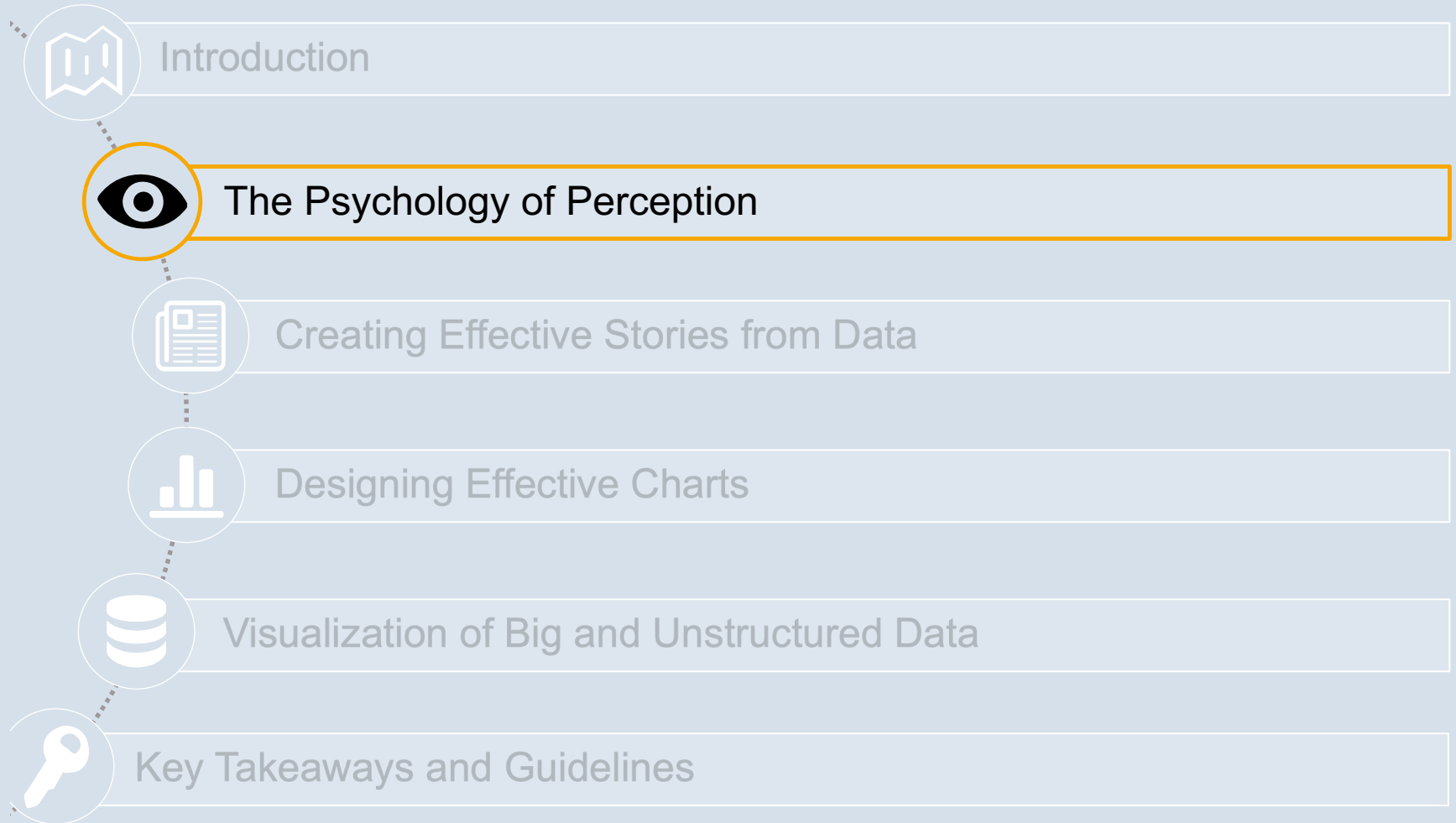




DATA VISUALIZATION

PROF. DR. FLORIAN STAHL

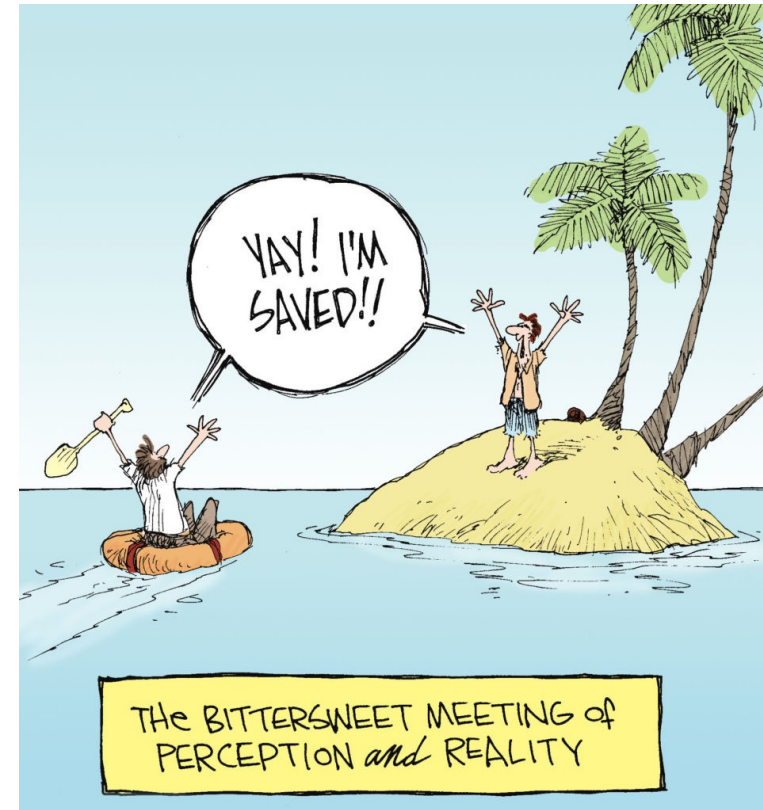
Overview – Data Visualization



Perception vs Reality

„Perception is a fantasy
that coincides with reality“

Chris Firth (2002)



