Memory is Memorable: Coaching and Remembering

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My comment to an elderly Lowe's employee: "You have a great memory!" [After he told me where a specific item was located in the Store.]

The employee's comments: "Yes, but I can't remember where I put it."

Both the Lowe's employee and I are like many people. In some areas we have great memories. In other areas we are completely lost. This is not the case with mnemonists. Many years ago, the noted Russian neuroscientist, Alexander Luria (1987) wrote about an exceptional man who had infinite memory. Called a "mnemonist", this gentleman could not only recall a list of words that he was shown many years before, but also accurately recall the color of tie worn by the person offering him the list of words to learn.

In more recent years, we in America observed the performance of a mnemonist during one of the very popular evening Quiz shows ($64,000 Question). This man was Teddy Nadler who was employed as a civil service clerk in St. Louis Missouri. He was knowledgeable in many areas and was labeled at the time as someone with a "photographic" memory. Later, his prodigious capacity to remember things was attributed to his retention of "eidetic imagery." We now would consider him, like Luria's patient, to be a Mnemonist who could recall everything that he had read in books. Remarkable!

Challenges for the Mnemonist

Both Luria' mnemonist and Teddy Nadler had something that most of us lack. They had a brain that retained memories. For most of us, the actual memories of what has occurred during our daily life is never directly stored. Rather these memories are organized, synthesized (and sometimes created) before being stored in our hippocampus. Much of this conversion occurs when we are asleep. Experiences have already been screened and modified before being stored in our short-term memory. During the night they are further modified, distilled and integrated with other memories before being stored for future use in our long-term memory system.

Only traumatizing (and fully delightful) experiences are stored directly in our amygdala (rather than in the hippocampus--the usual storage location) to be recalled in all of their vivid detail many years later. These "flash bulb" memories include those concerning the assassination of a president, the birth or death of someone who is close to us, or our own near-death automobile accident. There are memories that are critical for us to recall in great detail so that we can avoid them (as traumatic events) in the future or can always savor them when things get tough. These retained memories, in other words, are few in number, and directly related to the protective evolution of human beings. But, what about Luria's mnemonist and Teddy Nadler? Do they have an evolutionary advantage or disadvantage?

It seems that both men found infinite memory to be more of a burden than a gift. Nadler was able to cobble shoes, but not much else. Luria's mnemonist was unable to cope with much in his life—that is why he contacted Luria. Luria' patient might be successful in performing in a carnival or (like Nadler) he might have found himself a successful participant on a Russian quiz show. The big problem for both this patient and Nadler is that they "could not see the forest through the trees."

In less poetic terms, we can report that neither of these gentlemen were able to make sense of their world: they retained only details and were unable to establish any frameworks in which to place the multitude of experiences that were "inundating" them every day. With only a swirling mess of details in their head, neither man was able to plan, solve problems or make decisions. They were both poorly adapted messes and could only engage in simple, mechanistic tasks (such as producing shoes by hand). Their personal life was profoundly constrained: simple routines and no surprises!

There were some remarkable techniques of memory that both mnemonists (and other mnemonists) did report that could be of assistance to us poor souls with limited memory. Luria's mnemonist revealed that he made extensive use of identic imagery. When given a list of times to learn, he envisioned walking down a street and placing each of these items in store window. When he returned to this street at some later point, the mnemonist would simply walk down the street and view what he had previously placed in each window. Those of us with much more limited capacity to remember specific things (such as gifts given at Christmas or a list of items to purchase at the grocery store) might similarly place each of the items in a store window.

Other memory devices include placing the items to be remembered in a rhyme or in a song (much as is done in the use of rhyming and singing commercials). Visual images are also used to assist memory retention. Poignantly, memories are best retained through smell. We retrieve abundant memories (often quite vivid and detailed) when smelling something associated with an event from earlier in our life. Perhaps it is the smell of freshly baked chocolate chip cookies or a seafood chowder. We know that many "comfort foods" come with strong, pleasant smells. The "comfort" is often derived not from the food itself. Rather it is derived from the memories elicited by the smell emanating from the food when it is cooking or when it is served. The one feature that is to be found in each of these memory devices is its engagement through some sensory mode. Abstract thoughts never "hold a candle" (another visual and sensory image) to what we retain that is visual or auditory—better yet it is retained as smell (or even touch.

The Neural Base of Memory

The retention of memories from our life has always been a source of great interest on the part of philosophers as well as biologists and, more recently, psychologists. Now, with the ongoing revolution of the neural sciences, we are learning much more about how memories are formed, retained, forgotten and revised. Here is a brief summary of what we now know—or at least are considering—based on research done by biologists, psychologists and neuroscientists.

Neural-Based Memory Formation

If we move past vision, hearing and smell to the deeper dynamics that serve our memories, then we are likely to bump into the neural cell assemblies that enable us to organize and structure our neural processing. The noted neurobiologist, Donald Hebb wrote about these cell assemblies and the way in

which specific cells begin to link closely with other cells. His noted phrase is "cells that fire together, wire together."

With this theory of mind came a dramatic move away from the assumption that memories are preserved in specific cells or packets (called "engrams"). Instead of individual neurons storying complex information, there are neural networks that integrate information contained in multiple cells. We discover that cell assemblies (forming networks) come together in various ways to create integrated images of sight, sound, taste, smell, etc. that we call memories. As Stephen Kosslyn and Olivier Koenig (1992, pp.46-47) noted in their comprehensive portrayal of neural functioning this integration includes what they call "constrain satisfaction" meaning that the brain can not only integrate stimuli from several sources, but also integrate stimuli that are coming in from a single source but are initially processed selectively by specific neurons (e.g. color and orientation of a visual stimulus).

This integrative function is particularly important to note because it operates in full force when we are forging a memory. Individual neurons will hook up with many other neurons to form an integrated cluster of images from many sources that form the memory. Furthermore, individual neurons link with many other neurons to create many different memories—they aren't assigned to one specifically memory. Once formed, the memories settle into short-term storage and eventually are either discarded or synthesized and combined with other memories to be housed in the hippocampus.

Kosslyn and Koenig (1992) also write about the proactive nature of networks that are formed. A "feedforward" function is served by the neural networks which enable us to move forward from the reception and interpretation of external stimuli (input) to the hidden transmission of integrated stimuli (now becoming information) across and to different domains of the brain, and finally to the processing and use of this information (output). A "feedbackward" function is now being served as the output produces information back to other domains of the brain – what Kosslyn and Koenig identify as taking place through "recurrent networks."

