

1/1/2006 – Note: These ‘Recipes’ were posted to the Yahoo Laws of Form Group in January and February 2004. In an earlier post, I had claimed that it would be relatively easy to create a set of instructions that would be easier for the non-mathematician to follow than the Spencer-Brown text. Joao Leao politely changed me to come up with some. Hence, the title I gave them, ‘Recipes for Joao’.

The basic idea is to create a series of instructional ‘games’ that can be carried out in step by step fashion. They are designed (hopefully!) to clarify the early chapters of Laws of Form. You will get the most out of them by actually creating the necessary props and playing the games.

At some point, I’d like to edit and format the recipes, and perhaps add some graphics. As they stand now, they have simply been cut and pasted from my original posts via email. Sorry about this graphic clunky ness. It’s also highly likely I would choose to revise the content as well.

There was also some a very interesting follow-up dialogue, which I haven’t included, which may be of interest for digging up if you have questions.

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Recipes for Joao: 1 – 9

I promised some recipes, so here are some recipes. I'm not sure if they qualify as having garlic, but I did try to interject a bit of humor here and there (sorry no emoticons are contained herein, it's probably best to consider the whole exercise a joke ;-)). I hadn't intended to, but I created a total of 8 recipes. The first four are contained in this message. The second four will be contained in a second post. The basic idea was to keep the instructions un-abstract as possible. Unfortunately, while I did try to be simple, I certainly wasn't brief! (Mutters: damn need to be precise . . .)

The basic thing was to really hammer the point on the one to one correspondence of the blackboard and the paper -- because that's the part where people have the hardest time following the book. Hence the idea of the 'Indication Game' (recipe Two). Play it a few times and the point will surely be gotten.

Of course, I'm hoping these will of course be useful in actually helping someone.

The number of instructions may be a problem, but writing this stuff

(If it's not convenient to get to a classroom, any room will do. Tape a piece of paper up on the wall to represent the blackboard. When the recipe refers to the blackboard, simply substitute 'paper taped to the wall' for 'blackboard.' Using a blackboard or a wall helps keep the two forms easily forms separate -- think of it as one being vertical (eg. blackboard or wall) and one horizontal (eg. paper on desk)

<<3>> By the way, I suggest actually carrying these instructions out physically, but you may of course prefer simply to carry them out in your head.

<<4>> Erase anything that's already on the blackboard.

(To avoid any confusion, if there happens to be more than one blackboard in the room, erase everything on those blackboards, pick one and only one blackboard for your use, and forget about the others from here on out.)

<<5>> Draw a circle or oval shape on the blackboard.

- a. Make sure the circle you draw is 'closes'.
- b. Make sure that none of the points on the circle intersect the edge of the blackboard.

If either a. or b. are not true, erase the board and try again!

<<6>> Mark the inside (the outside will do as well) of the circle GSBs two sided token > . (Refer to the book to see how it's drawn if you wish.)

<<7>> Refer to the circle you have just drawn on the blackboard together with the mark you have drawn as 'The Distinction on the Blackboard.'

(You can if you wish refer to it as the 'First Distinction', or 'The Form' But using that term is by no means necessary, and may in fact be confusing. For example, if you on your way to the classroom, you happened to pass Dr. Bricken's lecture all, and you happened to notice that he has already drawn a distinction in his hall, you may become confused as to the meaning of the term 'first'. He did draw his first, after all.)

<<8>> Review your work to be sure you are reasonably pleased with your work so far. (If not, return to 4.)

<<9>> From this point on, MAKE NO OTHER CHANGES TO THE DISTINCTION ON THE BLACKBOARD! Add nothing, erase nothing. Modify nothing!

(In his recipe, Spencer-Brown fails to explicitly mention of this point at all. 25 years ago, I before I got the picture, in my mind the mark on the 'First Distinction was free to sort of flip and flop around)

<<10>> Once the necessary provisions are secured and the room is prepared, the average time to complete steps 1-10 should be about 30 seconds.

<<<<Recipe 1 -- Part 2>>>> Make a copy of the mark from the Blackboard on a piece of paper.

<<1>> Place a blank piece of paper on the a desk, table, or clip board.

