

**REALITY DOESN'T FIT IN BOXES**

**EINAR W. HØST**

# CATEGORIES

# **RIDICULOUS & SERIOUS**

# HELLO

# HELLO FELLOW

**HELLO FELLOW APES**

**HELLO FELLOW HUMANS**

**HELLO FELLOW SENTIENT BEINGS**

# HELLO FELLOW OBJECTS

HELLO FELLOW APES

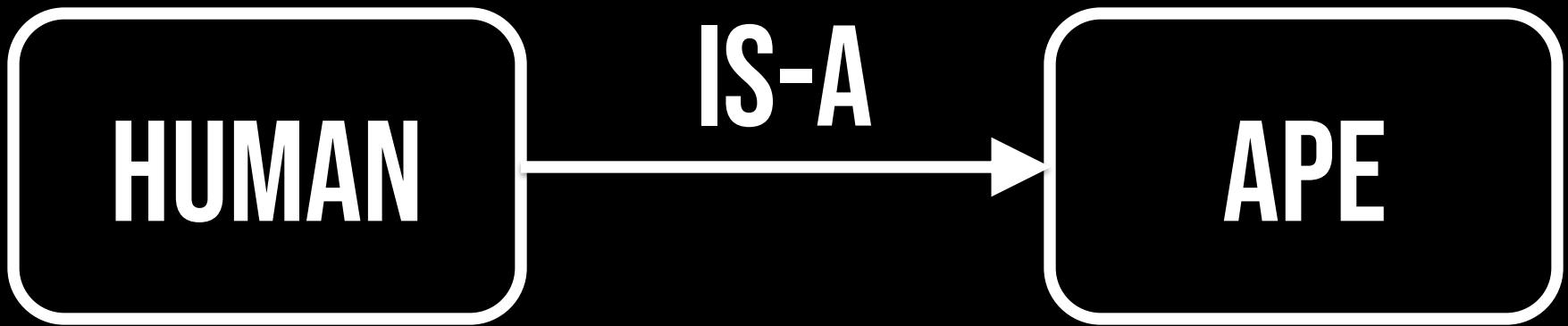
# WHY IS IT PROBLEMATIC?

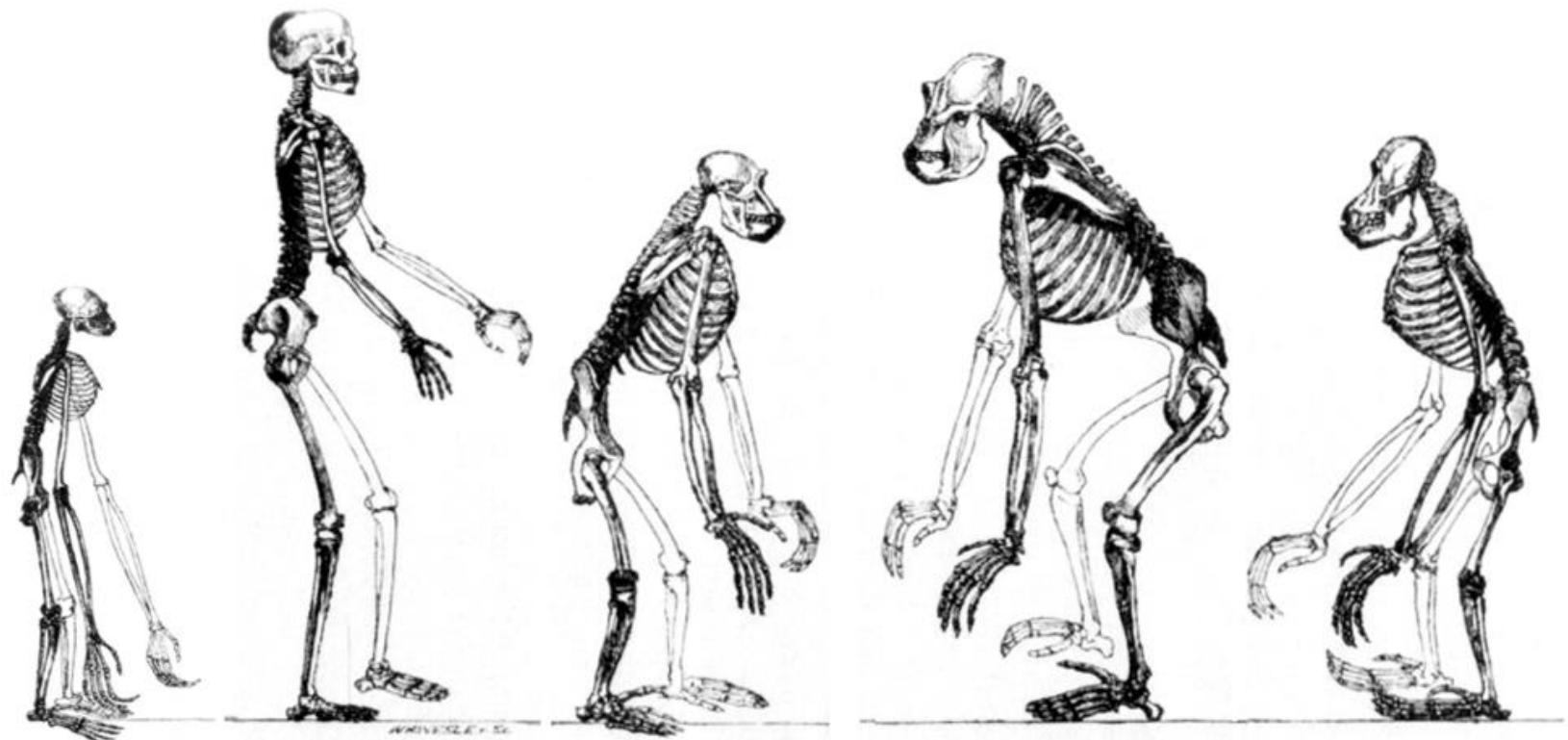
# IS IT WRONG?