I should also provide an obvious point: memories do not exist in isolation. They are intricated interwoven with many other functions being services by the brain. Kosslyn and Koenig (1992, p. 352) even provide us with a highly complex map that portrays the way in which memories interact with other neural operations.
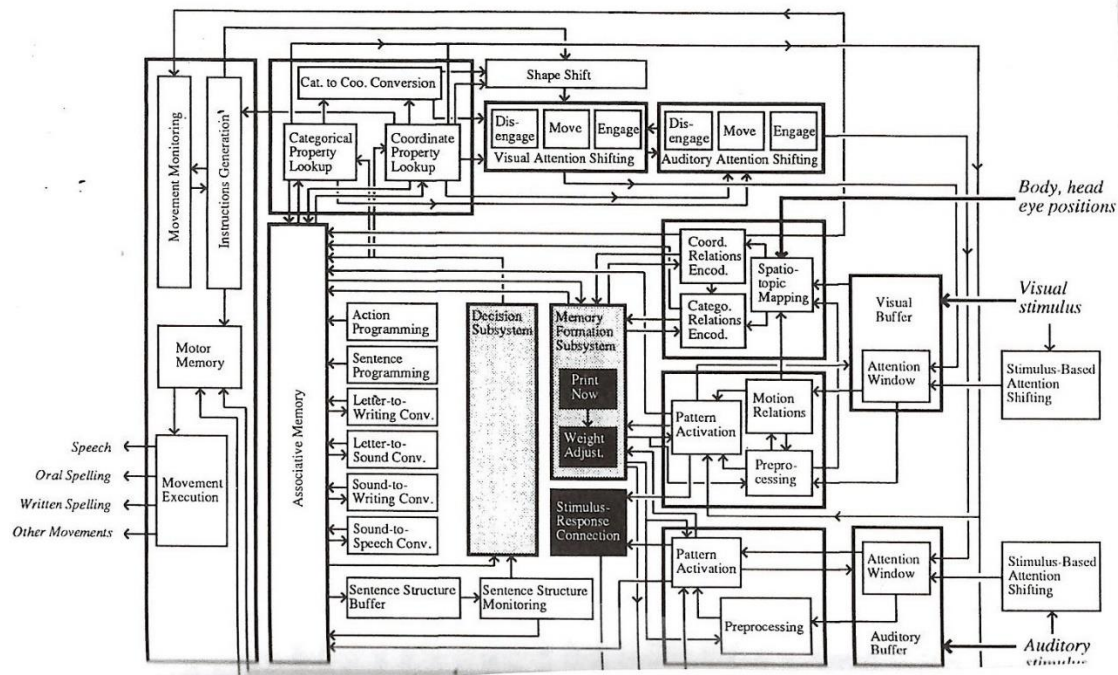
This truly is an amazing map that clearly pays homage to the complex nature of the human mind!

Neural-Based Forgetting

Equally as important as the neural process of building memories is the neural process of forgetting or not forging a memory. This neural dynamic is particularly important to address when seeking to understand something about the mnemonist and infinite memory. For many years it was assumed by neuroscientists (and most of us) that forgetting is a passive process. Our memories simply fade away – like the flavor of last evening's soup or the colors in a photograph or painting left out in the sun. We now know that forgetting involves active suppression of retained memories and that this suppression serves an important adaptive function (as the dysfunction of our mnemonists has demonstrated).

While the forgetting process is complex and not yet fully understood, it seems to involve dopamine and GABA (an inhibitory neurotransmitter) as they function in the hippocampus and prefrontal cortex. It is worth noting that these studies of forgetting may have major implications for the treatment of many mental illnesses which often involve forgetting – and remembering (especially of traumatic events). Furthermore, our understanding of the active forgetting process illuminates the importance of a good night of sleep. While forgetting occurs throughout the day, it does its final (and probably most important) work at night through the process of selection and consolidation that I mentioned earlier.

Neural-Based Memory Retention

Finally, as we gain an appreciation of the adaptive function served by forgetting, we also come to appreciate the adaptive function served by those few memories that are not forgotten. As I have already mentioned, these are memories related to traumatic and fearful events in our life. We DON'T want to forget what happened (as a child) when we touched the front burner on the stove or when as a teenager we drove into a tree after drinking too many beers. As already noted, we assign some of our trauma-related memories to our amygdala (which is located next to the hippocampus). Apparently, none of our forgetting neurochemicals and processes are to be found in the amygdala. Hence, nothing is forgotten.

Our immediate experience of retained memories in our amygdala is found in the "flashbulb" memories we have of specific past experiences in our life that were filled with trauma (either personally or collectively). Like most people of my age, I have very clear, detailed memories of the day when John Kennedy was assassinated (Brown and Kulik, 1982). We do need to remember what has threatened us individually and collectively so that we can prepare for this happening again in the future. Important evolutionary (survival) functions are being served by an amygdala that never forgets traumatizing experiences.

I do want to move beyond this widely accepted version of flashbulb memories. I want to suggest as I did at the start of this essay, that the "flashbulb" can be associated with very positive and very powerful events—whether personal or collective. I propose that positive events can be considered "memorable" and can be tagged for retention—just like the traumatic memories. Like many other people, I have a positive memory of the moment when Neal Armstrong landed on the moon. At a personal level, I remember the birth of my daughter in some detail. I was allowed to hold my then-wife's hand as she gave birth to Kate (whereas I was kept out in the waiting room several years earlier with the birth of my son). I also remember my own first and second weddings in great deal. I would pose a challenging question: isn't it just as "adaptive" for us to retain good memories that we can use to sustain ourselves, as it is to retain bad memories that guide us in deciding what we should avoid? Furthermore, we know that the retention of negative memories is not always adaptive. At a personal level, the retention and subsequent reliving of traumatic events can lead to enduring emotional distress and even mental illness. Positive memories, on the hand, have been associated with learned hopefulness and mental health.

