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**Harnessing the Power of Emotion for Social Change: Review of
*Numbers and Nerves: Information, Emotion, and Meaning in a
World of Data* by Scott Slovic and Paul Slovic (2015)**

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Abstract

Scott Slovic and Paul Slovic (Eds.). *Numbers and Nerves: Information, Emotion, and Meaning in a World of Data* (Corvallis, OR: Oregon State University Press, 2015). 272 pp. ISBN 978-0-87071-776-5.

Literature and environment professor Scott Slovic, and his father, psychologist Paul Slovic, editors of this collection of essays and interviews, describe and demonstrate the psychological effects which hamper our ability to comprehend and respond appropriately to large numerical data. The collection then offers a brief survey of art works which, by first appealing to viewers' emotions, can potentially move the viewer to a better understanding of numbers.

Keywords

emotion, cognition, decision-making, priming, numeracy, large numbers, psychology

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Cover Page Footnote

Anne Kelly is a professor of behavioral sciences and psychology and chair of the psychology department at Dakota Wesleyan University. Her research focuses on the causes, treatment and prevention of suicide, the psychological mechanisms underlying suicide ideation, and the cognitive and social factors that influence detection of suicide risk in others.

In *Numbers and Nerves: Information, Emotion, and Meaning in a World of Data*, editors Paul and Scott Slovic, a psychologist and a professor of literature and environment respectively, bring together the work of scientists, journalists, naturalists, activists, and artists, to demonstrate why we have trouble making sense of big numbers, how those big numbers have been presented effectively, and what we can do to overcome our limits and respond to big numbers more appropriately.

The Slovic's begin by expertly challenging the fundamental assumption that people's beliefs are internally consistent. They argue instead that our adherence to rules of logic and our understanding of numerical information used to describe big, and sometimes catastrophic, problems are undermined by a type of thinking that simplifies information processing and eases the burden of cognitive strain by allowing us to ignore or discount important evidence, especially numerical evidence. This habit of mind contributes to inaccurate judgments and bad decisions. As Slovic and Slovic point out, ignoring or disregarding big numbers can have calamitous results when we fail to act in the face of mass atrocities and environmental problems; for example, consider genocide, refugee crises, and global warming. This line of thought raises the question: How can we make sense of big data to minimize less-than-rational decisions and weaken their impact on the sustainable wellbeing of people and the planet? The answer, according to the book, can be found in connecting big data to personal stories and images that appeal to our emotions and strengthen our belief that we can make a difference.

In Part I of the book, the editors set forth to expose the myth that people are entirely rational. A rational decision-making model predicts that people will rely on logic, objectivity, analysis, and numerical data to make good decisions based on an understanding of problems and opportunities. This model assumes that people have full and perfect information about a problem, can identify criteria that will be important to solving it, possess the necessary cognitive skills to understand a problem and its solutions, and have the time and resources required to make the best decision. It also assumes that a problem is unambiguous. If this model and its assumptions are correct, then people should be willing to donate as much money, if not more, to relieve suffering from starvation when they are told about a starving child and also shown statistics about millions of others suffering from starvation than people who are only told about the single starving child; as the author Annie Dillard, in her article "The Wreck of Time," attributes to an English journalist, "either life is always and in all circumstances sacred, or intrinsically of no account." But research has shown that this thinking is not the norm: people who are told about a single starving child and are presented with statistics about starvation donate about half as much money as people who are told only about the starving child, begging us to ask why. The answer is that rational decision-making models fail to take into account a type of fast and

intuitive thinking that generates feelings and impressions and operates automatically.

