



## Basic Memory Phenomena, Explicit and Implicit Memory

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### Summary:

- I. Memory Aspect of “Mind Before Brain” (Autobiographical Memory Stored in the Mind)
- II. Multiple Parallel Memory Systems
- III. Explicit Memory vs Implicit Memory

Start lecture with first step of “priming” memory system demonstration: Present slide with 10 words, including “octopus.” Ask audience to simply look at them for 1 minute. Specifically request that they *not* write them down – just look at them.

### I. Memory Aspect of “Mind Before Brain” (Autobiographical memory stored in the mind):

As is carefully discussed in “Mind Before Brain: The Big Picture,” we believe that the mind is a psychological phenomena that uses the biological brain as a servant, but that is ultimately above, outside of, and more primary than the neurophysiological phenomena in the biological brain.

When studying memory phenomena, one of the foundational questions is whether some component of memory phenomena is carried in and/or handled by the mind, or whether all memory phenomena are mechanical processes of the biological brain.

My current assessment is that the memory phenomena discussed below are incompatible with any current brain biology theory. There is no way I can think of that our biological brains – the storage of information in synaptic modifications in the neural network – can account for these phenomena. On the other hand, I think this data is consistent with the *core/most fundamental memory engram* being carried in the non-biological *mind*, with the memory research focusing on the biological brain, and the cognitive psychology research focusing on “normal” patterns of learning and forgetting, applying to the *retrieval system*. Therefore, my tentative hypothesis is that the biological brain provides the retrieval system machinery, but that the core engram is carried by the non-biological mind. All the processes that impair memory by affecting the biological brain damage the machinery and/or “smudge” the information needed for retrieval, but do not affect the actual memory engram carried in the mind.

Memory phenomena/data indicating that the core autobiographical memory engram is stored ultimately in the non-biological mind:

Early pregnancy (pre-brain) memories: If the core engram is carried in the biological brain, then a person would not be able to have any memories before the brain forms in development. However, some people seem to have memories from early pregnancy – sometimes so early that the biological brain would not even have begun to form.

Precocious *autobiographical* memories: If brain biology was the ruling consideration, a person could not store any autobiographical, narrative memories until the hippocampus is sufficiently myelinated – by 18 months to two years at the very earliest, and usually not until three or four years of age. However, in certain unusual situations, people seem to have narrative autobio-

graphical memories as early as infancy, pre-birth, and even to the time of conception. Note: it's not clear whether these memories have the same subjective quality as explicit autobiographical memories, or whether they are something else – a mind/spirit phenomena qualitatively different than explicit memory.<sup>1</sup>

Memories from an “out of body” perspective: In out of body experiences, the mind is observing and recording memory material (*accuracy of content corroborated by others*), from a perspective that would be impossible for the biological brain to obtain. For example, events that occurred in another room, or even another building, during the out of body experience.

Memories of events while clinically dead: In the carefully studied and documented phenomena of near death experiences, the mind is present, and laying down clear, detailed long term memory material (*accuracy of content corroborated by others*), during times when the subjects were clinically dead and the biological brain disabled/inactive/off line.

Pre-death episodes of normal memory and cognition in severely demented patients: I have read a number of case studies/anecdotal accounts of patients with severe dementia who displayed sudden return of normal memory and lucid cognition for moments/minutes immediately before death.<sup>2</sup>

Memory prodigies:

“Blind Tom” displayed astonishing musical abilities in spite of being nearly blind, mentally retarded with respect to most cognitive functions, and without musical training other than listening to others perform. At 11 years of age, he demonstrated the ability to perform 33 pages of complicated original<sup>3</sup> music, without error or apparent effort, after hearing it played once.<sup>4</sup>

A.R. Luria, the Mnemonist: The famous Russian psychologist, A.R. Luria, studied one memory prodigy over the course of almost 30 years. This subject had “photographic” recall of numerical tables – he could “see” remembered numerical tables in his mind with such clarity that he could “read” the numbers in any direction/combination, even 10-15 years later,

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<sup>1</sup> We would like to collect careful descriptions of cases with early autobiographical memory, in order to clarify the details of this phenomena. If you have had this kind of experiences, or know of others who have, please contact me at [drkarl@kclehman.com](mailto:drkarl@kclehman.com).

<sup>2</sup> I encountered these accounts somewhere in the last 30,000 pages of material I have read, but can't remember where. If anybody has had similar experiences, or knows references for these accounts, please contact me at [drkarl@kclehman.com](mailto:drkarl@kclehman.com).

<sup>3</sup> A team of professional musicians, skeptical that his public demonstrations were somehow contrived, wrote two pieces of original music – 13 and 20 pages in length – for the explicit purpose of “testing” Tom's purported ability to perform a composition after simply hearing it performed once.

