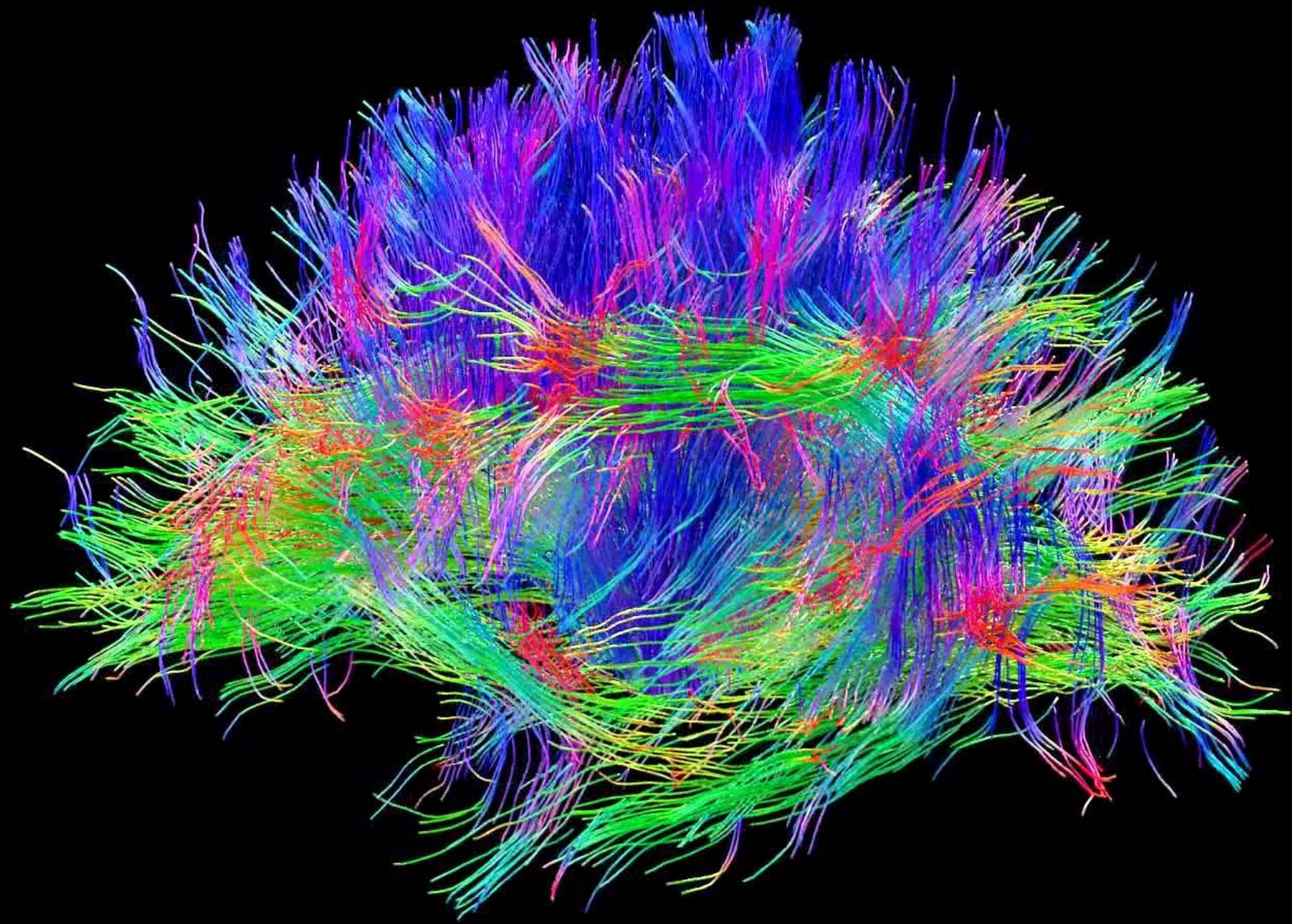


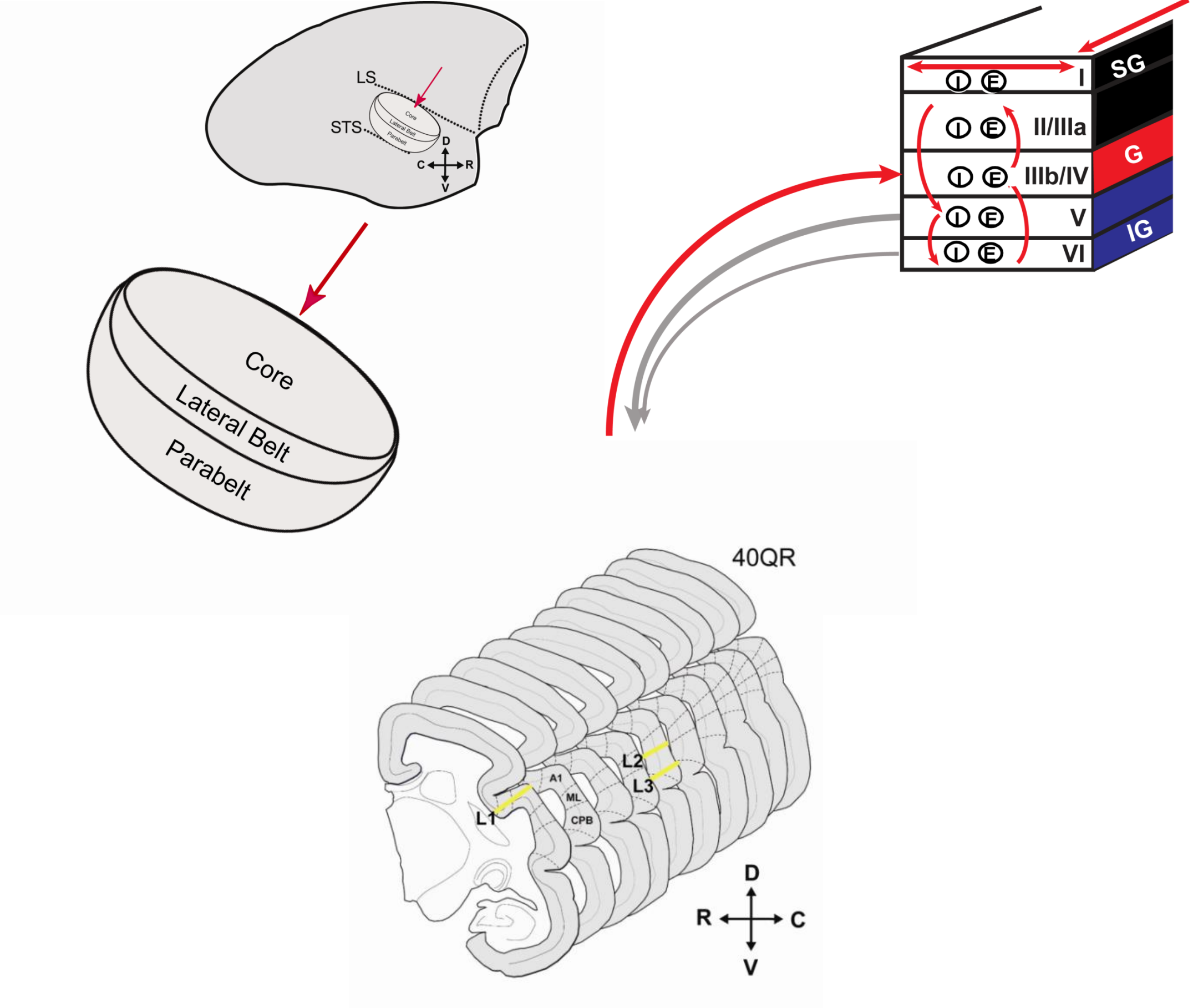
Poppy Crum
Chief Scientist
Dolby

ITU and You: How new dimension of media are changing how we interact with the audience

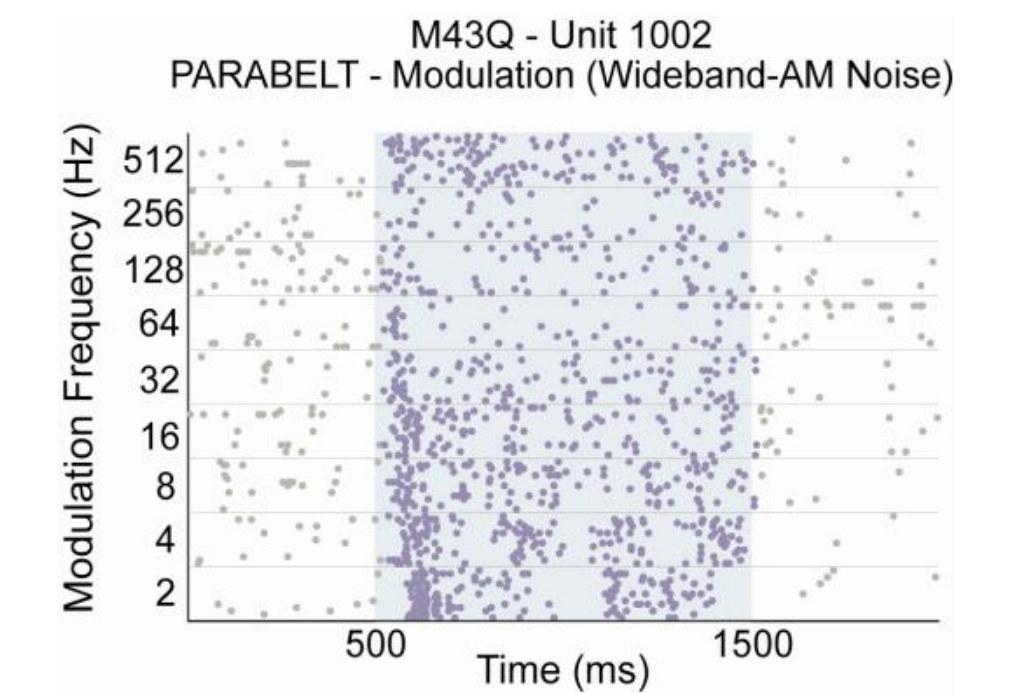
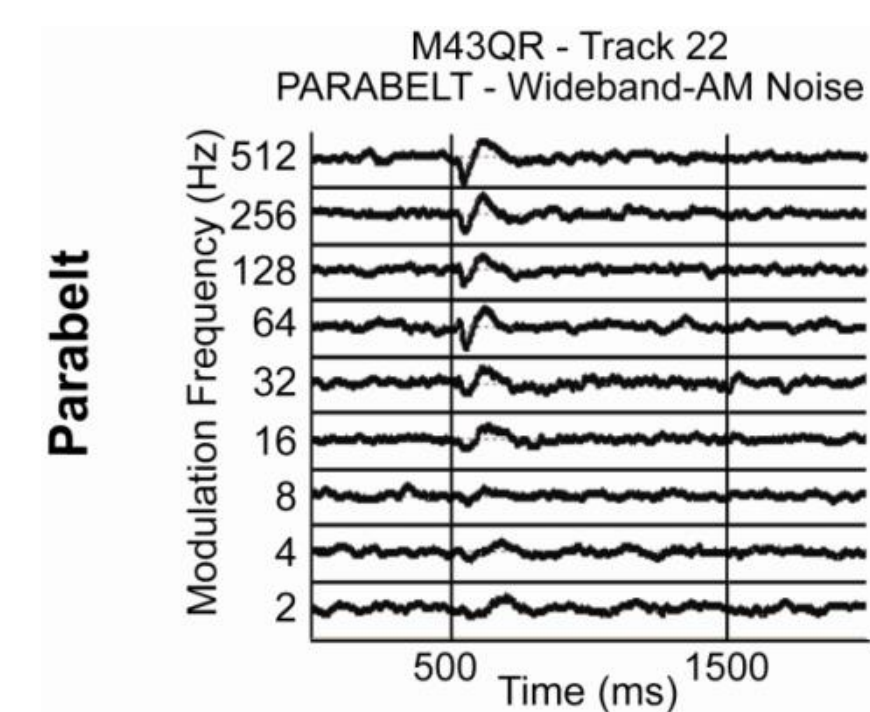
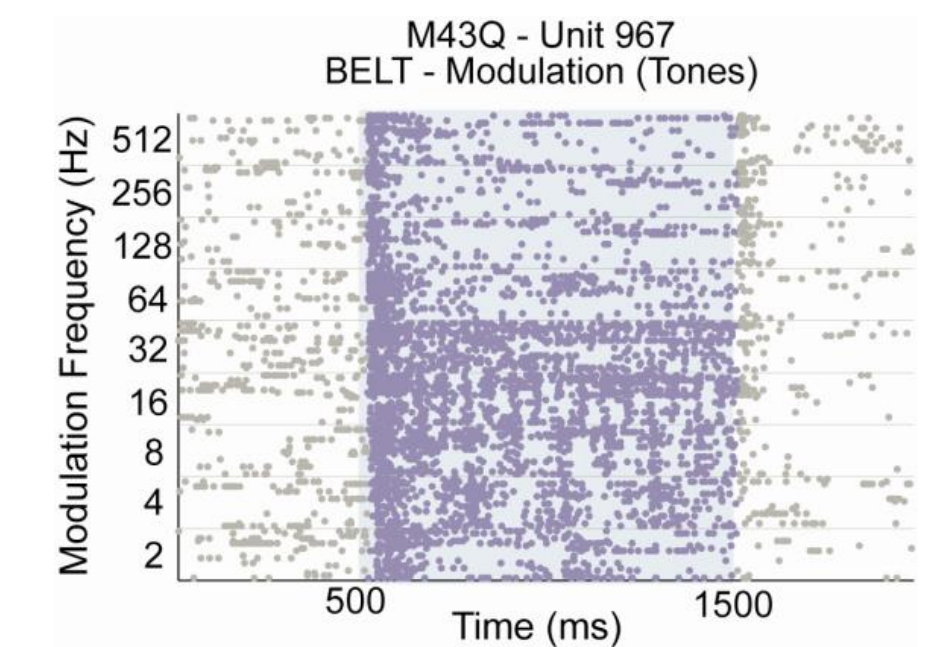
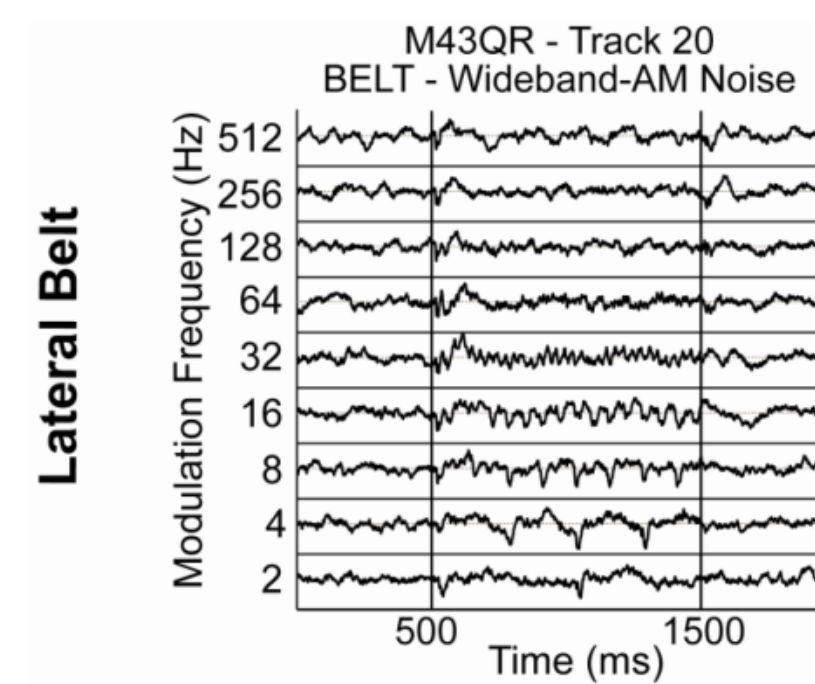
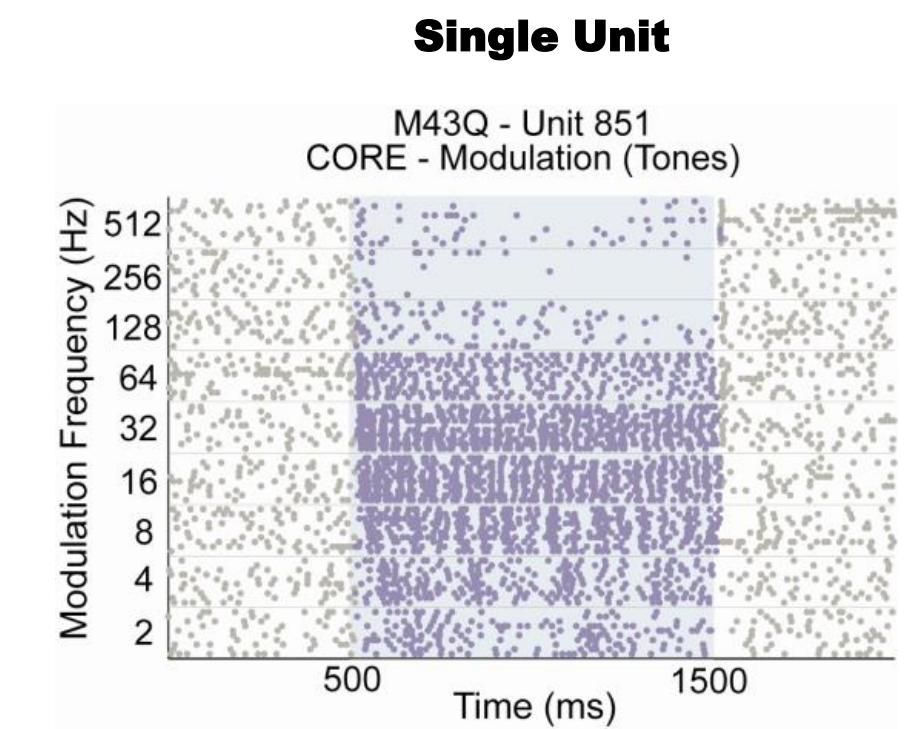
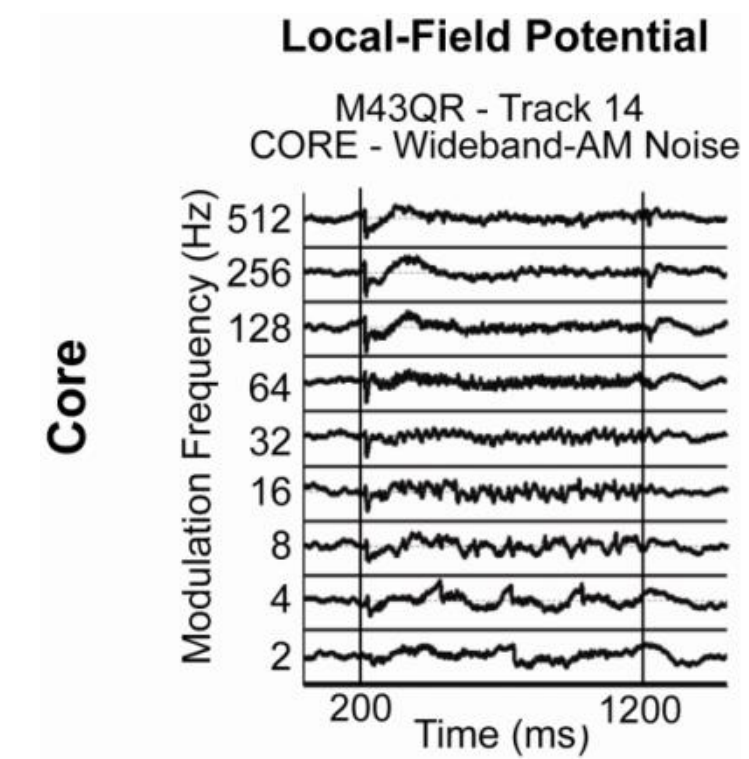
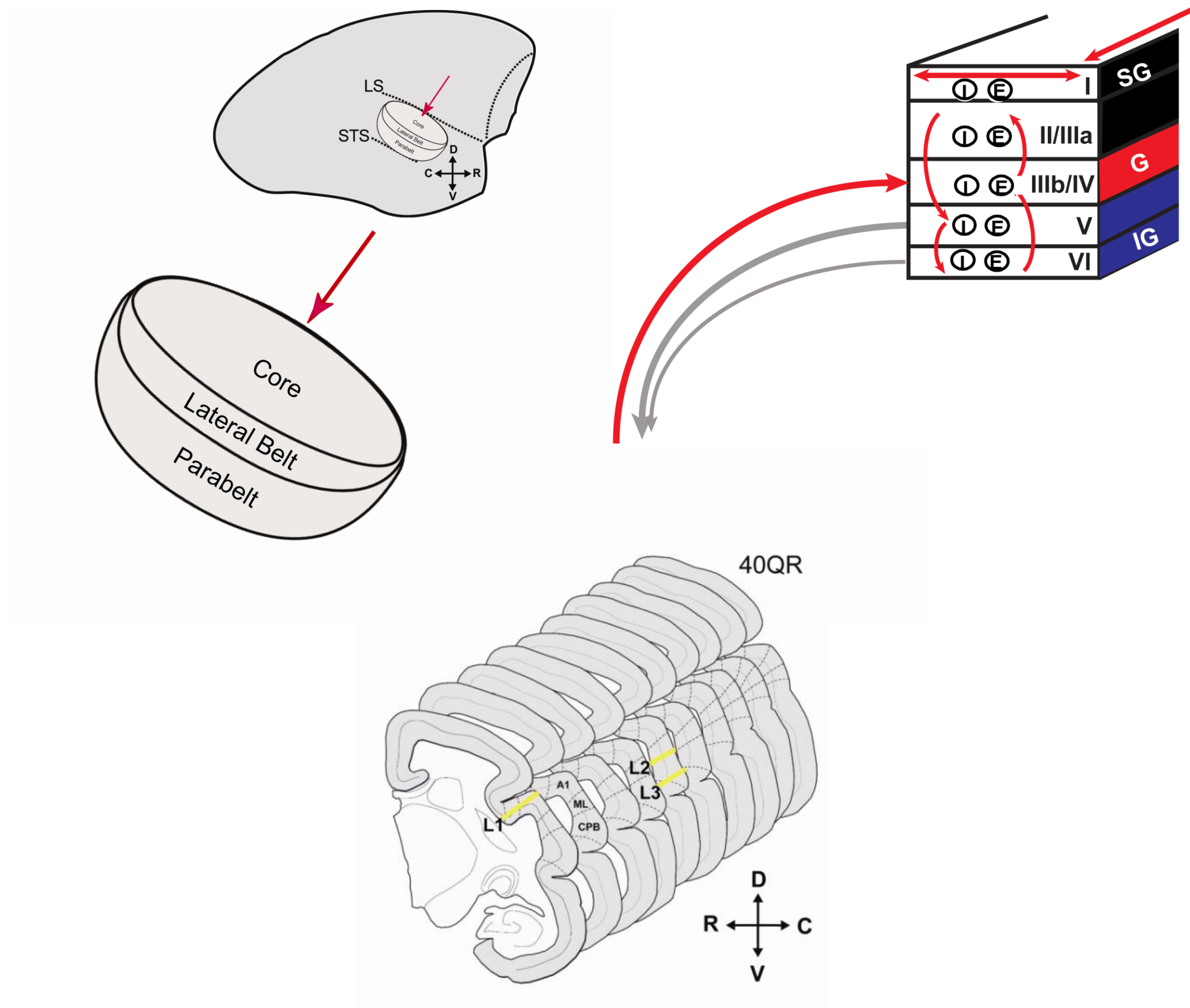


