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TO LEARN OR NOT TO LEARN - WHY IS THE QUESTION?

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Introduction to Specific Learning Difficulties:

All learning dysfunctions, hence difficulty in learning, have their root in how the brain functions. The brain is designed to "learn". From the time we are born until we die, learning is as natural as breathing, and certainly as important since our very survival depends on it. Initially it is our physical survival that depends on learning "Look both ways before crossing the road!". Later in technological societies it is our economic survival and success that are dependent upon what we learned in the educational and training environments we encountered. Since learning is so natural, why is it that some of us learn easily, others learn only with difficulty, while ours have a difficult time learning traditional skills such as reading, spelling, and mathematics at all?

You might say it is all a matter of access: what brain functions you can access, how well you can access the functions available, and what you have to access. A person with low innate intelligence, but full access to all brain functions may find learning difficult. On the other hand, a person of high innate intelligence, but with problems accessing specific brain functions may also experience difficulty learning, at least in some areas. The brain functions much like water running down a hill; it will always take the most direct processing route available. Unimpeded, water will always run straight down the hill, but if its path is blocked, it will seek the next most direct route down the hill. If that path is also blocked, it will again seek the next most direct route, etc. Each time it is blocked, the pathway becomes longer and less efficient at getting the water down the hill.

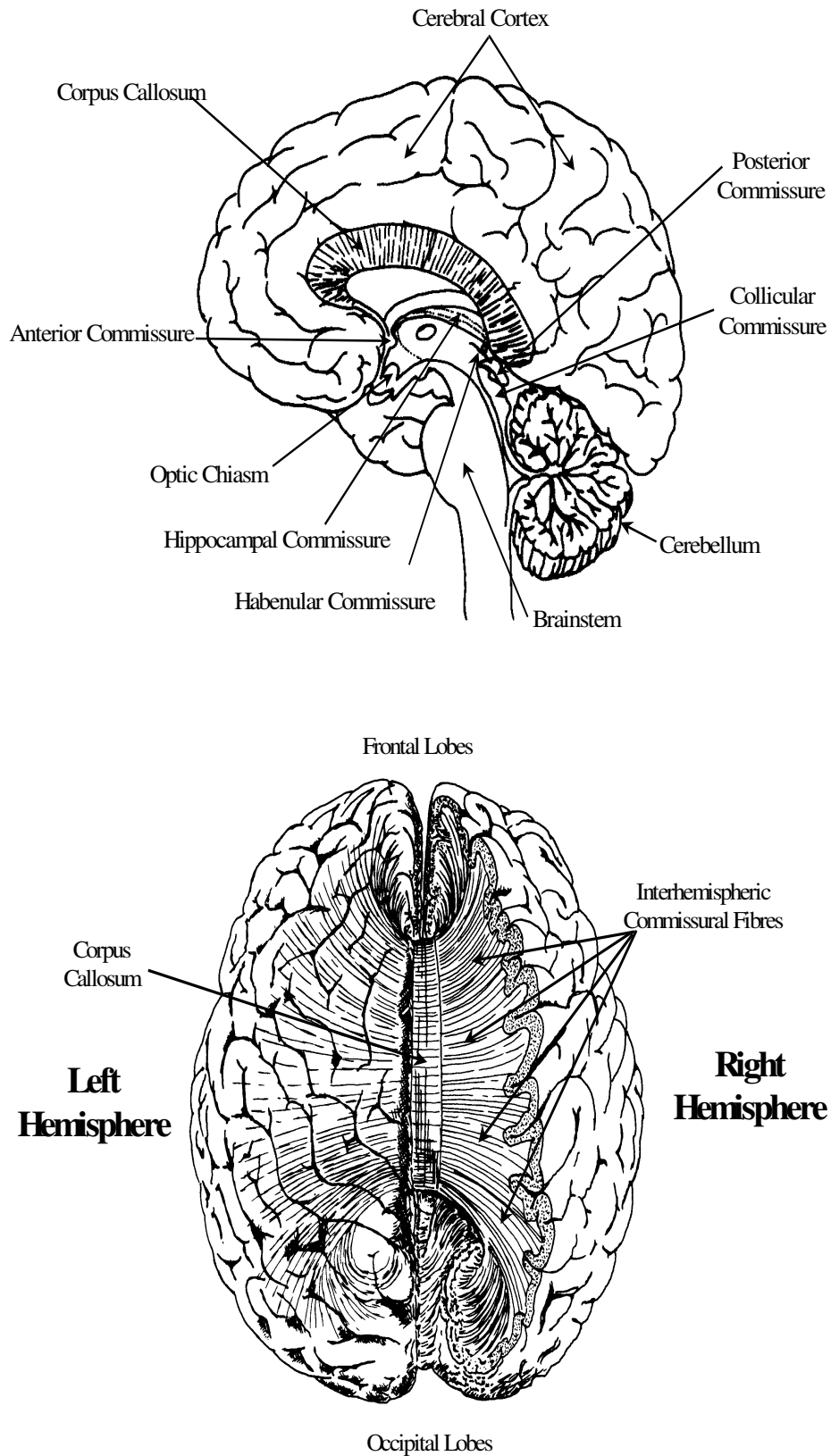
The same is true of processing in the brain. If all functions are equally accessible, the brain will always choose the simplest, most direct functions to do the processing required. However, there are many ways of performing all mental tasks and the brain will just choose the next most efficient route for processing if the most direct function is not available/accessible for whatever reason. If the next most efficient pathway is also blocked, the brain will then route the processing to other functions that are accessible, even if these functions are a far less efficient way of processing that information. If many brain functions are not accessible, the processing path may become very long and inefficient creating difficulties in doing tasks dependent upon these processes. Each time the processing path becomes longer and less efficient, the level of "stress" encountered using that pathway increases. When the level of "stress" reaches a high enough level, we may opt out of situations that require us to access these functions altogether.

