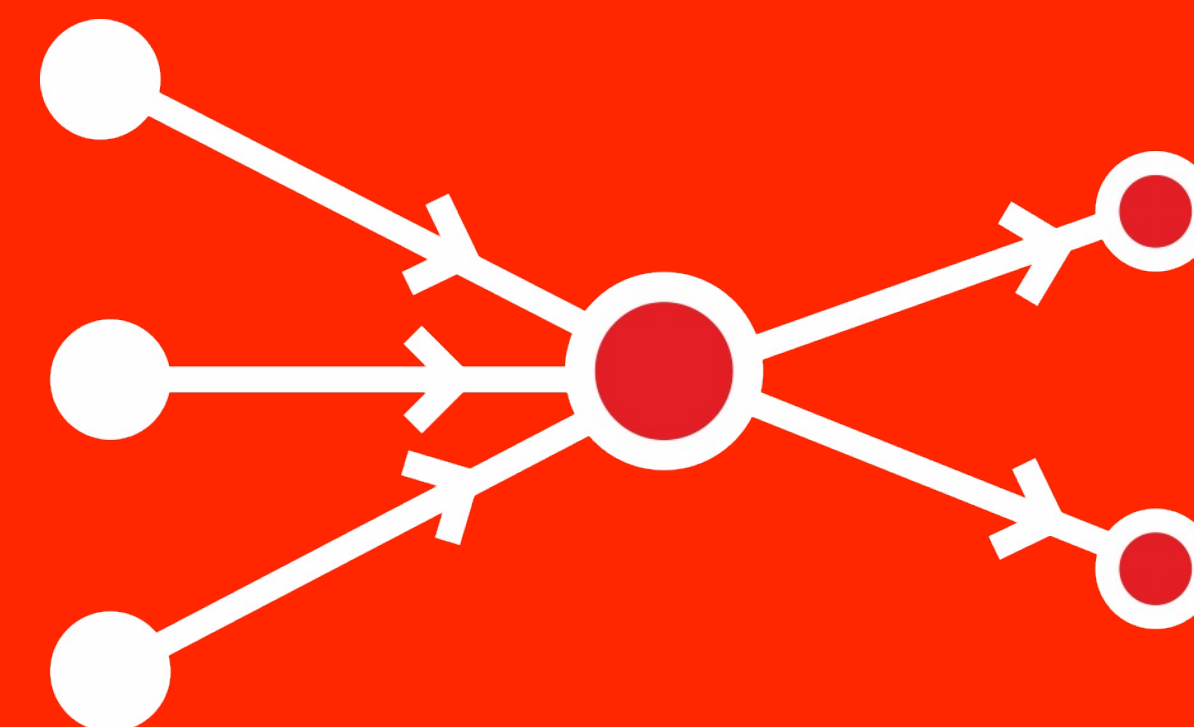
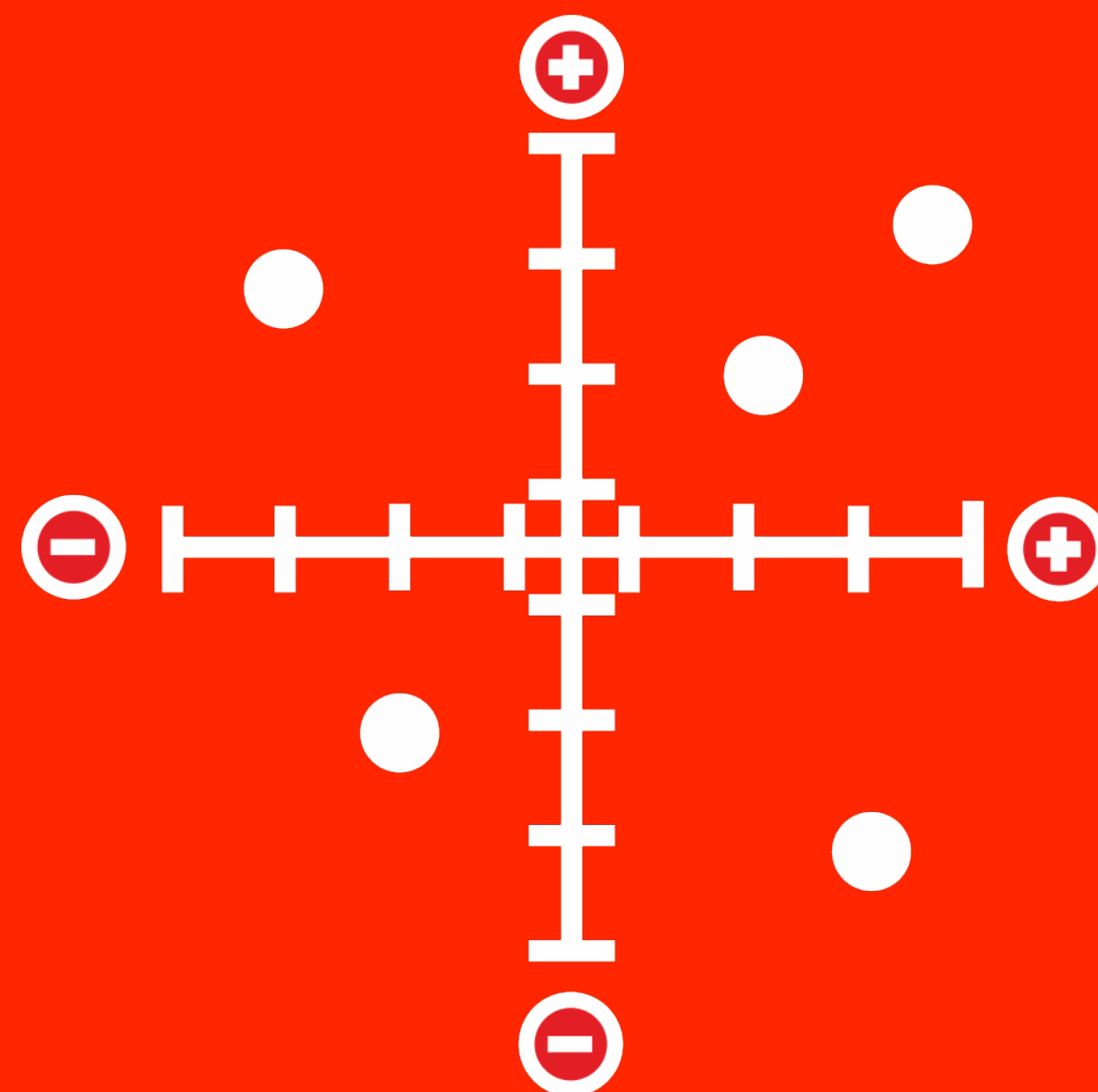
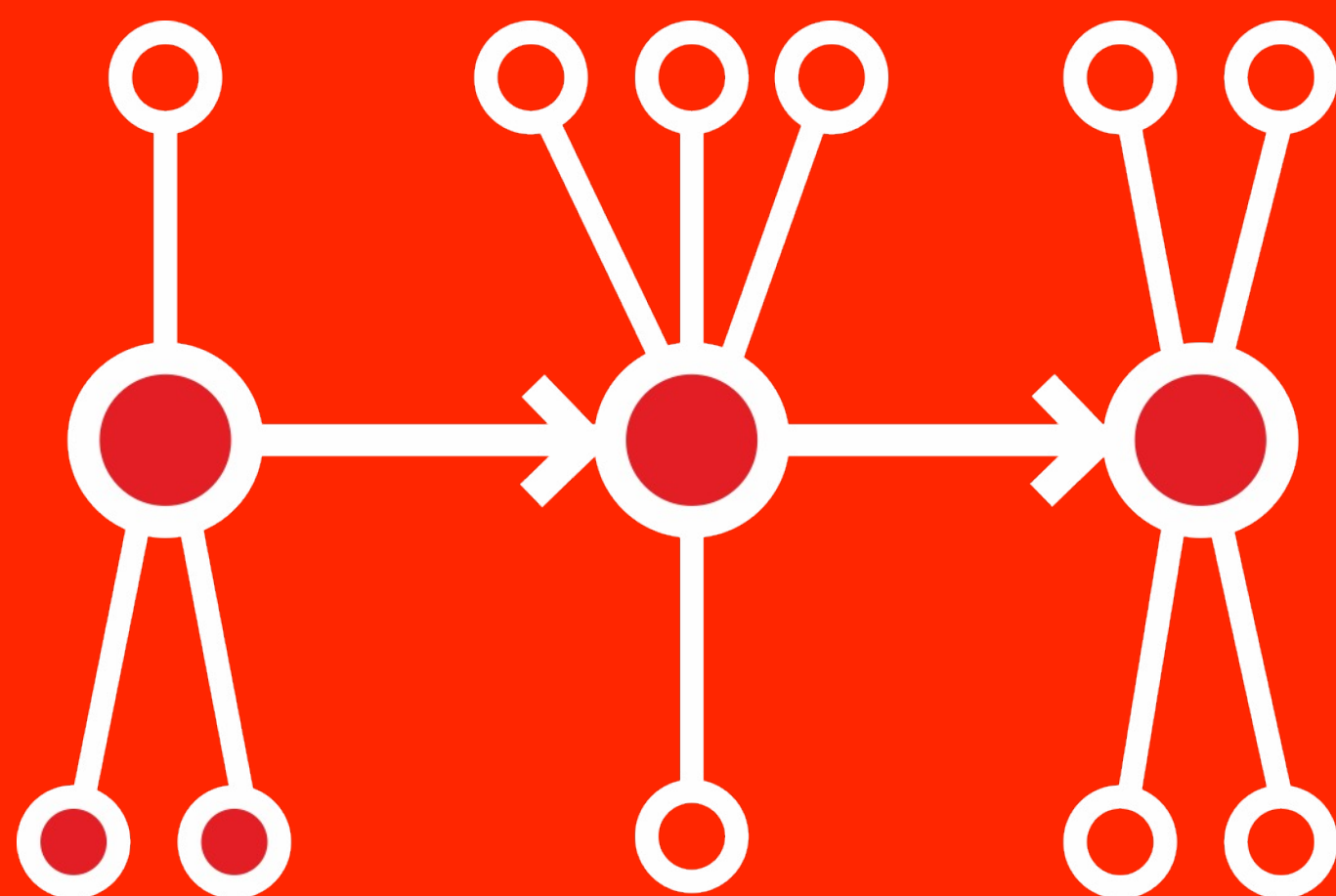




RESEARCH
ED DUBLIN
2022

ORGANISE IDEAS

PROJECTING THE MIND, THINKING WITH
OBJECTS



OLIVER
CAVIGLIOLI

TODAY'S SESSION

1

Organising
Ideas

2

Some
problems
with words

4

Ideas as
objects

5

Tools to
organise
ideas



1

Organising Ideas

1 2 3

4 SELECT | ORGANISE | INTEGRATE MODEL



LOGAN
FIORELLA



RICHARD
MAYER

4
ORGANISING KNOWLEDGE

Poorly organised knowledge cannot readily be remembered or used. But students don't know how to organise their knowledge effectively.



FREDERICK REIF

APPLYING COGNITIVE SCIENCE TO
EDUCATION, 2008

4 ORGANISING KNOWLEDGE

Teach the utility of good organisation.

Teach how to use good knowledge organisation. Teach how to generate good

led

APPLYING COGNITIVE SCIENCE TO
EDUCATION, 2008



FREDERICK REIF

4 ORGANISATION & MEMORY

Where information being learned has a framework or structure that can be used to organise both the learning and the retrieval, then memory is considerably improved.

