

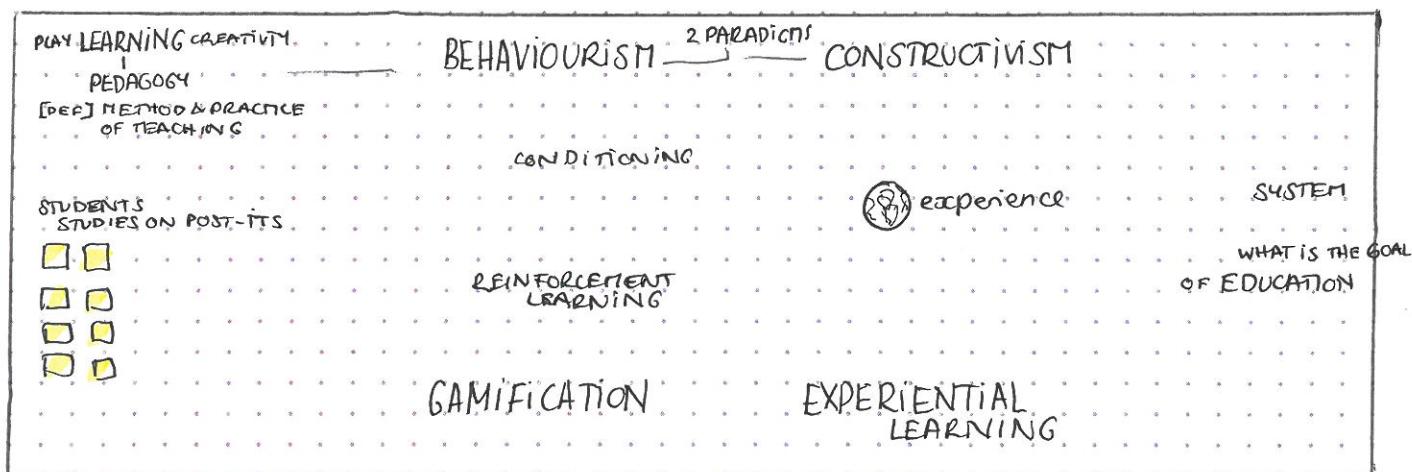
## READINGS AHEAD OF CLASS

- Ramirez & Squire (2015) Gamification and learning
- Resnick & Siegel (2015) A different approach to coding
- Resnick & Robinson (2017) A future kindergarten: Cultivating creativity through projects, passion, peers, and play. Chapter 1

## CONCEPTS DISCUSSED IN CLASS

- |                         |                          |
|-------------------------|--------------------------|
| > Pedagogy              | > Learning               |
| > Gamification          | > Constructivism         |
| > game-based learning   | > Behaviourism           |
| > Stimuli-Response      | > Reinforcement Learning |
| > Experiential learning | > Education              |

## WHITEBOARD STARTING POINT



## WHY NO POWERPOINT &amp; NO GUIDED QUESTIONS

- > Aware I promised guided questions for this week to help you focus.
- > Spend every day of the week staring at the black board announcement not sure what to share → realised at the end of the week that single was due to complexity of topic.
- > Needed to find a way to communicate the complexity in a meaningful format.
  - | my solution - a mindmap on the whiteboard illustrating how each aspect connects to previous.
  - | allows us to understand connections and not loose site of them (slides are focused on narrative and build on each other.)

## THE PLAN

- > course is called PLAY, LEARNING & CREATIVITY, so far we focused on play mainly and one class with Marc & Amos on creativity.
- > today we will focus on learning, what we mean by learning and how it connects to the overarching topics of this course
- > we will do this by focusing on pedagogies (that we learned about last week) and use these as a lens to understand the philosophical debate behind it

[DEF] PEDAGOGY - the method and practice of teaching (based on how we think students learn)

-  → I also would like to map what you study on to the discussion today. This is in order to make visible to you how your own fields are linked and inherently a part of it
- post + 5  
to be removed
- Studies: Information Studies, Cognitive Science, Psychology, Culture & Aesthetics, Literature, Anthropology, Digital Design, Philosophy
- > we will look at these learning understandings through the lens of two paradigms: behaviourism and constructivism
  - ↳ The reason that we will focus on these two is that they present two opposing but interconnected paradigms that dominate the educational landscape
  - > In this, we will gain an understanding of how gamification is extended on behaviourism and how experiential learning has its roots in constructivism

  
GOAL OF CLASS

understand the question: What is the goal of education  
In this, understand how experiential learning, play-based education and gamification are just the product of a century long philosophical debate.

