

*The Memory of Thought reconstructs the philosophy of Adorno and Heidegger in the light of the importance that these thinkers attach to two proper names: Auschwitz and Germanien. In Adorno's dialectical thinking, Auschwitz is the name of an incommensurable historical event that seems to put a provisional end to history as a negative totality.*

Memory is the term given to the structures and processes involved in the storage and subsequent retrieval of information. Memory is essential to all our lives. Without a memory of the past, we cannot operate in the present or think about the future. We would not be able to remember what we did yesterday, what we have done today or what we plan to do tomorrow. Without memory, we could not learn anything. Memory is involved in processing vast amounts of information. This information takes many different forms, e. For psychologists the term memory covers three important aspects of information processing: Memory Encoding When information comes into our memory system from sensory input , it needs to be changed into a form that the system can cope with, so that it can be stored. Think of this as similar to changing your money into a different currency when you travel from one country to another. For example, a word which is seen in a book may be stored if it is changed encoded into a sound or a meaning i. There are three main ways in which information can be encoded changed: Semantic meaning For example, how do you remember a telephone number you have looked up in the phone book? If you can see it then you are using visual coding, but if you are repeating it to yourself you are using acoustic coding by sound. Evidence suggests that this is the principle coding system in short-term memory STM is acoustic coding. When a person is presented with a list of numbers and letters, they will try to hold them in STM by rehearsing them verbally. Rehearsal is a verbal process regardless of whether the list of items is presented acoustically someone reads them out , or visually on a sheet of paper. The principle encoding system in long-term memory LTM appears to be semantic coding by meaning. However, information in LTM can also be coded both visually and acoustically. Memory Storage This concerns the nature of memory stores, i. The way we store information affects the way we retrieve it. Most adults can store between 5 and 9 items in their short-term memory. Miller put this idea forward and he called it the magic number 7. In contrast, the capacity of LTM is thought to be unlimited. Memory Retrieval This refers to getting information out storage. STM is stored and retrieved sequentially. For example, if a group of participants are given a list of words to remember, and then asked to recall the fourth word on the list, participants go through the list in the order they heard it in order to retrieve the information. LTM is stored and retrieved by association. This is why you can remember what you went upstairs for if you go back to the room where you first thought about it. Organizing information can help aid retrieval. You can organize information in sequences such as alphabetically, by size or by time. Imagine a patient being discharged from hospital whose treatment involved taking various pills at various times, changing their dressing and doing exercises. If the doctor gives these instructions in the order which they must be carried out throughout the day i. Criticisms of Memory Experiments A large part of the research on memory is based on experiments conducted in laboratories. Those who take part in the experiments - the participants - are asked to perform tasks such as recalling lists of words and numbers. Both the setting - the laboratory - and the tasks are a long way from everyday life. In many cases, the setting is artificial and the tasks fairly meaningless. Psychologists use the term ecological validity to refer to the extent to which the findings of research studies can be generalized to other settings. An experiment has high ecological validity if its findings can be generalized, that is applied or extended, to settings outside the laboratory. It is often assumed that if an experiment is realistic or true-to-life, then there is a greater likelihood that its findings can be generalized. If it is not realistic if the laboratory setting and the tasks are artificial then there is less likelihood that the findings can be generalized. In this case, the experiment will have low ecological validity. Many experiments designed to investigate memory have been criticized for having low ecological validity. First, the laboratory is an artificial situation. People are removed from their normal social settings and asked to take part in a psychological experiment. For many people, this is a brand new experience, far removed from their everyday lives. Will this setting affect their actions, will they behave normally? Often, the tasks participants are asked to perform can appear

artificial and meaningless. Few, if any, people would attempt to memorize and recall a list of unconnected words in their daily lives. And it is not clear how tasks such as this relate to the use of memory in everyday life. The artificiality of many experiments has led some researchers to question whether their findings can be generalized to real life. As a result, many memory experiments have been criticized for having low ecological validity. The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review*, 63 2: Cognitive psychology 2 nd ed. Harcourt Brace College Publishers. How to reference this article: Stages of memory - encoding storage and retrieval.

