Left or right brain

Is there a neurological relationship to traditional aboriginal learning styles?

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1. Introduction

One day I was discussing with one of my Aboriginal friends the differences between “western” and “Aboriginal” world views—we were planning to write a paper together. When I explained some of the ways we Westerners think, she exclaimed in amazement, “Do you really think like that?” It was good to understand each other better because what we know, how we know it, and why we believe it are very different in the two cultures.

The purpose of this paper is to look at these differences from one perspective—that of the organization of the human brain and the very different ways of thinking used by each hemisphere in it.

2. The left-right brain model

In the past 20 years, the description of the brain’s activity in terms of right hemisphere and left hemisphere has become well known. From medical records of people suffering brain damage, it was observed that loss of speech capability occurred more frequently when damage was to the left hemisphere than it did when the damage was to the right hemisphere.

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Extensive research has since been done, especially on patients who have had the corpus callosum, the linking nerve connection between the two hemispheres, severed in cases of intractable epilepsy. Experiments with these “split brain” patients have shown that the left hemisphere perceives in a different way from the right one, and each hemisphere processes data in its own way. When the corpus callosum is intact, information is passed across this link and “unified”; thus, a person is not normally aware that different parts of his brain may be functioning differently.

There is disagreement among researchers as to how distinct the two hemispheres are in their functions, and much is still not known about individual variation in brain organization. It is important to remember that no brain activity is completely centered in one hemisphere. But that one hemisphere has primary control “and that whatever contribution the opposite hemisphere may make is secondary, or minor, or perhaps that it is crude, weak, or even inhibited or suppressed by the role played by the primary hemisphere in the action or function in question” (Thompson 1984:101).

I became interested in the relationship between the left and right brain while attending language learning seminars given by Tom and Betty Brewster in 1985. One of their insights was that successful language learning is a right-brain activity because it is a social rather than an academic and analytical activity. (See Brewster and Brewster 1981.) It is the experience of many people that they have learned a lot about another language without being able to speak it; this is left-mode learning. There are others who speak a language accurately without being able to explain anything about the grammar; these are right-mode learners. In language learning, one or the other of these modes of learning is usually to the fore. Many “Westerners” or “whites” learn languages mostly by the left mode and, as a result, do not usually become really fluent. On the other hand, many of my Aboriginal friends speak a number of languages well—and have never analyzed a single word. The Brewsters also pointed out that most of us in Western cultures are dominated by the learning style of the left brain and, therefore, find any right-brain activities difficult, particularly in adulthood. My observation of Aboriginal people I know shows that many of them are dominated by right-mode thinking and as a result find left-mode activities more difficult.

During the seminars, the Brewsters quoted and used examples from a book by Betty Edwards, Drawing on the right side of the brain. Edwards cites evidence from neurological work with “split-brain” patients and states. “We now know that despite our normal feelings that we are one person—a single being—our brains are double, each half with its own way of knowing, its own way of perceiving external reality. In a manner of speaking, each of us has two minds, two consciences, mediated and integrated by the connecting cable of nerve fibres between the hemispheres” (Edwards 1979:31).

Edwards also gives some interesting descriptions about the way the two halves of the brain function (1979:32):

Sometimes they cooperate, each half taking on the particular part of the task that is suited to its mode of information processing. At other times the hemispheres can work singly, with one half ‘on’ and the other half more or less ‘off’. It seems also that the hemispheres may also conflict, one half attempting to do what the other half ‘knows’ it can do better. Furthermore, it may be that each hemisphere has a way of keeping knowledge from the other hemisphere. It may be, as the saying goes, that the right hand truly does not know what the left hand is doing.

Edwards relates these descriptions of the brain hemispheres to the process of learning how to draw. She explains that it is the right hemisphere that needs to process the information for a person to be able to perceive an object in a manner that allows its accurate reproduction. The left hemisphere’s mode of knowing what to draw seems to interfere with the visual perception needed to draw well. The left mode imposes symbolic and verbal input with disastrous results. That is, it “knows” the symbol for drawing a particular object and is impatient with the right mode’s slow, deliberate observation. It tries to speed up the drawing process by imposing the more symbolic form.

I followed Edwards’s instructions for making the shift from the left mode to the right mode in drawing. These instructions include drawing reverse images, copying line drawings upside down, and drawing behind your back while carefully observing an object such as your own hand. As I did these exercises, I was amazed at the depth of perspective and the detail I could see as I made the shift. I also experienced a sense of timelessness as I became engrossed in my drawing. To give an idea of the results that can be obtained, which Edwards links to the shift from left to right brain activity, I have included my own initial drawing of my hand, then the hand drawn a few days later, after following the instructions. Although the latter hand drawing is in a more complex position, there is an obvious difference in the quality of the two drawings.

