Strategies for Maximizing Favorable Beliefs, Attitudes
And Behaviors Toward the United States

Part I: Theory

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The Problem

Experience in combating terrorism over the past two decades has shown that US military forces have the capacity to defeat any combination of conventional forces that can be deployed against them. In spite of military successes, however, anti US forces have multiplied, and it has become clear that military force alone, however effective, is not sufficient to contain or eliminate the threat of terrorism.

US agencies, both public and private, have responded by seeking ways to augment military power with "soft power". According to a report from the Rand Corporation:

> Since the end of the Cold War, there has been growing interest in improving the nation's ability to employ various forms of "soft power"— capabilities that might allow the United States to effectively influence the attitudes and behavior of particular foreign audiences while minimizing or avoiding combat entirely (Larson, et. al., 2009).

Among the most effective methods identified is The Galileo System. Again, according to the Rand Corporation:

> One of the more interesting approaches to communication and attitude change we found was Joseph Woelfel's metric multidimensional scaling approach, which is called Galileo. In many ways, Woelfel's theory was the closest that any social science approach came to providing the basis for an end-to-end engineering solution for planning, conducting, and assessing the impact of communications on attitudes and behaviors (Larson, et. al., 2009).

This paper proposes a plan for implementing a system based on Galileo theory and method that will help the US to identify and implement strategies for maximizing beliefs, attitudes, and behaviors favorable to the US while minimizing beliefs, attitudes and behaviors hostile to the US.

Theory

While the Rand report (Larson, et. al., 2009) contains an excellent review of publicly available literature, its authors did not have access to proprietary information, most recent work and unpublished information, so it is important to present a concise description of the state of the art Galileo theory and method as of 2010. This paper will be aimed at the intelligent lay reader, not the professional scientist.

Objects

The sensory information that flows through individuals and cultures is continuous and ever changing. A chair seen from above, behind, below, close, far, empty, full looks different in each case. Overstuffed chairs, rocking chairs, reclining chairs, office chairs,

chairs on wheels, wooden chairs, plastic chairs, red chairs, brown chairs all look different. Each time we move, the image of the chair that falls on the eye changes. Yet we are able to recognize the continuously changing image as a single object, a chair. How does this happen?

All perception is a result of energy impinging on the human sensory system. When light energy, for example, falls onto the eye, it activates cells in the nervous system called "neurons". As the image changes, different neurons turn on and off. At any instant, the image in the brain is made up of the pattern of neurons that are "active."

If this were all that happened, human life would be an ever-changing chaos. But neurons are living things, and tend to grow connections among themselves when they are active.  If we see a pattern again and again, the neurons that represent that pattern tend become connected (patterns that occur very seldom are quickly forgotten, as connections that are not reinforced decay). A network of interconnected neurons is shown in Figure 1.
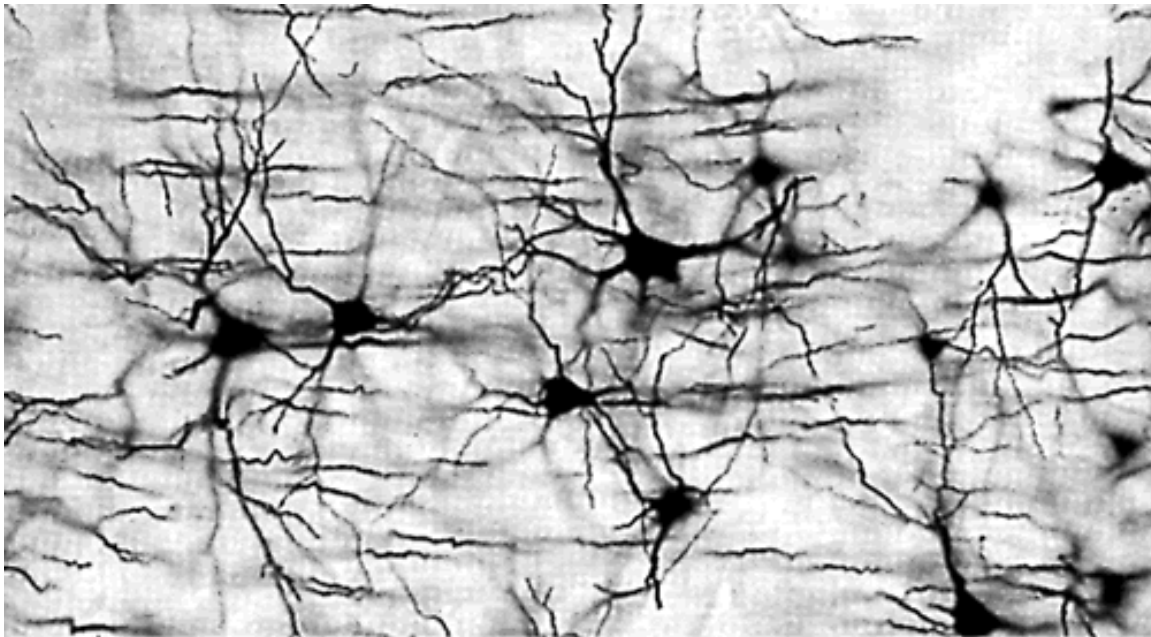