# **DO WE AGREE THAT WE ARE APES?**

# WHAT IS AN APE?

# APE (TECHNICAL)





Gibbon

Human

Chimpanzee

Gorilla

Orangutan

**WE ARE THE MOST COMMON APE**

1 : 26000

A HUMAN IS JUST A HOMINID  
IN THE CATEGORY OF SIMIANS,  
WHAT'S THE PROBLEM?

# TYPICALITY

**YES WE ARE TECHNICALLY APES BUT**

**WE DON'T USUALLY THINK  
OF OURSELVES AS APES**

**WE ARE PRIMARILY HUMAN**

**REASONS! EVIDENCE!**

**NOT HAIRY ENOUGH**

**TOO UPRIGHT**

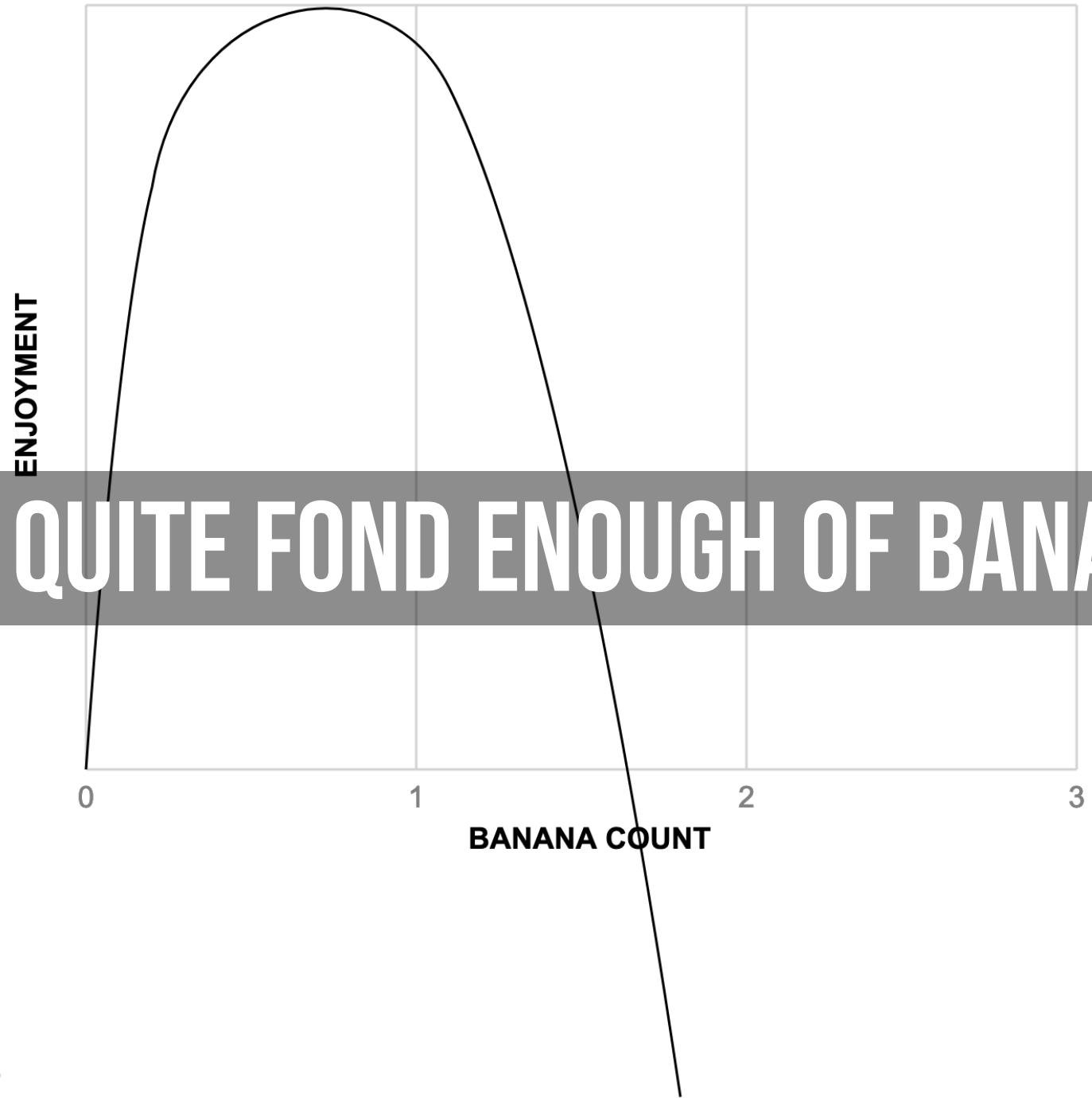
**NOT LONG ENOUGH ARMS**

# WEAK FOOTGRIP / POOR CLIMBER

**TOO INTELLIGENT**

# NOT QUITE FOND ENOUGH OF BANANAS

# NOT QUITE FOND ENOUGH OF BANANAS



# BANANAS?



NOT QUITE FOND ENOUGH OF BANANAS

**WE ARE DIFFERENT**

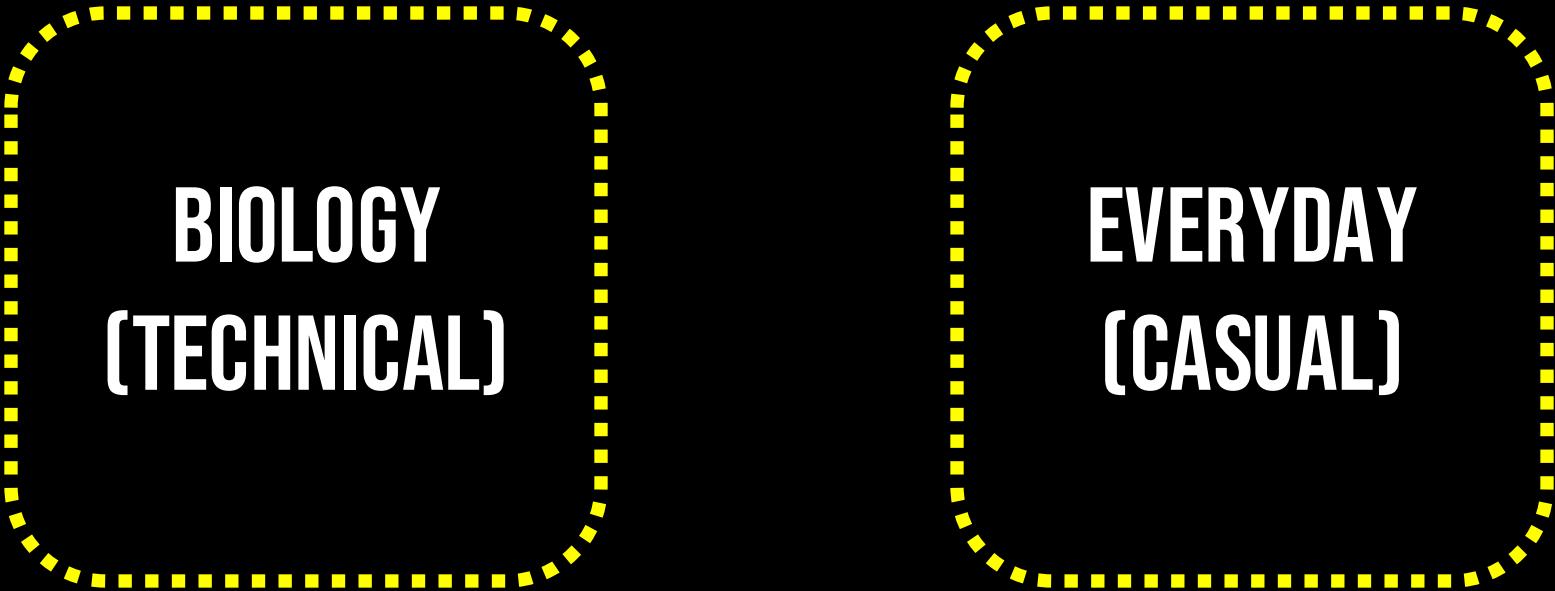


# WITTGENSTEIN AGREES

APE [CASUAL]

**SO ARE WE APES OR NOT?**

# DIFFERENT CONTEXTS



BIOLOGY  
(TECHNICAL)

EVERYDAY  
(CASUAL)

## APE AS HOMONYM

# **WE ARE CONFUSED**

# HOW APE ARE WE?





# **WHAT IS A CATEGORY?**

# THE FOLK THEORY OF CATEGORIES

# 1

THINGS COME IN  
WELL-DEFINED CATEGORIES