**Chapter 2 : Thought and Memory | D.A. Roberts**

*Language is a memory and not a thought - consider a child learning a language, when she learns of a word such as apple, she learns associating the sound apple with the object. This is a memory being formed by association.*

History[ edit ] Philosophically, ruminations of the human mind and its processes have been around since the times of the ancient Greeks. In BCE, Plato is known to have suggested that the brain was the seat of the mental processes. Some of those involved in this debate included George Berkeley and John Locke on the side of empiricism, and Immanuel Kant on the side of nativism. From the s to the s, the main approach to psychology was behaviorism. Initially, its adherents viewed mental events such as thoughts, ideas, attention, and consciousness as unobservables, hence outside the realm of a science of psychology. One pioneer of cognitive psychology, who worked outside the boundaries both intellectual and geographical of behaviorism was Jean Piaget. From to the s and into the s, he studied the thoughts, language, and intelligence of children and adults. With the development of new warfare technology during WWII , the need for a greater understanding of human performance came to prominence. Problems such as how to best train soldiers to use new technology and how to deal with matters of attention while under duress became areas of need for military personnel. Behaviorism provided little if any insight into these matters and it was the work of Donald Broadbent , integrating concepts from human performance research and the recently developed information theory , that forged the way in this area. Allen Newell and Herbert Simon spent years developing the concept of artificial intelligence AI and later worked with cognitive psychologists regarding the implications of AI. This encouraged a conceptualization of mental functions patterned on the way that computers handled such things as memory storage and retrieval, [4] and it opened an important doorway for cognitivism. Inside psychology, in criticism of behaviorism, J. Austin wrote "a study of thinking" in Pribram wrote their famous "Plans and the Structure of Behavior". The same year, Bruner and Miller founded the Harvard Center for Cognitive Studies, which institutionalized the revolution and launched the field of cognitive science. Mandler described the origins of cognitive psychology in a article in the Journal of the History of the Behavioral Sciences [8] Ulric Neisser put the term "cognitive psychology" into common use through his book Cognitive Psychology, published in The term "cognition" refers to all processes by which the sensory input is transformed, reduced, elaborated, stored, recovered, and used. It is concerned with these processes even when they operate in the absence of relevant stimulation, as in images and hallucinations. Given such a sweeping definition, it is apparent that cognition is involved in everything a human being might possibly do; that every psychological phenomenon is a cognitive phenomenon. But although cognitive psychology is concerned with all human activity rather than some fraction of it, the concern is from a particular point of view. Other viewpoints are equally legitimate and necessary. Dynamic psychology , which begins with motives rather than with sensory input, is a case in point. Cognitive control The main focus of cognitive psychologists is on the mental processes that affect behavior. Those processes include, but are not limited to, the following: Attention The psychological definition of attention is "a state of focused awareness on a subset of the available perceptual information". The brain is able to handle only a small subset of this information, and this is accomplished through the attentional processes. A number of early studies dealt with the ability of a person wearing headphones to discern meaningful conversation when presented with different messages into each ear; this is known as the dichotic listening task. When the experiment starts, the message about basketball will be presented to the left ear and non-relevant information will be presented to the right ear. At some point the message related to basketball will switch to the right ear and the non-relevant information to the left ear. When this happens, the listener is usually able to repeat the entire message at the end, having attended to the left or right ear only when it was appropriate. Subjects did notice if the pitch of the unattended message changed or if it ceased altogether, and some even oriented to the unattended message if their name was mentioned. Cognitive psychologists often study memory in terms of working memory. Working memory [ edit ] Though working memory is often thought of as just short-term memory, it is more clearly defined as the ability to remember information in the face of distraction. The famously known capacity of memory of 7 plus or minus

