

Chapter 15

The Physics of the Mind Body Connection

In the last chapter, we looked at the four philosophers whose work underlies what I've been telling you; that the mind and body connect through our perception of time. Why begin with philosophy? Because the primary clue to uncovering the actual mind body connection lies in how we psychologically experience this connection rather than in some physical location, such as within our brains. In this chapter of Plain Talk about Talk Therapy, we're going to look at the other end of the psychophysical continuum; the actual laws of physics which underlie these psychological experiences. Specifically the psychophysics underlying audio video recordings and how we technologically sync multiple media sources when we mix them down to one data stream. Did you just go into shock? Not sure where this is going? Don't worry. Just remember. The key to understanding the mind body connection lies not in understanding our physiology but rather in understanding how we experience it. Thus while we are indeed looking for the actual connection, we will not be looking for an actual physical location. Why not? Because there is none. Don't believe me? Let's see.

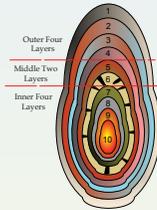
“Let's Get Psychophysical”

As I begin to write this chapter, for some reason the chorus from Olivia-Newton John's 1982 song, “Let's Get Physical,” keeps playing in my head. An-



The Fractal for a Good Therapy (how Emergence Personality Theory defines therapy)

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The Essence of All Good Therapies

Here, the idea is simple. All good therapies get past the Outer Four Layers; Layer 1 (personal non existence), Layer 2 (punishing questions, excuses and explanations), Layer 3 (time limited punishments), and Layer 4 (eternal punishments). They then work with Layers 5, 6, and 7, by contrasting and comparing what people can see (their symptoms) with what they logically know to be true but cannot see (their needs).

Layer 5 here are the symptoms

Layer 6

a block

contrast and compare

Layer 7 where is the need?

A good therapy contrasts and compares the symptoms of Layer 5 with the logically missing needs of Layer 7

noying when that happens, isn't it? The thing is, to some folks, even my knowing this song would indicate that I must be a very old dude indeed. Which I am. No big secret there. What is interesting about this though is that because I am this old, I was alive before a lot of what we're about to talk about was invented. Digital clocks? Sample rates? Certainly not common knowledge in 1982. Even for brainy types like me. And years later, when I was learning this stuff? It felt more mysterious than my former wife's thirty year old forgetting to buy her a birthday card resentment. I did it once. That's all it took. Ah, the mysteries of marriage.

Fortunately for us, by comparison, the mind body connection is a lot easier to understand. Especially if you focus on what we spoke about in the last chapter; on how we *experience* the mind body connection. Rather than on explaining it medically. In other words, to uncover the mechanism of the mind body connection, we need to focus on how we sense this connection rather than on searching for some fabled neurological site. Which is why, in the last chapter, we began our search by exploring how four of the great philosophers sensed this connection.

The four philosophers? Descartes, Spinoza, Herbart and Leibniz. And the four ideas we drew on from their work?

- That human beings have a threshold of perception, a point at which we begin to experience the mind and body (per Herbart).
- That above this threshold of perception, we experience mind and body as separate and distinct experiences (per Descartes).
- That below this threshold of perception, we experience mind and body as two aspects of one continuum (per Spinoza).
- That our perception of time is what connects our conscious awareness of these two experiences (per Leibniz)

Granted, stating this last idea as I have is a bit of a stretch; Leibniz actually never actually mentioned that we perceive two senses of time. Only that our having two clocks is a good metaphor for how the mind and body connect. Even so, it appears that Leibniz may have been the only person to make any reference at all to that the mind body connection involves our perception of time. Thus my including him and his ideas.

What will we be looking at in this chapter? As I said, we're going to get psychophysical. In other words, we're going to build a mind body bridge between the philosophical ideas of these four great men and the laws of physics underlying twenty first century digital recording. Specifically the laws underlying

digital audio and video recording whenever different audio video streams get combined into a single presentation.

Does this sound like it's going to be hard to understand? Don't worry. We're only going to explore three simple situations. One using 1950's tape recorders. One using 2007 television studio equipment. And one using us. Moreover, with the two technological examples, we're only going to explore the parts of these situations which involve syncing separate pieces of playback equipment together in time.

The three real life situations?

