



Dear Colleague:

I always knew that stories were critical to great communication. Facts and statistics never stuck in my brain. They may have traveled through, but they didn't take up residence until anchored by some kind of meaning.

When my teachers told stories about life in historical times, I remembered them. I remembered the facts too. The same goes for speeches. Memorable speeches that ignite action usually are usually built with stories that stir the imagination and call up universal experience.

Storytelling is now recognized as a critical business communication skill.

Still, I wanted the science behind what my gut knew. So I asked Kris Bough if he knew anything about it. Luckily, he does. I asked him if he would write a short paper about the brain and storytelling.

His paper explains that "Our Brains are Wired for Storytelling."

I'm delighted that Kris has given me permission to give you this copy of his paper.

Read and enjoy.

Warmly,

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Our Brains are Wired for Stories

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What is the purpose of a story?

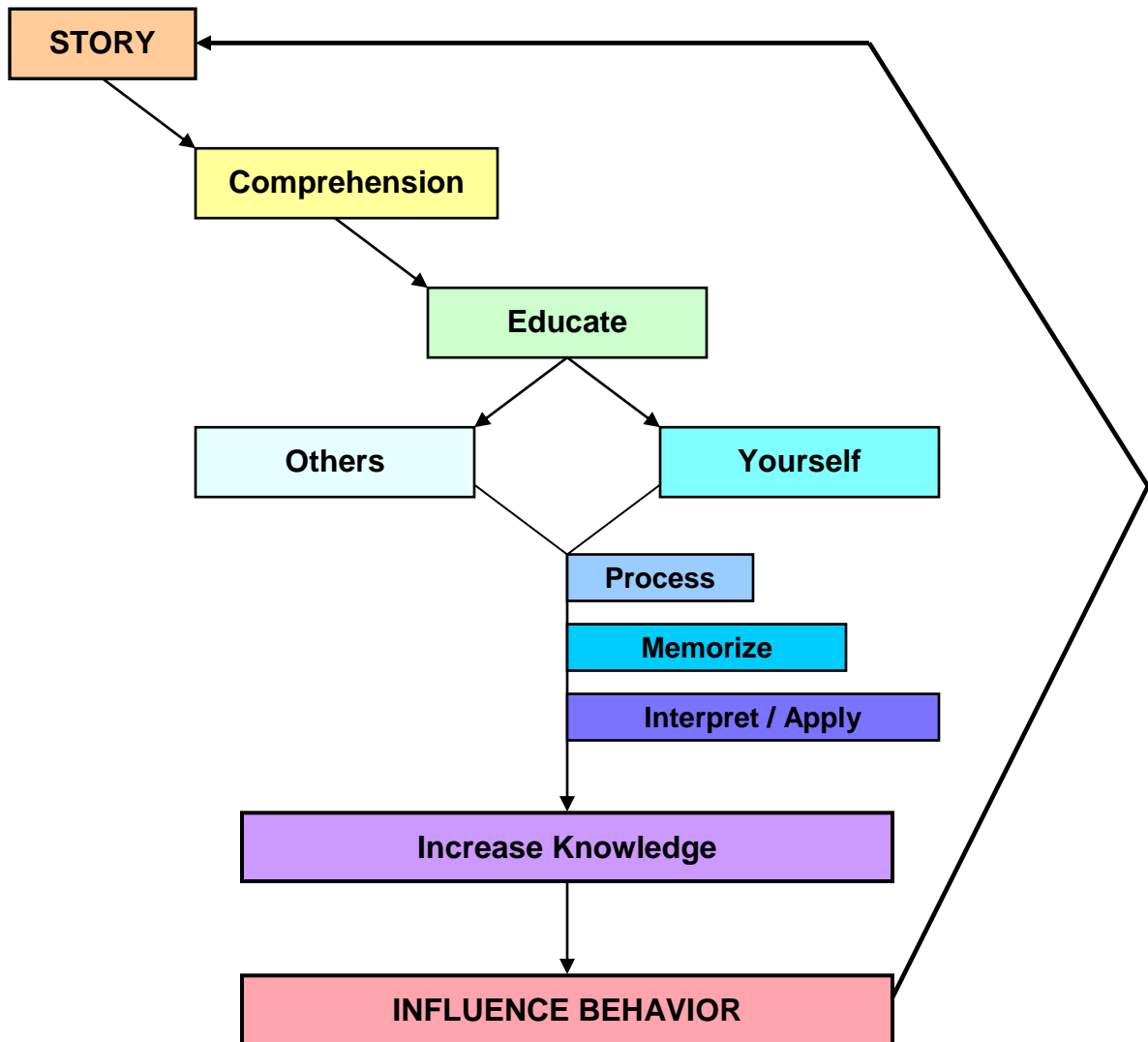
A story is a means to share or review your experiences. Stories can be communicated to others (interpersonal) or thought over by one's self (intrapersonal). They are a means to present a series of related events over time.