3. The left-right brain model and Aboriginal learning styles

My above-related experience in drawing, added to my previous experiences in language learning, increased my interest in the theory of left-brain and right-brain differences. Edwards’s book includes a table comparing the characteristics of left- and right-brain activities. As I read these comparisons, I found they related to another area of my experience, that of living and working with Aboriginal people, primarily the Wik-Mungkan people of Aurukun, North Queensland. Edwards’s table of comparisons is reproduced below. I will look at the comparisons (two of which I have modified) in terms of the
differences in Aboriginal and Western ways of knowing and ways of learning, illustrating with examples from my own or others’ experiences and citing linguistic and other findings regarding Aboriginal learning styles.

L - Mode

Verbal: Using words to name, describe, define.
Symbolic: Using a symbol to stand for something. For example, the drawn form ☺ stands for eye, the sign + stands for the process of addition.
Abstract: Taking out a small bit of information and using it to represent the whole thing.
Temporal: Keeping track of time, sequencing one thing after another; doing first things first, second things second, etc.
Rational: Drawing conclusions based on reason and facts.

Digital: Using numbers as in counting.
Logical: Drawing conclusions based on logic: one thing following another in logical order — for example, a mathematical theorem or a well-stated argument.
Linear: Thinking in terms of linked ideas, one thought directly following another, often leading to a convergent conclusion.

R - Mode

Nonverbal: Awareness of things but minimal connection with words.
Synthetic: Putting things together to form wholes.
Concrete: Relating to things as they are, at the present moment.

Analogic: Seeing likenesses between things; understanding metaphorical relationships.
Nontemporal: Without a sense of time.

Nonrational: Not requiring a basis of reason or facts, willingness to suspend judgment.
Spatial: Seeing where things are in relation to other things, and how parts go together to form a whole.
Intuitive: Making leaps of insight, often based on incomplete patterns, hunches, feelings, or visual images.
Holistic: Seeing whole things all at once, perceiving the overall patterns and structures, often leading to divergent conclusions.

A comparison of left-mode and right-mode characteristics

3.1. Verbal versus nonverbal

While trying to help a small Wik-Mungkan child put on a pair of sandals, I was continually verbalizing instructions to her. Her grandmother protested, insisting that she was “just a child”
and that it was useless telling her what to do. She was *kon-thaa'-way yippak* ‘ear-mouth-bad still’ which means ‘unable to learn’. Young people may be referred to this way even up to the age of puberty when they are expected to take learning seriously as in initiation.

Aboriginal learning style has been well documented by Harris (1980) and Christie (1984). Aboriginal children learn by observation and trial-and-error copying. The child learns if and when he wants to, without coercion. This learning style, in which the child is aware, often keenly so, of all that is going on, is not accompanied by verbalization by the adult being observed, and frequently the learner asks no questions. Graham (1980) and Harris (1984) both make repeated statements of the need to teach Aboriginal children to verbalize, if they are to succeed in Western education. My experience with Wik-Mungkan adults has shown that much the same style is still used.

A woman I was helping to make a dress brought it back to me for fitting. It needed some alterations, which I helped her prepare to make—but instead of taking it home and doing the alterations, she threw the dress in the bin on the way out.

The teenage boys did the same thing with woodwork at the Trade School as soon as they made a mistake. The teacher and I were equally surprised by these actions, but at that time we were not aware of the traditional way of learning. We did not know that a person would make an item up to when he marred it and then begin again on a new one—until he could perfect it in one go. There was no place for practicing or patching-up on the way. It was a long time before I understood the woman’s actions. She had marred the dress and needed to start again.

I heard recently of an Aboriginal man who had carefully observed the pilot of a small plane. One day, to the pilot’s surprise, the man took the plane and flew it himself. On a less dramatic scale, learning to drive a vehicle or learning to run an outboard motor, or even use the duplicator, are all done the same way.

The problem with learning this way is that all the contingencies may not have been observed—such as how to change from one fuel tank to the other when flying a plane. Oral instruction can handle this sort of information. For example, “If the left fuel tank gets low, switch it over to the right one like this.”

### 3.2. Analytic versus synthetic

An Aboriginal man in the Western Desert was ill and had wandered away from the camp and had become lost. He was of the Kangaroo totem. Others in the community were told not to shoot kangaroos as “it could be our brother.”

