

# **A Mind Genomics Cartography of Shopping Behavior for Food Products During the Covid -19 Pandemic**

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## **Abstract**

The study presents a new approach to understand the mind of the persons in order to drive desired action in crisis situation, specifically the COVID-19 pandemic. Understand the mind of the shopper in a pandemic situation, with massive uncertainty, should provide direction for governments and the retail trade to adopt practices and communications which will reassure their customers. This study investigates the nature of what people will do to reassure themselves in the pandemic, and has been executed during the period of the pandemic, making the study relevant to the actual events taking place. The focus of the study is on the likelihood of buying ordinary food, given certain descriptions. The study revealed three mind-sets, clusters of individuals who respond to the pandemic in one of three ways. These are: Mind-Set 1: Focus on sanitation & supply; Mind-Set 2: Focus on budget for lifestyle; Mind-Set 3: Focus on shopping, personal needs, consumption. These mind-sets are distributed through the population, and are not limited to specific age or gender. The paper closes with the PVI, personal viewpoint identifier, to assign a new person to one of the three mind-sets.

**Keywords:** Pandemic; Covid-19; shopping behavior.

## **Introduction**

Since the first death in China in early January 2020, the coronavirus (COVID-19) has spread across the globe, dominated the news headlines and led to fundamental changes in the health, social, political and economic landscape (Schroeter, 2018). Attributed to the recent COVID-19 pandemic, panic buying is now a frequent occurrence in many countries, leading to out-of-stocks and disruptions to the supply chain. Consequently, it has received much attention from academics and the retail industry (Yuen, Wang, Ma, & Li, 2020),

The pandemic has been addressed by requirements for behavioral change, the most important being social distancing. Social distancing manifests itself in reduced store capacity, more difficult shopping, insecurity about one's safety in the store, and a sense of diminished finances as jobs disappeared. Social distancing has ushered in a sharp change in consumer lifestyles which almost certainly will produce long-term effects on the ordinary shopping behavior of the typical consumer (Duckett, 2020).

The keywords for today are foresight, anticipation and of course preparations. Some aspects of consumer behaviour and marketing response will be seen to have permanently changed. Brands which prepare will emerge stronger from the disruption (Shaikh, 2020). The COVID-19 crisis overwhelmingly plays into the reality of worries shared by many regarding current food systems. The issues are complicated, involving a rainbow of issues, some technical such as biophysics, but the others softer, more people-relevant, such as demographics, business infrastructure, socio-cultural responses, and of course political responses to the pandemic.

The outbreak and spread of the COVID-19 virus make the shortcomings of our current food system, already frequently 'called out', once again painfully clear. Combined with an already growing feeling of "being fed up" with present food systems and the call for radical change, the crisis provides opportunities to carry out a "re-set" of our food systems, to determine what is important and what is not, to revalue the role of public goods, to reconsider "basic income" for all, etc. (Ruben, McDermott, & Brouwer, 2020).

### **Mind Genomics, systematic experimental design of test stimuli**

"Helping with a good cause" is a way for struggling retailers to stay relevant as they attempt to capture demand, which may be changing due to the behavior of their customers. We focus in this study on understanding the mind of the struggling consumer, living through the pandemic. The focus is on the consumer as a person going to the store, selecting the product, and taking the product home. Rather than focusing on the shopping experience, which for much of the pandemic becomes a fast trip the store, we focus on the mind of the shopper thinking about what to do, what to buy. Simply stated, we focus on the customer shopping from home base, and focus on the decisions made from this focus, viz., people at home who are shopping in a situation where shopping is no longer recreational (Viberg, 2020).

We use the method of experimentation, following the tenets of Mind Genomics. The emerging science of Mind Genomics has as its objective to understand the dimensions of the ordinary, everyday experience. In doing so, Mind Genomics identifies what specific characteristics of everyday experience are positive versus negative, costly versus inexpensive (cognitive economics), and finally what is the nature of the link between the characteristics of shopping and the expected accompanying emotions. For this study, we limit our focus to what people look for in the store, what they think they want to buy, how do they feel they want to budget their money, and what do they do when they get the product home.

Mind Genomics constructs an empirical, inductive science of perception and experience, layer by layer. The ultimate objective of 'mind genomics' is a large-scale, inductive science of the human experience, 'from the bottom up,' based upon emergent commonalities across many different types of daily experience (Moskowitz 2012.) The tools of Mind Genomics uncover different groups of people holding opposite or perhaps unrelated patterns of ideas about the same specific, granular topic (so-called Mind-Sets), and then create a system to assign a person to one of these mutually exclusive, exhaustive mind-sets.