# 2

## CATEGORIES ARE CHARACTERIZED BY SHARED PROPERTIES

# 3

THERE IS ONE RIGHT TAXONOMY  
OF THE CATEGORIES

**THESE ARE ALL WRONG**

# PERSPECTIVES ON CATEGORIES

# **HOW IS A CATEGORY REPRESENTED IN THE HUMAN BRAIN?**

# WE DON'T KNOW

# **BUT WE HAVE SOME MODELS**

# ESSENTIAL PROPERTIES [ CLASSICAL VIEW ]

# PROTOTYPICAL





PROTOTYPE



**MEMBER**



**EDGE CASE**

# WHAT ARE CATEGORIES USED FOR?

# HOW WE ORGANIZE AND STRUCTURE INFORMATION ABOUT THE WORLD

**THIS IS LIKE THAT**

**THIS IS IDENTICAL TO THAT**

**THIS IS ROUGHLY THE SAME AS THAT**

**THIS IS DIFFERENT FROM THAT**

# **COMPARISON, SORTING, CLASSIFICATION, DISTINGUISHING**

**ENABLES LANGUAGE**

# ECONOMY OF THOUGHT

# EFFICIENT COMMUNICATION

# ENABLES INDUCTION

**ENABLES LEARNING**

# NAVIGATION, CHOICE, PLANNING, ACTION

**ENABLES US TO BE EFFECTIVE  
AGENTS IN THE WORLD**

# CATEGORIZATION IN PRACTICE

# CATEGORIZATION IS HILARIOUS

# EVERYDAY CASUAL MODELLING

**COARSE, IMPRECISE, PARTIAL**

# MOSTLY ADEQUATE

# INCREDIBLY USEFUL

**TO ACHIEVE GOALS**



## Tweet



**Mathias Verraes**  
@mathiasverraes

...