<sup>4</sup> Treffert, Darold A. *Extraordinary People: An Exploration of the Savant Syndrome*. (New York: Harper and Row), 1989, and Seguin, Edouard. *Idiocy and Its Treatment by the Physiological Method*. 1866. Reprint, (New York: Kelly) 1971 as cited in Sacks, Oliver. *An Anthropologist on Mars*. (New York: Vintage Books) 1995, pg 189.

and in spite of thousands of similar exercises during the intervening time).<sup>5</sup> After almost 30 years of careful, systematic study of Sherashevsky's memory, Luria comments: "It was impossible to establish a point of limit to the capacity or the duration of his memory,..." (Page 61), and "Experiments indicated that he had no difficulty reproducing any lengthy series of words whatever, even though these had originally been presented to him a week, a month, a year, or even many years earlier." (Pages 11&12)

The neurologist Oliver Sacks describes twin brothers, who have baseline IQs of 63, but also extraordinary memory abilities. John and Michael can describe the general public events they would have heard about, the weather, and the tiniest visual details of their own personal experience for any day of their lives. They also appear to possess an unlimited digit span.<sup>6</sup> "And if you ask them how they can hold so much in their minds – a three-hundred-figure digit, or the trillion events of four decades – they say, very simply, 'We see it.' And 'seeing' – 'visualizing' – of extraordinary intensity, limitless range, and perfect fidelity, seems to be the key to this."<sup>7</sup>

Robert Evans, an amateur astronomer in Australia, demonstrates phenomenal, "photographic" memory: "Evans single-handedly, with a small telescope, observed the incidence of supernovae in a sample of 1017 bright galaxies which he observed for a period of five years. ... Evans used no photographic or electronic assistance, and thus seemed able to construct and hold in his mind an absolutely precise and stable image or map of more than a thousand galaxies..."<sup>8</sup>

Amytal interviews: Darold A. Treffert, M.D., a psychiatrist who has studied memory prodigies extensively, comments about a similar extraordinary memory phenomena that he often saw in the context of amytal interviews used to help access repressed and/or dissociated memories: "In those interviews, patients recalled in extraordinarily minute detail, a whole variety of experiences they thought they had forgotten. In some instances a whole journey down a particular street on a particular night would be recalled with exquisite attention to particulars – changing stop and go lights, street signs and passing autos. Both the patients and I were often startled at the voluminous amount of material stored but out of access in the patient's waking state,....The memories were there. What was missing was access and recall."<sup>9</sup>

Temporal lobe phenomena (direct stimulation, seizures, and L-dopa stimulation):

Direct temporal lobe stimulation: With direct stimulation of the temporal lobe, Dr. Penfield (and now others as well) have elicited recall of memory events that could be described in

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<sup>5</sup> Luria, A.R. *The Mind of a Mnemonist*. (Cambridge: Harvard University Press) 1968, see especially pages 11&12, 15-20, 33, 60&61.

<sup>6</sup> "Digit span," a term used in memory testing, refers to the number of digits one can hear, remember, and then repeat. Most people can only remember and repeat 7-9 digits.

<sup>7</sup> Sacks, Oliver. *The Man Who Mistook His Wife for a Hat*. (New York: HarperCollins) 1970, pages 195-213.

<sup>8</sup> Sacks, Oliver. *An Anthropologist on Mars*. (New York: Vintage Books) 1995, page 198.

<sup>9</sup> Treffert, Darold A. *Extraordinary People: Understanding "Idiot Savants."* (New York, NY: Harper and Row), 1989, pg xxi (prologue)

detail as if the person was reliving the event during the stimulation. Many of these events, even events that don't seem to be associated with significant trauma, are described in INCREDIBLE detail. The patients report that the detail they *re-experience* (see, hear, etc) during stimulation is much more than they can normally recall regarding the events in question (often reported to be specific events that the person also has "normal" memory for). Patients report that they can't retain the same level of details, even moments after the stimulation is stopped.<sup>10</sup> \*\*Just like with anybody looking at me, and then looking away. Even seconds after looking away, you will have trouble describing every detail. If you now look back at me, while looking at me you can "see" every detail, and thereby easily answer any question I might ask – "what color is the cap of the pen sticking out of my pocket? Draw the exact shape of the lenses of my glasses, how many times do my shoe laces cross?

