

# How a synthesizer works

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## Abstract

In their classic book, *The art of thinking*, Robert Bramson and Allen Harrison describe five thinking styles that one tends to adopt: pragmatist, analyst, realist, synthesist, and idealist. In this paper, we tell our story on thinking modes we often use, and sometimes we took a *synthesizer* mode, i.e. to combine three or four of the above thinking styles. We present some examples too. We hope this retelling may be useful for young scientists and mathematicians in developing new theories either in theoretical physics and cosmology.

## Introduction: Review of 5 thinking modes

Scientists in all fields need to adopt certain thinking modes, and analytical way is not necessarily to be the only approach he/she can adopt. In this regards, it seems worth to see 5 thinking styles of Bramson & Harrison. In this introductory section, allow us to quote in full an article by Carol Krucoff in Washington Post [4]:

By Carol Krucoff April 5, 1982

Over the past five years, Robert Bramson has asked several thousand people what seems like a simple question: "How do you think about things?"

"Most people find this extremely difficult to answer," says the 56-year-old organizational psychologist. "The typical response is a surprised stare, a blank look and words like, 'What do you mean, how do I think? I just think, that's all, as anybody else does.'"

What most people don't realize, Bramson says, is that "*in our Western world there are five distinct approaches to thinking: Synthesist, Idealist, Pragmatist, Analyst and Realist.* Each is useful in a given situation, but can be catastrophic if overused or used inappropriately. Yet almost all of us learn only one or two sets of strategies, and we go through life using them no matter what the situation.

"All around us we see people achieving success using strategies very different from our own. But despite the evidence, we persist in the ways that we believe work for us. We impose our own limitations, and we find it hard to understand those who persist in their own peculiar methods."

Psychologists call this human tendency "assuming similarity."

"In the absence of evidence to the contrary," says Bramson, "most people, most of the time assume others are just like them--only a little defective. Or, if their self-esteem is low, they think others are just like them only a little superior."

Bramson began researching styles of thinking in 1975 while trying to discover "why intelligent managers make terrible decisions." He and colleagues at their Berkeley, Calif., management-consulting firm uncovered two major studies relevant to the "problem-solving" issue: Philosopher C. West Churchman had identified five "inquiry modes" used by scientists, and Harvard professor Jerome Bruner had described four "conceptual strategies."

From this and other research (including Aristotle's description of the four different approaches to arguing) they isolated five styles of thinking and developed a test to determine thinking-style preference. In five years of conducting workshops and testing several thousand people--mostly white-collar professionals--they have isolated these characteristics of each style:

\* *Idealists*: Receptive and inquiring. Tend to focus on similarities among people and try to assimilate disparate views into a solution that will have something for everyone. Ethical, future-oriented and concerned with social values and goals. Excel in articulating goals and seeing the broad picture, but may try too hard for "perfect" solutions and screen out hard data and details.

Under stress, idealists often look hurt.

*Analysts:* Detail-oriented. Approach problems in a careful and methodical way. Gather as much information as possible before making a decision and look for the "one best way" to proceed. View themselves as factual, down-to-earth, practical people and view the world as logical, ordered and predictable. May screen out values and subjective factors and can appear inflexible and overly cautious.

Cool, studious and often hard to read, analysts under stress often withdraw.

\* *Pragmatists:* Flexible and adaptive. Focus on the shortest route to the payoff and excel at finding new ways of doing things with materials at hand. Believe the world is neither predictable nor understandable and are interested in "whatever works." May seem unpredictable, but tend to have well-developed social skills and are often well-liked.

Under stress, pragmatists may look bored.

\* *Synthesists:* Like to rearrange seemingly disparate things into new, creative combinations. Habitually question people's basic assumptions about things and enjoy philosophical arguments. Not likely to be interested in compromise or consensus.. Best in controversial, conflict-laden situations. May be labeled as "troublemakers."

Under stress, synthesists tend to poke fun.

\* *Realists:* View "reality" as whatever they can feel, smell, see, hear or experience. Believe that any two intelligent people ought to agree on the facts, and if something is wrong, want to fix it. Have a need to achieve and be in control. Pride themselves on incisiveness and can become impatient easily. Good at simplifying a problem and providing drive and momentum, but may try too hard for consensus and rush to over-simplified solutions.

Realists under stress become agitated.

The most popular style of thinking in this country, says Bramson, is Idealist with 37 percent of those tested showing that preference. Other styles, in order: Analyst (35 percent), Realist (24 percent), Pragmatist (18 percent) and Synthesist (11 percent).

"In the workplace we glorify the realists and analysts," he says, "and stomp out the synthesists. In the '60s there was a resurgence of interest in the synthesist style of thinking--which often comes up with new, fresh ideas--but today we tend to see them as troublemakers.

"In other cultures, style preferences may differ. That's something we're interested in testing. I believe there's likely a genetic bias toward one or two styles, which may be amplified or contradicted by early learning."

Sex is not a factor, Bramson claims, in the way people think. "We were surprised that we didn't find a difference in the style preference between men and women."

Occupations are, however, linked to style preferences.

"What we found," he says, "unfortunately supports the stereotypes. Social workers, for example, peak in idealist and are low in analyst, while budget officers are the exact opposite. . . Which makes it clear why the two groups often have trouble communicating. That can lead to poor use of funding."