This type of thinking can guide us through our daily lives efficiently with minimal need for the mind's slower, analytical mode. But fast thinking is difficult to control and error-prone. Paul Slovic skillfully demonstrates this fact in a creative and refreshingly simple experiment. He asked volunteers to imagine that they were in charge of distributing funds for a charity. Would they give \$10 million to fight a disease claiming 20,000 lives and save 10,000 or give \$10 million to fight a disease claiming 290,000 lives and save 20,000? Volunteers responded to the percentage of lives saved, choosing to save 10,000 lives, letting 10,000 others die. Evidently, the cognitive tendencies underlying this type of not-so-rational thinking can lead to bad judgments. These cognitive tendencies, including psychic numbing, pseudoinefficacy, and the prominence effect, are presented in Part I of the book.

The editors of the book and its contributors use psychic numbing to explain why we fail to act appropriately to stop threats that have massive consequences. Psychic numbing creates a psychological distance from emotional experiences that big numbers make even harder to comprehend; consider 800,000 to 1 million Tutsis and moderate Hutus slaughtered in the Rwandan genocide. It keeps catastrophic problems from feeling real, allowing us to ignore them and continue as we always have.

A second tendency that deters us from intervening in large-scale social, political, economic and environmental problems is pseudoinefficacy, described in *Numbers and Nerves* as an illusion of ineffectiveness created in the face of big numbers. Large numbers draw our attention to the people we cannot help, creating negative feelings and diminishing the good feelings we get from helping those we can.

The third tendency that undermines the internal consistency of people's beliefs and values is the prominence effect. Prominent, or more important, attributes are weighted more heavily in decision making than attributes that compete with our preferences. We end up choosing what is best depending on what feels most defensible. Borrowing an example from *Numbers and Nerves*, action to resolve humanitarian crises competes with our preference for security. Because concerns for our security outweigh our concerns for nameless, faceless victims, we opt for security and fail to intervene. But when volunteers are asked to quantify their values for both security and its competing objective, of intervening to prevent genocide, all before being asked to decide whether or not to intervene, they opt to intervene. The authors use this observation to advocate for values-focused thinking. This type of thinking would guide decision-making by giving people an opportunity to identify and understand their values relevant to a decision before making it.

This argument is particularly interesting because it hints at a slower and more analytical, explicit type of thinking than the type of fast thinking we usually use. It makes me wonder whether or not the decision to risk security to protect others after quantifying values for competing objectives could also result from an implicit memory effect called priming in which one stimulus influences a response to a subsequent stimulus. Could a simple prime prompt volunteers to consider humanitarian intervention by activating associations in memory relevant to saving lives and preventing genocide?

I found a possible answer to this question later in Part II when Kristof writes, in his chapter, "The Power of One," that people who are prepared to donate money to a charity, donate more when emotions are primed than people whose rational side is primed. This demonstrates the power of the priming effect and lends support to the idea that emotions influence the decision-making process and guide behavior. For *Numbers and Nerves*, creating an emotional connection to numbers is how we turn big data into useable information.

Part II of the book explores how we can build an emotional connection to very large numbers using personal stories and images. "Portraits of Grief" is an unforgettable series of profiles revealing personal anecdotes and stories about more than 1,800 victims of the attacks on the World Trade Center and Pentagon. These brief biographical entries use telling, personal details—an interesting hobby, a tattoo in middle age, a diasthema now seen in a grandchild—sketch for us a real person, a person who was loved. The series continued for months: a procession more than a list.

Consider, too, a collection of photographs on display at the Kigali Memorial Center: portraits of children slaughtered in the Rwandan genocide. The photographs are very moving, more so because our normal context for snapshots of children is in albums we have kept of our own family. Maybe even more moving are the placards in front of the portraits that share with us the child's age, favorite sport, favorite beverage, lots of other little details—and cause of death. To know that each of these children had a beverage they preferred above all others, and to learn that it was as unremarkable as Fanta or milk, impresses upon us something of the personality and the innocence of the child, taken so cruelly and unnecessarily, often "hacked by machete."