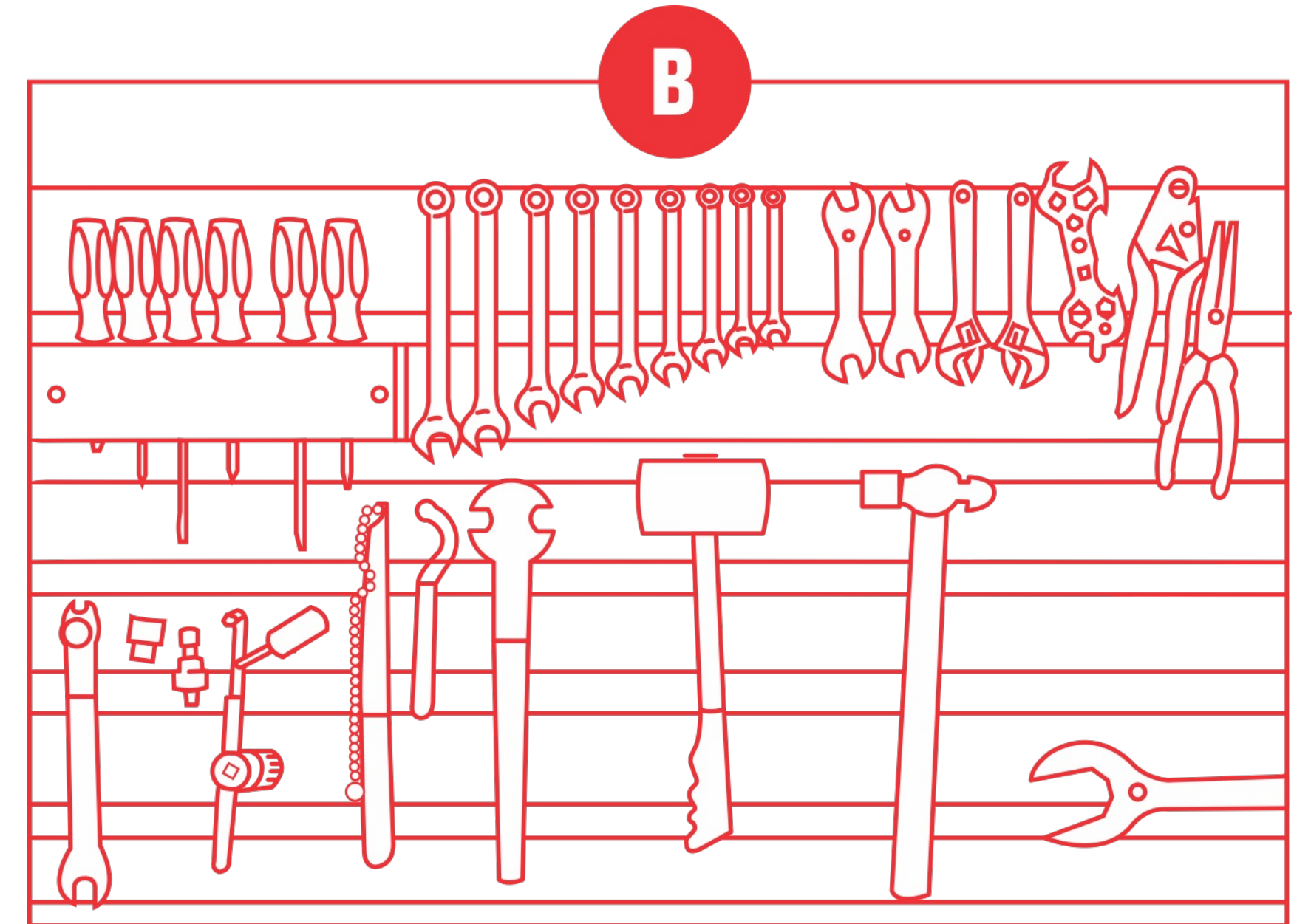
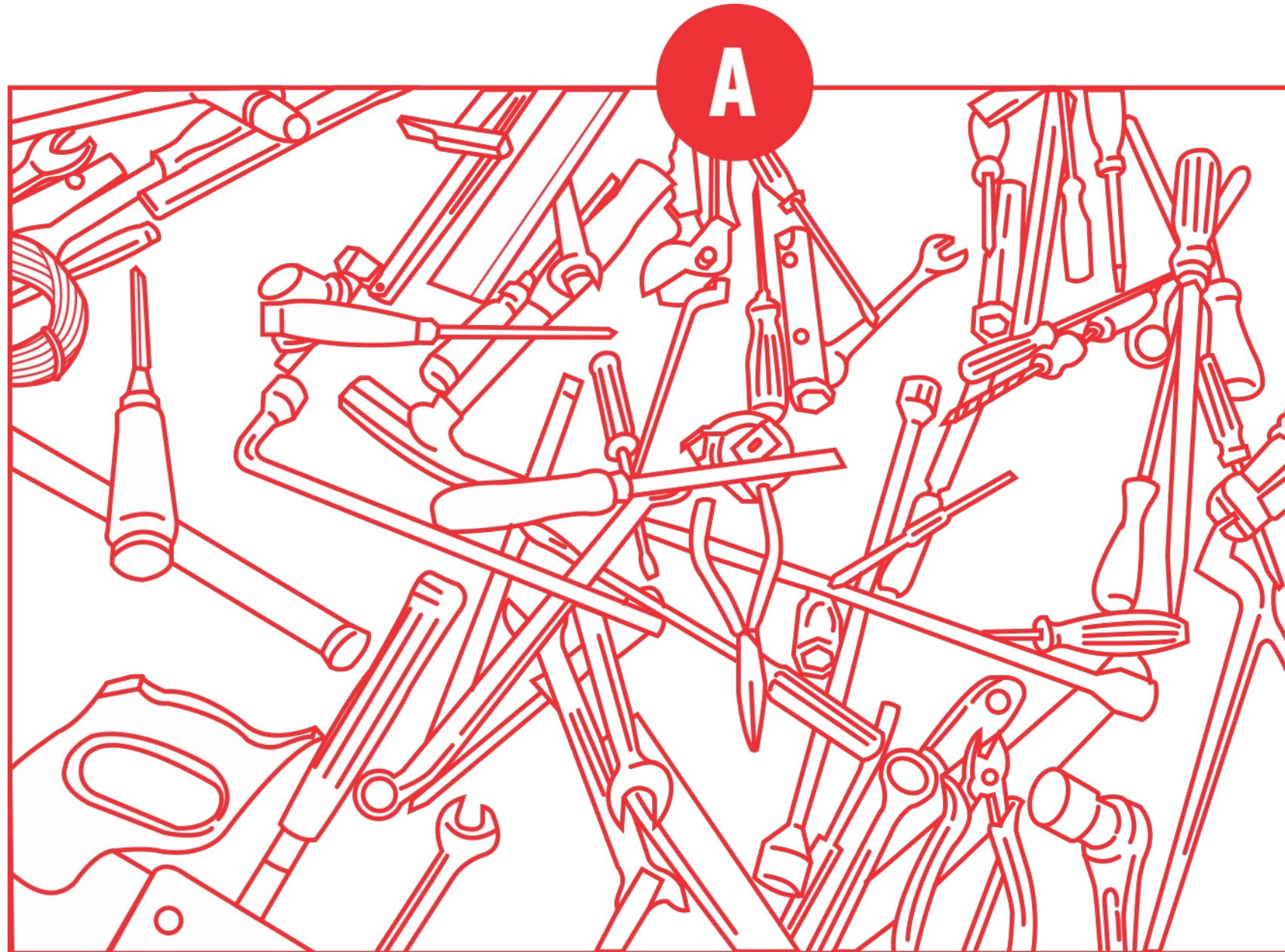
THE BLACKWELL DICTIONARY OF COGNITIVE
PSYCHOLOGY, 1994



MICHAEL EYSENCK

1 2 3

⁴
WHICH IS MORE EFFECTIVE A
OR B?