- **No Master Clock.** We're going to look at how recording engineers in the fifties on rare occasions tried to manually sync the output from two tape recorders so they could combine these two sources onto one master tape. By hand. By trial and error. The point here will be to offer you an example of how our two internal clocks function in everyday life; our minds and bodies free wheeling with no master clock to sync them together.
- **Digital Master Clock.** Next we're going to take another look at how digital systems work. This time in a modern television studio. Beginning with a quick look at how things get to be digital. Followed by a look at how the big boys do digital; how digital recording studios manage to sync together dozens of physically separate devices. The point here will be to show you how today's digital systems, DVD players to whole television studios, sync physically separate playback devices to a single external master clock. Which is what happens to us whenever we are in the presence of great beauty; the beauty we experience becomes the master clock.
- **Life as the Master Clock.** Finally, we're going to look at how the psychophysics of time within these two technological situations mirror what we experience in our minds and bodies in everyday life. First, when we "free wheel" with no master clock. And second, when our minds and bodies sync up and mix into one vivid experience. Just like what happens to playback devices in television studios when they broadcast it all as a single show.

What is my goal in all this? To give ordinary folks a way in which to grasp how our minds and bodies do and do not connect. As well as an understanding of what makes me so certain that what connects our minds and bodies is our perception of time. Both within ourselves and between us and others; mind to body and body to mind.

Before we begin this journey though, I need to first clarify something, by addressing one of the potential snags in this whole concept. What snag? That current mind body research assumes that by mapping specific physical locations to what we do, say, and feel, that they are locating the mind and body connection. What am I saying? That while the ongoing neurological discoveries regarding how cognition and neurological brain functioning seem to overlap are indeed fascinating, nothing discovered so far even begins to prove a connection between the mind and body. It proves only that coexisting activity occurs.

In other words, while current brain scan research *suggests* mind body connections, in truth it proves only that some psychological things *happen at the same time* as some physical things. Nothing more.

Thus, while fMRI's and SPEC scans can now show connections between certain human activities and experiences and increased or decreased blood flow to certain areas of the brain, none of this research shows how the physical experiences of the body connect to the non physical experiences of the mind. Unless, of course, our physical bodies are what create our minds. In which case, this research does reveal the mind body connection.

Does it though? Not really. And to see why I say this, consider this. Consider how, when researchers and scientists assume this coexisting activity suggests they are mapping the mind body connection, the unspoken assumption beneath their statements is that our bodies create what our minds experience. This assumption, in fact, is one of the major philosophical viewpoints underlying most current medically based research. The thing is, despite claims made by these researchers that their research is scientific, by not mentioning this assumption, they skew the opinions of all those reviewing this research. Ergo the leaps frequently made by untrained news reporters regarding the implications of this research.

Are they right though? Does the body create the mind? To see, we'll need to take a moment to explore this assumption. How? By turning to yet another a group of philosophers and specifically, to the view point known as materialism; the idea that mental events are causally dependent on bodily events.

Ironically, were the scientists who unknowingly espouse this view point to know of it's controversial beginnings, in the writings of Julien Offray de la Mettrie (1709-1751) for instance, they might seriously reconsider. In his book, *L'Homme Machine*, Mettrie suggests we are all just human automatons. And while this viewpoint obviously falls far outside of what most medically oriented researchers believe today, Pierre Jean Georges Cabanis' (1757-1808) interpretation of Mettrie's work does seem to state their view point pretty well. Cabanis wrote , "*to have an accurate idea of the operations from which thought results, it is necessary to consider the brain as a special organ designed to produce it, as the stomach and intestines are designed to operate the digestion, the liver to filter bile . . .*" (Rap-

ports du Physique et du Moral de l'Homme, 1802)

Does this at all sound like what underlies most of today's neuroscientific research? Indeed. Thus while these researchers claim scientific foundations for their work and conclusions, unless they can prove what we experience in our bodies occurs on a psychophysical one way street leading to our minds, their work, as exciting as it is, falls far short of explaining how the mind and body connect. Or anything else, other than coexisting activity.

So do any of these researchers admit they make this assumption? In my many searches, I have yet to find a single mainstream neuroscientist who openly admits they assume this let alone one who takes seriously the idea that what they are really researching is the mind body connection. It seems, to admit to this in print is tantamount to admitting the sin of researching forbidden questions. Or at least, admitting your research focuses on questions deemed quackery by the scientific community at large.

Note what they are calling "quackery" here. Not the search for these connections, mind you. Rather, the phrase itself; the mind body connection. Thus, if you do the research but do not mention this phrase, you can somehow squeak by the Cerberus of science.

