



# Conditioning and Observing

Health Psychology (CMED2006)

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# Learning Objectives

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

- Describe the processes of classical conditioning and extinction
- Explain how behaviours could be acquired through the process of operant conditioning
- Describe the conditions where observational learning can occur
- Suggest ways to modify people's behaviour using operant conditioning and observational learning



# Definition of Learning

Learning can be defined as “A relatively permanent change in knowledge, behaviour or understanding that results from experience.”

Not about reflexes and natural responses to environment;  
and mostly not about conscious decision making  
or studying of facts



# Behaviorism

Many early psychologists (~1900) were frustrated that a lot of psychology was about thought processes that are unobservable

Behavioural psychologists focus on what is observable – i.e., behaviour, and study what factors affect behaviours without worrying about how people think



# Part 1

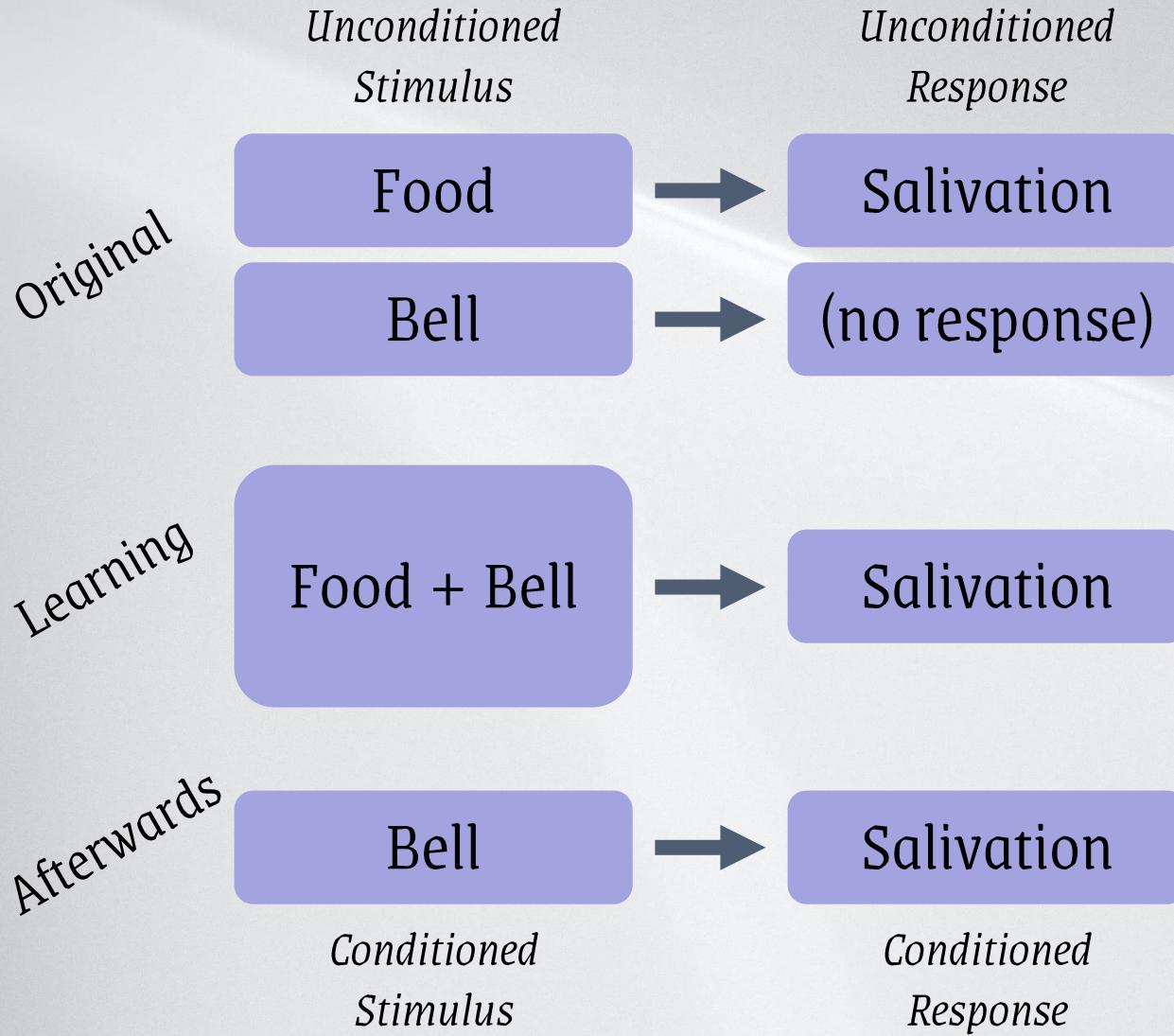
# Classical Conditioning



## Scenario 1: Pavlov's Dogs

Ivan Pavlov (a Nobel-prize-winning physiologist who studied dogs) kept a number of dogs in his laboratory, and always rang a bell before it was time to feed the dogs

One day, he noticed that the dogs not only started to salivate when they can see or smell their food, but also salivate when they hear the bell ringing – even if there is no food around.





# Stimulus and Response

Stimulus: an event or change in an event  
that alerts or arouses an organism

Response: any reaction of an organism to,  
or in the presence of, a stimulus



# Classical Conditioning

According to what Pavlov observed,  
after repeated pairing of unconditioned stimulus  
and a non-stimulus, the organism might create  