Systems Neuroscience – Understanding and predicting: data transfer, coding, and information optimization in the neural pathway

Systems Neuroscience – Understanding and predicting: data transfer, coding, and information optimization in the neural pathway

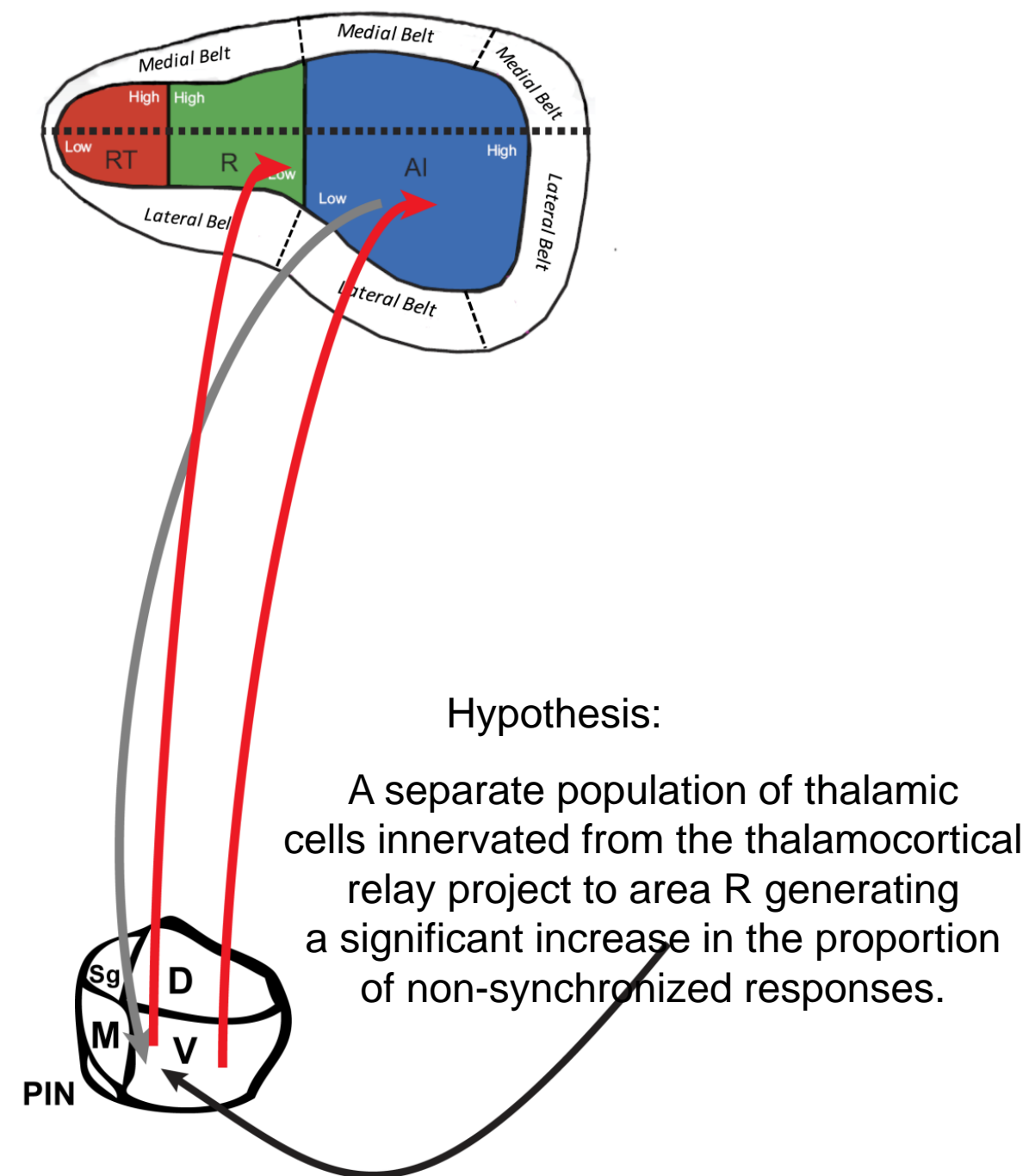


Systems Neuroscience – Understanding and predicting: data transfer, coding, and information optimization in the neural pathway



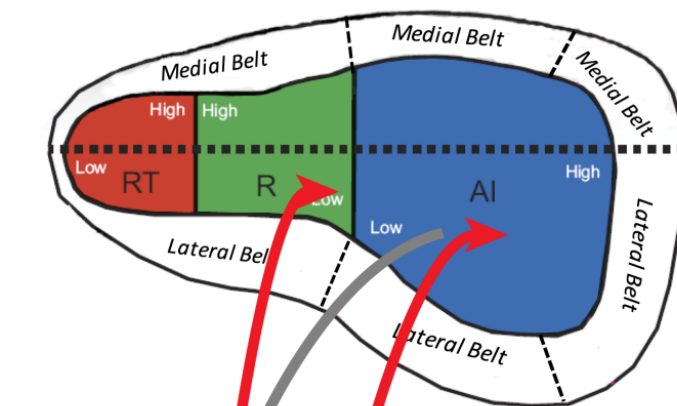
Goal: Understanding the Neural translations and dimensionality reductions that happen in the stimulus (content) to perception pathway (production).

What information matters? When do artifacts appear? What neural coding strategies preserve key features while others are lost?



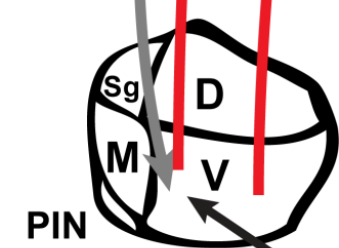
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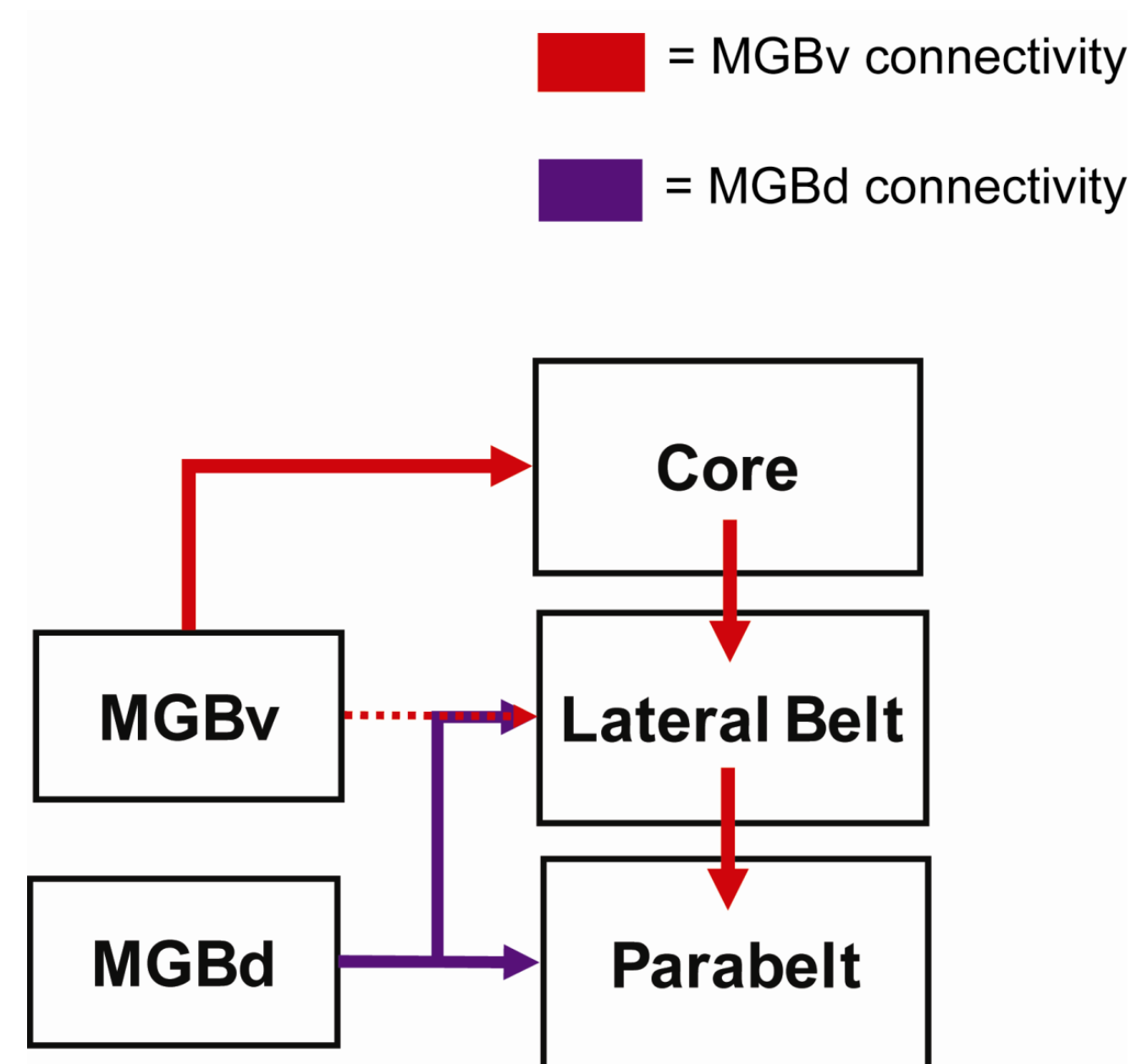
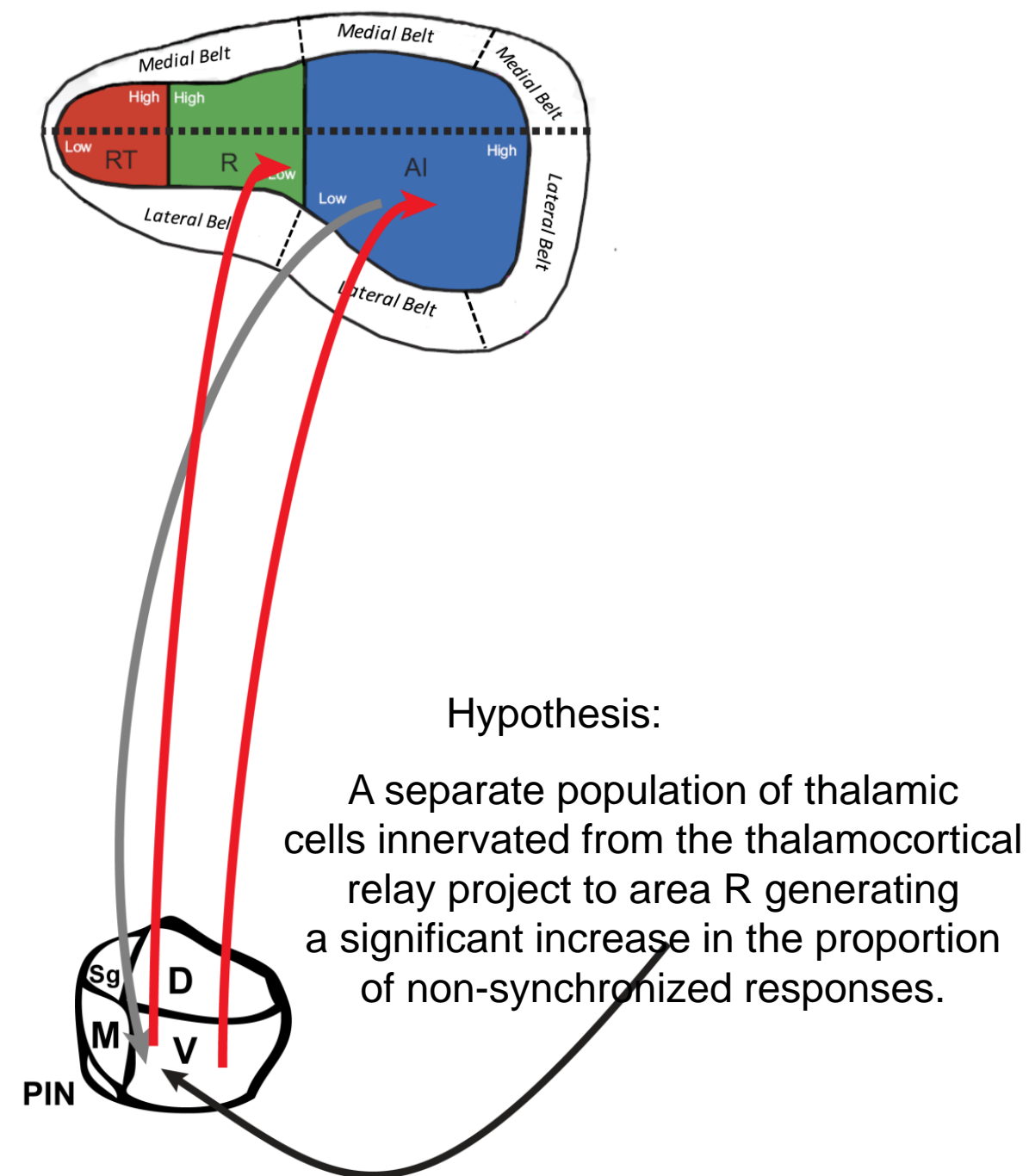
Hypothesis:

A separate population of thalamic cells innervated from the thalamocortical relay project to area R generating a significant increase in the proportion of non-synchronized responses.



