

Later adulthood is characterised by a gradual, inevitable loss

[Psychology](#)



What is cognition? It is the general term given for mental activities. In cognitive psychology, it is the study of higher mental processes; memory, attention, language and reasoning. In contrast to behaviourists; cognitive psychologists are more ready to posit mechanisms and processes that are not directly observable, such as memory stores and switches of attention. Cognitive research includes several different facets of mental life, such as the use of imagery in representation, processes of decision-making and problem solving and reasoning (A First Course in Psychology, Nicky Haynes, 3rd edition, Harrap Ltd, London, Page 202).

It is a common belief that cognitive capacities do decline with age. However what aspect of cognition is affected by age? Cognition is all to do with the memory. The memory is the ability to access information in the mind relating to past experiences and events. The theories of the memory deal with the causes of forgetting; pure decay or interference from other material, and the possibility that there are two or more distinct stores from which the information is forgotten at different rates, short term and long term memory.

They also analyse the distinction between episodic memory; the memory of specific events experienced by the individual, and semantic memory; knowledge and the way incoming information and previous knowledge interact in language comprehension and problem solving. Perception is not just about receiving information with our senses but also about making sense of that information. When we see a picture of a simple shape; a square - all we are actually seeing is a pattern of light waves. But, our brain receives this information and organises it so that we are able to make sense of it and recognise the shape as a square.

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Our brain does not just use the messages sent via our eyes, but also uses our past experiences of similar shapes and our understanding of those shapes. This involves applying our knowledge of the world around us as well as other cognitive processes. Perception is a continuous cycle, in which what we expect to see affects what we look for and vice versa. Information received is simply held in preparation for some future occasion. As we are storing this information in our sub conscious, it is referred to as long term memory (LTM). The information is stored here ready to be recalled later.

LTM holds a vast quantity of information and can be stored for long periods of time. The information kept in our LTM is diverse and wide ranging and it includes all of our personal memories, general knowledge and our beliefs of the world. It also holds our plans for the future and it is the depository for all our knowledge on skills and expertise. Research suggests that we often use semantic categories to help us in our LTM and that visual imagery provides another method (Psychology at AS Level, Cardwell, Clarke & Meldrum, 2nd edition, Harper Collins Ltd 2000, London, Page 6).

Researchers have found that LTM had distinctive characteristics. Tulving (1972) made a distinction between episodic and semantic memory. Episodic being the memory for facts, events and episodes, whereas semantic being the 'how to' memory - how to catch a train, how to understand the person talking to you, how to make a cup of tea. There are, therefore, many variables that affect cognitive capacities. Cognition refers to mental processes used for perceiving, remembering, and thinking. The question

remains as to whether there is sufficient evidence to suggest that cognitive capacities decrease with age.

Most studies show that, in general, cognitive abilities are the greatest when people are in their 30s and 40s. Cognitive abilities stay about the same until the late 50s or early 60s, at which point they begin to decline, but to only a small degree. The effects of cognitive changes are usually not noticed until the 70s and beyond. These statements are based on data from studies where averages were calculated for each age group. Within each age group, however, there are wide variations in cognitive ability. The information presented here represents general findings about age-related cognitive change.

They do not necessarily happen to everyone. One study of intelligence over a lifetime found that by the age of 81, only 30-40% of study participants had a significant decline in mental ability. Two-thirds of people at this age had only a small amount of decline and only certain cognitive abilities decline, while others may improve. Different aspects of cognition are affected in various ways over time. One measure of cognitive ability is intelligence. A commonly used system of categorising intelligence is into "fluid" and "crystallised" intelligence.

Fluid intelligence (also called "native mental ability") is the information processing system. It refers to the ability to think and reason. It includes the speed with which information can be analysed, and also includes attention and memory capacity. Crystallised intelligence is accumulated information and vocabulary acquired from school and everyday life. It also encompasses

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the application of skills and knowledge to solving problems. Many studies have shown that fluid intelligence is more likely to decline with age than crystallised intelligence. In fact, crystallised intelligence may continue to improve with age.

Many people continue to gain expertise and skills in particular areas throughout life. It is theorized that much of the cognitive decline with age can be traced back to deficits in the information processing system (fluid intelligence). Tasks that use well-practiced skills or familiar information are generally not affected by age. However, complex tasks that require taking in new information and analyzing it may become more difficult. Many researchers attribute this to deficits that occur in attention, speed of processing, and memory. Attention is necessary for information to be taken in to begin with.

Attention is the ability to focus on certain bits of information and to decide whether and how much further to process it. It's only possible to pay attention to a limited amount of information at any one time. Certain changes in attentional ability have been reported with older age. Some researchers have found that many older adults have increasing difficulty distinguishing between information that is relevant and information that is irrelevant to a particular task. They have difficulty focusing only on the necessary information, and are susceptible to becoming distracted.

This may slow down the speed of performing a mental task and may compromise accuracy. Some researchers have proposed that these attentional difficulties may be the result of a general overall slowing of

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information processing that has been observed as people age. Mental processing and reaction time become slower with age. This slowing of information processing speed actually begins in young adulthood (the late 20s), although imperceptibly at first. By the time people are past 60 or older (depending on the individual), they will generally take longer to perform mental tasks than younger people.