a link between the non-stimulus  
and the unconditioned response,  
thereby creating a new behaviour



# Features of Classical Conditioning

Subconscious and automatic

Extinction – in most cases, learned behaviour eventually stops if not continuously reinforced

Not everything can be conditioned – for example, the dog cannot learn to salivate in response to touching a particular texture



## Example of Little Albert

In an experiment to show that classical conditioning works on human beings, Watson & Rayner (1920) recruited a toddler, little Albert

They repeatedly paired a frightening UCS (a steel bar struck by a hammer behind his back) with the CS (a real rat). Eventually, little Albert developed fear towards the rat, as well as other furry creatures



# Implication of the Case of Little Albert

Watson et al. proposed that through classical conditioning, children can be made to like/dislike certain things – and therefore ultimately what kind of person they become

This can be “useful”, but also ethically dubious – can you think of any good use of the theory of classical conditioning?



## Tool 25: Classical Conditioning

A behaviour can be the result of classical conditioning, where an unconditioned stimulus (UCS) was paired with a conditioned stimulus (CS) which then produced a conditioned response (CR) when previously there were no response

It can be used to explain people's subconscious or uncontrollable reaction to something; and to use to change people's behaviour



# Part 2

# Operant Conditioning



## Scenario 2: Animal Behaviour

Jessica went the Ocean Park this past weekend,  
where she saw a show with dolphins and seals

She observed that every time the human trainers wants the animal to perform a certain trick, they gave a verbal signal or make a gesture. Also, after the animal performed the trick, the trainers gave the animals several fish to eat.