[!] END WITH: WHAT IS THE ROLE OF SYSTEMATICITY IN ALL OF THIS

SET UP FOR AN HOUR OF STUDENT LED

INTERACTION → ANARCHY → YOU DECIDE  
WHAT HAPPENS DURING THIS HOUR

## BEHAVIOURISM

### ② WHAT DO STUDENTS KNOW?

- ③ Ask background knowledge and add to the board
- > Guess what they know: Pavlov, Skinner Box, Conditioning
- > Extend on the points raised perhaps mind as a box input and output
- { LogSci should have had this in Studium Generale}
- > Make note that we will be discussing a simplified version of the construct and debate.

### WHAT IS BEHAVIOURISM?

- > A research program within psychology, but also a learning paradigm
- > Attempts to explain behavior in terms of external physical stimuli responses, learning histories, and in some cases conditioning and reinforcement

[ARG] Psychology is the science of behavior. Psychology is not the science of the inner mind - as something other or different from behavior.

[ARG] Behavior can be described and explained without making ultimate reference to mental events or to internal psychological processes.

The sources of behavior are external (in the environment) not internal (in the mind, in the head).

- > Historically, behaviorism has its roots in the late 19th century with the foundation of experimental research labs by Wilhelm Wundt and Pavlov's research (1897)
- > Watson publishes the behaviorist paper in 1913
- > until this point Young and Freud dominated through the method of **introspection** and focus on subjective experience
- > new scientist disagreed with this approach and found it unmeaningful to study the human mind in this way
- > for instance → how would we know if someone is confabulating  
↳ introspection required ~~too much~~ lengthy training
- > Behaviorist argued that we should disregard personal experience and focus in on what we can actually observe and objectify: behaviour

## THE IDEA OF THE BLACK BOX

INPUT →  → OUTPUT

As long as we can observe an input and output, it doesn't really matter what happens in between

🔗 LINK BACK TO

EXPERIMENTAL METHODS TO ILLUSTRATE THIS

- [X] In Bonawitz et al., for instance, we provide an input and observe a specific "output" to draw conclusions about an internal experience
- length of times in play indicate enjoyment across children  
vs. asking children about their experience.



SKINNER'S ARGUMENT ⇒

- [X] THE WATER GLASS



Causal chain example  
in Skinner (1953, p. 689)

"The objection to inner states [inner causes] is not that they do not exist, but that they are not relevant in a functional analysis." (Skinner, 1953, p. 690)



Skinner's understanding

- ① AN OPERATION PERFORMED ON AN ORGANISM (THE INPUT) - (STIMULUS)

↳ for example, water deprivation

- ② AN INNER CONDITION

↳ for example, physiological or psychic thirst

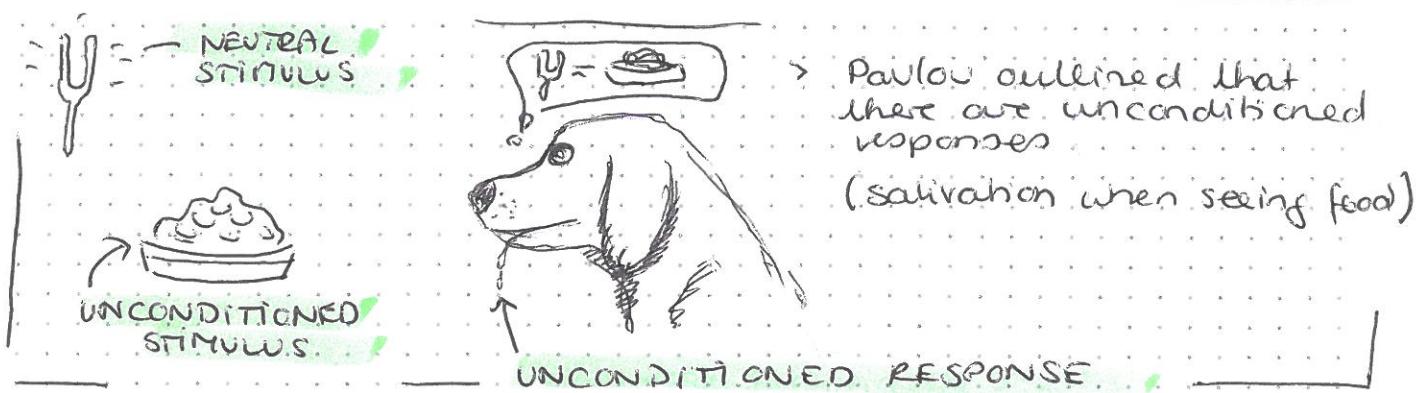
- ③ A MIND OF BEHAVIOR (OUTPUT - RESPONSE)