While some reconstruction no doubt has occurred (especially over the intervening years) of the Kennedy and moon events, they remain quite vivid—as if I was reliving them once again. An interesting (and important) question to ask at this point concerns how we arrive at a decision to shunt a memory off to the amygdala rather than the hippocampus. What makes an event "memorable" and worthy of being tagged for permanent retention. What is the label that we attach to specific events? I would imagine that the amygdala is first engaged not as a storage bin for memorable experiences, but also a source of immediate appraisal regarding all incoming stimuli.

Elsewhere, I (Bergquist, 2022) have speculated that this appraisal might related to the semantic differential categories identified many years ago by Charles Osgood (1957): is the incoming stimulate: (1) "good" or "bad" regarding its potential impact on me, (2) "strong" or "weak", and (3) "active" or "passive." If the incoming stimulus represents some thing or some event that is bad, strong and active, then the amygdala would trigger an alarm that would increase focused attention on this stimulus and preparation of our body for action (shifting from parasympathetic to sympathetic system).

Often the subsequent appraisal reveals that this is not a threatening object ("it is a piece of rope and not a snake"); however, if the stimulus turns out to be a source of real threat and even actual injury (physical or psychological), then the stimulus and following experiences will be stored permanently in the amygdala (that was a real snake and it actually tried to bite me. I had to stomp on it with my foot!").

If I am correct in my assertion that permanent positive experiences can also be stored in the amygdala, then the "good" (versus "bad") appraisal might be engaged. The "active" and "strong" categories would probably still apply. Something quite positive has occurred and it is neither accidental ("passive") nor trivial ("weak"). For example, I vividly recall the moment when I wed a woman that I love ("good") and am celebrating this wonderful ("strong") event that I helped to make happen ("active").

Memories: Limitations and Opportunities

With this brief portrait of both remembering and forgetting in the human brain, we can turn to the next level of analysis regarding the interplay between what we remember and what we forge. Kosslyn and Koenig (1992, p. 4) refer at this point to a shift from the "wet mind' (neural) to the "dry mind" (cognitive). An important insight regarding this next level of analysis was offered by George Miller (1956) who wrote a highly influential article about the "magic number seven." Miller focused on the human limits of memory (this limit being approximately seven items). In order to operate within these highly restricted boundaries, human beings begin to "chunk" things together so that there are still only seven items being retained (though now each item is much bigger and more complex). We find in Miller's chunking a process that parallels Hebb's cell assembly (though at a much different level of neural functioning). It is also a process that takes forgetting into account and yields benefits associated with selective memory and abstract thought (which are sadly absent in the minds of the mnemonists).

To get an immediate sense of the way in which the limit of seven works and how we go about dealing with this limitation, I am offering you a memory challenge. Please "remember" the following phone number: 262-2433. I ask you not to write it down. Just retain it in your memory for a short while. I will ask you later in this essay this number. This is hard (given that you are hopefully focusing on the content to be found in the remainder of this essay)). The task of remembering this phone number is a bit easier because several numbers are repeated. The two 33's can be "chunked"; also, you might be able to remember that this phone number has three "2s" (this is another kind of "chunking'). What if we change the numbers into letters that form a word. We can create a word by transferring numbers on the phone dial to letters. When we do so, a highly memorable word is produced: "COACHED" (2=C, 6=O, 2=A- 2=C, 4=H, 3=E, 3=D). While there is some "slop" in this translation (e.g. the number 2 can represent a range of letters from A to C on the phone dial), the "chunked" word is easier to remember than the individual numbers.

Large Scale Chunking

We can move to an even higher and more impressive example of memory-aided chunking. Large scale chunking is constantly being engaged by pianists, actors – and many other people who have to learn and convey a large amount of information without referring to notes. When learning a piece of music (concerto) or a play, the pianist and actor learns one specific chunk of the score or script. They then learn another chunk and will eventually put the chunks together. Each chunk has become one integrated unit that is solidly in place--though each unit must often be rehearsed.

One of my colleagues was recently learning the very demanding script of *The Belle of Amherst.* This play offers my colleague a major memory challenge for it is performed with only one actor who must retain and recite a very large script. She had to take on one chunk at a time—rehearsing this chunk many times until it was "locked" into her memory. Then she took on another chunk. Finally, she linked these chunks together. My colleague stayed in a cottage near my home while performing the play at aa nearby community theater. II would watch her repeatedly replay one segment of the play and then move on to a second segment. I have colleagues who are classical pianists. They report operating in a similar manner—building one chunk at a time.

Chunking vs. Literal Recall

The description I have just offered of chunking and the building of a structure for retention of meaningful material stands in direction contrast to the way in which memory was conceived and studying by learning specialists for most of the 20th Century. Memory was being studied by making use of nonsense words and random listings of letters. Though large in number these studies of learning were ill-directed—for we rarely try to remember something that makes no sense.

The closest thing we have to nonsense words and letters are phone numbers – that is why it is hard to remember a phone number—especially if it includes an area code (going beyond the magic number seven). It is only the mnemonist who has the ability to readily store nonsense material – and as I have already noted, Luria's mnemonist (and I suspect many other mnemonists) play a trick when retaining non-sense material. They transfer it to a sensory form (much as I have suggested you translate the phone number that I gave you to a meaningful word).

The challenge to this way of conducting research regarding memory was hoisted most memorably in 1978, when Ulric Neisser (1982, pp.11-12), an icon in the field of cognitive psychology, offered the following conclusion at a major conference:

> . . . [T]he results of a hundred years of the psychological study of memory are somewhat discouraging. We have established from empirical generalizations, but most of them are so obvious that every ten-year-old knows them anyway. We have made discoveries, but they are only marginally about memory; in many cases we don't know what to do with them, and wear them out with endless experimental variations. We have an intellectually impressive group of theories, but history offers little confidence that they will provide any meaningful insight into natural behavior.

Neisser goes on in Memory Observed (Neisser, 1982) to offer a set of studies which study memory in a quite different manner. Neisser even has the temerity to cite the value of work done by Sigmund Freud (the nemesis of modern psychology) regarding "natural" memory. In his own conclusion regarding the nature and function of memory, Neisser (1982, p. 16) offers the following:

> In most instances of daily remembering, it is meanings and not surface details that we must recall. Just as the oral historian remembers what happened instead of memorizing some formula of words that describes it, so too we recall the substance of what we heard or read rather than its verbatim form. This is now generally acknowledged, even in laboratory research. The new wave of enthusiasm for Bartlett's ideas and for the use of stories as memory materials has led us to devalue the study of rote remorization almost completely.

