

Research Article

Defining Science in the Minds of Generation Z

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Introduction

An up-and-coming new group of young adults collectively referred to as Generation Z is beginning to enter the workforce and have the opportunity to pave the future of science evolution. This paper presents a study using the methodology of Mind Genomics to understand what science means to Generation Z, from both a personal and global perspective. This study was performed in the context of the American public being inundated with scientific content. Seeking to filter through the noise, we explored the mindsets of members of Generation Z regarding what science is, what science does, and what sources of science are trustworthy. Understanding how to best channel Generation Z perspectives on scientific information will enable anyone working with this cohort to be more informed about their views of science. Additionally, it can help Generation Z situate themselves in relation to scientific perspectives and put them in a position to be the catalyst for change.

The Mind Genomics Process

Mind Genomics is an empirical method for understanding the dimensions of ordinary, everyday experiences, by identifying mindsets into which people can be classified, based on their responses to information and messages. First, we create a survey on a given topic, in this case Science, which consists of 16 statements or elements pertaining to the topic. The 16 statements are categorized into one of four silos, each encompassing four statements. Each silo is in the form of a question designed to stimulate critical thinking for the researcher. The silos also prevent similar elements from being shown together in the same vignette. A vignette is a quickly digestible story consisting of two, three, or four elements. In total, the respondent will see twenty-four vignettes, or twenty-four unique groupings of these sixteen statements, which the respondent rates as if they are flashed on the screen. By design, there is very little thinking time, which makes it more of a gut-level response. The rating for each of the twenty-four responses can be captured using a five-point, seven-point, or nine-point Likert scale. For this particular study, the 5-point Likert scale chosen entails:

- 5 – Precisely what my idea of what science IS
- 4 – Sort of my idea of what science IS
- 3 – Can't really tell

2 – Sort of my idea of what science is NOT

1 – Precisely my idea of what science is NOT

Following this rating, the Likert scale is converted into a binary scale where 1-3 becomes a 0, and 4 & 5 are converted into 100. In the event that the researcher is seeking insights related to disinterest, the Likert to binary scale is re-coded where 4 & 5 are converted to 0 and 1, 2, and 3 are converted to 100. After this respondent rating conversion, an ordinary least squares linear regression analysis is performed, where the independent variables are the 16 statements ranging from A1-D4 and the dependent variables are the binary scale ratings received from the respondent. This statistical calculation results in various regression coefficients, which inform the researcher of two to three unique mindsets amongst the respondents, in this case all coming from Generation Z, and which messages drive interest or disinterest. In order to classify new respondents into the identified mindsets, there is also an option of creating a new study called The Personal Viewpoint Identifier, comprising six survey questions (based on the top 2 elements in each mindset). In summary, the Mind Genomics process is an experimental approach integrating sociology, psychology, and statistics and enabling researchers to determine how to tailor messages most effectively (gathering information about what to say, how to say it, and to whom to say it).

Constructing the Current Study

In categorizing the 16 elements, the four silos include:

Silo A: What does science do for me?

Silo B: What does science do for the world? Silo C: Where does science come from?

Silo D: Who provides science in your community?

Results

The results of this Mind Genomics study have provided insightful data regarding three mindsets as show in Figure 1 below.

Analysis of Figure 1

Mindset One: Global Change Seekers

The first mindset places the importance of science on a high pedestal from both a personal and global perspective. From a

Groups	Mindset 1 of 3	Mindset 2 of 3	Mindset 3 of 3
Base Size	47	34	27
Additive Constant	41	41	52
Question A: What is science in the minds of the consumer?/What does science do for me?			
Science is performing an experiment to see what occurs.	8	-1	13
Science is beyond my control.	7	-9	7
Science is looking at outcomes and seeing how they can be improved.	10	-5	12
Science is within my control.	8	1	12
Question B: What does science do for the world?			
Science delivers groundbreaking healthcare solutions.	10	-7	-3
Science can lead to a new world with zero global emissions.	9	-8	-6
Science is advancing technology one day at a time.	11	-8	3
Science assists our evolution through time.	5	-7	-14
Question C: Where does the science come from?			
The science starts with subject matter experts.	4	1	-15
The science starts with scientific organizations.	-1	4	-14
The science starts with university publications.	0	3	-6
The science starts with the mainstream media and pop culture.	1	7	-16
Question D: Experts: Who provides the science in your community?			
I trust my family and friends to provide me with scientific information.	-8	18	10
I trust my medical community and doctors to provide me with scientific information.	-6	25	4
I trust educators/professors to provide me with scientific information.	-10	9	8
I trust politicians/policymakers to provide me with scientific information.	-11	15	8

