Learning and Memory in Martial Arts

Improving and understanding Memory For the Martial Artist

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Based on the **QUAN LI K'AN** style of Martial Arts

By

Bruce Everett Miller

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A Good Memory

is NOT a Magic Trick

Ok this book will hopefully be short! Well it is relatively long, but you can skip most of it if you only want the memory tricks

SO in fact, I am going to give you the option to make it very short.

If you simply want to know the how- then you don't waste your time reading the [unfortunately larger section] part that explains the why. Only read up to chapter 3

The goals of this book are threefold

1) To explain the how of improving your memory

2) To explain the how of using your memory under Stress... because it is NOT the same as regular memory and why that is

3) To explain WHY memory works the way it does [at least bassed on present understandings]

Hopefully this will give usable information and ideas

"If you tell the truth, you don't have to remember anything."

— Mark Twain

Chapter 1

Improving your functional memory - Short answer:

Ok this is "supposedly easy" at least the "experts" claim it is. No, it is not really as easy as they claim but here are some tips!

1) Just repeat things until you get them down.

Ah that doesn't always work so well. Does it? But you can try!

Well then easiest trick to try and thus one of the best ways is called association,

2) Associate things like a left turn with something else.

Take the letter A for example when you think of the letter A - remember to think of a left turn. Well that rarely works ... but the principle is good.

It is just that you need to know a few details to make it work better - much better. [The whys are in the long section]. For now, the what to do, is shorter. Simply the closer you make the association, the easier it is to remember it, and the better the link will be.

Therefore instead of thinking of let say "A" for Aardvark ... bird that you will rarely ever see or have the term come up in conversation ... think of "A" for So you think of Apples it should also bring up the thought of the letter "A". think of Apples and you brain remembers "A".

So the shorter the link the better! So "D" for down block would be a better link than XYZ. But then remembering an associated action or term which you will always do [when doing a left turn], would be even better.

SO think of response to a right hand grab includes a left turn [This is JUST an example here! I am not telling you a technique]

And the more times you enforce the link ... literally think of the association the better [i.e. stronger] the link will become!

Don't go for complicated links, like Grab equals hand - equals block equals - left turn. While you can do this, the way the brain learns means that it has to do a LOT of work to get where you want it to go it won't! But remember the more times you think of the link - IN BOTH DIRECTIONS, the better the link will be.

In short keep it simple [Yes the KISS RULE]

3) Finally. You can also make the memory into a Rhyme. Human have passed down stories and information for of generations without any formal writing system, simply by putting what they want to remember into a rhyme.

No, the rhymes do not have to make sense. But it helps if they have a rhythm.

4) Convert words to a mental picture. An important part of this is to make yourself see this action in your mind! Make it an uncomplicated SHORT action. The longer the image the less of a specific link you will have. Thus the less success you will have.

5) The more senses you involve in learning or storing something this memory, the better you will be at recalling it! Thus if you can feel the action [in your mind of course] you will also remember it better.

6) If you can engage [sense/remember] the FEELINGS you have about this action] like dislike, love, remember it hurts, etc, the better you will remember it. Positive emotions are however, ALWAYS better than negative ones - If you want to use the link because he brain will always shy away from bad memories!

7) Break complicated things into short sections. The more complicated it is the harder the brain has to associate it with a specific link.

8) Use acronyms. Terms that use the first letter to be the term you want to remember. In psychiatry one of the scales for depression is the SIGECAPS scale. [Sleep, Interest, Guilt, Energy, Concentration, Appetite, **P**sychomotor Retardation / Psychomotor agitation, and **S**uicidal ideation]... make up you own words. Yes these ones work better if they are REAL words but that is not needed if you repeat them enough.

9) Focus on YOUR individual learning style. Everyone has they own BEST learning style, whether it is visual, auditory, [tell yourself what you are doing], Writing [write it down a thousand times], etc. Tactile learners often need to physically interact with things in order to understand them well. But know your best learning style and use it!

10) The MORE Links you have to the same thing you want o remember the better you will be at remembering it

NOTE: Even if your style is not such of creating lists is not your best learning style, when you are first learning something. Writing it down so you get it right IS a good idea. Learning it wrong will NOT help you; it only creates confusion in the brain! The point is to get past needing that list/paper.

"Right now I'm having amnesia and déjà vu at the same time. I think I've forgotten this before."