"The longer you investigate something, the less coherent it becomes" — [@rebeccawb](#)

7:39 PM · Jun 3, 2022 · Twitter Web App

# CATEGORY MEMBERSHIP

# MEMBERSHIP EVALUATION

# **BOOLEAN VS RATING**

# EXAMPLES

# SOMETIMES IT'S EASY

# HORSE?



# HORSE?



# HORSENESS VERY HIGH

# HORSE?



# HORSE?



# HORSENESS QUITE LOW

# HORSE?



# HORSE?



# HORSENESS EVEN LOWER

# HORSE?



# HORSE?



# HORSENESS PRACTICALLY ZERO

**SOMETIMES IT'S A LITTLE HARDER**

# HORSE?



# HORSE?



# HORSENESS MEDIUM+

HORSENESS DEPENDS  
ON THE EXISTENCE OR ABSENCE  
OF OTHER CATEGORIES

**DONKEYNESS SABOTAGES THE  
HORSENESS OF THE DONKEY**





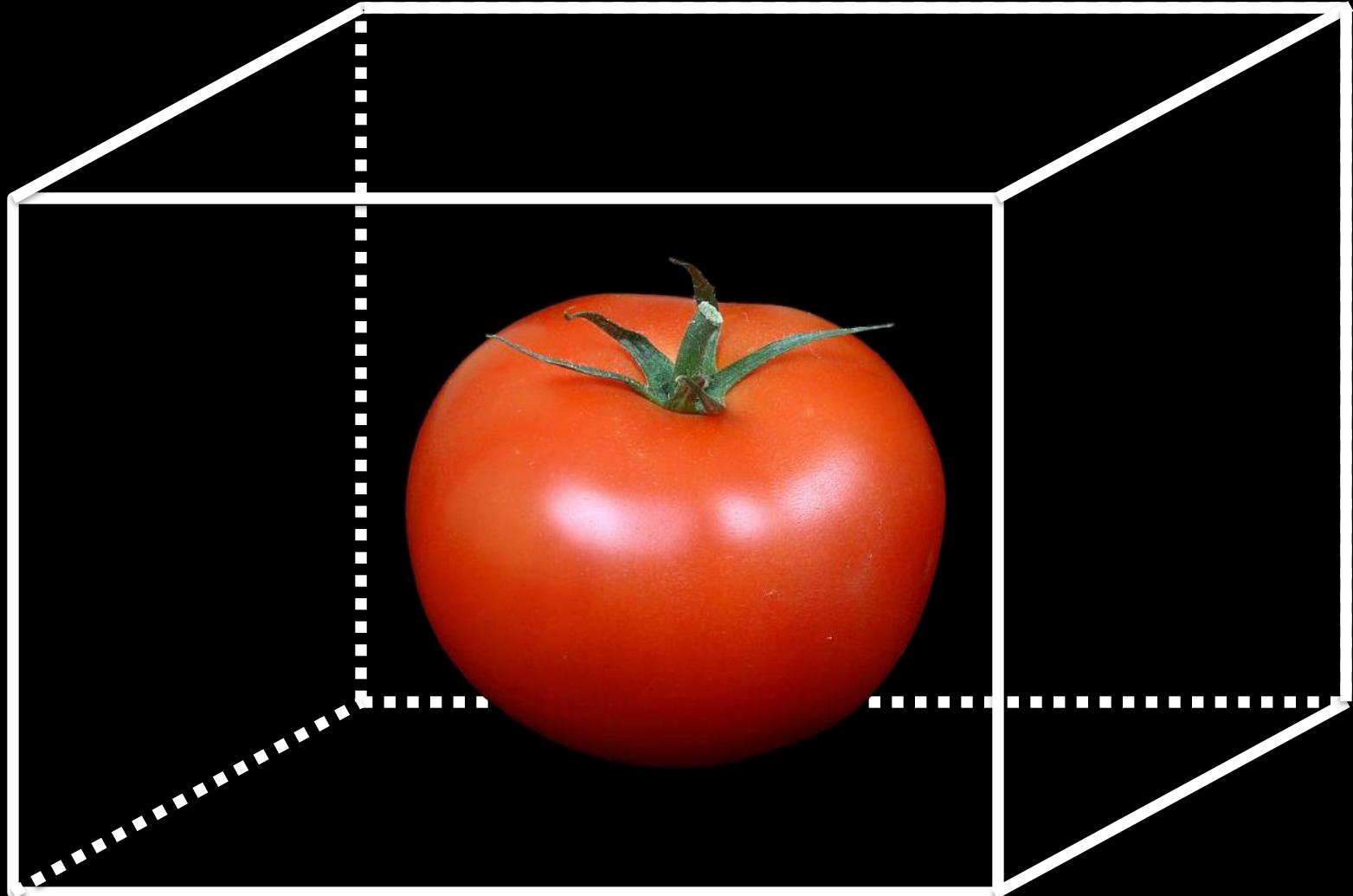




**70% VEGETABLE**



**30% FRUIT**





**Romeu Moura**  
@malk\_zameth

...