This prejudice aside, the thing to realize here is that there are many philosophical positions with regard to whether the mind and body do or do not connect. Not the least of which is the one Descartes observed; that we experience the mind and body differently and that they both interact. Moreover, while science, and psychology, can point to times wherein our minds play tricks on us, this is not one of those times. How can I be sure? Because the position I'm suggesting here goes far beyond mere philosophy and or scientific observations of concurrency. It's already helping people. Many of whom are among the most conscious folks I know. Including that they regularly and frequently question everything they see. Openly and honestly.

For instance, take Kristin and Allen. Kristin is a music therapist and a teacher in my Emergence Master Teacher's Group and her husband Allen teaches kinetic language among other things. Signing and such. And sadly, a few days ago, their eight year old daughter fell off a boat and hit her head on the boat propeller. Which then sliced through her jaw and skull.

That she lived is a miracle. One of many unexplained acts of kindness and beauty which occurred in the Universe that day I'm sure. But that she is recovering at a rate far in excess of what the hospital staff is used to is quite another thing entirely. Moreover while the hospital staff admits being at a loss as to how to account for why she is recovering so quickly, we know it is the love and support she's receiving. Especially from her mother and father, Kristin and Allen.

When mention this? Because yesterday my friend and fellow teacher Ed

and I drove to Rhode Island to visit the three of them. And in the pediatric intensive care unit, while standing within feet of their semi conscious daughter, Kristin and Allen spoke to us about how the idea of Mind First / Body First connection has already affected their marriage. Including that it has affected their ability to connect to each other in this deeply emotional time.

To say this deeply affected me is to put it mildly. I, the consummate lover of words, am still at a loss as far as how to express the love I saw there. Husband and wife love. Mother and father love. Family and hospital staff love. So many pictures of love. Many of which existed long before these mind body discoveries. Even so, that Kristin and Allen could so consciously express this love in the face of such a tragedy amazes me. Which makes me think and feel that if the only contribution these discoveries made was to their daughter's well being, it would still be worth my efforts.

Of course, this is not the only family being affected by what I'm positing here. In fact, even now, only weeks into having made these discoveries, a number of other families are reporting similarly increased abilities to connect. To each other and to those outside their relationships. My point? How many researchers can claim their work has accomplished this beauty even once? Moreover, of the folks who do believe in the mind and body connection, how many can make what they practice accessible to ordinary folks?

What follows is the physical science behind these admittedly grand claims. Please know these ideas are but one piece of the mind body puzzle. Still, when you combine this piece with what we looked at in the last chapter, we have the underpinnings of a great discovery. The actual mechanism of the mind body connection. Not the locality of it, mind you. There is no such thing. Rather the experiential substance from which this connection is made. Our physical and mental perceptions of time itself. And how these two perceptions do and do not sync up.

Ready for part two? The physical part of the psychophysical connection between mind and body? Here we go.

Old School Recording Studios - No Master Clock

Let's start with the easiest of the three situations to imagine. The old school 1950's recording studio. Back then there were no computers nor digital effects to contend with. Not even multi track recorders. Nothing but a few microphones to take in the sound. A small mixing console with which to mix these few mikes down to a single stream. And a reel to reel tape recorder on which to record this single stream of sound which would ultimately become a vinyl record.

Of course, even back then, musicians had dreams. Some of which included being able to add more instruments to a finished track after the performance.

Maybe a piano, because there had been none in the original studio. Maybe strings from the huge hall miles away. Or perhaps some backing vocals which the arranger thought of only after the recording was done.

Whatever the case, things like this which today are done all the time were literally next to impossible to do back then. Why? Because the tape was full. You couldn't add to it. And because even if you were to record a piano in another recording studio, and even if this second recording, in theory, matched the tempo of the first recording perfectly, it was next to impossible to get two physically separate reel to reel tape recorders to play back in sync. You could do it. If you did divided the tape into multiple pieces. But even this was purely a hit and hit deal. Trial and error. A next to impossible feat.

Did engineers ever attempt this? On rare occasions, yes. And being as crazy as I am and that I owned a recording studio in my youth, on one or two occasions, I attempted this myself.

What was it like? Well picture two reel to reel recorders both ready to play back with their outputs mixed and feeding a third. Similar to the three reel to reel recorders I drew in this chapter's drawing. Of course, the goal here was to make a composite of the two original tapes, a master tape which blended what had been played on the first recording with what had been played on the second.