Steven Wright

Chapter 2
Knowing Under Stress

Let me start off by saying that they things you learn, when you are NOT under stress are NOT the same things that your brain will reference when you are under stress.

And the more stress you are under the more true that is.

Literally this is one of the reasons why young black belts get their butts handed to them on the street. They may intellectually know the technique. But their limbic system does not have confidence in the technique to work! It may or not work ... but if you limbic system doesn't not trust it, then it won't use it under situations of stress. Perception by the limbic system part of your brain is what is important here.

Unfortunately the more stress you are under the LESS you are going to remember things. Traumatic things less, but not the things you want to memorize to save for later reference.

This is true for a couple of reasons!

However I will cover the WHY in later chapters

So the idea here is that you need to program the part of your memory that will be used during times of stress. Like which kata technique, you may try to use when you are attacked on the street, or even if you are capable of defending yourself.

It doesn't matter what your think, this is the emotional part of your brain and logic is NOT the decision maker!

Now I don't care how many times you have done the technique or how much you intellectually think it will work. That is the trap that way too many people fall into! You can talk all you want. That is ego! Ego is fragile under stress and unless your limbic system believes that it will work, it won't use the technique.

The real fact of the matter is that the brain doesn't work that way under significant stress - especially under sudden stress. IT reaches for things it feels will work. [Note I did not say believe] Logic is rarely part of the response.

SO if you want to remember how to do something when you are attacked, you have to make the part of your brain that will react refer to that information feel that it really will work! that it is a safe thing to do!

The easiest way to do this is to get your limbic system to believe in the technique! But to do that it has to FEEL it working!

Now again here I have to again note that telling yourself, that something will work, is worthless, in a sudden attack! Your brain could not care less what you have stored in your frontal cortex. Under acute distress it WILL do what it thinks best for self-preservation - based on what it believes [ie feels] will work at that very moment.

Now if your limbic system memory links doesn't have a plan that it **believes in,** even if you intellectually do, well that is the reason why some people freeze when they are attacked! [Far more information about this comes later]

What I am saying is that there are intellectual responses and memory, which you have - accessed by the frontal [intellectual] part of the brain. And then there is the limbic system of your brain. The limbic system works off of feelings [including fear] NOT cortical knowledge!

In this case feelings matter. Beliefs do NOT!

But yes you can program the limbic system to believe in what you are doing!

SO if you want to learn conditioned response, especially for times when you are under sudden stress, then you have to either subject yourself repeatedly to such stress, dangerous and not good for your general health] OR learn how to put those responses there [in the limbic system]. To be tapped when you are under stress.

SO how do you do that? Well the first thing is that you have to practice the technique with a partner. After you have the technique down of course.

Start by doing the technique, with your partner, with No resistance. Repeat until you get it down. By that I mean so you don't have to think about it! That will put it ingrained into your frontal cortical part of your brain.

Then practice the technique with your partner must increase their resistance to this technique. Literally have them SLOWLY stop cooperating. [I said slowly!]

I note that it is NOT the technique that your LIMBIC SYSTEM is learning. It is how it feels under the stress of a non-cooperating person that is important! You literally need to feel it though.

Especially pay close attention to both your partner's PHYSICAL response. Not just If they respond, but how they physically respond. This is what your LIMBIC SYSTEM needs to feel to believe!

Also the more partners you can train with the better. Significantly better. Again we are not trying to get the frontal part of your brain to believe or know. We are teaching the LIMBIC SYSTEM part of your brain to know [literally to feel] that this will work.

Don't start out by making it hard. Failures will not teach your limbic system what you want it to know. You need it to believe that this technique works and that you have a way to protect yourself that will work.

NOW I am going to tell you that your technique MUST WORK and WORK ALL THE TIME. 95% of the time is not good enough. You MUST find a way to perform the technique that works ALL THE TIME!

NOTE" in reality you are going to have to learn to modify the technique to fit your individual body style!

You literally have to teach your limbic system that this [technique] will work whenever you are grabbed in this way. You need your limbic system to believe it.

Again the complicated reason why this is true is in the WHY section. Now we are only covering the how to part.

So start slow, get that down. Then slowly increase first their resistance and then the speed at which you are attacked! In that order! This is especially true of grabs.

Your best training partner is the biggest strongest non-responder in your class. See one my [free] series of the books of pressure points to get these definitions of the types of Pressure points, and non-responders.]