Temporal lobe seizures: Dr. Oliver Sacks describes an 88 year old woman who began remembering vivid details from her early childhood following a temporal lobe stroke and the onset of associated temporal lobe seizures. During the temporal lobe seizures, she did not just remember details from the first five years of her life, but *re-experienced* them in vivid, extraordinarily detailed memory hallucinations (flashbacks) very similar to the phenomena described by Penfield in his work with direct temporal stimulation: "...I feel I'm a child in Ireland again – I feel my mother's arms, I see her, I hear her voice singing." As with Penfield's subjects, this unusual, flashback recall was dramatically more vivid and detailed than her "normal" memory recall experience.<sup>11</sup>

L-Dopa stimulation: Dr. Sacks' case study of a 63 year-old woman on L-Dopa indicates that, somewhere, her mind carried detailed and vivid memories that her usual retrieval processes were unable to access. Somehow, stimulation with L-Dopa resulted in the same kind of unusual memory content retrieval that is reported with direct stimulation of the temporal lobe:

"This period was marked by...uncontrollable upsurge of remote...memories and allusions. The patient requested a tape-recorder, and in the course of a few days recorded innumerable...songs,...jokes and limericks, all derived from party-gossip,...comics, nightclubs, and music-halls of the middle and late 1920's....Nobody was more astonished than the patient herself: 'It's amazing,' she said. 'I can't understand it. I haven't heard of thought of those things for more than 40 years. I never knew I still knew them. But now they keep running through my mind.' Increasing excitement necessitated a reduction of the dosage of L-Dopa, and with this the patient, although remaining quite articulate, instantly 'forgot' all these early memories and was never able to recall a single line of the songs she had recorded."<sup>12</sup>

Memory prodigies, amytal interviews, and temporal lobe phenomena demonstrate that it is possible for the human brain/mind to store most of our experiences in this incredibly detailed, vivid, accurate way. My hypothesis is that our non-biological minds routinely store our life experiences with this level of capacity and accuracy, but that there is usually a problem with

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<sup>10</sup> Penfield & Perot, "The brain's record of auditory and visual experience" *Brain*, (1963) Vol 86, Part 4 pp 596-696.

<sup>11</sup> Sacks, Oliver. *The Man Who Mistook His Wife for a Hat*. (New York: Harper Collins) 1970, pages 132-149.

<sup>12</sup> Sacks, Oliver. *The Man Who Mistook His Wife for a Hat*. (New York: Harper Collins) 1970, page 151.

the retrieval system.

NOTE: My perception is that those developing *brain biology based* memory theory, like Dr. Schacter (Harvard professor, prominent researcher, widely published author regarding memory), resist this data because it doesn't fit in their theories. Consider, for example, Schacter's misrepresentation (inaccurate? dishonest?) of Penfield's data.

Thought regarding temporal lobe phenomena: As discussed in "Mind Before Brain: The Big Picture," Dr. Penfield hypothesized that the diencephalon is the point of connection between the mind and brain. There are neurological pathways directly from the temporal lobe to the diencephalon. Does temporal lobe stimulation thereby bypass all the usual (fallible, impaired) memory retrieval processes, and access the mind engrams more directly through diencephalon stimulation/connection?

Practical implications:

It is always good to have accurate models, accurate theory. As we work with accurate theory/models, they will lead us to practical insights and tools that produce good fruit. If we work with erroneous models, they will lead us astray.

It is important to be aware of the possibility that mind phenomena can sometimes over-ride the usual limitations imposed by the biological brain. If the minister is not aware of this, she will refuse to acknowledge/see/accept some true phenomena. Any time we dismiss true phenomena, we open ourselves to a variety of misunderstandings and errors. Early pregnancy memories of any kind, and precocious autobiographical memories from birth or early childhood would be important examples of "true phenomena" that might be dismissed if we approach emotional healing ministry from a "brain first" perspective.

To some extent, the answer to "what are the practical implications?" is "we don't know that yet."

**II. Multiple Parallel Memory Processes:** One basic memory phenomena that it is very important to be aware of is that there are several parallel memory systems in the mind & brain. These different memory systems are *qualitatively* different, and can operate independently. The more carefully we study the mind and brain, the more complexity we discover with respect to different memory systems.<sup>13</sup> Some of the most easily understood data proving the existence of these parallel memory systems are observations from medical conditions where the different systems are affected separately:

Note: my primary purpose in presenting the following information is to transfer the deep, gut level understanding that there are truly multiple, parallel, qualitatively different memory systems in the mind and brain. I want you to *know, with personal conviction*, that there are different memory systems in the mind and brain – that the different terms we will be using are *not* just ideas to help us understand different *aspects* of *one* memory system.

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<sup>13</sup> "Contemporary memory research has demonstrated the existence of a great complexity of memory systems within each individual. Most of these memory functions take place outside of conscious awareness, and each seems to operate with a relative degree of independence from the others." Van der Kolk, Bessel A, McFarlane, Alexander C, Weisaeth, Lars, Editors. *Traumatic Stress: The Effects of Overwhelming Experience on Mind, Body, and Society*. (New York: Guilford Press) 1996, pg 280.