In the culinary bounded context: 🍅 is a vegetable

In the botanic bounded context: 🍅 is a fruit

In 💚💔 bounded context: 🍅 is feedback

2:17 PM · Nov 10, 2017 · Twitter Web App

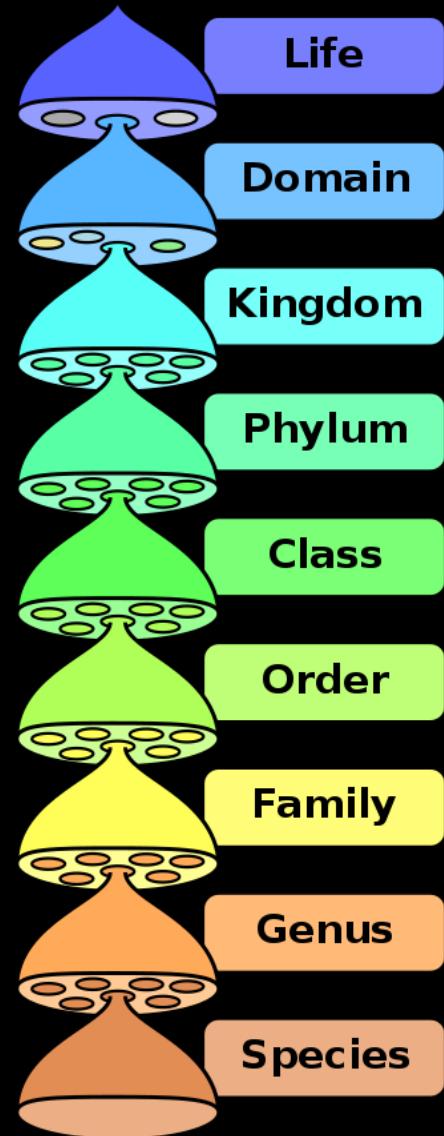
CATEGORIES ARE CONTEXTUAL

# CATEGORIES CAN BE FUZZY

# DEGREES OF MEMBERSHIP

# HIERARCHIES

# GENERALISATIONS & SPECIALISATIONS



## People also ask :

What are the 7 classifications of animals? ▼

What are the 5 classification of animal? ▼

What are the 10 classifications of animals? ▼

What are the 6 major classifications of animals? ▼

What are the 11 groups of animals? ▼

What are the 7 characteristics of animals? ▼

Feedback

[ THERE ARE NO SPECIES ]

