



Memory and Perceived Control

Health Psychology (CMED2006)

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Learning Objectives

At the end of the lecture, student should be able to

- Distinguish between sensory memory, short term memory and long term memory
- Use learning and memory theories to explain health behaviours
- Explain how behaviour could be affected by locus of control and self-efficacy
- Suggest ways to encourage healthy behaviour through the enhancement of perceived control





Part 1

Memory Storages & Memory Processes

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Definition of Memory

1. “The mental function of retaining information about stimuli [...] after the original stimuli are no longer present.
2. “The hypothesized ‘storage system’ in the mind/brain that holds this information
3. “The information so retained”

(Penguin Dictionary of Psychology)





Our Memory Storage

Our brain has 3 main memory storages:

Sensory memory

Working memory (also known as Short-term memory)(STM)

Long-term memory (LTM)





Tool 32: Sensory Memory

Sensory memory are memories that is closely linked to the senses (e.g. auditory or visual)

Sensory memory usually lasts for only less than one second
(maybe about 250ms)

Would disappear unless we focus our attention to them





Tool 33: Working Memory

Where we store the most recent items we are currently using

Limited in duration: it can store things for between 30 seconds
and 2 minutes before it is forgotten/replaced

Limited in capacity: around 4 pieces of data; newer pieces of data
displace older ones



Tool 34: Long-term Memory (LTM)

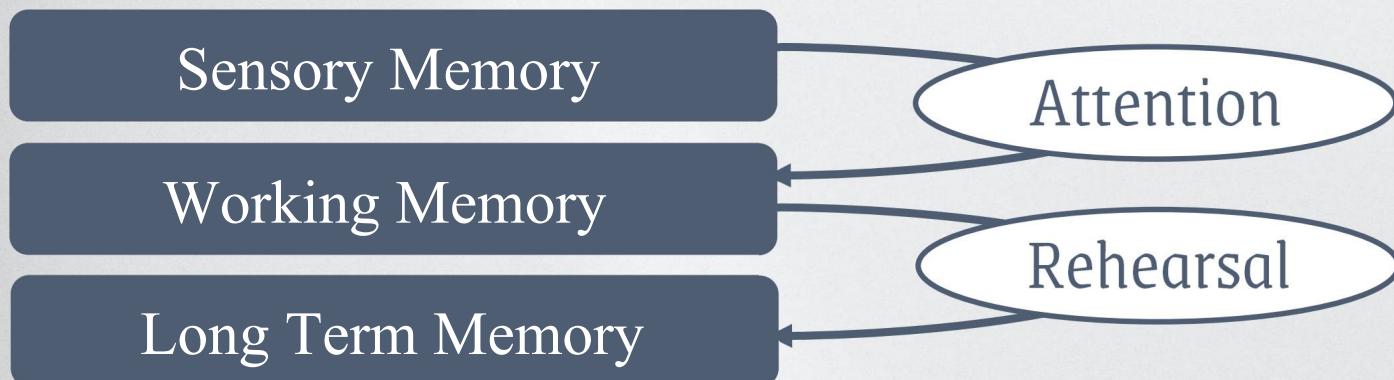
Theoretically, our LTM has unlimited capacity and can hold information for an unlimited amount of time; however, there might be information which we process in our working memory but do not store in our LTM

On the other hand, there might be information stored in our LTM, but we have a hard time retrieving them - either in terms of recognition (which is easier), or recall (more difficult)



Memory Processes

In order to improve one's memory,
we need to understand a bit about the processes involved





Tool 32a: Forgetting through lack of attention

“Forgetting” could be explained by the fact that our senses either did not pick the data up (i.e. the data does not register at our sensory memory), or that we did not pay enough attention to it for it to be transferred to the working memory.