The trick of course was getting these two physically separate recorders to play back in sync. How exactly did an engineer go about doing this? First, by literally measuring and marking these tapes with a white grease pencil so that you could physically line up the starting points on both these tapes. And second, by lining these marks up at exactly the same starting point on both recorders. Some measured distance before the exact center of the playback heads.

So far, so good. The two tapes are lined up. But now someone had to hit the play buttons on both machines simultaneously. And if you were lucky enough to have the play buttons of the two recorders within arms reach, one person could do this.

Definitely, a plus.

If not, then you had to get two people to push the two playback buttons at exactly the same time. A process which involved count downs and multiple tries. And many answered prayers.

For our purposes though, imagine that the engineer can reach both play buttons. And that he has already hit the record button on the third recorder. Everything is set, right? Not exactly. You see, even the finest tape recorders, then or now, cannot physically move tape in sync with another tape recorder for more than fifteen or twenty seconds. Not without an external source of time code that is. Why not? Because these recorders moved tape at a rate of fifteen inches per second. Thus asking two physically separate machines to stay in sync

for the length of a whole song, say, for three plus minutes, meant they'd have to move roughly 3225 inches of tape across the play heads of two mechanically separate recorders without audibly drifting apart.

How close in time would the two tapes have to be so as not to have audibly drifted apart? Well if we are talking fifteen inches of tape per second, one inch difference would amount to about 67 milliseconds of time difference. And for those for whom this number means next to nothing, we humans start to hear sounds echo problematically at about 50 milliseconds difference. Less than an inch of difference in the playing time of the two tapes.

The point is, no two recorders could "free wheel" and stay in sync beyond fifteen seconds or so. So what would engineers do? They would record the fifteen or twenty seconds of tape they could sync up. Then they would start this process all over again from a new starting point. Again and again and again. Until finally, when they had a whole songs worth of synced up pieces, they would cut and splice these pieces together into one final mix. Which would then become the master tape.

Does this sound like something no one would do today? Well consider this. Any DJ who mixes vinyl from two turntables faces the same free wheeling problem. As do DJs who mix together two DVD players.

Are you still having a hard time visualizing what these free wheeled sync processes are like? Well try this. Try visualizing two old fashioned mechanical stop watches. One in each hand. Now imagine you press the start buttons on both watches simultaneously so as to get them to count time in perfect sync. Could you do this? Perhaps. But not easily. You see, the little mechanical imperfections and whatever differences in your pressing the start buttons would continuously add up over time. To what? To two out of sync stop watches.

Why make you go through all these situations? Because we all have the equivalent of two mechanical stop watches inside of us. Two perceptions of time. Moreover, similar to trying to manually sync two free wheeling tape recorders in 1955, syncing our mental and physical perceptions of time for any length of time is never going to happen. At best, we can, on our own, maybe get these two perceptions of time to run in sync for a few seconds. Similar to what people could do in 1950's recording studios.

Do our minds and bodies ever run in sync then? Actually, they do at times. Albeit not from anything we ourselves usually do. Rather, to have this happen, we need something external to us to act as a master clock. Something extremely beautiful mostly. Or at least, something we feel surprised by.

Before we look at how this happens though, we first need to look at how present day digital technology mirrors these experiences. Specifically the technology which now allows us to sync together dozens of physically separate

digital devices, so well in fact that they appear to all have been recorded in the same event.

How does this happen? We're about to take a look. Starting with a quick look at how we digitize what we see and hear. What does it mean to say something is digital? Not a digital watch mind you. Digital video and audio. And no. I'm not going to dredge you through the whole complicated mathematical mess. Only the very basics.

How We Digitize What We See and Hear

This second story; how professional digital audio studios record things, may initially seem a bit more complicated. But don't worry. The ideas behind digitizing sound are actually quite simple. Especially if you ignore the technical parts of the conversion process and focus only on the three ideas we need to know here. First. How the digital devices called A to D converters (analog to digital converters) *break* the sound you hear into manageably sized chunks of digitized data. Second. How these A to D converters *know when to break* sound into manageably sized chunks of digitized data. And third. How the physical devices which store these streams of digitized sound *know when to move* on to the next manageably sized chunk of digitized data.

Let's start with the first idea. How A to D converters *break* sound into manageably sized chunks of digitized data. How do they do it? Simple. They take snap shots of whatever they are recording and store them as separate chunks of zero's and one's. Something like digital Polaroids only they develop much faster.