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Neisser has introduced important function being served by the chunking together of information to be stored. He has also brought forth the long-ignored work of Frederick Bartlett regarding the dynamics of memory.

Consolidation and Construction

We now are fully appreciative of the fact that chunking brings about (or is at least associated with) making meaning of something. In remembering a poem, we benefit not only from its structure and potential rhyming as an aide for the retention of the poem, but also benefit from the meaning of the poem. This is also the case when the pianist is "memorizing" a concerto. This piece of music has not only a structure (for example, a sonata form), but also a theme or progression of several themes. A concerto made up of a series of unrelated and dissonant ("nonsense") notes might be innovative—but it would also be much harder for the pianist to remember. Even Luria's mnemonist is creating something that is meaningful: the walking tour down a street in order to look in the store windows.

Schemata

This walking down the street by Luria's patient invites us to explore an level of cognitive processing in the brain. Like the walk down the street, it brings together many different elements and integrates them around some general theme or narrative. These Meta-assemblies are called Schemata. Originally presented as a way to think about the nature of remembering by Frederic Bartlett (1995) and offered in parallel fashion by Vygotsky (2012) and Piaget (Piaget and Cook, 1952) , (with a focus on cognitive development in children), schemas (another way to spell schemata) have come to play a prevalent role in the study of memory.

Schemata have typically been defined as an epistemological (knowledge-based) process of gathering together and clustering specific memories. We engage schemas to help us make sense of the world in which we live and work—much as Piaget wrote about the process of assimilation which brings in new information and incorporates in existing cognitive structures (schemas). Without this assimilative process, the world we encounter would be the great blooming, buzzing confusion that William James described as our initial at-birth (pre-schema) experience of the world

As adults, we are particularly dependent on schemata that center on our sense of self. These schemata, in turn, influence and even define the nature of our relationships with other people (Horowitz, 1991; Young, Kosko and Weishaar, 2003). We organize our memories—and I would presume sort out our memories during the night—in alignment with our dominating self-schema. While these self-schemata are hard to change as we "mature", they can be important sources of leverage when we are providing therapy, counselling of coaching with a focus on our client's life narrative (Drake, 2017).

A cautionary note should be offered at this point. In general, the consolidation of memories and formation of schemas can be a good thing. The chunking and consolidation enable us to build an expansion mind in the face of major magic 7 restrictions. The schemata help us not only find meaning in the blooming and bussing world in which we must operate, but also enable us to make decisions and doing some planning in this challenging world. Unfortunately, the chunking and consolidation processes inherent in the formation of schemata can also be a source of non-critical biases and prejudice.

At a trivial level we can point to the uncritical acceptance of commercials and find that those who prepared these commercials know how to embed them in our memory (almost as if they were sources of trauma!) We can easily accept a graphically pleasing promotion – or remember a silly song ("uhm good, uhm good, Campbell's soup is uhm good"). It is not just a soup commercial that we will remember, but also a catchy political slogan or a frequently replayed scene of violence. These phrases and images "chunk" for us – and if they are in any way threatening then they become the fore-mentioned "flashbulb" memories that are never forgotten. A political figure who is attached to this flashbulb memory will also never be forgotten (be this figure "good" such as John Kennedy or "bad" such as Lee Oswald).

At the heart of the matter is the incorporation in many of our schemata of the "heuristics" that have been highlighted by behavioral economist such as Daniel Kahneman. Schemata-based "heuristics" provide an easy way to work on problems and make decisions. These schemata might be centered on our personal sense of being unworthy or "stupid"—and the need to do what other people do or what other people accept as "reality". Memories of past humiliation and past failures of judgement will linger in our life. They are reinforced by ongoing relationships in our life—the other person is always right (we "take their word" that they are "right"). This "rightness" is particularly reinforcing if the other person is in a position of authority (Weitz and Bergquist, 2022)

There are other schemata that enable us to bypass the heuristics and Kahneman's "fast thinking." These are "slow-thinking" schemata that are concerned with reasoning processes and self-reflection. Unfortunately, these schemata are often overshadowed by quite primitive self-schema that are filled with a host of self-fulfilling assumptions about other people and our relationship to them. It is in these struggles between fast-thinking and slow thinking schemata that we find the greatest need for outside assistance (via therapy, counseling and coaching).

The Use of Memories

Much as I briefly describes the way in which memories interact with other functions when describing memory in the wet mind, so I wish to describe how memories interact with other elements of the dry mind when memories are being used while we are engaging with the challenging world in which we live and work. First, as I have just noted, memories that are brought together with other cognitive elements to form schemata serve as central guides in our interaction with other people. They build an assumptive world that play a critical role in determining how we interpret the motives and behaviors of other people in our life as well as providing us with our own enduring sense of self.

Secondly, the way in which we think about our world is determined in large part by our memories as they operate in two distinctive ways. There is Expository thinking. This is the conscious, intentional processing that we do when figuring out what we are going to do about a specific situation. Expository thinking, in turn, is likely to make primary use of what Kosslyn and Koenig (1992, p. 374) call "explicit memories" (those of which we are fully conscious). While expository work is at the forefront of our attention and typically is considered the most important dry mind work that we do, the second type of thinking—called Procedural (or operational) thinking—actually plays an even more important role in keeping us alive and performing in a skillful manner.

We think in a semi-conscious procedural manner when driving a car or brushing our teeth. We simply put our dry mind on "auto-drive" and attend to other matters. For instance, when we are driving, our procedural system does the actual moment-to-moment adjustment of the steering wheel (and even the accelerator) while we attend (using our expository system) to what is happening up ahead on the road and what other drivers beside us on the road seem to be doing.

It is only when we are learning to drive that our conscious, expository system is doing the driving—and we know how awkward we were in learning this skill (as well as other skilled performances such as hitting a golf ball or knitting a scarf). Kosslyn and Koenig's "implicit' memories tend to be of primary use in our engagement of procedural processes. The semi-conscious way in which we engage procedural thinking is assisted, appropriately, by memories of which we usually unaware.

Finally, there is the matter of how we use memory when planning for how we are going to behavior in the world and how, subsequently, we modify our behavior based on how our world reacts to this behavior. Specifically, I wish to conclude this brief journey through the dry mind by noting that the George Miller (magic number 7 fame), joined with two colleagues, Eugen Galanter (a noted mathematical psychologist) and Karl Pribram (a noted neuroscientist) to describe the larger scale way in which the dry mind works.