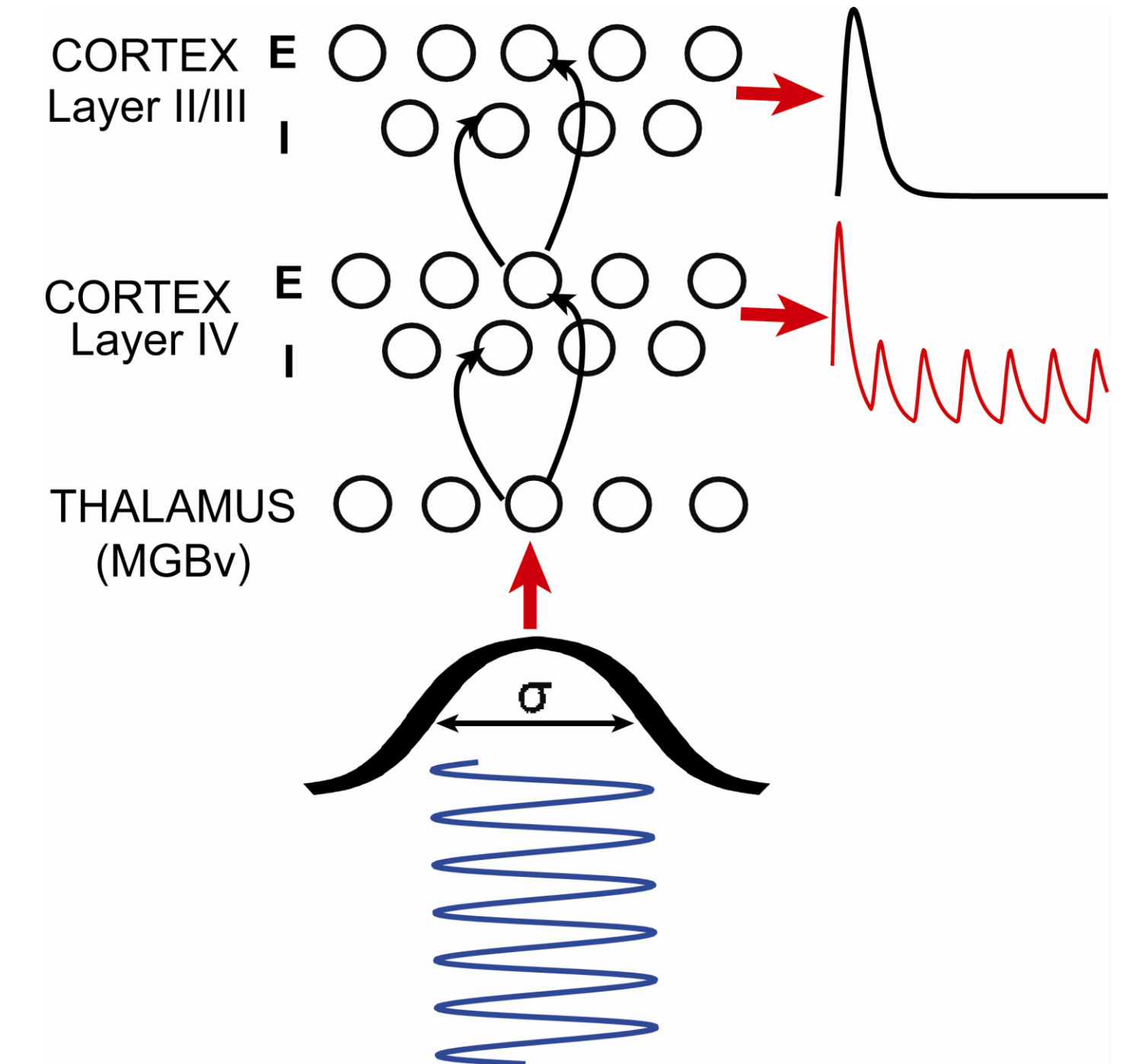
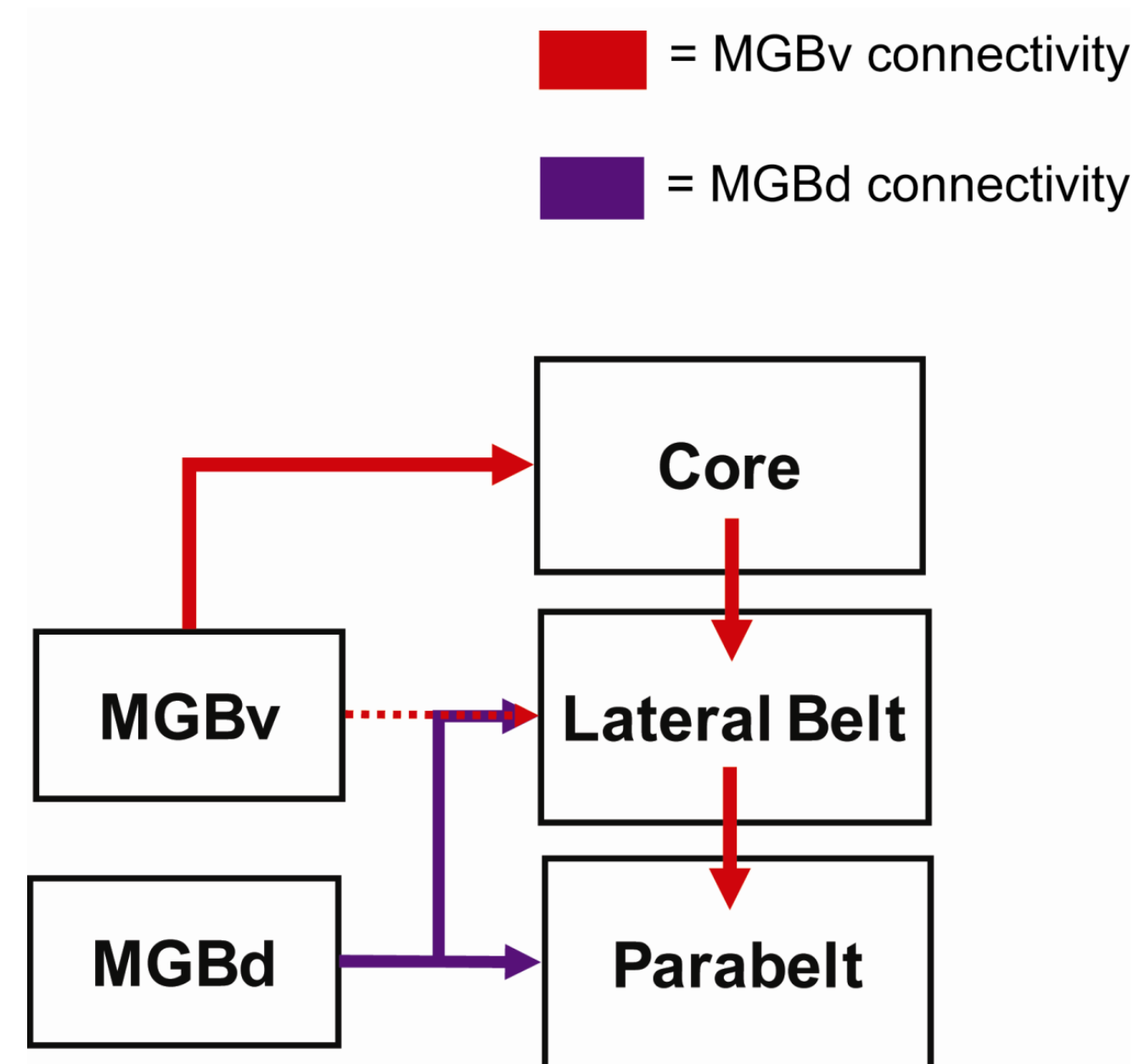
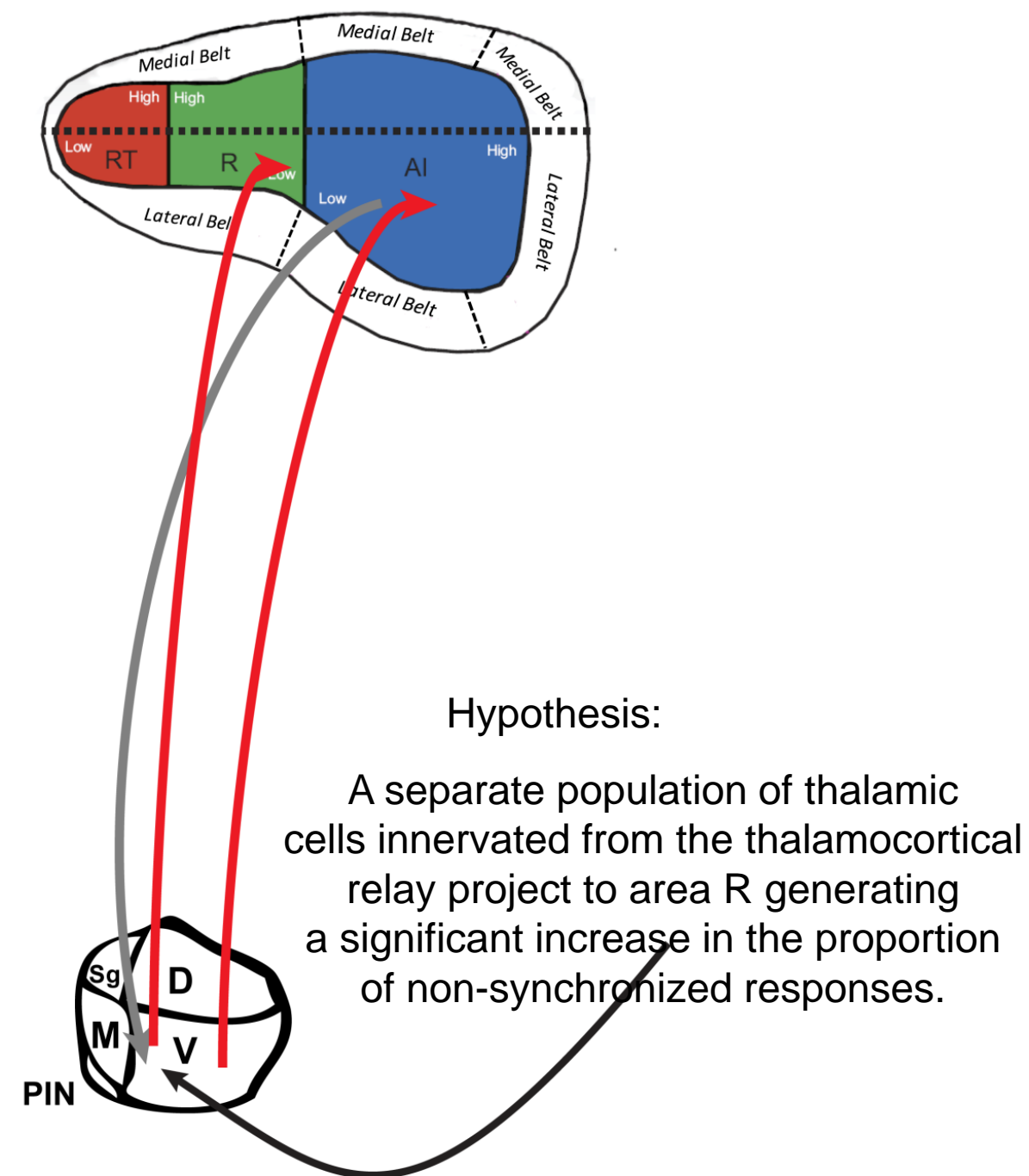
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What information matters? When do artifacts appear? What neural coding strategies preserve key features while others are lost?



Are we capturing the right code to preserve the creation intent
of future experiences?



Are we capturing the right code to preserve the creation intent
of future experiences?

Can new technologies change how we think
about preserving the experience of our media?



Are we capturing the right code to preserve the creation intent of future experiences?

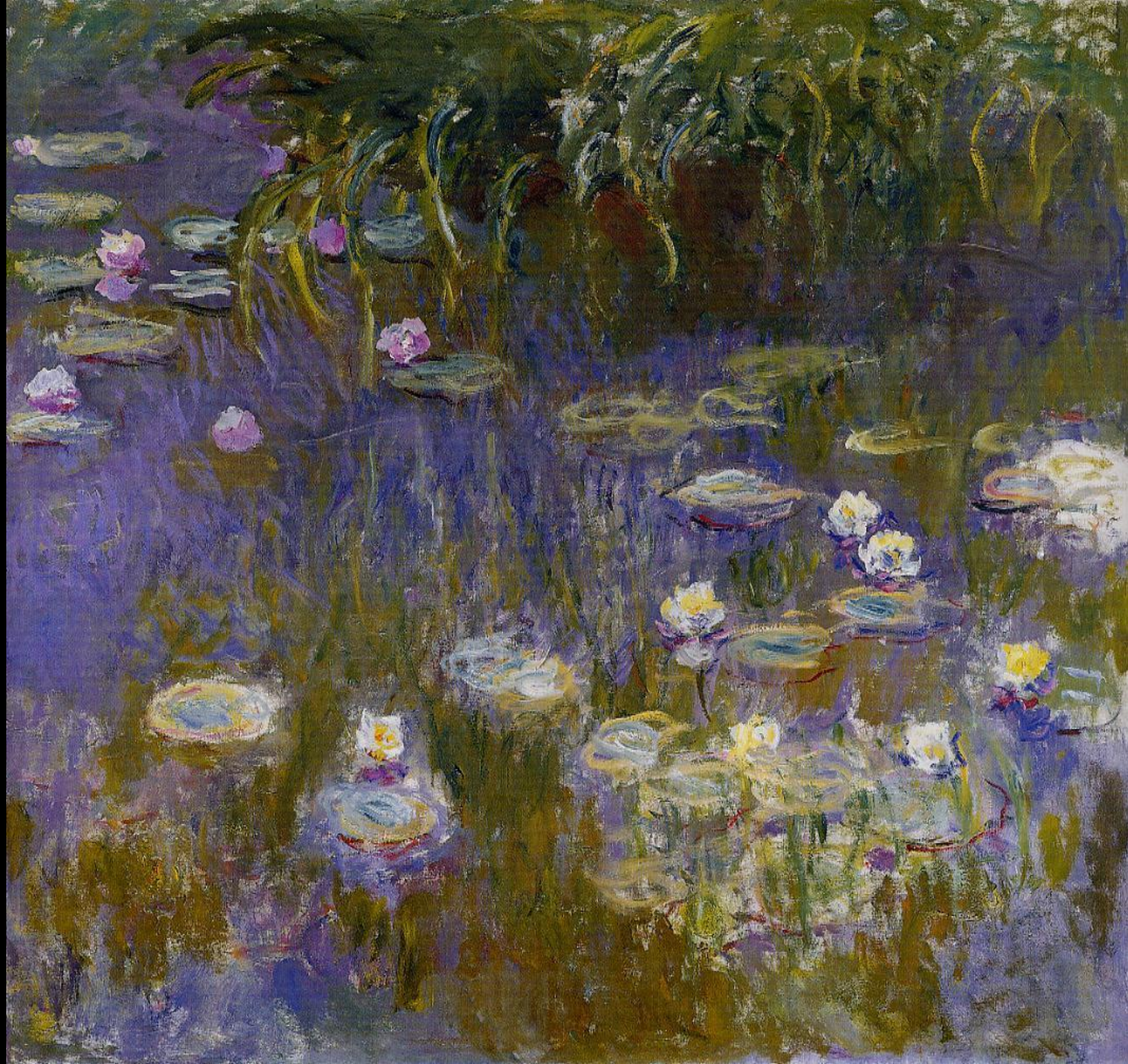
Can new technologies change how we think about preserving the experience of our media?



If we expect future content consumption environments to close the loop between our media and human response, how should our technology react? Are we ready?