It also follows that if we want to have a chance to remember something, we need to let our senses register it, and pay enough attention to it

Tool 33a: Forgetting through lack of rehearsal

Working memory has limited duration and capacity - if we want to remember things long-term, we need to move the data from working memory to long-term memory (LTM)

We can move data from working to LTM through the process of rehearsal (i.e. repeatedly make use of it) - although just repeatedly thinking about it or verbalizing it would also help



Tool 33b: Recency Effect

If we are given a long list of things to remember,
we are most likely to
remember the last few items (recency effect) because
these are still in our working memory (while older ones are not)





Tool 33c: Primacy Effect

To a lesser extent, we are also likely to remember
the first one or two items (primacy effect)
because there were more opportunities for these
to be transferred to the long-term memory



Tool 33d: Chunking

Although the working memory only has a capacity of about 4 pieces of data, what counts as a piece of data can varies

Therefore, we might be able to store more things in our working memory if we arrange pieces of data (e.g., random letters like “Y P H C S”) into a somewhat meaningful collection of data (e.g., a pseudo-word “PSYCH”)





Tool 34a: Forgetting through lack of retrieval cues

Our LTM is supposed to have unlimited capacity and duration -
but in order to use the memory stored in our LTM,
we still need to retrieve it

If the piece of memory is linked to pieces of information
(especially ones that are personal, familiar, and/or unusual)
it will make it easier for us to retrieve it



Tool 34a: Recognition versus Recall

Recognition - being able to identify the piece information when it is presented to us (like in a multiple-choice question) is easier;

Recall - being able to produce the information from nothing (like in a fill-in-the-blank question) is more difficult



Two Other Classifications of Memory

Declarative memory (a conscious memory of particular facts and events that one can declare) *versus* Procedural memory (an implicit memory that is linked to the performance of particular tasks)

Episodic memory (recollection of what happened to oneself) *versus* Semantic memory (recollection of facts or things otherwise one did not experience)





Amnesia & Memory Problems

Apart from general forgetting, more severe memory problem can be caused by either brain damage, disease, developmental problem or deterioration

Retrograde amnesia refers to the inability to recall past information, and anterograde amnesia refers to the inability to store new information; there are also people who only have problem with either declarative, procedure, or episodic memory



In Summary

Given the nature of our memory, we can help others (e.g. our patients or students) remember things better by:

Capturing / waiting for their attention

Presenting important information first or last

Pausing / giving them time to digest / rehearse

Repeating important information





Part 2

Control

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Control and Perceived Control

Control can be defined as “the ability or power to decide or strongly influence the particular way in which something will happen or someone will behave, or the condition of having such ability of power.” (Cambridge Dictionary)

Perceived control can be defined as “the belief that one can determine one's own internal states and behavior, influence one's environment, and/or bring about desired outcomes.” (Wallston et al., 1987)



Perceived Control as a Driver of Behaviour

In general, we are more likely to act if we think we have control - and not act if we don't think we have control

However, there are factors which affect our perception of control, some of which have nothing to do with whether we have actual control over the situation or not





Control as Attribution Style

Control is related to the process of attribution - rather than attributing one specific event to internal or external causes, we might have a tendency to attribute one class of events (or even all events) to either internal or external causes



Locus of Control (LOC)

“Locus” means place or location

LOC is an aspect of personality, and is relatively fixed

People with internal LOC tends to think that events are driven by their own ability or effort; and people with external LOC tends to think they are driven by luck, fate, other people, or the nature of the situation/environment/task



Health Locus of Control

Kenneth Wallston proposed the concept of Health locus of control - which is degree we think that we are in control of our health

Health LOC can be measured using the Multidimensional Health Locus of Control (MHLC) Scale



Health Locus of Control

MHLC scale divide Health LOC into “internal”, “chance” and “powerful others” - which are not exclusive to each other

Health LOC affect how people behave towards health, including whether they are likely to make effort to improve one’s health, and whether they are likely to seek and listen to powerful others

We can also measure LOC for specific health conditions



Tool 35: Locus of Control (LOC) & Health LOC

Behaviour can be explained by an individual's general tendency to attribute events to either internal or external causes - in particular, different people have different health locus of control, which refers to their belief that health is controlled by either:

