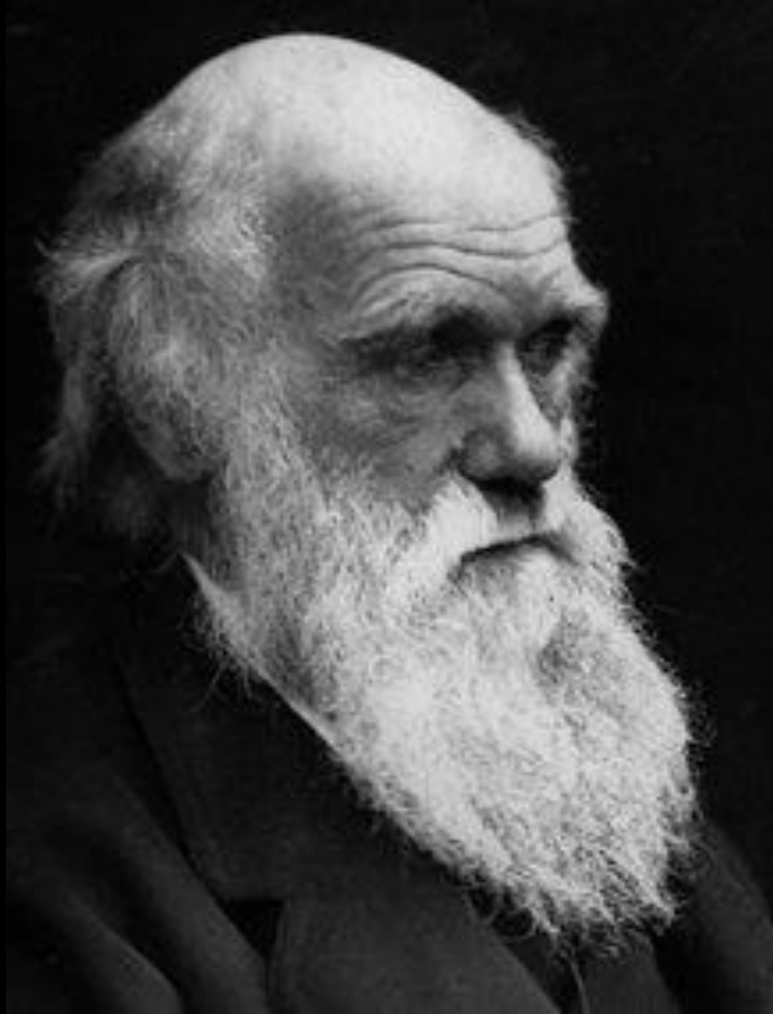


Dawn of the Duck An Evolution Game

Professor Norman Li
School of Social Sciences



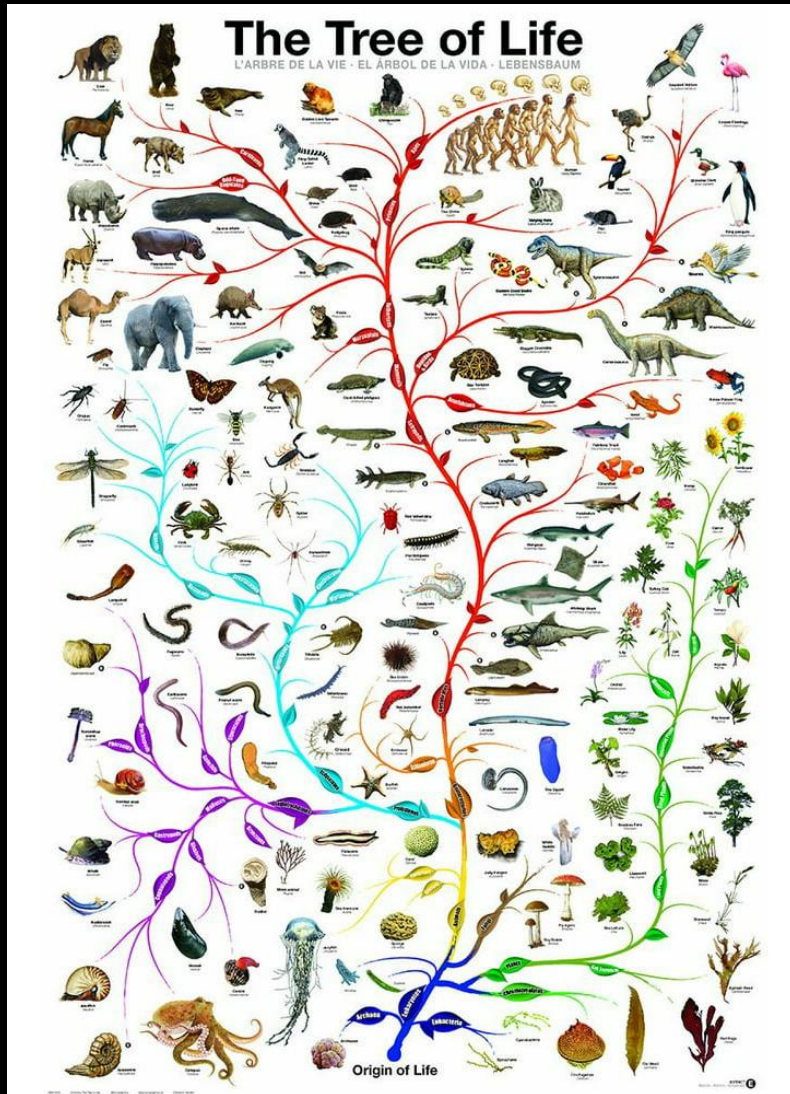


Evolutionary Psychology

Evolutionary Psychology

- Where do human thoughts, feelings, and behaviors come from and what are they designed to do?