Shortened Definition: Non-responder. Someone who does not react, [or reacts very little], to typical pain producing pressure points.

Do not speed up the interaction until you have it down, but at that point making the timing real is of great benefit to your real learning.

Aloes spread out the learning over a period of time rather than cramming it into one long period will help considerably!

Now this is proven to be true and it is method we use in Quan Li K'an I think the reasons why are very important but you do not have to know the why to make this work for you!

"Our memory is a more perfect world than the universe: it gives back life to those who no longer exist."

Guy de Maupassant

CHAPTER 3

Full STOP?

OK This is the start of the WHY parts. Verbiage warning noted!

I told you that I was going to present it short and sweet. At least the shortened version of it and I did, in chapters 1 and two.

But if you are NOT interested or think the why is boring, then I suggest that you shut this book at this point.

Because IF you follow what I have said in the first two sections it will work!

"The advantage of a bad memory is that one enjoys several times the same good things for the first time."

Friedrich Nietzsche

CHAPTER 4

TERMS

Yes I know this chapter can be boring! I openly note **you can ignore this chapter** and do just fine with the rest of the book

First off – as a starting point - I must to give you the "official definitions of memory". Now I am actually going to try NOT to use these terms much. Simply because we are not getting into research here and I would rather make the meaning clear without need a dictionary. But for completeness I have to at least present the terms.

Why?

Because as you will [hopefully] soon learn … that it is imperative to understand - something to retain that knowledge – furthermore understanding - roots the knowledge - in ways that it can be accessed [used] in many ways in the brain.

Additionally it is good to know this gives you the basic/ standardized terms you need to know and recognize to understand the details of good memory utilization. [The wording here is exact because there are many wildly varying memories of memory formation]

It also will allow you to do research on your own. To check on things I say here And you should.

Meaning you should never take one point of view – including mine. Do you own research and see if you can push your understanding beyond what I or anyone else presents. Or even if you find something I say to be wrong. in that case please send me a notice so I can correct the mistake [bemiller@cloudnet.com]

Now Research into memory is very complicated and as I noted there are many different theories and research opinions. I say opinions because as of now we do NOT know the real processes in memory and there are in fact many contradictory opinions out there.

I also think that many of these terms and theories have some good points but in my overall opinion many are wrong because you cannot actually understand the memory process unless you present it as a 3-D process. Where as many descriptions pretend that memory is linear. While it has been proven though that memory is not linear. That it is not is it stored in a 1 to 1 associated process but instead seems to be cross-linked and compressed in ways we do not [fully] understand. Still many researchers seem to cling to these antiquated notions.

However we do have some fairly intricate terms and ideas – many of which I have presented here … so that you can get a more detailed view and understand the terms that are frequently used.

TYPES of Memory

Common r**esearch** notes 4 Types of Memory. Note the word Research, because the theories are still evolving:

Sensory,

Short-Term
Working
Long-Term.

Note: These terms assume / imply that these types of memory are separate – which I personally disagree with – believing instead that every type merely is merely a progression or at least strongly linked to every other types - differentiated by their cross linking and retention.

=========

SENSORY: Sensory memory is a very brief (about three to five seconds) recall of a sensory experience, such as what we just saw or heard.

SHORT-TERM MEMORY: Some researchers use the term working memory and distinguish it from short-term memory, though the two overlap. Working memory can be defined as the ability of our brains to keep a limited amount of information available long enough to use it. Working memory helps process thoughts and plans, as well as carries out ideas.

EXPLICIT MEMORY: Memory that requires conscious thought—such as recalling what you ate for breakfast or dinner last night or the names of the presidents

IMPLICIT MEMORY: Also called "non-declarative" memory is a type of long-term memory differs from explicit memory in that it does not require conscious thought. This the memory type that allows you to do things by rote. This is the type of memory we use to train for physical acts.

AUTOBIOGRAPHICAL MEMORY. This type is a complex blend of memories of single, recurring, and extended events which our mind integrates

into a coherent story of self - you can call it the ego memory – as it remembers the things that make you – you.

LONG-TERM MEMORY: is our brain's system for storing, managing, and retrieving information. There are two types of LONG TERM memory: And see short term memory above.

Procedural memory and declarative memory.

PROCEDURAL MEMORY: The motor skills part of the long-term memory that is responsible for knowing how to do things. Like walking, talking or riding a bike.