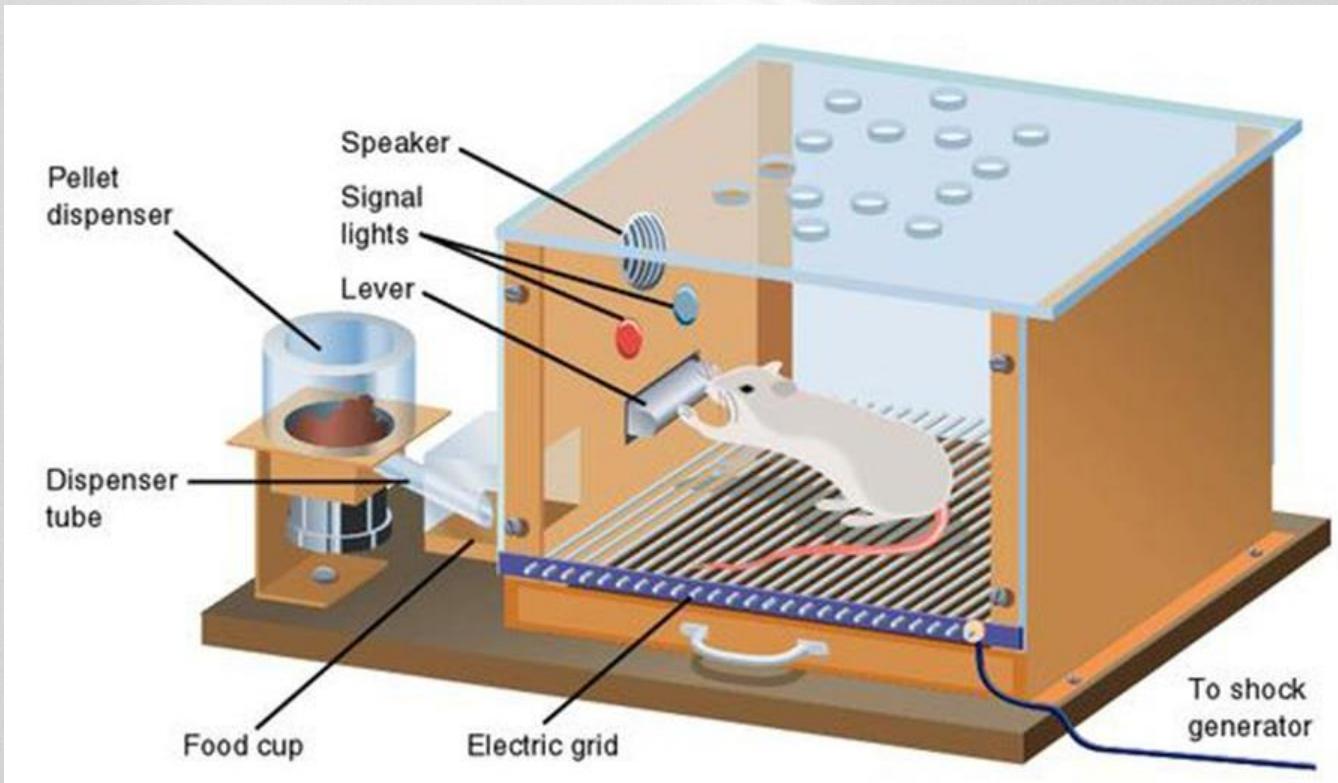
# Behaviours without UCS

Although there is no stimulus that naturally causes  
a dolphin to jump up and do a somersault,  
or a sea lion to clap their hands

But there are situations where they randomly  
(or just happens to) exhibit these behaviours –  
can we then make them learned behaviours?



# BF Skinner's "Skinner Box"





# Activity

What can you do with a Skinner Box with the following?

A mouse inside

A lever that the mouse can press

A way to deliver food to the mouse

A way to deliver electric shock to the mouse

A way to provide visual and audio information to the mouse



# Law of Effect

Edward Thorndike, an early psychologist, proposed that

*“Responses that produce a satisfying effect in a particular situation become more likely to occur again in that situation, and responses that produce a discomforting effect become less likely to occur again in that situation”*



# Behaviour & Consequences

A mouse might not know anything about the lever,  
but either because of curiosity or by accident,  
it is likely to press the lever eventually

What do you think would happen if  
a pallet of food is delivered to it every time it presses the lever?

What if it was an electric shock instead?



## Behaviour & Consequences (II)

What if one pallet of food is delivered automatically every minute, but every time the mouse presses the lever, no food is delivered the following minute?

What if one charge of electric shock is delivered automatically every minute, but every time the mouse presses the lever, no shock is delivered the following minute?