Different learning tasks require access to different functions and/or combinations of functions in the brain. The brain can be divided into several functional regions, each of which processes information in different and often unique ways. The two brain regions recognised most commonly by people are

the right and left cerebral hemispheres. When the brain is removed from the skull, it appears to have two distinct "halves" because of the deep longitudinal fissure separating the cerebral hemispheres (Fig. 1).

In the popular press these are often referred to as the "right and left brains" because of their anatomical distinctness and the differences in the way each hemisphere processes information.

Figure 1. Two views of the Corpus Callosum. At the top a side view of the Corpus callosum cut down the middle. At the bottom, a view from above with the cortex cut away on the right side to reveal how the fibres loop through the Corpus Callosum from one gyrus or ridge to exactly the same gyrus in the other hemisphere.



These two hemispheres are not separate, however, as they are connected along most of their length at the bottom of the fissure by a structure called the Corpus Callosum (Fig. 1). Neurologically, the Corpus Callosum is approximately 200 million nerve fibres running between the two hemispheres. It functions much like a telephone exchange allowing a two way flow of communication between the hemispheres. Whenever the hemispheres are required to "work together" to produce an integrated function, the Corpus Callosum is the site of that integration.

Each cerebral hemisphere carries out a number of different functions, and each processes information in a very different way from its partner. It is as if each side of the brain is a specialised organ of thought, with the right hemisphere possessing a set of functions that complement those of the left hemisphere and vice versa (See Table 1). The right hemisphere functions in most people are global or Gestalt in nature dealing with the whole and recognition of overall patterns, while the left hemisphere functions in most people deal with logically sequenced analysis of the parts of the whole. It is because of these differences in functions and processing that the right hemisphere is sometimes called the "Right" or "Gestalt" brain and the left hemisphere the "Left" or "Logic" brain.