2 is a combination of both memory in working memory and long term memory. One of the classic experiments is by Ebbinghaus, who found the serial position effect where information from the beginning and end of list of random words were better recalled than those in the center. One of the most regarded is the Baddeley and Hitch model of working memory. It takes into account both visual and auditory stimuli, long-term memory to use as a reference, and a central processor to combine and understand it all. A large part of memory is forgetting, and there is a large debate among psychologists of decay theory versus interference theory. Long-term memory [ edit ] Modern conceptions of memory are usually about long-term memory and break it down into three main sub-classes. These three classes are somewhat hierarchical in nature, in terms of the level of conscious thought related to their use. It is often activated on a subconscious level, or at most requires a minimal amount of conscious effort. A person is using procedural knowledge when they seemingly "automatically" respond in a particular manner to a particular situation or process. Semantic memory is the encyclopedic knowledge that a person possesses. Knowledge like what the Eiffel Tower looks like, or the name of a friend from sixth grade, represent semantic memory. Access of semantic memory ranges from slightly to extremely effortful, depending on a number of variables including but not limited to recency of encoding of the information, number of associations it has to other information, frequency of access, and levels of meaning how deeply it was processed when it was encoded. Episodic memory typically requires the deepest level of conscious thought, as it often pulls together semantic memory and temporal information to formulate the entire memory. Essentially, it is how people come to understand the world around them through interpretation of stimuli. Titchener began to work with perception in their structuralist approach to psychology. Structuralism dealt heavily with trying to reduce human thought or "consciousness," as Titchener would have called it into its most basic elements by gaining understanding of how an individual perceives particular stimuli. One study at CESPA concerns ways in which individuals perceive their physical environment and how that influences their navigation through that environment. Cognitive psychologists may study language acquisition , [20] individual components of language formation like phonemes , [21] how language use is involved in mood , [22] or numerous other related areas. A study from , showed that while this can be an effective strategy, it is important that those making evaluations include all relevant information when making their assessments. Factors such as individual variability, socioeconomic status , short-term and long-term memory capacity, and others must be included in order to make valid assessments. More specifically, metacognition includes things like: How effective a person is at monitoring their own performance on a given task self-regulation. The ability to apply cognitive strategies. As a part of this process, it is also important to ensure that students are realistically evaluating their personal degree of knowledge and setting realistic goals another metacognitive task. Intuition or system 1 , similar to associative reasoning, was determined to be fast and automatic, usually with strong emotional bonds included in the reasoning process. Kahneman said that this kind of reasoning was based on formed habits and very difficult to change or manipulate. Reasoning or system 2 was slower and much more volatile, being subject to conscious judgments and attitudes. Beck is generally regarded as the father of cognitive therapy. In his book titled Cognitive Therapy of Depression, Beck puts forth three salient points with regard to his reasoning for the treatment of depression by means of therapy or therapy and antidepressants versus using a pharmacological-only approach: Despite the prevalent use of antidepressants, the fact remains that not all patients respond to them. Many of those who do respond to antidepressants end up not taking their medications, for various reasons. They may develop side-effects or have some form of personal objection to taking the drugs. His theory is that the person essentially becomes reliant on the medication as a means of improving mood and fails to practice those coping techniques typically practiced by healthy individuals to alleviate the effects of depressive symptoms. By failing to do so, once the patient is weaned off of the antidepressants, they often are unable to cope with normal levels of depressed mood and feel driven to reinstate use of the antidepressants. Moskowitz defines social cognition as " Among his research, Dodge posits that children who possess a greater ability to process social information more often display higher levels of socially acceptable behavior. His model asserts that there are five steps that an individual proceeds through when evaluating interactions with other individuals and that how the person interprets cues is key to their reactionary process. One of the major paradigms of

developmental psychology, the Theory of Mind ToM , deals specifically with the ability of an individual to effectively understand and attribute cognition to those around them. This concept typically becomes fully apparent in children between the ages of 4 and 6. Essentially, before the child develops ToM, they are unable to understand that those around them can have different thoughts, ideas, or feelings than themselves. The child must be able to recognize that they have their own thoughts and in turn, that others possess thoughts of their own. Though there have been considerable challenges to parts of his stages of cognitive development , they remain a staple in the realm of education. Some of the most prominent concepts include: A key area of educational focus in this realm is related to self-monitoring, which relates highly to how well students are able to evaluate their personal knowledge and apply strategies to improve knowledge in areas in which they are lacking. The approach focuses on the formation of what it believes to be faulty schemata, centralized on judgmental biases and general cognitive errors. Cognitive psychologists are often heavily involved in running psychological experiments involving human participants, with the goal of gathering information related to how the human mind takes in, processes, and acts upon inputs received from the outside world. Cognitive science is better understood as predominantly concerned with gathering data through research. Cognitive science envelopes a much broader scope, which has links to philosophy, linguistics, anthropology, neuroscience, and particularly with artificial intelligence. It could be said that cognitive science provides the database of information that fuels the theory from which cognitive psychologists operate. Cognitive science is highly involved in the area of artificial intelligence and its application to the understanding of mental processes. Criticisms[ edit ] In the early years of cognitive psychology, behaviorist critics held that the empiricism it pursued was incompatible with the concept of internal mental states. Cognitive neuroscience , however, continues to gather evidence of direct correlations between physiological brain activity and putative mental states, endorsing the basis for cognitive psychology. Pythagoras to Present, for example, John Malone writes: Major research areas[ edit ].