2

Some problems
with words

4
DENSE AND TRANSIENT

*However, the
written word is
dense, and the
spoken word is*



MARY MYATT

FOREWORD TO
ORGANISE IDEAS,
CAVIGLIOLI & GOODWIN,
2021

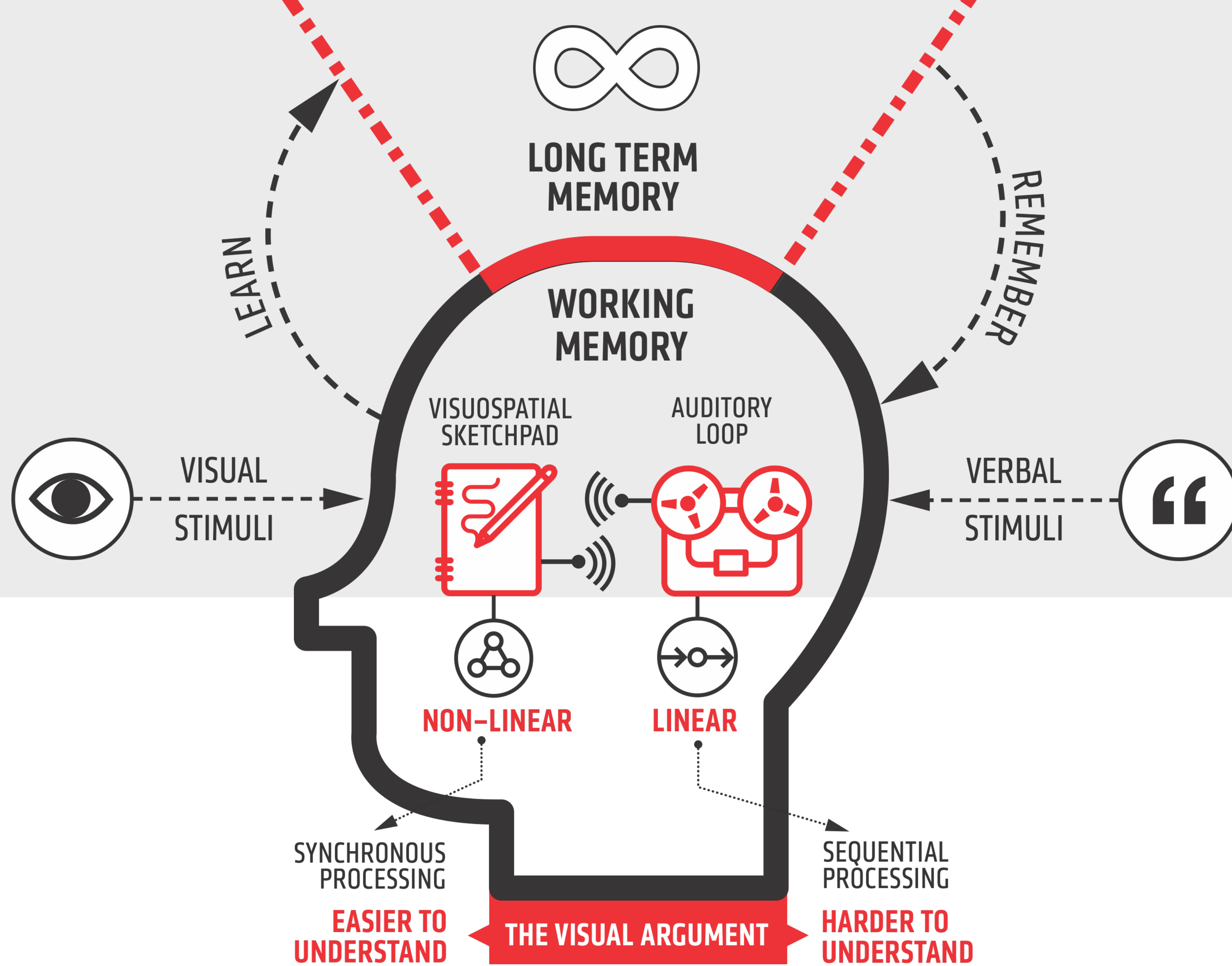
1 2 3

YOUR POSITIONS



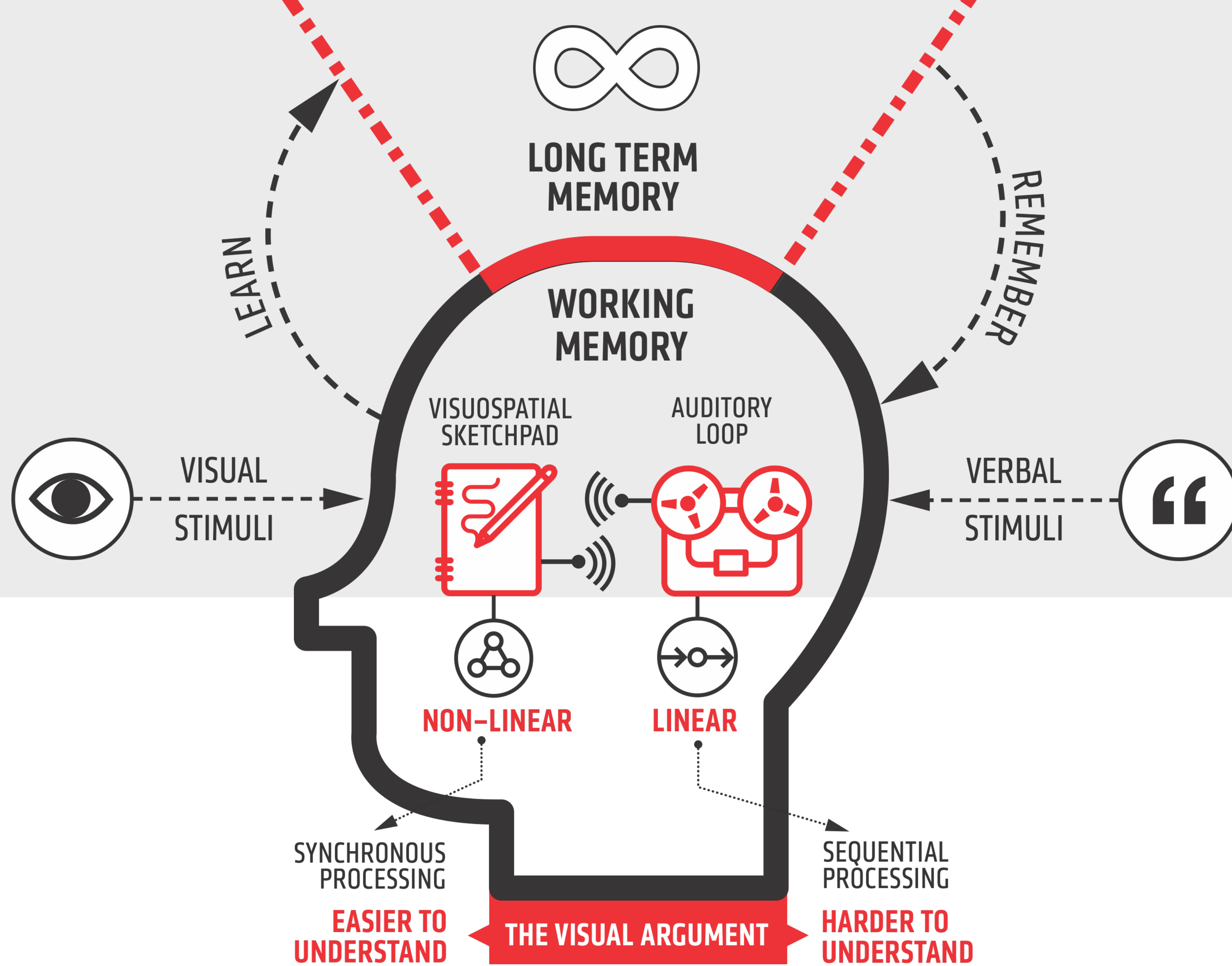
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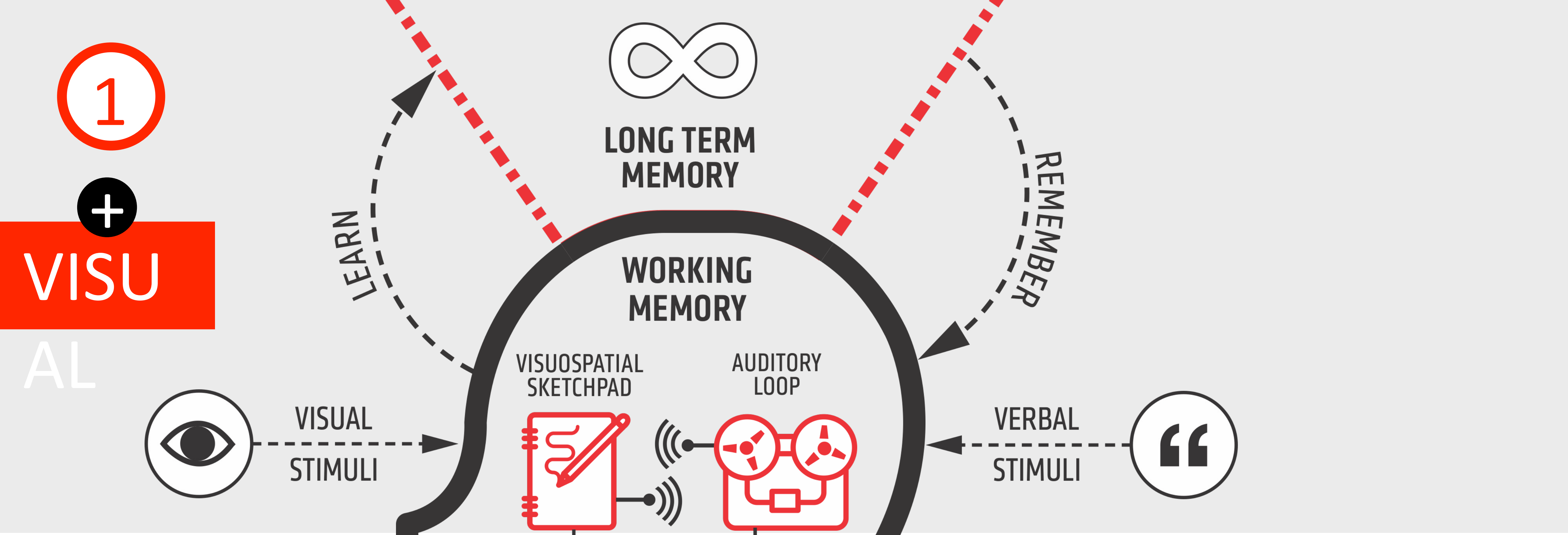
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1

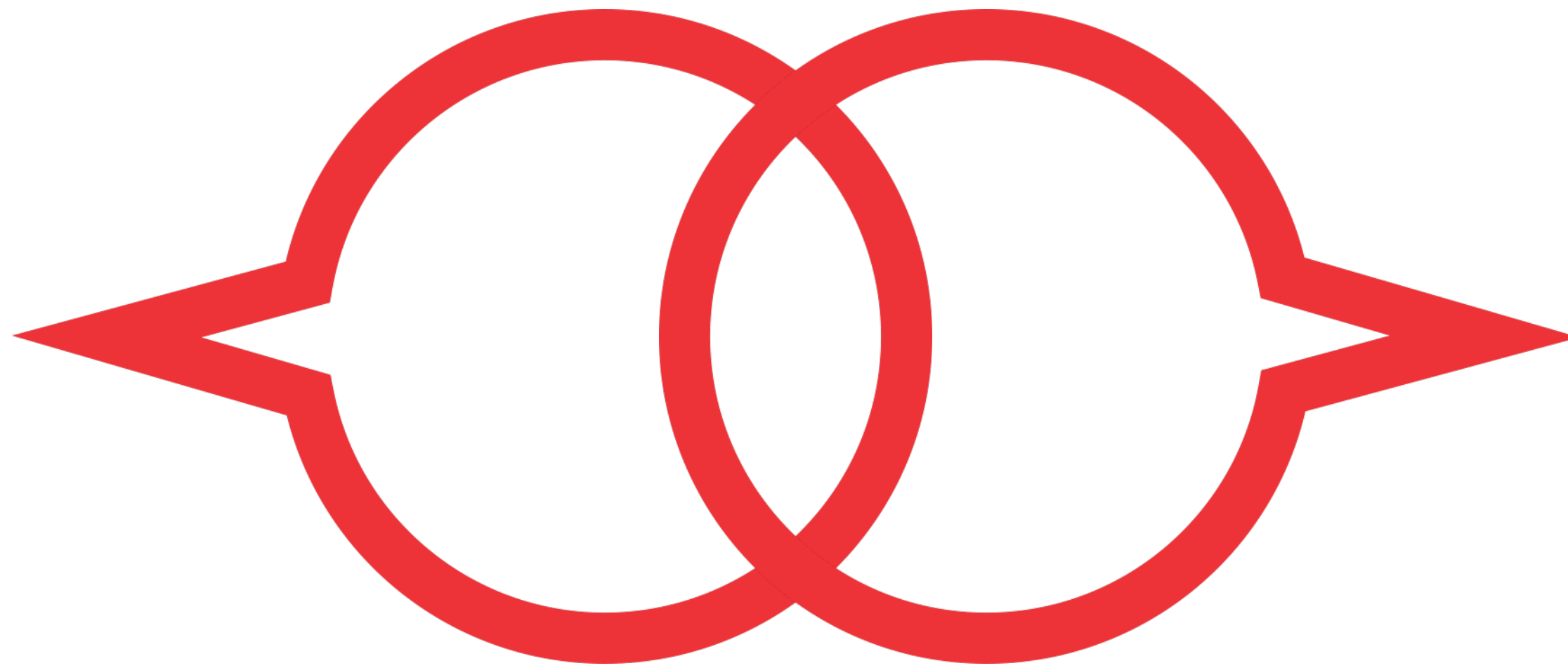
2





1 2 3

4 SHARE, THEN COMPARE

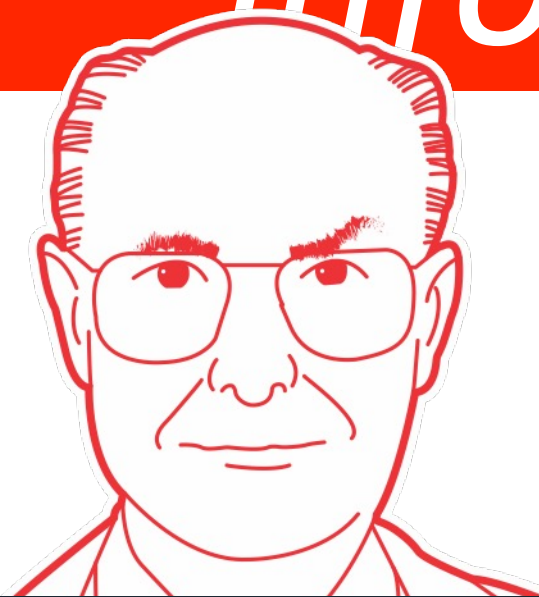


What was going on?
Does this ever happen in your classroom?



