

Try It yourself (page 169)

The analogy of the mind to a computer is a popular one today. In what ways do you see the comparison as reasonable? In what ways do you feel the analogy is not appropriate?

For example, do you see current computers as actually capable of thinking?

Imagine a science fiction universe in which part of the population was made up of mechanical people (androids) whose minds were, in fact, computers. Could you tell the difference between these androids and biological people? How could you tell? What sort of tests might you employ to determine which people are androids and which are biological?

Like a computer, our minds process information; that is, we receive input and then we apply operations to it on an internal level to produce a response or reaction. But computers are generally capable of only a limited number of operations to apply to input whereas we have a vast array of possibilities. Unlike a computer, we can freely choose which operations to apply and how to apply them. This includes which responses to make. And we can change our minds on the spur of the moment for no apparent reason. Take the simple example of buying a shirt. Should we buy the white one or the blue one? We decide on the white one, until we get to the payment desk when we spot a jacket in a colour we've never seen before. Like a flash, we replace the white shirt with the jacket and buy it instead. Note that in this example we have also responded to something we have never seen before. This may be part of the way we could tell androids from human beings: can they respond to stimuli that they have not been programmed to recognise? Also, can they make responses they have not been programmed to make (i.e., creative responses)? And what about the element of emotion? Have you ever heard a new piece of music that unexpectedly reminded you of someone or some event in your life and felt moved by it? Your emotional response may have an impact on your behaviour (e.g., you might buy the CD). Can a computer be programmed to do this? Perhaps a computer can be programmed to make random choices, but in our examples, the choices we make are not exactly random: there are reasons behind them that are based on our unique personalities and histories. Research is being conducted to make computer responses more like those of human beings, but it seems unlikely that in the near future a computer will be able to simulate the vast range of responses that humans make or the unpredictability that humans sometimes show.

Try It Yourself (page 173)

To better understand how STM and LTM differ, first review Box 4.1 on STM, then consider the following questions on LTM.

What is your oldest distinct memory? What was the situation? How long ago did the event occur? What details do you remember? How confident are you that your recall of this memory is accurate? Is there other information that you have known for a long time but don't remember when or where you learned it? How do those memories differ from STM?

It is often very difficult to tell whether we actually remember an event in our early life or whether we are merely remembering the stories that others have told us. Generally, we remember few details accurately of early experiences, but sometimes details are all we remember! For example, remembering the smell of Mother's cologne may be a small detail, and not placed within any particular context of experience. Other information seems to fit in the 'self-evident' category: for example, we may readily recall the days of the week, but we may not remember how or when we learned them. Unlike memories in STM, these LTM memories persist indefinitely.

Try It Yourself (page 178)

Various types of brain damage, such as Alzheimer's disease, can disrupt the capacity to form new long-term memories. (The movie *50 First Dates* revolves around a woman like this, whose suitor had to try to win her afresh every day!) Imagine that your capacity to form new long-term memories was gone. What would be the most important effects? How would it affect your schooling or job? What about personal relationships? Daily tasks like running errands? Would you rather lose new episodic memories or semantic memories?

If we lost the ability to form new long-term memories, our past would remain intact (i.e., we would remember old relationships and old situations). So we would remember what we learned at school or on the job before the impairment took place. But we would be faced with some profound problems if we wanted to learn new things. We could, perhaps, remember the answers to test questions if we had read the relevant part of the textbook immediately before being quizzed, but not if we studied a day before the test, and we would forget what we learned very quickly after the test. Similarly, if our workplace brought in new procedures, we could learn them while being taught, but the next day, we might not even remember that we had been taught something new. People with LTM impairments of this kind typically make use of lists and written instructions to function in their normal day-to-day lives. For example, in running errands, it would be necessary to have a list which might read 'Go to dry cleaners, pick up suit; Go to bank and deposit cheque (located in left hand pocket) and take out some cash, put it in right hand pocket, take dry-cleaned suit with you when you leave...' and so on. As in the movie, 50 First Dates, forming new relationships would be challenging indeed!

Try It Yourself (page 184)

Have you ever chosen an answer on a multiple-choice test, been confident you were correct, and then afterwards discovered you were wrong? Can you explain this in terms of context-dependent coding? Has the same thing ever happened on an essay test? What can you say about this?

As discussed in the chapter, whether or not we forget is heavily influenced by what happens while we're learning (i.e., during encoding). What is your environment like when you study? Many students study while lying on their beds with music playing. Knowing what you know about context-dependent coding, do you think this is a good idea? What would be the best setting for studying? What can you do to make your own environment optimal for studying?