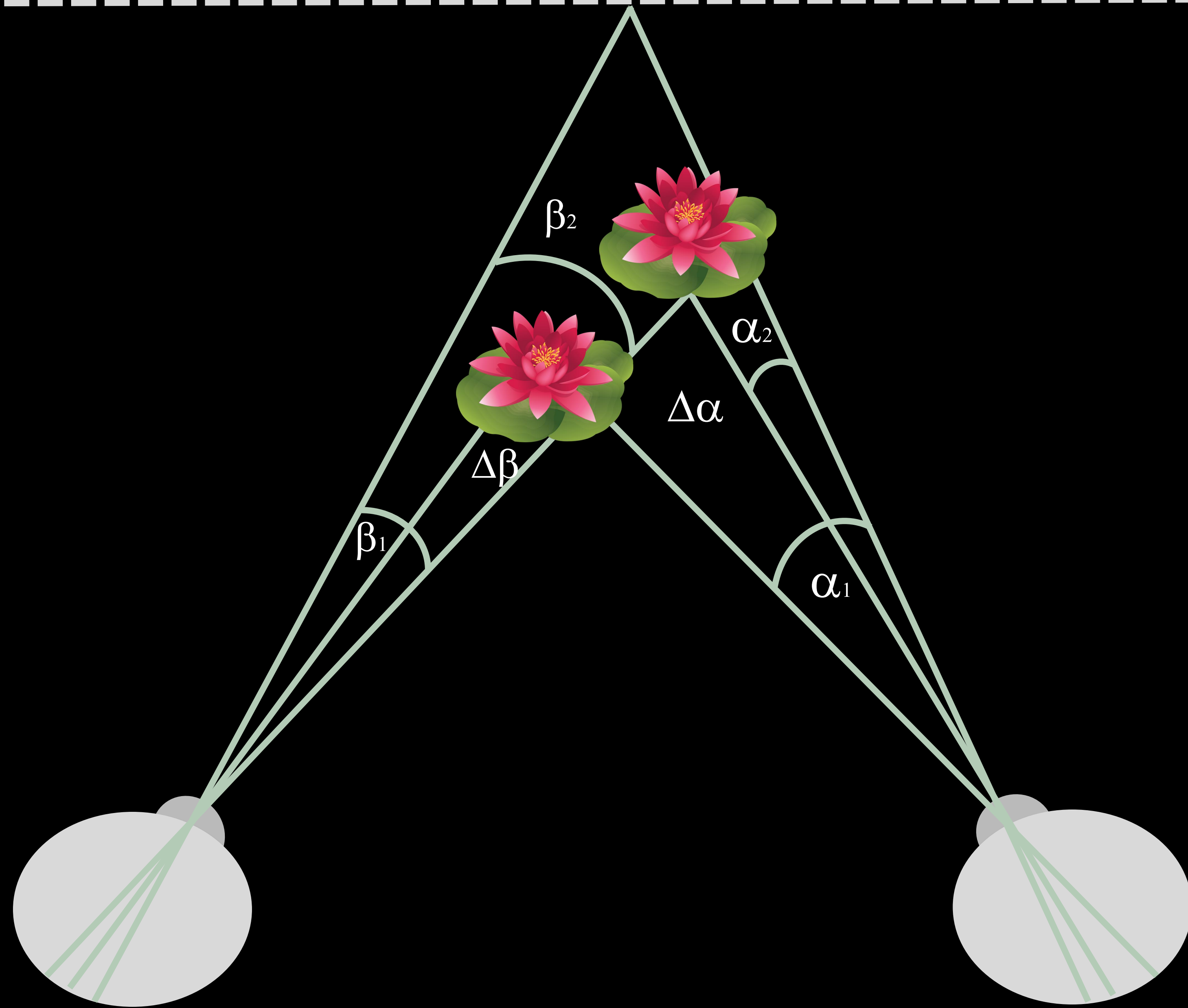
Intent

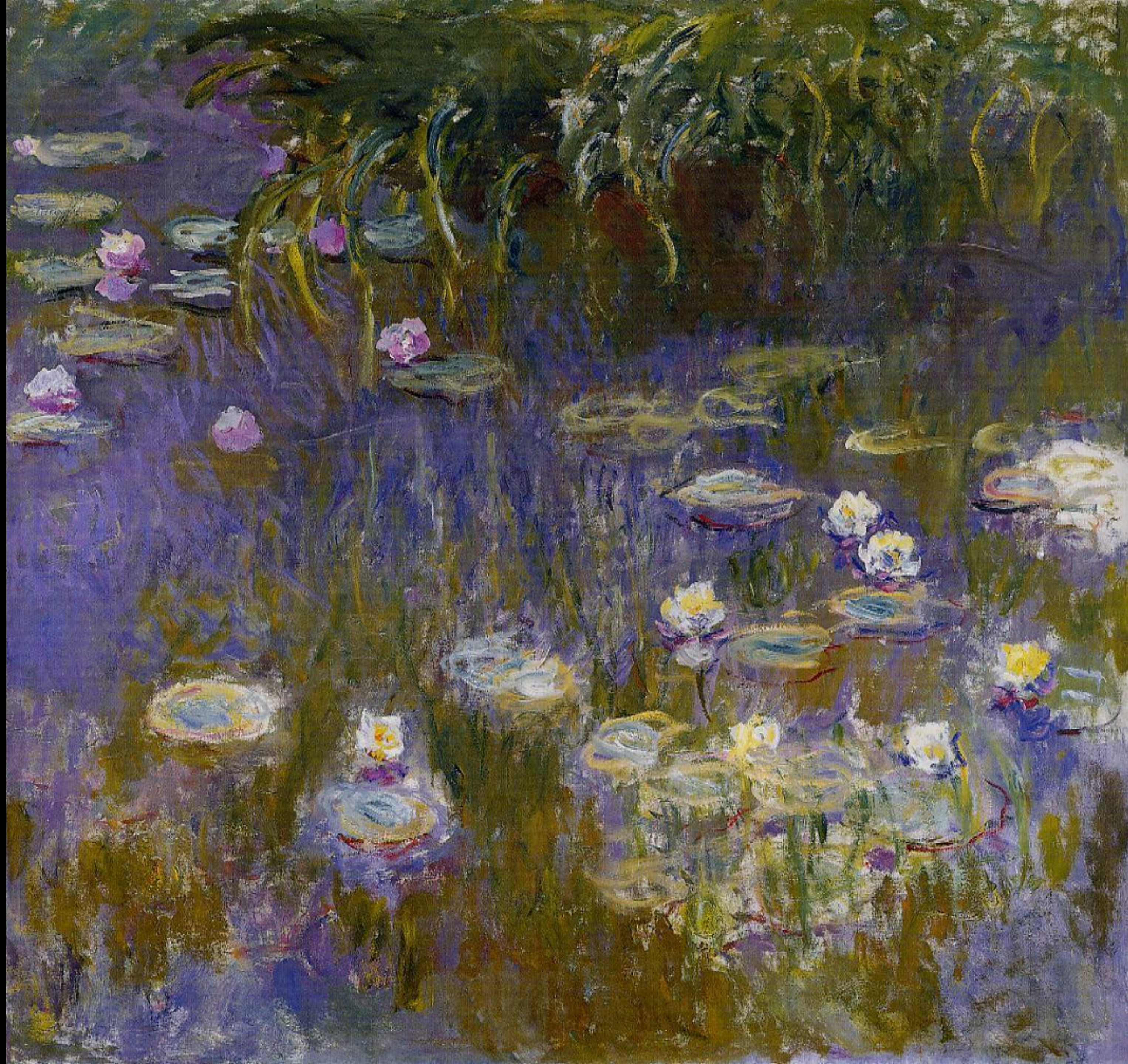


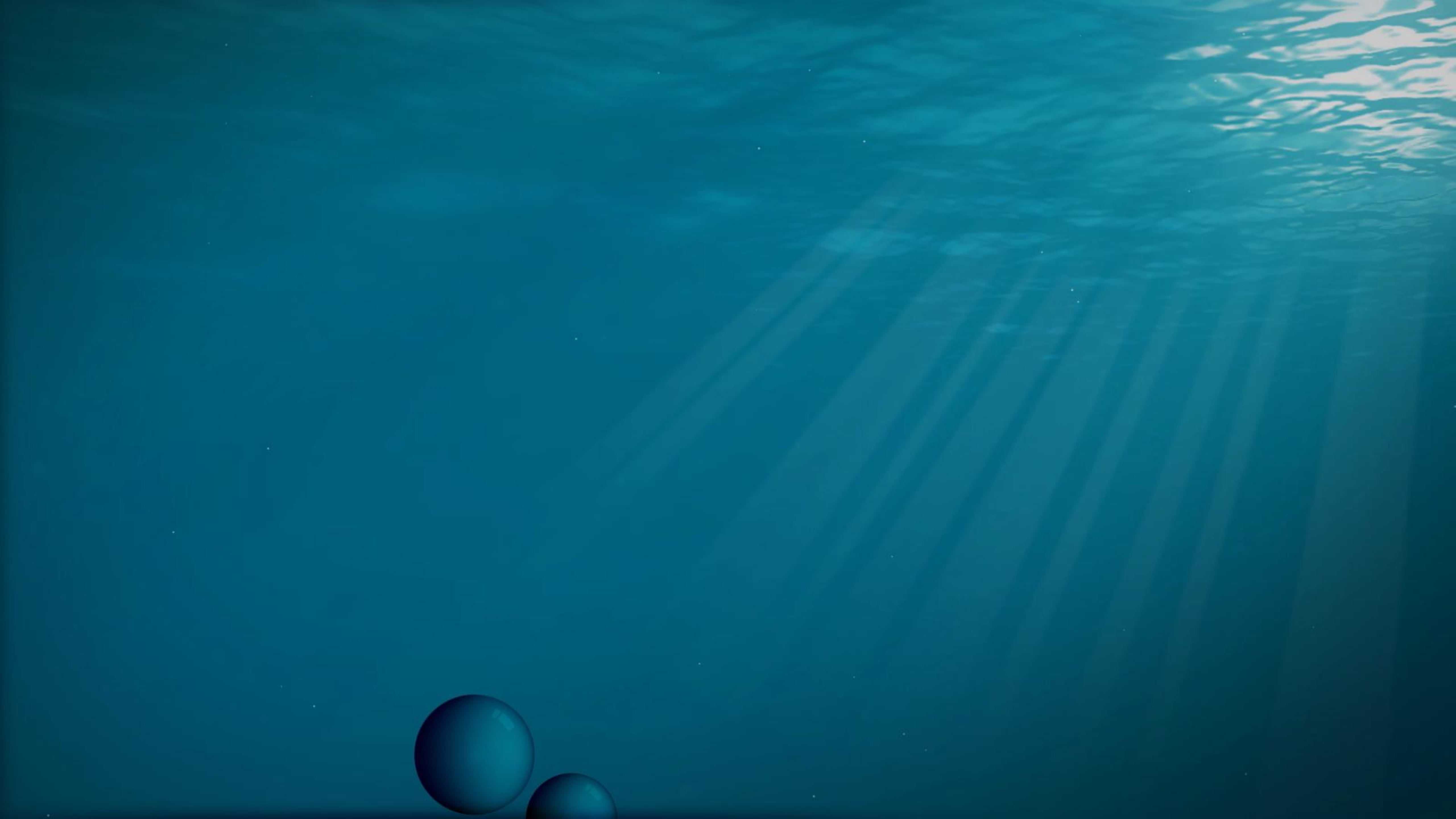


Relative Disparity – Stereoscopic Depth Cues

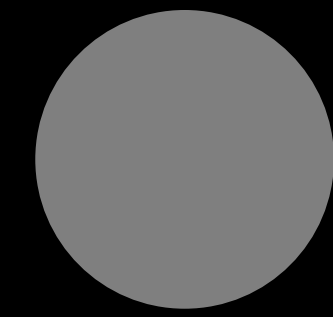
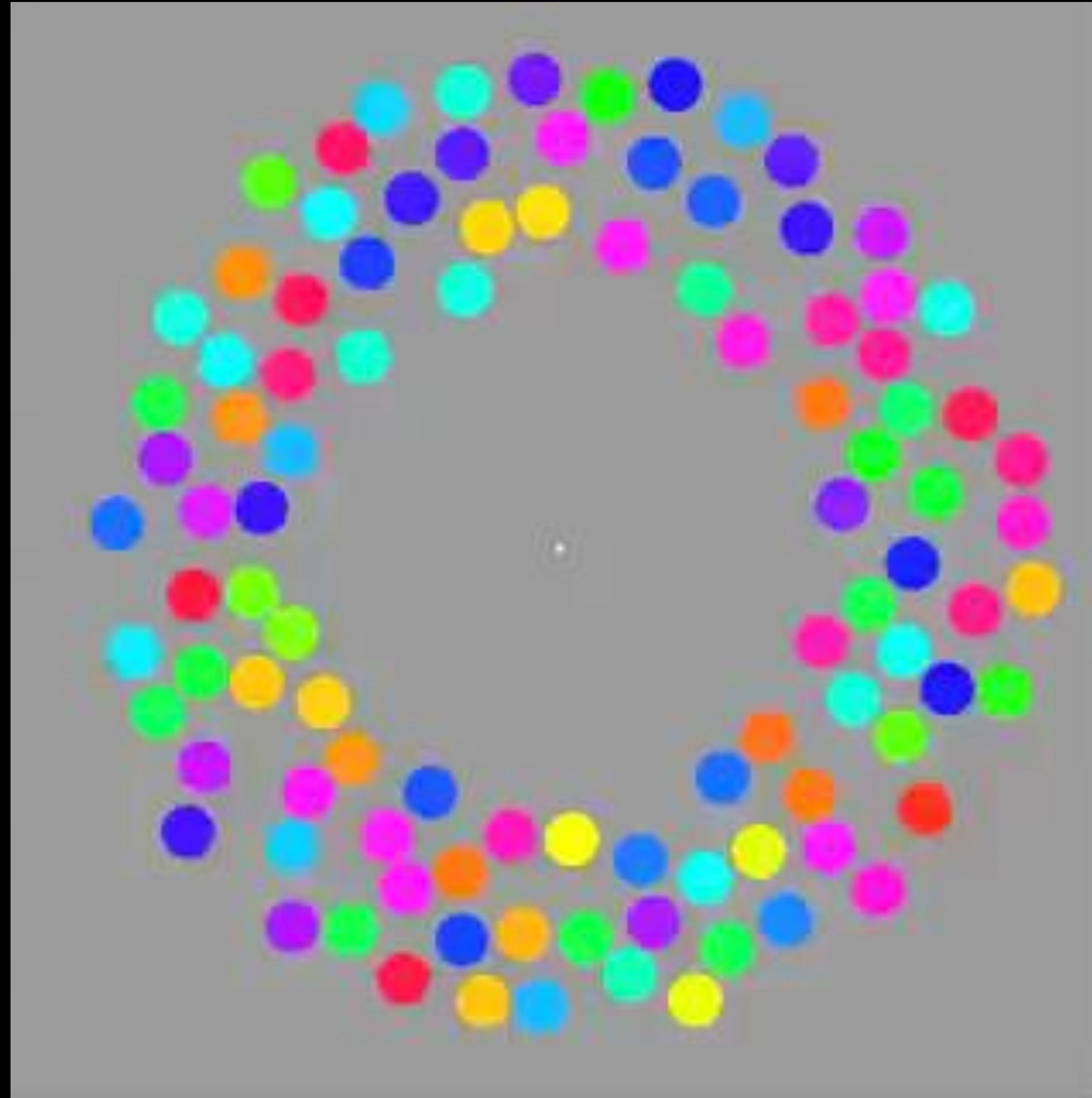
$$d_{rel} = d_{abs1} - d_{abs2} = (\alpha_1 - \beta_1) - (\alpha_2 - \beta_2) = \Delta\alpha - \Delta\beta$$



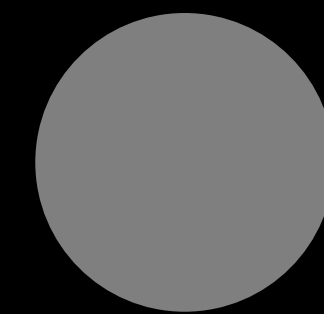
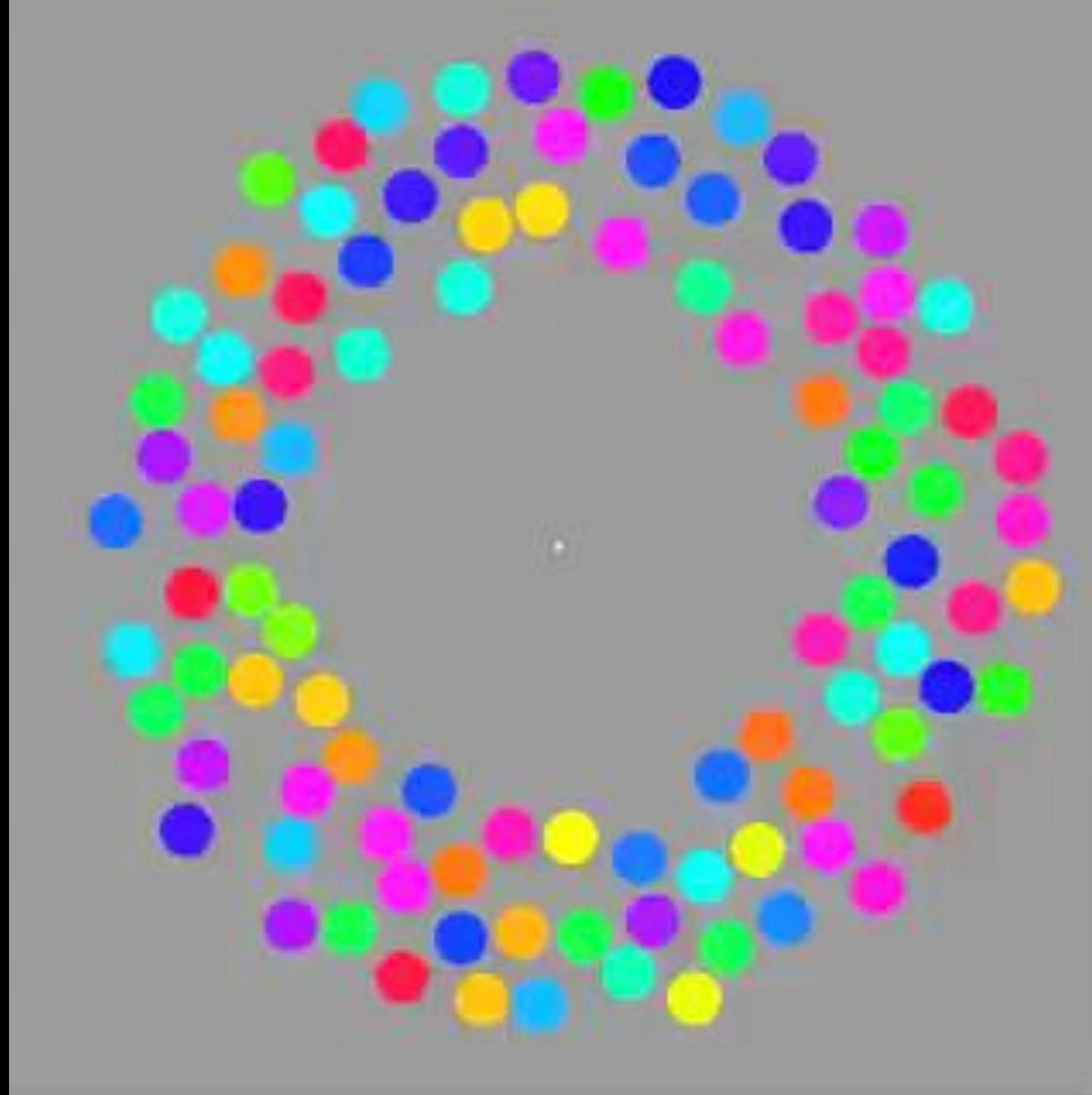




Perceptual Interactions- Perceptual Coding- Dimensionality Reduction?