4 TRANSIENT INFORMATION EFFECT

*Whenever a teacher
orally explains
something to a class or
a pupil...the
information presented*



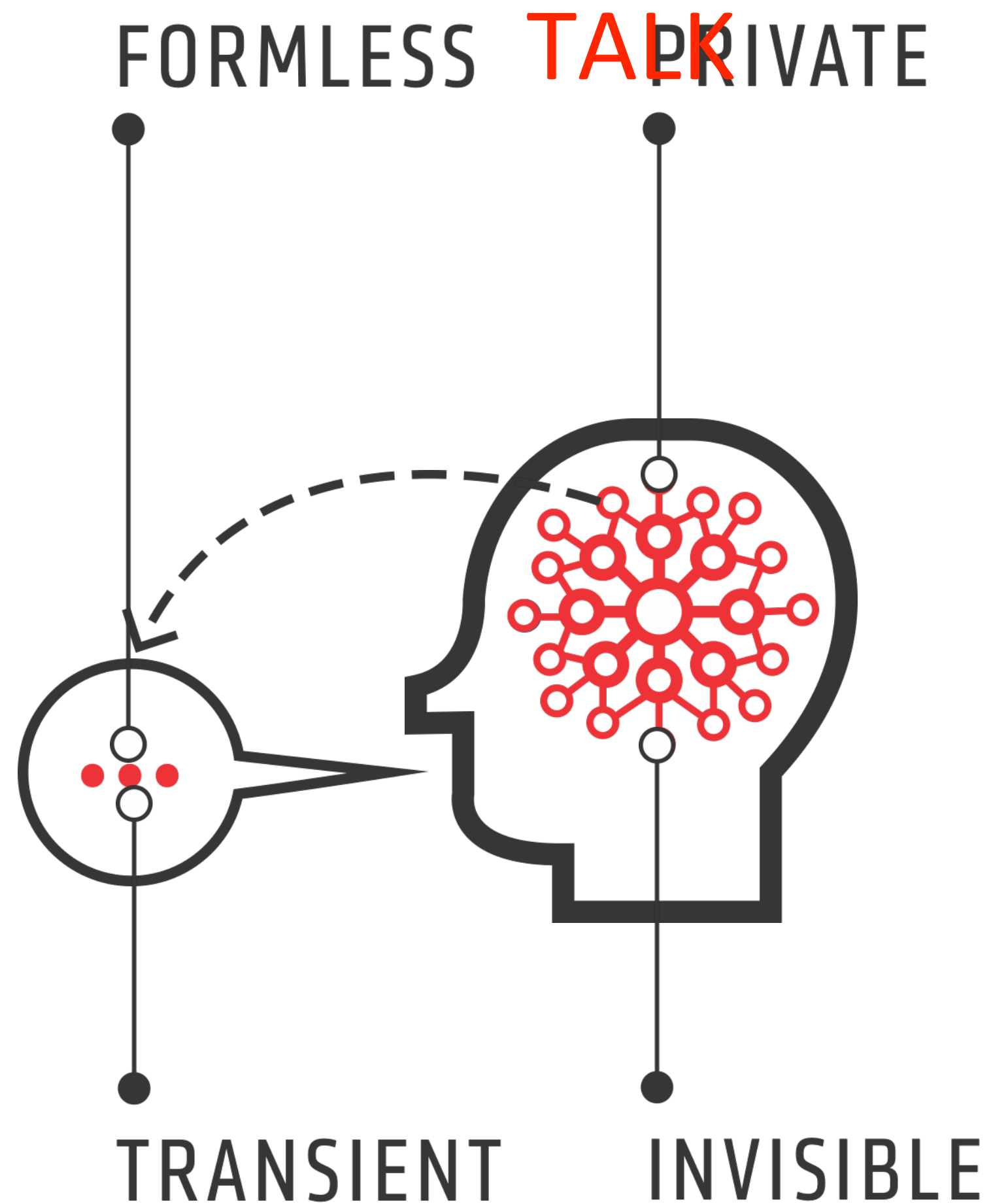
JOHN SWELLER

COGNITIVE LOAD THEORY,
SWELLER, AYRES & KALYUGA
2011, SPRINGER

FROM HIDDEN TO VISIBLE SCHEMA

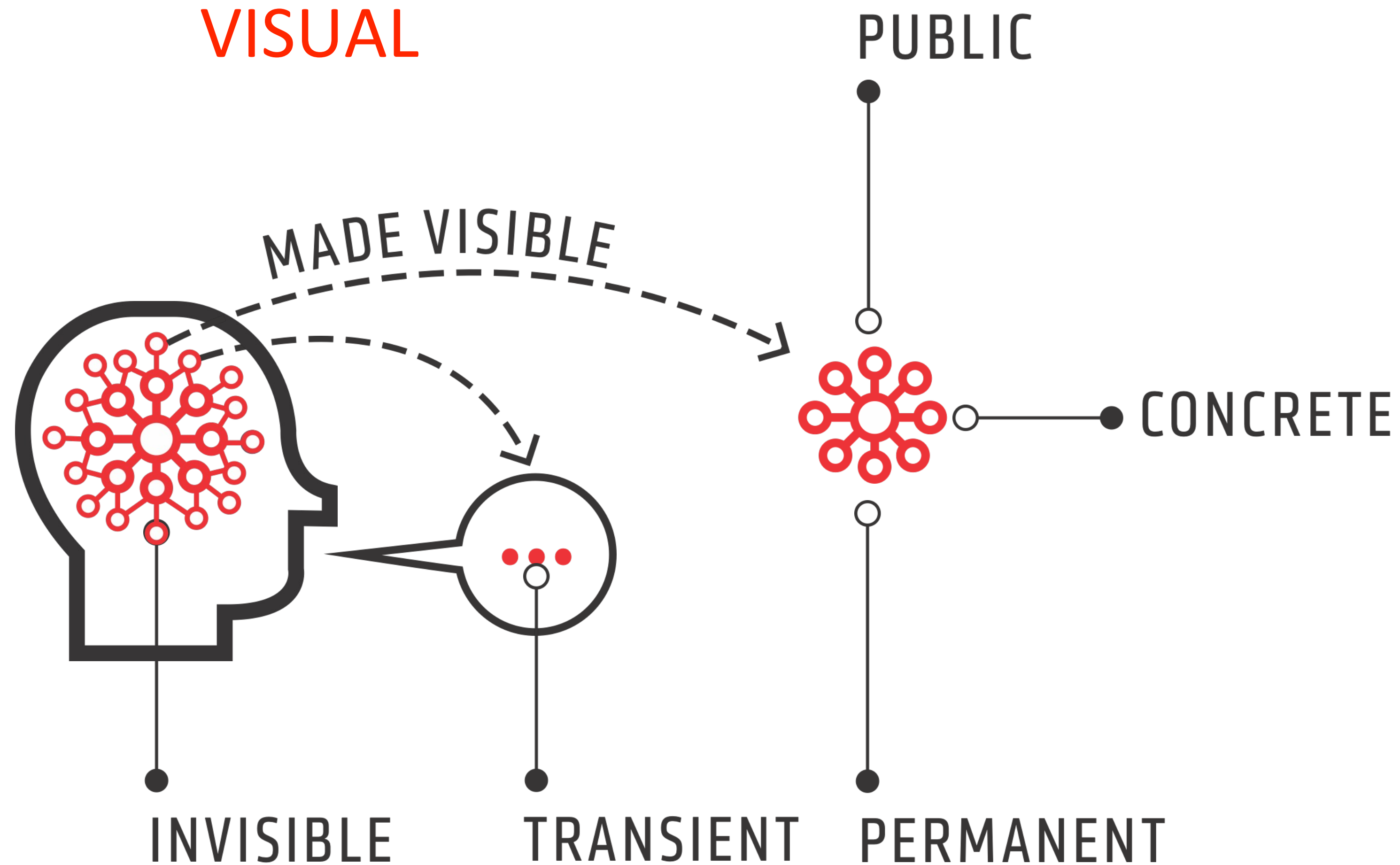
JUST

TALK



TALK PLUS

VISUAL



4 WORKING MEMORY CAPACITY

Working memory capacity can be effectively increased, and learning improved, by using a dual mode presentation.

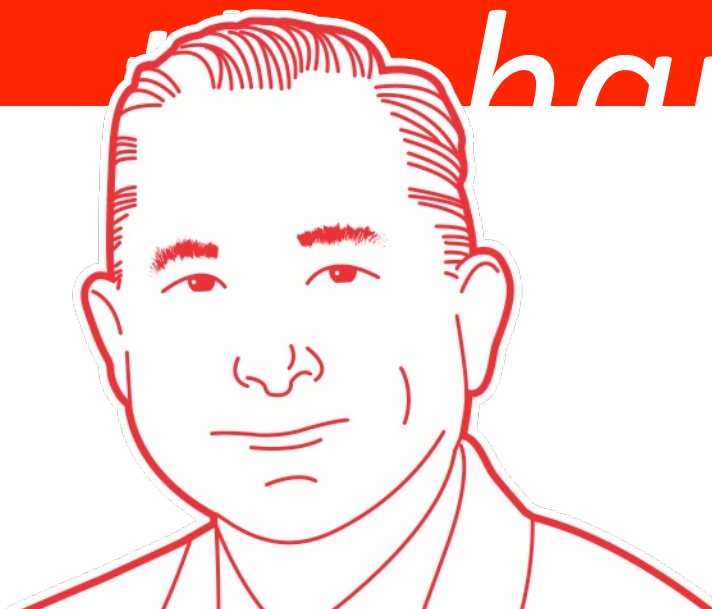


JOHN SWELLER

COGNITIVE LOAD THEORY,
SWELLER, AYRES & KALYUGA
2011, SPRINGER

4
ACCESS TO KNOWLEDGE

*Always look for the easiest
path to learning
challenging material, not
the hardest*



SHAUN ALLISON



ANDY THARBY

MAKING EVERY
LESSON COUNT,
2015, CROWN
HOUSE

4 THE MODERN EUROPE PROJECT

Jenny is head of the Humanities faculty. Fatima is the head of the History department. Tom, Joe and Sue work for Fatima. Harry is the head of the Geography department. Jo, Chaz and Tarnia report to Harry. Sue, Jo, Chaz and Harry are working together on the

Who is the highest ranking person on the Modern Europe Project?

Which department has the most people on the Modern Europe

Project? Who are not involved with the Modern Europe project?

1 2 3

THE MODERN EUROPE PROJECT

Who is the highest ranking person on the Modern Europe Project?

Which department has the most people on the Modern Europe project?

Which people are not involved with the Modern Europe project?

Head of Humanities



Jenny

History department

Geography department



Fatima



Harry



Tom



Joe



Sue

MODERN EUROPE PROJECT



Jo



Chaz



Tania

4
THE VISUAL ARGUMENT

Diagrams provide ‘computational advantage’ compared to text because they support information search and enable viewers to extract information.