# BASIC LEVEL CATEGORIES



# DOG



**DOG**



**GERMAN  
SHEPHERD**

**DOG**

**ANIMAL**



**GERMAN  
SHEPHERD**

# DIFFERENCE & INFORMATION

# THIS IS AUTOMATIC

**BASED ON UTILITY AND EXPERIENCE**

**DEPENDS ON EXPERTISE**



**CULTURE-SPECIFIC**

**BUT IT'S ALWAYS MORE COMPLICATED**

# **EXPERIMENT**

# TEST

3

2

1



09.05.2025

129

# LET'S RUN THE EXPERIMENT!

# PICTURE #1

3

2

1



**PICTURE #2**

3

2

1

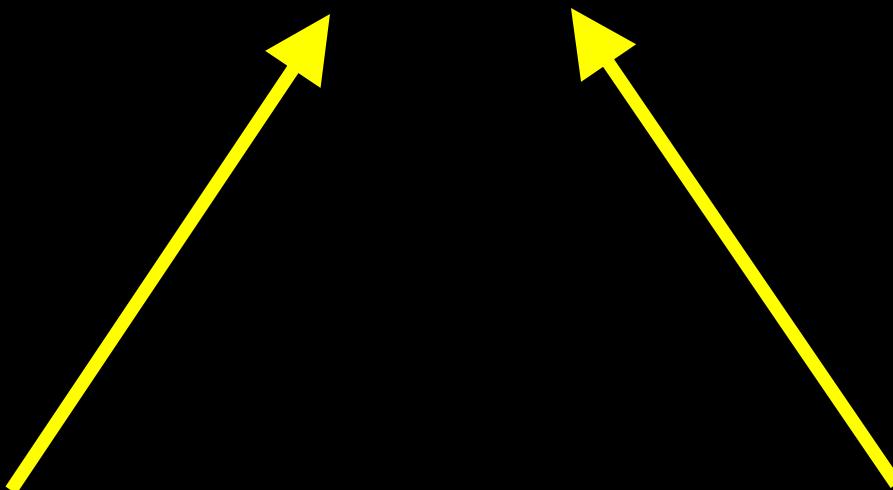


# WHAT HAPPENED HERE?

BIRD

ROBIN

PENGUIN



**A ROBIN IS A BIRD  
THAT HAPPENS TO BE A ROBIN**

**A PENGUIN IS A PENGUIN  
THAT HAPPENS TO BE A BIRD**

**ROBINS ARE TYPICAL BIRDS**

PENGUINS ARE **ATYPICAL** BIRDS

**TYPICAL CASES  
ARE CATEGORIZED AT  
THE BASIC LEVEL**

**ATYPICAL CASES  
ARE CATEGORIZED AT  
THE SUBORDINATE LEVEL**

# NEGOTIATING FUZZY CATEGORIES



# IS HTML A PROGRAMMING LANGUAGE?

**DO WE WANT HTML TO BE A  
PROGRAMMING LANGUAGE?**

# DESCRIPTIVE VS NORMATIVE

**THE PROBLEM IS NOT THE OBJECT  
BUT THE CATEGORY**





# CATEGORY DISCUSSION AS PROXY DISCUSSION

CATEGORY DEFINITION IS  
POWER OVER THE DOMAIN

IS X A MEMBER OF Y?