- i) their own ability and effort, ii) chance, and/or
- iii) powerful others



Tool 36: Self-efficacy

A related concept to LOC is self-efficacy, which is defined as "an individual's confidence to carry out a particular behaviour"

It is proposed that even if one has all the correct beliefs and attitudes towards a behaviour, self-efficacy is still needed for the behaviour to happen - a behaviour (or its absence) can therefore be explained by one's self-efficacy (or lack thereof)



Part 3

Problems with Control (and Lack of Control)

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Learned Helplessness

Although LOC is relatively fixed, we can learn - sometimes wrongly - whether we are in control or not

Martin Seligman reported a case where a dog was subjected to electric shock but was not allowed to escape; subsequently, the dog was given a way to escape, but rather than escaping, it chose to stay put and withstand the electric shock instead





Learned Helplessness & Lying Flat

After a prolonged period of aversive stimuli, we might learn that we are unable to improve the situation, and therefore stop trying

E.g., students who repeatedly fail might conclude that they are not smart enough, and decidedly to stop trying to learn

Similarly, people in abusive relationship might fail to leave the relationship, and subsequently stopped trying



Learned Helplessness and Health

Experience of being unable to improve one's health (or prevent a disease or death) might lead to us not recognizing situations where one CAN improve our health

E.g., ageing person is unable to stop their body from deteriorating, and therefore also stop trying to stay active; patient being convinced that they only need to stay put and accept treatment -> stop trying to improve their own health





Tool 37: Learned Helplessness

People's lack of behaviour could be explained by the fact that they previously tried, but was unable to improve the situation; they therefore learned that nothing could be done

This can possibly be reversed by being shown that things COULD be improved by specific behaviour / action





Illusion of Control

The other side of learned helplessness (thinking you do not have control when you do) is the illusion of control, where you think you have control when you do not

Although a sense of control (even without actual control) can be beneficial to the mental health of a person, it might also lead to bad/unhealthy behaviours that are otherwise avoided



Illusion of Control and Gambling

Gambling often involve situations of pure chance (e.g. mark six, slot machines) that we do not have control over

A (mistaken) sense of control make us feel that we have a higher chance of winning, and therefore lead us to gamble more

Casinos and betting companies often give us useless “information” and instill us with a false sense of control



Limited Control & Supposed Expertise

Sometimes we do have some information and some control, but not as much as we think we have

People might have some knowledge about football, investment markets, and medicine - but might be overconfident about their knowledge and make bad choices / bad bets; companies do harness this by acknowledging people's supposed expertise and tempt them to behave recklessly





Tool 38: Illusion of Control

People's behaviour might be explained by the fact that they believe they are in control - even when realistically they are not

Sometimes it is relatively harmless (e.g., not using scissors during pregnancy), but sometimes it can be wasteful (e.g., buying useless machines or supplements to try to improve one's health) or harmful (e.g., using supposedly advanced and new-to-science treatment rather than well established medical treatment)



Tool 39: Learned Optimism

As things are always caused by multiple factors, one can learn to be more optimistic in terms of explanatory style (especially when bad things happened to us):

Bad things being caused by temporary factors (and vice versa)

Bad things being caused by external factors (and vice versa)

Failure (and weakness) in one area does not mean failure in all



Part 4

Explaining and Suggesting Behaviours





Scenario o: Health LOC

Think back to your experience with COVID-19, how proactive were you in protecting yourself against it?

In general, how much do you think your risk of COVID and recovery from COVID is controlled by yourself (i.e., your own ability and effort), by chance, or by power others?

Is your Health LOC and general LOC also like that?





Activity: MHLC

Please go to

https://nursing.vanderbilt.edu/projects/wallstonk/form_a.php

and answer the questions;

then go to

<https://nursing.vanderbilt.edu/projects/wallstonk/scoring.php>

to calculate your own score



Scenario 1: Digit Span Task

Imagine I give you a string of numbers, and ask you to immediately repeat them back at me - how many digits do you think you can do?

(Note: this is a common test for working memory / short-term memory - especially to identify memory problems)



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10077696- 6^A9

68101214

728943

28315247

123456789

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Scenario 2: Free Recall Task

In a free recall task, a list of words are presented to a person. After listening to the whole list, the person needs to write down, in any order, as many words as they can remember.