Table 1. *Functions of and Information Processing in the Right and Left Hemispheres in most people.*

GESTALT or RIGHT HEMISPHERE	LOGIC or LEFT HEMISPHERE
LEAD FUNCTIONS:	LEAD FUNCTIONS
Spatial Orientation	Temporal (time)
Body Awareness	Mathematics
Facial Recognition	
Music Recognition (melody)	Rhythm
Pre-verbal & Non-verbal (gestural)	Language (verbal)
Interpreting Symbols	Assigning Meaning to Symbols
Creative/Lateral Thinking (daydreaming)	
PROCESSES INFORMATION:	
Globally, Wholistically as a Gestalt	Linearly, Logically and Analytically
Simultaneously, Subjectively	Sequentially
Intuitively	Objectively (with reference to "Facts")
"Knowing" based on intuition	

While the popular press may refer to it as "right and left brain thinking", it is not the physical hemispheres housing these functions that is important, but rather the location of the Gestalt and Logic functions themselves. In some individuals these cerebral functions may be transposed with the Gestalt functions physically located in the left hemisphere and the Logic functions physically located in the right hemisphere. By the definition of the popular press, these people would have their "right brain" in their "left brain," which doesn't make any sense. They just happen to have their Gestalt functions located in their left hemisphere and their Logic functions located in their right hemisphere. Only about 3-5% of people, however, display transposed Logic and Gestalt functions with 95-97% of people having their Logic functions in their left and their Gestalt functions in their right hemispheres. Because the dominant hand tends to be opposite the Logic hemisphere, most people are right-handed, while many people with transposed functions (eg Logic right) tend to be left-handed or ambidextrous.

It must be **emphatically** stated here that both hemisphere participate all the time at many levels in the "various thought processes." **The way we think is a result of the degree of integration of the two hemispheres** with each hemisphere contributing its own special capacities to all cognitive activities. The contrasting yet complementary contributions of each hemisphere is clearly demonstrated during complex mental activities such as reading as illustrated in the following quote from Levy: "When a person reads a story, the right hemisphere may play a special role in decoding visual information, maintaining an integrated story structure, appreciate humour and emotional content, deriving meaning from past associations, and understanding metaphor. At the same time, the left hemisphere plays a special role in understanding syntax, translating written words into their phonetic representations and deriving meaning from complex relationships among word concepts and syntax." (1)

Although there is no activity in which only one hemisphere is involved or to which one hemisphere makes the only contribution, functions predominantly in one cerebral hemisphere may be all that are required for many simple cognitive tasks. There are both psychological and physiological evidence that the relative degree of activation of functions in the two hemispheres varies depending upon the nature of the task being performed. When doing simple arithmetic tasks such as counting or adding $1 + 1$, the Logic functions will be activated with little Gestalt activity required. A predominantly Gestalt task, on the other, such as matching patterns, will require little Logic involvement. The more complex the learning task becomes, the greater the degree of activation and integration of functions in both hemispheres that is required.

Different learning tasks, therefore, require access to different types of functions, and different degrees of integration of these functions. Some of these functions are located predominantly in the Gestalt/right brain, while others are located predominantly in the Logic/left brain. The more complex learning tasks like reading and spelling require access not only to functions in both hemispheres, but the integration and simultaneous processing of information in both hemispheres. Therefore, if you can access all brain functions in both cerebral hemispheres with equal facility and can integrate all these functions well, you will probably find learning easy!

However, if for any reason you can not access certain brain functions or have difficulty integrating the functions accessed, you may well have difficulty performing tasks dependent upon or involving those specific brain functions. From our perspective here at Melbourne Applied Physiology, **all specific learning difficulties result from this lack of access to specific functions or the inability to effectively integrate these functions.** Depending upon how well a person can access certain Gestalt and/or Logic functions, he will demonstrate one of the patterns of specific learning difficulties briefly discussed below.