The Aboriginal system of totems is a synthetic view of the world. The traditional Aboriginal sees unity or synthesis in the totem, of which he is just one of the representations. Other representations are the animal, the sacred site, the songs, and body painting associated with the ceremony. The Aboriginal does not question how this can be true; he accepts what he has been taught such as that there is a “synthesis” or “unity” of things—even animate and inanimate. He performs the ceremonies the traditional way because “that’s the way we do it.” He does not analyze what he has been told, nor does he attempt to rationalize his beliefs. Many times when I was told “that’s the way we do it,” I thought people were not telling me (1990). *Notes on Literacy, 62.*
the “real” reason. It took me a long time to realize that such a statement was a real reason. “The way things are” does not need analysis, proof, or comment.

In some Aboriginal myths, the language shows that the man and the animals are seen as the same. For example, complex subjects are used such as “the man, the flying fox, he …” The storyline is lost for the Westerner when this type of construction occurs, as in Wik-Mungkan. Graber (1987:210–211) has an example of the same phenomenon in Kriol, a recent contact language.

3.3. Symbolic versus concrete

Aboriginal art is considered by Westerners to be symbolic. However, the Aboriginal artist describes his work in such statements as: “The circles are ______.” “The dots are ______.” While these metaphorical statements can reflect symbolic relationships, in the Aboriginal mind there is also a sense in which these symbols are understood not just as representations but as the actual things themselves. Therefore, his art is concrete as it relates to “things as they are.” Though this “concrete” view is not understood by most Westerners, yet it is akin to the viewpoint of those in churches where the bread and wine of communion or mass are believed to become the actual body and blood of Christ. For other Christians, the bread and wine are only symbols of the body and blood. (See Bain 1979:259–287 for a detailed discussion of “unity” in Aboriginal thought.)

3.4. Abstract versus concrete

I called out to a child taking my bike, “Don’t take my bike. Taking bikes is wrong.” Instantly, an Aboriginal woman called to the child, “Don’t take Barbara’s bike; she gets mad.”

The young Aboriginal twins would not go with their mother. Her verbal attempts to persuade them failed. Then their uncle covered himself with a sail and approached the twins. They ran to their mother screaming “ghost, ghost!” His concrete and frightening approach had worked very well.

Both of these examples illustrate concrete approaches to problems. My response to the “borrowing” of my bike was a typical Western one, using abstract moral principles. I had taken one incident and related it to “taking” bikes in general. The Aboriginal woman perceived the same situation in terms of that particular incident alone. She assumed taking my bike would make me angry, so warned the child appropriately. Abstract thinking allows for generalizations like my one about “taking bikes.” Concrete thinking is tied to the actual incident which makes it difficult to generalize. In the second example, the “realness” of the “ghost” was more effective than verbal arguments or threats.

3.5. Temporal versus nontemporal

A staff member was concerned that the church bell had not been rung for the service one damp overcast morning. When she could not find anyone to ring it, she did it herself. After waiting impatiently for the people to come, she went ahead and started the service. The people were upset, and wondered why she started without them. Of course everyone would sleep late on such a dark morning and the service would just start later. They would have rung the bell when they were ready; that was no problem.

When I am working alone, I, as a Westerner, keep time and live by the clock. When I am working with Aboriginal people I try to be more flexible. Because Aboriginal people place little value on time, many Westerners with whom they interact become frustrated. In Aboriginal culture, actually doing the thing, such as the church service, is far more important than doing it at a particular time. Aboriginal people often do not know how to interpret a white person’s rush to do things and may link it with “being greedy” or seeking monetary reward.

### 3.6. Reasoning from possibility versus reasoning from fact

An Aboriginal man was taking a vehicle over the river for cattle work. The white mechanic said to him, “If the oil is low, pour some more in.” The Aboriginal man took this as a statement of fact: “The oil is low. Pour more in.” He did what he thought he was told to do daily for a few days, seemingly without question, until the oil was used up and then came back to the very surprised mechanic for more oil. This Aboriginal man learned to understand this kind of instruction later on.

The problem here is twofold. One problem is that of a very different world view, particularly about the things that could happen in the future. The other problem is a linguistic one.

Aboriginal people talk about what they are going to do in terms of facts—and they need to know that it is a fact. They also reason from things they believe are facts—but which others might not—such as myths. They also talk about things that have happened or might happen from revelations such as dreams. And dreams are a major source for reasoning. Four months of living with two Wik-Mungkan women at a workshop in Papua New Guinea, in 1970, taught me the importance of dreams.

Westerners seldom take dreams seriously and so discount a valid source of Aboriginal knowledge. As well as this, Westerners do something that many Wik-Mungkan people find hard to understand. They reason from mere ideas. This is why the mechanic and the Aboriginal man had such a problem talking about putting oil in the engine.