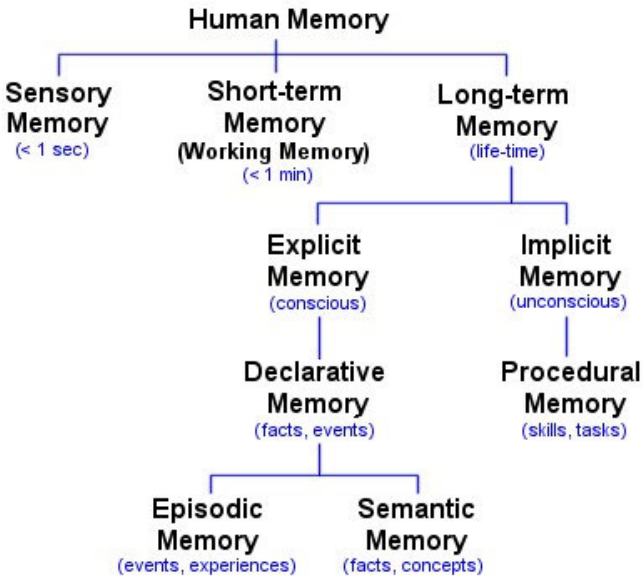
DECLARATIVE MEMORY: is the memory of facts, data, and events.

The two types of declarative memory are:

SEMANTIC MEMORY: The type of long-term memory involving the capacity to recall words, concepts, or numbers, which is essential for the use and understanding of language.

EPISODIC MEMORY. A type of long-term memory that involves conscious recollection of previous experiences together with their context in terms of time, place, associated emotions, etc.

The charting of these types of memory looks like this



Ok that done we also need to add

Learning has traditionally been studied in terms of its simplest components—the associations our minds automatically make between events. Which is good but also bad, because it ignores the complex reactions which make memory more than simple recall [more on that later]

LEARNING TERMS

We know though that our memory has a natural tendency to link events that occur closely together or in sequence. [See also the section on eyewitnesses]

Hence the terms:

ASSOCIATIVE LEARNING occurs when an organism makes connections between stimuli or events that occur together. Associative learning is central to all three basic learning processes.

NOTE: Associative processes can be both conscious and unconscious.

CLASSICAL CONDITIONING tends to involve unconscious processes

OPERANT CONDITIONING tends to involve conscious processes

OBSERVATIONAL LEARNING adds social and cognitive layers to all the basic

These learning processes will be discussed in detail in later chapters although I will TRY to not use any more "term's" than I need to [for clarity sake]. And I will try to make it all tie together to be focused on memory improvement for the Martial Artist.

Process of learning

Level 1. Unconscious Incompetence: You don't know what you don't know. This is where you are before you start a new piece.

Level 2. Conscious Incompetence: You find out what you don't know.

Like.."*oh wow that's how he plays it, ooh that's tricky, but I can see how it's played*"

and so on.

Level 3. Conscious Competence: You know it consciously.
Once you have started working on the piece, you find that if you pay attention you can get through the piece pretty well.
But…

Music at this level usually falls apart on stage if you are nervous, because you are using your conscious brain to control your hands. Any distractions can take your mind off track resulting in an on-stage musical train wreck.

Level 4. Unconscious Competence You know it subconsciously.
You've practiced it enough that the piece of music is in your unconscious mind, and literally "in your hands." Like when in the middle of a piece a drunken customer collapses, you know you are at the bridge of "Misty" but despite the distractions you keep the song without skipping a beat.

At this level you are not really "remembering it" – it sort of plays itself. This is the level of "you can play it in your sleep" – i.e. ***you have driven it into your subconscious mind.***
This comes from repeat, repeat, repeat the piece.

"Scars have the strange power to remind us that our past is real."

Cormac McCarthy, All the Pretty Horses

Chapter 5

What happens when it doesn't work!

Fear based memory

YES I covered the short version of all this in chapter 2. This is the long version is to tell you why!

I noted earlier that when we are under stress our normal memory, frontal cognitive memory doesn't work like it normally does

Normally, meaning when we are not under stress, our frontal cortex finds links in the area of the brain called the hippocampus, to link to the memories we want to recall.

Now note we do NOT know if the hippocampus actually contains our memories or just contains the link to the memories.