Typically, we study in environments very different from the ones in which we take tests. That means that the context in which we learned material is not the same as the context in which we are required to recall the material. This is more likely to occur on multiple choice tests which rely on recognition than on essay tests which involve recall because often the alternatives to a multiple choice question resemble the correct answer or pertain to something other than what the question asks. This leads us to false recognition. For this reason, one tip in taking multiple choice tests is to cover the alternatives, try to answer the question, and then look at the alternatives, selecting the one that matches your answer the best. The best environment for studying is one that replicates the setting in which you will write the test as closely as possible, at least a well-lit, uncluttered desk in a quiet spot. (In MH's class, she tells students to look at her when they can't remember the answer to a question that she has lectured on. Sometimes in doing this, the context of MH at the front of the classroom provides a context cue for remembering what she said.)

Try It Yourself (page 186)

The idea that memories are reconstructed (rather than static, like papers in a file folder) has a number of interesting implications. For example, think about events in your early childhood. Do you really remember them, or are you "remembering" something based on anecdotes that you have heard repeatedly from your parents and other family members?

How can you tell the difference? Are you sure?

Reconstruction also raises the possibility that we distort memories of earlier events to fit our later knowledge (Blank & Nestler 2007; Erdfelder & Brandt 2007). This *hindsight bias* is expressed in the phrase, "hindsight has twenty-twenty vision". For example, sports fans will often dissect a disappointing game, focusing on elements that seemed insignificant during the game itself, in order to 'explain' the outcome. Have you ever had the experience of looking back on a situation and thinking "I should have seen that!?" Was there really something you overlooked, or is this hindsight bias at work? Is there a simple way to decide?

There are countless examples of 'remembering' events from early childhood that are really the remembrances of stories told by our families and it is very difficult to ascertain the difference between the two. Certainly memories from before the age of about 4 to 6 years should be suspect. One of the saddest occurrences of the hindsight bias comes in cases of suicide in which, looking back, family and friends of the deceased blame themselves for not having seen what they now believe were readily apparent signs. But sometimes the signs are not there, and only in looking back do we re-interpret events to make them consistent with our new knowledge. There is no simple way to avoid the hindsight bias except to be aware of the multiple ways of interpreting a situation at the time it occurs and in being aware of the possibility that 'hindsight has twenty-twenty vision' afterwards.

Try It Yourself (page 190)

One obvious application for our understanding of memory is in studying. The following recommendations have been derived from memory research (Hadad & Reed 2007). Try them to enhance your own memory on tests and examinations.

1. Find an environment for studying where distractions are minimal. This will increase your attention to important concepts.
2. After a lecture, review your notes, and consider rewriting them into condensed study notes. This will both increase your attention and serve as rehearsal. Reviewing will also help you to see relationships between concepts, thereby aiding in organization.
3. Organize material in your study notes to see how concepts relate to each other and to your already-existing knowledge. This further elaboration of material will aid in retention and later retrieval of information.
4. When studying, ask yourself questions about the material. Try to imagine what questions might be asked on a test and answer them. This increases organisation and facilitates retrieval.
5. When you need to study many different topics or subjects, study those that are most different closest in time (e.g., study biology and French in the same evening, not French and Spanish). This will reduce interference.
6. Categorise information in your study notes (e.g., 'Types of memory'). This will reduce interference and increase the likelihood that information stored will be cued in questions on a test.
7. Use mnemonic techniques (see Fig. 4-7). These techniques will help to elaborate on the topic, providing greater organization and a hook for memory.
8. Finally, get a good night's sleep the night before a test, since memory is consolidated during sleep; sleep deprivation results in less recall of information (Huber 2007).

Try these techniques and modify them in light of what you have learned about memory to make them work for you. Although some of the techniques may seem time-consuming or

inefficient at first, in the long run, they save large amounts of time and produce better results.

Try It Yourself (page 198)

Using problem solving techniques can be very useful in everyday life. For instance, if you need to write a 20 page essay on an unfamiliar topic, the technique of *creating subgoals* can be helpful in dealing with the task. Using the technique may look like this:

1. Identify clearly what the assignment involves
2. Identify the specific topic which will be the focus of the essay
3. Find information (e.g., books and articles from the library) related to the topic
4. Organize the information, making notes where needed
5. Write an outline of the essay, identifying how the information will fit
6. Write the introduction to the essay

And so on.... Accomplishing each step and crossing it off this list breaks a large task into small, manageable parts—and completing each part can be reinforcing!

We often make sub-goals in our heads as write essays, but actually writing down each step makes our work much easier and less time-consuming.

Now consider the following problems: in each case, what algorithm or heuristic would you use to make problem-solving easier?

- You want to buy a t-shirt as a gift, but you don't know the person's size.

'One size fits all' is often the designation a t-shirts. In this case, you have been given an algorithm that will make purchasing the right size easy. If the t-shirts are sized, however, the heuristic of using metaphors and analogies may be helpful. "Let's see, George is

about the same size as Sean and I know George wears a medium sized t-shirt. So a medium-sized t-shirt will probably fit Sean too."