Greg: Dr. Sacks describes a carefully documented case study of a young man with complete loss of ability to lay down new autobiographical memory due to a brain tumor that destroyed his hippocampi.<sup>14</sup> He would completely forget any personal experience within minutes, but he could learn new pieces of information (factual/semantic memory), he could learn to find his way around the hospital (behavioral memories), he could learn to type or play the guitar (procedural/performance memory), he could learn songs – both the words and the music – quickly and easily (musical memory), and he could form emotional associations (emotional memory).

The most dramatic demonstration of the difference between his severely damaged conscious autobiographical memory and his “other” memory functions was his experience with attending a Grateful Dead concert. Dr. Sacks took him to a Grateful Dead concert – a band he loved, but had not heard for many years. It was an all day event, and one that he participated in enthusiastically and passionately. The next day, he had no memory of going to the concert. But he could remember and sing the songs from the concert, and had positive emotional associations (“And now, whenever I arrive, and he hears my voice, he lights up, and greets me as a fellow Dead-head”<sup>15</sup>).

The fact that autobiographical explicit memory could be destroyed, but factual/semantic, musical, procedural/performance, emotional, and behavioral memory was still intact proves that there are different kinds of memory, and that these different kinds of memory must be processed by different systems in the brain.

Amnesic seamstress: Robert Dunn, a British physician, describes a fascinating case that dramatically demonstrates separate neurological systems for autobiographical memory and procedural/performance/skill memory. A woman with brain damage from a near drowning incident demonstrated profound loss of ability to remember any new autobiographical information, but she was able to learn how to make dresses. She became an expert seamstress, but did not have any conscious autobiographical memory of working on any of the dresses she made.<sup>16</sup>

Other similar cases: Many similar cases – cases where autobiographical memory has been lost due to focal neurological damage, but other memory systems are intact – have been carefully documented. For example, Dr. Sacks mentions several similar patients in the chapter describing Greg, and describes other similar patients in *The Man Who Mistook His Wife for a Hat*.<sup>17</sup>

VDK case studies with small children. All the details of trauma were extensively documented. The kids reported and displayed no conscious explicit autobiographical memory. But they displayed emotional memory, with intense emotional reactions to triggers. They displayed physical memories (reported pain and other physical sensations that exactly matched the

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<sup>14</sup> Sacks, Oliver. *An Anthropologist on Mars*. (New York: Vintage Books) 1995, pp 42-76.

<sup>15</sup> Sacks, Oliver. *An Anthropologist on Mars*. (New York: Vintage Books) 1995, pg 76.

<sup>16</sup> Dunn, R. “Case of suspension of the mental faculties.” *Lancet*, 1845. Vol 2, pages 588-590, as cited in Schacter, Daniel L. *Searching for Memory*. (New York: Basic Books) 1996, page 165.

<sup>17</sup> Sacks, Oliver. *The Man Who Mistook His Wife for a Hat*. (New York: HarperCollins) 1970, pages 23-42.

traumatic events, but with no remaining actual physical cause for the pain or sensations). And they would re-enact the accurate details of the events if given dolls. All this indicates implicit memory intact (emotional associations, physical memory, behavioral memory), but not explicit autobiographical memory (as would be expected for the developmental age, especially in light of the trauma). Again, this demonstrates that there are different kinds/components of memory, and that they are processed differently.

Amnesic who wouldn't shake hands: People with brain injury causing complete loss of ability to remember new autobiographical experience can learn new emotional associations, such as being afraid of someone who has hurt them. For example, Dr. Sacks describes a demonstration by Edouard Claparede, who stuck an amnesic patient with a pin while shaking his hand. The patient had no conscious autobiographical memory of the event, but refused, thereafter, to shake Dr. Claparede's hand.<sup>18</sup> (Page 53).

Perceptual recognition system (PRS) and "priming": people with brain injury causing complete loss of ability to remember new autobiographical experience can learn extensive material through a process called priming.

Second step of priming demonstration: Start with partial word prompt e\_p\_\_d\_d (expanded), and observe slow, difficult response. Then show partial word prompt o\_t\_\_u\_s (octopus), and observe quick, easy response.

Careful research shows that, if we showed you o\_t\_\_u\_s even *weeks* later, you would respond quickly and easily with octopus, but usually with little insight regarding the PRS/priming memory process. If we asked how you came to the answer so quickly, you would respond with something like "it's just an easy word." The people in PRS/priming studies behave as if they are guessing, and report feeling like they are guessing or "just thinking of the answer," but careful research shows that they "guess," quickly and accurately, the material presented earlier.

