USING QUANTITATIVE TOOLS TO UNDERSTAND POLITICAL ISSUES

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Abstract

This study focuses on understanding what the Americans think about the groups of people that collaborating among themselves would make it possible to solve the thorny political issues that brought the events of January 6th, 2021. A Mind Genomics experiment is designed to collect and analyze the collected data. A four X four experiment is used; for each pillar/category four potential answers are provided to cover the entire response spectrum. Thus, the four considered categories are Ordinary People, Leaders, The political world, and Personages. The main issue with this study is to analyze and understand the following question: What will happen when these people work together to solve this problem: Insurrection - People who want to overthrow the government.
The study shows higher impact values of the answers for category "The Political World" that could solve complex social and political issues the USA is facing today. The higher impact values for the vital performing elements in the teens tell us that we have selected groups of respondents with similar points of view, with these strong points of view not being diluted.

Keywords: Leaders, Personages, Insurrection

JEL Classification Codes: P10, P20, R50

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Introduction

For quite some time, there has been a discussion in the scientific community about the best method to use in scientific studies. Generally, one discussion issue has been about using a quantitative versus a qualitative approach. The other discussion topic has been the hypothesis-based approach versus the hypothesis-free one. As for any other theoretical issue, different researchers would have different opinions. The research in the engineering and theoretical fields, due to their nature, is quantitative by default. The debate about the best research method is not unusual in the research community. Especially this debate can be of more relevance in the social and political sciences, which have a more narrative nature. There are different approaches to conducting research. Scholars, researchers, and students adopt one or more approaches that suit their backgrounds and orientation. There are valid arguments to support the fact that the choice of an approach(es) will affect the research outcome (PETER, 2018).

Thus, an intensive discussion has been ongoing among researchers regarding the best approach to embrace in social research. The disagreement had been between qualitative and quantitative methods of research. There are good reasons to believe that the heart of the discussion is the orientation and background of the researchers. Researchers using a qualitative approach are comfortable continuing with the same technique, whereas those researchers of a quantitative background are inclined to continue using the quantitative dimension to conduct social research.

The qualitative method deals with a ‘‘situated activity that locates the observer in the world,’’ where the researchers are ‘‘attempting to make sense of or interpret phenomena in terms of the meanings people bring to them’’ in natural settings (Gabrielian, Yang and Spice, 2008).

According to (Given, 2008), the quantitative method refers to “the systematic empirical investigation of observable phenomena via statistical, mathematical or computational techniques.”

In the 1960s, things started to change. A new approach emerged that called for the marriage of both existing orientations, the qualitative approach, and the empirical/statistical orientation. The new technique is referred to in the political jargon as the post–behavioral era.

Another battlefield among researchers has been the issue of the hypothesis-based versus the hypothesis-free approach. Hypothesis-based research and hypothesis-free research are two different approaches to scientific inquiry. Hypothesis-based research involves the development of a specific hypothesis or set of hypotheses to be tested through empirical research. The hypothesis is a proposed explanation for a phenomenon or observation that can be tested through systematic experimentation or observation. Researchers design experiments or studies to test the hypothesis and collect data to evaluate the hypothesis. On the other hand, hypothesis-free research is an approach that does not rely on a priori hypotheses to guide the research. Instead, researchers collect data without preconceived notions or expectations and use exploratory data analysis methods to identify patterns or relationships in the data. This approach is sometimes called data-driven research. Even on this topic, there are diametrically opposed views. Some authors like (Weinberg, 2010), strongly support hypothesis-based research. Others, such as (Goodman, 1999) and (Yanai and Lercher, 2020), will disagree and provide plenty of arguments for using a hypothesis-free type of research.

