

PBL

<https://www.youtube.com/watch?v=cMtLXXf9Sko>

Problem-Based Learning

- **Groups of up to 12 students**
 - Different roles:
 - Chairperson
 - Note taker
 - Tutor
- **Group meets for two hours:**
 - Discussion of a problem
 - Definition of learning objectives
 - Individual study
 - Reporting on and solving problem



7 Step Jump

1. Clarify concepts
2. Define problem statement
3. Brainstorm: previous experiences, and whether you recognize any ideas/concepts related to it
4. Cluster ideas
5. Set learning goals
6. Self-study
7. Sharing findings in a group

Problem Based Learning

Problem

Description of the problem
constructed by teachers



Discussion

“What do we already know?”
(activating prior knowledge)
“What do we need to know to solve
the problem?”



Independent Study, integration

of knowledge from different disciplines:

- Read
- Find
- Answer



Outcome:

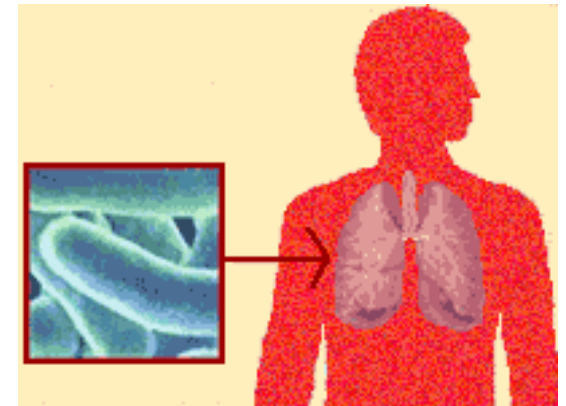
Exchange of information

- Did we solve the problem?
- Did all group members
understand everything?



An example

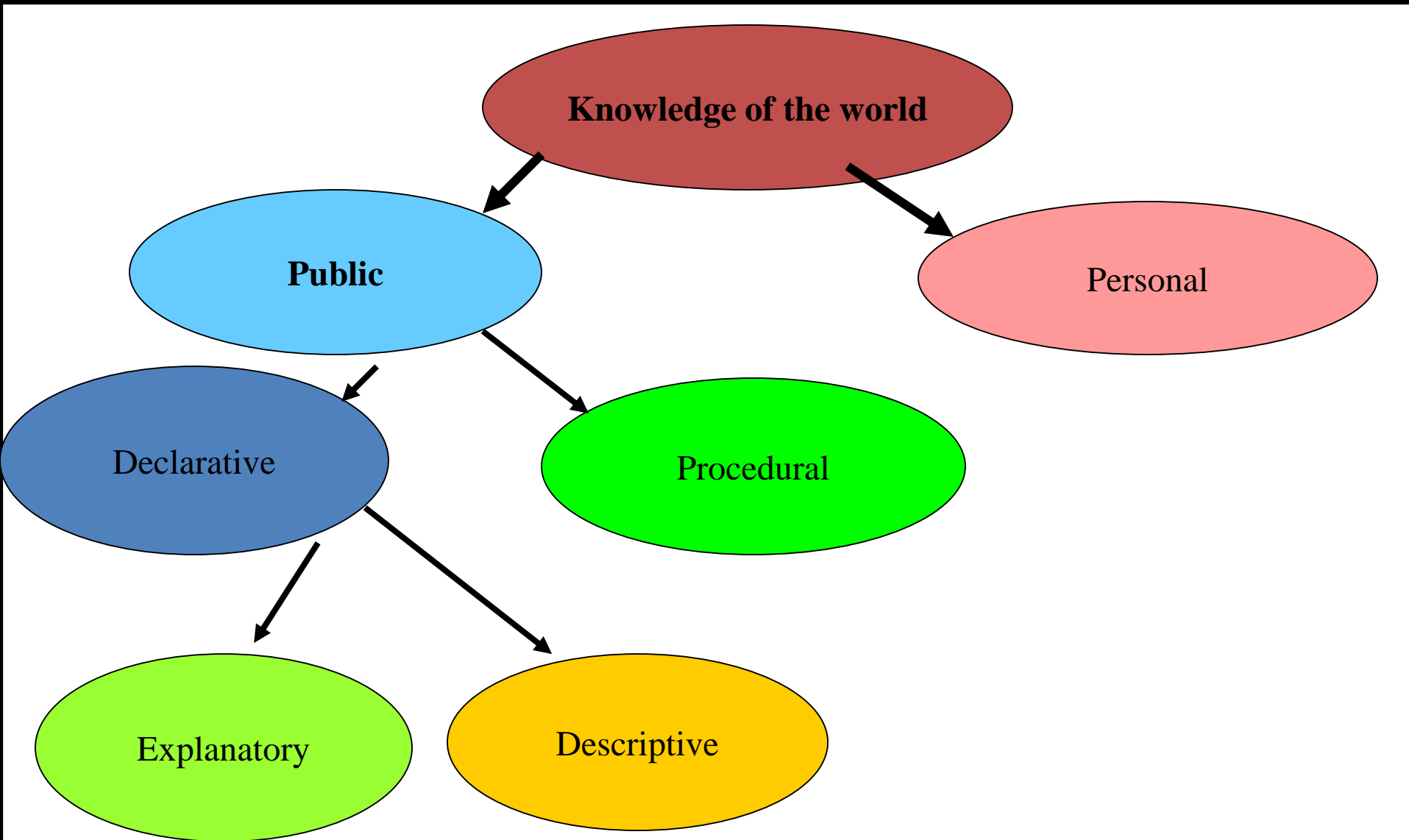
- **Problem:** Tuberculosis
 - read the case and explain difficult words
 - make a problem statement like:
“What is tuberculosis and how can we prevent it?”
- **Brainstorming:** What do we know about this problem?
 - were friends/family affected? What happened?
 - knowledge from high school about Tb?
 - what practical problems occur in the task description?
- **Learning objectives, e.g.:**
 - What is Tuberculosis and how does it develop?
 - How can you diagnose Tb?
 - What measures need to be taken to prevent Tb (cross-border)?