Perception vs Reality



Perception



Reality

How a person sees something



The truth & how things exist

Varies from person to person



Doesn't depend on people

Outcome of one's knowledge,
attitude & beliefs



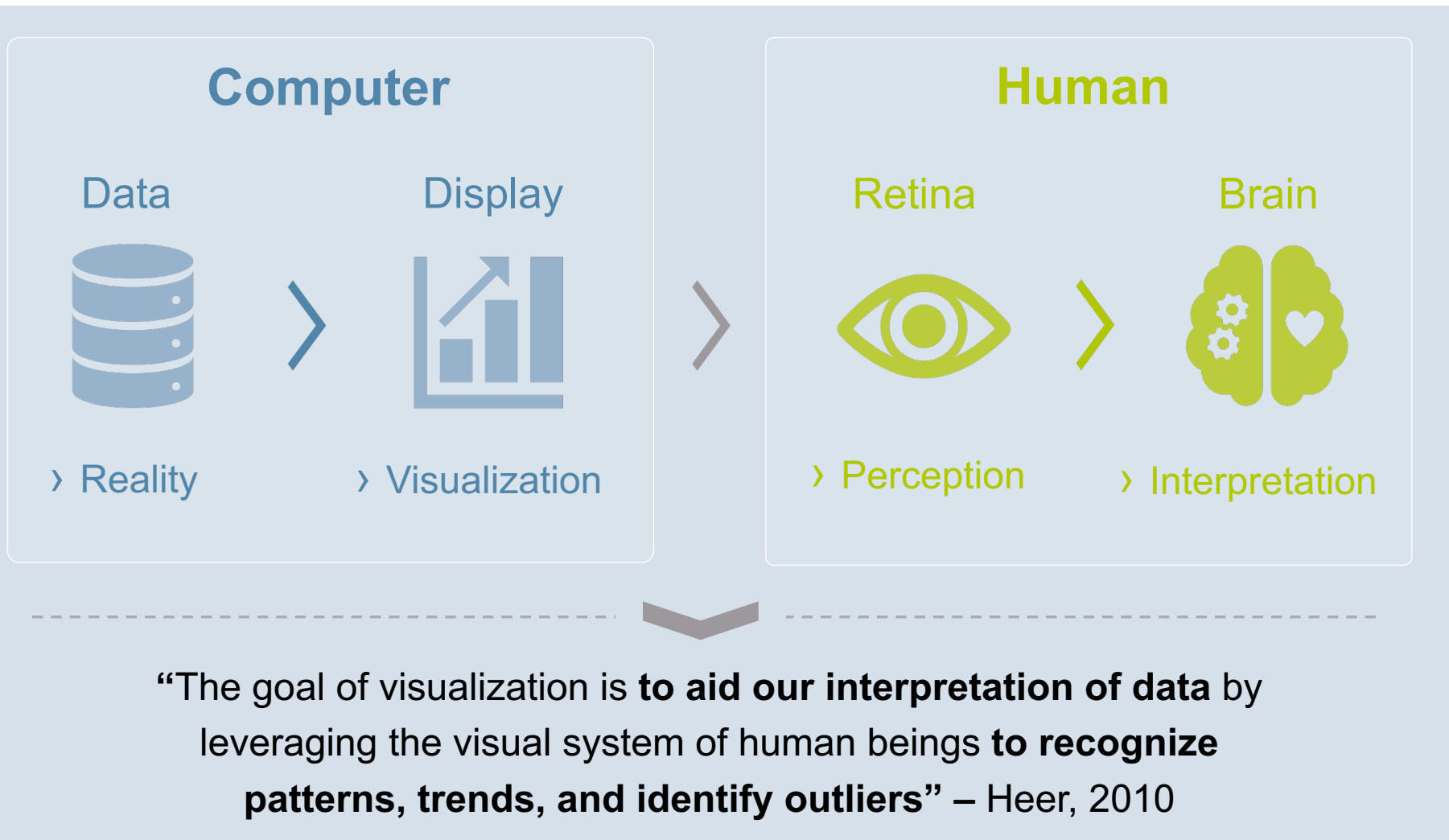
Not effected by these

Can be wrong or right



Always right

Visual Perception: Information Pipeline



Perception

Exposure



Occurs when a stimulus is placed within a person's relevant environment and comes within range of their sensory receptor nerves

Attention



Occurs when the stimulus activates one or more of the sensory receptors and the resulting sensations go into the brain for processing

Interpretation



Process whereby stimuli are placed into existing categories of meaning (cognitive thinking or affective emotional process)

Memory



Storing of things learned and retained

Exposure – Information Overload

Exposure

Attention

Interpretation

Memory



Exposure

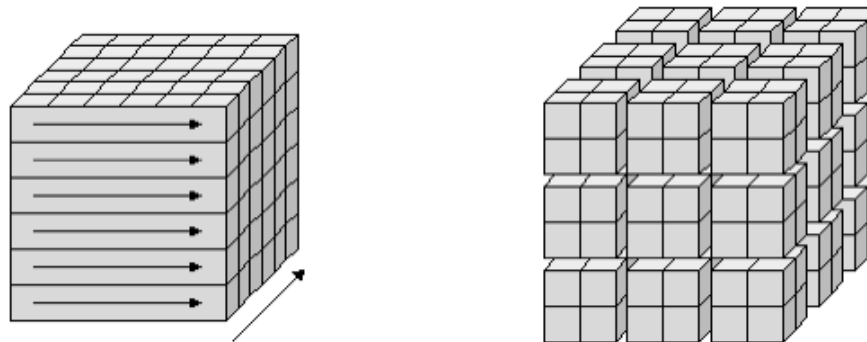
Attention

Interpretation

Memory

Chunking =
process in brains' **short-term memory** by which
**individual pieces of information are organized into
a meaningful whole**