IOANNA VEKIRI

WHAT IS THE VALUE OF GRAPHICAL
DISPLAYS IN LEARNING? EDUCATIONAL
PSYCHOLOGY REVIEW, Vol 14, No3 Sept
2002

3

Ideas as objects

4 ORIGINS OF THE MODERN MIND



MIMETIC AGE



MYTHIC AGE



THEORETIC AGE

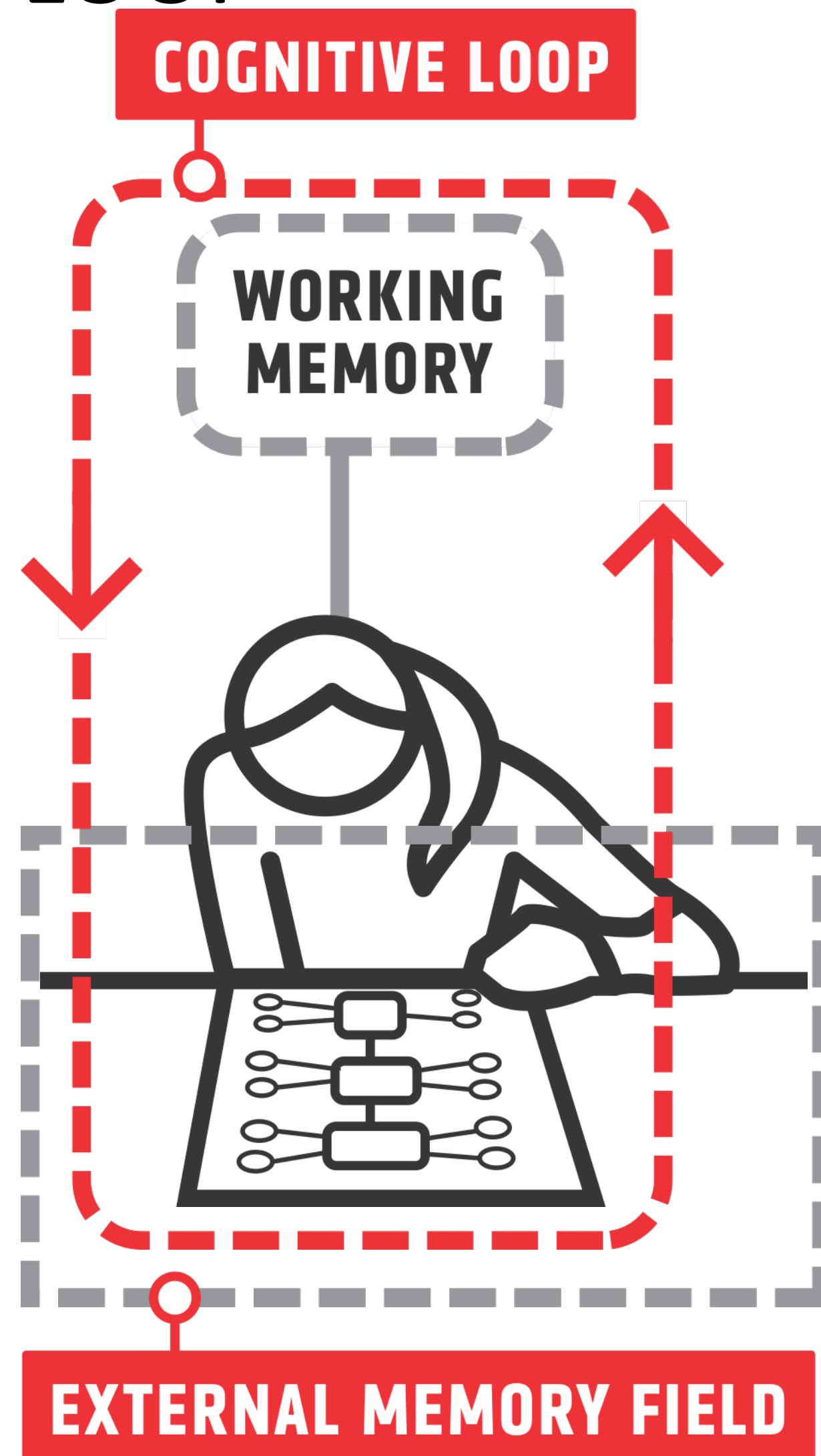
- External storage of info
- External memory field
- Iteration & reflection
- Public dialectic



MERLIN
DONALD

1 2 3

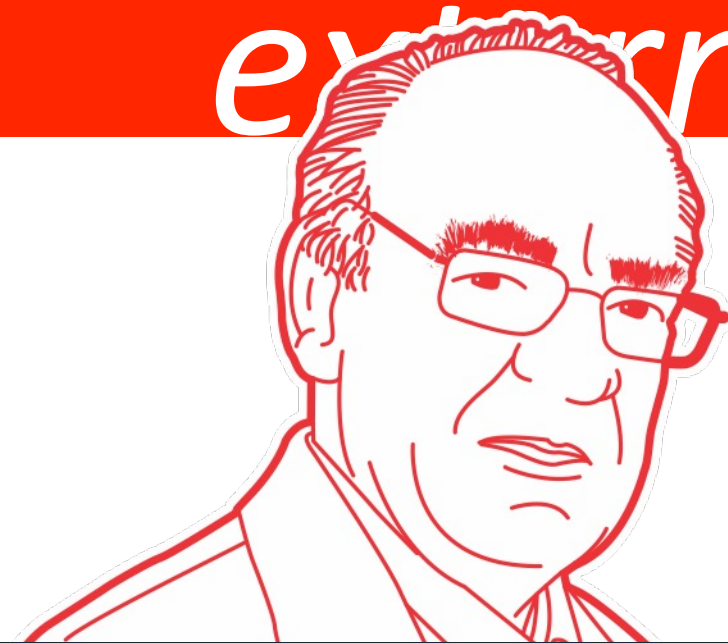
⁴ THE EXMF CREATES A COGNITIVE LOOP



1 2 3

4 TRUE VISUOSPATIAL SKETCHPAD

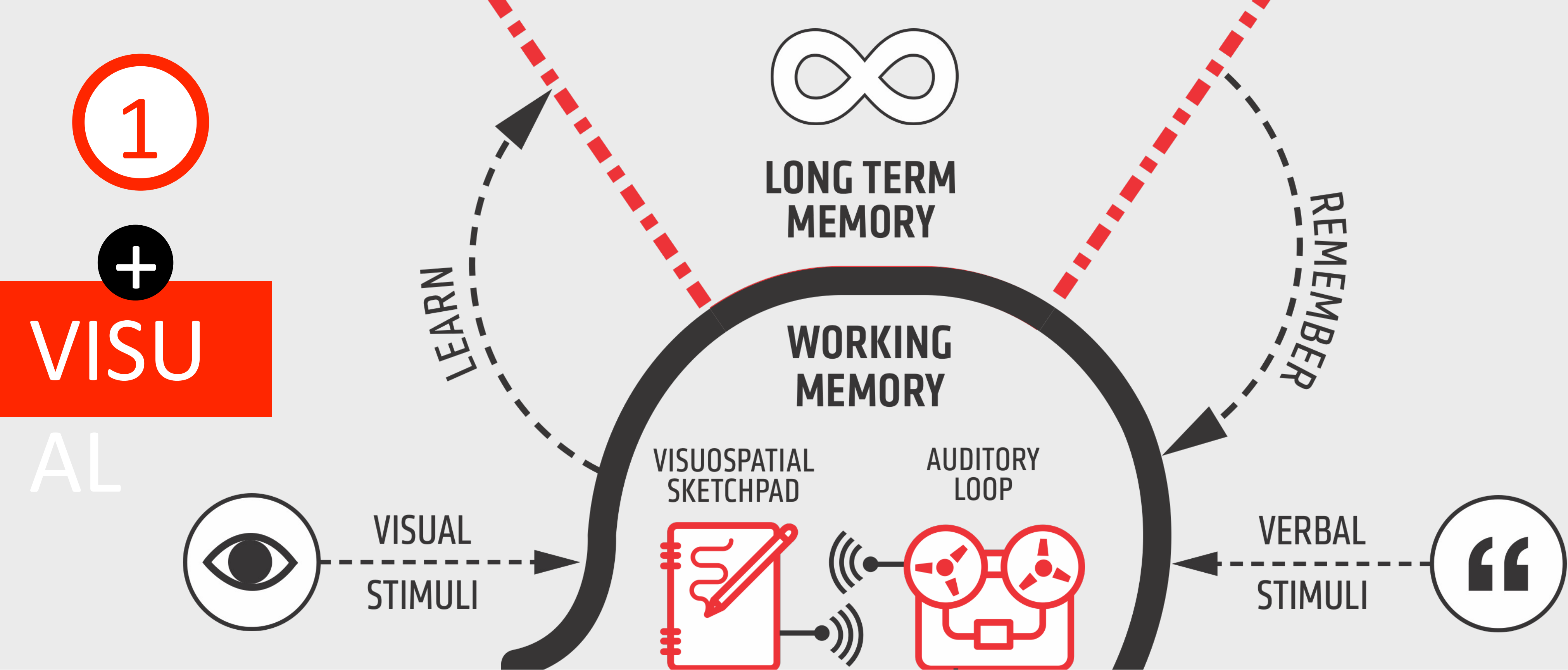
*The true
visuospatial
sketchpad is the
external working*