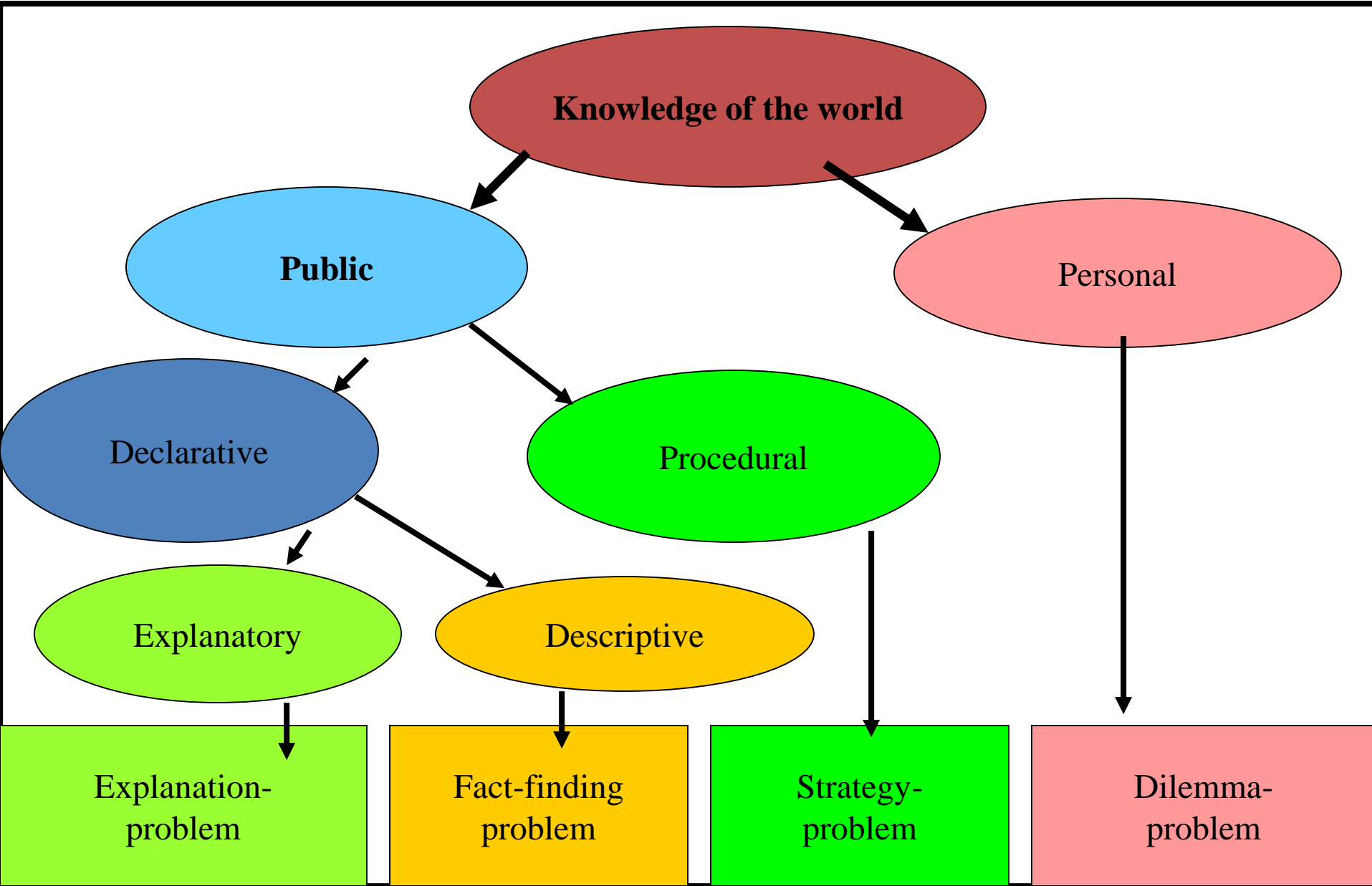
PBL

1. a constructive process
2. a self-directed process
3. a collaborative process
4. a contextual process

Different types of knowledge



Different types of knowledge



Explanation- problem

Explanation problem a more or less neutral description of a set of phenomena or events.

- Students are asked to explain these phenomena/events in terms of:
 - underlying process(es),
 - mechanism(s) or
 - principle(s).

Characteristics of the problem body text (1)

- Consists of a description of phenomena which need to be explained
- Is formulated in concrete terms or common language
- Is (relatively) short
- Doesn't contain too many distractions.

An example of an explanation problem (1)

Blue in Peru

- A group of healthy medical students from the Netherlands decided to visit the Inca Ruins at Macchu Pichu situated 20.000 ft (6.000 m) above sea level. When they reached the ruins they felt entirely breathless. The local guides who were not breathless, felt it was due to too much Heineken.
- Explain.

An example of an explanation problem (2)

Little monsters!

- Coming home from work, tired and in need of a hot bath, Peter, an account manager, discovers two spiders in his tub. He shrinks back, screams, and runs away. A neighbour saves him from his difficult situation by bringing the little animals in her hands outside. In the days and months to come Peter's behaviour changes. He insulates all windows of his house thoroughly. Often he asks his neighbour to control all his rooms before entering them. Words as Spiderman, Webmaster makes him very nervous.
- Explain.

Defining the problem

- How do people become afraid of spiders?
- Is arachnophobia something different from claustrophobia / agoraphobia / nosophobia / acrophobia, etc.
- Do phobia exist everywhere in the society? Are there differences between men – women? Are phobia culture dependent?

Possible explanations - brainstorm (part a)

- Imitating behavior of parents
- Classical conditioning
- It's something between their ears
- It's runs in the family, determined by heredity
- It has to do with our evolution as a human beings
- It's a disguise for other 'real' problems

Analysis – part b

Deeper exploration of the ideas (1)