We are more influential when we share our experiences through a story. The narrative that we build within our minds and subsequently tell others helps us and others organize, memorize, and ultimately learn from our daily lives.

Events and outcomes do not occur in disjointed factual or even logical occurrences. Rather, life's events emerge as interrelated scenes, interpreted by our senses. We are only able to take in a small part of what we are being told. We are constantly like being 'barraged' with new information, new ideas. Sometimes, it all comes at us very rapidly, especially in today's age of instant information. We need to recall actively the meaning of words, names, proceedings, places, and emotions. We need to put everything into context. We understand what we can project ourselves into, something that has some degree of familiarity to us. We learn from how we relate to the story. Otherwise, we might say, "it's all Greek to me". Therefore, thinking through your stories again and again helps to 'make sense' of these scenarios.

After interpreting life's events, how can we teach others from our experiences? Externally, we need stories to communicate effectively. For example, if I understand the inherent danger of driving without a seatbelt, how do I teach that lesson to a 17-year-old driver who has just received his license? Or, perhaps you know a lot about US presidential history; how do you best share with someone your passions for the myriad personalities that worked to help shape this country? The answer is in a story.

The purpose of a story might be envisioned in this way:



Effectively Communicating our Stories: Mind Map

Effective communication commences with shared experiences. It begins by finding a common experience(s) on which to build. For example, we can all probably relate to the experience of a birthday party, flying in an airplane or driving a car; but we would not all relate to military service, a trip to Africa, or the installation of a light fixture.

Once we have something to relate to the more we can attach to it in our memories. This also generates more interest. Subsequently, add on the unfamiliar experience(s) upon this 'foundation' of the familiar. The path that the speaker has taken before us is now illuminated; the audience can see where they are going.

In addition, use clever ways of describing these experiences using common perceptions. This helps convey your interest for the topic. If you're interested in an event, you're more likely to 'soak up' every last detail; not so much, if you're not as interested. Use all your senses. Express the sounds that were relevant; sing if it helps! We are all likely to have tasted a chocolate cake, smelled a campfire, been burned by a hot plate, seen a brilliant orange sunset, or heard the sounds of a piano. Depict every little detail of the story's setting; describe the texture so others can feel it; use simple words. Capture the subtleties. Share your emotions. Show your passion. Enthusiasm is vitally important because the emotional centers of our brains are closely linked to the regions of the brain where memories are formed. It is the application of these experiences, senses, emotions, dilemmas, and ultimately decisions that help create a memorable story.

When put together in this way, stories are communicated effectively because speakers are 'mapping the mind' for others to follow! The more skillful we are at describing these experiences, the more vivid the picture we paint in each other's mind. The more common these types of shared experiences used in a story, the more others can relate to your story. The more common the experiences and perceptions you use in building your story, the more 'lights' your story turns on in someone else's mind. The more people relate to your story, the more they comprehend. Ultimately, this increases the chance that someone else can relate to your message and the possibility that someone will remember and apply it later. In this way, your speech becomes more effective! People who fail to encapsulate their message in a story will likely have their experiences fall on 'deaf' ears.

The Neuroanatomy of Successful Communication

Communicatively speaking, our brains are wired for stories. Although still not precisely understood, the neuroanatomy of verbal communication involves numerous brain regions. In general, however, it is the 'spaghetti-like' cortex of the upper part of our brains that enables us to synthesize stories into thoughts and ideas that we each understand. While the deeper parts of our brain are generally thought to manage our bodily functions, the superficial regions of the upper brain are generally thought to recognize patterns, store and recall experiences, and 'link together' the key aspects of a story. More specifically, the spaghetti-like upper cortex can be further sub-divided into four major regions (Figure 2): 1) the frontal lobes, 2) the parietal lobes, 3) the temporal lobes, and 4) the occipital lobes. Each of these sub-regions has a different role in processing verbal communication.

Verbal communication consists of several parts. Different aspects of verbal communication are thought to be processed in three out of the four sub-regions of the brain. Recent evidence indicates that auditory communication can be broken down into the following: 1) perception, 2) comprehension, and 3) interpretation.

