

★ Interesting facts about memory

- ★ You store concrete words (table, chair) in long-term memory more easily than abstract words (justice, democracy).
- ★ When you're sad, you tend to remember sad things.
- ★ You can't remember much before the age of 3.
- ★ You remember things that you see (visual memory) more easily than words.

➔ People sleep and dream so they will remember

Some of the best research happens through serendipity. Neuroscientist Matthew Wilson was studying brain activity in rats as they ran mazes. One day he accidentally left the rats hooked up to the equipment he used to record their brain activity. The rats eventually fell asleep. To his surprise he found that their brain activity was almost the same whether they were sleeping or running mazes.

Ji and Wilson (2007) started a series of experiments to study this further. Their experiments led them to a theory, not just about rats, but about people, too: When people sleep and dream, they are reworking, or consolidating, their experiences from the day. Specifically, they are consolidating new memories and making new associations from the information they processed during the day. Their brains are deciding what to remember and what to forget.

Takeaways

- * Because people can store concrete words (table, chair) in long-term memory more easily than abstract words (justice, democracy), use concrete words instead of abstract ones in your speech and on your slides.
- * Because people can remember things that they see (visual memory) better than words, use images with or instead of words on slides.
- * Let people rest (and even sleep—break long sessions into multiple sessions with an evening between them) if you want them to remember information.
- * Try not to interrupt people if they are learning or encoding information.
- * Because people will remember beginnings and endings more than middles, have a strong opening and a strong closing. Break long sessions up into several mini-sessions so that there are more beginnings and endings.

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PEOPLE RECONSTRUCT MEMORIES EACH TIME THEY REMEMBER THEM

Think back to a particular event that happened at least 5 years ago. Maybe it was a wedding, a family gathering, a dinner with friends, or a vacation. Remember the people and where you were. Maybe you can remember the weather or what you were wearing.

MEMORIES CHANGE

When you think about this event, it probably plays in your mind like a short movie clip. Because you experience memories this way, you tend to think that memories are stored in their entirety and never change, like an archived movie. But that's not what happens.

Memories are actually reconstructed every time we think of them. They're not movie clips that are stored in the brain in a certain location, like files on a hard drive. They are nerve pathways that fire anew each time we remember the event. This makes for some interesting effects. For example, the memory can change each time it is retrieved.

Other events that occur after the original event can change the memory of the original event. At the original event, you and your cousin were close friends. But later on you have an argument and a falling-out that lasts for years. Over time when you recall the memory of the first event, it changes without you realizing it. It starts to include your cousin being aloof and cold, even if that is not true. The later experience has changed your memory.

You'll also start to fill in memory gaps with made-up sequences of events, but these will seem as real to you as the original event. You can't remember who else was at the family dinner, but Aunt Jolene is usually present at these events, and so over time your memory of the event will include Aunt Jolene, even if she wasn't there.

Takeaways

- * Because memory is unreliable, don't rely on it for critical information. Provide a hand-out with critical information so that people will not make memory errors after the presentation when they try to apply the information.
- * If you are concerned that people will forget what they experienced during the presentation, have an activity where they write down or record their impressions and important information they are taking away. In this way, you or they can go back and look at what was written or recorded rather than relying on faulty memory.

14 FORGETTING IS PROGRAMMED IN

Forgetting things seems to be such a problem. At best it is annoying (“Where did I put my keys?”), and at worst it can send the wrong people to prison with inaccurate eyewitness testimonies. How could something so maladaptive have developed in humans? Why are we so flawed?

It’s actually not a flaw. Think about all the sensory inputs and experiences you have every minute, every day, every year, and through your lifetime. If you remembered every single thing, you’d be unable to function. You have to forget some things. Your brain is constantly deciding what to remember and what to forget. It doesn’t always make decisions that you find helpful, but in general, the decisions it makes (primarily unconsciously) are keeping you alive!

Takeaways

- * People are always going to forget.
- * What people forget is not a conscious decision, so don’t take it personally.
- * Prepare your presentation with the understanding that your audience will forget some of it. If certain information is really important, don’t rely on people to remember it.
- * If you want people to remember information accurately, provide them with a summary handout after the presentation for them to refer to later.

15 PEOPLE ARE DRIVEN TO CREATE CATEGORIES

If you’re between the ages of 5 and 60 and grew up with a television in the United States, you will probably know what I mean if I say, “One of these things is not like the other.” This is a snippet from the popular children’s show *Sesame Street*.

★ Watch the *Sesame Street* video

If you don’t know what I am talking about, you can view YouTube clips—for example, <http://bit.ly/eCSFKB>.

The purpose of this *Sesame Street* lesson is to teach young children how to notice differences and, essentially, how to start to learn to categorize.

Interestingly, it’s probably unnecessary, and perhaps even ineffective, to teach children how to create categories, for two reasons:

- ★ People naturally create categories. Just as learning a native language happens naturally, so does learning to categorize the world around us.
- ★ Categorizing doesn’t emerge as a skill until about age 7. Thinking about categories just doesn’t make sense to children before that. After age 7, however, kids become fascinated with categorizing information.