As the means for collecting massive amounts of data became affordable, researchers started questioning hypothesis-based studies. One of the first works to question the validity of the hypotheses-based approaches is presented in (Goodman, 1999). The provided argument is that data acquisition is so fast and cheap nowadays, and the time has come to let go of the hypothesis part and take in every possible bit of data one can. However, it is crucial to only catalog how the data were collected, and the results of every measure done (Goodman, 1999). One of the most solid criticisms of hypothesis-based research is that the focus on finding something predetermined could switch the attention of researchers from looking into other patterns the collected data may contain (Yanai & Lercher, 2020). There are several cases in the history of science where discoveries were not made due to trying to prove a predetermined hypothesis (Biesecker, 2013) but just by pure serendipity. When someone seeks,’ said Siddhartha, ‘then it easily happens that his eyes see only the thing that he seeks, and he can find nothing to take in nothing (Hesse, 1922). The research community continuously makes serious efforts to find the best way of collecting users' opinions using intelligent systems (Furlan, Nikolic and Milutinovic, 2013). Thus, there is a need for a discipline that allows for gathering data from consumers and structures the analysis of such data in a cogent manner to achieve successful management. This research uses Mind Genomics is an interdisciplinary field that aims to study the mental processes and individual differences in the perception and understanding of complex

information, including texts, images, and multimedia content (Moskowitz, Beckley and Ashman, 2006), (Gofman and Moskowitz, 2010). It involves using experimental methods and computational models to measure and explain differences in people's responses to stimuli (Moskowitz, Wren and Papajorgji, 2020). The goal is to develop a deeper understanding of how people process information and make decisions, with applications in marketing (Saulo *et al.*, 2019), (Papajorgji *et al.*, 2021) education (Todri *et al.*, 2020), (Attila Gere *et al.*, 2019) and psychology (A. Gere *et al.*, 2019), (Papajorgji and Moskowitz, 2022). Mind Genomics is a hypothesis-free approach.
This Mind Genomics-based study is designed to evaluate the social phenomenon currently occurring in the USA. The following section presents the experiment, the methodology, and the results obtained.

The Experiment

The experiment consists of creating a bookkeeping system comprising four silos or groups, each silo comprising, in turn, four related elements or answers. The silos represent the topics considered the study's pillars. The elements within a silo are not necessarily opposites of each other but somewhat different expressions of the general idea embodied in the silo. Table 1 gives the silos and elements for this study on Understanding January 6, 2021, Events.

Table 11. Understanding the events of January 6, 2021.

Question A: Ordinary People	
A1	My parents
A2	People like me
A3	Ordinary working people
A4	The mayor of my town or city
Question B: Leaders	
B1	A civil right leader - e.g., Martin Luther King
B2	A pastor of a very large church - e.g., Joel Osteen
B3	A high-ranking official from the military - e.g., Chief of Staff
B4	A well-known business leader - e.g., Bill Gates
Question C: The political world	
C1	President Joseph Biden
C2	Former President Donald Trump
C3	Speaker of the House Nancy Pelosi
C4	Senator Mitch McConnell
Question D: Personages	
D1	My favorite schoolteacher
D2	Senator Bernie Sanders
D3	Oprah Winfrey
D4	Mother Theresa

Thus, the four considered categories are Ordinary People, Leaders, The political world, and Personages. The main issue with this study is to analyze and understand the following question: What will happen when these people work together to solve this problem: Insurrection - People who want to overthrow the government.
Answers/elements presented in Table 1 are combined using an Experiment Design model to create vignettes presented to participants in the study for evaluation. The evaluation schema is as follows.

1=Cannot cooperate ... and ... No real solution will emerge
2=Cannot cooperate ... but ... Real solution will emerge

3=Honestly cannot tell
4=Can cooperate ... but ... No real solution will emerge
5=Can cooperate ... and ... Real solution will emerge

Mind Genomics uses two default classification criteria that are age, gender. Besides, three or four others could be defined by the researcher. In this study, the following are used as additional classification criteria.
1=Old time Republican
2=Trump Republican
3=Democrat
4=No political party