First is perception. Communicated sounds have to be heard. The individual must be able to perceive acoustically the story being shared. Beyond the ear, acoustic sounds are perceived within the temporal lobe of the brain (black arrow, Figure 2). Interestingly, listening, in this most basic sense, is task dependent. That is, within the temporal lobe of the brain, listening to music is different than listening to a story. While each begins in the ear and employs similar neural pathways to begin with, they are processed within the brain very differently. In this way, speech perception is NOT speech comprehension; hearing is NOT listening. This is because listening involves speech 'processing'; it requires cognitive work. Listening involves the active use of working memories and other thought processes.

Second, the story has to be processed. Listening begins with speech comprehension. Within the temporal lobe, the 'building' process of the narrative begins. Words are recognized and phrases are put together. Linguistic memories are called upon as one of the memory centers, the hippocampus, which is closely linked to this same brain region, is employed. The verbal pictures painted within our minds helps us recall those common experiences we have all shared and we begin to understand the speaker's novel experiences being shared with us. This initial type of speech processing occurs on both sides of the brain.

Third, the speech is interpreted. While auditory perception and processing are fairly well understood, speech interpretation processes are less so. It is thought that speech interpretation occurs largely within of the frontal and parietal lobes. Here is where the novel aspects of a speaker's story begin to be interpreted and analyzed. We begin to 'map' the same decision-making processes the speaker has and to assemble the meaning of the story as it relates to us, the listener. These processes are thought to be largely localized to the left side of our brains. It is likely that information is stored here for short

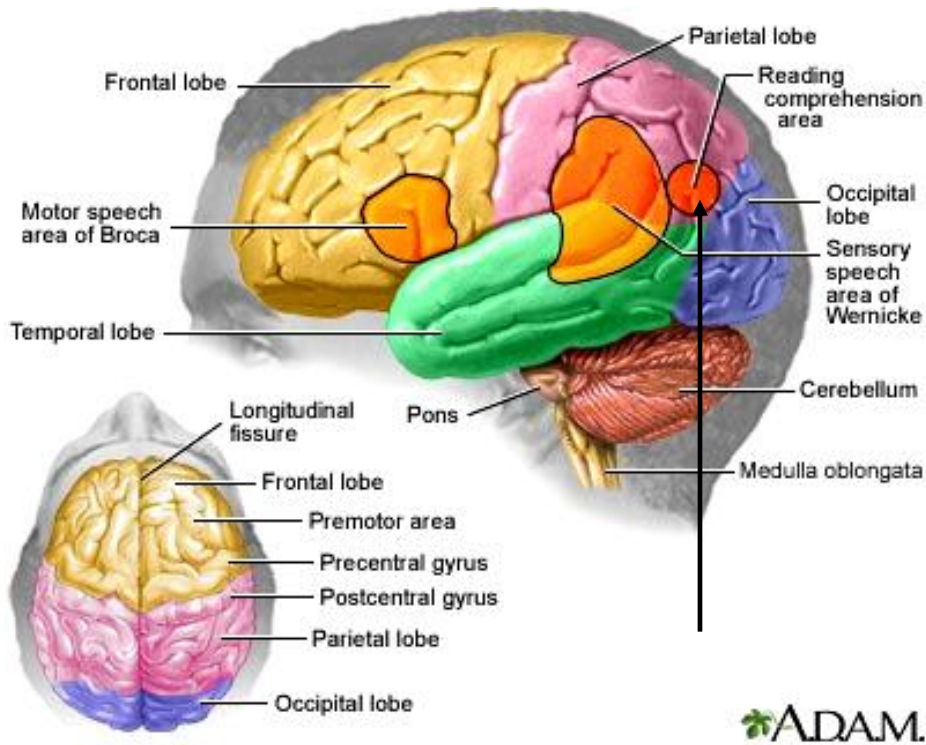
periods of time (minutes). From there, the speech can then be retrieved, linked to information from other parts of the brain, and used for subsequent speech generation.

Finally, as a story is further interpreted and processed within the brain, it can eventually enter long-term memory (months to years). Our long-term memories are stored in multiple locations throughout the brain. For example, our memory of what a tree looks like is likely to be stored in the visual cortex (occipital lobe); our memory of what a piano sounds like is likely to be stored in the auditory cortex (temporal lobe); our memory of what a hot plate feels like is likely to be stored within the somatosensory cortex (parietal lobes).