MERLIN DONALD

ORIGINS OF THE
MODERN MIND, 1991





4
SPATIAL THINKING

*Spatial thinking is the
foundation of abstract
thought.*



BARBARA TVERSKY

MIND IN MOTION
2019, P.289

4
EXTERNALISING THE MIND

*We organise stuff in
the world the way we
organise the stuff in
the mind.*



BARBARA TVERSKY

MIND IN
MOTION, 2019,
P.289

1 2 3

4 A NEW PERSPECTIVE ON COGNITION

*The mind
regards ideas as
objects.*

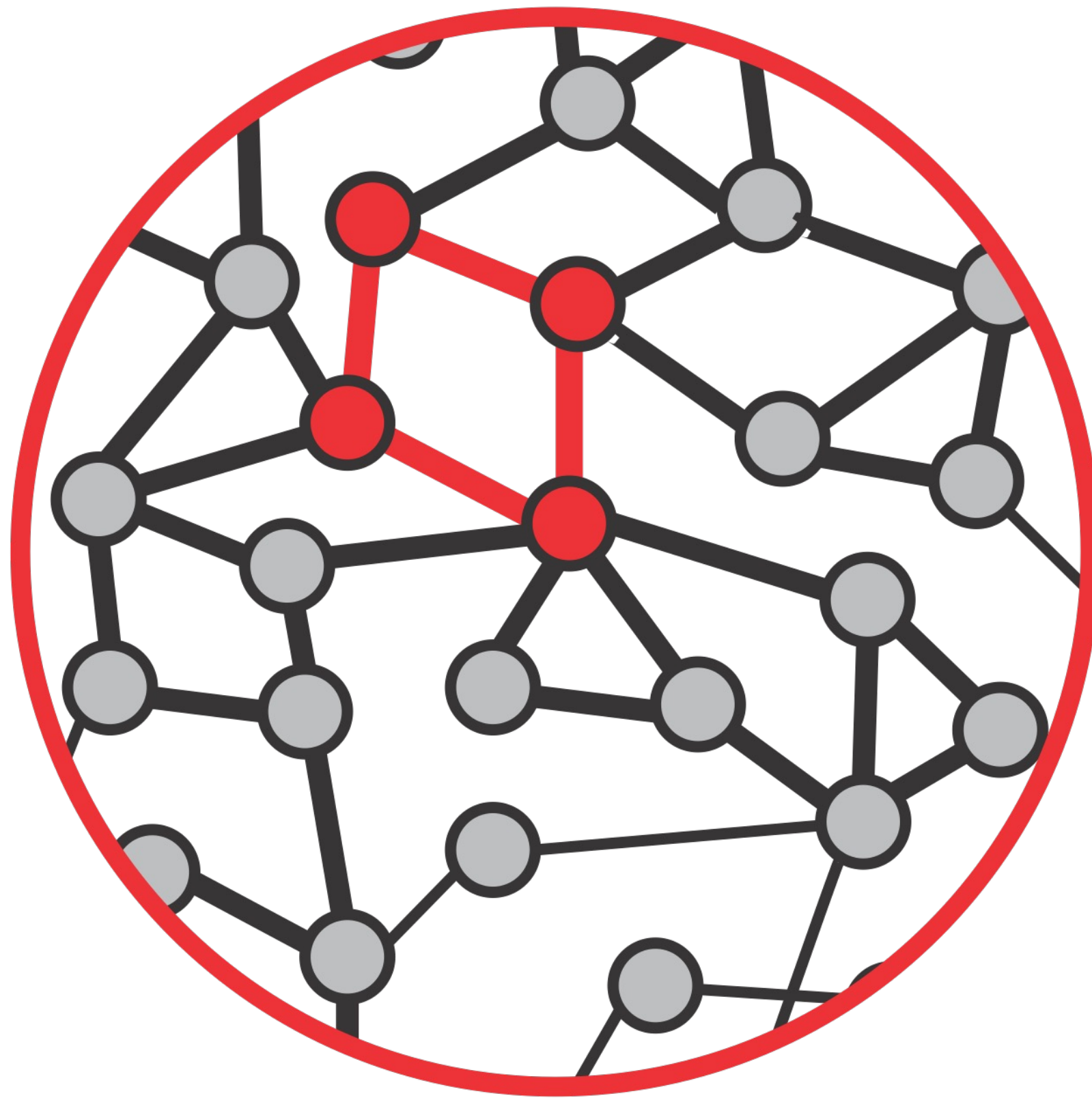


BARBARA TVERSKY

MIND IN
MOTION, 2019,
P.184



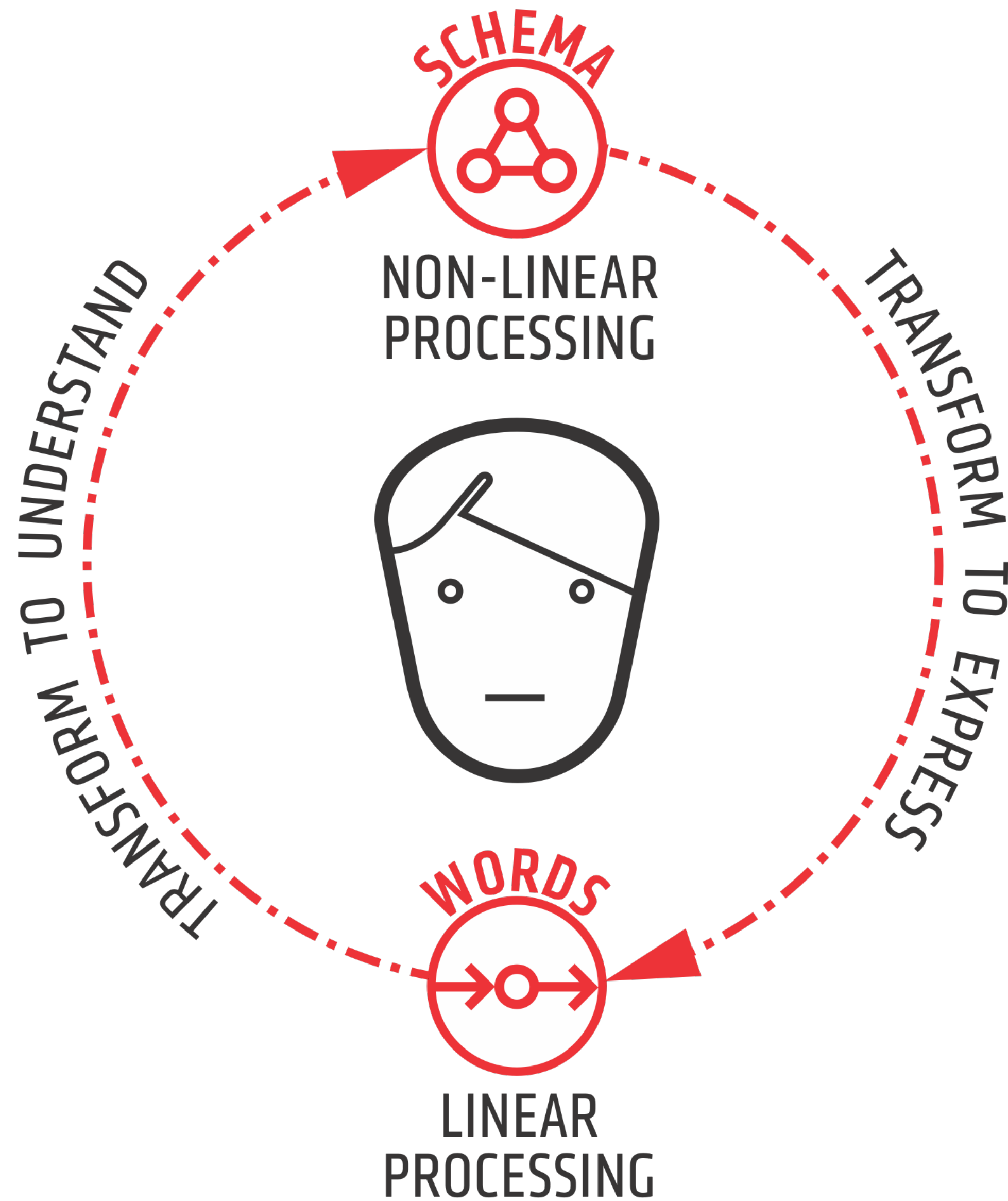
4 SCHEMA AREN'T LINEAR



EFRAT FURST
COGNITIVE
SCIENTIST 2018



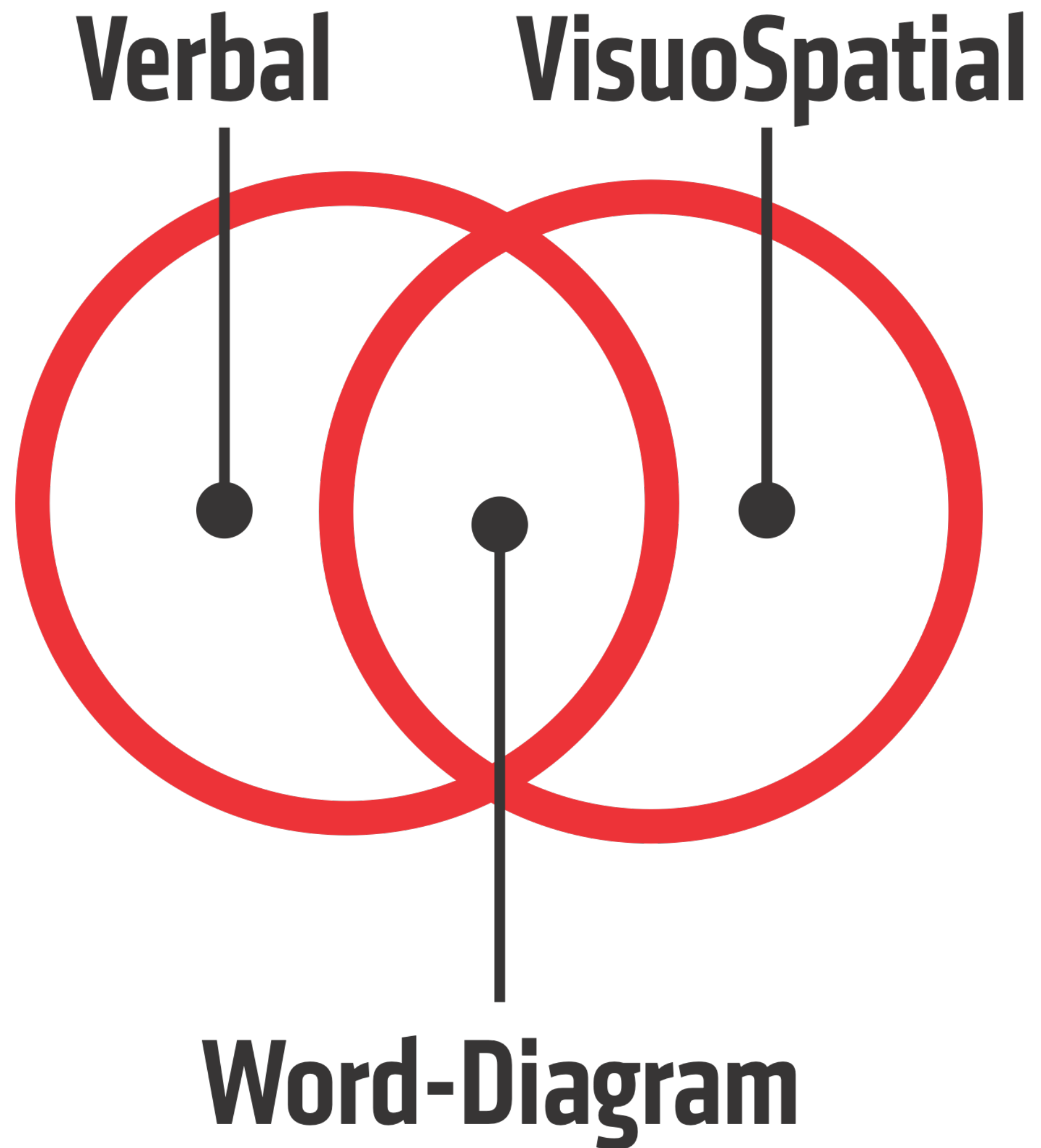
DAVID DIDAU
TEACHER
AUTHOR 2018

4
TRANSFORMING INFORMATION

4

Tools to organise ideas

WORD-DIAGRAM

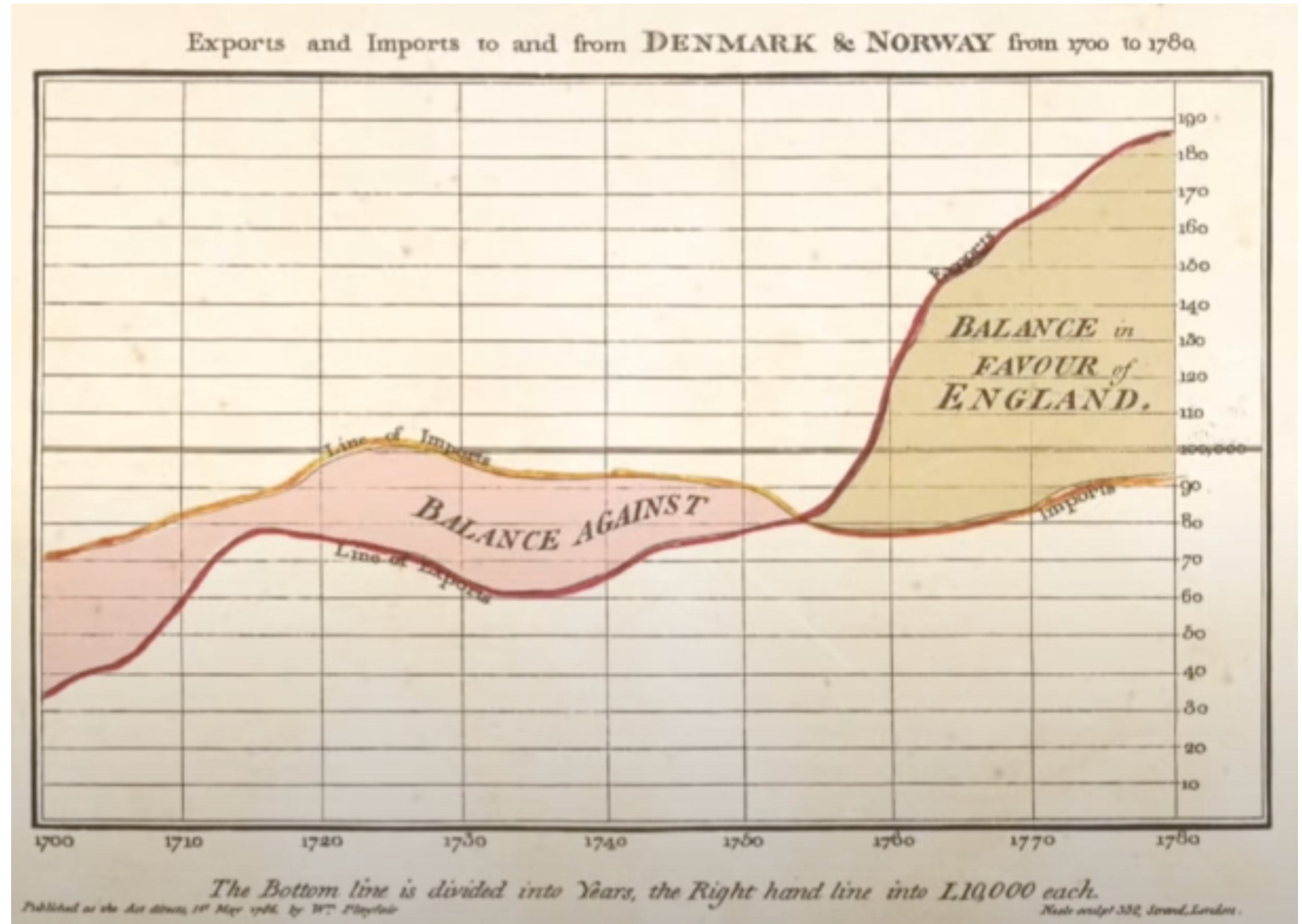




1 2 3

AFFORDANCES OF FORMATS

KINGDOM OF DENMARK.		29
Extent in square miles	170,000	
Number of inhabitants	2,150,000	
Number of persons to a square mile	12	
Extent in English acres	108,000,000	
Number of acres to one person	54	
Revenues in pounds sterling	1,520,000	
Public debts	2,600,000	
Land forces in time of peace	75,000	
Ditto in time of war		
Number of seamen in time of peace	18,000	
Ditto in time of war		
Ships of the line	26	
Frigates, sloops, &c.—7 frigates of 50 guns, and small vessels.		
Leagues of sea coast	573	
Number of inhabitants in the capital	90,000	
Number of cultivated acres	12,600,000	
Exports to England	110,300	
Imports from England	219,000	
Great divisions of the country	3	
Smaller ditto	12	
Chief towns, Copenhagen, Altona, Elfsineur.		
Longitude of central point of Denmark Proper $10^{\circ} 15'$.		
Latitude of ditto $55^{\circ} 30'$ north.		
Longitude of chief city 12° east.		
Latitude of ditto $55^{\circ} 41'$ north.		
Religion, Lutheran; others tolerated.		
Amount of taxes on each person 15s. 3d.		
The principal productions are corn, hemp, flax and cattle. An inferior quality of fir timber is exported from Norway in considerable quantity; but none of the Danish dominions are famous for manufactures; and in such a latitude the finer productions of the earth are not to be expected.		