# Four Main Types of Operant Conditioning

Reinforcement (i.e. increase in behaviour)

Positive reinforcement

Negative reinforcement

Punishment (i.e. decrease in behaviour)

Positive punishment

Negative punishment

	Definition	Result
Positive reinforcement	Presentation of a pleasant stimulus that follows a desired behaviour	Increase the likelihood of the desired behaviour
Negative reinforcement	Removal of an unpleasant stimulus after a desired behaviour	Increases the likelihood of the desired behaviour
Positive punishment	Presentation of an unpleasant stimulus after an undesired behaviour	Decreases the likelihood of the undesired behaviour
Negative punishment	Removal of a pleasant stimulus after an undesired behaviour	Decreases the likelihood of the undesired behaviour



# Features of Operant Conditioning

Conscious thoughts and understand of the system is not required

Verbal foreshadowing of reward and punishment might not be as effective

Learned behaviour might not happen in all situations  
(Discriminative stimulus)



## Tool 26: Operant Conditioning

A behaviour can be the result of operant conditioning, where that behaviour were previously followed by either positive or negative reinforcement – or that its alternative were followed by either positive or negative punishment

It can be used – and is often used in the real world – to control behaviour, but has some limitations, including practical, ethical, and issues like extinction and discriminative stimulus



# Part 3

# Subtleties in Operant Conditioning



## Scenario 3: Skinner Box with Lights

The Skinner Box has two lights – one red and one green.

When the green light is on, food is delivered every time the mouse presses the lever; when the red light is on, an electric shock is delivered every time the mouse presses the lever

What do you think the mouse would eventually learn to do?



# Discriminative stimulus

Even less-intelligent animals can learn to behave differently under different circumstances

For example, different lights in the skinner box are stimuli that indicates different “rules” are in play

The animal does not need to intellectually process this, but would just know what is the good thing to do



## Scenario 4: Skinner Box with Probability

Which of the following would produce more lever-pressing behaviour?

When the mouse presses the lever, there is 10% chance that a pallet of food is delivered  
(or)

When the mouse presses the lever 10 times, a pallet of food is delivered



# Schedule of Reinforcement

Continuous reinforcement (reward for every desired behaviour)

*versus*

Partial reinforcement (reward but not every time)

For example,

fixed-interval schedule (reward after  $x$  amount of time) &  
variable-interval (reward after an average of  $x$  amount of time)



# Schedule of Reinforcement

Fixed-ratio schedule (1 reward every  $n$  times of behaviour) &  
Variable-ratio schedule ( $n\%$  chance after every behaviour)

The latter usually leads to more of the behaviour –  
consider gambling (where you might win something big  
in your next play) versus working (where you get  
a fixed salary after working for a month)



## Scenario 5: Eating Ice-cream

Imagine you are the elder sibling of a small child who  
really likes ice-cream

Which one of the following do you think would  
discourage them most from eating ice-cream?



# Which One has the Largest Effect?

Three possible occurrences:

- P1. Suddenly, every time they eat ice-cream, they start to have a toothache
- P2. You tell them that from now on, every time they eat ice-cream, they will have a toothache
- P3. Suddenly, every time they eat ice-cream, they start to have a toothache – and you explain to them that is because of the ice-cream



# Learning versus Decision Making

Comparing (P1) and (P2), the former is often has the larger effect because it works on the subconscious and is more direct

In fact, P2 is not even operant conditioning, because no conditioning has yet happened – rather you are engaging the child's system 2 and invite them to think about the pros of ice-cream and the cons of toothache; it also depends on the child remembering and believing your warning



# Limitations of Using Operant Conditioning

Reward and punishment should be practical as well as ethical  
(i.e. there are things that should be administered or denied)

(and)

Regardless of which reinforcement and punishment you do,  
the person might not learn the behaviour  
for all situations and for all times – because of  
extinction, discriminative stimulus, and overjustification effect



# Discriminative stimulus

The fact that you are the one giving out the reinforcement/punishment, you might become the discriminative stimulus that signal to the child that a particular reinforcement/punishment schedule is in operation

When you are not there (or in other situations), the learned behaviour might or might not be exhibited



# Part 4

# Observational Learning



## Scenario 6: Bobo Doll Experiment

1. Small children (37m to 69m) brought into a playroom
2. Small children observed either an adult “perform aggressive behaviours towards bobo doll” (or) “perform non-aggressive behaviours towards bobo doll”
3. Adult left the room
4. Small children were free to play in the room with bobo doll or other toys



# Result of Bobo Doll Experiment

Observation of aggressive adults →  
more aggressive behaviours, including

Imitate aggressive behaviours towards the doll;  
and aggressive ways of interacting with other toys

What are the implications?