The thing to know here is that these separate chunks of data are called "samples." And the part of the converter which creates these samples is called the "sampler."

Now the second idea. How the samplers in A to D converters *know when to break* sound into manageably sized chunks of digitized data. How do they? It's simple. The samplers in all A to D converters receive their orders from a clock signal. This clock signal tells them that it's time to take the next snap shot. Moreover, these clocks are very, very fast, indeed. The sound on CD's for instance is sampled at a rate of 44,100 times per second. And DVD audio is sampled at rates up to 192,000 times per second.

These numbers; 44.1k and 192k, are called the "sample rates." (Here, the "k" part is short hand for 1,000.) And basically these numbers refer to how many digital snap shots the sampler takes in any given second.

All that in one second. Imagine. That's a lot of samples. Yes? Fortunately, our technology has evolved to the point wherein these sample rates are now common. Imagine that.

And the last idea? How the physical devices which store these streams of

digitized sound *know when to move* on to the next manageably sized chunk of digitized data. This time, the answer is a bit more complicated. You see, all digital sound recorders involve physical movement. Thus they all must record a reference to where they were in relation to each of these digital snap shots.

Thus all current digital recorders, whether tape or hard drive based, store two kinds of data. The snap shots based on the sample clock and the time code reference to where each sample was recorded.

Two senses of time. The timing of how fast the snap shots were taken and the clock time of when we took these snap shots. And in a very real way, these two senses of time very much mirror our two internal senses of time. How? We're about to see. Remember to go slow here though. And try to picture what I'm telling you as two separate ideas.

The Sample Rate Clock (our mind's sense of time)

The sampler in the A to D converter simply takes digital snap shots every time the sample rate clock tells it to. Moreover this process is analogous to how our minds sense time. We sample life constantly. With all of our senses. Of course, in our case, the rate at which we sample is not determined by a sample rate clock. Rather, the rate at which we sample life varies depending on our sense of need. Thus if we feel life as if we are driving a race car, then we sample as fast as we can. And if we feel life as if we are sitting on a porch on a sunny day, then we sample life at a slow pace.

Can you see the difference here? A to D converters sample at a constant rate, a rate determined by a sample rate clock. And while this clock sometimes physically exists within the same box as the sampler (as in the case of home DVD players), at times, it can also exist in a separate box.

Either way though, with A to D converters, the sample rate clock is what tells the sampler when and how fast to sample. And this rate is always a constant. Never a varying rate.

We on the other hand do not have sample rate clocks built into us. Certainly nothing analogous to the technology we are talking about. Nor do we normally have in our lives what amount to external sample rate clocks. At least not in our everyday lives.

In a sense then, our the rate at which we sample life free wheels to whatever speed seems appropriate to us in the given life situation. Which by the way is what enables us to sense that time is changing. We sense only what changes in what we sense. No change. No sense of time passing.

Having a hard time believing this? Try staring at an object, such as the end of a pen. Or at one of your finger tips.

Now do your best to neither move this object or your eyes.

Now watch what happens.

If you do this for long enough, what will happen is that what you are looking at will begin to visually dissolve. It will literally begin to become invisible to you.

If, at this moment, you then move the object, it will immediately snap back into focus.

My point? Change is what makes us conscious of what we are sampling. No change. No consciousness. Which is one reason why our eyes constantly move. Faster in dangerous events. Moreover, by free wheeling the rate at which we sample life, we can stand still and still sense time. Why? Because we can stand still and still sense change.

The Time Code Clock (our body's sense of time)

When I was learning digital systems, this second sense of time was the one which stumped me. Why? For some reason, I found it easy to imagine a sample rate clock saying, "next sample please." But a separate clock for the recorder? Why a separate clock?

To see, consider this. Most things which record audio and or video *physically* move while recording. Thus, digital recorders must record both what they sense and when they sensed this data.

This means the data they record must include two types of data. A sequence of equally timed samples and a reference to when, in life, these samples were each taken. In other words, both the samples themselves must be recorded, as well as a recording of how clock time passed as these samples were taken.

Still having trouble seeing the difference here? Then realize that the sample rate clock times *electronic* activity; it tells *electronic* things when to repeat an action. However, the time code clock tells *physical* things where they were physically when these samples were recorded. At the starting point. Two minutes into the recording. Or many hours into the recording.