1 2 3

AFFORDANCES OF FORMATS



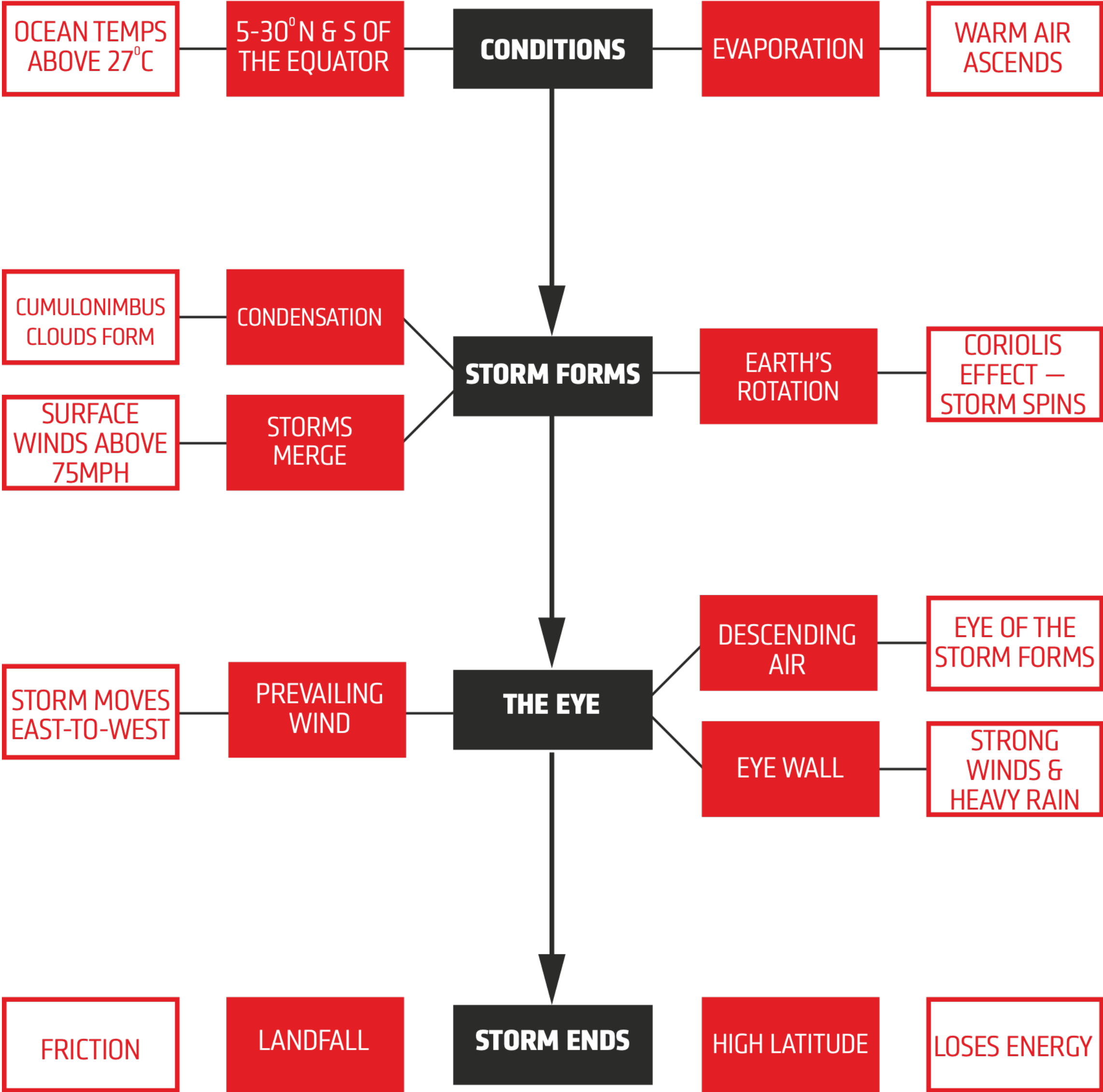
Tropical storms form between 5° - 30° north and south of the equator because ocean temperatures reach above 27°C, the main ingredient required for them to form. Ocean temperatures above 27°C produce latent heat — heat which changes a liquid to a gas — causing rapid evaporation. It is evaporation — the warm water changing from a liquid into water vapour, a gas — that heats the air above the ocean. The air above the ocean begins to ascend rapidly.

As the warm air ascends, it cools down. Condensation — when gasses change to a liquid — causes the formation of cumulonimbus clouds. Cumulonimbus clouds are tall, dense and vertical clouds. As the air condenses, it releases more latent heat, powering the storm and drawing up more heat from the ocean.

Several storms merge to form a giant storm; when surface wind speeds reach an average of 75mph, the storm is a tropical storm. As the Earth rotates, the storm spins. Experts call this the Coriolis effect. With the storm spinning, it will begin to develop an eye. The eye of a storm is at its centre. Air is sucked into the eye, descending rapidly, causing calm and dry conditions. Around the edge of the eye is what is called the eyewall. The eyewall is on the outside of the eye and is responsible for the intense rainfall and strong winds felt by tropical storms.

The storm moves across the ocean from east to west due to the prevailing wind. The prevailing wind is the typical direction winds travel. As the storm travels, it continues to gather more energy, increasing its strength.

When a storm reaches land, the storm's energy, rapidly evaporating water, is no longer available. Friction from the land will slow the storm down. Loss of evaporating water and friction from the land causes the storm to die out.



SELECTING TOOLS

*You will get the best
results from visuals
selected on the basis of
their functionality rather
than their surface*