Perceptual Interactions- Perceptual Coding- Dimensionality Reduction

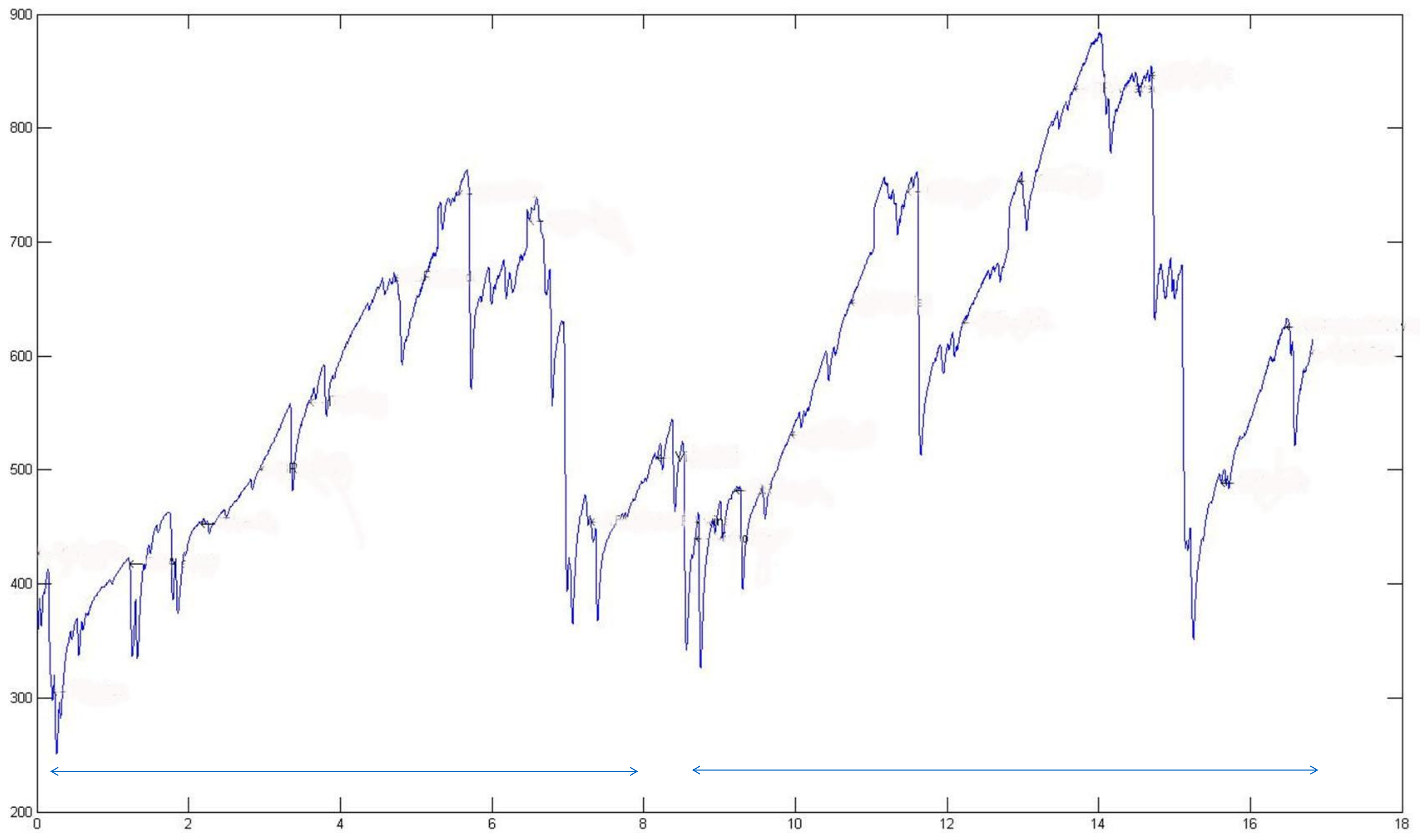




FOVE

Insight



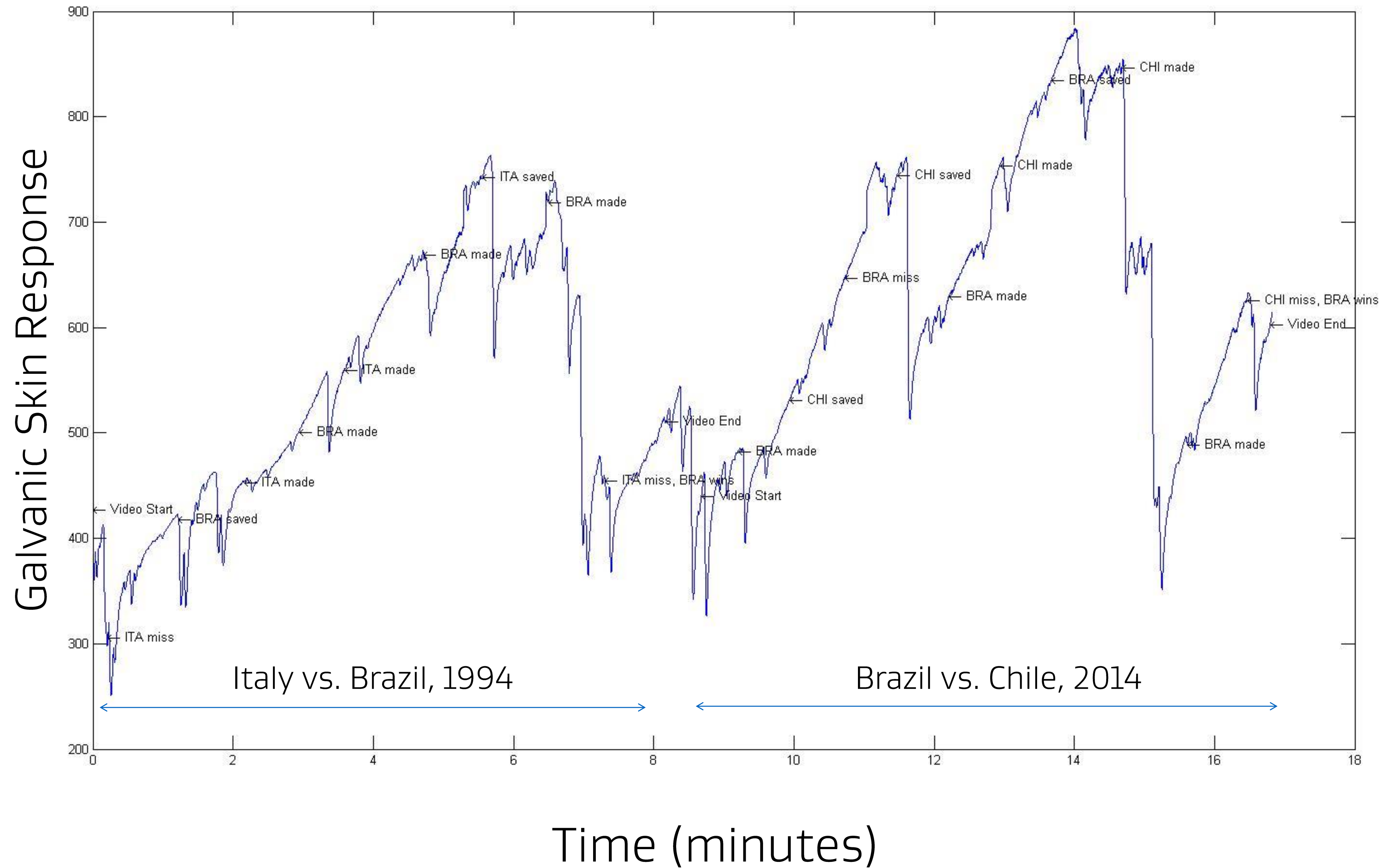




POWERADE

POWERADE

Sensors track our internal states – predicting and anticipating our experiences

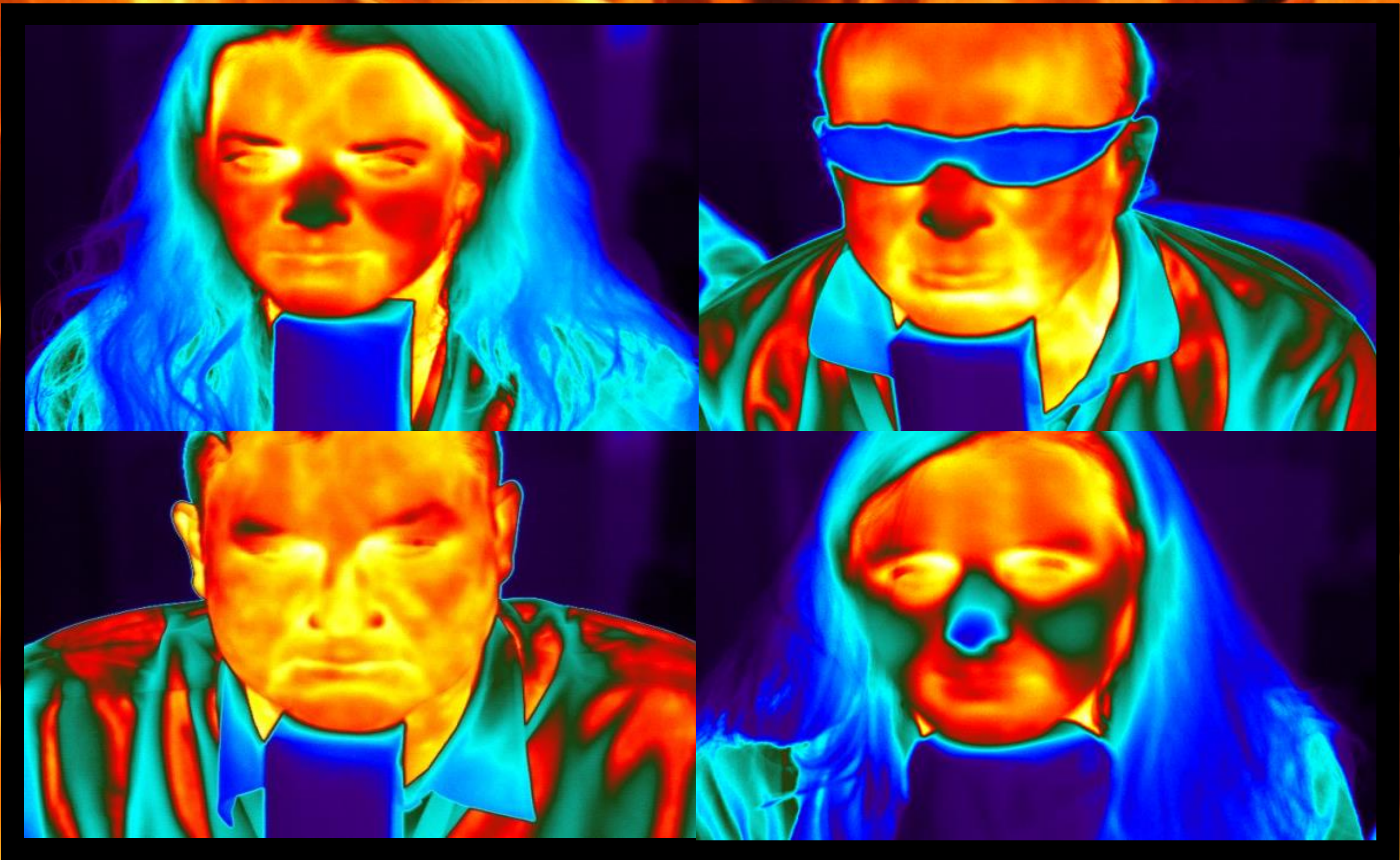


Reflection of the Creator's Intent



Immersive Physiological Experience

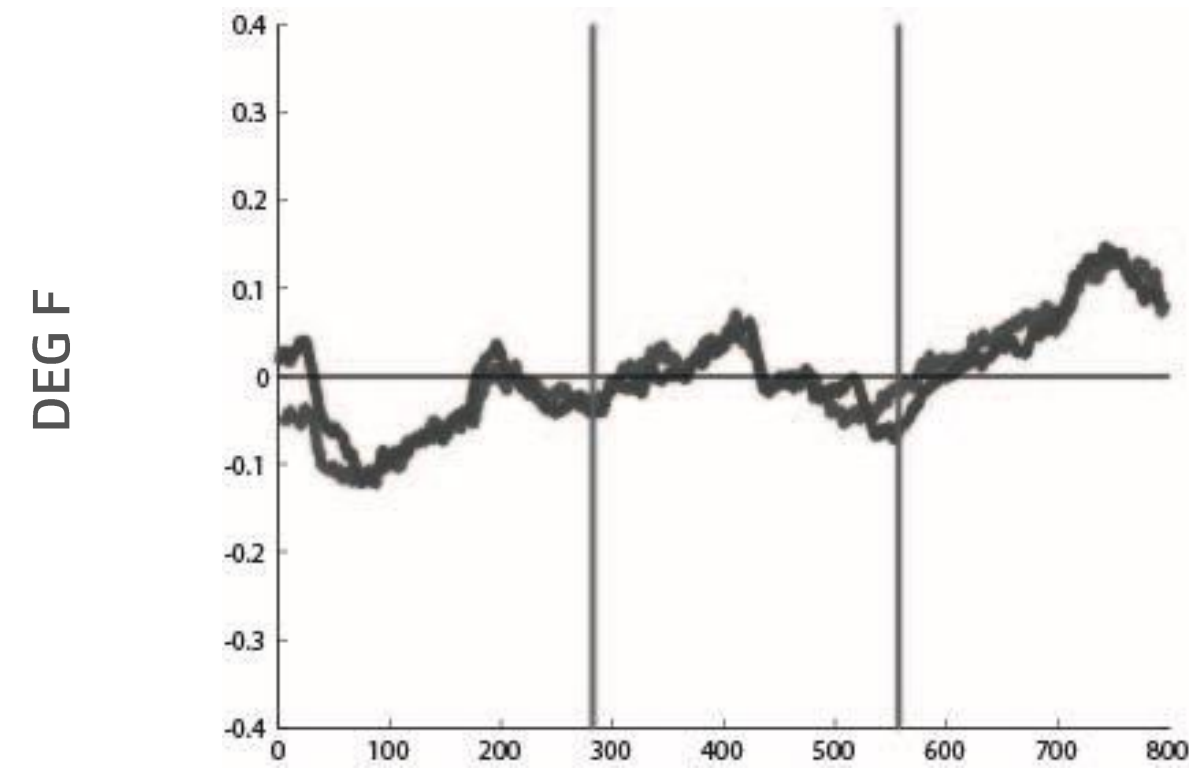




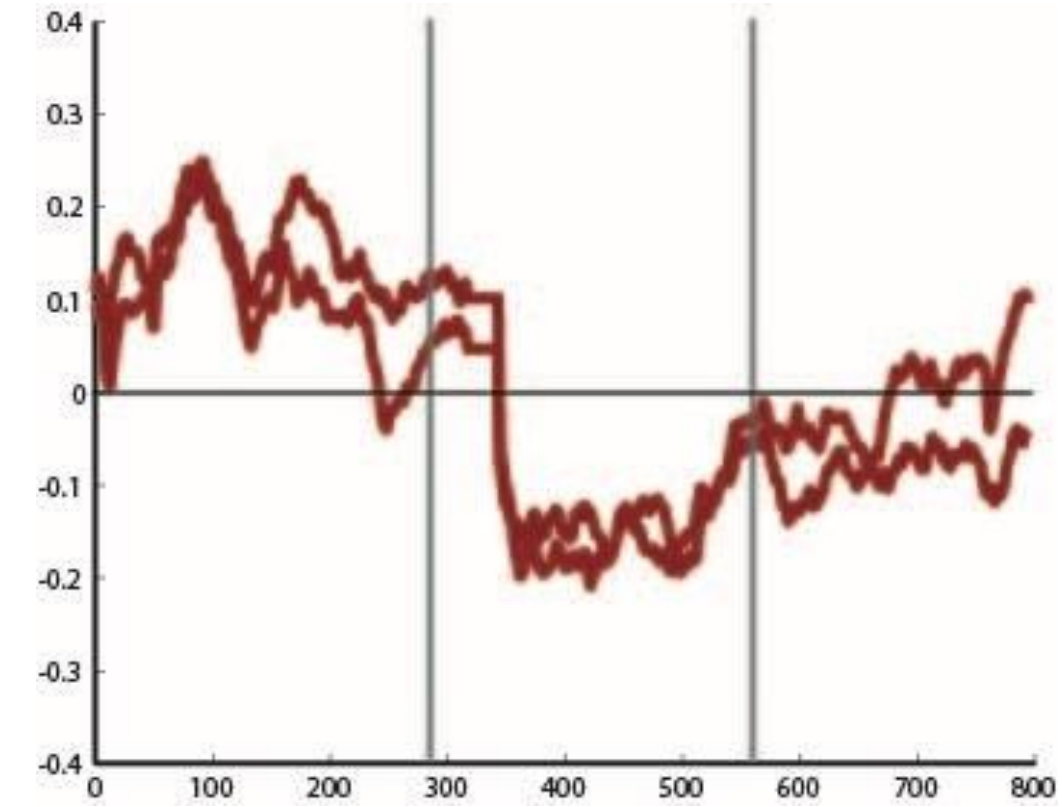


Change in Facial Temperature Viewing High Dynamic Range Flame

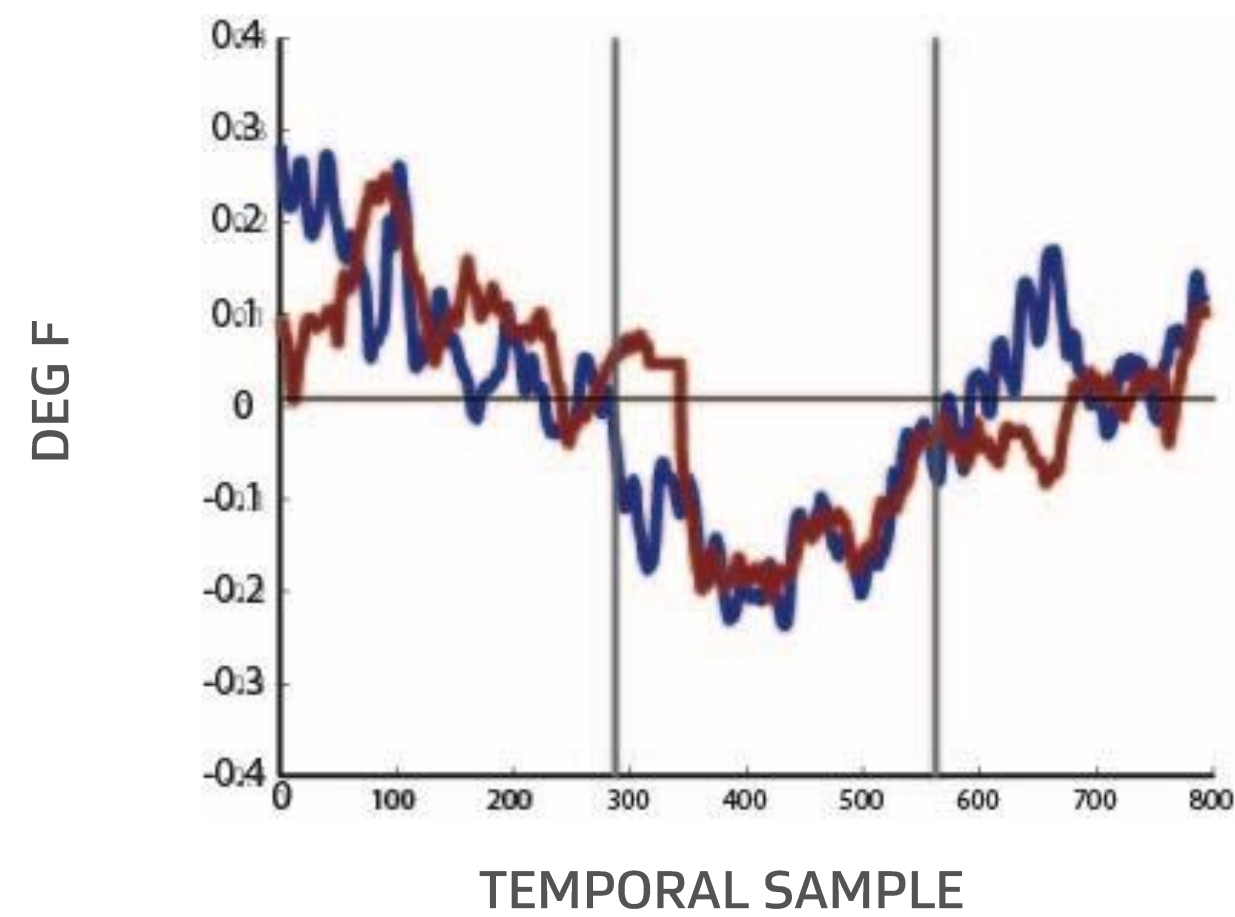
CONTROL SURFACE



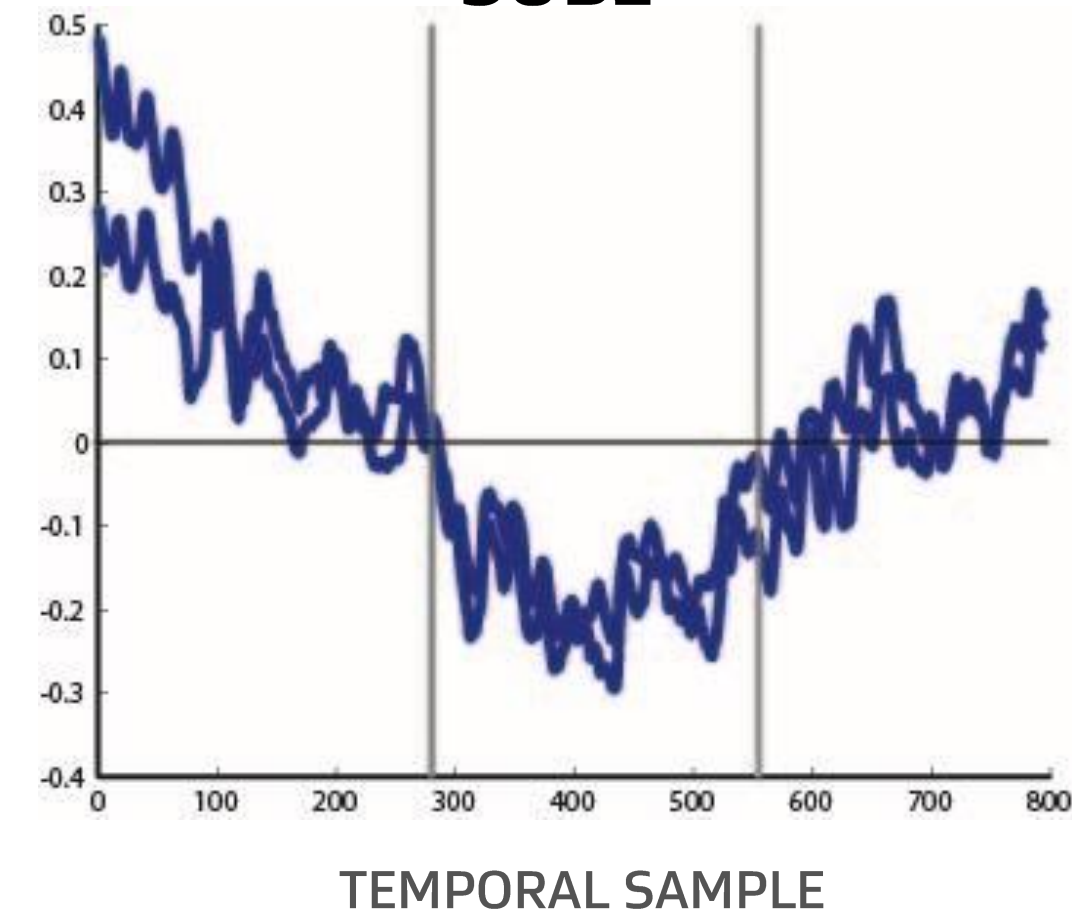
SUB1



SUB1/SUB2 ROI - 1



SUB2



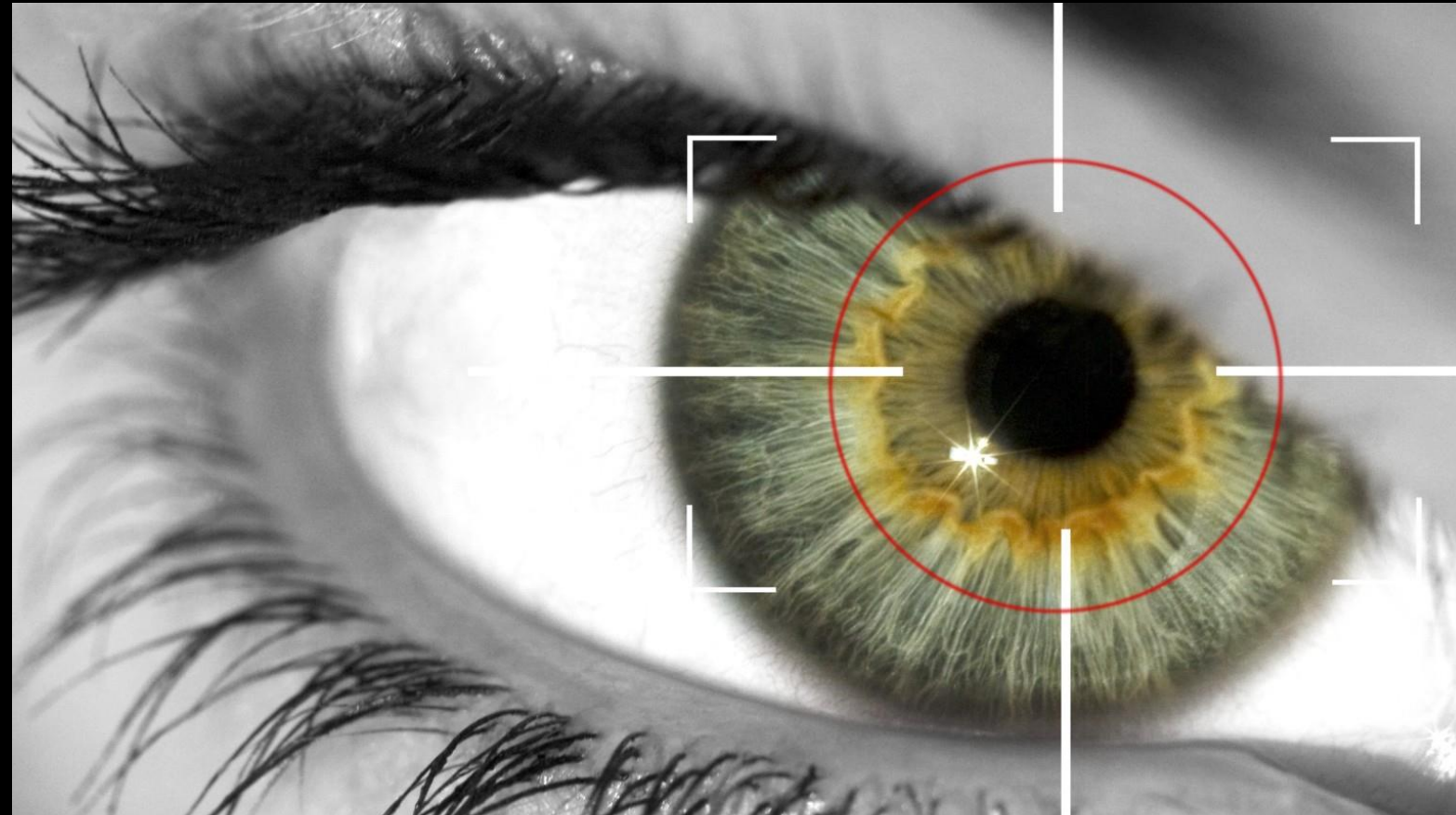
—
Indicates approx.
temporal appearance
of flame in content

Sensors track our internal states – predicting and anticipating our experiences

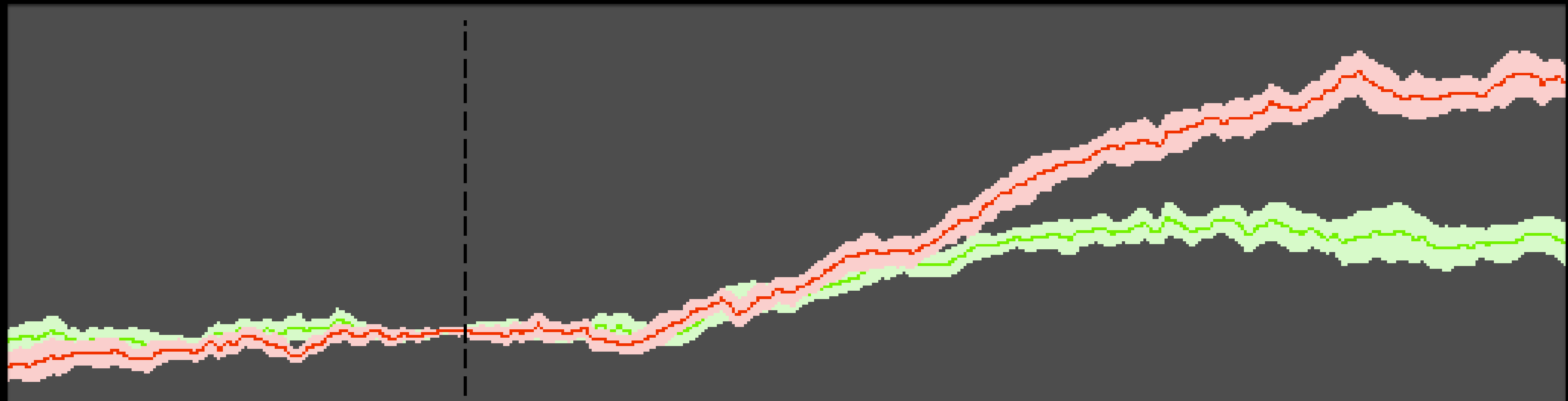
- Heart rate (HR)
- Thermal imaging
- Facial emotion estimation
- Eye-tracking and pupillometry
- Galvanic Skin Response (GSR)
- Electroencephalogram (EEG):
 - Band power measurements (alpha, etc.)
 - Event related potentials (ERPs)
 - SSVEPs
- In-Ear or wearable -- Ubiquitous