Figure 1: Golgi Stain of Neural Network in a Brain

Neurons that are connected to each other communicate with each other. If we see *part* of a chair, *some* of the neurons in our concept of chair become active. If enough of them become active, their activation flows through the connections to the rest of the neurons to activate the entire concept, and we think of a chair. In this way, our brains transform the continuous flux of experience into solid, stable objects.

It's important to understand that concepts, or objects as we call them in Galileo theory, are not insubstantial, ephemeral thoughts, but networks of real, living cells. *It takes energy to build the clusters of neurons that make objects, and it takes energy to change them. The laws of thermodynamics apply to cognitive structures and processes just as they apply to "physical" objects and processes.*

Beliefs

We can sit on a fence, sit on a couch, sit on a chair, sit on our hands, and everything's better when it sits on a Ritz (as per Nabisco's 1987 advertising campaign for Ritz crackers). Sitting, just like chair, is an object. All objects are defined in terms of their relationships to other objects. We can't understand the meaning of *chair* without understanding the concept of *sitting*. The relationship between any two objects is called a *belief*. Beliefs are not insubstantial, ephemeral abstract things, but are, like objects, networks of interconnected neurons. It requires energy to grow these structures, and it takes energy to change them.

Situations

Objects have different meanings in different contexts or *situations*. A tiger in a zoo has much different meaning than a tiger in your yard. To understand the meaning of any concept, it's necessary to consider the situation in which it occurs, and what other objects also occur in that situation. The relationship of an object to all the other objects in the situation is the meaning of that object in that situation.

Yourself

One very special object is you, yourself. It's the only object that's present in every situation because, wherever you go, there you are. Your definition of yourself -- who and what you think you are -- is determined by your relationships to the other objects around you. These beliefs about your relationship to other objects are called *attitudes*. Attitudes are important because attitudes influence behavior.

Changing attitudes changes behavior. Reducing terrorist acts toward the US requires changing attitudes toward the US. Like other beliefs, attitudes are living physical structures -- networks of neurons in brains. It takes energy to form attitudes and it takes energy to change them[1].

Culture

In the long view, individual beliefs and attitudes are not very important. Individuals are replaceable, and, in fact, on a worldwide basis, individuals are replaced at a rate of about 8% per year. Every hundred years or so, all of them are replaced, yet society and

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[1] One of the most effective and time-honored methods of changing people's attitudes is to identify those who hold bad attitudes and kill or incarcerate them. Thus in the third century BC, the Chinese emperor Qin threw Chinese intellectuals into a pit, thereby eliminating what he considered to be a lot of bad attitudes. Those who witnessed the killing, however, formed some new bad attitudes. In the third century BC, it would take a long time for people to hear about the burial, and only those present could see it. In the 21st century, however, everyone in the world can see it immediately, and photos, movies and stories can travel endlessly, creating more bad attitudes at a tremendous pace, so changing attitudes by death is no longer as efficient as it once was.

culture goes on. Although individuals can and do form concepts, beliefs and attitudes, most of them by far are formed by the culture and transmitted to new individuals (children) by their parents or whoever cares for them.

While individual beliefs and attitudes can be volatile, like individual leaves falling from trees, cultural beliefs and attitudes behave lawfully and are highly predictable, in the same way as you can track the changing color of the autumn leaves in the Adirondacks on the internet day by day.