Importantly, as the various facets of the speech enter long-term memory and are consolidated, each is thought to be stored symbolically throughout our brains. Memories are no longer coded verbally; we no longer 'hear' the words of the speech internally. While our brains and short term working memory are wired for stories, after these initial speech processes have occurred and we have interpreted the overall message of the story, then we categorize it in our minds accordingly. We remember only the 'overall picture' of the story long-term. This is why we tend to forget the little details of the story or speech over time. Once the 'gist' of the story is understood and enters our long-term memories, details of the story become less significant and fade into the background. It is just the main idea of the grasped story that is recalled.

Re-telling a story demonstrates understanding. When you share a narrative with someone, you have perceived, comprehended, memorized, and interpreted the ideas/thoughts gained from the story just listened to or read. In so doing, connections are strengthened between the brain regions described above and new connections are formed. As stories are told and re-told, short-term memories are combined and consolidated into long-term memories. Re-stimulating those various regions of the brain involved in the sharing of that particular experience or that story increases the chances that it will be remembered in the future. In addition, as mentioned above, the more vivid the story, the more sensory experiences we use in sharing our narratives, the 'stickier' it becomes to our memories. It is easier to recall those stories we have heard because we remember it had something to do with a hot plate, a beautiful piano recital, or a brilliant orange sunset. This improves recall and overall comprehension. A 'vividly-painted' picture stored in multiple brain areas is more likely to reemerge than a 'poorly-painted' picture stored in only a few brain regions.

Figure 2. A lateral view of the brain and its various sub-regions. The frontal lobes are thought to play a role in many ‘higher order’ functions including: judgment, temperament, problem solving, short-term working memory, and the generation of speech. The occipital lobes process visual information. The temporal lobes process auditory information and are involved the generation of memories. The parietal lobes play vital roles in interpreting sensory information; they are also thought to play a key role in ‘linking together’ information from various regions of the brain. The black arrow points to the region of the brain where acoustic information is inputted from the ear. (Figure taken from the national library of medicine: <http://www.nlm.nih.gov/medlineplus/>)



The Importance of Stories: Cognitive Development

We do not easily remember what others have said unless it is in the form of story. Stories are a key means of generating and preserving the web-like connectivity between the different events that might have otherwise been lost from memory over time.

It is the foundation of knowledge. From this knowledge, we build new memories, further comprehend new events and issues, and add to our knowledge. Stories are important because we learn to apply the messages we have gained from others to each of us, and our future experiences (see Figure 1 above).

Think of your best teachers. Think of some of your most influential friends. Think of the best speeches you've ever heard. Why do those moments or people stick out in your memories? The answer is most likely that they all 'touched' something in you. As above, the more common the experiences and perceptions that you use in building and sharing your story, the more 'lights' were turned on in your mind. The more people relate to your story, the more they comprehend and learn from your message. The same could be said for reading. When we read, internally, we are 'listening' to other people's stories as they 'mind map' their ideas and thoughts with ours. From this, we adjust the way we think. Each of your teachers made you think about things in a different way. Each increased your knowledge and understanding of a particular issue. Each told their stories with interest and passion. And, each, ultimately, influenced your behavior.

But wouldn't our lives be so much easier if we were biologically put together to remember every story we ever heard? Wouldn't it be simpler if we were geared to memorize every detail? No. This is one of the real beauties of our minds; we do NOT remember it all. While we have amazing memorization capacities, we also have the amazing ability to forget. It is like going through life with a pencil instead of a pen; we can correct and learn from our mistakes! Think if we were to remember every negative thing that happened to us. When we don't tell our stories often or soon enough after the experience, these memories fade over time as new information comes in. In this way, when we don't re-tell a story, it helps us forget the bad experiences and these bad memories gradually fade over time.

Through the stories we choose to tell, we determine what is important and what is not. That is precisely why we still remember the clothes we were wearing during a car accident 10 years ago, but we cannot remember the name of our neighbor that we just met 10 minutes ago! One was a story, a situation, which we wanted to learn and grow from; it was an event we wanted to avoid in the future. Learning our neighbor's name, we had not yet recognized its significance. We continue to put things into context over time. We continue to pare down which aspects are most important and likely to be of most value to us in the future, and which aren't so important and can be forgotten. In so doing, we define our core beliefs and apply these learned behaviors to new situations and/or experiences. We define ourselves. In essence, we are the stories we like to tell. Perhaps this is something to think about the next time you ask someone, "So, how was your day?"

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