## Mind Genomics, systematic experimental design of test stimuli

Mind Genomics begins by requiring the researcher to choose a topic, then, create four questions which ‘tell a story,’ and finally for each question provide a set of four different answers. The questions and answers are simple phrases, with each question or answer ‘standing on its own.’ The approach is ‘Socratic,’ designed to promote critical thinking about the topic, and to focus on the everyday. For this study, the topic is a ‘story’ about shopping. The questions and answers are framed in the language of the ordinary, as Table 1 shows.

	<i>Group (Binary Ratings)</i>
	<i>Base Size</i>
	<i>Additive Constant</i>
	<i>Question A: How is Covid-19 changing your shopping behavior?</i>
A1	<i>Analyze every purchase for affordability</i>
A2	<i>Maintain what I did before</i>
A3	<i>Focus on essential products</i>
A4	<i>Focus on products to maintain my personal health</i>
	<i>Question B: Where is the place that you shop mostly in this situation?</i>
B1	<i>Supermarket</i>
B2	<i>Retail stores</i>
B3	<i>Online Stores</i>
B4	<i>Local Bakery and Nearby Farms</i>
	<i>Question C: Which products do you buy most?</i>
C1	<i>Basic products (water, bread, vegetables, cereals, fruits and dairy products)</i>
C2	<i>Alcohol (wine, beers, colored alcohol drinks)</i>
C3	<i>Cookies, sweets and snacks</i>
C4	<i>Personal care products</i>
	<i>Question D: Based on this situation, do you trust the food products?</i>
D1	<i>Buy packaged foods products &amp; unwrap myself</i>
D2	<i>Disinfect every product that I buy and bring home</i>
D3	<i>Buy every needed, trust stores to be clean and careful</i>
D4	<i>Buy extra of key products to ensure my supply</i>

Table 1 – The raw material for the Mind Genomics study, comprising four questions which “tell a story” and four answers to each question

The Mind Genomics process combines these answers into small vignettes, combinations of answers. The questions never appear. The vignettes, comprising 2-4 answers, at most one answer from a question, produce little “stories” about the topic area that the respondent rates. Each respondent rates a unique set of 24 vignettes, set up according to an individual experimental design. All 16 elements are statistically independent of each other, allow for OLS (ordinary least-squares) regression to be used to estimate the contribution of each element to the rating. The OLS regression is run on the data from each respondent as preparation for clustering, and on the total data for relevant groups, such as Total Panel, and Mind-Set. Finally, the 24 vignettes for each respondent are different from those of all other respondents, much as in the fashion of the MRI, which takes pictures of the same tissue, but from different angles

and vantage points. With 135 respondents, the Mind Genomics system creates 134x24 or 3240 DIFFERENT vignettes

Each respondent read an orientation, telling them about the study:

*We have created this study, in order to better understand how the situation of Covid-19, is affecting consumer buying and what are they buying mostly, in the category of products.*

*Each vignette represents a situation. The rating scale is: How likely are you to buy basic food products in this situation? 1=Unlikely ... 5=Likely*

The analysis begins by transforming the ratings so that ratings of 1-3 are transformed to 0, and ratings of 4-5 are transformed to 100. Managers understand binary scales, no/yes. After the transformation, a small random number is added to the transformed numbers. The OLS regression analysis generates a single equation of the form: Binary Transformed Rating =  $k_0 + k_1A1 + k_2A2 \dots k_{16}D4$ .

The additive constant is the expected percent of responses 4 and 5 in the absence of elements. The additive constant is an estimated parameter, having no concrete value because it is a correction factor. It is useful, however, as a baseline or proclivity to say 'likely' in the absence of elements. Each positive coefficient shows the driving force of an element towards saying 'yes.' There are negative coefficients, driving to neutral or no. They are not relevant for this discussion, and have been left out of the paper to make the exposition clear. Finally, the standard error of the coefficients is around 4, so a strong and significant 'driver' to yes (likely, rating 4 or 5) is about 7.51 or higher.

Table 2 shows the positive coefficients for the Total panel, for gender, and for the different age groups having a sufficiently large base size. It is clear from Table 2 that although we have several drivers towards 'Likely', most are small and statistically non-significant, except for a few elements rated by respondents ages 18-24.