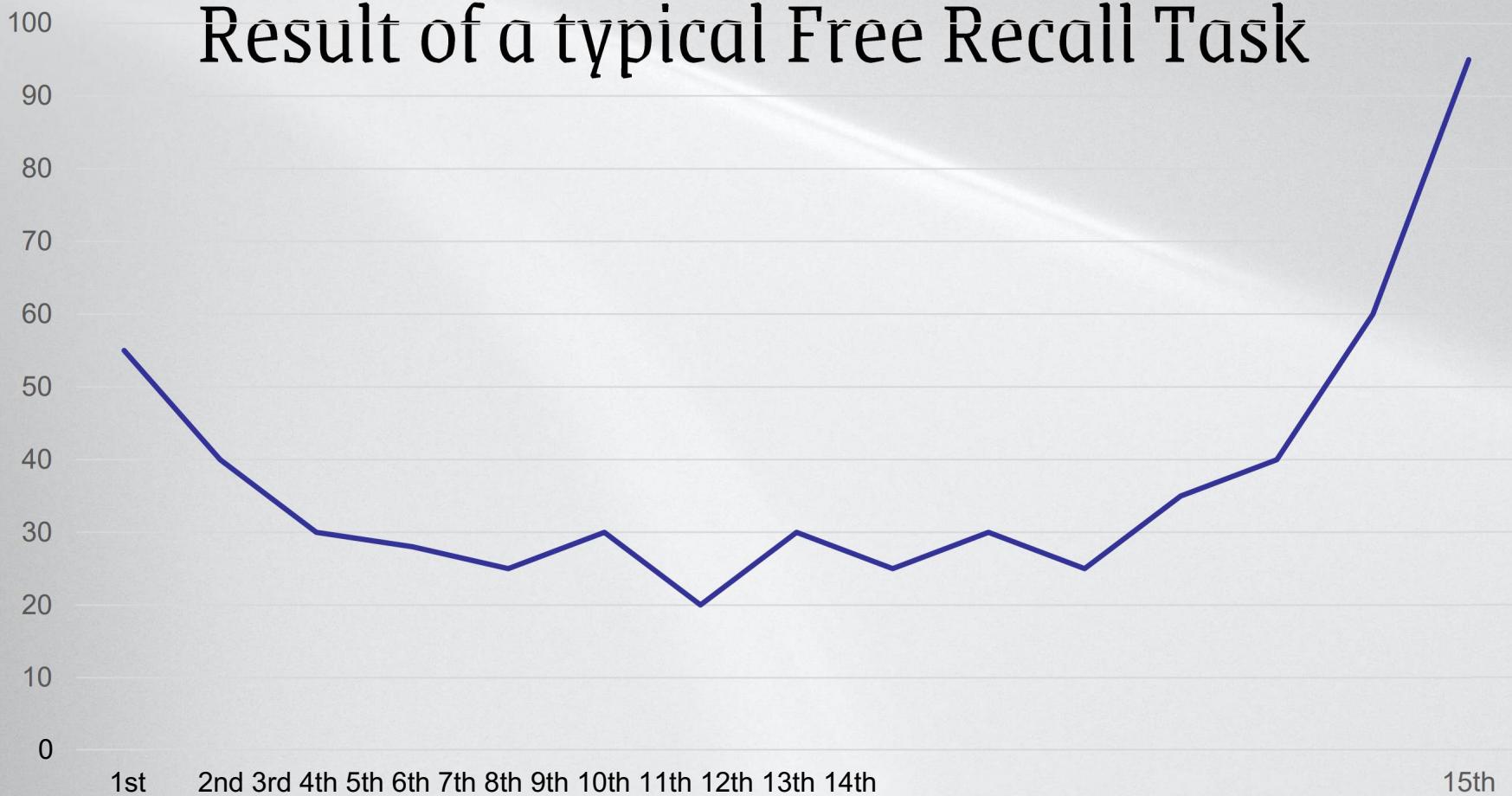
It involves you putting the words into your brain, and retrieving the words from your brain (the mental functions) - the brain being the storage, and the words being the information retained.