RUTH COLVIN
CLARK



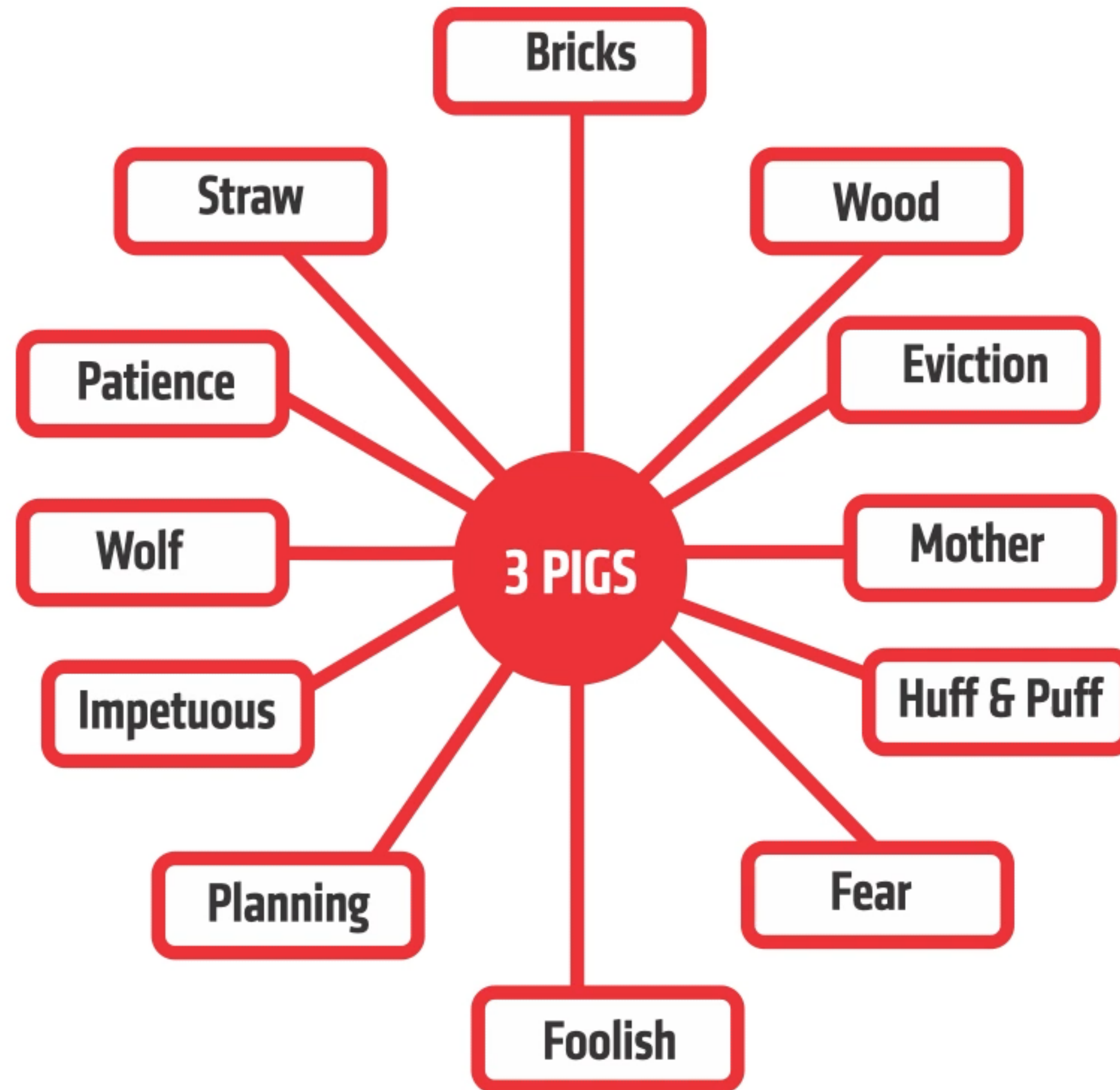
CHOPETA
LYONS

GRAPHICS FOR
LEARNING
P.326, 2004

THE TOOLS



CHUNK | SPRAY MAP

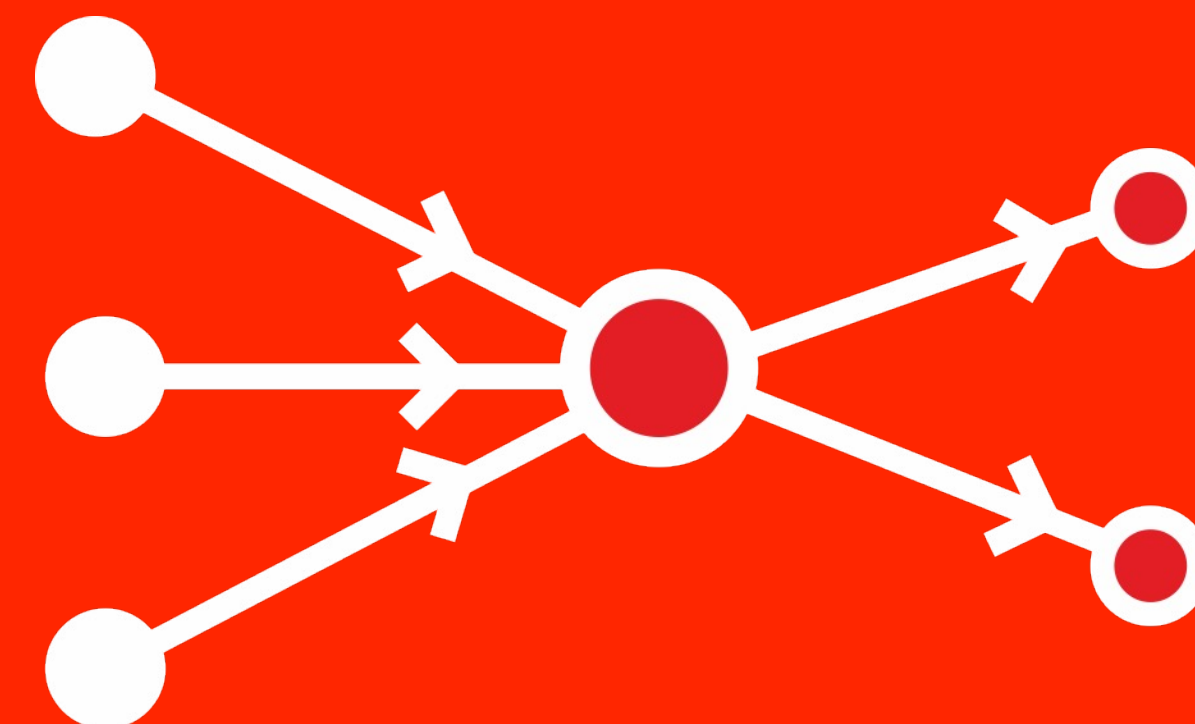
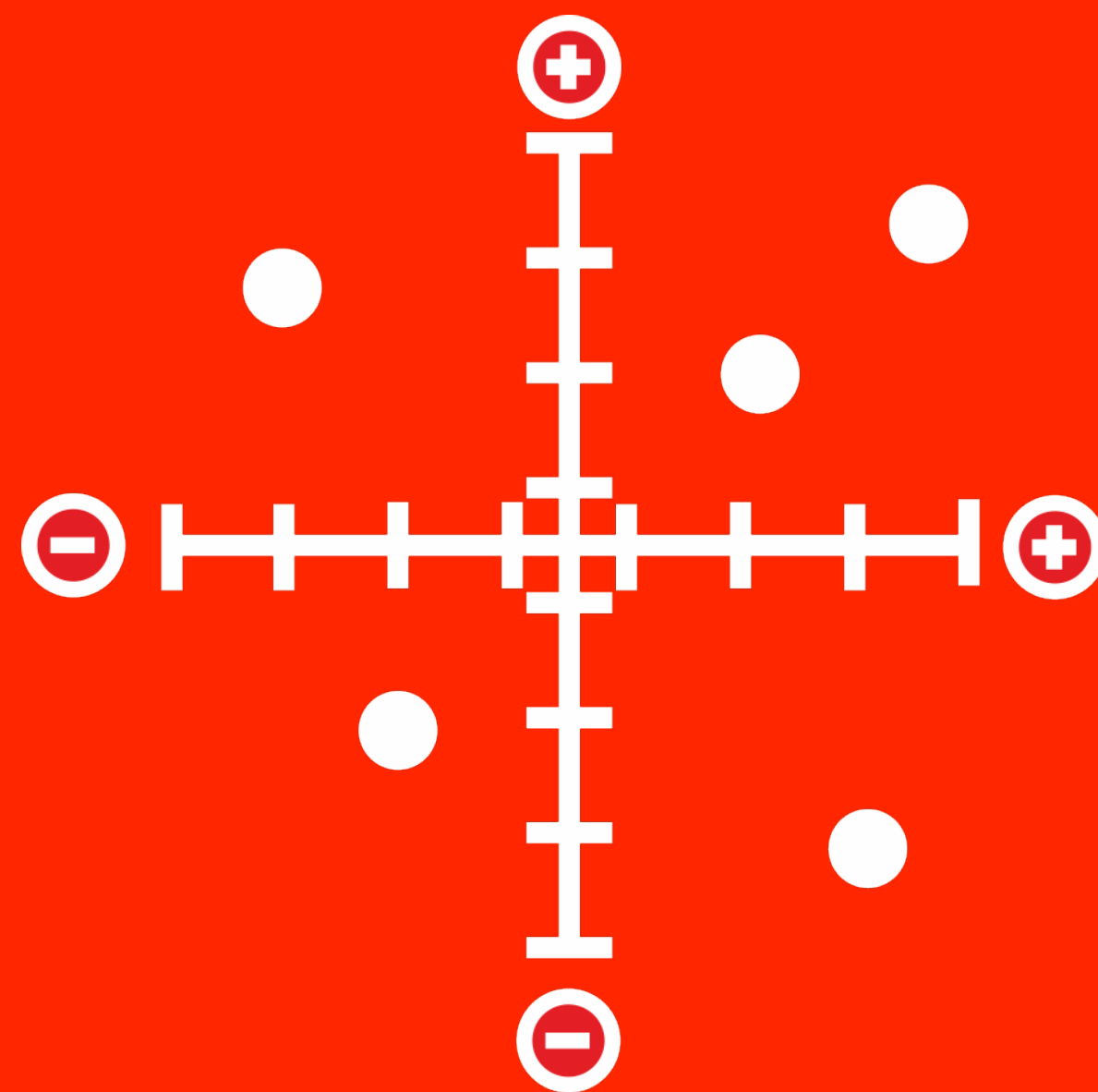
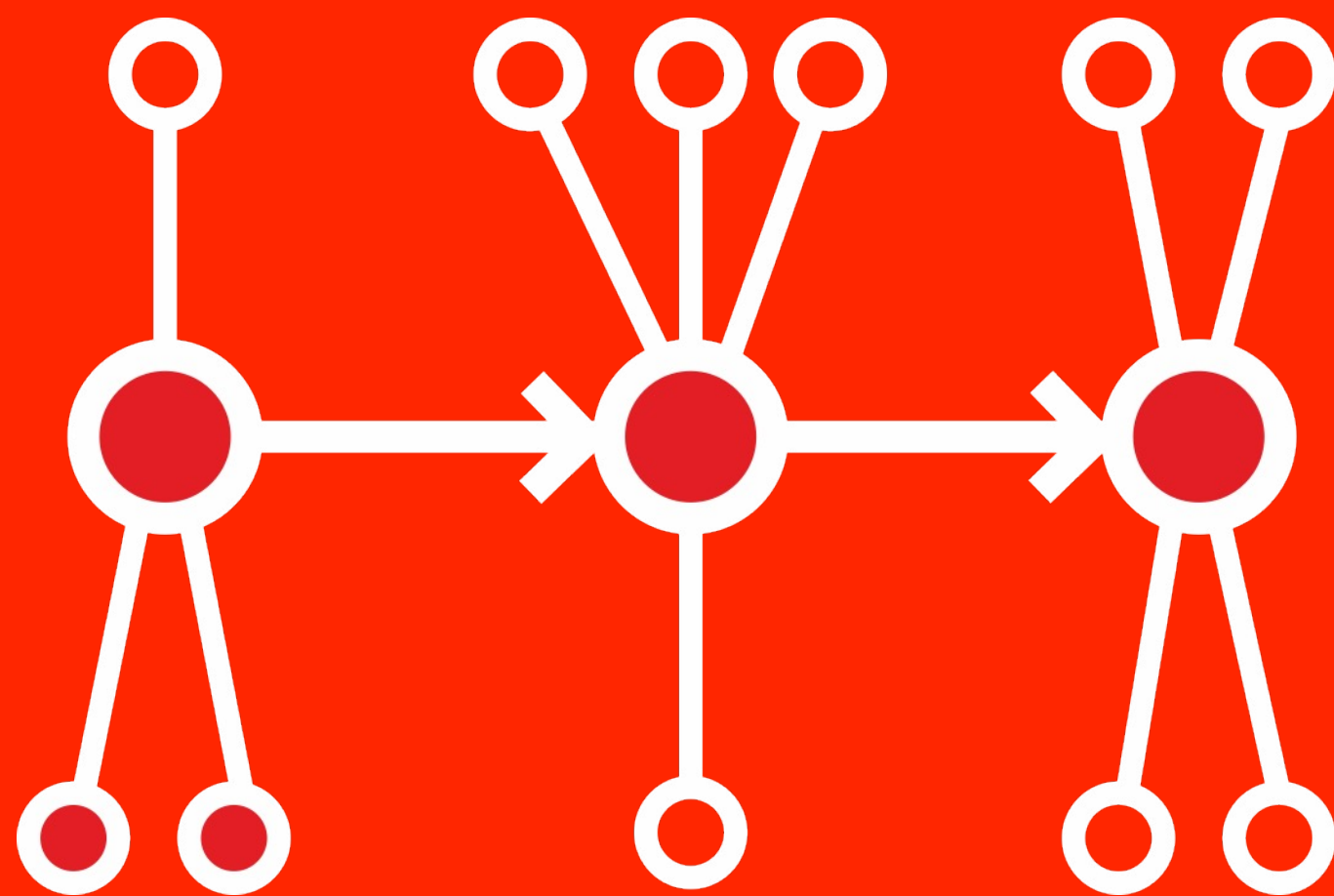




RESEARCH
ED DUBLIN
2022

ORGANISE

PROJECTING THE MIND, THINKING WITH
OBJECTS
IDEAS



OLIVER
CAVIGLIOLI