An online system (Mehta-Shah, Mehta and Zemel, 2021), (Biró and Gere, 2021) is used to collect and analyze the data. During the interview, each respondent provided 24 ratings for his perceptions of January 6 events and 24 ratings for his estimated perception by other Americans. The stimuli in the back of these 24 ratings are 16 elements, each appearing three times against different backgrounds. The 16 elements are statistically independent of each other by design. It is straight to relate the presence/absence of the elements to the ratings (the PER Model) or a transformation of the ratings (the INT Model, a binary transformation of the ratings).
Ordinary Least Squares (OLS) (Zdaniuk, 2014)regression is used to evaluate the statistical relevance of each of the answers provided by the respondents. The next step is combining the elements into concise vignettes or test concepts—each vignette comprising a maximum of four and a minimum of two elements. An underlying statistical plan creates the vignettes called an experiment design (Moskowitz, Kover and Papajorgji, 2022). During the vignette evaluation, it is critical to note that the entire context presented is the subject of evaluation. The Mind Genomics approach operates very differently from the yes/no surveys.
We write both models, the PER Model for the 1-9 ratings and the INT for the 0/100 transformation, by the same equation. Only the dependent variable changes:

PER = k0 + k1(Element A1) + k2(Element A2) + .. + k16(Element D4)
INT = k0 + k1(Element A1) + k2(Element A2) + ..+ k16(Element D4)

The underlying experimental design used for each respondent allows us to estimate the parameters of the PER and INT models for each respondent, one respondent at a time. Then the average is calculated for the corresponding parameters across all respondents in the considering group. For example, as we see shortly, we estimate the additive constants for all 100 respondents who participate to general a consensus value. After averaging the results from 10-20 respondents, we converge to a stable estimate. Adding more respondents at random changes our average, but each additional respondent contributes less and less to the average.

Results and Conclusions

Relevance of silos/answers

Knowing the statistical relevance of elements of different silos in descending order is relevant. Table 2 shows the respondents' answers ordered by relevance. The additive constant of this experiment is 52, meaning that 52% of participants are relatively optimistic about the issue of the January 6 events without any additional information about the elements. Calculating the sum of elements' evaluation for each silo allows us to determine how participants evaluated the silos/questions.

Table 2 Statistical relevance of elements of the experiment.

	Group (Binary Ratings)	**Total**
	Base Size	100
	Additive Constant	52
D1	My favorite schoolteacher	4
B1	A civil right leader - e.g., Martin Luther King	3
C3	Speaker of the House Nancy Pelosi	3
D3	Oprah Winfrey	2
B2	A pastor of a very large church - e.g., Joel Osteen	1
C1	President Joseph Biden	1
C2	Former President Donald Trump	1
C4	Senator Mitch McConnell	1
D2	Senator Bernie Sanders	1
B4	A well-known business leader - e.g., Bill Gates	-1
D4	Mother Theresa	-1
A1	My parents	-2
B3	A high-ranking official from the military - e.g., Chief of Staff	-3
A2	People like me	-4
A4	The mayor of my town or city	-4
A3	Ordinary working people	-7

Table 3 presents the total evaluation per silo/question. As shown, the sum of all elements of silo A is -17. This result indicates that participants are not persuaded that "Ordinary people" involvement could solve the complex problems caused by the events of January 6, 2021. The sum of elements of silo B is 0, meaning participants are indifferent vis-a-vis the role "Leaders" (Martin Luther King, Bill Gates, etc.) could play in addressing the complex social and political issues causing the January 6, 2021, events.

Table 3 Total evaluation per silo.

Question A: Ordinary People	-17
Question B: Leaders	0
Question C: The Political world	6
Question D: Personages	6

The sum of elements of silo C is 6. This result shows that participants demonstrate certain confidence that political leaders (president Biden, ex-president Trump, speaker Pelosi and minority leaders, and McConnell) could play a positive role in helping to solve the social and political issues causing the January 6, 2021, events.

The Mindsets

It is essential for a study to demonstrate that the entire set of interviewed people could be divided into two or three subgroups, each subgroup representing people thinking similarly.

One of the most advanced features of the Mind Genomics approach is to reveal underlying groups in the population who think differently. We usually need to discover a simple relationship between a person's identity (the traditional way of dividing people) and how people think. The mindset segments may not necessarily realize who these individuals that form the group are. Furthermore, these mindset segments are not necessarily divided into easy-to-understand ways or divisions that suit sociologists, political pollsters, or consumer researchers. Instead, these mindset segments exist in the population, typically in the same proportions in subgroups, like gender or ethnicity, as they do in the total population.