Evolution

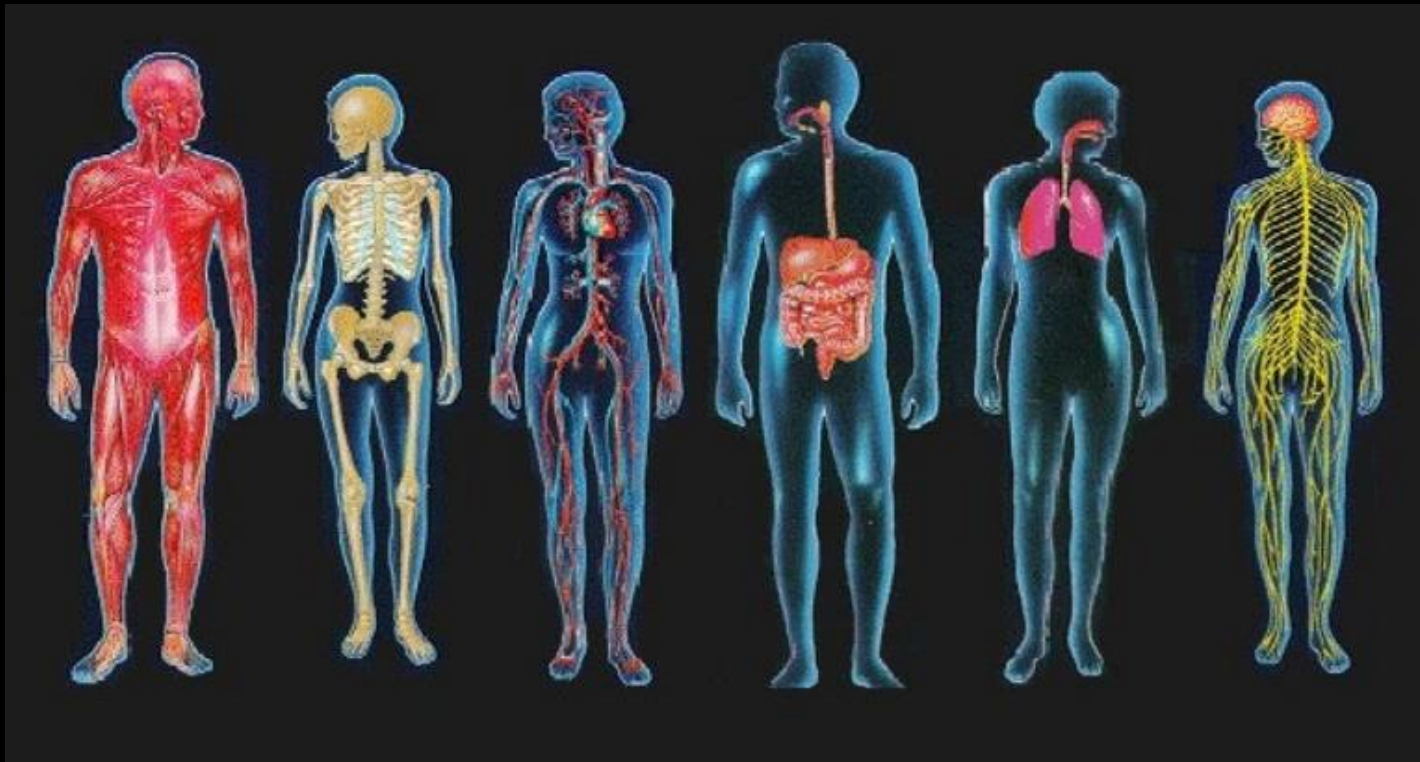


- Evolution is the one concept that parsimoniously and scientifically explains and connects all living things, including human traits.

Evolution doesn't just explain the origin and function of physical traits



or physiological ones



...but also psychological traits



...but also psychological traits



Natural selection

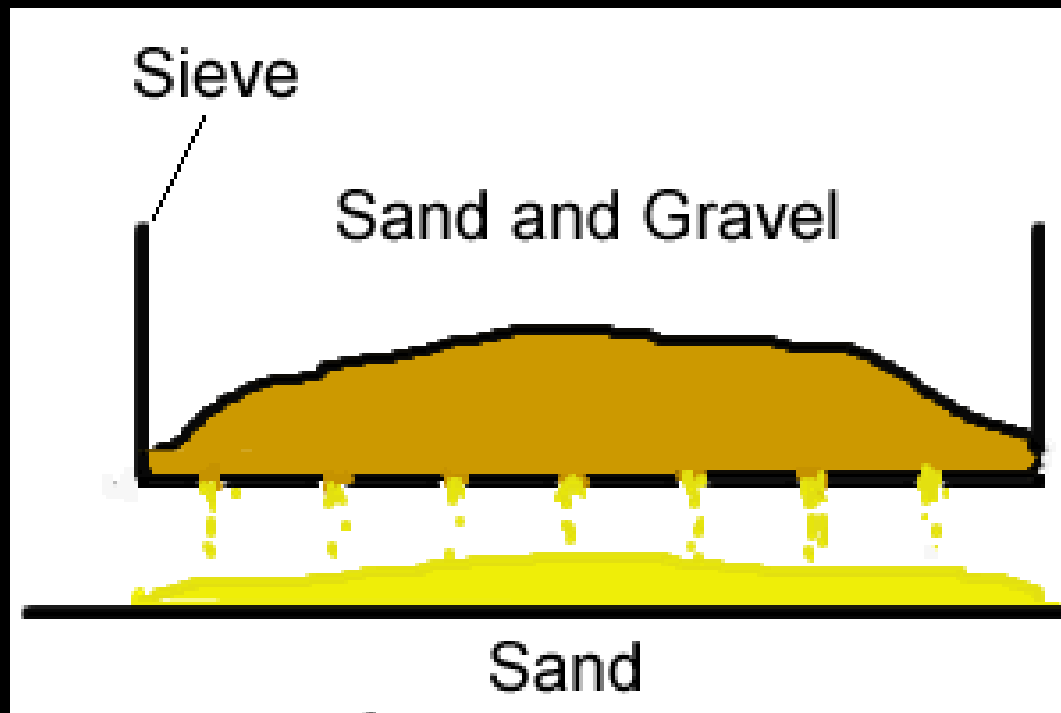
1. **Variation:** Organisms differ on various phenotypic traits or trait features (these include physical properties, appearance, behavior, psychology)
2. **Inheritance:** Phenotypic traits (coded for by genes, often with environmental input) can be inherited
3. **Selective retention:** Phenotypic traits or trait features (and the genes that code for them) associated with higher (more 'successful') rates of survival will tend to be selected over time by being over-represented in subsequent generations