The foregoing is the typical outcome for Mind Genomics studies. The total panel does not show strong 'drivers', perhaps because the total panel comprises groups with different points of view those differences canceling each other out. The differences do not emerge based on WHO the respondent IS. Even though the common wisdom is that age cohorts or genders think alike, the Mind Genomics data contraindicate that generalization.

	Group	Total	Male	Female	18 - 24	25 - 34	35 - 44
	<b>Base Size</b>	13 5	35	10 0	71	25	23
	<b>Additive Constant</b>	54	50	56	57	52	61
	<b>Question A: How is Covid-19 changing your shopping behavior?</b>						
A1	Analyze every purchase for affordability				1		
A2	Maintain what I did before						
A3	Focus on essential products						
A4	Focus on products to maintain my personal health	3	6	2	4		

	<b>Question B: Where is the place that you shop mostly in this situation?</b>						
B1	Supermarket					6	
B2	Retail stores			1		9	
B3	Online Stores	1		2	1	9	
B4	Local Bakery and Nearby Farms					8	
	<b>Question C: Which products do you buy most?</b>						
C 1	Basic products (water, bread, vegetables, cereals, fruits and dairy products)		5			10	
C 2	Alcohol (wine, beers, colored alcohol drinks)	1	5			10	3
C 3	Cookies, sweets and snacks		2			5	
C 4	Personal care products					3	
	<b>Question D: Based on this situation, do you trust the food products?</b>						
D 1	Buy packaged foods products & unwrap myself						
D 2	Disinfect every product that I buy and bring home						
D 3	Buy every needed, trust stores to be clean and careful						
D 4	Buy extra of key products to ensure my supply						

**Table 2–** Model for the key subgroups, for ‘Likely’ related to the presence/absence of the 16 elements

### Emergent mind-sets for positive shopping experiences

One of tenets of Mind Genomics is that within any experience, especially micro-experiences, such as shopping, people differ from each other in systematic ways called mind-sets. The analogy is to the genome. Genomes have alleles, different forms, which express themselves in different traits, possibly in different behaviors. Carrying that analogy forward, Mind Genomics creates these mind-sets by clustering the pattern of coefficients of the individual models relating the binary rating (here positive emotion) to the presence/absence of the elements in a study (here 16 answers to the questions, i.e., elements). The within-subjects experimental design allows the researcher to create the model (equation) separately for each respondent, and then cluster the respondents based upon the pattern of coefficients (excluding the additive constant.) The metric for ‘distance’ upon which the clustering is based is defined as  $(1 - \text{Pearson } R)$ . The metric takes on the value 0 when the coefficients for two respondents show a Pearson R of 1.0. The metric takes on the value 2 when the coefficients for two respondents show a Pearson R of -1. As a rule of thumb, there should be fewer mind-sets, rather than more (parsimony) and tell a story (interpretability).

Three mind-sets emerged for these data, and for clustering based upon the coefficients for ‘Likely’. The additive constant and the coefficients for three mind-sets appear in Table 3. All three mind-sets show low to moderate coefficients 43-48, so that it is the elements which will drive the rating of 4-5, viz., ‘likely.’

It is clear from Table 3 that there are three different mind-sets, with strongly positive coefficients, reaching and exceeding the cut-off for statistical significance. The mind-sets can be named by considering the commonalities of the elements generating the highest coefficients.

Mind-set 1 - Focus on sanitation/ supply

Strong positive coefficient for answer

D2 Disinfect every product that I buy and bring home

Mind-set 2 – Focus on budget for lifestyle

Strong positive coefficient for answer

A4 Focus on products to maintain my personal health

A3 Focus on essential products

Mind-set 3 – Focus on shopping, personal needs, consumption

Strong positive coefficient for answer

C1 Basic products (water, bread, vegetables, cereals, fruits and dairy products)

