fronto-temporal Dementia, but they cannot tell us what they like. We have to observe them.

Our nurse in charge must teach the other people in the food service to discover the food preference of each of our patients.

Answer each question in order. For the answer, given four answers, one for each Mind-Set. For the question, give the Mind Set name first (in all capital letters), and then answer the question for that mind-set in a paragraph.

1. How can you identify the food preferences of a patient with Fronto-temporal dementia who cannot verbally communicate?
2. What role does observation play in discovering the food preferences of patients with Fronto-temporal dementia?
3. How can non-verbal cues like facial expressions and body language help in determining a patient's food preference?
4. What strategies can be used to encourage patients with Fronto-temporal dementia to express their food preferences through actions or gestures?
5. How can involving the patient in meal preparation or tasting sessions help in identifying their preferred foods?
6. Why is it important to create a variety of food options to help determine the preferences of patients with Fronto-temporal dementia?
7. How can experimenting with different cooking techniques and seasonings assist in discovering a patient's preferred flavors?
8. What role does familiarity with past food memories play in identifying a patient's comfort food preferences?
9. How can creating a comforting dining environment enhance the experience and preferences of a patient who is a comfort eater?
10. What types of savory foods should be explored to identify the preferences of a patient with a savory lover mind-set?
11. How can incorporating a variety of sweet treats during mealtimes help in discovering the preferences of a patient with a sweet tooth mind-set?
12. Why is it important to offer texture-rich dishes to patients with a texture enthusiast mind-set?
13. What behaviors or reactions should be observed to determine a patient's preference for crunchy, smooth, chewy, or creamy textures?
14. How can combining various textures in a dish create a sensory experience for a patient who is a texture enthusiast?
15. What specific steps can be taken by food service staff to better understand and meet the food preferences of patients with Fronto-temporal dementia who fall into the four mind-sets?

Table 2: Expanded knowledge about understanding the food preferences of FTD sufferers, and the creation of material for a briefing document for four mind-sets.

their cultural background, upbringing, and any significant food-related experiences they may have had. Offer dishes that evoke nostalgia or comfort, such as traditional family recipes or favorite childhood meals. By tapping into their past food memories, you can create a sense of familiarity and comfort that resonates with their individual preferences within the comfort eater mind-set.

- To encourage patients with Fronto-temporal dementia to express their food preferences through actions or gestures, create a safe and familiar dining environment. Offer foods that

are reminiscent of their favorite comfort meals or childhood dishes. Allow them to explore different foods at their own pace and observe their reactions closely. Encourage gentle prompts or cues that prompt them to engage with the food in a non-verbal manner. By creating a supportive and inviting atmosphere, you can help comfort eater patients feel more at ease expressing their preferences through their actions and gestures.

Savory lover

- Experimenting with different cooking techniques and seasonings can assist in discovering a patient's preferred flavors within the savory lover mind-set. Prepare savory dishes using methods like grilling, roasting, or braising to showcase a range of flavors and textures. Incorporate various seasonings and herbs to add depth and complexity to the dishes. Note the patient's responses to different flavor profiles and seasonings to determine their preferences. By trying out different culinary styles, you can uncover which cooking techniques and seasonings resonate most with the patient.
- To identify the preferences of a patient with a savory lover mind-set, explore a variety of savory foods that cater to their taste profile. Offer dishes such as roasted vegetables, hearty stews, savory tarts, or flavorful dips and spreads. Pay attention to their reactions and level of enjoyment when tasting these savory options. Note if they display a preference for bold flavors, savory umami notes, or rich textures. By providing a range of savory dishes, you can discover which ones resonate most with patients who fall into the savory lover mind-set.
- When trying to identify the food preferences of a patient with Fronto-temporal dementia who cannot verbally communicate, pay attention to their reactions when different savory dishes are presented to them. Look for signs of enjoyment or disinterest in certain flavors, textures, or aromas. Offer a variety of savory dishes such as grilled meats, pasta with rich sauces, or hearty soups to see which ones elicit positive responses. Note if the patient seems more engaged or animated when certain types of savory foods are presented to them. By observing their non-verbal cues and reactions, you can start to understand their preferences within the savory lover mind-set.