# Mass Media & Observational Learning

We seldom just copy what we see on mass media;  
rather, we use it to inform our world view, and reflect on it

Most people can distinguish between real world and fiction;  
even more than they can distinguish between  
two different situations in the real world



# Conditions of Observational Learning

- Attention (observe)
- Retention (remember what we observed)
- Reproduction (ability to reproduce the behaviour)
- Motivation (good reason to adopt the behaviour)
  - One of the main motivations being to be like the person observed to behave in that way
  - The other being the predicted positive outcome(s)



# Observational Learning as Intervention

Often it is difficult or impossible to use classical conditioning or operant conditioning to encourage/discourage a behaviour – e.g. when the behaviour does not naturally occur, or that you have no access to individuals to impose reward/punishment

Observational learning might be a more suitable intervention in those situations



## Tool 27: Observational Learning

A behaviour can be the result of a person  
copying from other people

(or to explain how a behaviour might spread  
from one person (or one group) to another)

It can also be used to encourage a behaviour  
if all four conditions are satisfied



# Part 4

# Explaining Behaviours



## Scenario 7

Richard felt very sick after his first chemotherapy treatment

As he approached the hospital for his second treatment,  
he started to feel sick again



## Scenario 8

When little Suzie went for immunization,  
she was quite happy to see the nurse

Then, the nurse gave Suzie her immunization, which hurt a lot

Subsequently, little Suzie howls with protest  
whenever she approaches the clinic or sees any nurse.



## Scenario 9

Queenie was originally not afraid of spiders; however, after one incidence of camping with her aunt who has a fear of spider, Queenie developed Arachnophobia