I also noted that anxiety [i.e. fear as they both involve the amygdala] causes memory to be decreased.

And I noted that if the brain does not have a plan to deal with acute stress [like being attacked] that the person can freeze.

Unfortunately this is more common than you might think.

The Truth is that a REAL attack is an unknown situation. And in unknown situation things happen.

1) The amygdala puts out its normal fear messages.

and

2) Adrenaline is dumped at a much higher level than normal. This adrenaline affects both the body and the brain. And Adrenaline is broken down to Norepinephrine in the frontal regions of the brain.

Norepinephrine is an accelerator [much like adrenaline is] but in this case works mostly on the frontal cortex.

This breakdown of Adrenaline to Norepinephrine occurs naturally, but abnormal levels or inability to process higher levels of Norepinephrine have been implicated in all sorts of psychiatric illnesses.

So the fact that some people freeze under stress is felt to be due to the Norepinephrine levels being high in the frontal cortex portions of the brain and the inability of the frontal cortex to link to a specific plan.

But accelerating your thoughts in the frontal cortex may result in not having enough processing time for the hippocampus to identify a complete memory [node]. Thus it may not to be able to recognize the plans you had to deal with such an event.

May people have noted that when they can force themselves to slow down, they are able to do things better, this is a main part of the reason why.

This is because like it or not it takes time for the brain to process memories in the hippocampus.

So you MAY have a plan but can't execute it.

Additionally not having an executable control by the Frontal cortex can frequently trigger the limbic system [the emotional part of you brain]. Triggering the limbic system is sort of a crapshoot, because what emotions that result / be released, will be determined by a whole range of factors. Factors that are very hard to predict in advance.

But in Martial Arts training we are SUPPOSEDLY training to deal with this exact situation. Yet I just explained that such plans my fail.

So what can we do?

We know that we DO have a plan. And supposedly, the skills, to execute those plans.

Besides the first chapter, lists many types of memory AIDE/ suggestions, I list are three major things you learn can do.

1) Delayed stress response. Literally with training you learn to use adrenaline to enhance your physical actions [both speed and strength]. Note I did not say that you ignore the adrenaline because you are used to dealing with this situation in your body [and your emotions] and can will deal with what ever amount of adrenaline [and thus Norepinephrine] are dumped into your system or left over.

Some people actually get so used to this level of thing that they actively seek out experiences that cause such release. When you hear the term adrenaline junky this is what I am talking about

and

2) Unconscious Competence - which we covered in the definitions section. Literally learning the technique to the point you can do it unconsciously. This has a fairly high chance of working as long as it is a situation that your brain recognizes.

Unfortunately if you are in a completely different experience you will probably not be able to use this learning. It relies too much on past experience.

3) Learning the theory behind what you need to do!

Now I have already mentioned that one of the reasons why young black belts get their butts handed to them on the street. They may intellectually know the technique. But their limbic system does not have confidence in the technique to work!

Your plans may in fact work, IF you could execute the techniques, but if your limbic system doesn't not trust the plan, then it won't use it, under situations of stress. [The limbic system - at least in this case is the same as the subconscious]. Logic is not the rule maker here. Your subconscious is!

The reason for this is **perception** of fear [and thus risk] by the limbic system part of your brain is what is important here. Unless your amygdala and your limbic system trust that you will be able to get yourself out of a dangerous situation it will do what it feels is the safest thing to do. Even if that action is not the most rational.

A perfect example of that is that people untrained in falling, will rigidly stick their hand out in front of them when they fall, frequently breaking a wrist Yet

someone trained with go into a roll preventing both the damage to the head and also to other parts of the body.

the important thing here is that all this happens BEFORE you even have time to think it through. Many people mistakenly call it reflex training. It is not a reflex because Instincts and reflexes are innate behaviors—they occur naturally and do not involve learning. In contrast, learning is a change in behavior or knowledge that results from experience.

Such actions are in fact learning. But as we learn to fall and practice it our brains intimately recognize that we can do this and have much better results during a fall that sacrificing a part of our body.

The distinction is important because it is based on the fact that your limbic system, call it sub conscious if you want, has to KNOW that something will work.