Amnesic computer technician: Glisky and Schacter describe using this PRS/priming memory system to train a patient who lost her ability to remember new autobiographical events due to viral encephalitis. Amazingly, even though she had no memory of the training process, this training enabled her to work as a full time data processing technician, with speed and accuracy that were actually better than the average for her "normal" colleagues.<sup>19</sup>

Huntington's vs Alzheimer's: Huntington's disease and Alzheimer's disease cause damage in different parts of the brain. A team of researchers demonstrated that patients with Huntington's disease retain the ability to learn through priming memory, but have great difficulty learning new motor skills. Alzheimer's patients, on the other hand, retain the ability to learn new motor skills but show impaired priming. These results demonstrate that priming and procedural/performance/skill learning depend on different storage and/or recall systems.<sup>20</sup>

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<sup>18</sup> Sacks, Oliver. *An Anthropologist on Mars*. (New York: Vintage Books) 1995, page 53. Note that this demonstration took place in 1911, before the toxic effect of painful implicit memories was widely understood, and before medical schools had ethics committees.

<sup>19</sup> Schacter, Daniel L. *Searching for Memory*. (New York: Basic Books) 1996, pages 176-179.

<sup>20</sup> Butters, N., Heindel, W.C., & Salmon, D.P. "Dissociation of implicit memory in dementia: Neurological implications. *Bulletin of the Psychonomic Society*, 1990. Vol 28, pages 359-366, as cited in

Neil – loss of spoken recall but retention of written recall: Dr. Vargha-Khadem and colleagues present the fascinating case study of Neil, a 14 year-old boy who suffered marked cognitive losses after treatment for a brain tumor. He could still understand spoken language, and could also speak normally, but appeared to have great difficulty in remembering day to day autobiographical events. Then the psychologists who tested his memory noted that he was continuing to do well in school, and wondered how this could be. To their amazement, they discovered that although Neil appeared to remember nothing when asked to respond orally, he could accurately recall his school work, *and recent autobiographical events*, when asked to respond in writing. Furthermore, in spoken discussion about his memory he often expressed amazement at the content of his (accurate) written recall. This case study demonstrates that there must be neurological differences between the memory processes that moderate spoken recall and the memory processes that moderate written recall.<sup>21</sup>

Normal aging, with loss of frontal strategic search, but preservation of hippocampal associative recall: “Normal” aging affects the frontal lobes, but has minimal effects on the hippocampus and medial temporal lobes. Strategic recall – the systematic searching for something you are trying to remember intentionally, requires both systems, whereas associative recall – the “automatic” recall of information when appropriate cues are encountered, does not require the frontal lobes. Therefore, associative recall is essentially unaffected by the normal aging process, even while the person is having increasing difficulty with finding things they are intentionally looking for.<sup>22</sup>

**III. Explicit Memory vs Implicit Memory:** For those in emotional healing ministry, the most important distinction regarding different memory systems is between Explicit memory and Implicit memory.

Explicit memory: Explicit memory recall is what we all think of as “remembering.” Explicit memory autobiographical content *feels* like “normal” memory. When we recall events through the explicit memory system, it *feels, subjectively*, like “I’m remembering something from my personal past experience.” Daniel Schacter, the psychologist who first proposed and discussed the terms “Explicit” and “Implicit” memory,<sup>23</sup> states: “In order to be experienced as a memory, the retrieved information must be recollected in the context of a particular time and place and with some reference to oneself as a participant in the episode.”<sup>24</sup> Referring to explicit/episodic<sup>25</sup>

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Schacter, Daniel L. *Searching for Memory*. (New York: Basic Books) 1996, page 187.

<sup>21</sup> Vargha-Khadem, F., Isaacs, E., & Mishkin, M. “Agnosia, alexia and a remarkable form of amnesia in an adolescent boy.” *Brain*. 1994. Vol 117, 683-703, as summarized in Schacter, Daniel L. *Searching for Memory*. (New York: Basic Books) 1996, pages 64-66.

<sup>22</sup> Schacter, Daniel L. *Searching for Memory*. (New York: Basic Books) 1996, pages 283-294.

<sup>23</sup> For the original discussion of explicit and implicit memory, see Graf, P., & Schacter, D.L. “Implicit and explicit memory for new associations in normal subjects and amnesic patients.” *Journal of Experimental Psychology: Learning, Memory, and Cognition*, (1985). Vol 11, pages 501-518.

<sup>24</sup> Schacter, Daniel L. *Searching for Memory*. (New York: Basic Books) 1996, page 17.

<sup>25</sup> My understanding is that the terms “explicit memory” and “episodic memory” both refer to the same phenomena, but focus on different aspects of explicit/episodic memory. That is, “explicit” focuses on the person is aware of remembering, and has the subjective experience of “I am remembering,” and



memory, Endel Tulving comments: “Remembering, for the rememberer, is mental time travel, a sort of reliving of something that happened in the past.”<sup>26</sup> By definition, explicit memory includes source information (at least some vague sense/awareness/guess regarding source).