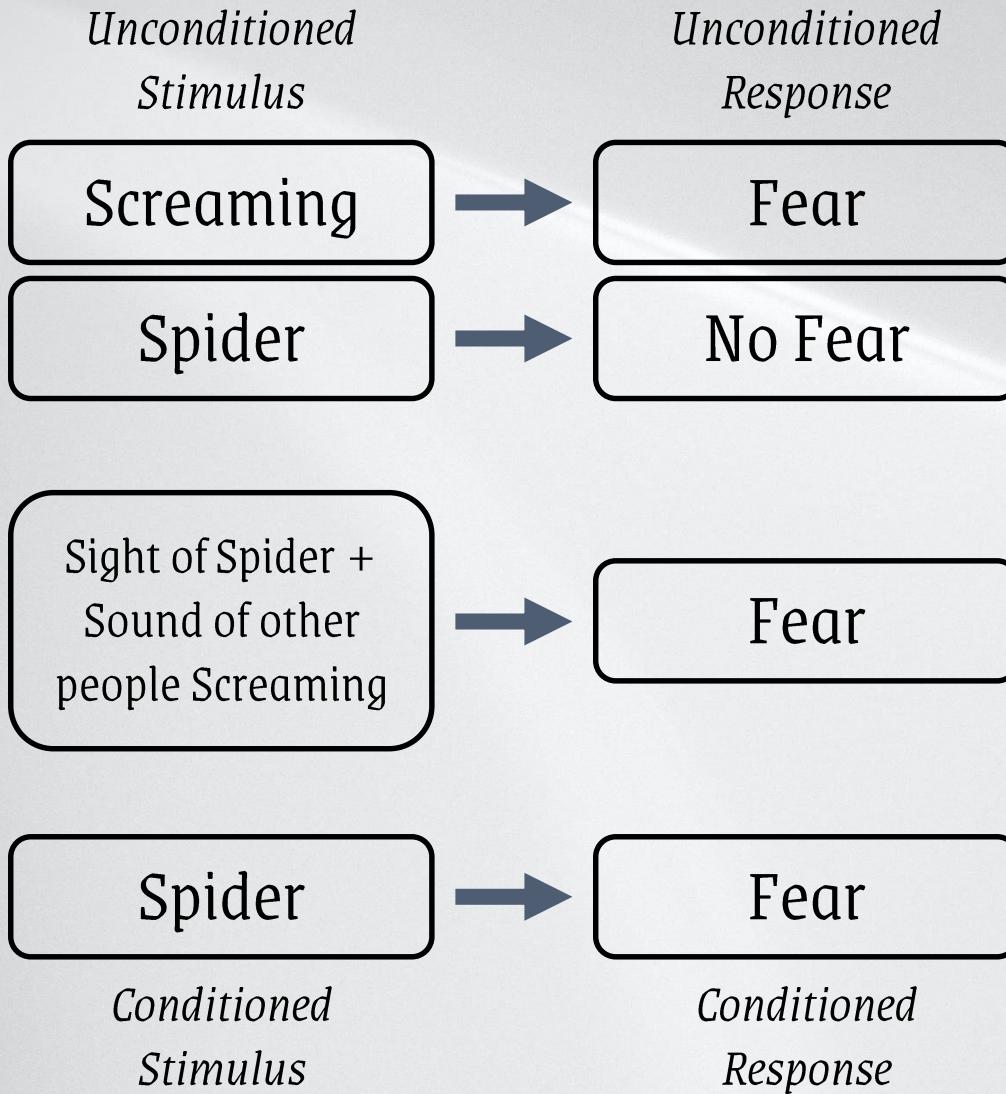
(Hint: The theory of classical conditioning is found to be a good explanation of phobia, which is an irrational fear towards something)



Original

Learning

Afterwards



### Examples of Phobias

*Acrophobia (fear of heights)*

*Arachnophobia (fear of spiders)*

*Claustrophobia (fear of confined spaces)*

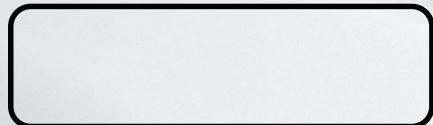
*Cynophobia (fear of dogs)*



Original

*Unconditioned*

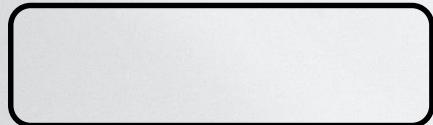
*Stimulus*



*Unconditioned*

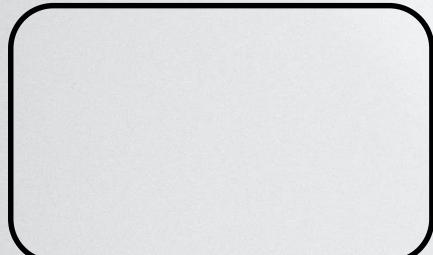
*Response*

Fear



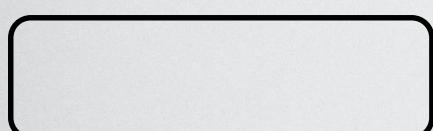
No Fear

Learning



Fear

Afterwards



Fear

*Conditioned*  
*Stimulus*

*Conditioned*  
*Response*

Examples of  
Phobias

*Acrophobia* (fear  
of heights)

*Arachnophobia*  
(fear of spiders)

*Claustrophobia*  
(fear of confined  
spaces)

*Cynophobia* (fear  
of dogs)



## Scenario 10: Video / Video Commercial

A child is really into Pokemon, and saw a video (maybe a video commercial) about Pokemon-trainer & Pokemon drinking milk

The child naturally finds the commercial attractive,  
and sees it many times

The child always ask their parents to give them milk to drink



# Scenario 11: Clicker/Idle Games

Try one of these clicker/idle games:

<https://orteil.dashnet.org/cookieclicker/>

<https://www.clickerheroes.com/play.html>

<https://melvoridle.com/>

Can you explain why you/someone might enjoy playing them?



