The Brain and Perception

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Neurological Structures of the Brain

Fig. 1
The Brain

Different human functions (speech, vision, smell, symbolic capacity) are located in different parts of the brain. Research of Sperry on the difference between right and left brain has helped us to understand how the brain works and has revolutionized our approach to the learning process.

The Brain and Perception

I. Brain lateralization and language learning:

- Functions of the Right side of the brain:
- Functions of the Left side of the brain:
- Lateralization process: one becomes dominant about 12 years old. In West it is the Left side.

II. Parallel ways of knowing: Left brain vs. Right brain

Fig. 2
Left/Right

LEFT MODE	RIGHT MODE
Verbal	Non-verbal
Analytic	Synthetic
Symbolic	Concrete
Abstract	Analogic
Temporal	Non-temporal
Rational	Non-rational
Digital	Spatial
Logical	Intuitive
Linear	Holistic

- Yin vs. Yang
- Moon vs. Sun
- Male vs. Female
- Both learn well but differently.
- One dominates the other.
- Society conditions which one dominates.
- After lateralization the brain has no patience for the workings of the other side. It's "wasting" time!

III. Understanding Perception:

- Drawing is not a matter of learning to draw but learning to see (perceive).
- Learning how to draw is a matter of learning how to perceive what is really there.
- Learning another language is a matter of learning to "hear" (perceive) what's really there.
- Learning another culture is a matter of learning how to perceive in new ways.
- Westerners are used to Left-brained ways of learning and acting.
- Africans are used to Right-brained ways of learning and acting.

Learning to See What is There

Ten basic steps toward better perception:

- Learning to recognize and, to some extent, control brain shifts.
- Learning to prevent closure.
- Learning to be flexible; to stay open.
- Learning how and when to get the left out.
- Learning to recognize the strength of our concepts.
- Learning how to lessen their grip.
- Learning to recognize and apply the constancy principle.
- Learning not to perceive what is not there
- Learning how to learn from your mistakes. "Trial and error."
- Learning to see with the eyes of an artist.

I. Learning to recognize and control mode shifts:

Fig. 3
Face/Vase

Recognizing the shift by its "feel":

1. Look at face/vase What do you see? Face or vase? Does it shift back and forth? Is this involuntary?
2. Try NOT to see the face; NOT to see the vase. Impossible? Yes! Why?

It is involuntary because normally we must make a conscious decision to see negative space. The ambiguity gives the "conscious experience" of a shift which brings about an alternative perceptual experience. Experiencing this shift brings to awareness the actual shifts in the brain from Left to Right mode.

Fig. 4
The Duck/Rabbit (Jastrow 1900)

Fig. 5
Necker Cubes (Necker)

3. Try to see one of the cubes.
4. Try to see the other; Try to see both at once.

5. Try NOT to see one; NOT to see the other. Impossible?
6. Watch as one involuntarily changes to the other.

Fig. 5
The Husband/Lover
The Old lady/Young lady

II. Learning to prevent closure:

1. Try to see one; then the other.
2. Try to see both at once.
3. Can you decide to shift from one to the other? Practice. Once the mind is "closed" (has decided what is there), it is very difficult to see something else.

Fig. 4
Jesus & The Calf
Dark figures

The mind yearns for "closure", termination, labeling, symbolizing substance. What is really "out there" is NOT what our culture lets us see. What we see is limited by our perceptual categories. See Carolyn M. Bloomer (1976) "Principles of Perceptual Vision." She says "You can see only in relation to categories already established in your mind." This is to simplify the number of perceptions though "perceptual prejudices" and make life manageable.

The ability of the left brain to symbolize makes life easier but tyrannizes because the symbolic image it substitutes for the vast reality actually there. So it also acts to prevent perception of what is really there.

4. Look at the Jesus/Calf.
5. Experience the shift from one to the other.

III. Learning to be flexible, stay open:

The "Saturation Stage" requires a prolonged state of mental openness. Learners must learn to keep it open when the brain longs for closure.

1. By relaxing the Left Mode.
2. By tricking it: By giving it a task it finds impossible: picking up papers, just sitting there, "wasting time," boring repetitive acts, looking at a small part of the whole.
3. By challenging it: Challenge the conceptual mode by canceling its logic, e.g. turn it upside down, disrupt the logical connection.
4. By proving it is wrong: use sightings and other "glitches".
5. By looking for anomalies. Exceptions to the rule. Things that are not explainable by the internal logic.

Eventually the Saturation Stag will give way to a new and broader integration that satisfies the anomalies and challenges. This involves a process of "trial and error." Learners proceed from what does not work to what works (Edison made 1,800 attempts before getting the light bulb right.)