Chapter 3 : What Is Memory? - The Human Memory

*Marc Cr pon's The Thought of Death and the Memory of War is a call to resist such images in which death is no longer actual death since it happens to anonymous others, and to seek instead a world in which mourning the other whose mortality we always already share points us toward a cosmopolitics. Cr pon pursues this path toward a.*

Sure, your brain is a wonder. But some cognitive scientists argue that without the help of your body, your brain would be nowhere. Corbis We think big. We think out loud. We think outside the box. We think on our feet. The notion that we think with the body â€” the startling conclusion of a field called embodied cognition â€” flies in the face of long-standing views. Early cognitive psychologists defined thought as an activity that resides in the brain: Sensory data come in from eyes and ears, fingers and funny bone, and the mind turns these signals into disembodied representations that it manipulates in what we call thinking. But dozens of studies over the past decade challenge that view, suggesting instead that our thoughts are inextricably linked to physical experience. When they did, they found that getting a whiff of a fishy odor evoked feelings of suspicion; likewise, when research participants were exposed to another person behaving suspiciously, they were better able to detect a fishy scent. The range of findings demonstrating embodied cognition is impressive. Looking upward nudges people to call to mind others who are more powerful, while looking down prompts thoughts of people we outrank. People judge a petition to be more consequential if it is handed to them on a heavy clipboard rather than a lightweight one. Baseball players with high batting averages perceive the ball as bigger than poorer hitters. Thinking Is for Doing On their surface, findings like these seem like mere fodder for amusing cocktail conversation: In fact, we fundamentally perceive the world in terms of our ability to act on our environment, says Sabrina Golonka, a cognitive psychologist at Leeds Metropolitan University in the United Kingdom. In one study, researchers at the University of Virginia asked volunteers to estimate the steepness of a hill just by looking at it from the bottom. They rated the hill as steeper when they wore a heavy backpack, and likewise, athletes described the hill as less steep than volunteers who were unfit. Thinkstock To investigate, Witt and a colleague showed college students photos of people holding different objects and asked them to quickly decide whether what they saw was a gun or some neutral object, like a shoe or a cell phone. Merely seeing a gun nearby had no such effect on their perceptions. Such findings raise a mind-bending question: Do different bodies dictate different thoughts? In one study that confronts that idea, cognitive scientist Daniel Casasanto of the New School for Social Research in New York reasoned that if people use their physical perceptions and motor experiences to construct mental simulations, then physical characteristics that cause us to interact with the environment in systematically different ways should in fact send people down different mental pathways. To test the possibility, Casasanto and colleagues examined spatial preferences in left- and right-handers. The constraint changed their preferences: After completing a motor task with their left hand, people preferred choices presented on their left. Studies that demonstrate embodied cognition seem to defy conventional wisdom, which paints thought as a set of computer-like algorithms that unfold entirely within the skull. That characterization is a mistake, Golonka argues. She and Leeds colleague Andrew Wilson advocate an ecosystem-like approach that treats even the most sophisticated cognitive tasks as a product of how our brains and bodies have evolved with our environments. The astonishing implication is that our bodies, through perception and action, can actually replace the need for complex mental calculations. Consider a baseball outfielder who must run to catch a fly ball: How does he get to the right place at the right moment? Yes, he uses his brain; but his eyes and legs are just as crucial. Clear evidence of embodied cognition is now voluminous. What to make of it The view that thought depends crucially on bodily sensation and action has yet to overtake the traditional model of cognition, as Lee observes. Golonka and Wilson hope their ecosystem-like model can become this unifying framework. I think, therefore I am. The embodied cognition model suggests a slightly different philosophy â€” I am, therefore I think.