Natural selection

- Natural selection is not forward-looking or purposeful (genes are not *trying* to outcompete each other or design organisms that are better at surviving and reproducing; nor is nature trying to do anything) – it simply occurs:
 - Through **random** mutations in DNA, new genes (which code for or influence phenotypic features, including behaviors) come about.
 - **Selection**: Phenotypes (and the associated genes) that are associated with greater survival and reproduction in organisms will, over the generations, become more common among organisms of that species.

Natural selection

- Think of a box with sand and gravel. Small holes gradually appear at the bottom of the box. Only the small grains can get through the sieve, resulting in mostly sand, not gravel, at the bottom after one pass.



Natural selection

- Natural selection works similarly, but the “sieve” that separates one generation from the next requires, at a minimum, that organisms survive and reproduce. You can’t get traits and their genes into the next generation if you don’t survive long enough to reproduce or if you don’t reproduce.
- So, for traits and genes to make it to the next generation, they need to contribute to better survival and reproduction.
- Over several generations, the traits and genes that best contribute to better survival and reproduction will be most prevalent in the population.

Class Activity/Discussion:

How would we go about getting wolves to eventually change into chihuahuas?



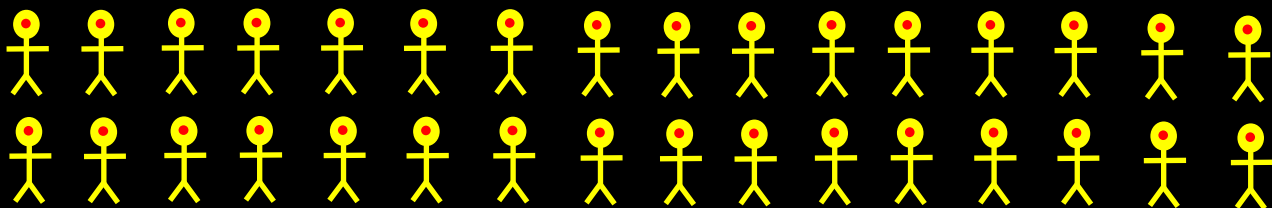
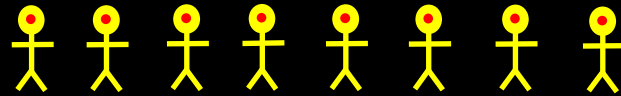
A



B



C



Some students don't completely get it



It's understandable because...

So, most people can't really visualize it

?



CTE



Learning Innovation Festival 2023

More Than Fun & Games: Elevate Teaching & Learning through Game-Based Learning

6th October 2023 / 9am - 12pm

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I N T E R A C T I V E

Evolution game: Dawn of the Duck



Evolution game

EXPERIMENT MODE

Duck Traits | Configure Scenario | Reset to Defaults | Randomize

0001		Lifespan	<input type="range"/>	5	Speed of Duck on land affects food procurement and predator avoidance.	0		
0002								
0003		Body Size	<input type="range"/>	2		Agility (Ground)	<input type="range"/>	10
0004		Mutation Rate	<input type="range"/>	10%		Agility (Water)	<input type="range"/>	4
0005						Insect Digestion	<input type="checkbox"/>	
0006						Plant Disgestion	<input type="checkbox"/>	
0007		Parenting	<input type="range"/>	3		Huddle	<input type="checkbox"/>	
0008								
0009		Disease Resistance	<input type="range"/>	8				
0010								
0011								
0012								
0013								
0014								

Excess Energy Action Priority
Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Nullam vehicula ipsum a arcu cursus vitae congue. Ultricies mi eget mauris pharetra et ultrices. A laculis at erat pellentesque adipiscing.