Much as Kosslyn and Koenig describe a complex feedforward and feedbackward system that operate in the wet mind, so Miller, Galanter and Pribram (1960) describe a dynamic feedback system—called T(test) O (operate), T (test), E (exit)--that operates in our broader planning and enactment of behavior. Memories play an integral role in planning for behavior that is to be engaged when confronting the ongoing exigencies of life.

Furthermore, memories play a critical role in the interpretation of feedback from behavior that is engaged. It seems that we are looking at a complex, highly adaptive system when examining the wet mind, as well as the dry mind. There are not just multiple components of the human mind—these components all tightly interact with one another, and each participate in multiple feedback systems (TOTE's) that keep this system adaptive in a fast changing environment (Miller and Page, 2007).

Coaching and Remembering

As coaches, we justifiably hope that our clients will retain something of what we have discussed during our coaching session. We know that our clients will take what we have talked about and inter-mesh (assimilate) this with their existing constructs and schemata. Irving Yalom has noted in a moment of candor that he realizes each of his therapy client leaves their session with him carrying a quite different story regarding what occurred during their session then he is carrying from the session.

Nevertheless. we hope that this coaching content won't be simply abandoned during the night following our session when our client is consolidating that which occurred during the previous day. It makes sense for us to use some mnemonic devices ourselves when working with our clients so that they retain at least some of what was revealed or explored during the coaching session.

Visual Images

While many sources are to be found in the schemata being formed, the visual elements of the schemata often play the prominent role. In our memory, we hear someone speak; however, the spoken word comes out of the mouth of someone we visualize. We retain visual memories of an impressive graph and then hook in the narrative that accompanies this graph. We "see" a beautiful woman or handsome man on the commercial that we remember and only then recall something of the message they are conveying.

Many organizations offering leadership and management training programs make use of visual images. This has become an almost automatic feature in programs that seek to leave a "lasting impression" on those enrolled in their program. The graphic might be a flow chart or a graphic showing the change in performance over time by a team that has been introduced to a new way of working together.

Increasing, these visual images come in animated form with lines moving, boxes expanding or shrinking in size, and objects (such as figures of people) moving in and out of clusters. We are also on the edge of animations that can be manipulated by those participating in a program. Computer-based modeling tools such as those used to display the dynamics of systems or the influence of "agents" on one another are now in the hands of those learning how to lead in systems that are operating in environments that are volatile, uncertain, complex, ambiguous, turbulent and filled with contradictions (VUCA-Plus) (Bergquist, 2020).

Visual images are also of great value when seeking to promote retention of concepts addressed during a coaching session. During my own sessions, I often make use of visual images. I might portray some important concept on a flip chart or white board located in my office or the office of my client. I might want to stretch a sheet of butcher paper across one of the office walls and begin to portray my client's narrative by drawing (or having my client draw) images on the paper. We place it back up on the wall each week and add to the ongoing portrait narrative.

Pictures of the portraits on the flip chart, white board or butcher paper can be taken on a handheld device and sent after the session to our client. We might instead stay small and more intimate by drawing a diagram or image on a small slip of paper and hand it to our client—or place this slip of paper (perhaps post-it notes) on a wall of our office. Any of these visual tools can serve our memory and the memory of our coaching clients regarding the content of our session with them.

Visual Image and Narrative

We know that while schemas are often founded on visual images, they are likely to be sustained (and will even evolve) through the presence of narrative. Furthermore, procedural thinking typically involves some ongoing visualized process (such as swinging a golf club or driving a car) and this process is retained itself as an implicit narrative. I can "see" myself performing a skilled act and typically accompany this visualization with a verbalized narrative (("first I do xyz and then I do abc").

Given this powerful partnership of visual images and narrative, I am inclined to use graphics and accompanying narrative to portray more complex concepts such as bifurcation, tipping points and change processes. I wish to spend a time of time and space in this essay describing a process that engages a visual image, a metaphor and an ongoing narrative to make a set of important concepts not only understandable, but also memorable for my coaching (and consulting) clients.

I borrow a graphic from one of the books I published quite a few years ago (Bergquist, 1993). I am specifically making use of a metaphor offered by Conrad Waddington (1977) regarding what he calls "epigenetic landscapes) or chreods (warped plains). Here is a graphic portrayal that I often provide to my coaching and consulting clients:
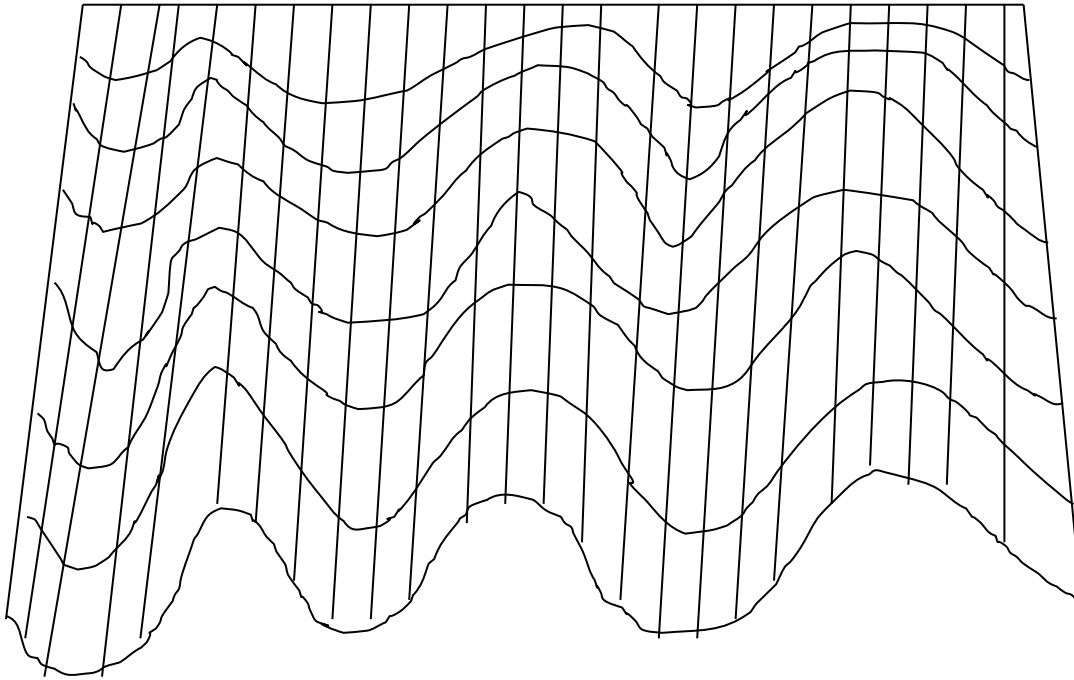
When I introduce this graphic and the accompanying metaphor, I ask my client to imagine that a ball is placed on this plain. The inherent dynamics of the plain become evident. The ball will begin to roll straight down the plane until it encounters one of the ridges. At this point a series of oscillations tend to occur. The ball moves back and forth before it eventually begins to roll down one of the valleys and picks up speed again.