PEOPLE LOVE TO CATEGORIZE

Because of my work in user experience and the design of Web sites and other technology products, I’ve spent a lot of time doing what is called a card-sorting exercise. In card sorting, you typically give someone a stack of cards. On each card is a word or phrase about something they would find at a Web site. For example, if you’re designing a Web site that sells camping equipment, then you might have a set of cards that say things like “tents,” “stoves,” “backpack,” “returns,” “shipping,” and “help.” In a card-sorting exercise, you ask people to arrange the cards into whatever groups or categories make sense to them. You can have several people do the task, then analyze the groupings, and have data from which to build the organization of your Web site. I’ve done this many times, including using it as an exercise in classes I teach. It’s one of the most engaging tasks I have people do. Everyone gets very involved in this exercise, because people like to create categories.

IF YOU DON'T PROVIDE CATEGORIES, PEOPLE WILL CREATE THEIR OWN

People will impose categories when they're confronted with large amounts of information. People use categorization as a way to make sense of the world around them, especially when they feel overwhelmed with information.

If you don't organize your material into different categories, then the audience will try to organize it themselves.

WHO ORGANIZES DOESN'T MATTER AS MUCH AS HOW WELL IT'S ORGANIZED

I have a Ph.D. in psychology. Along the way I also earned a master's degree in psychology. For my master's thesis, I conducted research on whether people would remember information better if other people had organized it or if they had organized it themselves. Basically, what I found was that it didn't really matter. What mattered most was how *well* it was organized. The more organized the information, the better people remembered it. Some people (those who measured high on "locus of control" measures) preferred to organize the information in their own way, but self-organization versus other-organization schemes didn't really matter as long as the information was well organized.

How you organize the material for your presentation is very important. In the chapter "How to Craft Your Presentation," you will learn a way to organize your topics for maximum engagement and persuasion. Whether you use that method or some other way, make sure that you do organize your information. You can have great content, but if it is poorly organized it won't seem great—it will seem mediocre.

Takeaways

- * People like information to be organized into categories.
- * If there is a lot of information and it is not in categories, people will feel overwhelmed and try to organize the information on their own.
- * Spend time organizing your information into logical groups and categories. It will make your information easier to understand and remember.
- * If your audience is children under age 7, any organization into categories you are doing is probably more for the adults viewing your presentation, not for the children.

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TIME IS RELATIVE

Has this ever happened to you? You're traveling 2 hours to visit friends. It's 2 hours to get there and 2 hours to get back, but the trip there feels much longer.

In his interesting book *The Time Paradox*, Philip Zimbardo discusses how our experience of time is relative, not absolute. There are time illusions, just like there are visual illusions. Zimbardo reports on research that shows that the more mental processing you do, the more time you think has elapsed. This is related to the concept of progressive disclosure, discussed earlier in this chapter. If people have to stop and think at each step of a task, they'll feel that the task is taking too long. The mental processing makes the amount of time seem longer.

If your presentation requires too much mental work, then people will think that a lot of time has passed. They will feel that the presentation is taking too long, and they will start to fidget. In order to prevent this, make sure that you have broken up difficult ideas into smaller, easier to understand chunks and that you have activities for people to assimilate the material before adding new information.

EXPECTATIONS AFFECT THE PERCEPTION OF TIME

Think about the last time you attended a presentation that went over the allotted time. Even if the topic is interesting and the presenter is great, if the presentation goes over the allotted time and/or is disorganized, the audience's perception will be that the presentation is too long.

Takeaways

- * Structure your talk so that your audience can tell that you are making progress. For example, if you have five points you are making, and they know you are on point three, they can gauge the progress and weigh it against how much time is left.
- * If possible, make the amount of time it takes to go through each part of your presentation relatively consistent, so people can adjust their expectations accordingly.
- * To make your presentation seem shorter, break it up into steps and have people think less. It's mental processing that makes something seem to take a long time.

THERE ARE FOUR WAYS TO BE CREATIVE

Have you heard someone say, “Oh, John—he’s so creative! I wish I were creative like that.” It makes it sound as if creativity is a natural skill or talent, like the ability to sing or paint. Other times people say, “I’m going to a seminar to learn how to be more creative.” That makes it sound as if creativity is a skill that anyone can learn. So, which is it? Well, both and neither.

Arne Dietrich (2004) wrote a paper on creativity from a brain and neuroscience point of view. Dietrich identifies four types of creativity with corresponding brain activities:

- ★ Deliberate and cognitive creativity
- ★ Deliberate and emotional creativity
- ★ Spontaneous and cognitive creativity
- ★ Spontaneous and emotional creativity

Think of it like a matrix, as shown in **Figure 17.1**.

	Cognitive	Emotional
Deliberate	Thomas Edison	Therapeutic A-ha Moment
Spontaneous	Newton and the apple	Artists, Musicians

FIGURE 17.1 Four kinds of creativity

Creativity can be either emotionally or cognitively based, and it can also be spontaneous or deliberate. That gives you the four types.