Major Patterns of Specific Learning Difficulties Based on How Well Logic and Gestalt Functions are Accessed are:

The most commonly observed specific learning difficulty is Gestalt dominance in processing information or Attention Deficit Disorder (A.D.D.). People with this pattern of learning dysfunction have good access to most Gestalt functions, but only poor access to Logic functions, with Gestalt processing the predominate mode used for performing all tasks. Because of this Gestalt dominance in processing information, the normal balance provided by complementary Logic functions is largely absent. These people, therefore, often display the following behavioural symptoms:

Gestalt Dominance in Mental Processing (Attention Deficit Disorder):

- * tendency to be impulsive.
- * little appreciation of the connection between "cause" and "effect": I want to do X so I do it, never thinking, "What will happen if I do!"
- * difficulty budgeting time: Because of this and difficulty concentrating, projects are often left incomplete and organisational skills are poor.
- * difficulty concentrating: "Concentration" is merely paying attention over time. If there is no "sense of Time", attention can not be paid over it?
- * difficulty spelling: Generally spelling is phonetic by putting letters together until it "sounds" like the word.
- * difficulty with mathematics: Difficulty remembering times tables and/or understanding mathematical concepts.
- * reading may be fluent, but there is often poor comprehension of what was read: Interpretation of symbols (Gestalt) may be accessible, but there is difficulty assigning meaning to the words/symbols interpreted (Logic).
- * often well co-ordinated or even gifted athletically. Remember the Gestalt functions control body awareness and orientation in space.

It is precisely because of the above symptoms that people displaying Gestalt-dominant processing are found to be "attention deficit". Attention Deficit Disorder is assessed by having a person perform a series of sequential tasks, any one of which the person can do easily. However, people suffering from A.D.D. will not be able to complete the series of tasks, not because they can not perform them, but rather, because they lose concentration or are easily distracted.

Much less common than Gestalt dominance is Logic dominance in decision-making processing. People who access their Gestalt functions poorly, but have good access to Logic functions are the "true dyslexics" by standard psychological definition. That is, they display the following four behavioural symptoms:

Logic Dominance in Mental Processing (Dyslexia):

- * can not spell or do so entirely phonetically by putting letters together to "sound" like the word is said.
- * have great difficulty reading: Usually stumble over words, mis-read words, or just can not "sound" words out. However, comprehension of what was read is often excellent.
- * display dysrhythmia, an inability to clap or tap a tune.
- * are physically uncoordinated or "clumsy".

In addition, these people are usually good at mathematics at least to the level of algebra, display good concentration, and follow sequential directions well. However, they may have to be taught things that other people learn unconsciously.

The next most common type of learning difficulty after Attention Deficit Disorder or Gestalt Dominance is poor or limited access to both Gestalt and Logic functions. This pattern is usually associated with a great deal of confusion in cerebral processing and creates the greatest learning difficulties. If a person has good access to either Gestalt or Logic, but poor access to the opposite side functions, he can at least compensate with the functions he does access well! However, if there are major deficits in both Gestalt and Logic functions, then the ability of the brain to compensate for these deficits is extremely limited. The following behavioural symptoms result from this pattern of access:

Limited Access to both Gestalt and Logic Functions (Real Problems):

- * language development often extremely delayed for age: For instance, an eight year old child that only recognises 3 letters and 2 numbers.
- * reading very delayed for age: Often difficulty even recognising words, or word recognition a real struggle.
- * spelling very delayed for age: Often can not spell words with more than 3 or 4 letters.
- * difficulty understanding numbers, even basic arithmetic: Often have difficulty with learning to count, concepts of adding and subtraction, knowing the days of the week, etc.
- * no concentration or focus: Appear away with the "fairies".
- * person appears confused/lazy or just plain "slow mentally": Often fairly apathetic and lethargic with no zest for life.

We generally only see these people as children in early adolescence. Because of the extreme nature of their learning dysfunctions these people have normally been dismal failures in school and have departed the academic scene by their early teenage years.