On the basis of his study, Bramson believes that about half the population tends to rely on a single style of thinking and about 35 percent favors a combination of two styles.

Albert Einstein, he says, was probably an Analyst/Synthesist: "He had a vision, then backed it up with data." Thomas Jefferson was likely a "Synthesist/Idealist" who continually upset and confused "Analyst/Realist" Alexander Hamilton.

Ronald Reagan's style, he says, "is difficult to determine since he's so good at presenting himself . . . but he exemplifies the politician's profile: Realist/Pragmatist."

*There is, stresses Bramson, no "best" style. "This is not a measure of ability, but of how you use your intellect. Each individual must stop wishing they were different, learn to be more skillful with the strengths they have and acknowledge their liabilities--which are usually simply the overuse or inappropriate use of their strengths."*

Someone who learns to recognize the errors their preferred style of thinking may lead to, he says, can compensate for blind spots. The best way to broaden a style repertoire, he says, is to "link up with someone who is high in the areas you are low in and listen to them.

"My wife, who is also my partner, is a Pragmatist/Realist, low in Synthesist, while I'm a Synthesist/Realist, low in Pragmatist. She values the ideas I have as a Synthesist, but she can bring me down to earth when I've got my head in the clouds. We're sensitive to the ways we differ, try to listen and respect one another and value that different style of thinking."

### **How to be a Synthesizer**

As Bramson argued, that each mode of thinking can be useful in certain context, and may be not so useful in other situations, therefore we also adopted a mode that you may call "Synthesizer" mode. A synthesizer ('sinTHə,sīzər/) can be defined as follows:

1. an electronic musical instrument, typically operated by a keyboard, producing a wide variety of sounds by generating and combining signals of different frequencies
2. any of various electronic, sometimes portable consoles or modules, usually computerized, for creating, modifying, and combining tones or reproducing the sounds of musical instruments by controlling voltage patterns, operated by means of keyboards, joysticks, sliders, or knobs.<sup>1</sup>

In a similar way, we sometimes adopted 2-3 thinking styles altogether such as: Analytical/Realist/Synthesist like in Cantorian Navier-Stokes Cosmology. And sometimes Idealist/Synthesist/Analyst etc. like in Smarandache's Neutrosophic Logic. This mode is called as '*Synthesizer's way*."

In the following section we will describe a few examples how to be a Synthesizer in physical sciences and mathematics fields.

### **Our story**

a. Neutrosophic Logic:

One of us developed a new theory called Neutrosophic Logic as an extension of Intuitionistic Fuzzy Logic.[5] Instead of working on Zadeh's

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<sup>1</sup> [www.dictionary.com/browse/synthesizer](http://www.dictionary.com/browse/synthesizer)

Fuzzy Logic, he developed a novel way, to unify the whole logic and probability theory, with implications range far into new fields such as AI, Information Fusion, Dezer-Smarandache Theory (DSmT) etc.

Below is a summary of Neutrosophic Logic: [5]

**Neutrosophic Logic** is a general framework for unification of many existing logics, such as fuzzy logic (especially intuitionistic fuzzy logic), paraconsistent logic, intuitionistic logic, etc. The main idea of NL is to characterize each logical statement in a 3D Neutrosophic Space, where each dimension of the space represents respectively the truth (T), the falsehood (F), and the indeterminacy (I) of the statement under consideration, where T, I, F are standard or non-standard real subsets of  $]0, 1[$  with not necessarily any connection between them.

For software engineering proposals the classical unit interval  $[0, 1]$  is used.

For single valued Neutrosophic logic, the sum of the components is:

$0 \leq t+i+f \leq 3$  when all three components are independent;

$0 \leq t+i+f \leq 2$  when two components are dependent, while the third one is independent from them;

$0 \leq t+i+f \leq 1$  when all three components are dependent.

When three or two of the components T, I, F are independent, one leaves room for incomplete information (sum < 1), paraconsistent and contradictory information (sum > 1), or complete information (sum = 1).

If all three components T, I, F are dependent, then similarly one leaves room for incomplete information (sum < 1), or complete information (sum = 1).

b. Cantorian Navier-Stokes Cosmology:

Around mid of 2002 one of us tried to rekindle the superfluid interstellar medium in astrophysics, but after studying some existing papers, he ended up in superfluid quantized vortices model of the Solar System.[6]

He argued that the Universe can be modelled by Navier-Stokes equations, which reduce to superfluid quantised vortices. It was quite rare at the time to come up with a whole new idea in astrophysics, connecting NS equations and superfluidity, but now the use of NS into superfluidity context becomes more common.[9][10]

Among our result there was a prediction of 3 new planetoids beyond Pluto orbit, which then the three new orbits have been found to be inhabited by new planetoids, like Sedna.

c. Retro-Classical Physics

This is a new term we argued in a paper discussing how we can work out new theories beyond the subjective-idealism tendency of Relativity Theory and Quantum Mechanics. Interested readers are advised to see our paper [7]. See also [8].

**Concluding remarks**

In the last 10-11 years, we have published more than ten books in this area of quantized astrophysics and also Neutrosophic Logic. Although there were different thinking modes between us (as mathematician and as a nocturnal physicist), we chose to publish rather than perish.

We hope this short article may inspire younger generation of physicists and mathematicians to rethink and furnish their approaches to Nature, and perhaps it may also help to generate new theories which will be useful for a better future of mankind.

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