# WHAT ARE THE IMPLICATIONS?

# **PROS & CONS**

# TRADEOFFS

# **MODELLING**

**MODELLING IS SERIOUS**

# MODELLING IS LOSSY

# HIGHLIGHT & HIDE

**OUR CATEGORIES DETERMINE  
WHAT WE CAN TALK ABOUT**

**MODELLING DETERMINES  
WHAT THE WORLD LOOKS LIKE**

# **PRECISE MODELLING**

# TECHNIFICATION OF CATEGORIES

# **ELIMINATING AMBIGUITY**

# HANDLING EDGE CASES

**TECHNIFICATION OF CATEGORIES  
HAVE SURPRISING CONSEQUENCES**

**NUTS ARE FRUITS?!?**

# ALMONDS ARE NOT NUTS?!?

**WE'RE WRONG ABOUT EVERYTHING!!!**

# BUT WE'RE NOT WRONG

# CONTEXT

# **EVERYDAY VS TECHNICAL CATEGORIES**

# TECHNICAL CATEGORIES FOR PRECISION

# PRECISION COMES AT A COST



# VARIATIONS ON A THEME

# **UNMARRIED PEOPLE LIVING TOGETHER**

**TWO PEOPLE ABOVE 18 YEARS OF AGE  
WHO ARE NOT MARRIED, REGISTERED  
PARTNER OR LIVING WITH ANYONE ELSE**

**TWO PEOPLE WHO USUALLY LIVE  
TOGETHER EVEN IF THEY ARE  
TEMPORARILY SEPARATED**

**TWO PEOPLE LIVING IN THE SAME  
HOUSE, EVEN IF THEY LIVE IN SEPARATE  
PARTS OF THE HOUSE**

[...] UNLESS THEY EACH LIVE IN  
SEPARATE UNITS IN A HOUSE WITH  
FOUR OR MORE INDEPENDENT AND  
CLEARLY SEPARATED UNITS

# HAVE PREVIOUSLY BEEN MARRIED

# LIVING TOGETHER IN A MARRIAGE-LIKE RELATIONSHIP

**COULD LEGALLY GET MARRIED OR  
ENTER PARTNERSHIP**

**HAVE OR ARE EXPECTING  
CHILDREN TOGETHER**

**HAVE OR HAVE HAD  
CHILDREN TOGETHER**

# JOINT RESIDENCE

# COMMON HOUSEHOLD

**HAVE LIVED TOGETHER  
FOR AT LEAST 12 MONTHS**