↳ for example, drinking

↳ As long as we know the stimulus and response, we can draw inferences and derive at 2

- [X] PAVLOV'S DOG & CONDITIONING (1927)

- > Pavlov began with the simple idea that there are some things that dogs do not need to learn
- > Specific to his study he observed that dogs do not learn to salivate when they see food
- > This response (or "reflex") is hard-wired into the dog. An unconditioned response → a stimulus-response connection that required no learning.



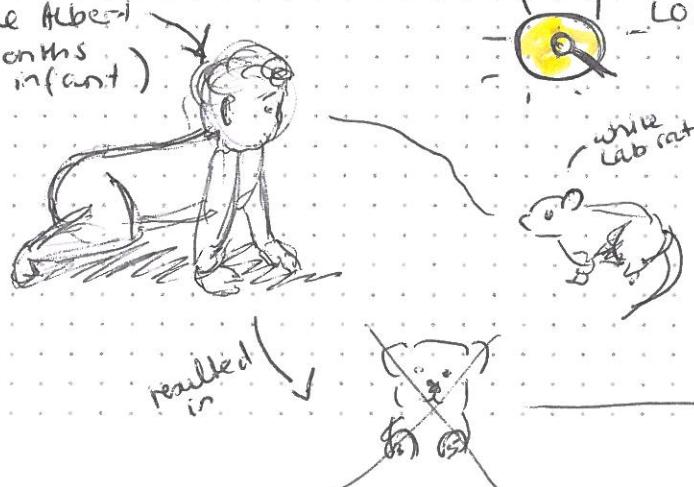
- > Pavlov outlined that there are unconditioned responses (salivation when seeing food)
- > Pavlov then used a neutral stimulus (meaning it does not elicit an innate response), to condition the dog to associate the sound of a bell with food by ringing it everytime the dog would receive food.
- > After a number of repeats of this procedure, the bell on its own lead the dog to salivate.  
↳ because the new behaviour was conditioned, it was now referred to as a conditioned response.

This theory came to be known as classical conditioning.

- > This was focused on animals, Watson later on extended on this research through the "Little Albert study" (Watson & Rayner, 1920)
  - > controlled experiment and first empirical evidence for conditioning in humans
  - > Watson hypothesized that children's response to loud noises (fear, crying) was an innate response that could be used to condition children

Subject:

Little Albert  
(9 months old infant)



LOUD GONG

> initially LA showed no fear of rat

> produced loud sound every time Albert engaged with rat

> soon Albert showed fear of rat

→ also began to fear all furry things

## REINFORCEMENT LEARNING

> operant conditioning: process by which an animal/human learns to behave to gain rewards and avoid punishment.