Can you see the difference yet? No? Then let's try to relate these two technologies to something we human beings experience. How we ourselves sense time. Starting with that we sense time in two ways too. One, as what tells us the rate at which the present moment is passing. And two, as when in our lives we are doing this noticing.

In other words, with the first sense of time, we know how quickly or slowly we are doing something. The speed at which our life is passing in this particular moment. And with the second sense of time, we know how long we have been engaged in trying to sense these moments passing. Something like clock or calendar time only with no fixed starting point.

Still having trouble seeing this difference? Try imagining this. Try imagin-

ing that you are at a football game. A play off game. You can see this difference as the difference between how quickly we sense the game is being played and how long we have been at the game.

Now let's say we've been at the game for hours now. And at this point in time, the seconds are counting down to the final buzzer. How fast would you sense these seconds?

If the game were tied, we'd sense life passing by very quickly. And this would be how our minds would sense time. In other words, in these final seconds, we'd have no sense of clock or watch time. Only a sense of the speed at which the game is ending.

And in the next instant? In the moment right after the buzzer sounds, when we suddenly remember we need to hurry to get to our cars in order to beat the rush out of the parking lot? How fast would we feel time was passing then?

At this point, we would feel clock and watch time. Physically. In our bodies. Most of us, very acutely in fact. Especially if you were standing in a slow moving line and worried you're going get stuck behind hundreds of physically slow moving cars. Even have that happen? I have. Whew!

The point here is that we have two ways we sense time. Both analogous to some part of a digital recording studio.

One. We have the equivalent of sample rate clocks inside us, and this is roughly analogous to how our minds sense the speed at which the present moment is passing. And two. We have the equivalent of time code clocks inside us, and this is roughly analogous to our physical sense of time. Our sense of how long we have been sensing time passing.

These are the two ways we sense time. With our minds, as a sense of how fast this moment is passing, and with our bodies, as a sense of clock and calendar time. As such, they are the essence of the mind body connection, which in fact, does and does not exist based entirely on how well these two sense of time sync up.

How We Sync Up Digital Equipment So It All Makes Sense

Now we're going to look at how engineers in television studios synchronize different digital devices. DVD's to flat screens. HDTV cameras to digital video recorders. And so on. And to be honest, regardless of how many pieces of digital gear we are talking about, the underlying principles are all the same. Play back one sample. Then move to the next. All starting from the same physical starting point.

To see how this happens, let's imagine the simplest example. The one

which occurs in most peoples' homes each and every day. The play back a DVD example.

Where's the television studio? It's right here. You see, even though what is in your living room is no where near as complicated as the gear in a television studio, most of what happens is the same. Except, of course, that it all happens in only two or three physical boxes. What I mean is, while television engineers have many processes to synchronize, our DVD players and flat screen TVs do much the same thing only in less physical space. And with fewer pieces of equipment.

For example, say you have a DVD player and a flat screen TV. Both these devices are digital devices. In other words, both these devices process digitally sampled video and sound. The thing is, in this case, there is only one device which physically moves things. The DVD player. The flat screen moves nothing physical and only turns dots on and off. Remember? Electrical movement? Similar to how our minds work.

In this example then, we have no need for a time code clock. Why not? Because there is only one device which physically moves something. Thus, there is no need to synchronize anything physically. There is one box which moves things physically, so there is nothing to physically sync up.

What about the samples then? Do we need a sample rate clock to play back digital recordings? Yes. And if you were to see what was being transmitted inside the digital cables which connect your DVD player to your flat screen TV, you'd find the same two kinds of data we've been talking about. The samples themselves, and a sample rate clock signal.

Why transmit the sample rate clock signal from the DVD player to the flat screen? Because the DVD player and the flat screen TV must both play back the samples at the exact same rate and at the exact same time. In other words, they must both do the same dance, the old one, two. One. Show a sample. Two. Move to the next sample.

And if the sample rate clocks in these two devices are not in sync?

Then what you see, hear, or both is in some way compromised. Sometimes, you hear no sound. Sometimes, you see no picture. And sometimes the sound or picture stutters forward or gets distorted in some way.

When does this happen? Whenever you turn the DVD player on before the flat screen. Not always mind you. Mostly not. But often enough for most folks who have flat screens to have experienced this. At least once or twice.

What makes this happen? The idea that in all digital playback situations, there can be only one master sample rate clock. All the rest of the sample rate clocks must then slave to this one master clock.

Where's the master clock in the case of DVD players and flat screen TVs? It's in the DVD player. Which means the clock in the flat screen TV must slave to this master clock in order to be in sync.