**HAVE LIVED TOGETHER  
FOR 12 OF THE LAST 18 MONTHS**

**INTEND TO KEEP LIVING TOGETHER**

# PRECISION COMES AT A COST

# EXPLOSION OF SIMILAR CATEGORIES

# SIMPLIFICATION?

# **WE MUST CHOOSE**

# **CHOICES ARE NOT RIGHT OR WRONG**

# **CHOICES HAVE CONSEQUENCES**

# CONSEQUENCES CAN BE DELAYED

**MODELLING IS DIFFICULT**

# MODELLING IS META-PROGRAMMING

# DISCOMFORT

# RELUCTANCE

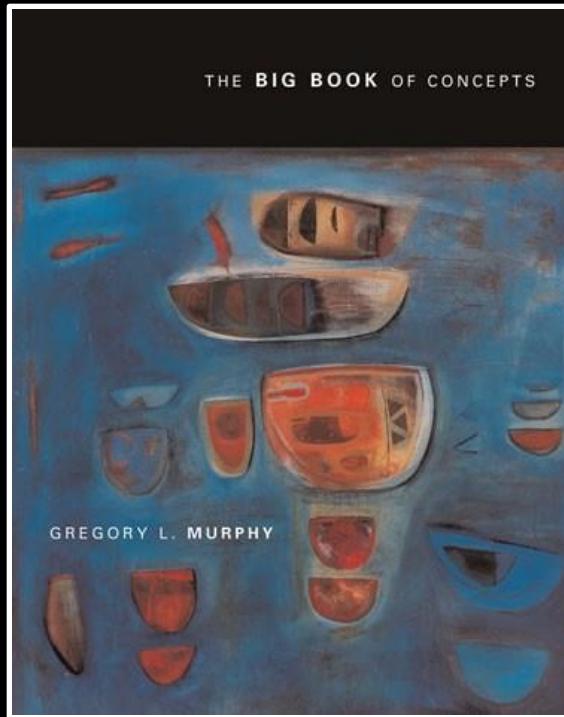
**“ WHY ARE YOU MAKING IT  
SO COMPLICATED? ”**

**TO AVOID MAKING IT UNNECESSARILY  
COMPLICATED OVER TIME**

# MODELLING IS TEACHABLE

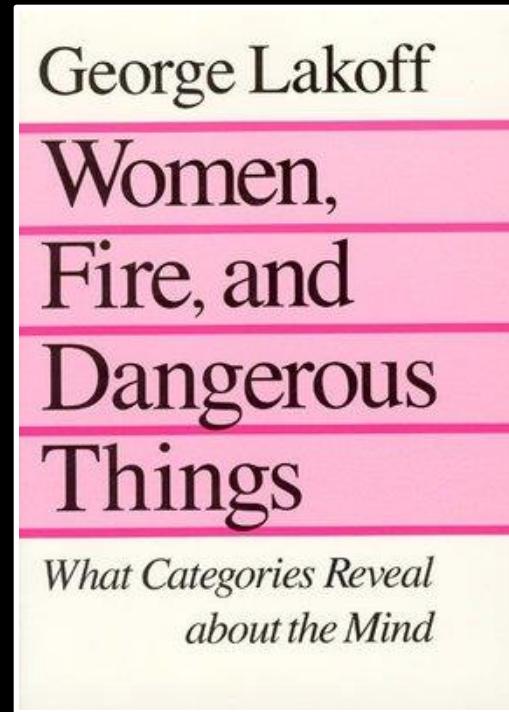
# LEARN ABOUT CATEGORIES

# THE BIG BOOK OF CONCEPTS



# GREGORY L. MURPHY

# WOMEN, FIRE, AND DANGEROUS THINGS



## GEORGE LAKOFF

# SORTING THINGS OUT



# BOWKER AND STAR



# SUMMARY

USEFUL  
NOT REAL  
IMPOSED STRUCTURE  
CHOSEN & NEGOTIATED  
REALITY DOESN'T CARE  
RIDICULOUS  
HIDES & HIGHLIGHTS  
SERIOUS

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charlesazorn  
@charlesazorn

...

## Bees Are Officially a Type of Fish, California Judges Say



insider.com

California court rules that bees are a type of fish in order to protect them under...  
In a move that thrilled bee enthusiasts, California judges decided that endangered invertebrates were legally protected — under the category of "fish"

1:20 PM · Jun 17, 2022 · Twitter for Android