# Explanation

A lot of “casual games” on mobile relies  
heavily on positive reinforcement  
(and often has minimal gameplay or requires minimal skill)

Reinforcement includes winning a level, defeating an enemy,  
encouraging sound effects and visual effects,  
or just numbers going up



## Scenario 12: Slot Machine

Keith is playing a slot machine, which costs 1 dollar per pull

Every time he pulls the lever,  
the machine plays a flashy video clip

On most of the pulls, he does not win anything;  
but about 1 in 10 times, he wins 5 dollars



# Explanation

There are a few mechanisms in play

1. Positive reinforcement of a flashy video clip
2. Partial positive reinforcement (that does not happen every time) of winning some money
3. The fact that the probability of winning & losing is not transparent



## Scenario 13

Mr Tam is a retiree who spends a lot of time in the Casino. He enjoys the availability of good restaurant and free drinks in and around the Casino. Among the gambling games, he enjoys slot-machines the most. He thinks that the odds is probably in the Casino's favour, but there is a particular machine where he occasionally wins the jackpot. Every time he pushes the button to start a spin, he thinks to himself 'I didn't win the last push, but maybe this time I'll be lucky!'



## Scenario 14

Uri is a 5 years old boy.

When his little brother was born, Uri became much naughtier

His mother scolded him, believing that this will deter him

However, Uri became even naughtier  
and does not seem to mind being scolded at



## Scenario 15

Victoria scolded her son Victor when he attempted to go near the stove in the kitchen.

This stopped him from approaching the stove in her presence, so she assumed that it was now safe to leave him alone in the room when the fire was lit.

However, as soon as Victoria left the room, Victor attempted to poke the fire again.



## Scenario 16

Mrs Wong tried to persuade her son Wayne to cut down on fried food and snacks. She pointed out that every time he had fried chicken and Korean barbecue for dinner, he coughed a lot the following day. Looking back, Wayne realized that his mother is factually correct, but wondered why he did not recognize the link himself.



# Part 5

# Behavioural Change



## Case 5

Canice, 9, is not very fond of leafy vegetables (but is quite fond of root vegetables and fruits). At every meal, his parents will prepare one small bowl of leafy vegetables for him and urge him to finish them. However, he often does not – claiming that he does not like them (that they taste bitter to him), and is already full for eating other parts of the meal. In fact, he is good at eating everything apart from leafy vegetables.

His parents are very concerned and ask you for help.



## Case 5 Focuses

The most obvious explanation of Canice's behaviour is that he does not like the taste of the leafy vegetables; therefore, try to focus on thinking up possible (feasible, acceptable and ethical) interventions first

And then maybe go back and think about other factors that are relevant to why he does not eat much vegetables; and maybe questions you would like to ask



# Template for Operant Conditioning

Positive reinforcement:

*[Every time, or other time schedule] [behaviour] happens,  
[someone] [provides positive consequences] to [the target]*

Negative reinforcement:

*[Every time, or other time schedule] [behaviour] happens,  
[someone] [takes away or stops a negative consequences]*



# Template for Observational Learning

Target population:	<i>Canice, 9yo, who does not like vegetables</i>
Role model:	
Attention:	
Retention:	
Reproduction:	
Motivation:	





# Conclusion

Classical conditioning, operant conditioning, and observational learning are the 3 main ways where we acquire behaviours without necessarily making a decision to behave that way

They often work on a subconscious level – and it can be argued that they work best if they remain subconscious. We can use them to attempt to change behaviours, as well as help people by bringing these to their consciousness.



# Reading / References

- Cacioppo, JT, Freberg, LA & Cacioppo, S (2022). Discovering Psychology: Science of Mind (4th ed.). Chapter 8: Learning. Cengage Learning.



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