Sensors track our internal states – predicting and anticipating our experiences



Pupil Diameter

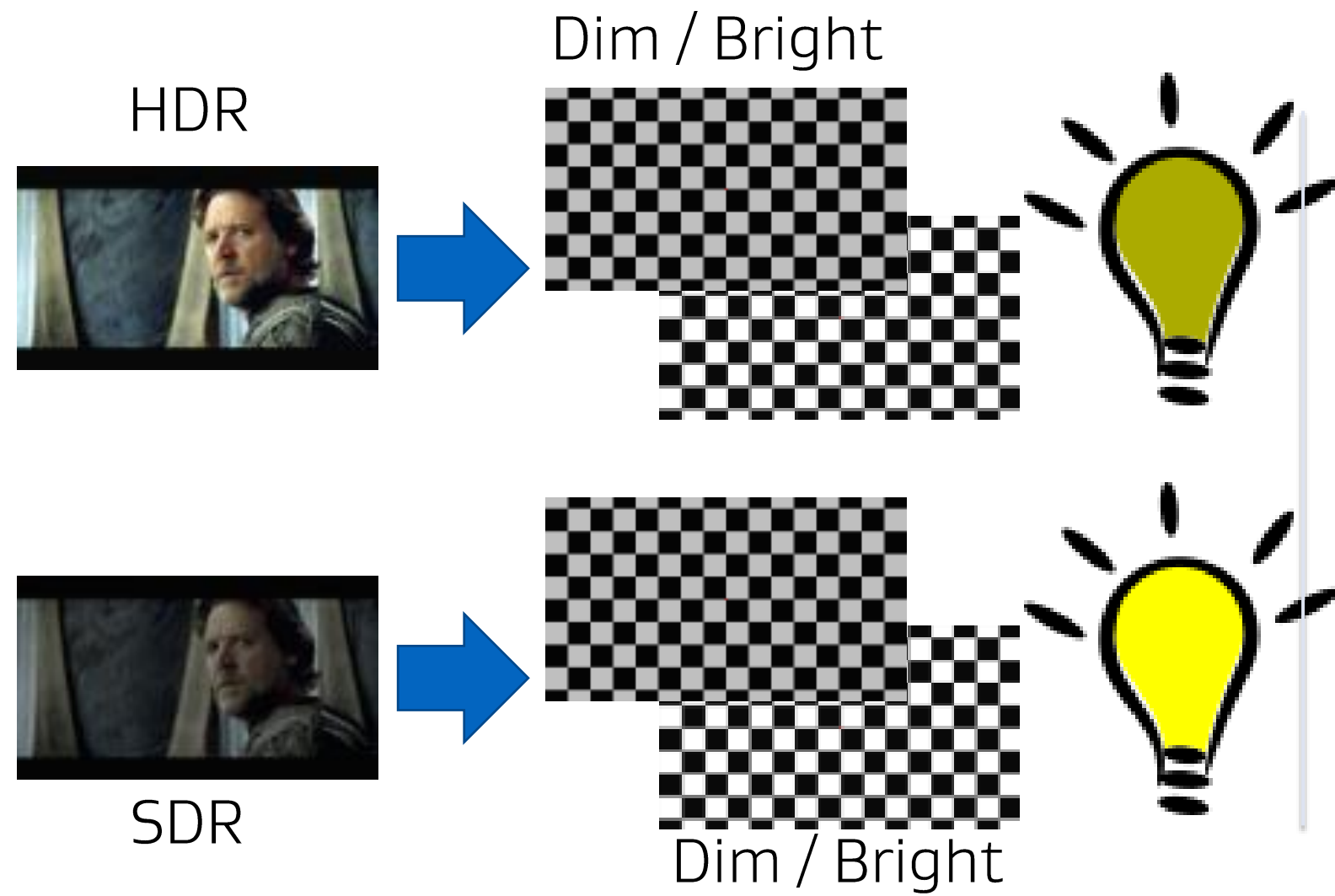


Competing Talkers

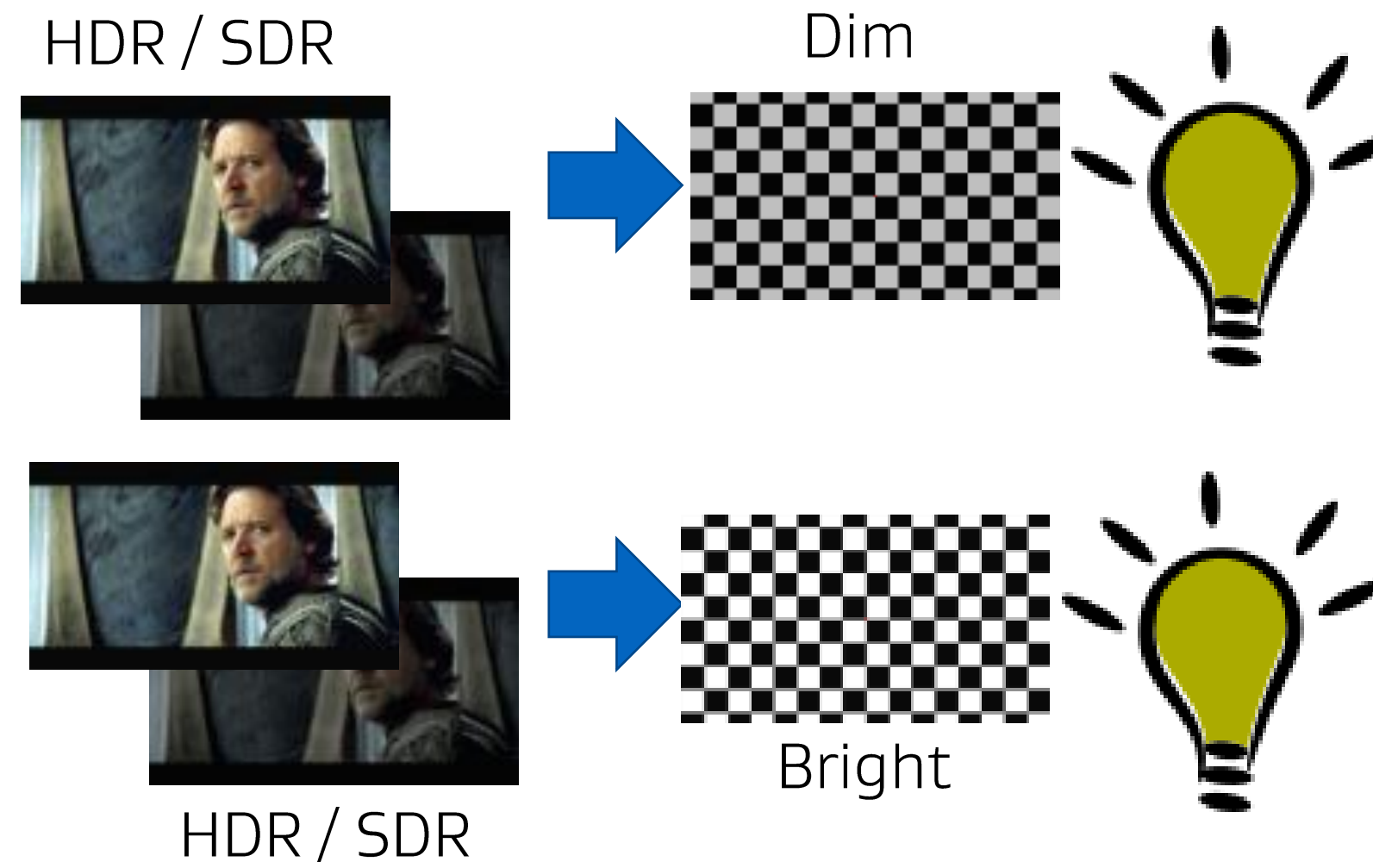


DD Evoked P300 responses indicate increased engagement under HDR viewing conditions

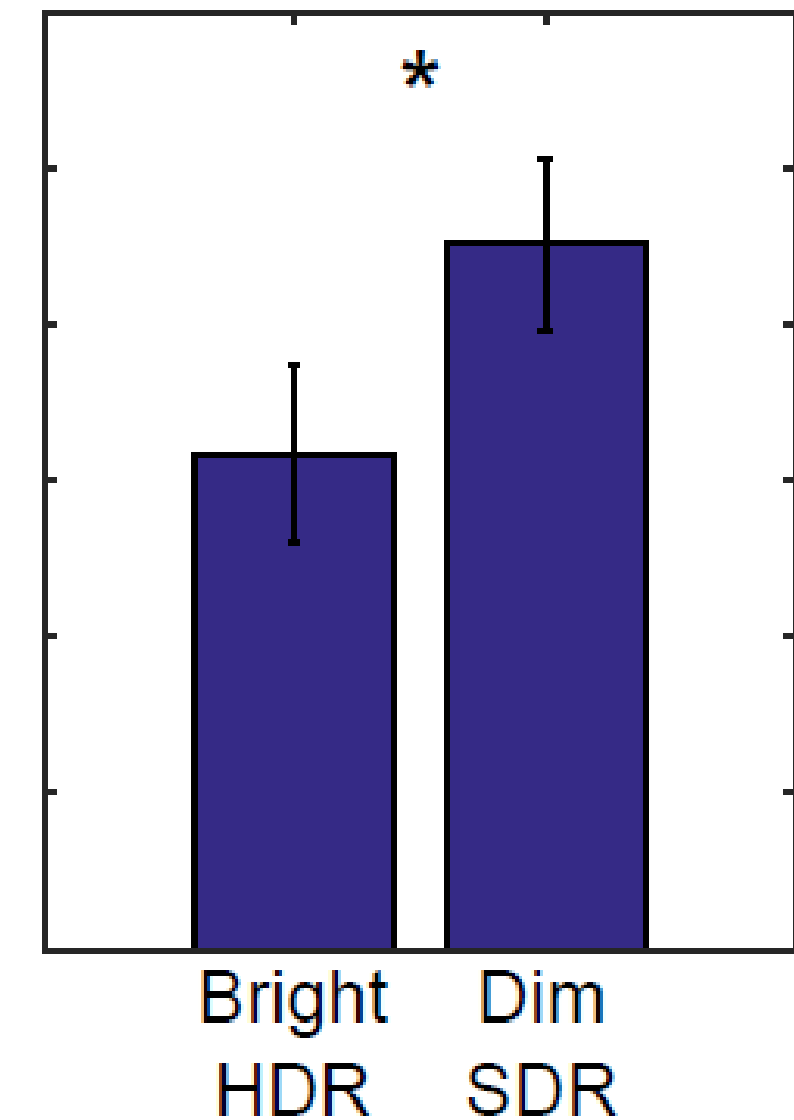
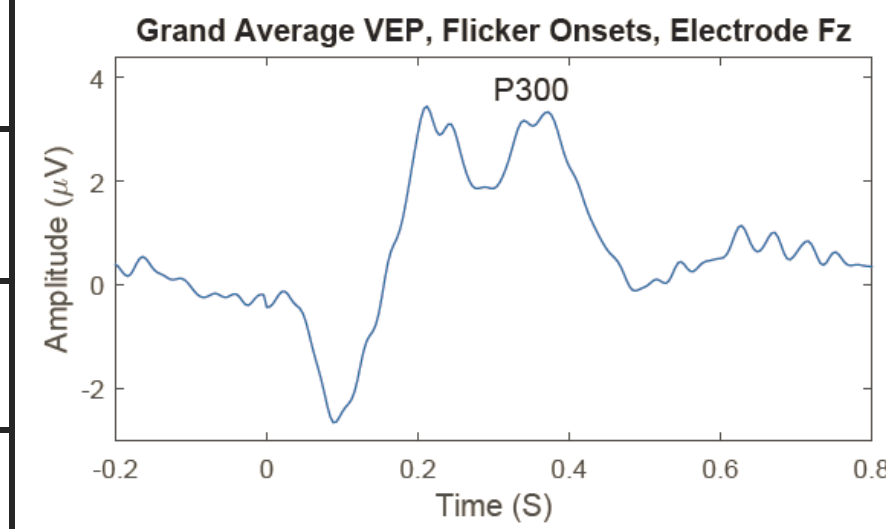
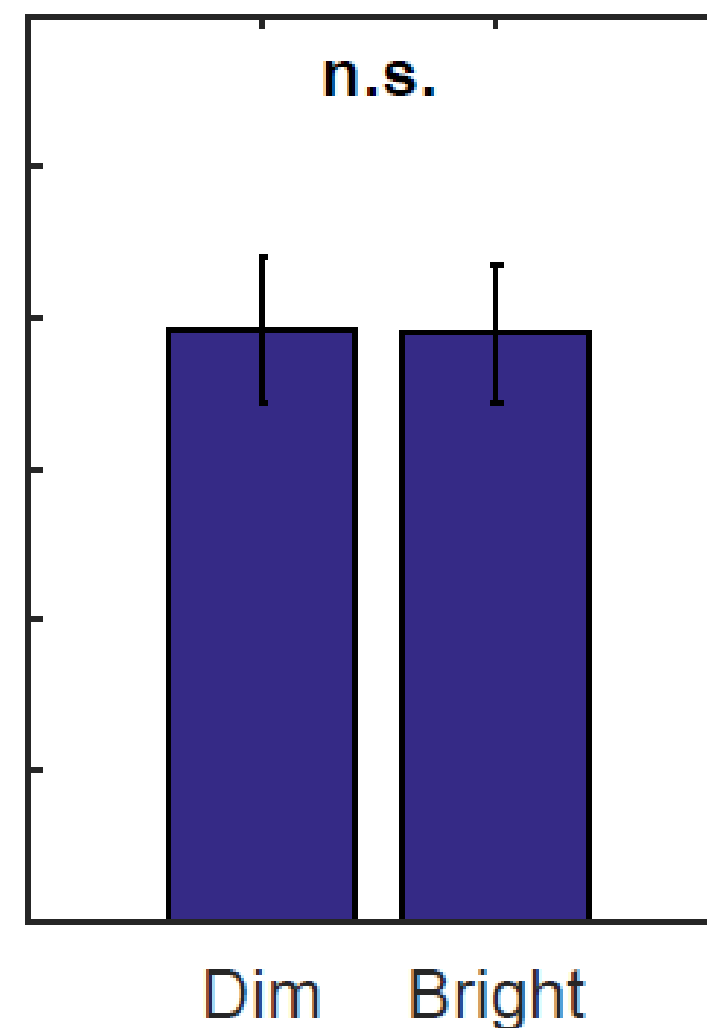
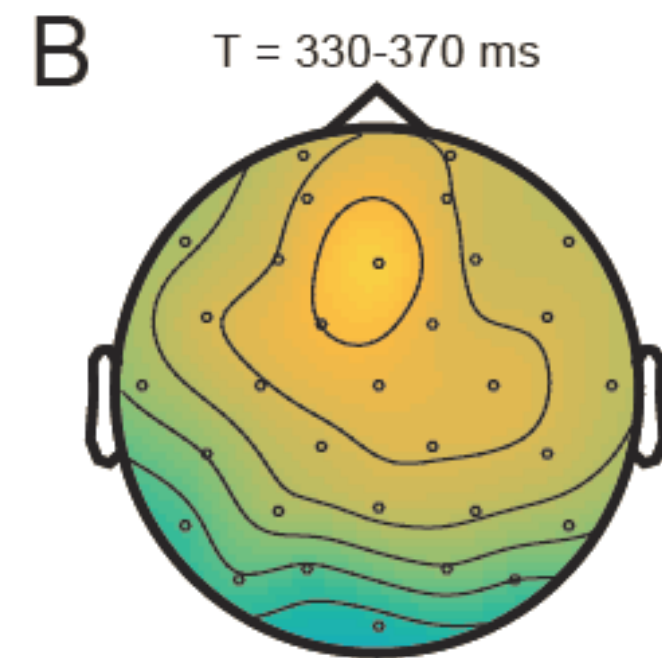
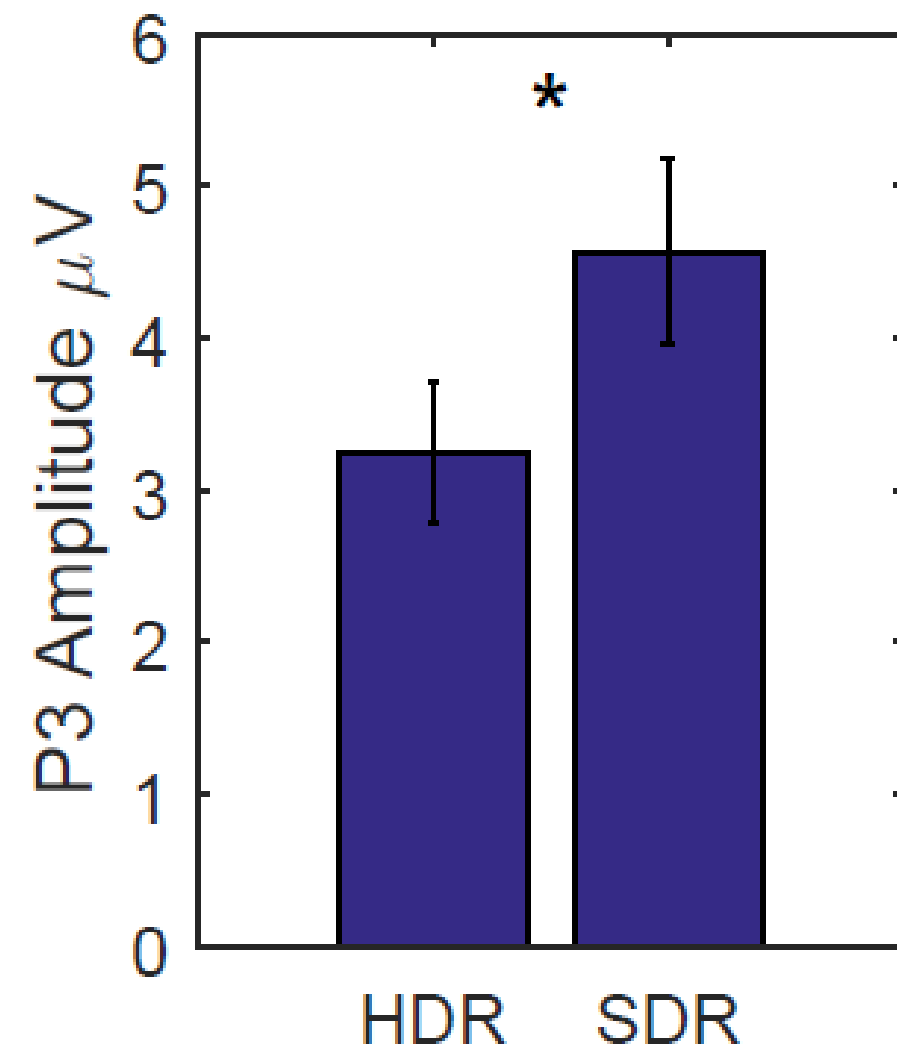
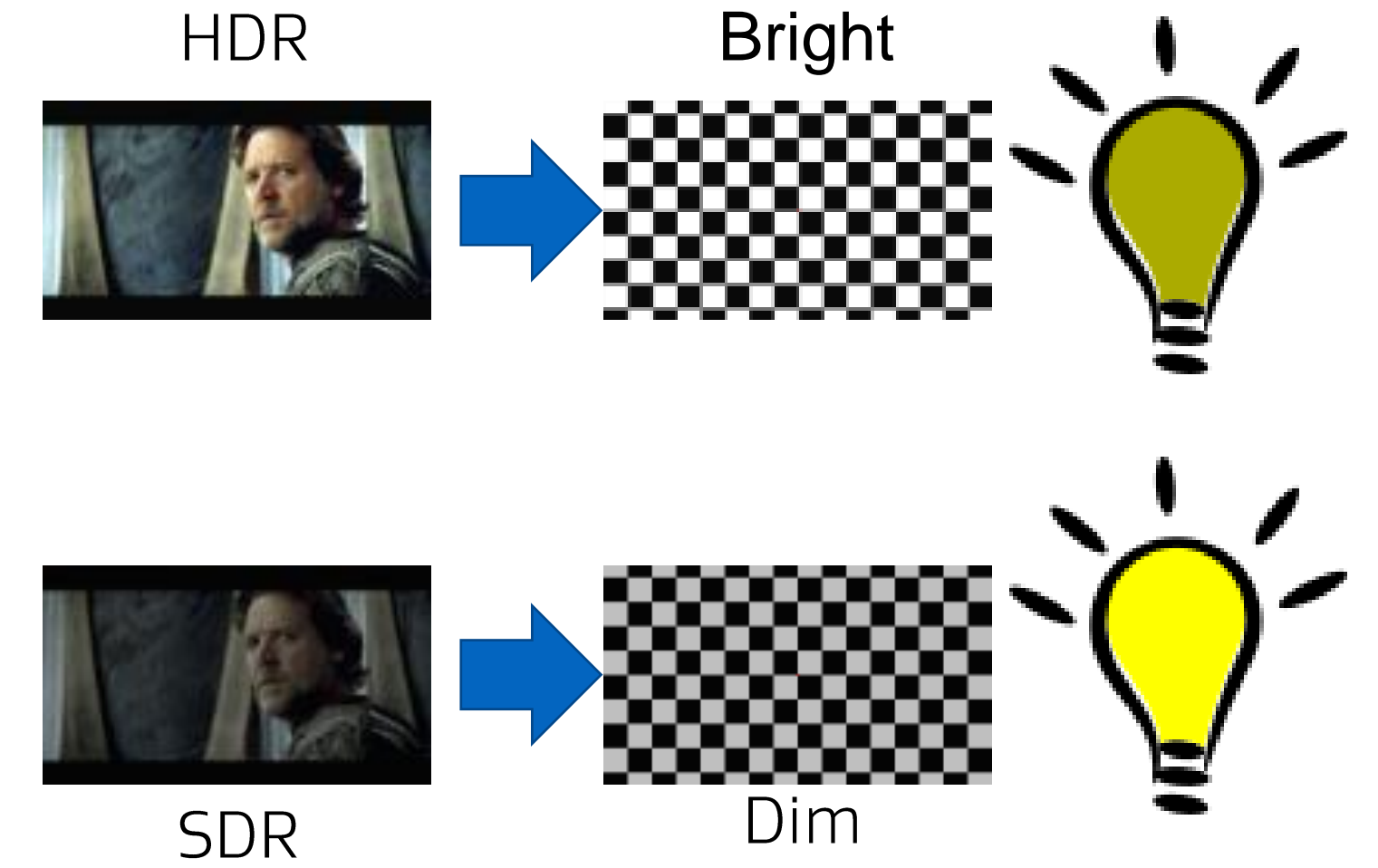
P300 Suppressed by HDR