The least common pattern of learning difficulty are people who have good access to both Gestalt and Logic functions, but they can only "integrate" these functions poorly if at all. This lack of integration of Gestalt and Logic functions often limits the use of the functions that they can access giving them learning dysfunctions similar to people having poor access to one or the other hemispheres. The most common behavioural symptoms are:

Poor Integration of Gestalt and Logic Functions:

- * reading very difficult: Often so stressful to read that it can only be done for a few minutes at a time, or is avoided altogether.
- * spelling is totally phonetic: words spelled like they sound.
- * difficulty with higher mathematics (eg algebra) even though arithmetic may have been perfect.

For these people, school is often an extremely frustrating experience. They can often perform well all tasks except those requiring good integrated function. Since integration of Gestalt and Logic functions are required for reading and spelling, but integrated functions are very stressful for these people to perform, these essential academic tasks may often be avoided.

The True Nature of Specific Learning Difficulties:

From the perspective of the Learning Enhancement Program (LEAP) all learning difficulties result from the degree of access each person has to specific brain functions and how well these functions can be integrated. If a person can access all brain functions in both cerebral hemispheres with equal facility and can integrate all these functions, he performs well in all areas of learning. However, if for any reason he can not access certain specific brain functions, he will have difficulty performing tasks dependent upon or involving those specific brain functions.

Indeed, standard psychological testing to evaluate specific learning problems rely on determining which types of cerebral functions and processes can be accessed, and how well these functions are accessed. Standardised intelligence tests such as the Wechsler Intelligence Scale Test are a carefully devised series of tasks which are divided into two groups: Verbal subtests and Performance subtests. The Verbal subtests are tasks which require access to predominantly Logic functions. Some of the Verbal subtests require access to only a few Logic functions, while others require access to both Logic and Gestalt functions at the same time, but with the "lead" functions contributed by the Logic brain. Likewise, some of the Performance subtests are tasks which require access to only Gestalt functions, while others require integrated functions with a Gestalt "lead."

The score on each subtest depends upon how well a person can access the specific functions required to perform that subtest. Subtests that a person scores poorly on indicate which types of functions he has difficulty accessing. Difficulty accessing specific functions has been correlated with poor performance in certain academic areas.

Behavioural Aspects of Limited Access to Cerebral Functions and/or Poor Integration of these Functions & the Stress-Avoidance Cycle:

An appreciation of some of the behaviours associated with learning difficulties may be useful at this point. How do people's behaviour reflect their underlying ability to participate in this natural process of learning? In our clinical practice we are told about and see the same types of behaviours from people (especially children) who come to us for treatment of specific learning difficulties. Again and again we see the same behaviours ticked on the Behavioural Evaluation Form filled out for each client when people have certain learning dysfunctions. Why might this be?

Lack of access to specific cerebral functions will almost always have a discernible behavioural corollary. The nature of the functions accessed, or not accessed, determine to a large degree how a person behaves. A child that is Gestalt dominant will often be perceived as "emotionally immature" because emotional maturity is essentially the ability to modulate and control the expression of emotions based on a logical analysis of circumstances. A well integrated person with good access to all cerebral functions may "feel" angry (largely a Gestalt experience), but make the rational judgement that "now" is not the appropriate time to express that anger. A Gestalt dominant person, on the other hand, will experience the anger and tend to act on these feelings with little logical consideration of the consequences.

It is the LEAP philosophy that people's behaviour reflects the degree of access and integration of their cerebral functions. Poor access to, or integration of, specific brain functions will result in difficulty performing tasks dependent upon these brain functions. Difficulty performing these tasks will almost always generate "stress" when attempting to do these tasks, often resulting in "avoidance behaviours." The extent of the "avoidance behaviours" usually relates to the degree of "stress" generated when attempting to access and integrate the relevant functions.