Figure 1: Data of Mind Genomics study.

personal standpoint, there lies a near even balance between science being within or beyond one's control. When science is perceived as falling within one's control, an optimistic and resilient viewpoint of a brighter future awaits. Forming this future does not occur on the sideline. Rather, they may want to be involved in scientific discovery used to improve the world. To further such discovery, mindset one is determined to advance innovation in the fields of technology, healthcare, and the environment. In this respect, they are convinced that science improves the world, and they are seekers of change. In some cases, they may feel science falls outside their control. Science being out of one's control can hold true regardless of valiant efforts. For example, COVID-19 has put us in a position of uncertainty where we can do our part and control the spread of COVID-19 by getting a vaccine, wearing a mask, and social distancing. However, we unfortunately cannot control the behaviors of others to do the same. In this respect, science can be out of our control. Mindset one is also less trusting of scientific information that is brought to them, regardless of the source. They seem conflicted about their own ability to engage in science, which probably has something to do with their distrust of other people as sources of scientific information. Overall, they seem to like science for what it can do for our world, but they feel separated from the process.

Mindset Two: The Followers of Science

Mindset two is less interested in what science is and what it can accomplish than in how scientific information is received. For these individuals, it is important to identify what mechanisms trigger trust and belief, and from which sources the science is being communicated. Similar to previously described silos, the science can come from a global perspective by following sources of origin such as subject matter experts, scientific organizations, university publications, and mainstream media/pop culture.

Alternatively, the science can come from a more personal and local perspective by listening to members within one's community. This includes examples related to trusting family/friends, medical professionals, politicians, and educators. For this particular mindset, Generation Z are likely to be the most impacted by what they hear from people within their community rather than engaging on where scientific material is coming from. They tend to trust the medical community most but are generally trusting of personal connections, policymakers, and educators, as well. Understanding that trust forms on a local scale allows one to imagine that members of mindset two are believers in what science can do for the community. This thought process is an excellent segue into mindset three.

Mindset Three: Local Change Seekers and Followers

Mindset three shares the reliance on gathering information from trusted members within their community. While they do trust educators and policymakers, personal connections are most trusted. Alongside trusting people closest to them, they are also believers in what science can do for the community. However, rather than watching and believing the impact science will have on their community, they are engaging as change-seekers in ways similar to the description of mindset one. These change-seekers operate on a smaller scale in comparison to mindset one, focusing on a grassroots initiative of improving science within their community. Since this initiative is on a smaller scale, science is perceived as being more within their control and less beyond their control, in comparison to the global efforts portrayed in mindset one. Overall, this group feels connected to science as a process in which they can engage and through which they can discover how to make improvements. With engagement in believing and seeking scientific change, mindset three is a combination of mindset one and two.

What is Science to Generation Z

Despite each segment carrying a distinct perception towards Science, there is a key commonality in the additive constant amongst all mindsets. Referring to the metric scale below, the additive constant for each mindset falls within the range of 41-60. This indicates that in the absence of any elements the meaning of Science only has a typical base interest to Generation Z. Science can attract higher interests upon introducing elements that have a regression coefficient of 8 and above. These elements explain a story whereby science is the future in terms of how we listen to it and/or act upon it.

Norms for the additive constant:

0-20: Little Base Interest

21-40: Modest Base Interest

41-60: Typical Base Interest

61-80: High Base Interest

81+: Very High Base Interest

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