Representing Cultural Beliefs and Attitudes

As we've seen, objects are networks of neurons in brains. Objects that are similar -- that "go together" -- are tightly interconnected. Those that are dissimilar have few or no interconnections. We can capitalize on this notion of "close" and "far apart" to represent beliefs and attitudes as points in space[2]. Those that are similar or "go together" are close to each other in the space, while those that are dissimilar are far apart.
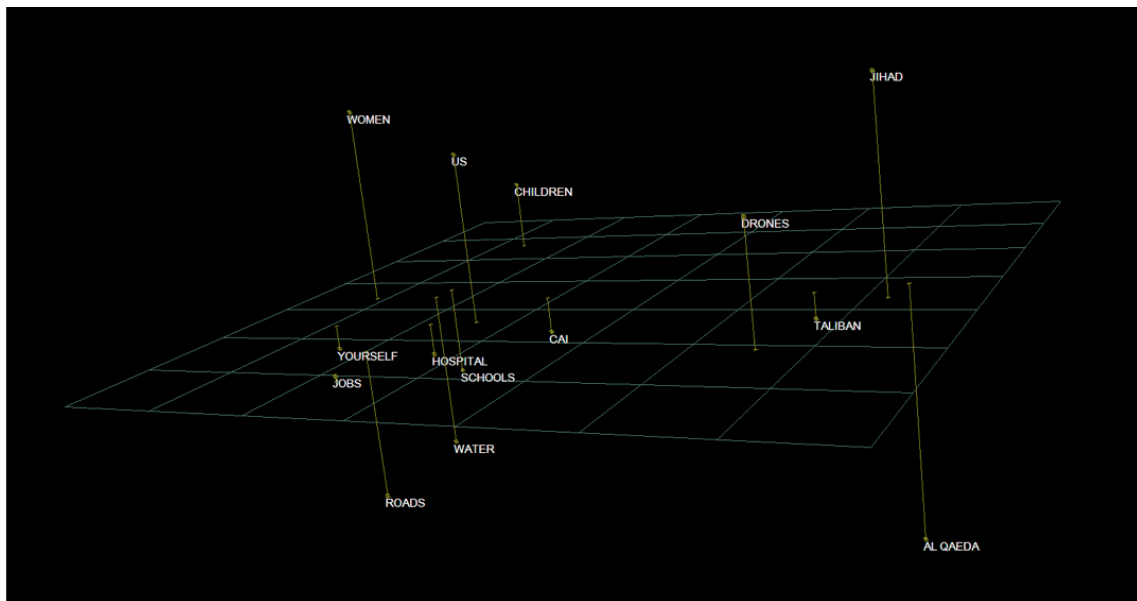


**Figure 2: Beliefs and Attitudes about the US in Afghanistan**

Figure 2 shows the beliefs and attitudes of three Americans toward the US, the Taliban, Al Qaeda and the Central Asia Institute, an NGO that builds girls' schools in Afghanistan and Pakistan. Their attitudes toward the US are much more favorable than their attitudes toward the Taliban and Al Qaeda, as is indicated by their distances from "yourself" in the lower left side of the space. While this space is just a snapshot in time, changes of beliefs and attitudes over time are represented by movements of the points through the space.

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[2] The space that results from actual measurements is more complicated than ordinary three dimensional space as it appears in everyday life, but the mathematics for dealing with it are well developed, and computers have no problem with it.

Messages

Messages are anything that moves objects through the Galileo space. They can be simple messages, such as a sign saying "The US will help you find a job," or compound, such as "The US will build roads, schools and hospitals." Or they could be actions, such as building a school, or attacking Al Qaeda personnel with a drone. Each of these, and many, many more, can result in moving objects in the Galileo space, thus changing attitudes and beliefs.