**Chapter 4 : Memory, Encoding Storage and Retrieval | Simply Psychology**

*Memory is our ability to encode, store, retain and subsequently recall information and past experiences in the human brain. Memory can be thought of in general terms as the use of past experience to affect or influence current behaviour.*

Declarative memory Declarative memory requires conscious recall, in that some conscious process must call back the information. It is sometimes called explicit memory, since it consists of information that is explicitly stored and retrieved. Declarative memory can be further sub-divided into semantic memory, concerning principles and facts taken independent of context; and episodic memory, concerning information specific to a particular context, such as a time and place. Semantic memory allows the encoding of abstract knowledge about the world, such as "Paris is the capital of France". Episodic memory, on the other hand, is used for more personal memories, such as the sensations, emotions, and personal associations of a particular place or time. Episodic memories often reflect the "firsts" in life such as a first kiss, first day of school or first time winning a championship. Visual memory is part of memory preserving some characteristics of our senses pertaining to visual experience. One is able to place in memory information that resembles objects, places, animals or people in sort of a mental image. Visual memory can result in priming and it is assumed some kind of perceptual representational system underlies this phenomenon. It can best be summarized as remembering how to do something. Procedural memory is primarily employed in learning motor skills and should be considered a subset of implicit memory. It is revealed when one does better in a given task due only to repetition – no new explicit memories have been formed, but one is unconsciously accessing aspects of those previous experiences. Procedural memory involved in motor learning depends on the cerebellum and basal ganglia. A characteristic of procedural memory is that the things remembered are automatically translated into actions, and thus sometimes difficult to describe. Some examples of procedural memory include the ability to ride a bike or tie shoelaces. Thus, retrospective memory as a category includes semantic, episodic and autobiographical memory. In contrast, prospective memory is memory for future intentions, or remembering to remember Winograd, Prospective memory can be further broken down into event- and time-based prospective remembering. Time-based prospective memories are triggered by a time-cue, such as going to the doctor action at 4pm cue. Event-based prospective memories are intentions triggered by cues, such as remembering to post a letter action after seeing a mailbox cue. Visual paired comparison procedure relies on habituation: The time spent looking at each photo is recorded. Looking longer at the new photo indicates that they remember the "familiar" one. Studies using this procedure have found that 5- to 6-month-olds can retain information for as long as fourteen days. Infants notice that when they kick their foot the mobile moves – the rate of kicking increases dramatically within minutes. Whereas 2- to 3-month-olds can retain an operant response such as activating the mobile by kicking their foot for a week, 6-month-olds can retain it for two weeks, and 12-month-olds can retain a similar operant response for as long as 13 weeks. Studies using the elicited imitation technique have shown that 12-month-olds can recall the action sequences twelve months later. Paired associate learning – when one learns to associate one specific word with another. For example, when given a word such as "safe" one must learn to say another specific word, such as "green". This is stimulus and response. On the other hand, items that have been presented lastly suffer little RI, but suffer a great deal from proactive interference PI, which means the longer the delay in recall, the more likely that the items will be lost. This is similar to fill in the blank assessments used in classrooms. Recognition – subjects are asked to remember a list of words or pictures, after which point they are asked to identify the previously presented words or pictures from among a list of alternatives that were not presented in the original list. Detection paradigm – individuals are shown a number of objects and color samples during a certain period of time. They are then tested on their visual ability to remember as much as they can by looking at test items and pointing out whether the test items are similar to the sample, or if any change is present. Savings method – compares the speed of originally learning to the speed of relearning it. The amount of time saved measures memory. Transience – memories degrade with the passing of time. This occurs in the storage stage of