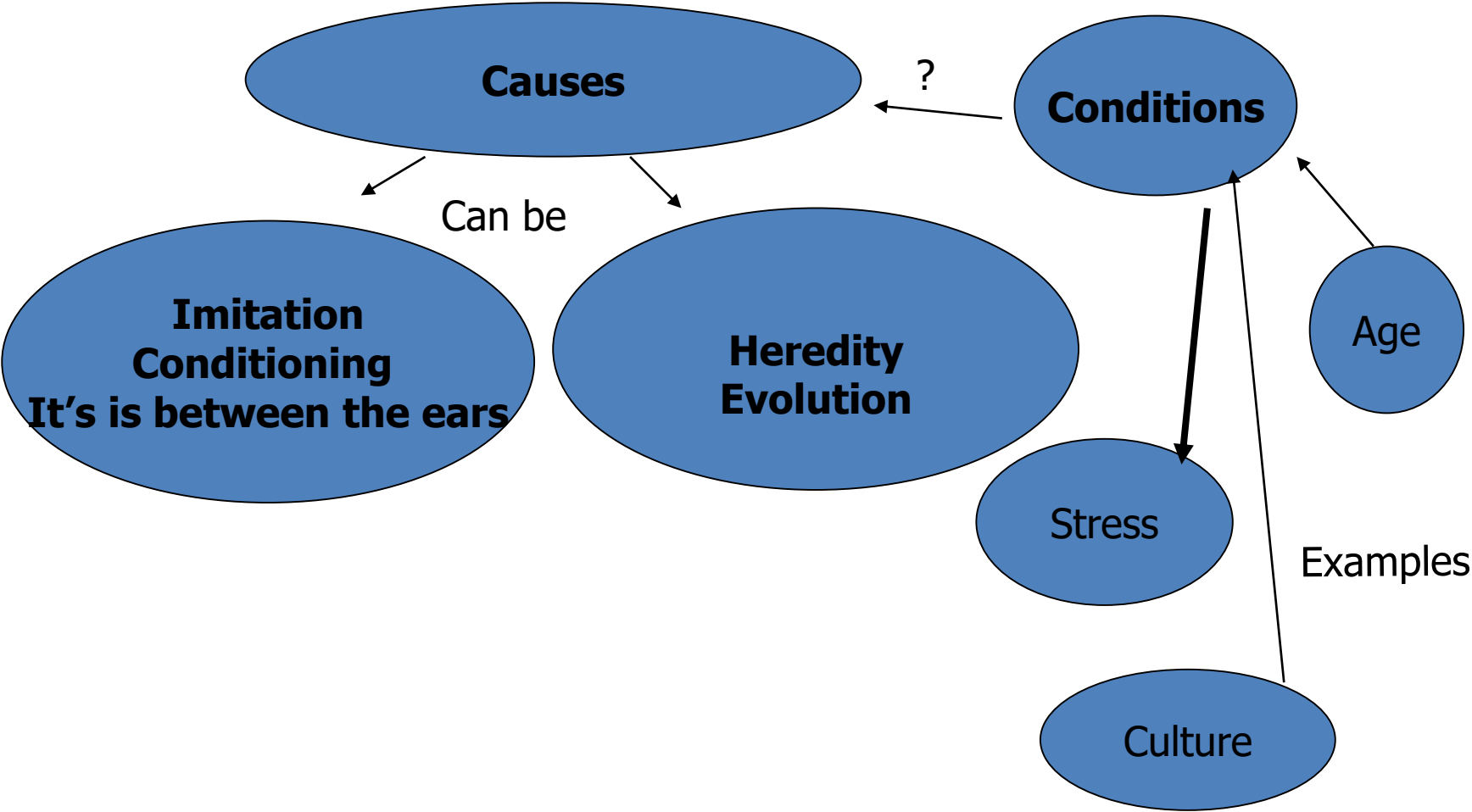
- **Conditioning – imitation**
 - People learn to be fearful – people link unpleasant feelings with a spider, height, elevator, etc. when distasteful feelings comes up later they are associated with spider, etc.
- **Heredity – genes**
 - Research twins – neurotransmitters in brains do not function in an optimal order – correlation between agoraphobia / panic / constraints / depression – relationship with specific types of phobia still ????
- **Theory of disguise**
 - Sigmund Freud, begin 20th century, psycho-dynamical theory, people suppress their sexual & aggressive drives, looking for acceptable ways of behavior – fear for own feelings leads to phobia

Analysis of the problem - part b

Deeper exploration of the ideas (2)

- Theory of evolution of human beings
 - In ancient times fear for spiders, snakes, etc. was normal; some people are still more afraid than others.
 - Cultural differences – in some cultures spiders are a synonym of fear, e.g. in the Netherlands spine-chilling movies are announced with the logo of a spider.