No matter how many times you do something, if you don't intimately understand what is going on, [not just superficially] then your sub conscious will not rely on it in times of stress

NOW from personal experience, and I admit this is my personal opinion.. Understanding the physiology or what is happening gives my brain and understanding of what is going on. Now I don't mean something like hit this point [especially not TCM acupuncture points!]. Especially if i strike something and don't get hte response I want, my subconscious does not go in to overdrive. It knows that such is probably due to one of several reasons but far more importantly it understands WHAT TO DO ABOUT IT... literally what to do next.

You need to understand that your subconscious can have a WHAT is happening reaction! Because that is exactly what is natural and what will happen if you are in an unknown situation. And it is this - the "I don't understand" reaction of the

subconscious that gets people into trouble, because their brain spends time trying to figure out what is happening, what is wrong, and that is what is called freezing.

We all know that freezing can be deadly. This is why it happens.

SO you have to learn things that give you the WHY of things, which do not go as planned.

And I am a big believer in the saying that **no battle plan survives contact with the enemy**.

So either your subconscious brain understands what is going on, and can allow you to adapt your actions immediately, or you risk freezing.

SO don't blame yourself if it happens. Such is actually a very natural occurrence.. Not helpful but natural.

So my recommendation is to learn techniques but also all the what if situations. But that and it will be next to impossible to learn every possible scenario.

But understanding the physiology of how the body works [and for that I truly believe western medicine gives the best answers] gives your subconscious the best answers to lock on to and allow you to keep executing something to get you our of trouble.

All I can say is that so far, it has worked for me. In both the military and in civilians life

"One of the keys to happiness is a bad memory."

Rita Mae Brown

Chapter 6
Focus, practice and Effective Learning: Learning How to Learn

Ok we have covered a lot of material and by now you should now how to improve your recall …but how do you learn new (especially physical) techniques?

You may have heard that it takes 10 thousand hours to become a master at something … actually this is a myth. To master something it takes considerable QUALITY practice … the hours are not even close to as important as the quality of the practice that we do. 10 thousand hours of poor quality practice will NOT make you a master. All it will do is waste your time!

We also know that quality practice means really focusing on what you are doing, critically examining the weak parts and doing thing (or exercises) that improve our weak points.

So you MUST Focus on what you are trying to learn. Yet No one can focus on a single thing for hours ... [Not the same as reading a book, which traverses a whole collection of new ideas, so you are not simply focusing on one thing]

So the trick is to break up practice sessions into short periods and do you best to focus ONLY on what you are trying to learn or improve. In fact trainers for professional athletes so the same sort of thing but divide the training sessions

Which means you must get rid of distractions if you really want to learn. Turn off that music, your phone and that TV. I don't care if it relaxes you. It also distracts you.

It is a physical skill that you are trying to improve …

Also science knows that to learn correctly you must practice correctly … practicing wrong only builds bad habits that you then have to break. Therefore you should practice slowly, focusing on the details and NOT try for speed until you have the motion down correctly. Then and only then should you try to move faster … you should increase your speed slowly so that you can continue to ensure that what you are doing is correct and not a sloppy adaptation of what you are really trying to do.

BDH: Or learning how to learn

Science has also proven that when we learn something new we grow new spindles (also called receptors) on the nerve pathways in our brain.

This is because when we learn we release a polypeptide hormone in our brains called Brain derived Neurotrophic Hormone (BDH).

BDH not only helps current memory and brain pathways survive it helps the brain grow new pathways (called spindles).

What is important here is that BDH creates new spindles off of already established nerves. It is does NOT create new nerves. The importance of that is that you are basing this learning off of something you have already learned.

So the old saying that you need to be ready to learn something is very true … if you have absolutely no experience to base the new material on it is going to be very hard to get the material wired (so to speak) into your brain.

In the terms of physical skills however since we already have a basis of moving we do have something to base our new learning on… it just takes both understanding of what we are trying to do (the more detailed the better) and practice to get those movements down correctly.

As far as practicing a movement, studies of professional athletes have shown that when we practice something (as in repeat something we already know over and over again) we increase the myelin coverings around nerves that are associated with that movement. This myelin helps nerves transmit faster and more efficiently.

So when we learn something we are actually learning how to learn …

And as a benefit BDH is actually an antidepressant (which lasts a short period) so therefore learning makes us feel better and helps us learn even more new things.

Imagination and Mental practicing

Science has also proven that ONCE you have a skill down you can improve that skill from carefully going through what you are doing in your head. Literally imagining yourself doing the motion and you will gain

Again you MUST have the motion down first and that motion must be correct. Running through the motion in your mind, (especially if you can feel yourself doing it), is almost as good in developing the myelin coating, around the nerves of the brain, as the physical act is. But since it can be done easier than the physical actions. It can be better.