The Galileo space can predict the effect of these or any other messages on beliefs and attitudes before the fact, and measure the actual effect after the fact. This gives planners the ability to play "what if" for various prospective scenarios. It can also calculate the most effective messages for creating a desired change in attitudes. Figure 3 shows the likely effects of providing schools, roads, hospitals and jobs in Afghanistan.
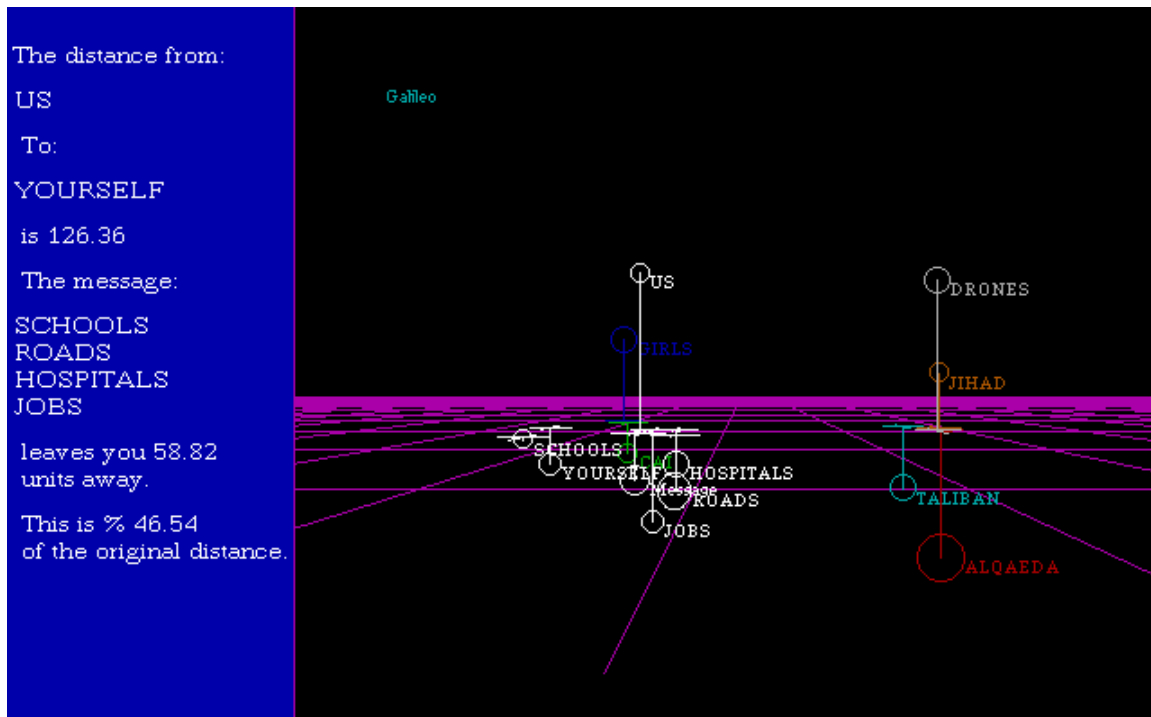


**Figure 3: Predicted Effects of the Message "Schools, Roads, Hospitals, Jobs."**

It shows that the present distance between the US and "yourself" -- a measure of attitudes toward the US -- is 126.36 units. The message "schools, roads, hospitals, jobs" can move the US to within 58.54 units, an improvement of over 53%.

Figure 4 shows the predicted effect of the message "drones" on attitudes toward the US.
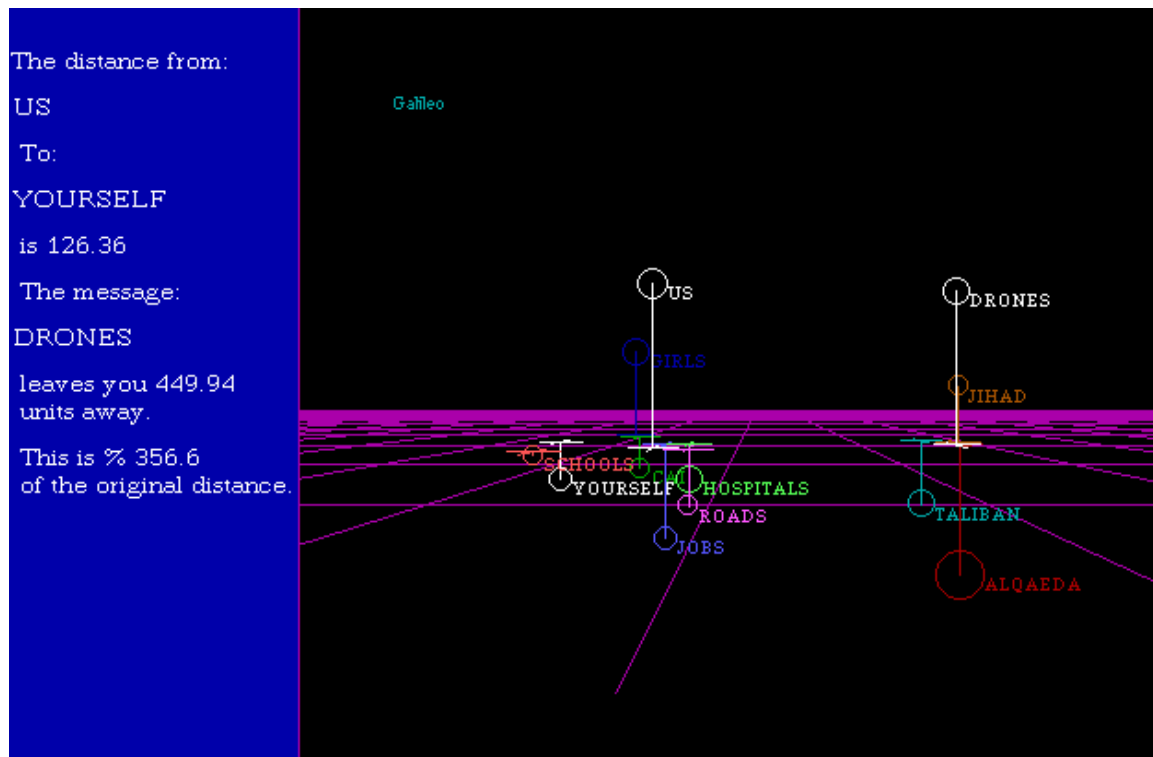
Figure 4: Predicted Effect of the Message "Drones" on Attitudes Toward the US.