<<2>> Using a pencil (pen, etc) copy the mark > from the blackboard onto the blank paper.

<<3>> Make no further marks on the paper.

<<4>> Call the paper together with the mark you have just made, "The paper with the mark."

(If you like, you can note that this paper corresponds with GSB's "A form separate from the Form.")

<<<<Recipe 1 -- Part 3>>>>

<<1>> Interpret the mark on the paper as corresponding to, or indicating either the inside or outside of the circle on the blackboard.

<<2>> Observe the appearance of the form on the paper.

<< 3 >> Walk to the blackboard, and note the occurrence of the mark inside (or outside) the circle on the blackboard.

<< 4 >> Use your finger to point to the portion of the circle with the mark.

<< 5 >> Consider it said that you have just "Indicated" the part of the

blackboard that corresponds to the mark on the paper.

<< 6 >> You may wish to observe that the part of the blackboard to which you did not point has no mark.

<<<<Recipe Two >>>> Indication Game (preferably played with 2 or more people, 1 will work, . . .).

<<1>> Draw a distinction on the blackboard by following the steps of Recipe One part A. (If you are continuing directly from Recipe One, you can of course simply leave the distinction and mark you have just drawn on the board, rather than erasing and re-drawing it!)

<<2>> On a blank paper, draw a copy of the mark from the distinction on the blackboard, following Recipe One, Part 2.

<<3>> Place a second piece of paper in front of you, making sure it is blank.

<<4>> Refrain from drawing on the second piece of paper.

<<5>> Refer to the second piece of paper as the Blank piece of paper..

<<6>> You will now find yourself with one blank piece of paper and one marked piece of paper.

<<7>> Begin the fun part of the game by choosing one player to be the holder and one the pointer.

<<8>> Let the holder select one of the two pieces of paper and hold it in the air for the pointer to see.

<<9>> Let the pointer observe the piece of paper held by the holder to determine whether the held paper is marked or unmarked.

<<10>> Based on their observation, let the pointer walk to the blackboard and indicate the portion of the blackboard that has the corresponding mark or (or lack of mark) they observed on the held paper.

<<11>> Repeat the game for as many turns as desired, with the holder sometimes choosing to hold the blank paper, and sometimes the marked paper. You may wish to comment on the degree of steepness or flatness of the learning curve as the pointer does his/her job . . .

<<<<<<<< **Recipe Three** >>>>>>>> **The first Axiom / First Initial**

<<1>> For the purpose of cooking these recipes, there is nothing that prevents us from completely ignoring the difference between Axioms and Initials. In taking this course, the aim is simply to ease the burden on the student. But read the book, and ponder (for quite a while probably) regarding the foundational questions this step may bring up!

<<2>> As per recipe one, draw a distinction on the blackboard and mark it. (this is a good time to note, by the way, that you should be diligent about erasing your distinctions when you finally do leave the room. The world is already littered with the detritus of too many abandoned distinctions already. ;-))

<<3>> As per recipe three, place two separate blank pieces of paper in front of you. Draw a mark on one, leave the second blank.

<<4>> Play a revised versions of the indication game (Recipe Two) as follows.

<<5>> Hold up the piece of paper with the mark, and indicate the corresponding part of the blackboard.

<<6>> Repeat step 5, preferably in fairly quick succession to its first completion.

<<7>> Note that in both cases, the pointer points to the same portion of the blackboard, notably the portion marked by the mark.

<<8>> Now play the indication game twice holding up the blank piece of paper, and again note that the pointer on both occasions points to the unmarked portion of the blackboard.

<<9>> As many times as you like, repeat playing the game by twice holding up the blank paper, and twice holding up the marked paper.

<<10>> Now place a 3rd piece of paper in front of you (blank of course). Draw on it two instances of marks arranged as follows < > < >.

<< 11>> We will now choose to interpret the pattern of two such marks on the paper as an instruction to hold up the singly marked paper twice in succession.

content may be thought as 'Nothing', as in 'There is nothing on the page.'

<<3>> On the other hand, the page itself constitutes a kind of token or mark in itself. Which is to say, a blank page is not really a nothing, its a definitely a something -- a blank page!