> Reinforcement learning: a system learns to maximize rewards and minimize punishment through acting in the world

[Ex] google deepmind learning to walk

## EDUCATION

> can see this in grading system

! Behaviourism → sloths hibernate → enjoy it? Actually not, just because we can draw inferences doesn't mean they are correct



## GAMIFICATION AS REINFORCEMENT LEARNING

> level structure

### [GAMIFICATION]

> tutorials

using game-design elements in non-game contexts

> narratives

(digital & non-digital)

> badges, reward structures

GAME-BASED LEARNING VS GAMIFICATION  
(including actual games or creating games to learn vs using game-elements)

## LEARNING & BEHAVIOURISM

> if behaviourism holds true: learning is pure associations

> born as blank slate with few innate reflexes (drives) <sup>too</sup>

> no need for mental content → free will is an illusion

Behaviourism leads to the question of who decides the input

↳ control conditioning  $\Rightarrow$  hierarchical social system

## CONSTRUCTIVISM (THE OTHER HALF OF THE COIN) AT THE EXAMPLE OF JOHN DEWEY

The diagram illustrates the tension between two competing worldviews. On the left, a portrait of Immanuel Kant is shown. In the center, there are three question marks above a portrait of Wilhelm Wundt. On the right, a portrait of John Dewey is shown. A small text box asks: "Is the human experience of the world a true representation of the world, or is human experience inherently spiritual (limited to the subject)?". Below the portraits, the names "IMMANUEL KANT" and "WILHELM WUNDT" are written.

Dewey's early work concentrated on the tension between two competing worldviews (J. Dewey, 1930; Hildebrand, 2018). On the one hand, he was drawn to ideas from Neo-Hegelian Idealism, which opposed metaphysical theories of materialism and naturalism, i.e. the idea that human perception is an exact representation of the world (Dykhuizen, 1959, 1961). On the other hand, having studied under Hall, a scholar of James and Wundt, he was fascinated by the empirical study of attention as well as the study of evolution and Darwinian biology (Hildebrand, 2018). This tension opened questions of whether the human experience of the world was a true representation of the world, or whether human experience was inherently spiritual (e.g., Fichte's "Absolutus ich", Köbel & Breitenbach, 2019). Dewey was convinced that both views were compatible under a new understanding of experience.

Kant had stipulated that the subject experiences the world with the help of so-called "Kategorien" (e.g., time, singularity, multitude, etc), which are *a priori*, meaning unlearned, and not derived through experience itself. The important consequence of this idea is that humans cannot experience the world as it truly is (i.e. they cannot understand the world as it is), but only mediated through these categories. This poses the challenge of how the subject and world relate to each other, which subsequent philosophers were trying to address (e.g., Fichte, British Empiricist, Hegel).

A portrait of Kant is shown with a small heart above his head. The text "Categorical imperative" is written above the portrait. Below the portrait is a quote: "Act in such a way that you treat humanity, whether in your own person or in the person of any other, never merely as a means to an end, but always at the same time as an end." A small portrait of Dewey is shown with two hearts above his head.

The response to this fundamental problem that Dewey developed was to take a pragmatic stance that highlighted the role of the "Augenblick" (after Kant, in Engl. the momentary experience). By taking experience as the focal point, Dewey was able to circumvent the dualistic nature of the problem. In this, Dewey remained sympathetic towards Morris's Neo-Hegelian idea of experience as the unifying product of the interaction between subject and world. In a letter to his mentor Torrey, he writes, "subject and object are in organic relation, neither having reality apart from the other [as cited in Dykhuizen, 1961, p.108]."

For Dewey, one of the primary outcomes of this pragmatic turn is the intrinsic value of experience. Inspired by Kant's categorical imperative, particularly the "Selbstzweckformel" (cf. Kant, AA, IV, p.429), which addressed the idea that one is to treat humanity as an end in itself and not merely as a means to an end, Dewey stated that each experience is singular and purposeful.

"Der praktische Imperativ wird also folgender sein: Handle so, daß du die Menschheit, sowohl in deiner Person, als in der Person eines jeden andern, jederzeit zugleich als Zweck, niemals bloß als Mittel brauchest." (Kant, AA, IV, p.429)

## EXPERIENCE LEADS TO DEMOCRACY

- > if all experiences are equally, democracy is the only way forward
- > democracy hereby being a guiding principle. It is first and foremost ~~not~~ institutional or government structure
- > realising equality through others
- > Dewey's idea to achieve democracy is an embryonic society (education) that allows people to have experiences
  - ↳ through long generational processes we can thrive towards democracy
  - ↳ never reach its ultimate form — always is organic

## SYSTEMATICITY & GOAL OF EDUCATION

- > FORM A SOCIETY
- > structures and systems constrain and form us
- > (look at classroom)