> If several balls are rolling down the plane at the same time, this first ridge will become a point of bifurcation for the entire system. Some balls will move in one direction (depending on the pattern of oscillation when encountering the ridge) and roll down one valley, while other balls will move in a different direction, rolling down one or more of the other valleys.

> A ball may gain enough momentum to roll over the top of one ridge into a second valley. If there is not sufficient momentum, the ball will remain in the current valley. Thus, a few critical moments in the life of the ball's roll down the plane make a major difference in the outcome of the roll. The pattern of oscillation determines which valley is chosen and whether or not the momentum is sufficient for the ball to shift to another valley. There is a cluster of conditions (in the form of valleys and ridges) that define the specific alternative courses to be taken by the ball.

Waddington's warped plane relates directly to the alternating patterns of chaos and order that are often found in the organizations with which I have consulted and in which I have offered coaching. The tendency toward order is evident in the movement of the ball down a specific valley. Once we know which valley is chosen, we can predict the movement of the ball back and forth down this valley. However, before the ball moves into a specific valley we can only guess. In essence, the balls appear to be groping for order and a specific direction of movement. The balls engage in a process of oscillation that occurs immediately before the balls bifurcate and begin rolling down one of the specific valleys.

I often now turn to the experience of living vulnerably on a warped plain.

> At the start, as the ball Is rolling down the warped plane it encounters the first warp (a ridge with two adjacent valleys). At this point, it tends to oscillate. Bifurcation tends to be preceded by oscillations. At the point the ball ceases to oscillate and begins to move down one of the adjacent valleys, an irreversible decision has occurred.

> When the ball begins to move down one of the valleys, however, it usually doesn't move directly down the center of the valley. Rather, because it entered the valley from an angle (having oscillated among several options before entering the valley), it rolls up the side of one of the valley's ridges. The ball then corrects itself by rolling back across the floor of the valley and up the other ridge of the valley—while continuing to roll down the valley.

> In this setting, an organization makes orderly changes and operates in a self-correcting fashion. The organization is moving toward a specific goal (the bottom of the valley) and its leaders usually can rather clearly articulate the skills, knowledge and attitudes that are needed among the men and women who are working in the organization. The ball or organization may not yet be done with the change process.

> At times, the ball may swing too far and actually roll up over the top of the ridge into the adjacent valley. Changes in the first valley have become too great —usually as a function of the speed of the ball's movement (the faster the speed, the wider the swings). As in the case of the initial oscillations that preceded the ball's movement into the first valley, the movement into a second valley is preceded by oscillations—though in this case the oscillations are usually very large and quite public.

I typically pause at this point and turn to the lived experiences of my coaching client. Typically, under these conditions, everyone in the organization knows that things are in disarray and that something is about to happen. Unfortunately, one can only speculate on what will happen under these conditions of disarray or chaos.

> When the ball is swinging widely from one ridge to the other ridge, it has as great a chance of moving over the top of the left ridge into the adjacent valley as it does of moving over the top of the right ridge into that adjacent valley. Most of the members of an organization don't really know much about either of the adjacent valleys and there is always hope that the ball will continue to roll down the current valley and never really go over the top.

If the ball does move over the top of one of the ridges, then it will roll down the side of the second valley. A whole new set of parameters will be in operation. The organization needs to make some immediate adjustments to this new valley. The ball will not be at the top of the valley when it rolls over the top of the ridge. Hence, it is not like a ball that is starting at the top of the valley and has had ample opportunity to learn from its mistakes.

The ball/organization and its members must "hit the ground running" in this new valley. It will never be the same as a ball/organization that started at the top of the valley. It must instead develop its own style. A large company that downsizes will never be the same as a smaller company that was never large in the first place. A reformed alcoholic will never be the same as a lifelong teetotaler. The reformed alcoholic, for instance, might be more compassionate (or less compassionate) with regard to those who are still active drinkers. The wounds caused by downsizing will never really heal.

I offer my coaching client an insight. In addition to all of the fast learning that must occur, the ball/organization may be in for a spectacular ride!

The ball enters the second valley at an angle and at the peak of one of the second valley's ridges. Therefore, it will tend to roll high up on the opposite ridge of this second valley. It may even roll over the top of this second valley into yet another valley (another revolution). Regardless of the valley in which it settles, the ball will swing back and forth wildly from one ridge to the other ridge before settling into a more stable pattern of slowly oscillating, self-correcting movement down the floor of this valley.

What determines the nature and outcome of the movement of the ball/organization down the warped plane? I have already mentioned to my client that speed as an important determinant. The faster the ball is moving, the more likely it is to shift between adjacent valleys. The amount of oscillation is also dependent on the height of the ridges. Adjacent valleys and organizational types with low ridges (highly permeable boundaries) are conducive to frequent movements between valleys. Thus, in a postmodern world with highly permeable boundaries (Bergquist, 1993), we are likely to find more revolutionary changes in organizations—more swinging between valleys.

The amount of oscillation within a specific valley is also dependent in part on the amount of friction that exists between the ball and the plane on which it is rolling. High levels of friction in a valley tend to slow down the roll of the ball and hence the extent (and height) of the movement up the side of either ridge of the valley. Organizational valleys exhibit friction to the extent that they have strong cultural resistance to change. Organizations with dominant, stable cultures tend to slow down oscillations as well as the movement of the organization down the valley.