IV. Getting the Left out in stages:

1. Start with recognizing you are in Left-mode: Look at its characteristics.
2. Slowly start the move to the Right-mode.
3. Let perception deal with conceptualization.
4. Look more closely.
5. Grapple with the logic.
6. Relax. Let the retinal image win.
7. Once it is out, keep it out.

V. Recognizing the strength of our concepts:

Fig. 5
Flags

In *Drawing from the Right side of the Brain*, Betty Edwards says that drawing helps us to set aside the brain's programs and relax its control over our perception. Let's see what its programmes are.

1. First flag is a straight, purely symbolic model. A programmed response. "It's a flag!"
2. Second flag: look at it for a longer time. See some of the distortion, the reality of it. Deal with the paradox "it is a flag but not a flag." Allow the right mode to take over. Second flag drawing is closer to retinal image.
3. Third flag: as close as possible to actual retinal image. What is really there? Look at all the little wrinkles, subtle shades, unexpected colors, shapes, distortions, hidden parts, disorganization. Give it internal order. Reduce your perception level to "infinite disorderliness" or organized chaos.
4. Learning to write, draw, create is actually learning to perceive order in reality rather than conferring our own culture-controlled conceptual order on the things perceived.

VI. Learning how to weaken the grip of our concepts:

Fig. 6
The Cup

1. Draw a cup: Look at the bottom. Draw a round bottom. Feel the tug of logic; enter the paradox and deal with it: "if the bottom is round it will roll away."
2. Learn to trust your senses: Throw in a "glitch" to challenge what is there, e.g. a thumb, or an extraneous bit of information that disrupts a

smoothly integrated pre-programmed or familiar train of thought.
3. Test the glitches with perceptual puzzles.

VII. Dealing with the "principle of constancy"

The logic of constancy involves sounds (voice in the distance) sizes, shapes and proportions.

1. Constancy of sound: use "reality glitches": e.g. a sound chamber, recorder etc.
2. Constancy of shapes and proportions: use a hollow tube to view something near and far away. Why VWs have accidents at night (constancy of proportion). In movies: Godzilla, King Kong, Avalanche, Titanic, Ten Commandments.

3. Ask the following questions:
"What is it?" (thing, event, relationship)
"Where is it?"
"What is the constancy factor here?"
e.g. VWs = "All headlights are the same"
e.g. "All people hug when they meet."
"Where is the anomaly?"

Fig. 7
Cypresses

Fig. 8
Men in a subway

4. Look at the figures: Grapple with the logic. Things are not as they seem. If you need a glitch use one. Experience the struggle for dominance.
5. Let the retinal image win.
6. Learn to ignore what the left brain tells you sometimes.
7. Test the constancy principle.

VIII. Learning not to perceive what is not there:

Fig. 9
Long Head

1. Look at this picture of a man's head. See anything wrong? What are the correct body proportions (see diagram, constancy principle)?
2. Look at the picture again. See anything now?
3. Know things as they really are.
4. Gain technical knowledge of the facts. Build up a reservoir of this knowledge. Use the technical devices at one's disposal: art, the sciences, anthropology.

IX. Learning from your mistakes, trial and error:

1. Be systematic; keep records, a diary, fieldnotes.
2. Examine them regularly, ask for help.
3. Learn how to elicit help from the community.
4. Form relationships; make friends; get helpers.
5. Don't be afraid to make mistakes. You make them anyway. They are your door to knowledge.
6. Learn how to listen to advice of friends & community.
7. Learn how to read the signals of others.
8. Be a credible learner. When given advice show that you are taking their advice and learning.

X. Learning to see as an artist:

1. Learn to perceive what is really there.
2. Relax the Left-mode and let the retinal image win.
3. Test the constancy principle. Are they actual sounds, shapes, relations?
4. Start with boring and repetitive acts.
5. Seek out solitude. Creativity occurs only in solitude.
6. Don't be afraid to make errors.
7. Avoid premature closure.
8. Search for anomalies.
9. Make instant summaries, thumbnail sketches.
10. Make gesture drawings, superfast summaries.
11. Hold the pen, notebook etc. poised in hand.
12. Brainstorm.

Seeing through the Eyes of Others

The TICCS course stresses that the proper context for language- and culture-learning is in "bonded," trusting and loving relationships. This is key for experiential learning. One can learn from experience and from making mistakes only with the help of insiders. Through their eyes learners can begin to see new worlds opening up before them. Here there are no textbooks or course syllabi. The learning process rests upon the ability to enter deeply into relationships across cultural lines. This is a prerequisite for successful language- and culture-learning.