On tests of intelligence that require the person to perform tasks within a short time frame, older adults often do worse than younger counterparts. In the past, this was considered to be a measure of decreased cognitive functioning. However, on intelligence tests with liberal time limits, older adults are often able to perform just as well as younger people. Therefore, it's now thought by some experts that older adults don't lose mental competence; it simply takes them longer to process the necessary information.

One theory holds that the slowing of processing speed is the cause of many of the cognitive difficulties experienced by older adults. However, it is not the only factor. It's not yet known what other factors may be responsible. It has been found that some mental processes are slowed more than others. The reasons for this are not known, and researchers continue attempts to figure out the exact role of slowed processing speed and to determine what other factors may be at work. In addition to cognitive decline, slowed processing speed has also been linked to a decline in motor function.

Older adults may have less dexterity and coordination than when they were younger. They may walk slower and take a longer time to react. Some

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researchers have suggested that slower processing speed may also have a negative impact on some types of memory. Whether or not this is the reason, most people experience at least some degree of age-related decline in some types of memory ability. Much research has been undertaken to study the relationship in the elderly between prospective memory performance, IQ score and a variety of self-rated variables, including anxiety, depression and reports of cognitive failures.

As a result researchers have been able to identify three sorts of cognitive failure in old age: " mind-not-on-task", " self-monitoring" and " inhibition", and these match up to performance on three different sorts of prospective memory task. As has already been described, memory is a complex function that has been divided into different types. Only some of these are affected by age. Difficulties that occur with memory are usually small and vary widely from person to person, making generalizations difficult.

Further complicating the memory picture are the different methods by which different researchers categorise memory. However, it is widely believed that one type of memory, called working memory, is most affected by age.

Working memory is the retention of information that must be manipulated or transformed in some way. Conscious mental processing goes on in working memory. It requires taking in information from the environment and from memory stores and accomplishing a mental task. For example, a restaurant cheque comes to \$36.43.

This amount is kept in memory while figuring out which notes to use to pay the cheque, and how much change is due back. Everyone has limits on how

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much they can keep in working memory at any one time. As people get older, complex mental tasks can become more difficult if they require too much information to be held in memory in order to process it. Some researchers postulate that the problem with working memory is related to reduced speed of information processing, which reduces the efficiency of working memory. One popular method for categorising memory divides it into " implicit" memory and " explicit" memory.

Implicit memory is the retention of skills and reflexes that have been acquired, such as the procedures for driving a car. Implicit memory generally remains intact throughout life. Explicit memory is the conscious memory of facts and events. These memories are more vulnerable to age-related decline. Older adults may have increasing difficulty with word retrieval. In other words, when recalling the name of a familiar person or object, they may experience the " tip of the tongue" phenomenon. The reasons for this are not known.

One theory suggests that this is also due to slowed processing speed. As people get older, they've known more people, so searching a larger memory " database" for the right name takes longer. The information is not forgotten altogether. If someone says the name or word, it will be recognizable. There may also be a physiologic explanation for this word-finding problem, having to do with atrophy of a brain structure called the prefrontal cortex. In general, memory tasks that are complex and require manipulating a lot of new information quickly become more difficult with age.



Facts, names, and events that are not often accessed may become more difficult to retrieve from memory. However, knowledge that has been accumulated over a lifetime and repeatedly accessed and expanded is generally retained. Well-practiced skills and abilities remain intact. And vocabulary usually continues to increase throughout life. It is important to emphasize that the changes in cognition described here do not necessarily happen to everyone. There is wide variation among individuals. Additionally, for those who do experience declines in cognitive functioning, they are usually not disabling.

The degree of decline is small and should not interfere with normal day-to-day functioning. And there are many ways to compensate for the deficits or even to regain lost function. It may take longer for an older person to learn something new, but it's still possible to learn it. Despite this Harris and Sunderland (1981) compared subjects aged between 20 and 36 with retired people aged between 69 and 80. They found the younger subjects experienced much more memory failure than the older group (First Course in Psychology, Nicky Hayes, 3rd Edition, Harrap Ltd, London, 1984, page 219).

There are some types of ageing where memory loss does occur and only affects a very small minority of old people, and an even smaller minority of young people (it is rare in the younger people). It usually occurs as a result of brain damage through 'senile dementia' or 'Alzheimer's disease'. These people become confused and make their memories worse by trying really hard to remember things. It appears that displacement, trace decay and interference theories are all based on the assumption that material becomes

lost and is no longer available for retrieval. These factors all have a role to play in forgetting.

As some material is irretrievably lost from memory, it is also sometimes the case that we have that memory 'on the tip of our tongue'. Psychologists believe that forgetting occurs as a result of retrieval failure and that we can only retrieve with the aid of cues. Emotional factors also play an important part in determining what is remembered. According to Freud, repression is where we push unpleasant memories from conscious awareness. A situation where repressed memories are thought to occur (in fact they do occur) is in the areas of child abuse, and where adults are abused.

Whatever the age, if we deny it ever happened, then it never happened. Forgetting things happens for many reasons, mentally, emotionally and physically, whatever our age. Despite much evidence being inconclusive as to whether later adulthood is characterised by a gradual, inevitable loss of cognitive capacities, three sorts of cognitive failure in old age have been identified: " mind-not-on-task", " self-monitoring" and " inhibition", and these match up to performance on three different sorts of prospective memory task.