Contribution of stimulus intensity

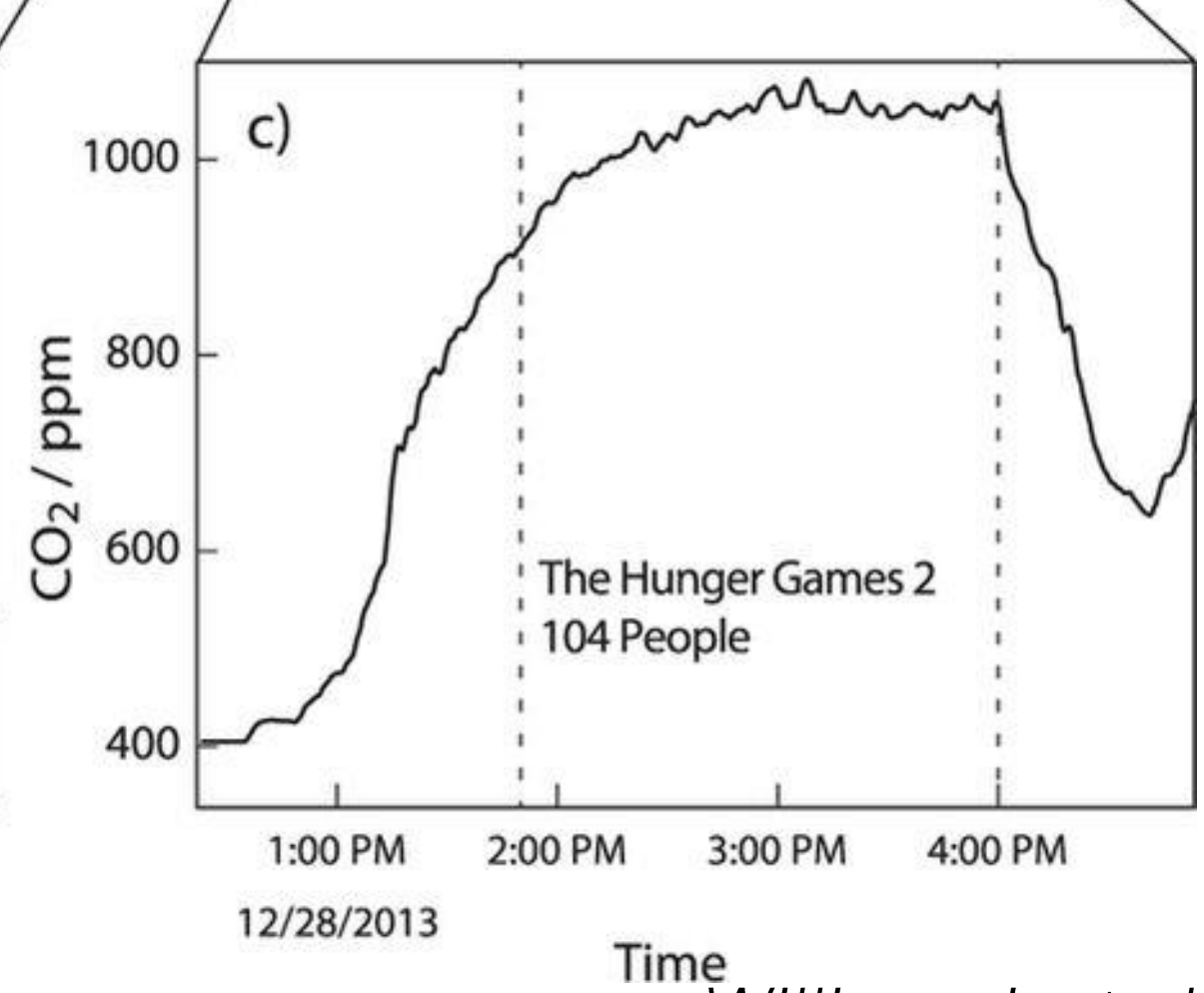
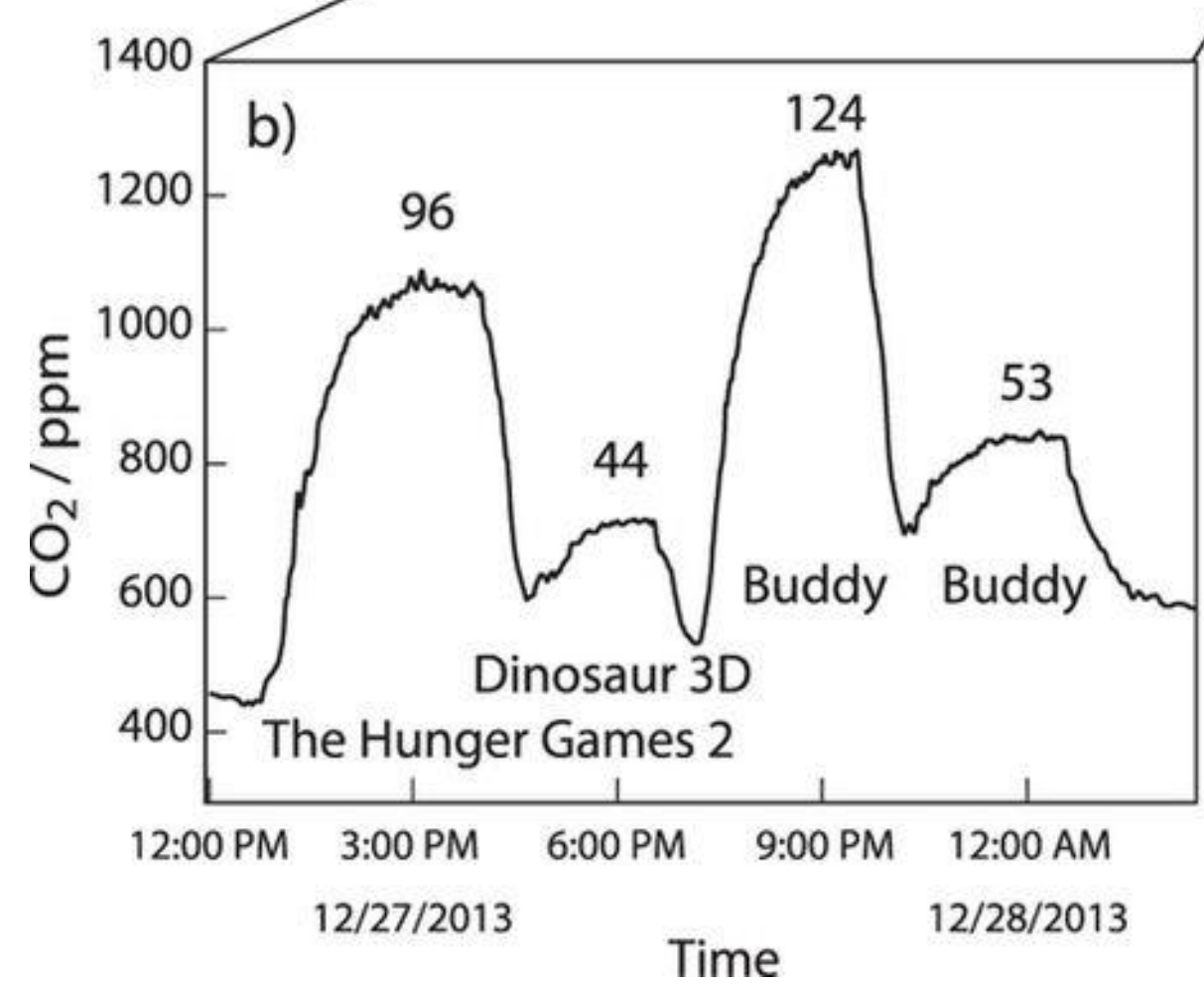
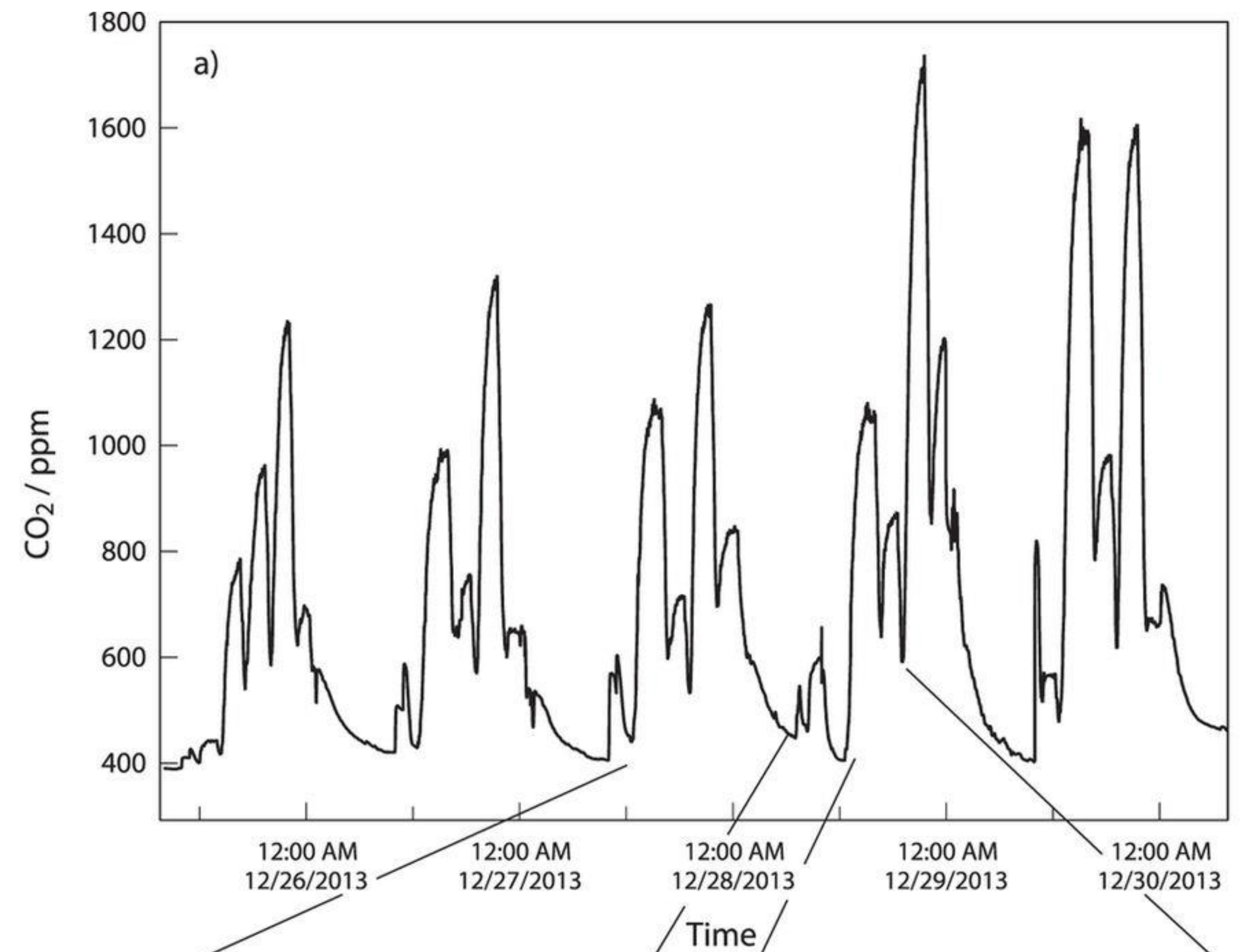
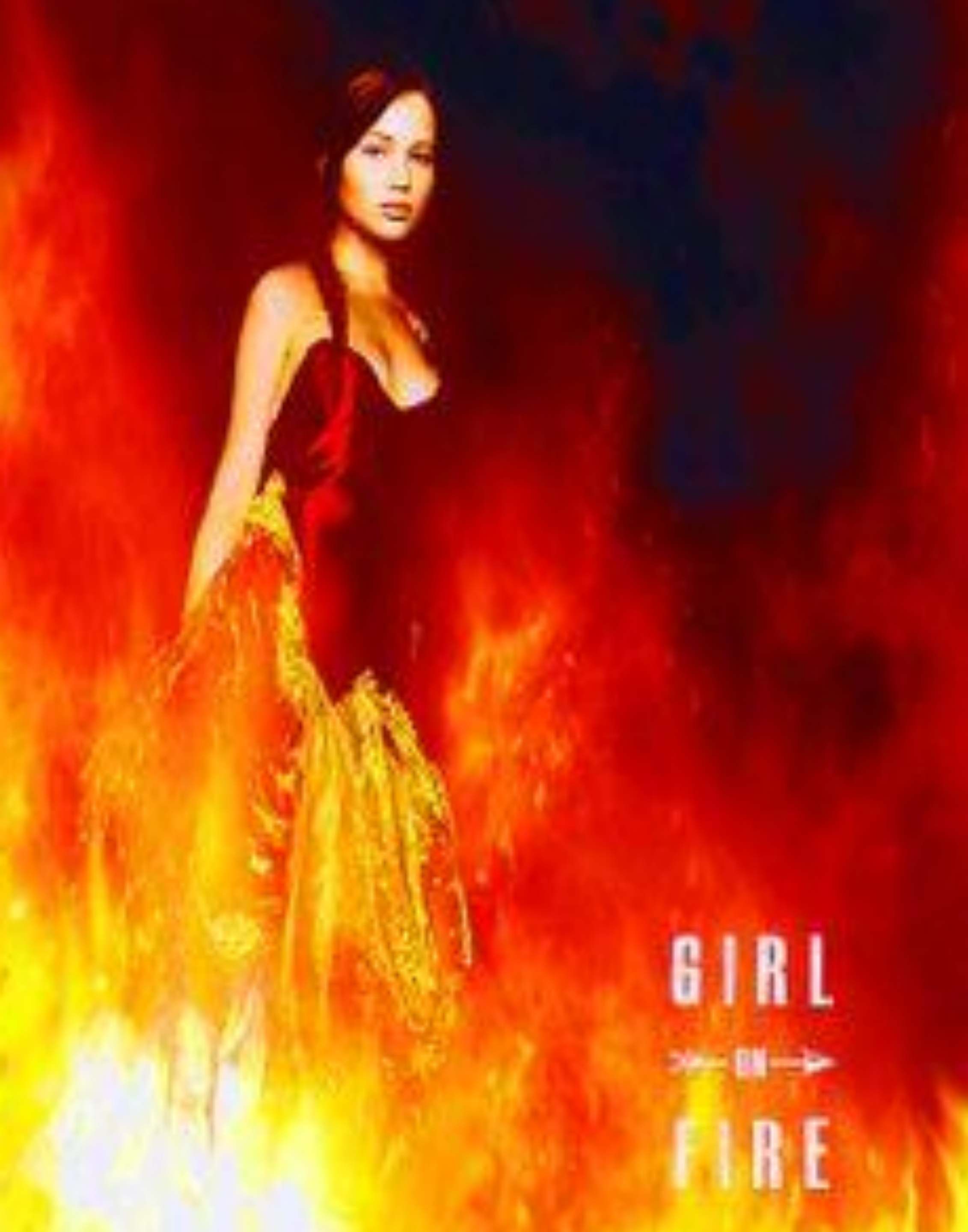


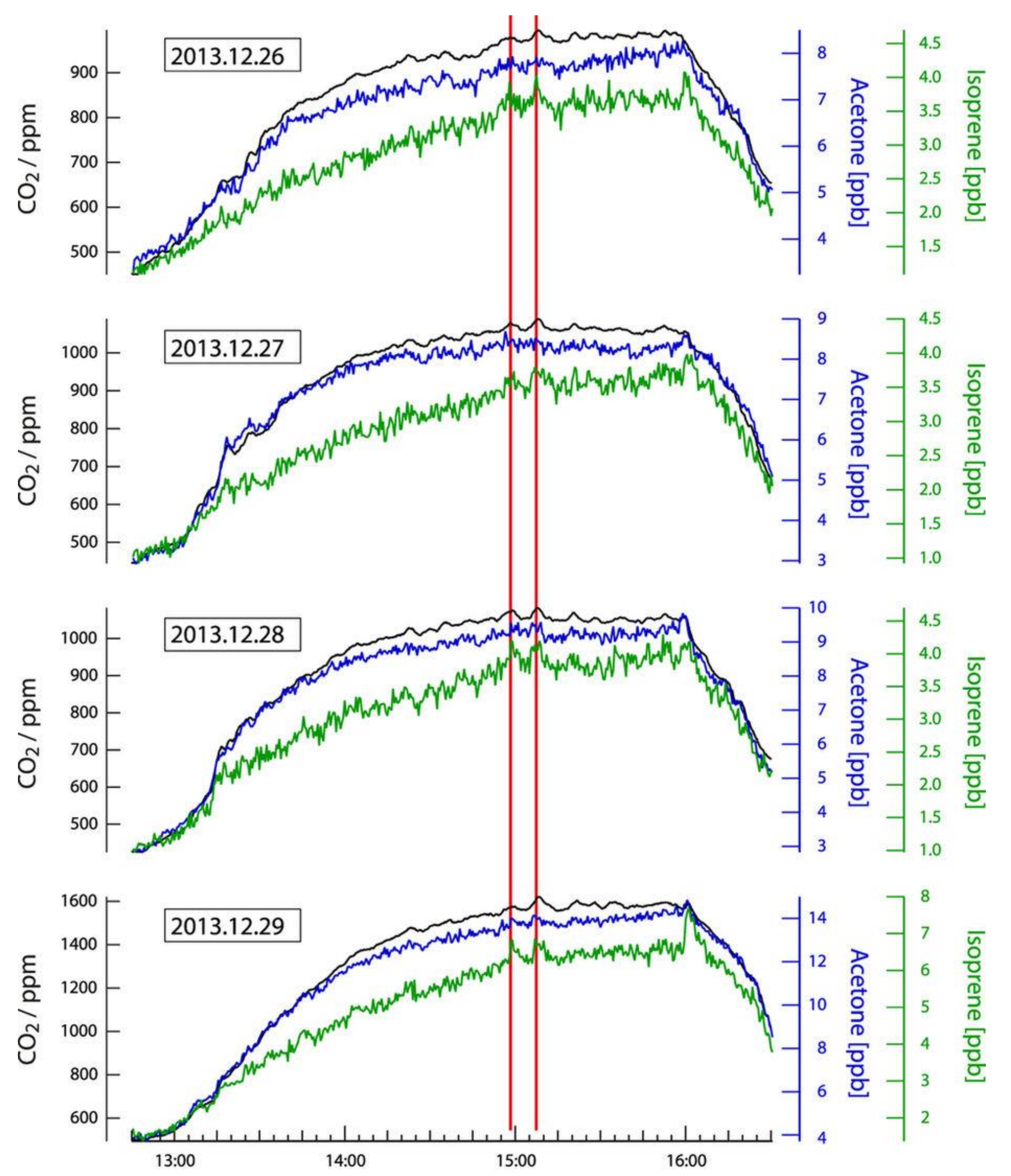
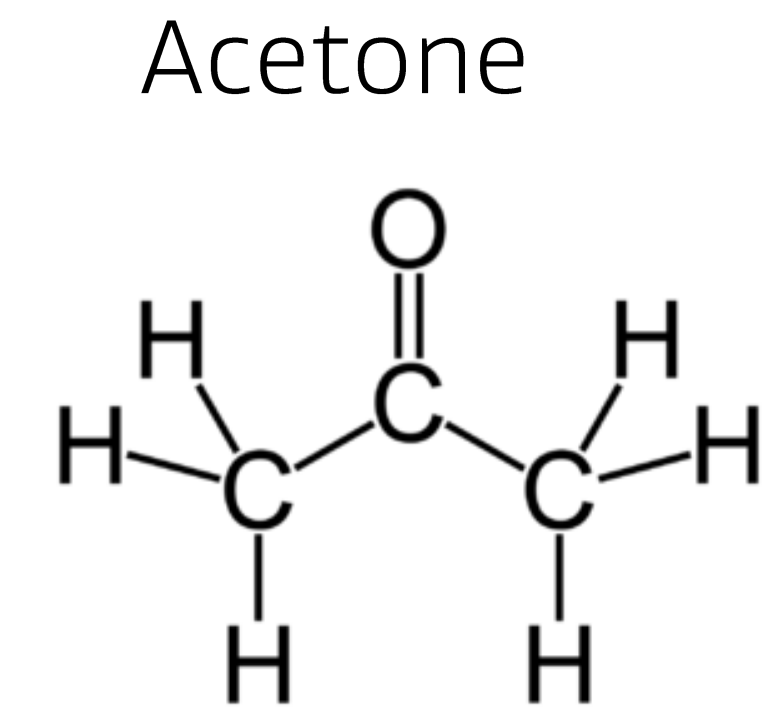
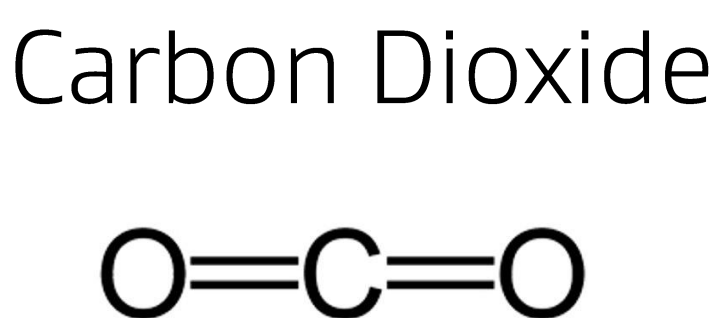
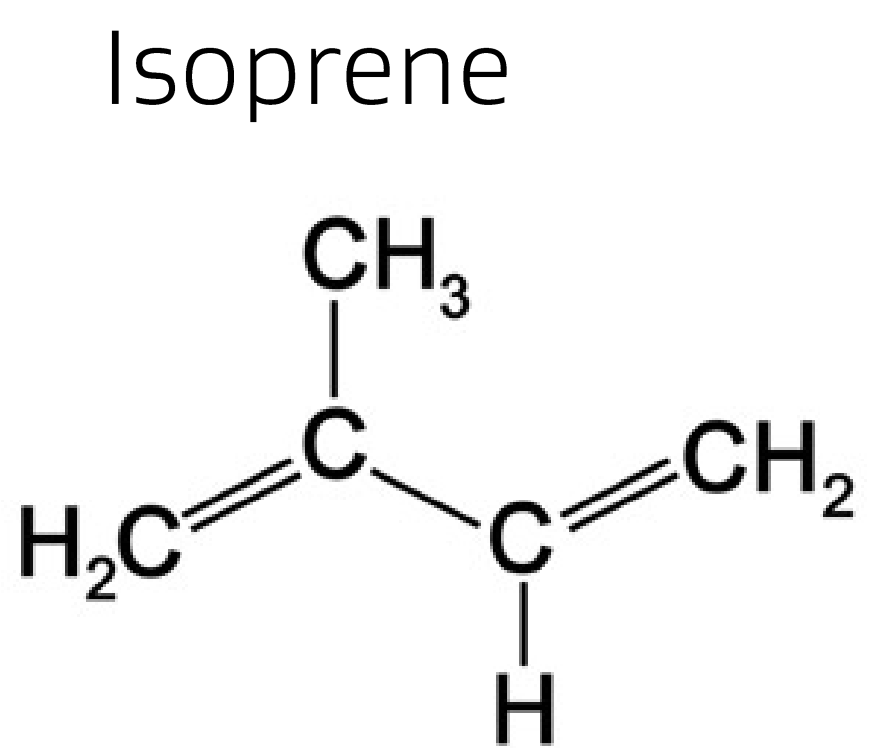
Response under matched intensity