<<4>> So, let's try a modified version of the Indication Game that tries represent the unmarked side of the distinction by not using any paper at all.

<<5>> Procure a single piece of paper, and draw one instance of the mark representing the marked state from the distinction on the wall (just as you did in Recipe 2).

<< 6>> Instruct the Pointer to point to the Marked side of the distinction on the wall when the paper with the Mark on it is raised.

<<7>> Instruct the Pointer to point to the Unmarked side of the distinction on the wall when there isn't any Mark raised.

<<8>> Let the Holder raise the paper with the Mark, and observe the action of the Pointer as he points to Marked side of the distinction of the wall.

<<9>> Have the Holder lower the paper, and observe that the Pointer points to the unmarked side of the Distinction on the wall.

<<10>> Let the Holder raise an lower the marked paper repeatedly, and observe the corresponding actions of the pointer.

<<11>> Invite a third player into the game. Call them the Barker. The job of the Barker is to instruct the holder when to raise and when to lower the paper with the mark.

<<12>> Observe that as the Barker says 'Lift the Paper', the holder holds, and the Pointer points to the Marked portion of the blackboard. Observe that when the Barker says 'Lower the Paper' the Pointer points to the unmarked portion of the Board.

<<13>> Assume the Barker is a lazy sort, who wants to say as little as possible. The Barker decides that it's much simpler to just say -- "Shift"

<<14>> Play the game again. The Barker begins the game by saying "Shift", and the Holder, who has been standing with his hands in his

pockets, grabs the marked paper from the table and raises it in the air for the Pointer to see. The pointer, who has diligently following orders, was initially pointing to the unmarked state, but seeing the holder raise the paper, now points to the marked side of the board.

<<15>> Observe that anytime the Barker says shift, his bark results in the shifter pointing to the opposite side of the circle, but that when the barker barks a second time, the pointer is again pointing to the same side of the distinction to which he had just been pointing prior to the intervening bark.

<<16>> Notice that if the pointer is pointing to the unmarked state, a bark results in the pointer pointing to the marked portion of the board.

<<17>> LoF uses the word 'cross' instead of the word shift. (If you like, play the game a few more times, having the Barker substitute 'cross' for 'shift'.

<<18>> Pause for a second, and recall how the game was played in Recipe 2. In recipe 2, the marked portion of the board was indicated (unfailingly of course) by the raising the marked piece of paper. Here in recipe 4, without fail, whenever the pointer is pointing the the unmarked portion of the board, the command to cross results in his now pointing to the marked portion of the board.

<<19>> LoF interprets that the single mark on the page, (), has two identical interpretations (identical in these sense the action of the pointer is the same regardless of which is adopted).

<<20>> First, the single mark on the page () may be interpreted as an indication to point to the marked state (as in Recipe 2).

<<21>> Second, it can be observed that the mark () contains unmarked space inside the two brackets, and can in a sense be regarded as harboring an an unwritten mark. LoF adopts the second interpretation that the single mark () can be interpreted as an instruction to cross from the side indicated on its inside, or in other words to cross from the unmarked portion of the board to the marked portion of the bord.

<<22>> LoF gives the name 'cross' to the mark (), and also, as mentioned above, uses the term 'cross' to denote the instruction earlier denoted as 'shift'.

(As an aside, you may wish to observe that the dual nature of the word in the english language (noun / verb) is is reflected here.)

<<3>> Note that part of the blackboard pointed to is first the marked portion, then the unmarked portion.

<<4>> Repeat this process in reverse, by first holding up the marked paper followed by the blank paper.

<<5>> Note that in the second instance the pointer first points to the marked portion, then the unmarked portion of the board.

<<6>> In both cases, we observe, that first holding up one of the two pieces of paper and then holding up the other results in the pointer making a correspond change in the side of the distinction to which they are pointing.

<<7>> Consider the case where first the blank paper is held followed by the marked. We notice the result is the same as if the holder had simply held up a single marked piece of paper.

<<8>> To reflect this observation, we can choose to interpret the the marked token as an instruction to first indicate the unmarked state, and then indicate the marked state.