However I caution you to pay attention to details. As we noted in the previous chapter the mind will fill in details that may not be correct if you are not careful.

and learning something wrong means you have to UNLEARN the mistake to learn it correctly.

Therefore – in reality- you can practice several times a day … and as noted above every repetition improves the myelin making that movement better and more efficient.

"If you wish to forget anything on the spot, make a note that this thing is to be remembered."

Edgar Allan Poe

Chapter 7
An IMPORTANT note
About drugs to Improve Memory

We have all tried to use things like caffeine to improve our concentration – especially when are trying to learn something, less than stimulation.

Unfortunately it rarely works like we would like it to …

The reason is not what you might think … because in fact drugs like caffeine and even improperly used Ritalin (improperly because that is NOT what this medication is for!) DO help you focus – Temporarily! But as with using any such drugs, there is always a COST, and I mean besides legally.

So that does imply that they should help ... and in fact they will help you get through the material … however they rarely help test performance (the next day) and in fact frequently hurt test performance.

The reasons are twofold

First: Being awake and focused requires a chemical in our brain called Norepinephrine. But Norepinephrine is stored in our nerve terminals to be released when there is a nerve impulse in the frontal part of the brain that uses it … Caffeine and Ritalin increases the Norepinephrine release so that the nerve impulse get though better … stronger and faster. So far that sounds good.

However, that is also where the problem is. The facts are that we all need a certain level of reserve Norepinephrine in our pre-synaptic Nerve frontal lobe cells of the frontal lobe of the brain in order to be able to think – at any level. And the body knows that. So when we use Caffeine and other stimulant drugs we get the temporary boost by tapping into those reserves at higher than normal levels … but that depletes those reserves. So when the stimulant wears off our body automatically goes into a conservation mode, DECREASING the amount of Norepinephrine released with each nerve impulse. The body is literally trying to rebuild the normal store. This conservation mode lasts far longer than the time we were using the stimulant. [1-3 weeks, not simply hours but it is not a linear process so most of the recovery happens in the first 4-24 hours]

Now we could use the stimulant again to overcome the conservative mode but all we will really accomplish is to bring the level of Norepinephrine levels released, closer up to what they would have been in the first place without ever using the stimulant.

Now NOT all drugs – which act **directly** - are equally as bad! Notice i said directly. Direct action drugs are Far more potent.

Coffee is far better than other stimulants in this regard because Caffeine works IN-DIRECTLY to cause Norepinephrine release [not directly!] This is very important. Thus the body has way to override even fairly large amounts of caffeine and prevent too severe of Norepinephrine reserve depletion but with direct stimulants like Ritalin or other amphetamines there is a direct effect on the pre-synaptic nerves and the body can not override the effects of the drug … meaning you will get significant depletion!

Secondly: It is proven that anxiety can worsen performance … and a side effect of too much Norepinephrine is the generation of anxiety. Thus if you take a stimulant which can cause direct stimulation of Norepinephrine nerves, you will

also produce more anxiety with the increased Norepinephrine release. Whether you actually notice it the increase baseline anxiety will also cause a worsening both recall and performance.

Additionally of course there are the other dangers of amphetamine drug usage - including causing symptoms that mimic psychosis! SO using Ritalin (or other stimulants to "increase" studying is a losing game! You will get the best results from gradual studying, reviewing material repeatedly and proper sleep! This is not controversial for it has been proven.

Conclusion

I hope I have given you at least some usable ideas. AND hopefully I helped you understand why some things happen that you did not plan on. And that if something unexpected happened it probably was not your fault, because some reactions are natural, even if they don't make logical sense

The fact is that the brain is very complicated and we really do not have an actual working knowledge of how memory, nor even of all the different structures in the brain, work. Especially not those that are involved in memory!

However what I have tried to present is a good OVER VIEW. And I hope I have given you some clues on how to improve your own memory.

As memory is something that affects all of us constantly and I suspect that many of you may at some time be involved in teaching others, I hope this manual will also help, help them to accomplish their goals.

Thank you for the time you spent reading this.

May you read this in good health and Peace!

Bruce Everett Miller

bemiller@cloudnet.com