	Group	Total	MS1	MS2	MS3
	Base Size	135	47	45	43
	Additive Constant	54	52	58	58
	<i>Mind-Set 1 - Vigilants - Focus on sanitation/ supply</i>				
D2	Disinfect every product that I buy and bring home		17		
D3	Buy every needed, trust stores to be clean and careful		16		
D1	Buy packaged foods products & unwrap myself		15		
D4	Buy extra of key products to ensure my supply		13		
	<i>Mind-Set 2 - Focus on budget for lifestyle</i>				
A4	Focus on products to maintain my personal health			15	
A3	Focus on essential products			15	
A2	Maintain what I did before			13	
A1	Analyze every purchase for affordability		2	8	
	<i>Mind-Set 3 - Focus on shopping, personal needs, consumption</i>				
C1	Basic products (water, bread, vegetables, cereals, fruits and dairy products)				15
C2	Alcohol (wine, beers, colored alcohol drinks)	1			14
C3	Cookies, sweets and snacks				11
C4	Personal care products				9
B1	Supermarket				8
	<i>Not a strong focus in terms of mind-sets</i>				
B4	Local Bakery and Nearby Farms				6
B2	Retail stores				6
B3	Online Stores	1			5

## Identifying the mind-sets of new individuals in the population for more effective communication

Research scientists, marketers and many others find the notion of Mind Genomics attractive because it works from the micro-level, rather than working from the macro-level. The results can be immediately put into action because they deal directly with the topic. The messages are the raw material from which the mind-sets are derived. The only recurring problem is that it is difficult to assign a new person to a mind-set segment based upon either behavioral data that one can capture, or attitudinal data from larger-scale segmentation studies. How does one know the 'attitude of a respondent' in terms of imputing emotions to the shopper? There is no such data, at certainly no data of the granularity provided by Mind Genomics.

For practical use of these data, e.g., communicating and reassuring customers, it is necessary to identify the mind-set of a new individual. The data shown here suggest that it will probably be hard to link individuals to mind-sets simply on the basis of who they are. In study after study, Mind Genomics data suggest that the mind-sets distribute across the normal classification variables of who a person IS, what the person DOES, and even what general BELIEFS a person holds about a topic.

A different approach is necessary, one which uses the profile of coefficients to identify elements which differentiate among the specific mind-sets uncovered in the study. Author Moskowitz and a colleague, Prof. Attila Gere, have developed a Monte-Carlo-based system for identifying the combination of six elements, presented as questions, with two answers. These elements are created from the original data used to uncover the mind-sets, and so the system, the PVI (personal viewpoint identifier), can work anew at any level of granularity covered in the original Mind Genomics study leading to the mind-sets.

The PVI system creates 64 possible patterns of answers and identifies the most likely mind-set corresponding to each pattern, when the coefficients are subject to random permutation, noise in the results. Figure 1 shows an example of the PVI, the personal viewpoint identifier, created for this study. The PVI is located at: <https://www.pvi360.com/TypingToolPage.aspx?projectid=192&userid=2018>

**SHOPPING1 PVI 06.23.2020.1**

**No Specialty Questions for This Study**

ACTION: DISINFECT EVERY PRODUCT THAT I BUY AND BRING HOME	<input type="radio"/> ME	<input type="radio"/> NOT ME
ACTION: BUY EXTRA OF KEY PRODUCTS TO ENSURE MY SUPPLY	<input type="radio"/> ME	<input type="radio"/> NOT ME
ACTION: BUY EVERYTHING NEEDED, TRUST STORES TO BE CLEAN AND CAREFUL	<input type="radio"/> ME	<input type="radio"/> NOT ME
ACTION: BUY PACKAGED FOODS PRODUCTS & UNWRAP MYSELF	<input type="radio"/> ME	<input type="radio"/> NOT ME
FOCUS ON ESSENTIAL PRODUCTS	<input type="radio"/> ME	<input type="radio"/> NOT ME
FOCUS: MAINTAIN WHAT I DID BEFORE	<input type="radio"/> ME	<input type="radio"/> NOT ME



## Discussion

The global market of eCommerce is growing fast and bigger in the past years. After this situation, from the Covid-19 situation consumers are more careful on their purchases and they do not have contacts with other to protect themselves.

The Mind Genomics cartography about shopping during the pandemic suggests that the direct statements about online shopping are only modest drivers of responses. The coefficients are low. We conclude that it is NOT online shopping per se which emerges from the pandemic but rather the specifics about the shopping behavior. This focus on the specific is the most important finding of the study.

When studying behavior, the data suggest that there are different mind-sets. People think differently from each other. Emerging from this study are three very clear groups, the Vigilants, the Budget-Conscious, and the Product-Oriented. These three mind-sets distribute equally in the population, and show the same likelihood of basic agreement, and indicated by similar additive constants. It is only their 'minds' which differ. When we merge all three mind-sets together into one group, the total panel, we lose sight of the individual foci, the different driving forces for the mind-sets, and end up with bland results, insignificant coefficients, often around 0 or negative.