Firstly, the mechanic gave an instruction assuming something needed to be checked before any action was taken—but he did not say it. He had two ideas in his head. 1) Maybe the oil would be okay. 2) Maybe the oil would be low. But he did not know which the Aboriginal man would find when he looked. The second problem was that he gave only one of the two alternatives. What the Aboriginal man needed to do was to look so that he could decide which alternative to act on. What he did should have been based on what he found out when checking out the two ideas or possibilities.

However, the man did the only thing he knew to do. He took the one thing that was said and assumed it was a fact and then he did what he understood was a direct instruction. He misinterpreted what was said as “The oil is low—pour some in.”

Once Aboriginal people understand how we Westerners reason—and many do—they often borrow the English word *if* and use it to introduce a future conditional: “If ______ then ______.” The Wik-Mungkan language does have a form that can be used for future conditionals, but past conditionals are more often used because they are based on known facts. The following are two examples taken from Wik-Mungkan texts:

Had he come, I’d have gone.

Had they been husband and wife, I’d have killed the man and kept the woman as my wife.

Both of these conditional sentences imply facts known to the speaker. The first implies *he did not come*—that is why I did not go. In the second, the implication is that *the two were not husband and wife*—so he could not kill the husband.

The difference between reasoning from facts with implications and reasoning from ideas where nothing is implied is a major one. The misunderstanding of the second type of conditional has caused many communication breakdowns between Aboriginal and white people.

I have tried various ways of presenting the nothing-implied conditional statements in Wik-Mungkan, including such a full statement as, “Maybe he will come, maybe he won’t come. (If) he comes, I will go. (If) he doesn’t come, I won’t go.” This statement can be understood as a conditional by the more sophisticated and educated, but it still causes problems for others.

### 3.7. Digital versus spatial

When an Aboriginal stockman asked me to buy him a pair of boots in Cairns, I asked for his size. He did not know what shoe sizes were so could not tell me. Another Aboriginal could have bought the man the right sized boots without any problem, but I could not.

The same Aboriginal stockman was reporting some missing cattle. When asked how many, he responded, “Maybe 20, maybe 200.” This man did not think in terms of numbers but was able to tell which cattle were missing and give further details a white stockman could not—which was very helpful in the situation.

Aboriginal people shop with great success by using spatial perception, rather than memorizing number sizes. I was given a dress by an Aboriginal friend who had looked at the dress and related it to her knowledge of what I looked like. She did not know or care about my “size,” but the dress fit perfectly.


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As the example about cattle illustrates, in traditional Aboriginal culture, items were seen individually, as unique entities, and, therefore, generalizations were not easily made. The introduction of mass-produced items has enabled some Aboriginal people to generalize about, for example, boxes of matches or packets of tea. Once this is done, numbers can be abstracted and the concept of numbering understood (see Sayers 1982 and 1983).

Pam Harris (1980) and Mary Laughren (1978) have documented the Aboriginal child’s superiority in handling directional and spatial material at an early age. These skills can be used in an Aboriginal community to show how clever a child is in much the same way as a European child’s skill in counting is used. Graham (1984) also carefully documents the Aboriginal child’s skills in meaningful classification and extensive understanding of spatial relationships.

**3.8. Logical versus intuitive**

The hospital window was broken and I wondered who had done it. A passerby looked at the window and not only told me which child had broken it, but also that he had been running when he threw the rock. It was interesting to me that the women always examined a new baby’s feet and were very quick to point out likenesses to family members. On one occasion they used this method to establish a child’s paternity.

I stopped to look at a snake track across the road. “Where did the snake go?,” I asked. “That way,” was the response. “How do you know?” The answer was, “See, see.”

The Aboriginal’s perceptual skills are well recognized, particularly in tracking when it appears he gets his clues from incomplete patterns. He does not explain how he knows by logical deduction but simply by telling the observer to “look.” I can “look” but I do not recognize what I am supposed to see.

There are examples from linguistics which show the minimal use of logical connection in Aboriginal languages (Hudson 1970; Marsh 1970; Sayers 1976, 1986). Argumentation is often by a statement of fact followed by observations about it or comments upon it. No overt conclusion is given. The observations about the statement are frequently given in the form of binary statements or the opposition of one idea with another, such as the following positive/negative ones: “It’s not big; it’s very small,” or “It’s not only for one; they share it with everybody.” Logical conjunctions are not just absent, there is no place in such constructions for them. Logical conjunctions may string together a whole series of points rather than just opposing two.