Sweet tooth

- Incorporating a variety of sweet treats during mealtimes can help in discovering the preferences of a patient with a sweet tooth mind-set. Offer desserts like pies, puddings, ice cream, or fresh fruit to gauge their reactions and preferences. Note if they show a preference for specific sweet flavors such as chocolate, fruit-based desserts, or creamy confections. By providing a diverse selection of sweet treats, you can observe which ones elicit the most positive responses and tailor their meals accordingly.
- Involving the patient in meal preparation or tasting sessions can help in identifying their preferred sweet treats. Allow them to participate in baking or dessert-making activities where they can sample different sweets. Observe their reactions and level of enjoyment during these sessions to gather

insights into their sweet tooth preferences. Encourage the patient to taste-test various sweet treats and note their responses to different flavors and textures. By actively involving them in the process, you can gain a deeper understanding of their preferred foods within the sweet tooth mind-set.

- Observation plays a crucial role in discovering the food preferences of patients with Fronto-temporal dementia, as it allows you to see how they interact with different sweet treats. Watch for signs of pleasure when desserts like cookies, cakes, or fruit compotes are offered to them. Note any facial expressions or gestures that indicate a preference for sweet flavors. By observing their behavior during mealtimes, you can gather valuable information about their fondness for sugary foods. Observation helps food service staff tailor meals and snacks to better accommodate the sweet tooth mind-set of these patients.

Texture enthusiast

- Behaviors and reactions to observe when determining a patient's preference for different textures include how they handle and interact with their food. Note if they show a preference for foods that require chewing, like hearty grains or fibrous vegetables. Watch for reactions to crunchy foods like nuts or crispy vegetables, as well as their response to smooth or creamy textures. Pay attention to their facial expressions and body language to gauge their level of enjoyment with different textures. By closely observing these behaviors, you can gather valuable insights into their texture preferences within the texture enthusiast mind-set.
- Combining various textures in a dish can create a sensory experience for a patient who is a texture enthusiast. Incorporate elements like crispy toppings on a creamy soup, crunchy croutons in a salad, or chewy protein sources with a smooth sauce. By introducing contrasting textures within a single dish, you can cater to the preferences of individuals who enjoy a variety of tactile sensations. Experiment with texture combinations to provide a more engaging and satisfying dining experience for patients with this mind-set.
- It is important to create a variety of food options to help determine the preferences of patients with Fronto-temporal dementia, particularly for those with a texture enthusiast mind-set. Offer a diverse selection of dishes with varying textures such as crispy, creamy, soft, and chewy. By presenting a range of texture-rich foods, you can observe which textures the patient gravitates towards or enjoys the most. Providing a variety of options ensures that you can cater to the specific texture preferences of individuals with this mind-set.

Discussion and Conclusions

The increasing prevalence of dementia, as well as other diseases of old age and infirmity, make it imperative that nurses and other caregivers be given a technology which allows them to learn about what their patients are suffering and what to do. For many years, the information has been passed by teacher to student, by teacher to student, given in special classes, put into books, put into pamphlets, given in special and continuing education. The advent of artificial intelligence and the increasing computer sophistication of virtually everyone is producing a new era for information and learning. This paper has presented a simple example of what might be obtained from such an effort focusing just on frontotemporal dementia. The paper does not intend to cite many references, nor to be a deeply academically oriented paper. Rather, the paper focus is simply on showing what can be done in the matter of an hour or two. This means that the era of learning from books, from perhaps dated pamphlets, from perhaps secondhand information can be augmented by the research that a person can do in the privacy of their own space and their own time.

An interesting question emerging from this paper is the degree to which this type of self-teaching will be acceptable in the medical, the nursing, and the food, and the caregiving professions, respectively. Is there an opportunity for self-learning? Will the opportunity to create one's own curriculum be appreciated, or will it be looked down by professionals because it has not been certified? At the same time, one also has to wonder whether the information being used in practice has always been from the scientifically rigorous, passed down and approved by some professional board, or whether people have always learned from experience from talking to each other and from observation. Certainly, none of the material presented here is of clinical importance. None of it pertains to the medical aspects of frontotemporal dementia, nor the medical aspects of feeding a person. Whether these ideas emerging from AI are meant to be practical things, practical suggestions of how to learn, almost tips to the professional that one might read in any magazine. Not tips for diagnosis, not tips for treatment, but things to look out for, things to be cognizant of, little tips, little pieces of information which can help.

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