Lateral puzzles of the “thinking outside the box” type can only be solved by going outside the boundaries of the original problem statement. A parallel is here drawn between the solution heuristic for these puzzles and for the kinds of communication puzzles encountered by technical communication professionals. I argue that abstract theories, once properly understood, are indispensable tools for explanation and problem solving, just as experimental questioning and hypothetical reasoning must likewise be employed to solve lateral puzzles.

Why did the bubble gum cross the road?

[The audience pauses, confused]

Why did the chicken cross the road?

[To get to the other side?]

No. Because it saw the zebra crossing.

Think again: Why did the bubble gum cross the road?  
Answer finally emerges: Because it was stuck to the foot of the chicken  [see endnote].

This above illustrates something called a lateral puzzle. It’s the kind of problem that can’t be solved if we just stick, like gum as it were, to the information given. For a satisfying answer to a lateral-type puzzle, we have to step laterally or “outside the box” to use the popular corporate-speak cliché. Some people find such puzzles entertaining;
others find them annoying. Either way, they illustrate in a nutshell the reason why
workaday practitioners (and here I mean technical-communication people specifically)
need theory, why we all need to know some abstract things about linguistics and rhetoric
and philosophy and psychology (to name a few theoretical domains). We need to know
such things in order do do our jobs most effectively.

Why did some bubble gum cross the road? Without some theory, here without the
cultural archetype of chicken jokes, which transcends the boundaries of the original
question, many things “just are” even though they make no sense. Without theory, tech.
comm. professionals are often stuck having to explain their content, format, and style
choices as “stuff that just works better,” or “this is the way it’s done.”

Trivial and humorous things like lateral puzzles might seem to be only a cute metaphor
for the need for theory in professional communication practice. Even so, I will here try to
demonstrate that the connection is based on a genuine common principle. The majestic
moon in it’s orbit and the funny, fabled apple that konked Newton on the noggin are both
manifestations of the common principle of gravity.

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So a man goes into a bar and asks for a glass of water. The bartender pulls a gun on him
instead. The man says “THANKS VERY MUCH!” (and very sincerely too) and he
leaves.


****
You just decorated your den in 1970s Retro style. You go in there one morning and find
a white bean on the floor

What happened here?

****

What do these two riddles have in common?
Answer: they’re both lateral puzzles, but what does that mean exactly?

To answer that question, we need a theory of reasoning. Our purpose here is best served
by a logical model developed by C.S. Peirce in the nineteenth century (1958: 2.623).
This is illustrated in Figure 1. In Peirce’s model, any argument reduced to its most basic
(=atomic) form, consists of three primitive terms (in the example given, “white,” “this
bean,” and “every bean from this bag”) and the three primitive terms are arranged in three
propositions, and the three “x IS y” propositions have three possible alternative
orderings: a deductive order, an inductive order, and an “abductive” order, as shown
below.

The thought process behind a lateral puzzle is different from ordinary deduction and
induction. In deduction and induction the reasoner works with the evidence given and
derives a conclusion. To solve a lateral puzzle, the reasoner has to go beyond what’s
given. The technical name for this kind of reasoning is ABDUCTION, sometimes also called HYPOTHESIS, which goes like this:

IF this bean IS white.
AND every bean in my bean-bag chair IS white.
THEN: This bean IS from my bean-bag chair.

The conclusion seems like common-sense reasoning, but it’s logically rather shaky. The bean might have come from the kitchen stuck to your shoe, or a chicken might have flown in the window and dropped it. Contrast this uncertainty with an air-tight, valid deduction:

IF every bean in my bean-bag chair IS white,
AND this bean IS from my bean-bag chair.
THEN: this bean IS white.

In deduction, if the premises are true, there’s just no way for the conclusion to be wrong, since the conclusion is just an alternate description of what the premises already say. In contrast, induction seems much weaker:

IF: this bean IS from my bean-bag chair.
AND: this bean IS white.
THEN: every bean in my bean-bag chair IS (probably) white.

Based on a solitary sample bean, there’s no way to be sure there aren’t brown or red or black beans in the chair too. However, induction very quickly becomes almost as certain as deduction, when the IF and the AND steps are successfully repeated several times: in other words, if several beans are pulled randomly from the bag, and they’re all white, then the statistical likelihood of error becomes very small and our working theory of bag-bean color is almost surely right.

Abduction/hypothesis lacks both the absolute validity of deduction and the increasing confidence that comes from repeating an induction. There might be a dozen random white beans on the floor of your den, and you still might not be even remotely sure they all came from the bean-bag chair. So why is abduction even worth thinking about? Hintikka (1998) gives two reasons:

First, abduction is a form of thinking that expands knowledge (p. 506).

Deduction and induction only derive from known premises and limited direct experience.

Second, abduction provokes the thinker to ask a question and search for answers (p. 527), a search from which things will be learned EVEN IF the abductive conclusion proves wrong.

Abductive conclusions are validated by experiments, almost invariably experiments that we wouldn’t have even thought to run if we weren’t trying to test the abductive
conclusion. We go to the bean-bag chair and look for a hole. We shake the bag. If more beans fall out, then we conclude that the first bean also came from there, AND WE MIGHT STILL BE WRONG. The first bean might still have been dropped by a bird, but now because of the experiment, WE ALSO KNOW that the bean-bag chair has a hole, regardless of whether the first bean came from there or not.

Let’s go back to the bartender example: a man asks him for water, but is equally satisfied when the bartender points a gun at him. It’s another lateral puzzle and another case where abductive thinking is required:

IF All the beans in this bag are WHITE  
-------
IF Water having property “X” is WHAT THE MAN WANTED

AND this bean is WHITE  
------
AND a pointed gun is (equally well) WHAT THE MAN WANTED

THEN this bean is from this bag  
---------
THEN Water and a pointed gun have the same property “X”

The question which is provoked by the bean-bag abduction is, first, “Does this bean = beans in my chair?” and second, “Does my chair have a hole in it?” and that question provokes investigation.