I would propose that effective (and powerful) coaching and consulting in a contemporary organizational setting might best be described as a short-term excursion of the ball/organization into foreign valleys: into valleys that can be anticipated, valleys that offer alternative perspectives on the valley in which the

leader is now traveling, or alternative valleys that might better serve the leader and her organization. As interventionists, we help our clients enter these foreign valleys not by chance, but by choice.

One other point. As my colleague, Jeremy Fish, has recently noted, this metaphor of a warped plain can easily be reframed as the putting green on a challenging gulf course. The green is uneven (warped) and the golf ball moves in strange and unpredictable directions. How do you get the ball into the hole—and how do you lead your organization on this warped plain?

Language

There are some linguists and anthropologists who suggest that the way in which we view the world is strongly influenced by the language we apply in attending to and seeking to understand this world. Led by the work of Benjamin Whorf (2012), the case is being made for the influence of language on our perception of reality ("weak Whorf") or even the determination of reality ("strong Whorf") (Bergquist, 2019). At the very least, language plays an important role in how we consolidate short-term memories into long-term memories and how we form schemata.

Given the weak or strong Whorfian hypothesis, we might attend to the use of language in our coaching practices. What are the ways in which written language can make a difference regarding that to which our clients attend and that which they are likely to remember (and use). Letters, words and names can all serve as powerful mnemonic devices that can be used effectively in our coaching practices.

Letters: For instance, we can provide a series of word that start with the same letter. I make extensive use of a problem-solving model that centers on five words that all begin with the letter "I": Information, Intentions, Ideas, Initiation and Insight. My clients tend to remember these five words (and what they represent) as do readers of my books where this problem-solving model is presented. If they don't remember all five words, then they can mentally sort through words that begin with "I" and will soon arrive at the right word. This will enable my clients and readers to retrieve, in turn, the content related to this word.

Acronyms: Even if the words don't start with the same letter, their starting letters can form a meaningful word. This is known as the construction of an acronym. Our field of coach (and related fields of leadership and management) are saturated with acronyms – ranging from L.E.A.D. to P.R.I.D.E.. In my own work with Agnes Mura, Richard Lim and Mirasol Delmar, extensive use is made of a planning models called DRIVE (Bergquist, Mura, Lim and Delmar, 2021)

D IRECTION	WHAT DO YOU WANT TO CREATE?
R EVIEW	WHAT'S REALLY GOING ON?
I NVENT	BRAINSTORMING POSSIBLE IDEAS, PATHS
V ENTURE	A COMMITMENT TO BOLD ACTION
E VALUATE	WHAT HAS CHANGED, BASED ON THIS CONVERSATION?

We trace out the implications of each step in this model with our coaching and consulting clients (and with the leaders who attend our workshops). The steps are easily remembered given this "chunking" acronym.

Repetition: we know that repetition can serve as an effective linguistic mnemonic at many levels. I have recently encountered the recordings of five young pianists (who have all been attending Julliard). The last name of each pianist is "Brown." Together, these performers go by the name "The Five Browns." While they are gifted musicians, I suspect that it is their unique possession of the same last name that led to their signing of a recording contract and to them becoming Memorable in the field of classical music. We might also predict that when these five pianists will benefit from the last name of "Brown" when they strike out on their own.

Homonyms: As a coach, I might similarly find a way to make repeated use of a single word that has multiple means (called "homonyms). For instance, the word "play" is replete with many rich meanings. We can act in a playful manner, or we can be quite diligent and concentrated in playing a game of chess or a piano concerto. It is important to recognize when playfulness and a carefree or even creative perspective becomes a focus on "getting it right."

This shift is important to note when raising children and "inviting" them to take piano lessons or play a game of chess with us. There is also the transition that can occur between playing a piece of music for the sake of art and expression and playing on another person's emotions in order to achieve some nefarious outcome. When we introduce the word "Play" there are many directions in which we might go. Furthermore, the word "Play" suddenly gains our attention and becomes memorable.

One of my favorite homonyms is "Right." It is particularly relevant with regard to leadership. I like to use the phrase "turning right." While this phrase can have political implications (and implications regarding directions to be taken when driving a car), I employ it when working with leaders who are addressing issues related to finding the best ("right") answer to a question or determining what constitutes a valid ("right") assessment of the real world.

I can also engage this word when working with a leader on ethical matters: what is the "right" (honest) way in which to move. There is a third use of the word "right" that I often employ: what is the extent to which a leader can justify their control of a specific situation (the "right" to control) as opposes to granting other people in their team (or organization) the "right" to control (or at least influence) the direction in which the team or organization is moving.

There are important decisions for a leader to make when "turning right." [By the way, the word "turn" is itself filled with multiple means. "Turning" can mean moving physically in a new direction or it can mean "turning" our attention to some other matter.] It is a matter of identifying desired outcomes (intentions) and engaging appropriate information when determining the "right" (correct) answer to some issue. It is instead a matter of verification criteria when a leader is seeking the "right" (correct) assessment of a specific situation.

Conversely, it is a matter of identifying the norms and values of an organization when it is a matter of operating and making decisions in a "right" (moral) manner. Then there is the matter of determining what "rights" one has as a leader. The "right" decision about what are a leader's "rights" resides in the domain of ethics (once again a review of the "right" and moral way in which to act in the world) as well

as the domain of organizational and leadership strategies (what is the "right" and correct way in which to achieve the desired outcomes in this organization).

I find that insightful and memorable dialogues often can be generated by introducing the word "Right" in a coaching session. Recently, I have also introduced a four-fold table which points to the way "Rich" as correct relates to "Right" as privilege. Here is the table:

The RIGHT Table

	I have the RIGHT to determine what we do	I share the RIGHT to determine what we do
I know what is RIGHT (correct/valid) in this situation	Autocratic Leadership	Manipulative Leadership
We need to work together to determine what is RIGHT (correct/valid) in this situation	Authoritative Leadership	Collaborative Leadership

I typically append a brief description of each leadership style to this table:

> *Autocratic Leadership*: one person holds all the power and determines what is real and what is the best solution to any problem that arises in this setting. ["Holding all the cards']

> *Authoritative Leadership*: one person sets up conditions for the appropriate engagement of other people in making decisions in this setting. ["Determining how the game will be played."]