<<9>>. Now obtain a third piece blank piece of paper. Place the mark < > on the paper. Now place a second mark in such a way as it covers the first mark as so < < > > (see book for graphics details, obviously).

<<10>> We can choose to interpret the pair of marks < < > > an instruction to first indicate the marked state, and then to subsequently indicate the unmarked state.

<<11>> Playing the indication game we note that in both cases we end up indicating the same side of the distinction, notably the unmarked state: a) if we hold up the paper marked < < > > and interpret it as noted in 10; and b) if the blank paper is held up once.

<<12>> Therefore we conclude that holding up the paper marked with < < > > is the same as holding up the blank paper. (As in Recipe three, we could have chosen to invoke Axiom 2 at this point, rather than justify our results based on playing the indication game.)

<<13>> As a way of recognizing this result, we a-fix the paper with the marks < < > > together with a paper clip.

These 4 recipes assume the first four recipes have been completed. As noted in the last post, the paper clip ends being the hero. (Not the

<<Recipe Six >> Complex Expressions and the Rules (3) of Paper Clips (also, see Recipe 9, non-Existent version, hint 2)

<<1>> We start with two stacks of papers clipped together with paper clips as follows.

<<2>>The paper with one mark <> is clipped to the paper with two mark
<><>

<<3>> The paper with no marks is clipped to the paper with marks
arranged thusly <>>

<<4>> With no particular order in mind, we write more complex
expressions on new pieces of paper, either making them up or selecting
them from LoF.

<<5>> For example, we can write the expression <<>> <> on a
previously blank expression. For the moment we will call this paper
'E'.

<<6>> We can now observe that as a result of our explorations in Recipe
5, the expression <<>> paper clipped in the same stack of papers as
the blank paper.

<<7>> We choose at this point to create a rule, the Rule of Paper Clips.

<<8>> The rule of paper clips guides us in drawing up a new piece of
paper which may be paper clipped to the paper E we are now observing.

<<9>>The procedure for applying the rule of paper clips is as follows:

a. Observe any marks or groups of marks that occur on paper E. (For
example, E has the group of marks , <<>>.

b. Look through the stacks of papers that are already clipped.
(Currently there are 2).

c. A 'hit' is considered to be an occurrence of any the groupings of
marks on from the paper E -- that takes up the entirety of one of the
papers in our stacks.

d. In this case, we find the grouping <<>> occurs as the sole
pattern of marks on a page that is paper clipped to the blank paper.

e. Finding a paper with <<>> <<>> would not have been a hit of

remember an instance of its application.

<<2>> We can choose any names we like in remembering such applications.

<<3>> For example, since both << >> <> and <> are now both in the same stack, we can in the future apply the rule in another context apply the rule to replace <<>> <> with <>. If we found this application occurring frequently, we might give its use a name. 'Fred' is once such name that comes to mind. Likewise, we might refer to the replacement of <> with <<>> <> as an instance of 'Barney'.

<<4>>LoF refers to an instance of applying the paper-clip-defined-relation <><> goes to <> as 'condensation' and an instance of the paper-clip-defined-relation <> goes to <><> as 'confirmation'. Both cases are also known by the term 'Initial 1. Number' otherwise known as I1.

<<5>> LoF refers to an instance of applying the paper-clip-defined-relation <<>> goes to the unmarked paper as 'cancelation' and to the paper-clip-defined-relation the unmarked paper goes to <<>> as 'compensation'. Both cases are also know by the term ' Initial 2. Order' or I2.

<<<<<<<< Recipe Eight >>>>>>>>> Representing a stack on a Single piece of paper

<<1>> After sufficient investigation, stacks of paper tend to become cumbersome. As long as care is taken to avoid misrepresenting the allocation of expressions in stacks, it is the content of any stack may be represented on a single sheet of paper.

<<2>> Once such way of representing the content of each single paper within a stack within a box, and by linking each box so represented as part of the stack with a sign of linkage, which will be called the sign of the paper clip.

<<3>> So for example, the two paper stack containing << >> and the unmarked page can be represented by a box containing the expression << >>, a linkage, and a by a box that is empty. For the purposes of writing about this recipe, this will be written as

[<< >>] - - []. , but on paper boxes would be drawn to fully enclose the each expression.