The thing is, in order to do this, it's best to have the slave clock waiting before you turn the master clock on. In a sense then, flat screen TVs are only too willing to slave their sample clock rates to any master which sends them a clock signal. However, for this to happen correctly, it's best to have the flat screen on and waiting rather than turning it on in the presence of an already on master clock.

Did I just confuse you again? Sorry. If so, try picturing this. Try picturing that the flat screen clock is like a three year old at nap time waiting for you to come and carry him to the car. You come, pick him up, and carry him to the car. Easy. Now picture doing this only you are already walking to the car and the three year old needing a nap has to rush to catch up to you. Not so easy.

Flat screens are like three year olds at nap time. And DVD players are like parents who must first pick up this three year old and carry him to the car.

Now let's look at how whole television studios do this. Here they have to synchronize dozens of physically separate devices, some of which only issue electronic orders, similar to how flat screens order dots on and off, and some of which must physically move things in sync with each other, such as the tapes or hard drives inside of progressive scan video cameras and digital editing stations.

In this example, we need to control both senses of time. The sense of how fast life is passing now (the sample rate clock) and the sense of how long we need to be playing back the life we sensed (the time code clock). In other words, we need both an electronic sense of time (which is analogous to our mind's sense of time), and a physical sense of time (which is analogous to our body's sense of time).

Because we have two sense of time here, we must have two master clocks. One master clock for each of these two senses of time. Thus television studios have both a master clock for synchronizing when all the electronic devices sample time (mental time) and a master clock for when all the physical recording and play back devices physically move in time (physical time).

So what happens if one of these master clocks screws up? Well, if it's the master sample rate clock, then the sample rates of all the equipment will vary randomly. Result? All the problems I mentioned a moment ago; no sound at times, no picture at times, and distorted and or stuttering picture and or sound.

And if it's the master time code signal that has problems? Then the various cameras and digital mixing stations would all be physically free wheeling. Just like the 1950's tape recorders I told you about. Imagine the mess that would

create? The pictures and sounds you saw would all be out of sync with each other. Just like what used to happen in a badly edited movie, wherein the audio did not match the actors lips or the scenes changed abruptly.

So are you beginning to see how these two sense of time being out of sync can create problems in us? Everything from stuttering and distorted recall to not knowing we are eating and not being aware we are hurting ourselves with drugs.

How We Experience these Two Clocks in Everyday Life

Now welcome to the big moment. How all this applies to how we human beings experience life. Body to mind. And mind to body. Within ourselves. And between ourselves and others. And between us and life itself. Such as in the big moments like when we see things like the Grand Canyon for the first time. Or the face of a just born newborn baby.

Know we're only going to touch on this idea briefly at this point. Why? Because there is far too much to tell you about to include it all here. And because I've already given you more than enough information for one chapter. Which means you'll have to wait until the next chapter to see in detail how all this plays out in real life.

Before we end this chapter though, I want to give you a taste of what is to come. Not the "how it happens" stuff. Just the "what it is like when it happens" stuff. A couple of real life examples.

Example one. How our sense of time affects how we eat.

Example two. How our sense of time affects how we talk.

Example one. How our sense of time affects how we eat.

In this example, we are normal. Meaning, our two clocks are free wheeling. Mind to body wise. Now let's look at how our free wheeling clocks affect our ability to eat. Starting with a person whose mind clock is running ahead of his body clock. What is it like for a Mind First person to eat?

The best way to see how this feels is see our mind and our body as the two over tired children again, both waiting for a parent to come and pick them up and carry them to a car. Only in this case, there is no parent. At least, none in sight. Impatience then provokes the older child to start walking to the car on his own. And because we are talking about the mind being the older child (Mind First, remember?), the younger child (the body) has to try to catch up.

Just as in real life then, the younger child will have to really run to catch up with the older child. And often, because of how fast the younger child is going, she'll overshoot her older brother and pass right by him. Which again puts them both out of sync with each other, only this time, in the opposite direction. Body

first instead of mind first.

We experience the same thing, only in our minds and bodies. And while none of us has what might be analogous to twin children, even if we did, even twins are born one after the other. Never simultaneously.

The point is, if we are talking about how a Mind First person eats, this is like the sample rate clock trying to run the time code signal. Our minds may sense how fast we are eating, but not how much we have eaten.

And if we are talking about a Body First person eating?

