Welcome to R Fundamentals!

While people enter . . .

1. Create a Folder for this workshop (e.g “R_Fundamentals”)
2. Set your working directory to this folder (Session > Set Working Directory)
3. Install the tidyverse packages . . . install.packages(‘tidyverse’)
4. Download some data . . . download.file(url = "https://ndownloader.figshare.com/files/2292169", destfile = "survey_data.csv")
5. Ask if you need assistance!

R Fundamentals

Workshop presented to the Department for the Ecology of Animal Societies, Max Planck Institute of Animal Behavior

January 25th, 2021

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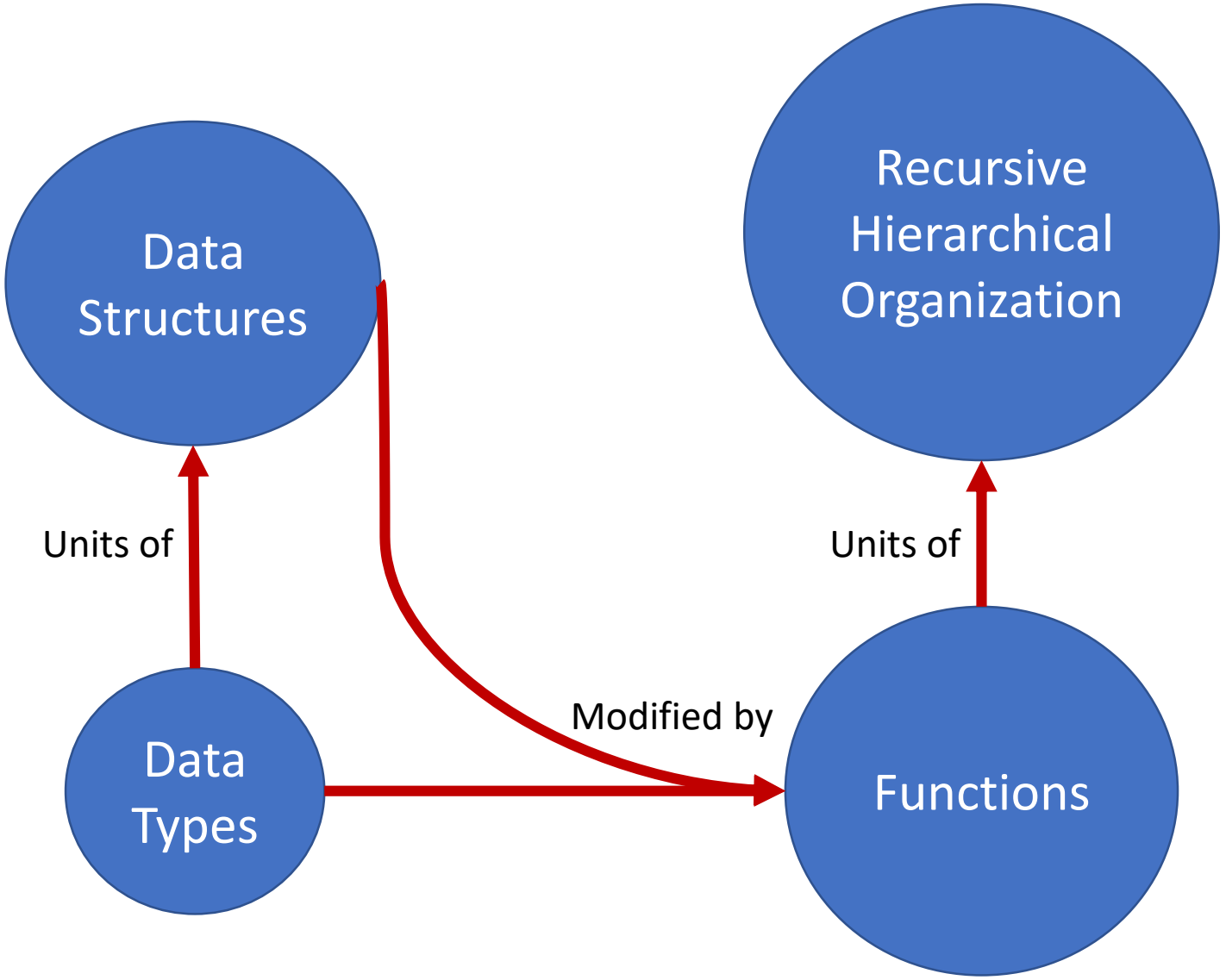
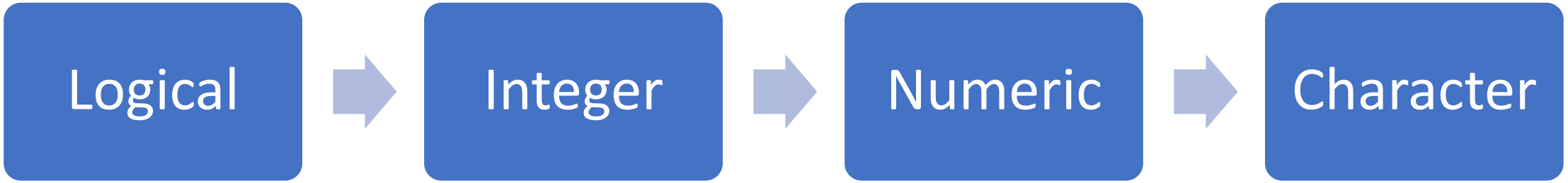
This Course's Main Concepts