› Greatly increases processing capacity



Exposure – Information Overload: Chunking - Example

Exposure

Attention

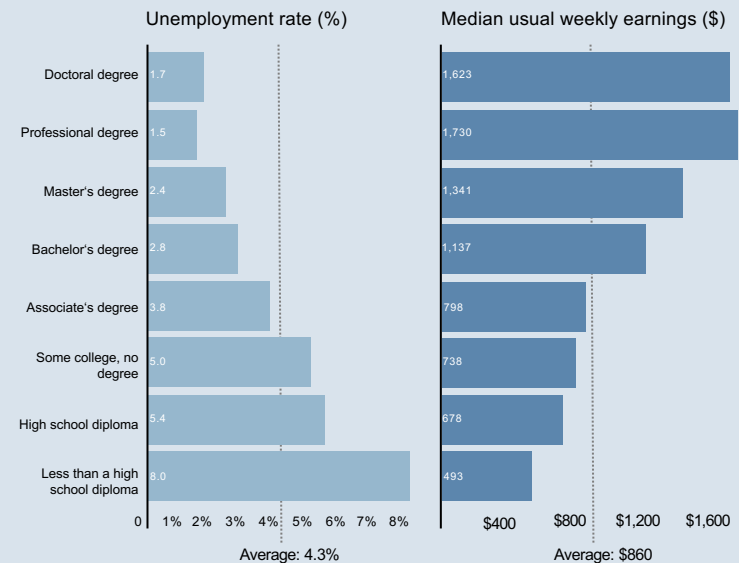
Interpretation

Memory

Earning and unemployment rates by education level, 2015

Education level	Unemployment rate in 2015 (%)	Median weekly earnings in 2015 (\$)
Doctoral degree	1.7	1,623
Professional degree	1.5	1,730
Master's degree	2.4	1,341
Bachelor's degree	2.8	1,137
Associate's degree	3.8	798
Some college, no degree	5.0	738
High school diploma	5.4	678
Less than a high school diploma	8.0	493
All workers	4.3	860

Earnings and unemployment rates by education level, 2015



Exposure

Attention

Interpretation

Memory



Attention depends on ...

- › Stimulus factors
- › Situational factors
 - › Clutter
 - › Involvement
- › Individual factors
 - › Motivation
 - › Ability

Attention – Cognitive Tunneling

Exposure

Attention

Interpretation

Memory



Cognitive tunneling

=

mental state in which your brain hangs on to the thing that is closest to you or in front of you and does not see the rest of the environment, or other, relevant data.