What is often not appreciated is that people's behaviour tells the truth, if you understand what is being said! When a child says, "I hate Reading, Mathematics, English, or _____ (fill in the blank)", what that person is actually saying is, "I can not access the brain functions I need to do that task easily!" The only reason anyone "hates" doing anything that is enjoyable for most other people is that he finds that specific task difficult to perform. If a person can read well and easily, he doesn't avoid reading, but rather seeks it out because there is just so much to learn and enjoy in books. If, on the other hand, reading is a very demanding and stressful task, people soon develop avoidance mechanisms, for instance labelling reading as "boring." Who wants to do something that is "BORING!"

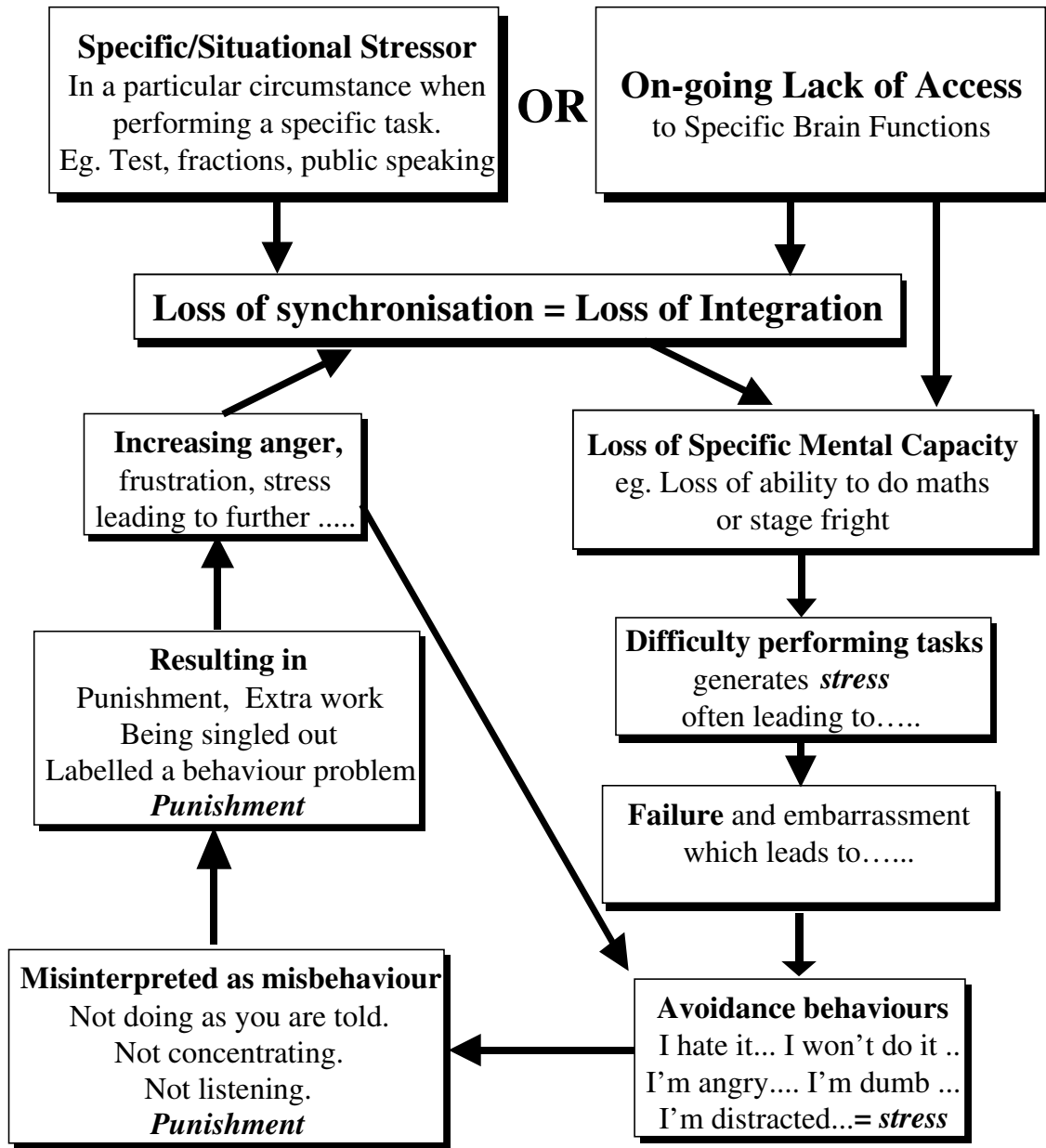
Unfortunately, these avoidance behaviours are often mis-interpreted as "just not doing what you are told" or "misbehaviour" plain and simple. The response to these "avoidance behaviours" may be to tell the person to just stop misbehaving and "pick up your game!" This only compounds the "stress" of attempting to do these tasks, usually leading to further avoidance behaviours, and exaggerated misbehaviour. Part of what exaggerates the misbehaviour is simply the frustration and anger of NOT being able to perform the assigned task, even when great effort is expended. Imagine how you would feel if you have struggled through your reading, mathematics, English etc. assignments, putting in the best effort you are capable of, only to be told, "Well you're just going to have to try harder!"