- Movement
- Reproduction
- Mating
- Offspring

Begin Simulation
Return to Main Menu


Evolution game

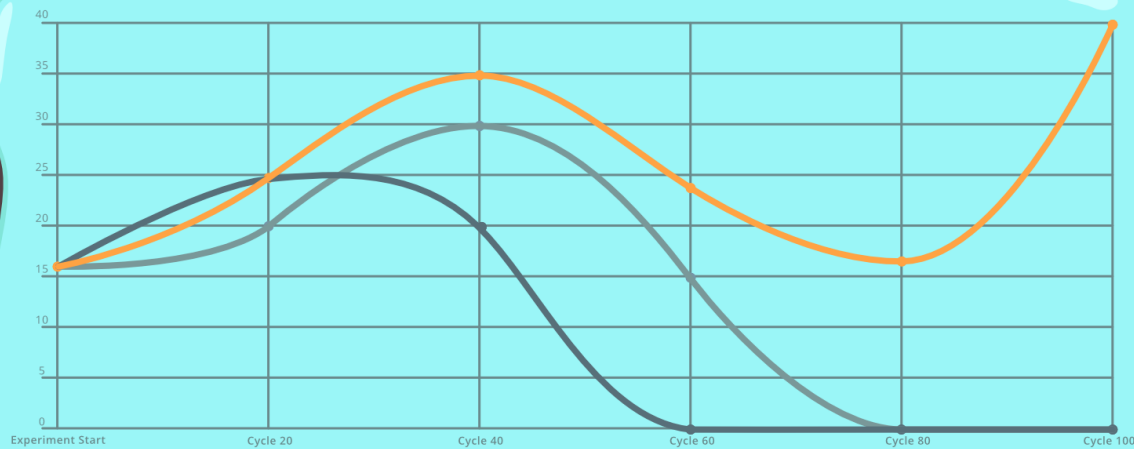


Evolution game

Success!

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi id efficitur turpis, iaculis rhoncus nunc. Curabitur varius mauris non maximus ornare. Donec imperdiet venenatis turpis, ac fermentum tortor dapibus a. Nunc accumsan id orci id mattis. In condimentum, urna ut lacinia elementum, lectus augue vehicula eros, sit amet ornare eros ipsum a urna. Pellentesque nec sapien vitae purus eleifend porttitor in sit amet leo. Cras eget massa nisl. Nulla sollicitudin volutpat nulla, vel sollicitudin tortor. Integer scelerisque euismod elit at venenatis. Integer egestas in erat eu convallis.

Population 



[Return to Main Menu](#)

Responses so far

The game simulates how populations of a species survive environmental challenges, with some individuals doing better than others and having their traits passed on, strengthening a trait in a population over generations

It illustrates natural selection in a simple manner, showing how adaptations that increase survival in an environment get passed down to their offspring which in turn also helps in their survival.

It allows me to show the class how different selection pressures can alter the consequences for the continuity of the species.

Every scenario is well thought out when it comes to life history.

The game allowed me to understand how different ducks have differing capabilities at surviving the simulation due to their different features that could confer some a selective advantage in some scenarios and how these features are selected and become more apparent in the next generation.

Playing the game

- Evolutionary Psychology students will be introduced to the game in the first week of class
- Game will also be used in Social Psychology class to introduce the evolutionary psychological perspective

Who else can play the game?



Any instructor can use this in their classes, anytime the evolutionary perspective or evolutionary psychology is introduced



Anyone who wishes to better understand the process that explains and connects all living things can play the game