% recalled

Result of a typical Free Recall Task





Scenario 3

James is an elderly man living with his wife. Although he knows that many people are contracting seasonal influenza these days, he is not that worried about getting infected himself. He still goes to the park to exercise and has breakfast at dim-sum restaurant everyday. When asked, he says he is very safe from infection because he is already vaccinated. Do you agree?



Scenario 4

Madame Jo is very worried about COVID. She understands that the government is recommending vaccines, mask-wearing, and social-distancing; but she also heard stories about people getting infected even though they had vaccines, wore masks, and practiced social-distancing. As a result, she decided that there is ultimately nothing she can do to avoid COVID - it is just a matter of fate. Is she mistaken?



Scenario 5

Jenny is a diabetic patient. Although she is very good at adhering to the medical treatment prescribed by the doctors, and are never late to any appointment to GOPC or diabetic clinics, she never tried very hard to modify her eating habits, quit smoking, or do more exercise. In fact, she believes that whether her diabetes is well controlled is more about what the medical professionals do than what she herself does. Do you agree?



Scenario 6

Jonathan has been staying in a medical ward for a few weeks. He found that the ward is often understaffed, and all the nurses are extremely busy. In the first few days in the ward, he sometimes tried to ask the staff if someone can help him to walk to the toilet - but the staff always just asked him to use a diaper instead.

Other times, he felt that he is fit enough to walk to the toilet himself, but was prompted stopped by the nurses from leaving the bed. Soon afterwards, he stopped trying. Do you understand why?



Scenario 7

A lottery ticket (mark six) costs HK\$10 - and you can either i) choose your own numbers, or ii) let the computer choose some random numbers for you.

Imagine HKJC now change the prices so that (i) still costs \$10 but (ii) costs \$9 - do you think anyone would still buy (i)? Why?





Scenario 8

You are at a casino, next to a table for “Sic Bo / Hi-lo” (大細).

You noticed that for the last two rounds, the results have all been “Big” (i.e. 3 dice totaling 11 to 17). The display on top of the table shows this clearly, which attracts a lot of gamblers to come and bet on small (i.e. 3 dice totaling 4 to 10).

Can you explain why?





Scenario 9

John is a Liverpool FC supporter, but he rarely watches their games live. This is because he thinks that when he watches them live, they are more likely to lose; and when he does not watch, they are more likely to win.

Can you explain John's behaviour?





Scenario 10

Jacob is a self-proclaimed expert in football, and often bets on football results. In particular, he likes to bet on complex odds like “Liverpool 4-1 Norwich with Salah scoring the first goal” - even when he mostly loses money on these bets.

Can you guess why he likes to bet on these?





Part 5

Behavioural Change



Case 7

Canice, 75, is a retired office worker suffering from high blood pressure - but otherwise suffers from no symptoms. He is prescribed medication to lower his blood pressure, as well as asked to measure his own blood pressure everyday. However, during follow-up, it is revealed that he seems not to have done either regularly.

You suspect that part of the reason is that he does not fully appreciate the cost-effectiveness of the management plan, and therefore does not care enough to follow them meticulously. On the other hand, you cannot yet rule out the possibility that he is having memory problems due to his age.



Conclusion

A lack of behaviour (and sometimes unsuitable behaviour) sometimes is a result of forgetting rather than being deliberate; understanding how memory works help us to solve some of this

On the other hand, one's perceived control often determines the behaviour that we actually attempt; and we want to encourage the proper understand of the level of control we have





Reading / References

- Cacioppo, JT, Freberg, LA & Cacioppo, S (2022). Discovering Psychology: Science of Mind (4th ed.). Chapter 9: Memory. Cengage Learning.
- Wallston KA, Wallson BS, Smith S & Dobbins CJ (1987) Perceived control and health. Current Psychology, 6,5-25.
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~ End of lecture ~

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