Basic Data Types



[FALSE, TRUE]

[0, 1]

[0.0, 1.0]

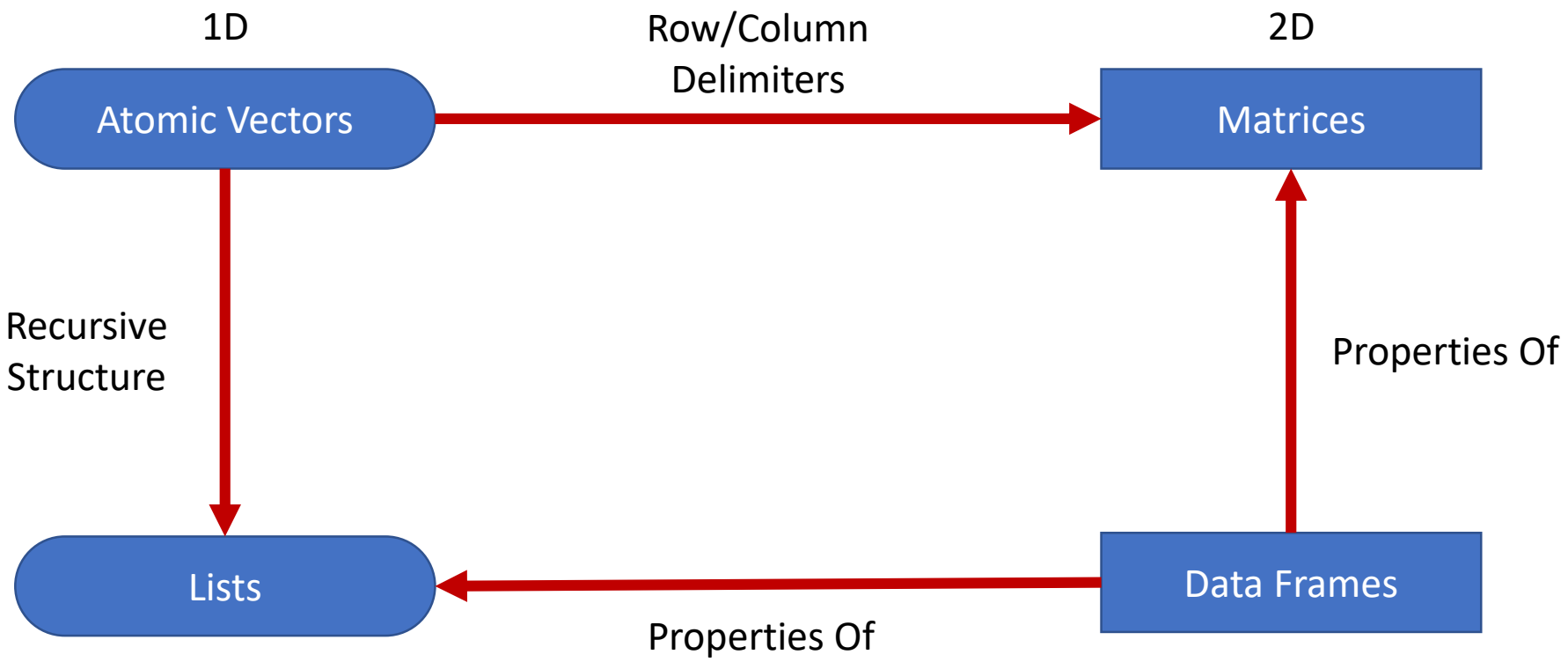
[“0.0”, “1.0”]

Let’s try it in R!