Autobiographical memory: Narrative story of yourself, in time. Uses medial temporal and hippocampus to record and retrieve new and long term (but not permanent). Note: for most of our memories (~5 years old and onwards), implicit emotional content is smoothly included and integrated with explicit content when we recall autobiographical events. For example, if you ask me to remember an embarrassing event, my explicit strategic recall system will retrieve my memory of having diarrhea in second grade, *and* I will feel the associated thoughts and emotions as I remember and describe this autobiographical event such as my diarrhea memory. From my understanding of Schacter, if my amygdala were damaged, I could retrieve my second grade diarrhea memory through the explicit system, but I wouldn’t feel any shame (the implicit, emotional association component has been stripped off). If my hippocampus were damaged, I could go to the central school bathroom, and experience shame as an implicit emotional association memory, but I would not have any insight as to where it was coming from (I would not recall the explicit memory of the autobiographical event).

Semantic memory: Semantic memory is conceptual and factual memory. The memory of facts, such as “Springfield is the capital of IL,” and the memory of concepts/principles, such as understanding how old traumatic memories can cause emotional symptoms in the present. Note that semantic memory content can be stored and retrieved through either explicit or implicit memory systems. In my understanding, when semantic memory is processed through the explicit memory system, it is actually a form of autobiographical memory – you recall the information in the context of remembering the autobiographical experience of learning it.

Implicit memory: Implicit memory is all memory phenomena that *does not* include the subjective experience of “I’m remembering something from my personal past experience.” Implicit memory content *does not* feel like “normal” memory. When we recall and/or use “learned” information through one of the implicit memory systems, we often don’t have any awareness that we are remembering or being affected by past experience. Even if we are aware that we are being affected by some kind of memory phenomena (for example, we learn to recognize emotional triggering as a memory phenomena), we still don’t have the subjective experience of “I am remembering something from my personal past experience.” By definition, implicit memory does *not* include source information.

Semantic: people with brain injury causing profound explicit amnesia can learn semantic information through their implicit system, but have no memory of where they learned it, and will usually come up with a source error left hemisphere explanation. For example, ask “what’s the capital of IL?” “I don’t know” “Springfield.” Five minutes later, ask “what’s the capital of IL?” “Springfield” “How do you know that?” “I think I read it in a magazine last week.”

Procedural/performance (skill learning), habit learning, uses basal ganglia

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“episodic” focuses on “the content is perceived as material from the person’s autobiographical past.” Note: this can refer to material from a book or movie, but the person experiences “I’m remembering something from a book I read/movie I saw....”

<sup>26</sup> Tulving, E. *Elements of episodic memory*. (Oxford: Clarendon Press) 1983, Page 127, as cited in Schacter, Daniel L. *Searching for Memory*. (New York: Basic Books) 1996, page 17.

Perceptual recognition (priming), uses perceptual cortexes (visual cortex for visual memory, auditory cortex for auditory memory, etc)

Emotional associations: These unconscious, automatic emotional associations are “learned” and remembered through an implicit memory system. This is consistent with our subjective experience (these associations don’t feel like explicit remembering), is demonstrated in animal research **footnote**, and is also demonstrated in carefully documented case studies of patients who have lost their explicit memory system but who can still learn new emotional associations (examples discussed above).

Emotional associations are not only lie based negative responses – they can be either positive or negative, and can be either lie-based or truth-based.<sup>27</sup> Examples: Truth-based negative associations would be learned fear/caution, of appropriate intensity, of things that are dangerous and/or cause pain. A truth-based positive association would be the way in which warm, positive emotions come forward spontaneously when I hear certain songs that Charlotte and I listened to together during our courtship.

Emotional memory – learning new emotional associations – does *not* need the hippocampus and medial temporal required for explicit memory, but *is* completely blocked if the amygdala is damaged.<sup>28</sup>

Conditioned responses: conditioned responses, such as Pavlov’s famous dog that “learned” to salivate when the bell was rung, are unconscious, automatic behaviors that are learned and remembered through an implicit memory system.

Unresolved, undigested, “flashback” type memories of traumatic events: Note that people consistently experience these as subjectively, qualitatively different than “normal” memories, even including “normal” memories of other emotionally intense positive or negative events (e.g., weddings, births, graduations, and traumatic events that were painful but not overwhelming to the point of dissociation).<sup>29</sup>

Somatic (what your body felt like at the time of the memory)

Perceptual (other sensory perceptions – sight, sound, smell, taste)

Emotional (emotions at the time)

Behavioral (what you were doing with your body). For example, children who act out the trauma with their bodies, even though they don’t remember the event consciously or have any insight into why they are engaging in the repetitive re-enactment behavior.