Nurturing relationships for language- and culture-learning demands much patience, the ability to be childlike, a talent for learning from one's mistakes, flexibility in one's own behaviour and a high level of tolerance for the culture-bound behaviour of others. But flexibility in the face of our many, inevitable mistakes and the willingness to see through the eyes of others and to learn from them is the most valuable skill of cross-cultural learners.

The Brain, Perception and Ministry

Areas in the brain for perceptual functions:

Neural biologists now tell us that neural information from visual stimulus is processed in four areas of the brain controlling the following four perceptual functions: motion, color, shape, depth. If damage is done to one of these crucial parts, there is no perception in that category, e.g. the case of a woman in Germany with tumor in the "motion" section who does not perceive motion (see Michael Long's article in *National Geographic* 1992).

Growing new synapses:
Another intriguing fact provided by the biologists is that the synapses between nerve sells are constantly being refined and more connections are constantly being made. The more connections, the more enhanced our perception. In other words, culture and the contexts for new perceptions stimulate and actually expand the biological bases for perception.

Language centres in the brain:
PET scanners have been used to demonstrate a neurological base to language and culture (see Harlan Patfield, "Culture and the Two Interfaces of the Brain" AAA, 1992). Different languages actually have different centres in the brain. In these centres are located the grammar and internal logic of the particular language. Switching from one to another involves a shift from one cognitive centre to another in the brain.

Initially second-language learners use their first language categories to learn the second. However, once the second language begins to be used successfully to convey meanings there is no further attempt to interface the two centres. Communication proceeds directly from within the other centre. A person shifting from one language/culture to another simply makes mental leaps to the other part of the brain--from one centre to the other. These centres do not get mixed up. They seem to be complete units in themselves and the elements and structures of each language/culture are so different that "there is nothing of substance that can be interfaced" (see Kirwen's article "Conversion").

"Nature vs Nurture" and the Church:
The upshot of this information applied to cross-cultural ministry is that the process of inculturation actually has a biological basis. It seems that the "Nature/Nurture" pendulum is swinging back in the direction of nature again. Now anthropologists, sociobiologists, neuroscientists, ethologists, and eco-system analysts have been quite busy demolishing some of anthropology's most cherished assumptions concerning the importance of culture over genes in the evolutionary process. It is now clear that, in addition to whatever other realities are involved in learning a different cultural system, there is a biological foundation for it in the way the brain works.

Another trend in the biological revolution involves bio-social eco-systems understood as positive feedback loops. Robin Fox maintains that the quest of anthropology today should be "the basic processes in the 'ethosystem': the total feedback system involving general species propensities and ecological subsystems" (1987:28).

The object of gospel transforming culture would involve an entire system or systems of systems. Keeping in mind that the reality is the process itself, not any causal relation between the components, the Church could be characterized as a process promoting a positive feedback system involving genetic, social, behavioral, and ecological components.

A Biological basis in the brain for ethnocentrism:
Our new brain information can also tell us more about ethnocentrism--that cultural self-preservation instinct. It, too, has a biological base. Robin Fox points out that the brain vets new information for a period of three years by passing it repeatedly through the limbic system which is the center for emotional facilitation and control. Thus, he says, "the categories of social classification are established on a strong emotional basis. And this basis is *physical*--actual changes in the size and functions of the synapses occur, triggered by the cell DNA after a critical point of 'rehearsal' has been passed" (1987:36). It's no wonder we react with extreme anxiety when our established categories are challenged!

The Brain remembers what we do:
Although we may be conservative by nature, it has been shown that learned items are retained better the more physical the learning process. We tend to forget 98% of what we read, 80% of what we hear, 70% of what we see, 50% of what we see and hear, 30% of what we say, but only 10% of what we do and say (Danielle). A learning process that is physical and experiential, would seem to be the appropriate counter-measure to the biological rootedness of ethnocentrism.

Implications for cross-cultural ministry:
African Religion is embedded in African culture. Michael Kirwen has pointed out that the "grammar" of African Religion (along with language) is also located in a different part of the brain from that of Western Christian beliefs (which are located in the part reserved for what Whorf calls "general European"). Following the principles of inculturation, African Christianity belongs not to the Western neurological centre but to the African Religious one. However, the process of conversion in most main-line Christian churches up to the present still requires a convert to develop a new, "Christian," cognitive centre that reflects the Western religious values and attitudes of the messenger.

African Christianity having an African centre:
Kirwen says, "to attempt to convert Africans by interfacing Christian beliefs and morality with beliefs and morality of African religion is impossible." He goes further to say that "If one wants to understand Africans on the level of their spirituality, then one must put aside Western Christian beliefs and traditions and learn, to the point of appropriation, the 'grammar' of African religion through systematic, formal study." Programmes of study and research can change us. "African cultures and religions can be taught systematically like African languages."