Such a message might occur when a village is attacked by a US drone. The predicted effect is to move the US from its present distance of 126.36 units from "yourself" to 449.6 units, and worsening of attitudes toward the US of more than 355%. Whatever the military advantages of such a strike, there is a severe penalty to be paid in attitudes toward the US. Four hundred forty-nine units is far enough to move "yourself" all the way to "jihad."

Tracking

With a system in place to provide continuous inputs of data, Galileo can provide a useful and easy to understand method for tracking changes in attitudes and beliefs. Figure 5 shows the distances between the presidential candidates in the last US presidential election over a six-week period.
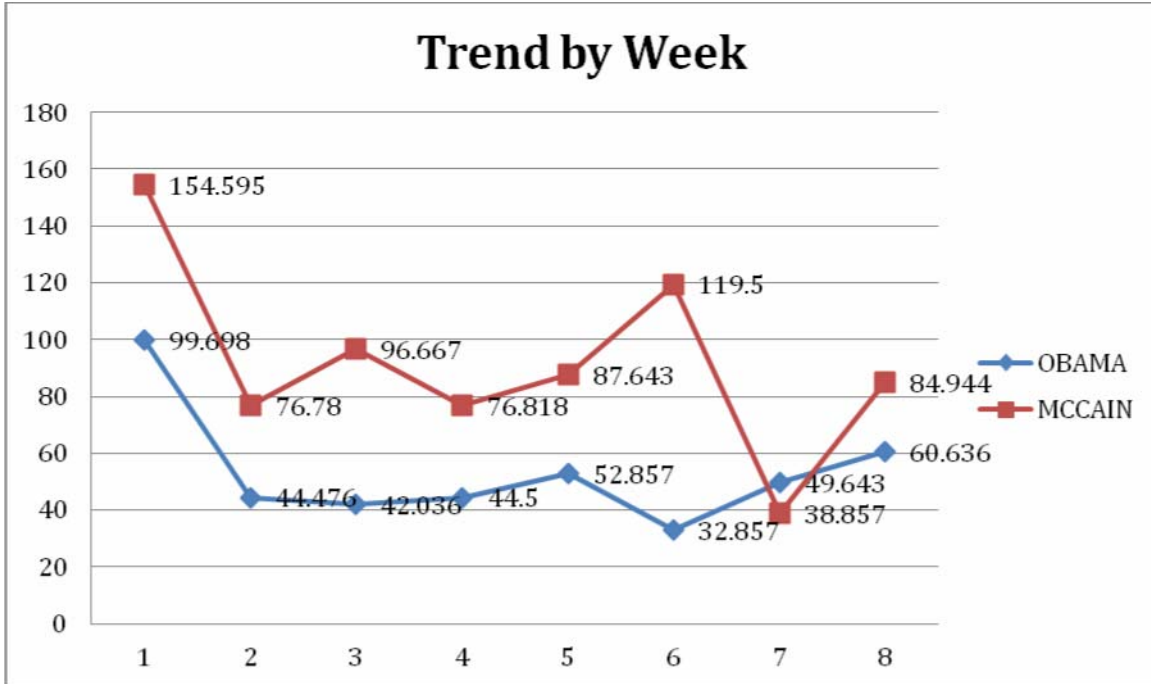
**Figure 5:Distances from "Yourself" for Obama and McCain over Eight Weeks**

Experience with elections shows that the candidate closer to the self wins elections, and the last presidential race was no exception. Unlike traditional polling, which can tell who's leading and by how much, Galileo can tell what has to be said to move closer -- or to move your opponent further away -- on a continuing basis.

Summary

Galileo is a theory and method that can represent beliefs and attitudes as both physical networks of neurons in the brain and points in space. This makes it possible to measure beliefs and attitudes, and changes in beliefs and attitudes with great precision. It also makes it possible to calculate the predicted effects of messages and other events on beliefs and attitudes, and to track these changes over time. Although the data presented here are only illustrative, they can serve to provide a brief overview of some of the capabilities of Galileo in understanding and communicating with others.