Data Types Review

- Data types map up in the sequence Logical -> Integer -> Numeric -> Character
- R will automatically coerce a value up to it’s expected type
- Use the as() function to manually coerce a value’s type
- Use logical operators (e.g. ==, <, <=, >, >=) to compare values and produce a logical value

Basic Data Structures



Atomic Vectors Review

- Use [] to subset atomic vectors
- Use length(), class(), and str() to inspect atomic vectors
- Use operators like ==, >, < to perform conditional subsetting

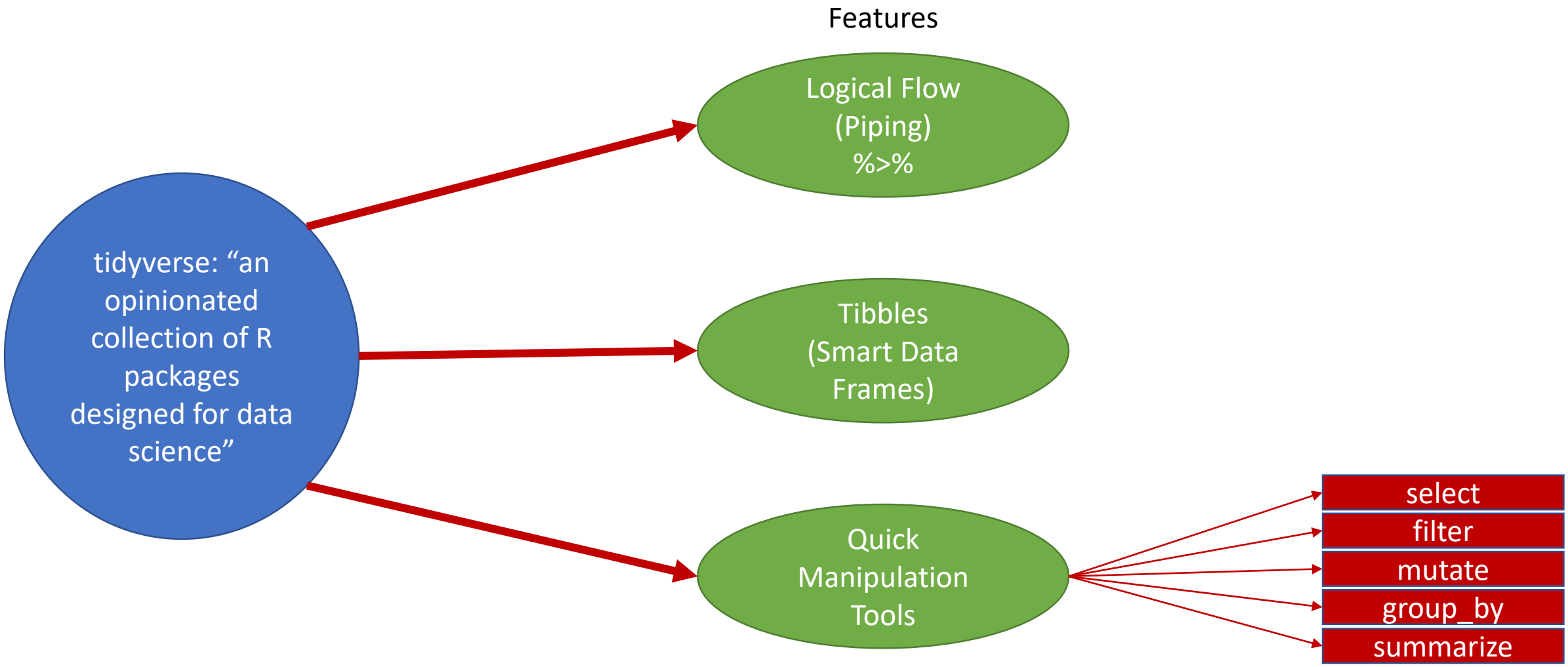
Matrices and List Reviews

- Matrices and Lists each add a dimension to vectors
- Use [,] to subset matrices, use [[ ]] to recursively subset lists
- Use lists when your data are not rectangular, or of one type.