Comment about explicit/implicit definitions: Many people use the terms explicit and implicit

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<sup>27</sup> See “Healthy, *Truth-based* Emotions and Associations” on the “Articles and FAQs” page of [www.kclehman.com](http://www.kclehman.com) for additional discussion of positive and negative emotional associations that are appropriate and *truth-based*.

<sup>28</sup> LeDoux, J.E. “Emotion as memory: Anatomical systems underlying indelible neural traces.” In S. Christianson (Ed.), *The Handbook of emotion and memory: Research and theory*. (Hillsdale, NJ: Erlbaum). 1992, page 269-288, and LeDoux, J.E. “Emotion, memory, and the brain. *Scientific American*. 1994. Vol 270, pages 32-39 as cited in Schacter, Daniel L. *Searching for Memory*. (New York: Basic Books) 1996, pages 213-214.

<sup>29</sup> Van der Kolk, Bessel A, McFarlane, Alexander C, Weisaeth, Lars, Editors. *Traumatic Stress: The Effects of Overwhelming Experience on Mind, Body, and Society*. (New York: Guilford Press) 1996, pp 287-9.

memory, with a fair amount of variability, and sometimes also with sloppy thinking (using implicit and explicit interchangeably with other terms that only partially overlap). When you see “explicit memory” and “implicit memory” used in other material, be aware of the possibility that the author may not be using the terms in exactly the same way we are using them here.

Partial overlap: There are a number of concepts that are often presented as if they are equivalent terms, but that actually only partially overlap:

Summary:

Explicit:

Requires hippocampus and medial temporal lobes

Conscious

Autobiographical and semantic

Left brain

Verbal

Strategic

“Late” (not present until later)

Implicit:

Does not require hippocampus or medial temporal lobes

Nonconscious

Content other than autobiographical and semantic (emotional associations, unprocessed trauma, perceptual memories, priming)

Right brain

Nonverbal

Associative

“Early” (present earlier in life)

Expanded comments:

Explicit memory, “hippocampus and medial temporal lobes”: Actually, this is true only for long term explicit memory content. Neither immediate/“working” explicit memory or permanent explicit memory use these structures.

working memory (immediate – doesn’t use hippocampus and medial temporal, because these can be destroyed and working memory is still maintained),

Long term (does require hippocampus and medial temporal),

Permanent with cortical consolidation (note: again, does *not* require hippocampus and medial temporal. Can be accessed even though these are destroyed).

Conscious, nonconscious:

Explicit memory is thought of as conscious, but dissociated parts can carry explicit memory content that is not normally accessible to the conscious mind (e.g., long time block fugue states, with each part carrying large blocks of apparently “normal” explicit memory)

Implicit memory phenomena are thought of as being nonconscious, but one can learn to recognize implicit phenomena so that most implicit content and phenomena are routinely

conscious.

Content: Autobiographical memory is always explicit, and semantic memory can be explicit. Semantic memory is accessed through the explicit process especially when recall includes trying to reconstruct the context in which the material was learned. However, both case studies and careful research shows that semantic memory storage and recall can also both occur through the implicit memory system.

Left brain, right brain: the spontaneous associative process feels right brain, and the strategic “search” process feels left brain. Language, verbal, narrative of explicit are especially left brain functions. Some truth to left/right corresponding to explicit/implicit, but not complete. For example, associative autobiographical explicit recall can feel very “right brain,” and various explicit and implicit processes use both sides of the brain (for example, right frontal cortex is very active during recall of explicit autobiographical memory<sup>30</sup>).

Early development vs late development: explicit memory is not available until the hippocampus mylenates, and strategic search/recall must wait for development of the frontal lobes. Implicit memory is available even before birth, and continues throughout life. Note that explicit memory does not replace implicit memory, but rather is added to it.

Associative vs strategic: Both strategic and associative recall processes can access both explicit and implicit memories, but strategic is more often explicit and associative is more often implicit. Strategic can search for explicit autobiographical and semantic, and for implicit semantic, *but note that the strategic recall system is not used to access other forms of implicit memory*. Associative recall processes access all forms of memory, including the forms of implicit memory not accessed by strategic recall.

Associative memory: an involuntary form of remembering. This is when a memory file is brought forward “automatically” by a cue in the present that is associated in some way with the content of the memory. All implicit memory phenomena is associative, but explicit autobiographical and semantic memory can also be accessed by association with a memory prompt “cue.”

Strategic memory: the frontal lobe, voluntary, intentional “searching” for specific memory content. You would use strategic memory to “search” your memory files if I asked you what you did last Saturday night, or if I asked you to name the states that begin with the letter “M”.