DELIBERATE AND COGNITIVE CREATIVITY

Deliberate and cognitive creativity is the kind that comes from sustained work in a discipline. For example, Thomas Edison, the inventor of the electric light bulb as we know it, was a deliberate and cognitive creator. He ran experiment after experiment before he came up with an invention. In addition to the light bulb, Thomas Edison invented the phonograph and the motion picture camera. He held 1093 US patents, and more in Europe and the UK.

For deliberate, cognitive creativity to occur, you need to have a preexisting body of knowledge about one or more particular topics. When you’re being deliberately and cognitively creative, you are putting together existing information in new and novel ways.

DELIBERATE AND EMOTIONAL CREATIVITY

I remember a moment many years ago when I was having a series of crises. I remember sitting quietly in my office. I had to figure out why all these things were happening. Why did I seem to be making a series of bad decisions? Then I had an *a-ha* moment. In the 10 years before the current crisis, I had some tough times, including both of my parents dying. I had to be strong and independent and take care of myself. I had a belief that said, “I am a strong person. I can handle any crisis.” I realized that I was making decisions that would eventually cause more crises, at least partly so I could overcome them to prove to myself that I was strong.

I decided right then to change my belief. I said out loud, “My life is easy and graceful.” I began to make decisions that would make my life easier.

That is an example of deliberate, emotional creativity. This type of creativity also involves the prefrontal cortex—that is the deliberate part. But instead of focusing attention on a particular area of knowledge or expertise, people who engage in deliberate, emotional creativity have *a-ha* moments having to do with feelings and emotions.

SPONTANEOUS AND COGNITIVE CREATIVITY

Imagine you’re working on a problem that you can’t seem to solve. For example, you have two presentations that you need to merge into one, but you can’t figure out how to make it fit into a 1-hour presentation. You don’t have the answer yet, but it’s lunch-time and you’re meeting a friend and need to run some errands too. On your way back from errands and lunch, you’re walking down the street and suddenly you get a flash of insight about how to organize the presentation. This is an example of spontaneous and cognitive creativity.

Spontaneous and cognitive creativity involves the basal ganglia of the brain. This is where dopamine is stored, and it is a part of the brain that operates outside your

conscious awareness. During spontaneous and cognitive creativity, the conscious brain stops working on the problem, and this gives the unconscious part of the brain a chance to work on it instead. If a problem requires “out of the box” thinking, then you need to remove it temporarily from conscious awareness. By doing a different, unrelated activity, the prefrontal cortex is able to connect information in new ways via your unconscious mental processing. The story about Isaac Newton thinking of gravity while watching a falling apple is an example of spontaneous and cognitive creativity. Notice that this type of creativity does require an existing body of knowledge. That is the cognitive part.

SPONTANEOUS AND EMOTIONAL CREATIVITY

Spontaneous and emotional creativity comes from the amygdala. The amygdala is where basic emotions are processed. When the conscious brain and the prefrontal cortex are at rest, spontaneous ideas and creations can emerge. This is the kind of creativity that great artists and musicians possess. Often these kinds of spontaneous and emotional creative moments are quite powerful, such as in an epiphany or a religious experience.

There is not specific knowledge necessary (it's not cognitive) for this type of creativity, but there is often skill (writing, artistic, musical) needed to create something from the spontaneous and emotional creative idea.

BE SPECIFIC WHEN YOU DESIGN A CREATIVE ACTIVITY

If you are going to include an activity in your presentation in order to foster creativity, or if you want to use creativity when you create a presentation, then you have to decide which of the different ways to be creative you are thinking about.

- ★ Deliberate and cognitive creativity requires a high degree of knowledge and lots of time. If you want to promote this kind of creativity for yourself as you work on your presentations, you will have to make sure you have enough prerequisite information. You will need to study material beforehand so that you have assimilated the information, and you will also need to give yourself enough time to work on the presentation. If you are expecting your audience to do creative work as part of your presentation, you will need to provide them with the information and give them lots of time for the activity.
- ★ Deliberate and emotional creativity requires quiet time. You can gather material to ponder, but don't expect that you will be able to come up with answers quickly. If you are expecting your audience to do this type of creative work during your presentation, you will need to give them quiet time to work alone before you ask them to come back to the group and share their insights with others.

- ★ Spontaneous and cognitive creativity requires stopping work on the problem and getting away. If you are working on a presentation, take plenty of breaks where you go do something else. Or sleep on it and return to it the next day. If you have a creativity exercise for the audience of your presentation, you may need to lay out the problem they are supposed to solve, then have them do something else, and later come back to work on the problem.
- ★ Spontaneous and emotional creativity probably can't be designed or planned for, other than learning the skills (for example, artistic or musical skills) that are prerequisites.

Takeaways

- * If you build a creative project for your audience into your presentation, make sure you give them all the information they need and lots of time.
- * If you include a creative exercise that requires deliberate and emotional creativity, build in time for them to work individually before they bring ideas back to their team or to the group.
- * In order for you to use spontaneous and cognitive creativity when you are preparing a presentation, take plenty of breaks or “sleep on it.”
- * You probably can't plan for spontaneous and emotional creativity in your presentation.