An example of structuring



Examples of learning objectives

- What are the differences between phobia – fear – anxiety – (definitions)? What are the characteristics of phobia? Categories?
- Is the explanation of John and Mary concerning Freuds' theory of disguise correct – up to date?
- Jany states that phobia are learned by classical operant conditioning. Is her explanation correct – complete?
- Are phobia really connected with our genes? In what way do neurotransmitters play a role?

Why is this phase of analysis so important?

- Curiosity! In the case of conflicting ideas: who ideas are correct? What can we learn more about it? We have the feeling of misunderstanding of this topic. What are correct ideas about it?
- 'Ownership'
- Demarcation of what will be studied for the next meeting

Example of learning resources

- Heimberg, R. G. (Ed.) (1995). *Social phobia: diagnosis, assessment and treatment*. New York (N.Y.): The Guilford Press
- Scholing, H.A. (1993). *Social phobia: cognitive and behavioral treatment*. Groningen: PhD-thesis
- Molen, G.M. van der (1988). *Panic, phobia and hypocapnia*. Maastricht: PHD-thesis
- American Psychiatric Association (1995). *Brief manual diagnostic criteria van de DSM-IV*. Lisse: Swets @Zeitlinger
- Mentalhealth.com (1999). Google Groups. Newsgroup.alt.support.social-phobia

Fact-finding problem

- **A fact-finding problem:** a description of a set of phenomena or events students have to study

Strategy- problem

Strategy problem a more or less neutral description of a set of phenomena or events. Students are asked to bring forward possibilities to solve / reduce these phenomena /events.

An example of a strategy problem

Help!

- Peter's fear for spiders became stronger and stronger . Photos of spiders, words like spinn-off, pincode and movie-announcements with the symbol of a spider (horror!) became taboo. Holes in his rooms have been sealed. Every new confrontation with spiders became worse. His neighbour, a little bit tired of bringing out spiders time after time, advises him to look for help. Now Peter is in your office, telling his story and asking for help.
- What will you do?

Dilemma- problem

A dilemma problem a more or less neutral description of a set of phenomena or events. Students are asked to bring forward their own norms, values regarding this event.

An example of a dilemma problem (2)

- **Another therapy?**
- Peter's arachnophobia is persistent. He has been seeing several therapists, each trying to help him with another therapy. Nowadays he also suffers from serious problems in concentrating at his work. His boss has been complaining, saying "This cannot go on! Perhaps you have to look for a less demanding job." Peter becomes despairing. His new therapist advises him a brand new therapy: drugs which inhibits the production of Ras-GRF protein. He says that gen therapy has the future. However, it is still in an experimental phase.
- Peter asks you for your opinion?

To vaccinate or not to vaccinate

Vaccines are an essential tool in disease prevention, as they have been responsible for the eradication or drastically reduced mortality rate of various infectious deadly diseases. However, in some regions where vaccinations are readily available and accessible, certain groups are slow to accept or outright refuse vaccination due to various concerns. This phenomenon, is therefore one of the greatest challenges facing public health leaders today. In the distant past, it was mandatory, as was the case in the UK's 1871. Since coercive methods like these are both morally controversial and may propel sentiments, a more sensitive method that promotes cooperation is required.

What is the problem at stake?

What do we already know and what we do not know yet ?

What are our learning goals ?

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Gardner, L., Dong, E., Khan, K., & Sarkar, S. (2020). Persistence of US measles risk due to vaccine hesitancy and outbreaks abroad. *The Lancet Infectious Diseases*, 20(10), 1114-1115.

Gerretsen, P., Kim, J., Caravaggio, F., Quilty, L., Sanches, M., Wells, S., ... & Graff-Guerrero, A. (2021). Individual determinants of COVID-19 vaccine hesitancy. *PLoS One*, 16(11), e0258462.

Greenwood, B. (2014). The contribution of vaccination to global health: past, present and future. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 369(1645), 20130433.

MacDonald, N. E. (2015). Vaccine hesitancy: Definition, scope and determinants. *Vaccine*, 33(34), 4161-4164.