**3.9. Linear versus holistic**

A man looked at a tree, said it had water in it, chopped into it and the water ran out. His explanation as to how he knew water was there was “Look and see.” A young man tried the same
procedure on another tree without success. The older man simply explained again by “look and see,” which in Western terms would mean “learn by observation.”

I would have had the same problem as the Aboriginal young man in this example, cited in Huttar (1977:24). I do not know how the older man knew there was water in one tree but not in another. I would have needed logical explanation with specific signs to observe which would lead me step by step to the conclusion—a kind of cause and effect chain. But the experienced Aboriginal man saw the situation in a holistic way, recognizing the overall picture and coming to the right conclusion. Many of us non-Aborigines have been amazed by such perceptual skills. However, in driving a car, and in many other areas of daily life we all operate on the basis of perception. For example, I do not need to understand anything about physics to know when to turn the wheel, take my foot off the accelerator, or apply the brakes when turning into a narrow drive. And I can quickly adjust from one sized car to another. A logical or linear-thinking approach to learning many such skills would be counterproductive and “illogical.”

Many more examples, both personal and from the literature, could be given of the differences in Aboriginal and Western learning styles. My point is to relate Aboriginal styles of thinking and learning to the hemispheric view of the brain. It seems clear to me that Aboriginal people use predominantly right-mode thinking. This in no way implies any lack of intelligence. Both hemispheres of the brain are capable of marvelous things, but “the right hemisphere is not under very good verbal control and is not used for making logical propositions” (Edwards 1979:36).

4. Right-mode thinking and cognitive research

Looking at the chart Edwards has provided and relating the features of thinking of each mode to what some psychologists say, it seems to me that the features of the left mode characterize what is usually called by psychologists the formal-operational mode of cognition. The features of the right mode of thinking relate much more to the concrete-operational mode as well as to some aspects of preoperational thought.

The basis for reasoning in traditional Aboriginal culture stems from his world view and his dependence on known and experienced facts. The traditional Aboriginal person had little need to use operational thought, or the left mode of thinking. This does not mean that he was unable to develop it, but it says that his background simply did not require it. To achieve the shift to the left mode, the Aboriginal has to stop relying on perception, known and experienced facts, and revelations as the only bases for reasoning. Once he is able to do this, he can reason from facts and from ideas as well. In this way left-mode thinking, or formal operational thought, can be used. Many Aboriginal people have become left-mode thinkers and use this mode when appropriate.

5. Areas needing further investigation

As I have struggled to shift into the right-mode of thinking so that my perceptual skills are increased and I can “see” well enough to draw well, I wonder what can be done to help Aboriginal people develop skills associated with left-mode thinking.

A number of ideas come to mind. The first is teaching to hypothesize from real-life experiences—in preference to a formal classroom situation which may not be perceived as “real.” For example, the experience of the outboard motor running out of fuel today, or some other real experience the people have had and the problems it caused, could be talked about in terms of how it could have been avoided. Then questions could be developed to talk about the possibility of the same thing happening tomorrow. From one real life event, many other situations could be talked about the same way. The ideas expressed in conditional sentences need to be talked about until it is clear they are just ideas and not facts. For example, when I say, “If I go to Cairns next week …,” I need to make it clear that I might go and I might not, and that I do not know yet. It is only after this is clear that I can move on to the alternatives I want to offer if I go.

Another area I feel needs careful examination is the language used to a child by the mother or other child caretaker in the early days of the child’s development—both before he learns to speak and as he does. I believe some significant differences would emerge when, for example, comparing the language used by a white/Westerner mother to her child and an Aboriginal mother to hers.

Immediately comes to mind my hearing an Aboriginal grandmother giving a small child detailed instructions about what to call various relatives and what they would call her. As well, the grandmother outlined obligations and appropriate behavior for the child to take. This kind of information is passed on to the child over and over again until she knows who is who and how she is expected to behave.

In contrast to this, in my family, I have observed the young mothers giving a lot of verbal instruction to their children but it has been quite different. It usually includes reasons why the child should behave the way the mother wants. For example, “If you go outside without your shoes you’ll get a cold.” “If you want me to take you shopping this afternoon, pick up your toys.” “Why don’t you go out to Grandma in the kitchen. She might have something for you.”

Some detailed “diary” studies of real Aboriginal situations would be very helpful. As well as learning how to talk, the child learns what is appropriate to say. The Aboriginal child learns about kin; the white child to question everything, “Why, Mummy, why?”

My hypothesis is that many white children are born into an environment where left-mode thinking is used in interaction with them—long before they can use that sort of language themselves. I continue to hypothesize that many Aboriginal children are born into an environment where primary focus is on “who’s who” and how to behave—in a real life situation, not a hypothetical one.

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