Attention – Pre-Attentive Processing

Exposure

Attention

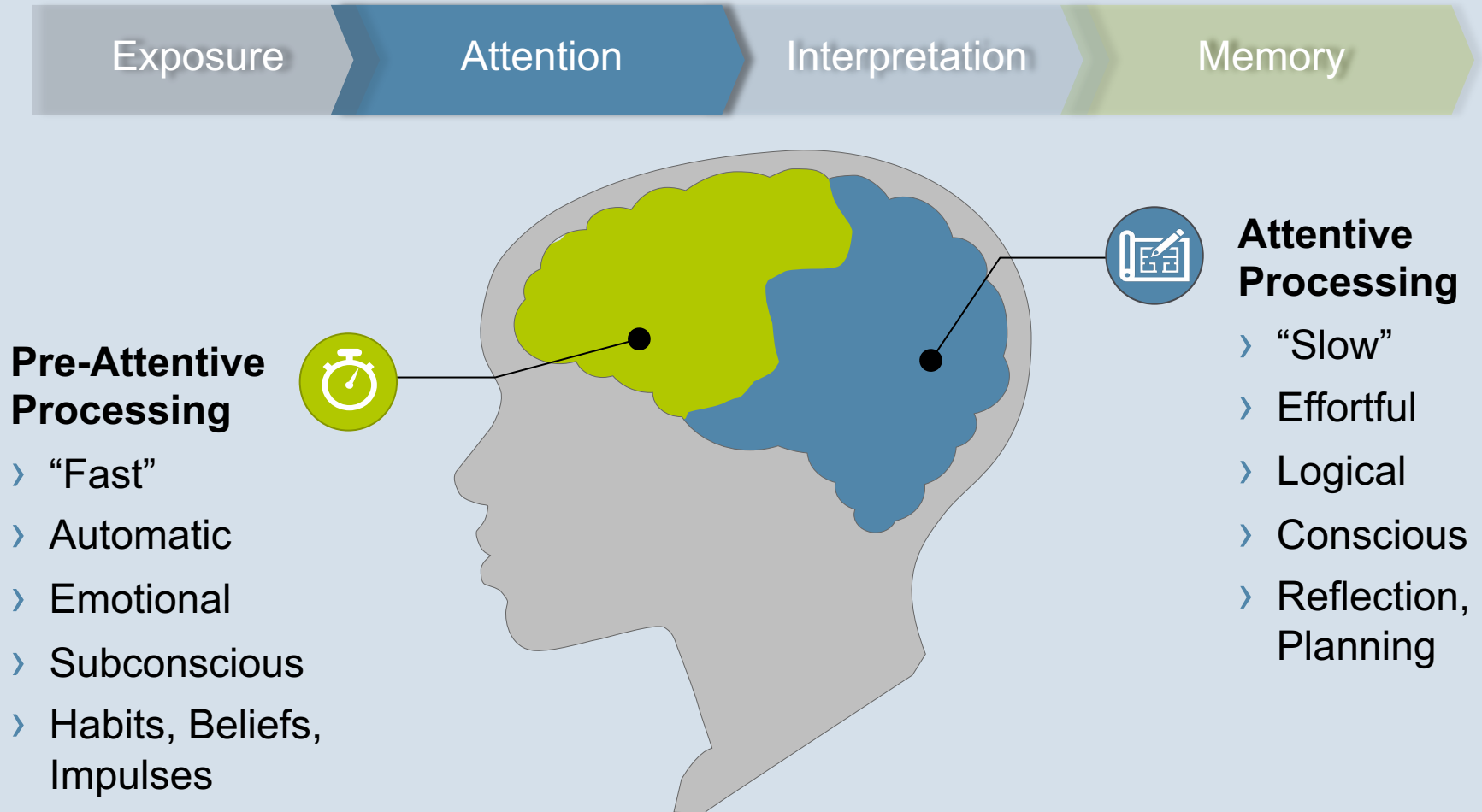
Interpretation

Memory

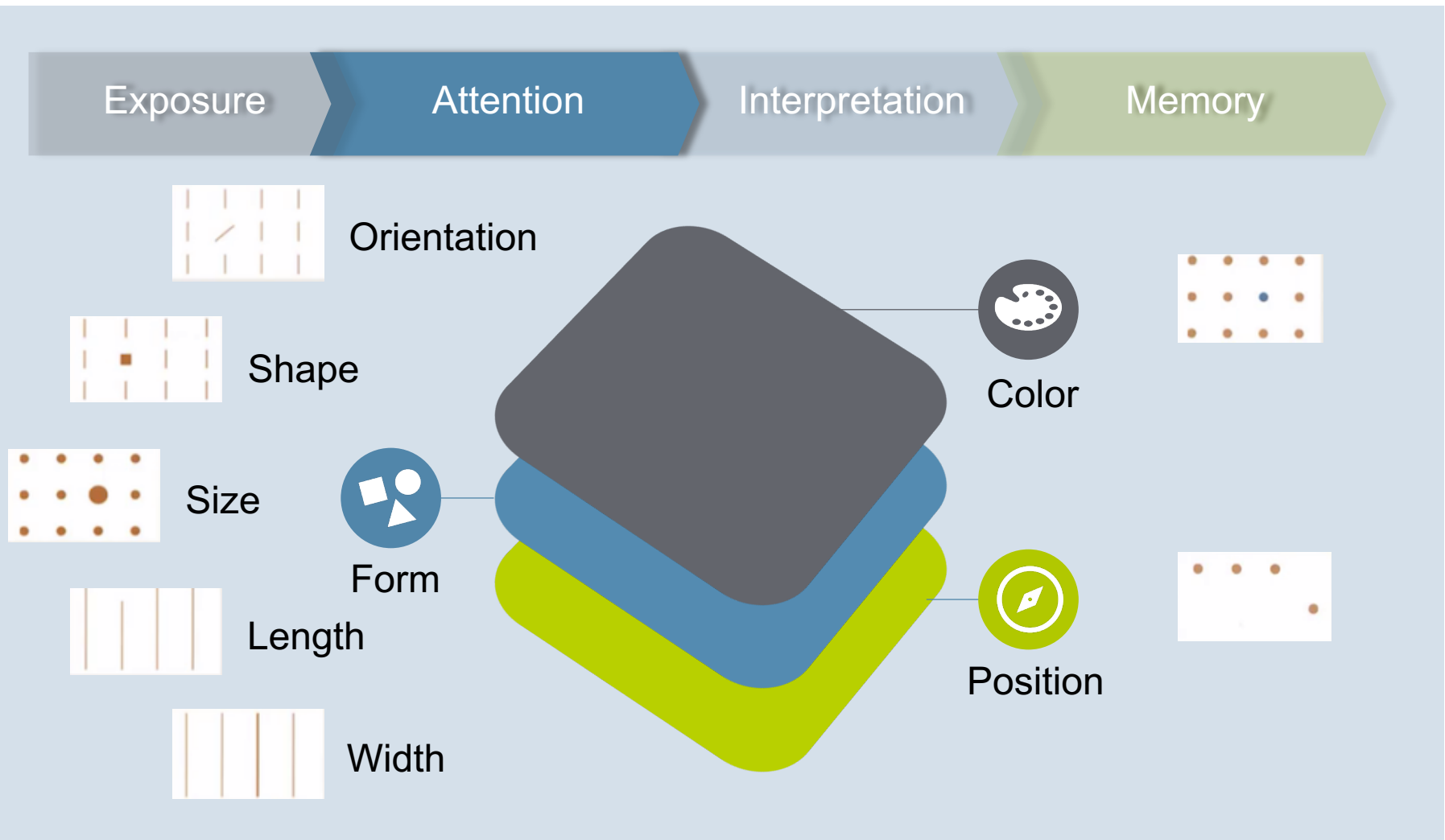


System 1 and System 2