From our experience, many of the people having the greatest difficulty with "learning" are often innately very clever. They just can not access specific brain functions they need to perform certain tasks that they are required to do. When you talk with these people and listen to the questions that they ask, they are often clearly clever, intelligent people. If a clearly clever, intelligent person does not read well or spell well, or has great difficulty understanding and doing even simple mathematics, a reasonable assumption is that person just isn't "concentrating", or "paying attention" or "trying hard enough." Surely, if a clever, intelligent person was "concentrating, paying attention, and trying hard enough", then he would be successful at these rather pedestrian tasks accomplished with ease by even their less clever peers! What is over-looked is that these clever, intelligent people may indeed be clever and intelligent, but unable to access the relevant brain function when needed, or only able to do so under duress.

Perhaps an analogy here will help demonstrate the above point. If I say to most boys or men, "Do you know how to hammer a nail?", most would answer "Yes." "Will you hammer a nail for me?" "Sure, just give me a hammer!" However, if their hands were tied to their legs, they may still answer "yes" to the question, "Do you know how to hammer a nail?", because they do know how; but, they would be unable to do so when asked. If you just ignored their lack of access to hand function (because it is tied up) and said "Come on now, hammer that nail!", they may become frustrated and angry because they **could** hammer that nail if only they could access the function of their tied-up hands.

The difference between this analogy and the above lack of access to brain functions is that they would clearly understand their inability to hammer the nail, and they would likely state, "If you'll just untie my hands, I'll gladly do it for you," letting you know why they can't at this time do what is asked of them, also alleviating their frustration at not being able to do so. However, with lack of access to specific brain functions, people can not (nor can those around them) understand why they can not perform certain tasks dependent upon the specific brain functions not accessed! The individual almost never knows consciously why he can't access these specific brain functions, and just gets "frustrated", which often leads to "anger" and that anger often leads to "inappropriate behaviour." (See **Figure 2 The Stress-Avoidance Cycle**)

The Stress Avoidance Cycle generated by Loss of Brain Integration



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Brain Integration

This is the state of having access to all relevant Gestalt & Logic Lead functions, the subconscious processing centres and the pathways to integrate these processing modules.

Integrated brain function requires the synchronisation of processing occurring in widely distributed subsystems in many different areas of the brain at the same time. Loss of timing or synchronisation results in the inability to perform those mental tasks dependent upon integrated brain function. This is termed loss of brain integration.

Figure 2 The Stress-Avoidance Cycle. Whenever there is lack of access to specific brain functions or the ability to integrate these functions this initiates the avoidance of tasks dependent on these brain functions. This is often misinterpreted as misbehaviour.