Data Frame's Introduction Review

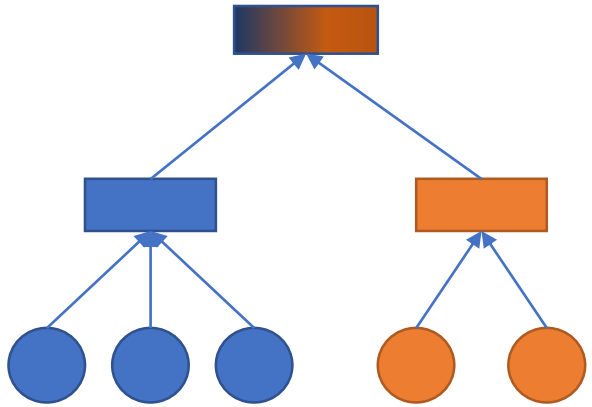
- Data frames have properties of a list and a matrix
- Each column in a data frame can have it's own data type
- Can subset data frames using names and row.names attributes
- Data frames treat characters as factors, unless specifically told not to

Manipulating Data Frames: An introduction to tidyverse

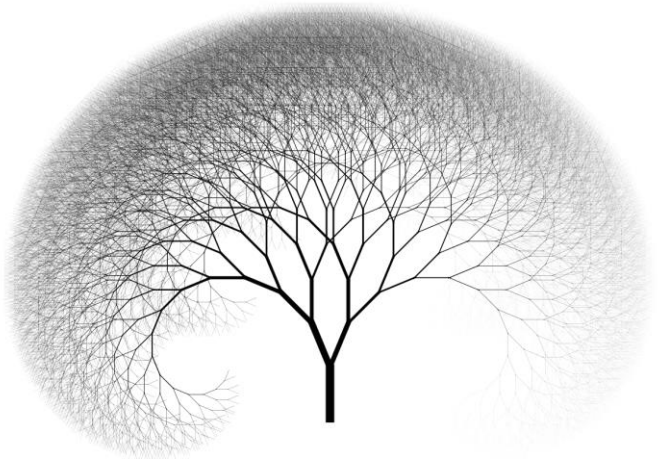


Recursive Hierarchical Organization

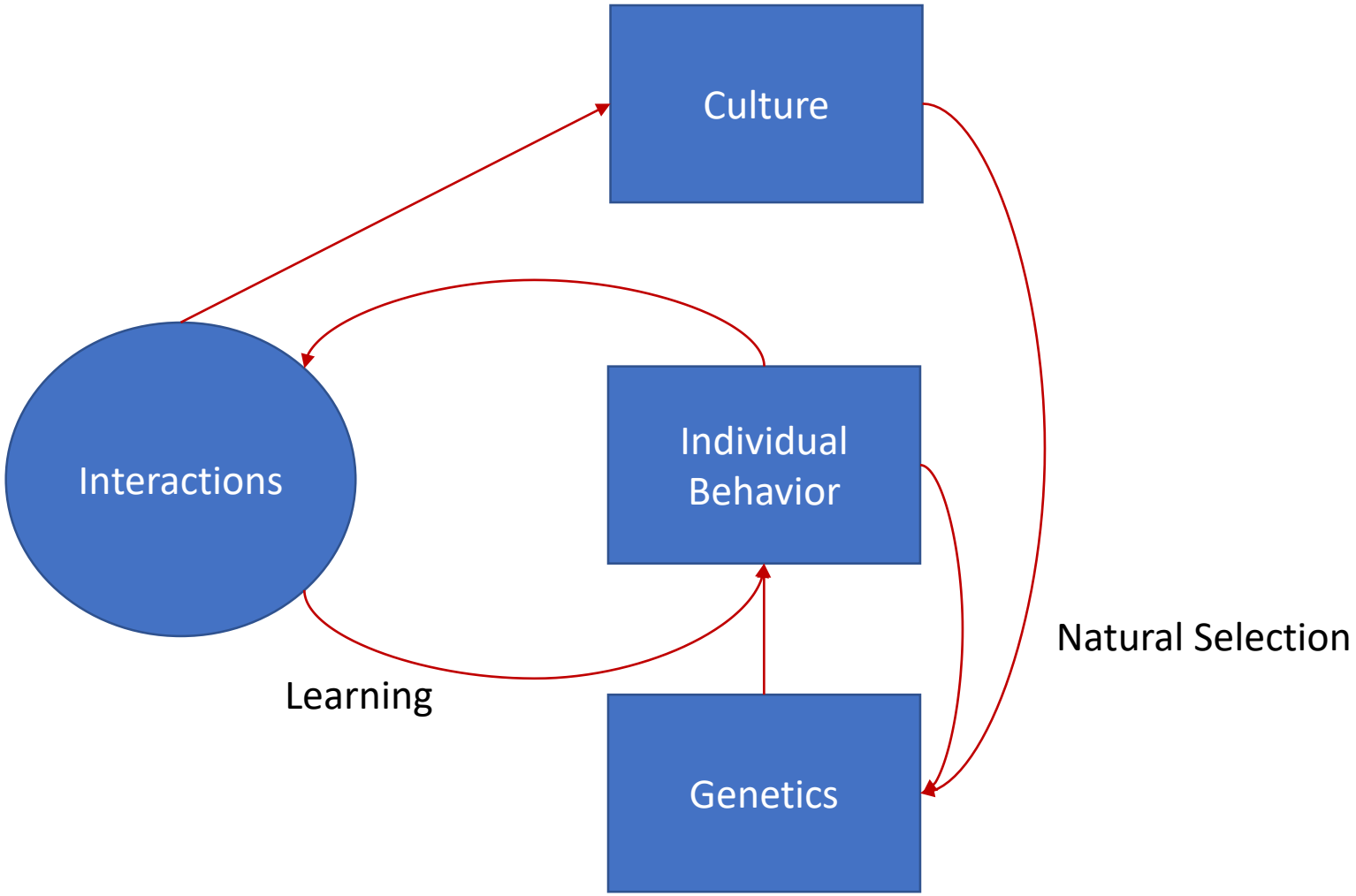
Hierarchy



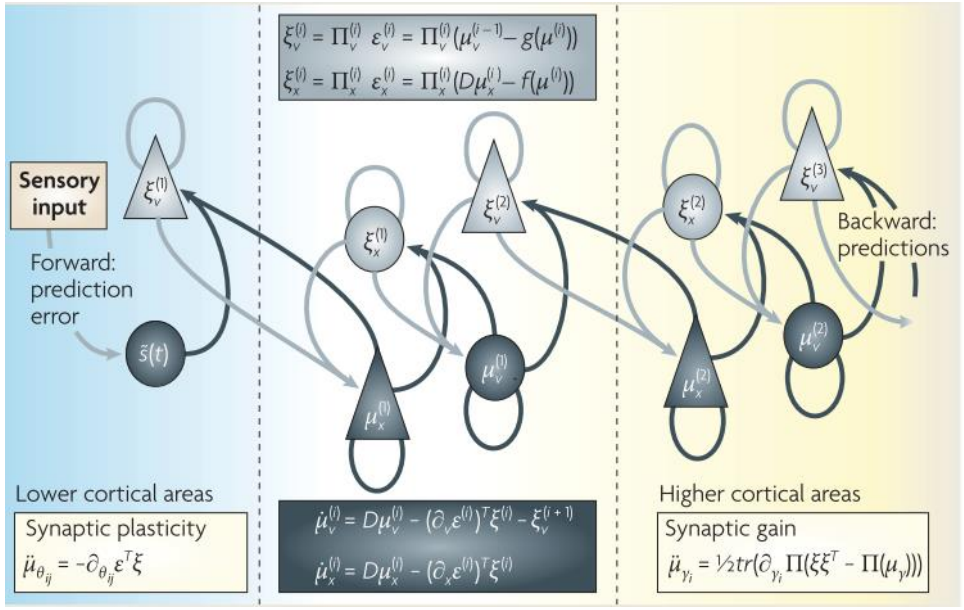
Recursion

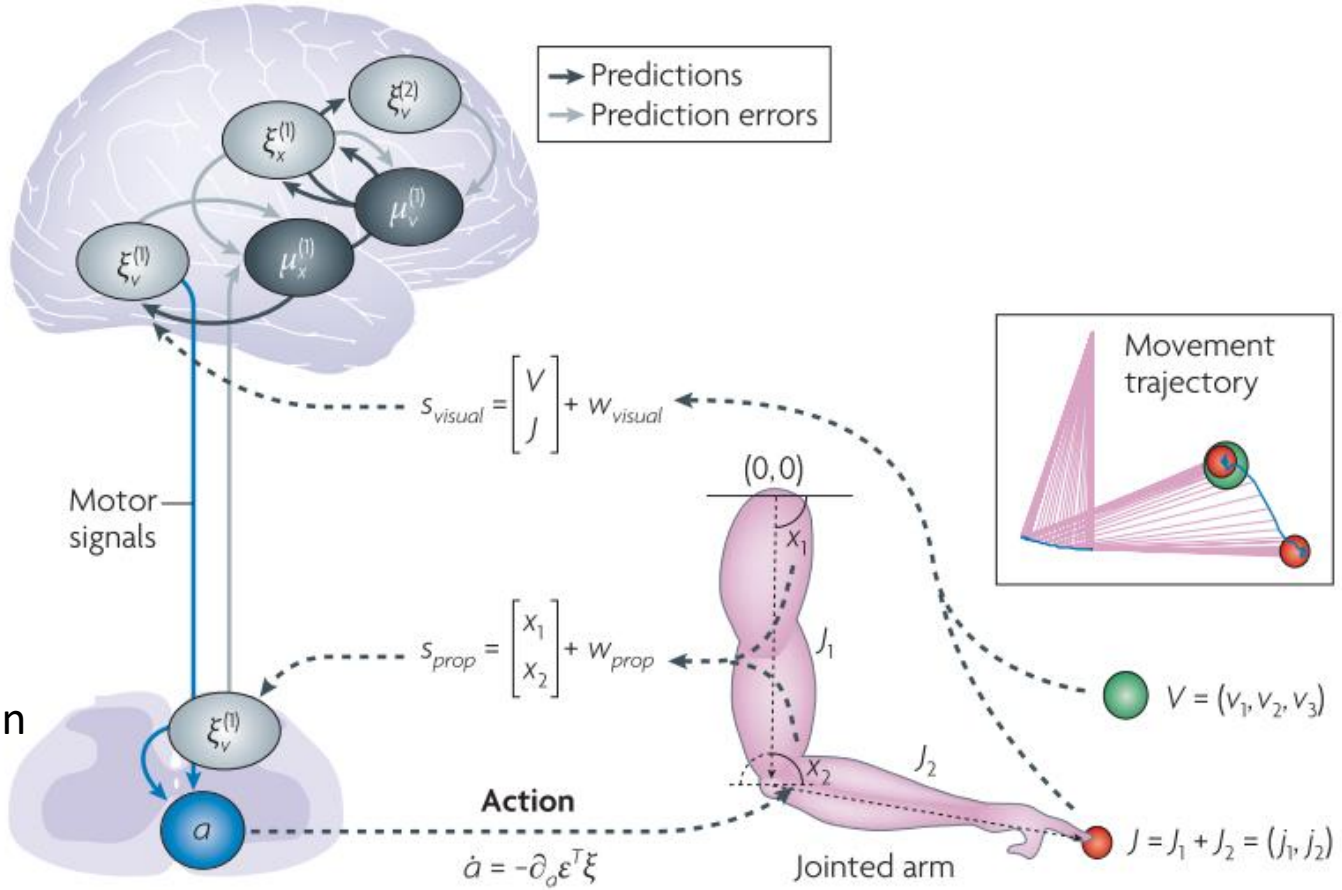


Example Recursive Hierarchy: Social Systems



Example Recursive Hierarchy: The Brain





Friston, K. (2010). The free-energy principle: A unified brain theory? Nature Reviews Neuroscience, 11(2), 127–138. https://doi.org/10.1038/nrn2787

Looking Ahead: Build your own system