> *Manipulative Leadership:* one person sets up conditions for the apparent engagement of other people in making decisions in this setting yet will ultimately determine what will be done ("knowing" what is correct and valid). {"Hiding the cards."]

> *Collaborative Leadership*: authority and expertise are shared in determining what is accurate (valid) and what is the correct decision to be made regarding the problems arising in this situation. ["Playing by the rules."]

All of these distinctions in leadership style and function can be further infused with insight and memorability by introducing the third morality-based use of "Right." The question can be posed: what is the ethical ("Right") way in which to operate as a leader? Which type of leadership fits with your own values and your own deeply held conviction regarding the "right" way to operate in this organization (or more generally in this world)? In the use of "Right" in these multiple ways, we are fulfilling the critical role played by TOTE as a feedback system which helps us plan for, reflect on and correct our behavior as a leader.

Unique Name: Even the use of a memorable name can make a difference – such as borrowing the unique name of a semi-famous composer (Engelbart Humperdinck) by an obscure British singer named Arnold George Dorsey. With his new name--that could not be forgotten--Engelbart rose to fame (and ironically is now better known than his namesake).

In my role as a coach, I sometimes work with my clients to "invent" a new name that describes their behavior. For instance, I use the word "Complexify" with one of my clients—who tends to mash things together so that they become more complicated. With another client (actually a cluster of clients), I co-authored the word "plork" to represent their attempt to bring word and play together in their life. In making use of this new word ("plork"), I give my clients permission to introduce new ways in which to bring about an integration of work and play.

MAPS

In a previous essay (Bergquist, 2021), I presented a series of coaching strategies—called MAPS--that are clearly directed toward not just assisting a client in understanding a concept but also helping them retain this concept for application in their life and work. We can point, once again, to the powerful role played by schemata in not just understanding something but also retaining that which has just been understood. As a coach, I can offer a unique and compelling way in which my client might view a challenge they are facing in their work or life. With this "fresh" perspective and potentially new (or revised) schemata in mind, they can try out new ("fresh") ways of being in their world – much as my clients could find a new way of "plorking."

I identify four schema-based strategies that are associated with MAPS (itself a mnemonic acronym). These four strategies are metaphor (M), analogy (A), parable (P) and Simile (S). I encourage the reader to go to this essay where examples of each MAPS strategy are offered. In the current essay, I will only offer one example of a MAPS strategy. It is a parable—and it is intimately associated with the role played by narrative in the retention of both implicit and explicit memories (as well as being used in both procedural and expository thinking).

I was coaching the head of a major faculty development program at a liberal arts college in California. This college was the recipient of a very large grant to fund developmental work with its faculty. The grant was one of the largest ever given for this kind of program in an American postsecondary institution. The funds were provided not because this college was uniquely qualified to receive the grant, but because the college is located in a community where a major foundation is located (and where the foundation must devote all of its funds given firm restrictions placed on the foundation by the primary donor).

While the grant was welcomed by the faculty at this college, it did not meet their primary need—which was for higher wages. The cost of living had skyrocketed in this community and the faculty at this college could no longer afford to live near the college. They had to commute from long distances and, in most cases, were spending several hours each day in their car. Or they retained their home near the college and were either spiraling into debt or relying on the income of their spouse. In working with the director of this faculty development program I found that most of the faculty receiving faculty development grants were trying to find ways in which their grant would ease their financial burden rather than facilitate their professional development.

I offered a parable that went viral in this college –and soon appeared in a major urban newspaper located in a city near this college. I described a village that was located in the shadow of a large damn. The damn held a large quantity of water; however, none of the water could be used by the residents of this village to either quench their thirst or irrigate their plants. The water had to be used for cleaning the streets of the village.

Standing in the "shadow of the damn", the villagers with parched throats witnessed the withering of their crops. What was to be done. They soon began to notice that some of the street-cleaning water began to splash up into their face and wet their lips. Other water seemed to flow from the overwatered streets into trenches that led to the fields. Soon, there was a large amount of water splashing from the streets unto the villagers' faces and from the streets to the trenches. Living in the shadow of the damn, the villagers now found refreshment and food> However, they wondered why this foolish policy remained in place regarding the restrictive use of water to clean their streets. And they found that too much water was still being wasted in efforts to divert water from the streets to their mouths and fields Who after all owned the damn and who could change the policy?

This parable appealed to the literary sensibilities of many faculty at this college. More importantly, it provided some direction for the faculty to take corrective action. Rather than sitting back and grumbling about the "stupid" use of faculty development funds and finding ways to divert funds from professional development to the padding their inadequate salary, the faculty (and especially the program director) went to the foundation and asked for a review and modification of the program's focus. They took action while living in the shadow of the damn.

Conclusions

As a coach we can assist our client in not only retaining what they wish to remember, but also in constructing a narrative about their life and work that is both MEMORABLE and INSPIRING. It is at this point that our clients are most likely to consider (consciously or unconsciously) a major shift in their governing self-schema. We provide new visual images, new language, new MAPS—and new narratives.

Most of we poor souls do not have infinite memories as do Luria's patient and Teddy Nadler. Instead, we must explore the powerful, constructive power that we (who do not have infinite memory) find in the consolidation that occurs when we retain something in long-term memory. When we find and acknowledge this constructive power then we come to another important realization: a profound reconstruction of reality accompanies the consolidation. We are selective in what we retain and have a choice regarding the category or schema to which we assign particular memories. We are in the business of interpreting what we have stored in memory as these memories relate to our constructed life narrative.

As coaches, we can influence this "business" on behalf of our client's own welfare. We can help our clients construct their personal, life narrative and use this narrative to guide their future actions. (Drake, 2017). Most importantly, as coaches we can encourage and assist our client in the construction of a narrative that is positive in nature and that builds on the appreciation of their own distinctive strengths and their own history of success (Bergquist and Mura, 2011).

One final item. Do you remember the phone number. If you had problems with remembering any of the numbers, it was likely the last two numbers (3 and 3). You probably had no problem with the numbers that were associated with COACH (262-24). I suspect it was the ending two letters (ED) that were easily forgotten. They are an addition to the basic chunk (C>O>A>C>H). We know from the neurosciences that we tend to store words in their basic form and then add on modifiers (such as "er", "s" and "ed"). These

modifiers are given lower priority and are therefore rather easily forgotten. One more lesson to be learned from the exciting new world of neuroscience.

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