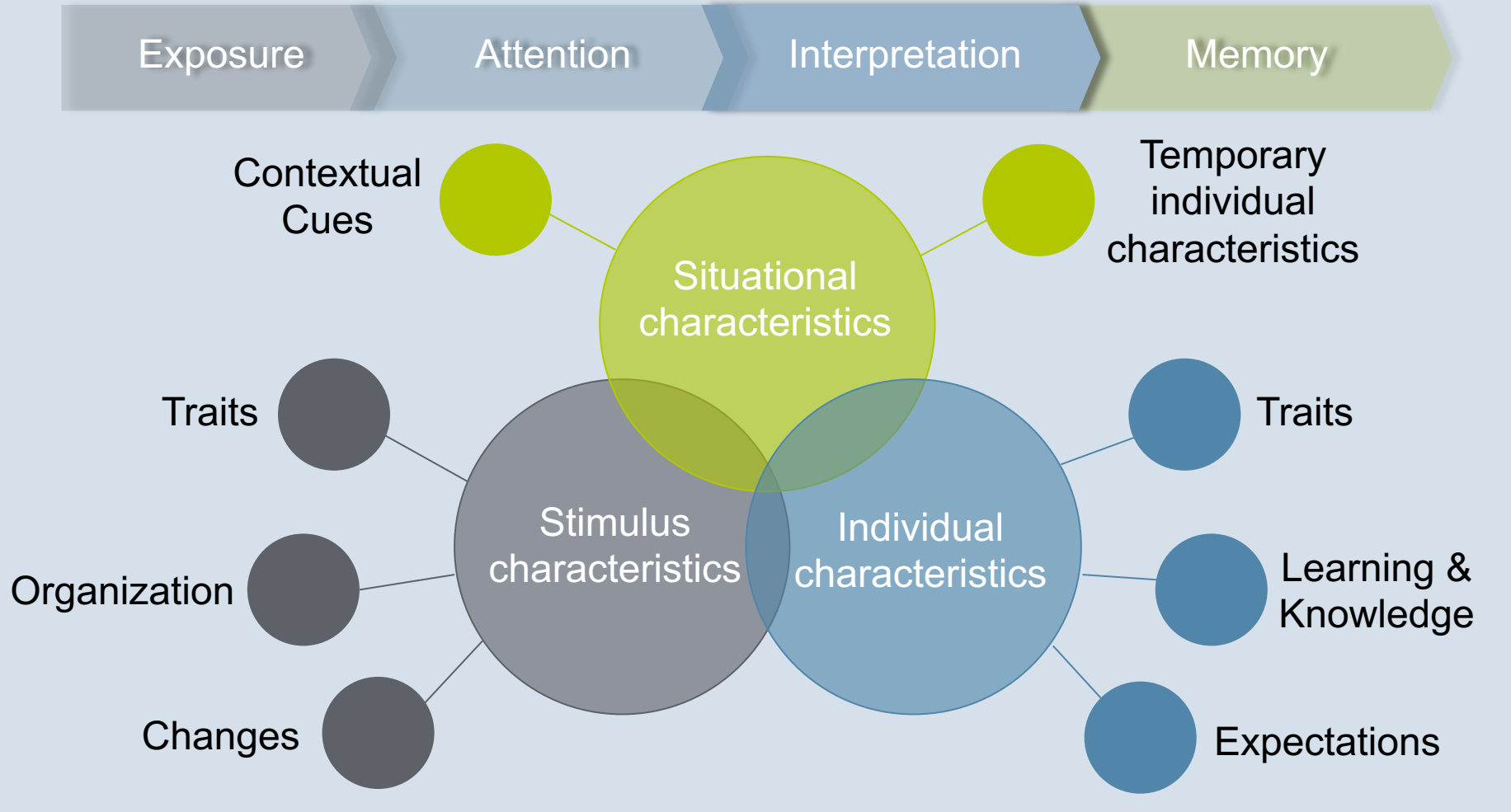
Attention – Pre-Attentive Processing



Attention – Visualization



Interpretation – Influencing Factors



Interpretation – Optical Illusions

Exposure

Attention

Interpretation