memory, after the information has been stored and before it is retrieved. This can happen in sensory, short-term, and long-term storage. It follows a general pattern where the information is rapidly forgotten during the first couple of days or years, followed by small losses in later days or years. Absentmindedness is Memory failure due to the lack of attention. Attention plays a key role in storing information into long-term memory; without proper attention, the information might not be stored, making it impossible to be retrieved later. Physiology[ edit ] Brain areas involved in the neuroanatomy of memory such as the hippocampus , the amygdala , the striatum , or the mammillary bodies are thought to be involved in specific types of memory. For example, the hippocampus is believed to be involved in spatial learning and declarative learning , while the amygdala is thought to be involved in emotional memory. However, rather than implicating a specific area, it could be that damage to adjacent areas, or to a pathway traveling through the area is actually responsible for the observed deficit. Further, it is not sufficient to describe memory, and its counterpart, learning , as solely dependent on specific brain regions. Learning and memory are usually attributed to changes in neuronal synapses , thought to be mediated by long-term potentiation and long-term depression. However, this has been questioned on computational as well as neurophysiological grounds by the cognitive scientist Charles R. Patients with amygdala damage, however, do not show a memory enhancement effect. He postulated that any memory that stayed in short-term storage for a long enough time would be consolidated into a long-term memory. Later research showed this to be false. Research has shown that direct injections of cortisol or epinephrine help the storage of recent experiences. This is also true for stimulation of the amygdala. This proves that excitement enhances memory by the stimulation of hormones that affect the amygdala. Excessive or prolonged stress with prolonged cortisol may hurt memory storage. Patients with amygdalar damage are no more likely to remember emotionally charged words than nonemotionally charged ones. The hippocampus is important for explicit memory. The hippocampus is also important for memory consolidation. The hippocampus receives input from different parts of the cortex and sends its output out to different parts of the brain also. The input comes from secondary and tertiary sensory areas that have processed the information a lot already. Hippocampal damage may also cause memory loss and problems with memory storage. The term of internal representation implies that such definition of memory contains two components: The latter component is also called engram or memory traces Semon Some neuroscientists and psychologists mistakenly equate the concept of engram and memory, broadly conceiving all persisting after-effects of experiences as memory; others argue against this notion that memory does not exist until it is revealed in behavior or thought Moscovitch One question that is crucial in cognitive neuroscience is how information and mental experiences are coded and represented in the brain. Scientists have gained much knowledge about the neuronal codes from the studies of plasticity, but most of such research has been focused on simple learning in simple neuronal circuits; it is considerably less clear about the neuronal changes involved in more complex examples of memory, particularly declarative memory that requires the storage of facts and events Byrne Convergence-divergence zones might be the neural networks where memories are stored and retrieved. Considering that there are several kinds of memory, depending on types of represented knowledge, underlying mechanisms, processes functions and modes of acquisition, it is likely that different brain areas support different memory systems and that they are in mutual relationships in neuronal networks: Encoding of working memory involves the spiking of individual neurons induced by sensory input, which persists even after the sensory input disappears Jensen and Lisman ; Fransen et al. Encoding of episodic memory involves persistent changes in molecular structures that alter synaptic transmission between neurons. The persistent spiking in working memory can enhance the synaptic and cellular changes in the encoding of episodic memory Jensen and Lisman Recent functional imaging studies detected working memory signals in both medial temporal lobe MTL , a brain area strongly associated with long-term memory , and prefrontal cortex Ranganath et al. However, the substantially more working memory signals seen in the prefrontal lobe suggest that this area play a more important role in working memory than MTL Suzuki Short-term memory STM is temporary and subject to disruption, while long-term memory LTM , once consolidated, is persistent and stable. The former involves a protein synthesis process in the medial temporal lobe MTL , whereas the latter transforms the MTL-dependent memory into an MTL-independent memory over months to years Ledoux In

recent years, such traditional consolidation dogma has been re-evaluated as a result of the studies on reconsolidation. These studies showed that prevention after retrieval affects subsequent retrieval of the memory. Sara New studies have shown that post-retrieval treatment with protein synthesis inhibitors and many other compounds can lead to an amnesic state Nadel et al. These findings on reconsolidation fit with the behavioral evidence that retrieved memory is not a carbon copy of the initial experiences, and memories are updated during retrieval.

**Genetics[ edit ]** Study of the genetics of human memory is in its infancy. The search for genes associated with normally varying memory continues. One of the first candidates for normal variation in memory is the protein KIBRA , [42] which appears to be associated with the rate at which material is forgotten over a delay period. There has been some evidence that memories are stored in the nucleus of neurons. Up until the mid-1990s it was assumed that infants could not encode, retain, and retrieve information. Whereas 12-month-olds can recall a three-step sequence after being exposed to it once, 6-month-olds need approximately six exposures in order to be able to remember it. It is only by 9 months of age that infants can recall the actions of a two-step sequence in the correct temporal order – that is, recalling step 1 and then step 2. Younger infants 6-month-olds can only recall one step of a two-step sequence. Importantly, infantile amnesia is not unique to humans, and preclinical research using rodent models provides insight into the precise neurobiology of this phenomenon. A review of the literature from behavioral neuroscientist Dr Jee Hyun Kim suggests that accelerated forgetting during early life is at least partly due to rapid growth of the brain during this period. Older adults tend to exhibit deficits on tasks that involve knowing the temporal order in which they learned information; [52] source memory tasks that require them to remember the specific circumstances or context in which they learned information; [53] and prospective memory tasks that involve remembering to perform an act at a future time. Older adults can manage their problems with prospective memory by using appointment books, for example.