If we are talking about how a Body First person eats, then her body clock may well sense how much she has eaten, but not the rate at which she is eating.

What does this do to how we ourselves experience eating? Well, if you are a Body First person, you may find yourself remarking on the rate at which Mind First people eat. Usually it will seem fast to you. At the same time, these Mind First people may remark to you, the Body First person, how much, or how little, you have eaten. Usually how little.

What's the fractal here?

Are you a Body First person? Then you see the rate at which people eat but not how much. Are you a Mind First person? Then you see the amount people have eaten but not how fast.

By the way, can you see how this makes Mind First people very similar to the younger child in our story, in that they must rush to catch up but frequently overshoot the mark, by eating way more than they intend.

This is the essence of all overeating. No motive. Just plain psychophysics.

Example two. How our sense of time affects how we talk.

Rate and amount. The two ways we sense life passing. Rate being analogous to our mind's sense of life, and amount being analogous to our body's sense of life.

How do Mind First people talk? Usually similarly to how they eat. At a fast rate and overshooting what they intend to say.

And Body First people? Body First people also talk similarly to how they eat. At a slow rate but with no idea of how much they have said.

Beginning to get a clue as to where all this is going? To be honest, even I am having a hard time at this point imagining all the possibilities. And I am the one who has made this discovery.

What I'm saying is, if you got lost somewhere along the way in this chapter, please try rereading what you've just read. Before you do though, ask yourself this.

Are you a Mind First person ? Then slow down the rate at which you read.

And if you are a Body First person? Then don't try to read everything in one sitting. You'll overestimate how much your mind can take in and end up blankly staring at the page.

Either way, please, do not blame yourself. Or me either. Why not. Because as they say, timing is everything in life. Thus if you consciously manage your sense of time as you read, you'll take in a whole lot more.

This Chapter's Session Notes

One again, we've discussed a whole lot of stuff. In fact, we've discussed what seems to me to be an incredible amount of stuff. Which can make some Mind First folks feel like it's all too complicated to actually understand. And some Body First folks feel like it's just too much to take in.

In reality, it's neither. Too complicated nor too much. And if you remember that all what we have been speaking about here is just the two normal states in which our mind and body clocks can be in, you'll realize that underneath it all, it's really simple. We have two normal states of the mind body connection. Not all that many to understand really.

Of course, how these two states play out in real life is incredibly complicated to say the least. Thus, in the next chapter, we're going to begin to look at how being in these two states affects how we can and cannot connect to things in life. One. By synchronizing our minds to the rate at which we take these things in. And two. By synchronizing our bodies to the amount of what we take in.

In other words, what we'll begin to explore in the next chapter is how the rate at which we sample life and the amount of life which we sample affects our ability to consciously sense these two experiences. And in doing so, have happy and healthy lives.

What I also hope to do is to tell you about the third and final mind body connection state. The one wherein we our minds and bodies sync to an external master clock. In which case, we experience the events we commonly call, "aha's" or "eureka's." The amazing life changing, sudden realizations wherein the person we knew ourselves to be becomes different for life.

How does all this relate to talk therapy? It's simple. Imagine having a key which could unlock the nature of everything we address in therapy? Not the solutions mind you but the key to understanding where to look for these solutions? Can you imagine?

Then there's the other thing which this third mind body state reveals. The thing to which all talk therapies aspire. Therapeutic breakthroughs. Imagine knowing how these occur?

Before we go, let me briefly list once more the three mind body connection states I've just mentioned.

- One. We spoke about the state in which our mind clock is running ahead of our body clock. Fast talking, fast eating, fast draw McGraw. In other words, silver tongued devils with mercurial minds. The mental geniuses in life.
- Two. We spoke about the state in which our body clock is running ahead of our mind clock. Slow talking, slow eating, Mechanical Mike. In other words, the jocks, tech's, and master musicians of life. The physical geniuses in the world.
- And third. We spoke, briefly, about the magical mystery state wherein our mind and body clocks both run in sync. Synced to some external life event. Such as to a beautiful event, like witnessing a baby being born, or to a significantly unexpected event, such as when we hit the lottery. Or crash a car. Or get a Dear John letter. Or lose our job.

In the next chapter then, we'll look at all these situation in more depth. And at how our syncing, or not syncing, our mind body clocks to external people, places, and events is what creates our entire experience of life. The good. The bad. The ugly. And all the rest.

Until the next chapter then.

I hope you are well,

Steven