Memory



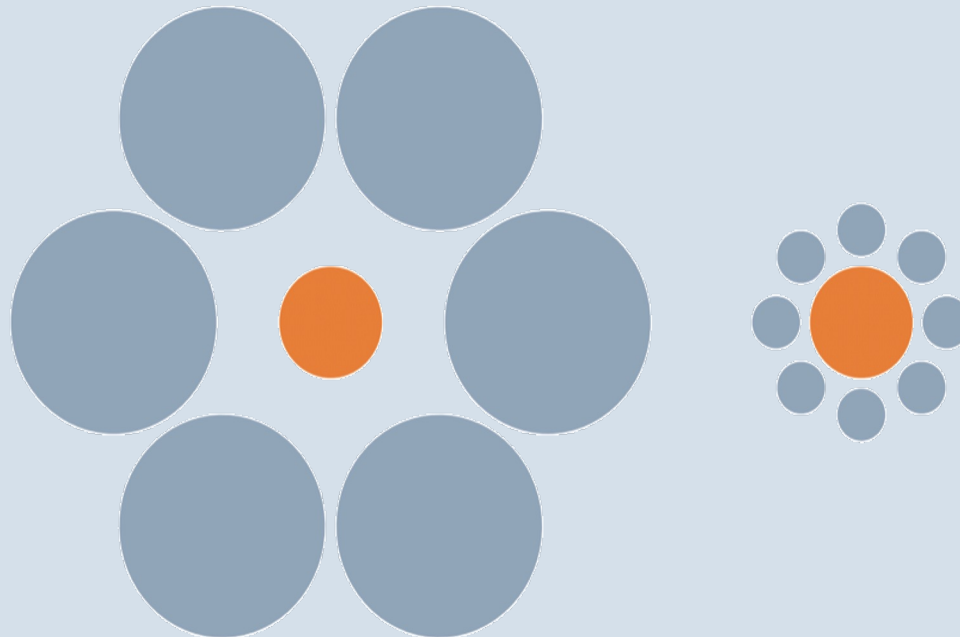
Interpretation – Optical Illusions

Exposure

Attention

Interpretation

Memory



Source: Optical illusion: The two orange circles are the same size. [8]