# U-SIT And Think News Letter - 73


**U**nified **S**tructured **I**nventive **T**hinking is a problem-solving methodology for creating unconventional perspectives of a problem, and discovering innovative solution concepts, when conventional methodology has waned. **H**euristic **I**nnovation is an extension of **USIT**.

**Subject Keys**

PD = Problem definition
H = **Heuristics**
T = Theory
M = Metaphors
A = Analysis
BH = **Brain hemispheres**

**Dear Readers**:

. This newsletter continues the brief series on using both cognitive hemispheres as tools for innovation.

. The "Two Brains Are Better" lectures began with logic-oriented thinking and its suppression of intuitive thinking. In the last lecture images were the initial focus. This orientation is continued here.

**Mini USIT Lecture – 73**

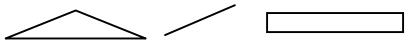
## Two Brains Are Better – IV

**Think you've seen everything?**
I'm always impressed, when working problems in qroups, with how many different perspectives participants have from the same initial information. Here's a fresh view of an image in the last mini-lecture, sent in by Matt Smith.

> "In this most recent issue, another interesting occurrence: my brain saw figure 1, and was trying to process it in accordance with the text above it, which is what I was reading when I spotted the figure. I didn't wait until the text got to the place where it said "in figure 1…" Instead, I tried to imagine what relevance the figure would have to the current discussion, which up to that point had not included anything vaguely related to bears or trees. I thought the vertical lines were wires, each oval a bird, and the little lines (claws) were the beaks. I was desperately trying to figure out why there were now 16 birds, in four groups of four, on two different wires!"

This is an ideal lead-in to the current lecture (thanks Matt). I propose to begin with images having no introductory verbiage in order to give our intuitive brain hemispheres a head start over their logical counterparts.

**Give your intuitive hemisphere some respect**
You will be shown three sketches, in three exercises, and given no further information. Allow yourself only 3 minutes, per exercise, to ponder the sketches and make something of them, anything or things. Give a sketch and an explanation of what you make. Please do each of the three exercises without reading further into the lecture. Write your ideas and then do the next one.

1) 

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2) 

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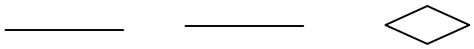
3) 

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Please send me your ideas for these three sets of sketches. I will try to compile them for us to see the variety of reactions our brain hemispheres provide. Please do not change any of your ideas or add new ones after reading the rest of this lecture. Comments on how you reacted to each exercise would also be of interest.

**Creative Cognition**

I hope you have worked the above three exercises and will share your results with the rest of us. This is my attempt to test our reactions to ambiguity in graphic metaphors.

I got the idea for doing the above exercises while reading the book "Creative Cognition – Theory, Research, and Applications" by R. A. Finke, T. B. Ward, and S. M. Smith., The MIT Press, 1996. In this book, the authors describe their well-defined laboratory experiments for testing people's ability to be original and creative in thinking of uses for simple shapes. From the results of these experiments they drew conclusions about inventiveness. Their experimental procedure was well defined and their results clearly explained. However, I had some skepticism that bothered me regarding the relevance of their work and what we as technical problem solvers do when solving technical problems.

What bothered me was a question lingering in my mind regarding authenticity of problems concocted by cognitive psychologists having relevance to real-world problems that scientists and engineers are trained to solve. Part of the time I gave them the benefit of the doubt and part of the time I didn't . Here's why.

They begin their chapter on creative invention with an example from an earlier study in which object parts and categories of application were limited. I like this – it sounds like an engineer's closed world.

> "The initial experiments tested the idea that creativity would be enhanced whenever one is forced to use unusual sets of parts or to interpret the resulting objects in unconventional ways."

An example result was shown in Fig. (1).

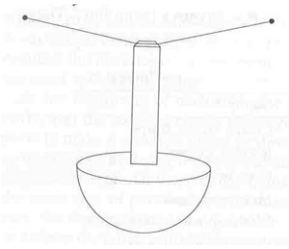

Figure 1. "The hip exerciser, constructed using the half-sphere, wire, and rectangular block, an example of an object that was classified as a creative invention. By shifting one's weight from side to side while standing on the half-sphere, one can exercise one's hips. (From Finke 1990.)"

Note that in their experiment, and this example, the subject was given three sketches and told what they represent; “a half sphere, wire, and a rectangular block”. This made me wonder if such information is necessary for creative thinking. It seems to me, but not proven, that application of the heuristics learned in USIT could accomplish similar results.

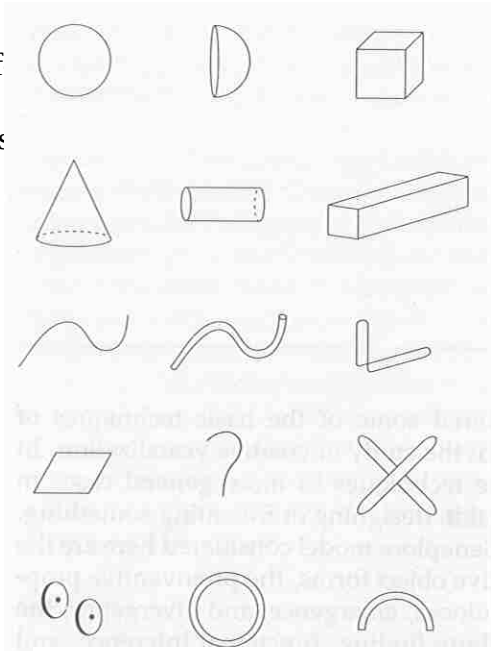

Figure 2. Set of object parts in experiments on creative invention.