LEAP: CORRECTION PROGRAM

The program is based upon the powerful brain formatting techniques initially developed by Richard Utt, Founder and President of Applied Physiology, and then developed further into the LEAP brain integration technique by Dr. Charles Krebs, Founder of Melbourne Applied Physiology. This brain integration technique "opens up" access to both Gestalt and Logic functions and removes blocks to integrated function. Further research and development of specific correction techniques by Dr. Charles Krebs, now allow for the correction of most specific learning difficulties.

The Basic Learning Correction Program requires between twelve (10) and twenty four (24) hours of treatment. This includes an initial assessment that serves as a benchmark against which to evaluate future change, and points out the areas needing the most attention. The next several hours are devoted to Brain Integration which lays the foundation for the specific learning corrections that follow. Much like building a house, there is little sense in putting time and effort into creating a functional structure unless it rests on a solid foundation. The Brain Integration procedure releases stresses in the deep brain centres, including the Limbic System, which control access to and integration of hemisphere functions.

Once the Brain Integration procedures are complete, we then apply specific learning corrections for dysfunctions in reading skills and comprehension, spelling, mathematics, and the whole range of Wechsler Intelligence Scale subtests. When all the functional areas have been addressed, low self-esteem and behavioural problems related to the previous learning difficulties are addressed using effective emotional and memory stress release (defusion) techniques. Just because you now can perform a learning task well does not mean that you will. Previous conditioning and memory of "how it was" often shut off our will to give it a go.

All correction techniques used are non-invasive. The techniques are based on the use of muscle monitoring, acupressure, emotional and memory release, and sound and light techniques, together with other left/right brain integration exercises.

The LEAP Program developed from work with clinical psychologists who tested many of clients on Standardised intelligence tests and retested them after treatment. The results of the retests show significant improvement in many areas that were previously deficit, and highlighted areas requiring further work. Assessments by neurologists demonstrated that when the Program had limited effects, there was usually organic damage involved. LEAP Practitioners also work closely with tutors and special education teachers that are helping to fill in the deficits in knowledge created by the previous learning difficulties.

A typical Learning Correction Program may look like the below:

Session 1 - Assessment and Estimate Time of Treatment and begin
Brain Integration (2 hours)

Session 2 - Brain Integration (2- 6 hours)

Session 3 - Complete Brain Integration Procedures and begin Specific
Learning Corrections - Usually Reading or Spelling
first (2- 4 hours)

Session 4 - Continue Specific Learning Corrections -
Completing Correction of Reading,
Spelling, and Mathematics (2- 4 hours)

Session 5 - Continue Specific Learning Corrections -
Correcting performance on various Verbal and
Gestalt tests (1- 4 hours)

Session 6 - Defuse Negative Attitudes which Block Learning
and Self-esteem, as well as Defusing Behavioural
Problems (1- 4 hours)

The basic ten to twenty four hour program is an estimate based on the median time for treatment as each person's program will vary on the basis of their individual needs. The median time is the length of treatment that occurs most often. Some people with only one or two areas of deficit may take only four to six hours to go through the whole program, while others with many areas of deficit may take far longer. Children with severe learning problems and major deficits in most areas of function indicated by Low Average, Borderline, or Serious Deficit ranking on standardised tests, may require thirty hours of treatment or more. Our experience is that even these children improve significantly in function, but that the rate of improvement is slower than for people with less severe deficits. At the end of the Assessment during the first session, you will be advised of the probable length of treatment required in your specific case.

Founder of LEAP Program:

Dr. Charles Krebs and is the founders of Melbourne Applied Physiology, and developed the Melbourne Applied Physiology Learning Enhancement Acupressure Program (LEAP). Charles has been working with the application of kinesiology and acupressure techniques to the correction of specific learning problems for over twenty years. Charles' background is in science both as a research scientist and university lecturer, and he has over twenty years of clinical experience.

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1. Levy, J. 1985. Right brain, left brain: Fact and Fiction. May 1985, Psychology Today.