<< 4 >> As a matter of convention, the practice will be adopted that only those paper clips that are named will be permitted to be represented on paper.

<< 5 >> Therefore, the above expression would properly be written as [<< >>] - Number - [].

<< 6 >> Relating the the example in Recipes Six and Seven, either [<< >> <>] - I2 - [<>] or [<<>><>] - Fred - [< >] suffices.

<< 7 >> In LoF, the only names that are given at this point are those associated with Initial 1 and Initial 2. Sadly, use of 'Fred' would in reality be frowned on in some quarters.

<<8>> On the positive side, this does mean that for anyone willing to buck the establishment, there is plenty of room for anyone wishing to promote the usage of Fred, Barney, or other countless names that might be created for these paper-clip-defined-relations.

<Recipe 9 (Non-Existent Version)>

is not found here,

but can be defined recursively ...

```
recipe9 = write(recipe9);
```

```
// Hint1: Express Theorem 1 in terms of stacks . . .
```

```
// Hint2: Maybe a prior recipe entitled 'Wastebasket' is needed --  
defining illegal 'expressions' and where to put papers containing them.
```

```
// Alternative Direction for Recipe 9 (perhaps an easier one): drop  
silly boxes, introduce something normal looking such as left to right  
writing on lined paper & replace link marks with names at end of line .  
..
```

OK, I felt compelled to write up one more recipe (presumably the last).

It's worth noting that there are an infinite number of potential other recipes that could be written, so if these aren't helpful, find some others. It's also worth noting that I wrote recipes 1-8

yesterday while sitting at a pleasant and popular little cafe, the White Rabbit, in the Village where I live (Red Hook, NY). Above the seat where I was sitting there was a painting painted directly on the wall of a fat green caterpillar sitting on a mushroom and smoking from a hookah . . .

After recipe 9, the direction would start proving the various theorems. The first theorem would then be stated that every expression ends up in one of the two stacks that have already been created . . .

<<<<<<< **Recipe 9** >>>>>>>> **Firing the First Canon**

<<1>> The distinction police have contacted me and they are upset that I have been so cavalier about disregarding all of LoF's rules and cannons, particularly the first one. So I agreed to bring up that unpleasant subject.

<<2>> My take on this is that in distinction land there is one High Crime, and lots of Misdemeanors you can commit.

<<3>> The One High Crime you can commit is accidentally or intentionally placing one of your papers in the wrong pile.

<<4>> For example, putting a paper with the two grouped marks < < > > in with the pile containing < > would be a high crime.

<<5>> Likewise, putting a blank paper in with a paper with a single mark < > is also a high crime, in this case a particularly brazen one.

<< 6 >> The consequence for creating a High Crime is that the distinction police shoot off lots of canons and make lots of noise, and possible seize all of your stacks. At the very least, you may be forced to undergo an lengthy audit to clean up your stacks. But you may loose all of your stacks permanently, and be forced to erase your blackboard.

<<7>> Misdemeanors are much more numerous and various. The main category is adding improper pieces of paper to any of your stacks.

<<8>> Essentially, groupings of marks have to be written on these papers in a well formed way, basically for example, as < >, < < > >, < > < < > >, etc. See LoF for more examples. These marks can be close together, by the way, but they aren't supposed to touch.

<<9>> Papers with marks that touch are not well formed.

<< 10 >> The list of misdemeanors in this category, however, is much more lengthy. Some examples are papers containing any of the following:

- a. Random scribbling.
- b. Photographs of any kind, for example pornography or pictures of the president of the United States.
- c. Artwork, such as drawings of cats, rabbits, or caterpillars (not to mention penguins).
- d. Text messages, such "Hey dude, pass that hookah will you", or the text of the Gettysburg Address.

(Later something of an exception will be created in certain contexts for the use of letters and possibly even short words. But for the moment, consider these completely forbidden.)

<< 11 >> The Consequence for committing such a misdemeanor is that the offending paper has to be removed and placed in the trash, or at least removed far enough from the area that you will not be tempted to mix it with any of your stacks.