In their later experiment on creative invention they used fifteen objects, shown in Fig. 2. The objects were identified as sphere, half-sphere, cube, cone, cylinder, rectangular block, wire, tube, bracket, flat square, hook, cross, wheels, ring, and handle. “At the beginning of each trial, the experimenter named the three parts, and the subjects closed their eyes and imagined combining the parts to make a practical object or device. They were never told to be creative in doing the task but simply to think of an object that might be useful. All three of the named parts had to be used, even if the same type of part was named more than once. The subjects could vary the size, position, or orientation of any part but could not bend or deform the parts, with the exception of the wire and the tube, which had been defined as bendable”

The problem I have with this experiment is the naming of the sketches and assigning them attributes in addition to their shapes (size, position, orientation, flexibility). I see this as biasing the mind toward logical thinking and away from intuitive thinking. My preference would be to provide the sketches with no names or attributes, just the illustrated shapes. This would allow both brain hemispheres to be involved using their different protocols of thinking. As shown above the problem is over defined, in my opinion.

As a student, and as a teacher, I have always enjoyed more, and learned more from, problems that give only sufficient information for solving them. These are especially inspirational when you find no obvious starting point but must make one or more assumptions. What follows is both rapid generation of intuitive ideas and logical filtering of ideas that violate the assumptions.

I’ve probably mentioned this in the past, but a favorite problem of mine is: “How far can a goose fly?” This is not a joke, but a tractable physics problem that requires a number of reasonable assumptions. You may not be able to do the mathematics for this problem but with a little thought you can imagine a series of logical assumptions needed to reach a reasonable answer. That, in itself, is a masterful bit of creative thinking.

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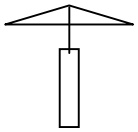
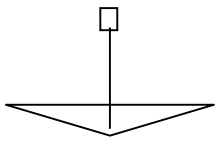
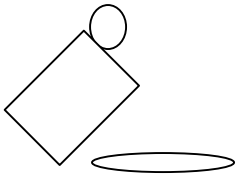
My three-minute exercises produced:

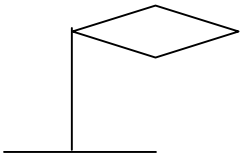
1) A cover for a bird feeder.  and a tilting, rotating toy for a child to stand in, hold the handle,  and rotate himself around the center.

(The latter was obviously influenced by earlier reading.)



2) An inclined box from which to roll an egg to test the height it can fall without breaking.

3) A mooring post for a trapezoidal blimp.



The object of this exercise is not to find overwhelming invention, but recognition that without words to inspire logical thinking, simple shapes can inspire intuitive thinking.

I found three minutes too brief to actually reason using USIT heuristics. Did you?

**Other Interests**

1. Have a look at the USIT textbook, "Unified Structured Inventive Thinking – How to Invent", details may be found at the Ntelleck website: www.u-sit.net
2. See also "Heuristic Innovation", and register for multiple resources.

| Publications | Language | Translators | Available at … |
|---|---|---|---|
| 1. Textbook: Unified Structured Inventive Thinking – How to Invent | English | Ed Sickafus (author) | www.u-sit.net |
| 2. eBook: Unified Structured Inventive Thinking – an Overview | English | Ed Sickafus (author) | www.u-sit.net |
| | Japanese | Keishi Kawamo, Shigeomi Koshimizu and Toru Nakagawa | www.osaka-gu.ac.jp/php/nakagawa/TRIZ/ |
| | Korean | Yong-Taek Park | www.ktriza.com/www/usit/register_form.htm |
| "Pensamiento Inventivo Estructurado Unificado – Una Apreciación Global" | Spanish | Juan Carlos Nishiyama y Carlos Eduardo Requena | www.u-sit.net |
| 3. eBook "Heuristics for Solving Technical Problems – Theory, Derivation, Application" -- HSTP | English | Ed Sickafus (author) | www.u-sit.net |
| "Heurísticas para Resolver Problemas técnicos – Teoría Deducción Aplicación" | Spanish | Juan Carlos Nishiyama y Carlos Eduardo Requena | www.u-sit.net |
| 4. U-SIT and Think Newsletter | English | Ed Sickafus (Editor) | www.u-sit.net |
| | Japanese | Toru Nakagawa and Hideaki Kosha | www.osaka-gu.ac.jp/php/nakagawa/TRIZ/ |
| | Korean | Yong-Taek Park | www.ktriza.com. |
| Mini-lectures from NL_01 through NL_67 | Spanish | Juan Carlos Nishiyama y Carlos Eduardo Requena | www.u-sit.net click on Registration |

Please send your feedback and suggestions to Ntelleck@u-sit.net and visit www.u-sit.net

**To be creative, U-SIT and think.**