These examples illustrate the psychological power of storytelling and images to evoke our emotions by humanizing numbers, but I am not convinced that they really change our understanding and handling of excessively large numbers. Getting a feel for what a huge number means is not easy, and Annie Dillard knows this when she wryly quips that there "are 1,198,500,000 people alive now in China. To get a feel for what that means, simply take yourself—in all your singularity, importance, complexity, and love—and multiply by 1,198,500,000. See? Nothing to it." We have trouble grasping the enormity of big numbers;

seeing numbers is just hard. One way the featured artists have tried to make numerical information less abstract is to communicate numbers visually.

The Tower of London poppy installation used 888,246 ceramic poppies to represent the number of British soldiers who died in World War I. The red poppies were placed in the moat area of the Tower over four months in 2014, marking the centenary of Great Britain's entry into World War I. The installation attempted to convey the magnitude of British loss of life in the war by way of a large and striking visual display.

After Part II's descriptions of various media, Part III concerns itself with writers and artists who use personal stories and images, along with numbers, to advocate for change. These artists' works attempt to make quantitative information meaningful and to override the psychological tendencies presented in Part I: psychic numbing, pseudoinefficacy, and the prominence effect.

Poet Homero Aridjis and his wife Betty are both active in combating pollution in Mexico. In the interview, they speak about the importance of using numbers to lend credibility to their arguments and of using stories to emphasize to the Mexican people the impact of pollution on their personal lives. He believes the comparison of concrete images helps us work around the sometimes vague abstraction of large numbers and thereby understand problems more fully. For example, appreciating the meaning of 800,000 victims of the Rwandan genocide is hard, but can be made easier if we imagine the disappearance of an entire city the size of Albany. The author and scientist Sandra Steingraber also focuses on using personal stories along with numerical information. She believes that using the big numbers which describe the scope of a problem is necessary, but that an essential first step is to make listeners receptive by connecting with relevant and personal stories.

Author and environmental activist Vandana Shiva, although also emphasizing the importance of both story and number, sees them as different paths of argumentation, either of which can lead the listener to the desired goal of behavior or policy change—but each of which is best suited to one particular audience. For Shiva, numbers can be a dull alternative to the excitement of an emotional response, but they can also thus be a most effective tool when working with polarized groups in which an emotional response is not as controllable.

Even when it is controllable, however, I doubt just how likely it is that emotions drive large-scale or permanent change. Indeed, many of the artists interviewed speak of the frustration they feel with people's unwillingness to either change or even admit that they personally contribute to global problems despite both emotional and numerical appeals. They put their personal comfort ahead of environmental and social considerations and use a post-hoc justification to defend their behavior, often within the framework of an us versus them mentality.

This thought makes me question the strength and depth of newfound convictions which are achieved by means of emotional appeal among those who are willing to change—even when numerical data has been part of the message. Indeed, the comprehension of the numbers itself comes into question, and I wonder whether the numbers are in fact understood or are simply being used to prop up an opinion without much understanding. Could it be people tend to understand the credibility of numbers, but do not deeply understand the numbers themselves?

If emotional engagement is in fact, as some of the artists argue, a necessary prerequisite to thinking seriously about numbers, then we must inform and edify citizens accordingly. But if, on the contrary, emotions are yielding results too shallow, short-term, and unpredictable, perhaps we should all instead redouble our efforts to teach people how to think more deliberately, scientifically, and rationally. This type of thinking is harder and slower, and it is taxing to call upon the part of our brain that deliberates and reasons. But, to twist a line from Chesterton: convincing people by use of deliberation and reason has not been tried and found wanting; it has been found difficult, and left somewhat less than fully tried.

Numbers and Nerves is a book worth reading, which well informs the reader of some of our most frustrating psychological limitations to responding adequately to large numerical data. These psychological mechanisms are examined and demonstrated well in Part I. Although Parts II and III are more tentative, they do actively bring the reader into a conversation around what may very well be the most important questions of our time: Why are we not responding as we should to large numbers which quantify human suffering and environmental collapse? And how, then, might we work around these limitations? This collection would serve as a fine introduction to the topic for undergraduates and educated readers of general interest.