**Memory disorder** Much of the current knowledge of memory has come from studying memory disorders, particularly amnesia. Loss of memory is known as amnesia. Amnesia can result from extensive damage to: Sufferers of Anomic aphasia also called Nominal aphasia or Anomia , however, do experience the tip-of-the-tongue phenomenon on an ongoing basis due to damage to the frontal and parietal lobes of the brain.

**Influencing factors[ edit ]** Interference can hamper memorization and retrieval. There is retroactive interference , when learning new information makes it harder to recall old information [58] and proactive interference, where prior learning disrupts recall of new information. Although interference can lead to forgetting, it is important to keep in mind that there are situations when old information can facilitate learning of new information.

**Chapter 5 : Models for thinking: Memory is the residue of thought - Oliver Quinlan**

*Models for thinking: Memory is the residue of thought Posted on January 12, August 5, Author oliverquinlan 2 Comments What makes great teachers is great thinking.*

The new work also answers a longstanding question as to how the brain is so energy efficient and could help engineers build computers that are incredibly powerful but also conserve energy. A key part of the activity happens when branches of neurons, much like electrical wire, interact at certain junctions, known as synapses. Signals travel across the synapse as chemicals called neurotransmitters to tell the receiving neuron whether to convey an electrical signal to other neurons. Each neuron can have thousands of these synapses with thousands of other neurons. Larger synapses—“with more surface area and vesicles of neurotransmitters”—are stronger, making them more likely to activate their surrounding neurons than medium or small synapses. The Salk team, while building a 3D reconstruction of rat hippocampus tissue the memory center of the brain, noticed something unusual. In some cases, a single axon from one neuron formed two synapses reaching out to a single dendrite of a second neuron, signifying that the first neuron seemed to be sending a duplicate message to the receiving neuron. But Tom Bartol, a Salk staff scientist, had an idea: In a computational reconstruction of brain tissue in the hippocampus, Salk scientists and UT-Austin scientists found the unusual occurrence of two synapses from the axon of one neuron translucent black strip forming onto two spines on the same dendrite of a second neuron yellow. The spine head volumes, synaptic contact areas red, neck diameters gray and number of presynaptic vesicles white spheres of these two synapses are almost identical. Click here for a high-resolution image. Salk Institute To do this, researchers used advanced microscopy and computational algorithms they had developed to image rat brains and reconstruct the connectivity, shapes, volumes and surface area of the brain tissue down to a nanomolecular level. The scientists expected the synapses would be roughly similar in size, but were surprised to discover the synapses were nearly identical. No one thought it would be such a small difference. Because the memory capacity of neurons is dependent upon synapse size, this eight percent difference turned out to be a key number the team could then plug into their algorithmic models of the brain to measure how much information could potentially be stored in synaptic connections. It was known before that the range in sizes between the smallest and largest synapses was a factor of 60 and that most are small. But armed with the knowledge that synapses of all sizes could vary in increments as little as eight percent between sizes within a factor of 60, the team determined there could be about 26 categories of sizes of synapses, rather than just a few. In computer terms, 26 sizes of synapses correspond to about 4. Previously, it was thought that the brain was capable of just one to two bits for short and long memory storage in the hippocampus. What makes this precision puzzling is that hippocampal synapses are notoriously unreliable. When a signal travels from one neuron to another, it typically activates that second neuron only 10 to 20 percent of the time. One answer, it seems, is in the constant adjustment of synapses, averaging out their success and failure rates over time. The team used their new data and a statistical model to find out how many signals it would take a pair of synapses to get to that eight percent difference. The waking adult brain generates only about 20 watts of continuous power—“as much as a very dim light bulb. Chirillo and Jennifer N. Bourne of the University of Texas, Austin.

## Chapter 6 : Cognitive psychology - Wikipedia

*The medial temporal lobe (the inner part of the temporal lobe, near the divide between the left and right hemispheres) in particular is thought to be involved in declarative and episodic memory.*