Mind, Brain, Explicit, Implicit time line (included in the seminar handouts): **power point slide, discuss**

### **Practical implications/applications:**

Multiple memory systems:

Pay attention to neurological pathways, communication modalities that seem to work

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<sup>30</sup> Tulving, E. et al. “Hemispheric encoding/retrieval asymmetry in episodic memory: Positron emission tomography findings.” *Proceedings of the National Academy of Science, USA*, 1994, Vol 91, pages 2016-2020, as cited in Schacter, Daniel L. *Searching for Memory*. (New York: Basic Books) 1996, page 67.

especially well for a given person. Does writing access memories more effectively than talking? or vice versa? Notice that many people find that reporting mental contents, out loud, is very important and helpful in connecting with emotions. Does music? Touch/massage? Motor movement? help access memory content? Notice that many people find that it is helpful to pay attention to/focus on physical sensations. The research on multiple memory systems encourages us to be creative and pay attention to what works as we try to develop the most effective memory access tool box.

Implicit, explicit developmental time line:

Simple developmental considerations result in most very early memories (before 2-3 years old) being “implicit memory only,” early childhood memories (2-6 years old) often have implicit/explicit separate. Don’t experience unnecessary confusion about why you can’t find “the memory,” and don’t waste lots of time and energy searching for explicit memory that’s not there. Don’t invalidate and shut down what is happening because you can’t find explicit memory.

You can work with implicit memory only, if you realize this is what is happening and validate it. For example, my experience with 2 year-old separation from parents. Stuck, dismissed, invalidated, didn’t recognize because it was implicit only. Realizing that it was implicit memory only, and so giving myself permission to stay with it and work with it, was part of the breakthrough. Much like “normal” TPM, with focus on negative cognitions/lies that feel true, connection with negative emotions, removing clutter, and asking Jesus to come with healing, but just no explicit memory. Sometimes perceptual fragments, but usually not nice explicit autobiographical narrative. Focus on the implicit, learn to stay with it, and do all the rest of “normal,” Theophostic®-based emotional healing, but just let go of needing to find explicit autobiographical memory. I have gotten significant clinical improvement as a result of “implicit memory only” work. Note that the NR video segment also provides a good example of this.

Indistinct implicit memory packages vs distinct internal parts:

It is important to understand that the person can have implicit memory packages, but without a discrete internal part (neither implicit child ego state package nor dissociated internal part). If you try to access the memory by using direct eye contact and trying to speak to/work directly with an internal part, the person will stare at you blankly and say things like “I don’t feel any resistance to going to the memory/emotions, I just don’t know how to get there.” If you don’t understand the implicit memory phenomena, you will assume either there is nothing there or conclude there are internal parts that the person is choosing to withhold. Instead, try tools to access implicit memory files.

Also, you can introduce unnecessary complexity, “weirdness,” confusion by pursuing and/or trying to work with parts that aren’t there. This is especially valuable in situations where the people involved are already at their limits with respect to weirdness.

Implicit memory parts vs dissociative parts: I think it is helpful to recognize implicit memory internal child parts (implicit memory child ego state packages) as being a qualitatively different phenomena from dissociated internal parts. If they really are two different phenomena, then it will certainly cause confusion and trouble at some point to refer to both of them with the same term.

Implicit memory internal child parts/child ego state packages: the person may look, sound, and act like a child at the age of the memory, but you relate to the person as being her adult self blended with, co-conscious with the child ego state package. You can use language as if you are talking directly to 8 year-old Karl, and I can use language as if I am talking directly from 8 year-old Karl, but we can also use language that recognizes I am 43 years old in the present, but thinking, feeling, responding from the perspective of myself in the 8 year-old memory. Implicit memory internal child parts don't use plural pronouns (e.g., "we," "us"), and don't refer to the adult in third person. My experience with implicit memory internal child parts is that they can carry guardian lies and other concerns (e.g., vows) that need to be addressed (the person carries these things from "inside" the child memories), but use of internal family systems principles and techniques is difficult and usually unnecessary.

Dissociated internal parts: functional alters will relate to you as if the person receiving ministry is an entirely different person. Dissociated child parts of the core self will acknowledge "I am \_\_\_\_\_ at 7 years old," but will also refer to the person receiving ministry in third person (note: in Sybil, parts of the core self from different ages had different names, and did *not* readily acknowledge that they were Sybil at different ages, but some of these parts *did* carry portions of her core self time line). My experience is that dissociated internal parts spontaneously use plural personal pronouns, such as "we," and will spontaneously refer to the adult person receiving ministry with third person language. Dissociated internal parts seem to appreciate it when I recognize the reality of their existence by using the same language they use, and sometimes seem offended and invalidated if I insist on using language that tries to downplay their semi-autonomy and importance. Use of internal family systems principles and techniques is easy and often important (it usually seems easy and helpful to work with dissociated internal parts as if they really are a family system).