The importance of mind-sets cannot be over-stated. Successful coping and adaptation in the years to come may well emerge from knowing how the person THINKS, rather than increasingly refined measures of who the person IS, or what the person has DONE in the past. Furthermore, the success may come quicker, and less expensively, in days, and on a very low budget, by focusing the topic, by being granular, and by developing knowledge from the ground up, from the specifics of everyday life.

## Conclusion

This paper presents the emerging science of Mind Genomics as a way to bridge the gap between the impersonal, quantitative dimension of social science and the qualitative, story-telling, emotion-filled and narrative-rich material provided by qualitative methods and by literature. The contributions of this paper to the literature may be summarized as follows:

Experimental design of the shopping situation, which creates a verbal experiment. The Mind Genomics method is an experiment, with controlled conditions, and defined measures.

Ability to identify mind-sets in the population, and then to create a short, easy-to-administer tool to assign a new person to a mind-set. This tool, the PVI, makes it possible to extend the application of the science to new people, as well as do in context validations of the results.

Ability to 'scale knowledge', rapidly, inexpensively, from the 'ground up,' from the granularity of life, to build a 'Wiki of the Mind.'

From this Virtual Experiment it is easy to understand from the strong positive emotions, which specific types of products that will be sought during the pandemic crisis, where respondents feel they would like to shop, and how do they perceive different actions which communicate 'safe.'

The granularity of this first experiment suggest ways that companies might organize their selling efforts, and the nature of the products that they might find to be in strong demand. The study can be replicated, with each topic (e.g., venue, safety, product, etc.) explored with



increasing granularity. The speed of the procedure, hours and days, and the depth of the information, provide a learning system which can 'keep up with changing conditions,' producing knowing in virtually 'real time,' hours after the Mind Genomics virtual experiment, our so-called 'Cartography' has been launched.

The PVI, the personal viewpoint identifier, provides the potential for online shopping to present specific landing pages 'tuned' to the mind-set of the respondent. The feedback from the PVI, viz. the mind-set, can move from informing the person as 'nice-to-know-about-me' into more directed, focused landing pages containing the appropriate information and 'tonality' for the mind-set. Marketing now becomes a path, from meeting the respondent, 'gamifying' the PVI to discover the mind-set, and immediate presentation of the 'right information to the right person at the right time.'

## References

- [1] Duckett, J. (2020). COVID-19: THE LONG-TERM IMPLICATIONS FOR UK CONSUMERS. In INSIGHT.
- [2] Moskowitz, H. R. (2012). 'Mind genomics': The experimental, inductive science of the ordinary, and its application to aspects of food and feeding. *Physiology & Behavior*, 107(4), 606–613. <https://doi.org/10.1016/j.physbeh.2012.04.009>
- [3] Psychology Today. The Science of Panic Buying and How to Stop It: Economic Research Demonstrates the Best Course of Action. Available online: <https://www.psychologytoday.com/us/blog/evidence-based-living/202003/the-science-panic-buying-and-how-stop-it> (accessed on 1 April 2020)
- [4] Ruben, R., McDermott, J., & Brouwer, I. (2020). Reshaping Food Systems after COVID-19.
- [5] Schroeter, U. G. (2018). Ad Hoc or Institutional Arbitration - A Clear-Cut Distinction? SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.3086537>
- [6] Shaikh, A. (2020). Effective Factors in Changing the Buying Behavior of Consumer Due to Covid-19. *Studies in Indian Place Names*.
- [7] Sheu, J.-B.; Kuo, H.-T. Dual speculative hoarding: A wholesaler-retailer channel behavioral phenomenon behind potential natural hazard threats. *Int. J. Disaster Risk Reduct.* 2020
- [8] Steven, D.; O'Brien, E.; Jones, B.D. *New Politics Strategic Resources: Energy and Food Security Challenges in the 21st Century*; Brookings Institution Press: Washington, DC, USA, 2014
- [9] Viberg, E. (2020). Retailers giving a helping hand to support frontline medical staff fighting COVID-19 - 17th April 2020.
- [10] Yuen, K. F., Wang, X., Ma, F., & Li, K. X. (2020). The psychological causes of panic buying following a health crisis. *International Journal of Environmental Research and Public Health*. <https://doi.org/10.3390/ijerph17103513>