For a time during the s, it was hypothesized that all the cells of the human body were capable of storing memories, not only those in the brain, an idea known as cell memory or cellular memory. This was based on memory transfer research using cannibal flatworms, and on anecdotal evidence of organ transplants where the recipient was reported to have developed new habits or memories, but such theories are now considered pseudoscientific and have not made it into peer-reviewed science journals. Memory is our ability to encode, store, retain and subsequently recall information and past experiences in the human brain. It can be thought of in general terms as the use of past experience to affect or influence current behaviour. Memory is the sum total of what we remember, and gives us the capability to learn and adapt from previous experiences as well as to build relationships. It is the ability to remember past experiences, and the power or process of recalling to mind previously learned facts, experiences, impressions, skills and habits. It is the store of things learned and retained from our activity or experience, as evidenced by modification of structure or behaviour, or by recall and recognition. In more physiological or neurological terms, memory is, at its simplest, a set of encoded neural connections in the brain. It is the re-creation or reconstruction of past experiences by the synchronous firing of neurons that were involved in the original experience. As we will see, though, because of the way in which memory is encoded, it is perhaps better thought of as a kind of collage or jigsaw puzzle, rather than in the traditional manner as a collection of recordings or pictures or video clips, stored as discrete wholes. Our memories are not stored in our brains like books on library shelves, but are actually on-the-fly reconstructions from elements scattered throughout various areas of our brains. Recent studies suggest that repeated bouts of jet lag may cause harm to the temporal lobe, an area of the brain important to memory, causing it to shrink in size, and compromising performance on spatial memory tests. It is thought that stress hormones, such as cortisol, released by the body during times of stress such as the sleep disturbance, general stress and fatigue caused by long flights are responsible for this impairment of memory and other mental skills. Memory is related to but distinct from learning, which is the process by which we acquire knowledge of the world and modify our subsequent behaviour. During learning, neurons that fire together to produce a particular experience are altered so that they have a tendency to fire together again. For example, we learn a new language by studying it, but we then speak it by using our memory to retrieve the words that we have learned. Thus, memory depends on learning because it lets us store and retrieve learned information. But learning also depends to some extent on memory, in that the knowledge stored in our memory provides the framework to which new knowledge is linked by association and inference. This ability of humans to call on past memories in order to imagine the future and to plan future courses of action is a hugely advantageous attribute in our survival and development as a species. Since the development of the computer in the s, memory is also used to describe the capacity of a computer to store information subject to recall, as well as the physical components of the computer in which such information is stored. Although there are indeed some parallels between the memory of a computer and the memory of a human being, there are also some fundamental and crucial differences, principally that the human brain is organized as a distributed network in which each brain cell makes thousands of connections, rather than as an addressable collection of discrete files. The sociological concept of collective memory plays an essential role in the establishment of human societies. Every social group perpetuates itself through the knowledge that it transmits down the generations, either through oral tradition or through writing. The invention of writing made it possible for the first time for human beings to preserve precise records of their knowledge outside of their brains. Writing, audiovisual media and computer records can be considered a kind of external memory for humans.

## Chapter 7 : Thought and Memory | A Raven Called Me

*Declarative memory is usually the primary process thought of when referencing memory (Eysenck, ). [ better source needed ] Non-declarative, or implicit, memory is the unconscious storage and recollection of information (Foerde & Poldrack, ).*

That he might not return, But I worry more for Muninn. For without them, we lose ourselves. We lose who we are, what we perceive and how we relate to the world around us. Without them, we lose our spark. Each of us has our own version of divinity. Be that your faith in a religion, in science, in logic or in a myriad of other ways. Philosophical debate aside, I feel that we all need to believe in something bigger than ourselves. To fail to do so means that this existence is lessened, loses its richness and fades the hope that there is something better out there to strive for. I can only account for my own beliefs and aspirations. The things that both shape me and drive me. My own Huginn and Muninn. Thought and Memory will forever drive our perceptions, both in life and in literature. They are as much a part of who we are as the flesh that forms us and the blood that flows within us. Thought and Memory touch the soul of who we are. They touch the spark of creativity and divinity that exists within us. Words of wisdom from Odin, still echoing down through the centuries to shape the world of man. But maybe, just for a moment, you will remember these words. That rare glimpse of divinity within us all. Then again, maybe it really is Huginn and Muninn. What more magnificent image of inspiration than the memories invoked by the ebony wings of magnificent birds in flight. Embrace your own Huginn and Muninn. The world will be a better place for it. Thank you for taking this journey with me, in your thoughts and memories.

## Chapter 8 : Memory - Wikipedia

*Memory makes us who we are. If we couldn't recall the who, what, where, and when of our everyday lives, we would struggle to learn new information, form lasting relationships, or even function.*

## Chapter 9 : The memory of monsters: That bleak thought by Alicia Pinchok on Prezi

*Memory is a vast topic of study, and much is known about it. Let's take the broad question, what will improve a student's memory?, and break it into three more manageable parts: (1).*