The question which is provoked by the bartender abduction is “What human need might water and a pointed gun satisfy equally well?” And in this second case, the puzzle may finally be unlocked when the thinker considers another question: “What are some different folk-remedies for hiccups?”

[Audience says “AH-HA!”]

In either case, the thinker begins to visualize a hypothetical situation in which two apparently unrelated things have a property in common. The imagined reason for that common property amounts to a theory, a speculation about the source of the common property. In the bubble-gum example we likewise begin to search for a circumstance where bubble gum has properties in common with other road-crossing things...like chickens, and then the riddle practically solves itself.

( A post to <www.lateralpuzzles.com> by John Rickard on May 23, 2000 - 12:36 pm: )

When the [cell] phone rang, both Graham and Mary laughed. Why?

Lateral-puzzle enthusiasts entertain each other by searching for right question to ask, the question which presupposes the right common property. Here, when would a ringing phone be like other things that people find funny/ironic?
>Is their cell phone in plain sight?
>Had they forgotten the phone number?
>Was Graham calling from a regular phone?
>Are Graham and Mary together in the same place, or is Graham calling from another location?
>Were they expecting the phone to ring?

>Michael

By John Rickard (Jrr) on Wednesday, May 24, 2000 - 02:48 pm:

Michael,

Irrelevant; no; yes; they are together; they were expecting the phone to ring.

-- John

By John Murphy (Jmurphy) on Wednesday, May 24, 2000 - 04:36 pm:

John R,

My guess:
Graham and Mary had just had a guest over, who, when leaving, had forgotten his jacket. Graham called his friend's cell phone to tell him, and they laughed when the jacket pocket started ringing.

John M.

By John Rickard (Jrr) on Wednesday, May 24, 2000 - 04:56 pm:

* * * SPOILER * * *

John M,

Yes! Well done.

******End of transcript******
So what does all this fun have to do with technical communication puzzles and the need for theory?

Just this: the essential game of lateral puzzles is to visualize a theoretical scene where two otherwise dissimilar things become similar and the puzzle situation suddenly has an explanation.

Explanation is the bread and butter of technical communicators. On one hand a product has to be explained to users. What’s sometimes more critical though is the need to explain to engineers and supervisors why a manual (or even the product itself) needs to be designed in a particular way. “Just because it works better that way,” may not be an adequate answer.

Theories, good ones at least, serves as tools for thought and explanation. Let’s look at one last illustrative example (finally a serious one) before moving to specific tech. comm. issues:

Everybody learns the Pythagorean theorem, sometimes in grade school, sometimes in high school. Because we learn it by rote at an early age, most people accept the formula without question, but it too is a kind of lateral puzzle: $x^2 + y^2 = z^2$. Why WOULD the square of the hypoteneuse have any property in common (like equal squared area) with the squares of the adjacent sides, in every right triangle, EVERY time?

As usual, the explanation lies outside the formula itself. The formula refers to any single right triangle, but the mathematical proof refers actually to four identical right triangles, arranged in two different squares of equal area, two different boxes as it were, as shown in Figure 2, left and center (cited in Stjernfelt, 2000: 369). It’s important to realize too that Figure 2 represents an abstraction: it applies not just to one kind of right triangle, but that similar boxes could be made of right triangles of any proportions, as shown in the third box on the far right.

The point here is that it is ONLY in correctly formulating an abstract situation--the diagrammatic arrangement of four triangles in two squares and the equivalent areas of their squared sides--only in this form that the Pythagorean theorem is explained. In other words, like every other lateral puzzle, a theoretical situation must be imagined in which two otherwise dissimilar things are seen to have a property in common.

In this, we see by demonstration that the imagined diagram, the abstract situation not seen in the original puzzle statement constitutes a kind of theory and theory is an indispensable tool for thinking correctly about a problem. It remains only to be recognized that technical communication professionals typically face comparable puzzles.

This has been demonstrated over and over in the pages of the _IEEE Transactions on Professional Communication_, most particularly in the Interface features (in nearly every issue since March of 1998). One of these is particularly worth mentioning here because it
uses essentially the same theory of thought shown in Fig. 1 to organize a quite different-looking body of information:

Registered Professional Engineers (PEs) in most states...must also take a professional ethics refresher course at least once every two years.... [S]ince the duration of these courses (1 or 2 hours) is so short, it is difficult to give a meaningful treatment of the very broad field of ethics and also apply it to real-world situations in the time frame allotted..... This feature will introduce Peirce’s categories and show how they can be used to organize the major schools of ethical thought in a very compact and understandable way, thus allowing an ethics instructor to cover a large body of material in a short period of time. (Chambers, 2002: 45).

Chambers’ ethics presentation is summarized in Figure 3. The presentation is made more compact and economical primarily because all the different schools of thought can now be seen as being projected from a single system of three competing values, just as Peirce derives different modes of reasoning from systematic recombinations of three basic terms.

In sum, in solving the ethics-presentation problem, Chambers was essentially solving a lateral puzzle. Instead of moving chewing gum across a road, he was faced with the problem of “moving” an unwieldy collection of ethical positions through a tight timeframe. In either case the concrete problem is solved by attaching the difficulty to an abstraction outside its immediate, tangible limits.


References


FIG. 1  THEORIES = TOOLS for thinking
(even thinking about thought)

FIG. 2  WHY was Pythagoras right?

FIG. 3  Thinking about engineering ethics