Finding the mindsets means dividing the respondents by the pattern of ideas they seem to embrace. Usually, two or three groups are distinguished. In our study, two patterns or mindset segments are identified. These two patterns emerge from a simple analysis of the individual patterns of responses.

The following straightforward steps are performed:

1. Prepare the data at the individual respondent level.
2. For each respondent, relate the presence/absence of the 24 elements to the 5-point rating using OLS (ordinary least-squares) regression. The equation which emerges from the analysis is the aforementioned PER (persuasion) Model.
3. Each respondent generates a row of 25 numbers, one number for the additive constant and 24 numbers corresponding to the coefficients or impact values of the 24 elements.
4. Use a class of programs called cluster programs (or clustering) to identify groups of respondents with similar patterns of coefficients or impact values. For the Mind Genomics studies, one particularly favorite method computes the Pearson correlation between each pair of respondents (Pearson R) and then computes the number (1-R). The Pearson R varies from a high of +1 when two patterns follow identical paths, so increases in one pattern correspond to precise, predictable increases in the other. In such a case, the Pearson R of +1 becomes a 'distance' of 0 (1-1) = 0. A perfect inverse relation generates a Pearson R of -1 or a distance of 2 (1- -1 = 0).
5. With these 'distances' between pairs of respondents, the clustering program creates solutions, such as a 2-cluster solution where each respondent is a member of exactly one of two segments (groups) or a 3-cluster solution where each respondent is a member of exactly one of three segments (groups), and so forth.
6. We select the best segmentation, i.e., the 2-cluster, 3-cluster, and 4-cluster solution, based on two simple criteria, parsimony, and interpretability, respectively.
7. Parsimony means as few segments or clusters as possible. Ideally, no clusters would be best; everybody will have the same opinion. Usually, this is not the case, but some situations come close, such as the response to serious crime, where people might share a common revulsion.
8. Interpretability is a subjective notion, left best to one's ability to see a bigger 'picture' within the data. Interpretability means that the segmentation should narrate a story. The segments or clusters should reveal each cluster's meaningful, unique pattern.

The well-known clustering algorithm (Mucherino, Papajorgji and Pardalos, 2009), considering the criteria of parsimony and interpretability, provides the two mindset segments, shown in Table 12.7. Notably, the dramatically higher impact values of the elements for Question C, describing "The Political World" could solve complex social and political issues the USA faces today. In this silo, we find high values such as 8, 10, and 11 that show a strong tendency that cannot be diluted. Dilution occurs when we have individuals of opposite views of the same element, with low impact values, often near 0, beliefs that cancel each other.

Table 4. Dividing participants into mindsets.

	Group (Binary Ratings)	Total	Segment 1 of 2	Segment 2 of 2
	Base Size	100	56	44
	Additive Constant	52	55	48
Question A: Ordinary People				
A1	My parents			
A2	People like me			
A3	Ordinary working people			
A4	The mayor of my town or city			
Question B: Leaders				
B1	A civil right leader - e.g., Martin Luther King	3		5
B2	A pastor of a very large church - e.g., Joel Osteen	1	1	2
B3	A high-ranking official from the military - e.g., Chief of Staff			
B4	A well-known business leader - e.g., Bill Gates			
Question C: The political world				
C1	President Joseph Biden	1	6	
C2	Former President Donald Trump	1	8	
C3	Speaker of the House Nancy Pelosi	3	10	
C4	Senator Mitch McConnell	1	11	
Question D: Personages				
D1	My favorite schoolteacher	4		10
D2	Senator Bernie Sanders	1		11
D3	Oprah Winfrey	2		9
D4	Mother Theresa			3

Analyzing the obtained results in table 4 allows summarizing as follows:

1. The additive constants for segments are relatively high, 55 and 48.
2. Segment 1 is characterized as ***Believers in the political world***. Respondents have evaluated high elements C2, C3, and C4. The results show that members of segment or mindset 1 have put their faith in political leaders such as Trump, Pelosi, and McConnell to solve today's America's social and political issues.
3. Segment 2 or mindset 2, can be characterized as ***Believers in personages*** with strong personalities. One could notice that senator Bernie Sanders is leading, followed by the favorite teacher, and lastly comes Oprah Winfrey.

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