- You want to find a misplaced CD, and know it's somewhere in your home, because you played it yesterday.

In this case, the heuristic of working backwards is usually useful. "Where was I when I last had the CD? Where did I go from there? Is the CD there now? No? OK, where did I go after that?" and so on.

- You're trying to explain how to bake a cake to someone familiar with chemistry.

Chemistry experiments often bear a similarity to recipes. In each case, subgoals are used. Someone familiar with chemistry will find baking a cake much easier if the directions are given in straightforward manageable steps: "(1) The ingredients needed are..., (2) The equipment needed is..., (3) Collect all the ingredients and equipment in one place, (4) measure 2 cups of flour and place in a bowl," and so on.

Try It Yourself (page 207)

Do you speak a second language? If so, you might explore Whorf's hypothesis by thinking about your experiences. Do you notice any ways in which your thinking changes when you switch languages? Are there ideas or feelings you would have trouble expressing in your second language? Is that because of your own lack of fluency, or does the language itself matter? Ask any friends of yours who speak other languages about their experiences; do the results support or contradict Whorf's hypothesis?

As noted in the text, there are some words in some languages that have a rich meaning, but are untranslatable into other languages. English has adopted many of these words (such as angst) and in this way communication is enriched. It is unlikely that your friends who speak other languages view the world in ways vastly different from your own because of the language they speak, but they may report having an easier time communicating some ideas in some languages that are not as easily conveyed in others. For example, people who are fluent in French, Italian or Spanish may not love more, but they may find it easier to communicate their love in these languages as opposed to many others!

Try It Yourself (page 212)

Have you ever felt judged unfairly because someone attributed your behaviour to your personality instead of taking into account the situation you were in? Were there times in childhood, for example, when an adult punished you and you strove to explain that the situation was the determiner of your actions, not your character? Did the adult listen to you? Knowing about the fundamental attribution error, can you think of any situations when, on reflection, you wonder if you misjudged someone because you did not fully consider the context of the event? (Don't worry--we have all done this at one time or another!) What about the role of culture? Do you think the way you perceive people reflects your cultural upbringing? In what ways?

The role of culture cannot be underestimated. Take the case of personal space. Personal space is the distance we like to keep from others when we interact with them. This varies from person to person and from situation to situation (e.g., you are likely to keep less distance when talking to a friend than when talking to your employer). But culture plays a large role as well, and this may lead to unfortunate and unnecessary misunderstandings. Many English tourists to countries such as those in the Mid East, for example, feel uncomfortable talking to people there: as the native to the country moves closer and closer to the tourist to talk, the tourist backs away farther and farther! The tourist may erroneously assume that the native speaker is pushy and intrusive because they don't realize that the cultural norm is to maintain a smaller personal space. It would not be surprising to find that some people in the Mid East may find people from England to be cold based on their cultural norm of maintaining a larger personal space! Before making judgments on an individual's personality, we are well-advised to consider the situation the person is in and the culture he or she comes from.

Try It Yourself (page 216)

Consider the following hypothetical scenarios:

1) Jurgen and Raj entered the classroom on what seemed like a normal day, only to hear their instructor announce a "surprise quiz." Jurgen immediately felt anxious, while Raj said cheerily, "No sweat!"

We often assume that Jurgen is a poor student who does not keep up with his reading while Raj is a good student who studies constantly. This attributes their reactions to their personality characteristics. But it is possible (and perhaps even likely) that both Jurgen and Raj are good students who do their best, but their situations differ, accounting for their different emotions about the test. For example, what if we learn that Jurgen knows he has to pass the test to get credit for the course, but Raj is taking the course for interest only, not for credit, so marks are unimportant to him? In this case, Jurgen may feel anxious and threatened in the face of evaluation since passing means so much to him and the consequences of failing are severe. Raj, on the other hand, has no reason to be upset since in his case, failure has no bad consequences. He is free to regard the test as a fun challenge rather than an anxiety-inducing event.

2) Lisette and Jackie were invited to a party. Lisette looked forward to it while Jackie dreaded having to attend.

People often jump to the conclusion that Lisette is a sociable person who loves interacting with friends while Jackie is a shy, introverted person with few friends. Again, however, the situation may account for their differing emotional responses. Perhaps Lisette knows that her friends will be at the party so she can anticipate having a good time with people she knows and likes, and who know and like her. But what if Jackie knows that people who have made fun of her in the past will be at the party? She is more likely to feel anxious and apprehensive about interacting with these people again. She may fear that she will be subjected to ridicule again, and so she wishes she didn't have to go to the party.

How would you explain the differences in the reactions of these characters to the same situations? Can you think of a case where you and another person (perhaps a friend) reacted with different emotions to the same situation? How would you account for this?