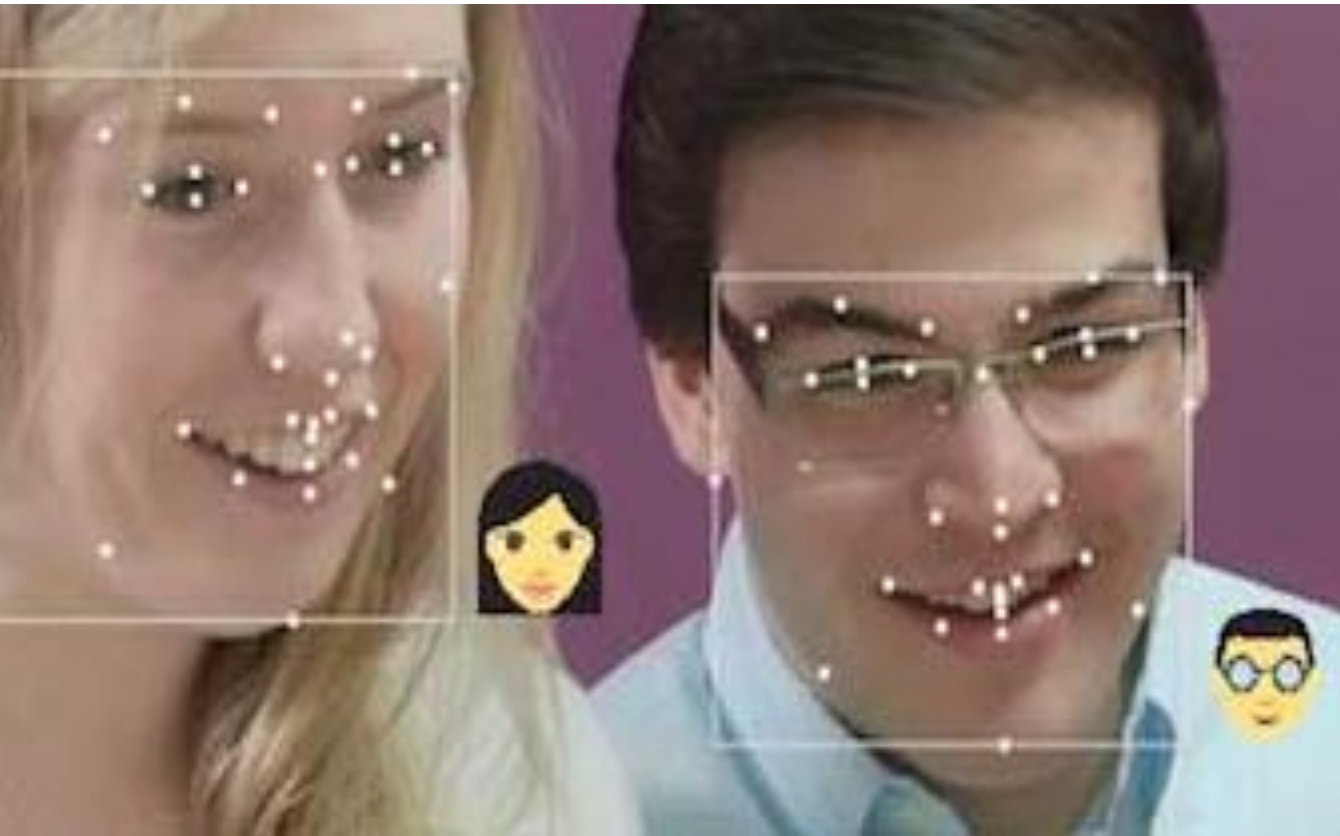
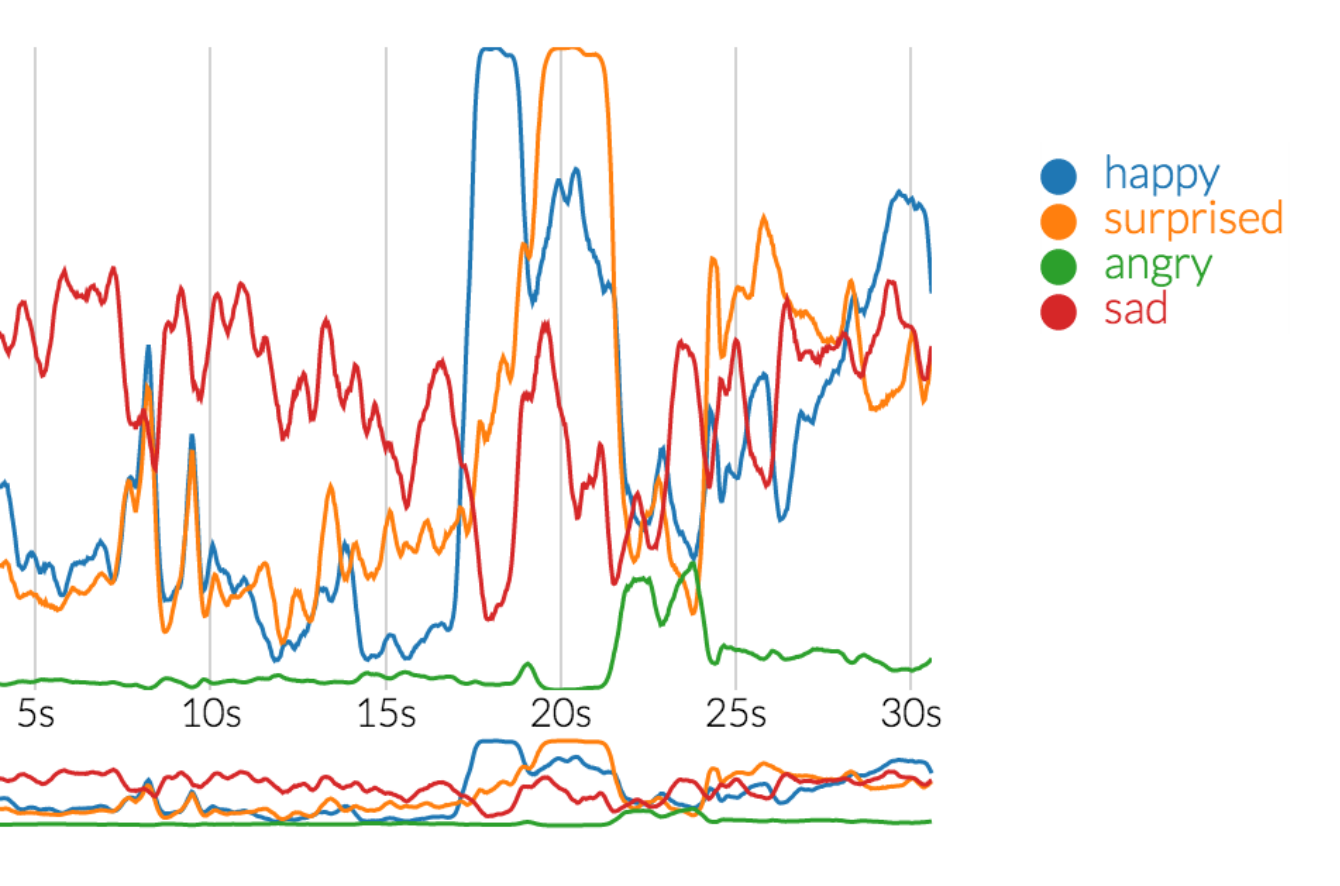












Capturing neural and physiological metrics -- predicting our response to anticipate and monetize consumer state

Advertising – Video, Digital, Print

Shopping – Packaging, Shelf Layout, Promotions

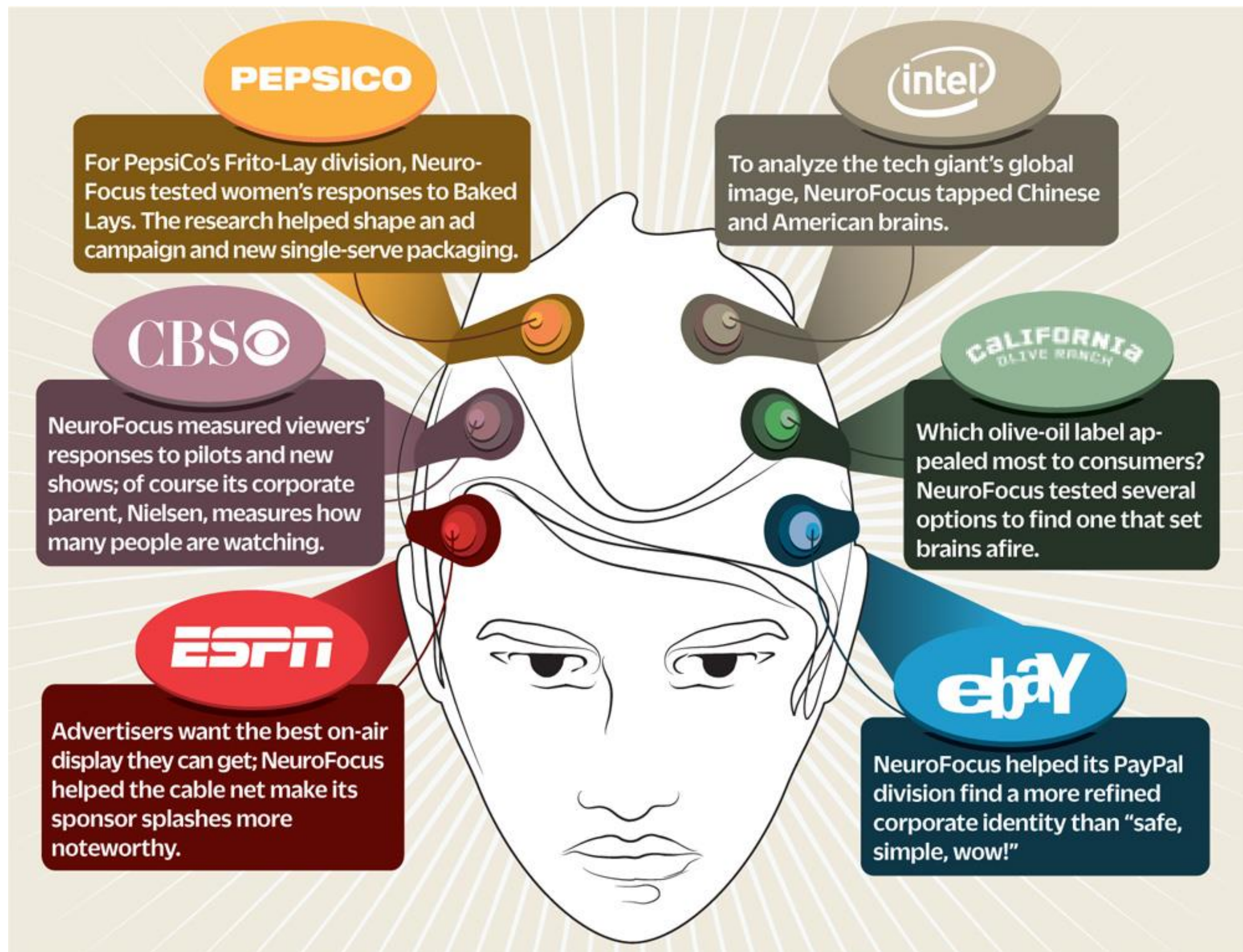
Media – Programming, Promotions

Product – Experience, Development

Content – Creation, Programming

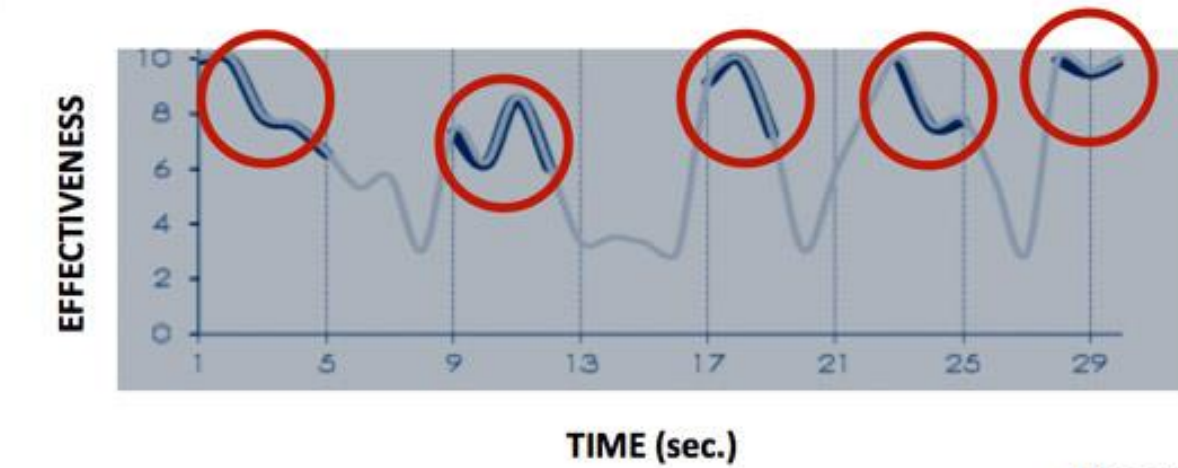


Capturing neural and physiological metrics -- predicting our response to anticipate and monetize consumer state



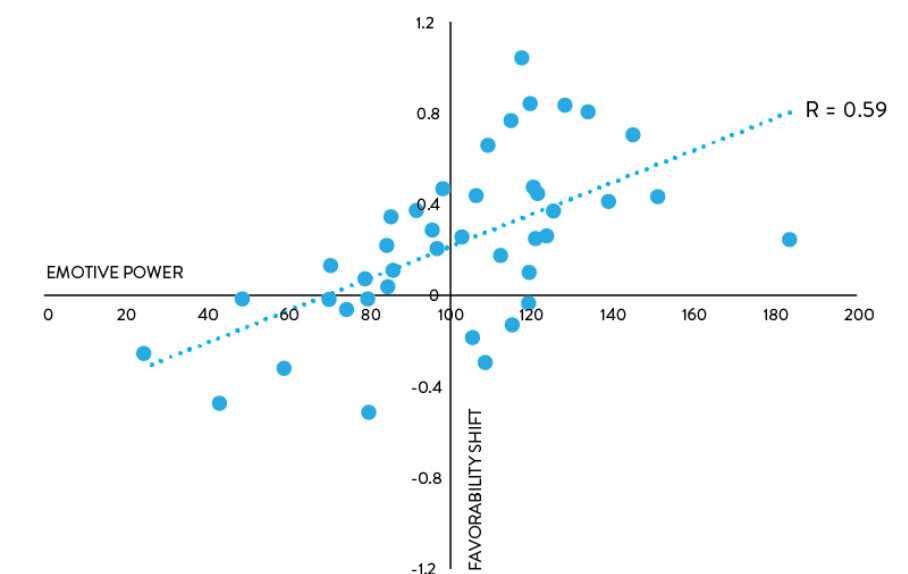
FastCompany

A 60 Second TV Spot Can Be Compressed to 30 Seconds; A 30 Second Spot to 10 or 15 Seconds.



nielsen

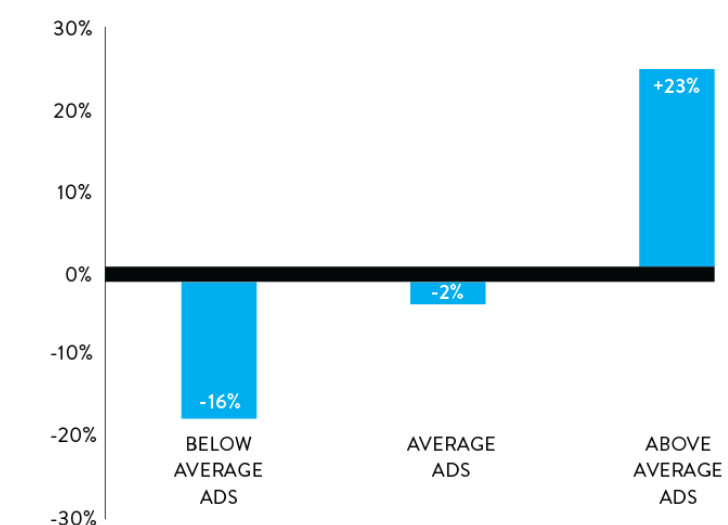
CORRELATION BETWEEN EMOTIVE POWER AND SHIFT IN BRAND FAVORABILITY



Source: Nielsen

ADS WITH THE BEST EMOTIONAL RESPONSE GENERATED A 23% LIFT IN SALES VOLUME

LIFT IN SALES VOLUME VS. ALL ADS FOR THE BRAND



Source: Nielsen Consumer Neuroscience Internal Study - FMCG brands - 2015

Creation



Maximize Perceptual Control

Enhance Our
Physiological Experience

Understand and Innovate Immersive
Multisensory Technology

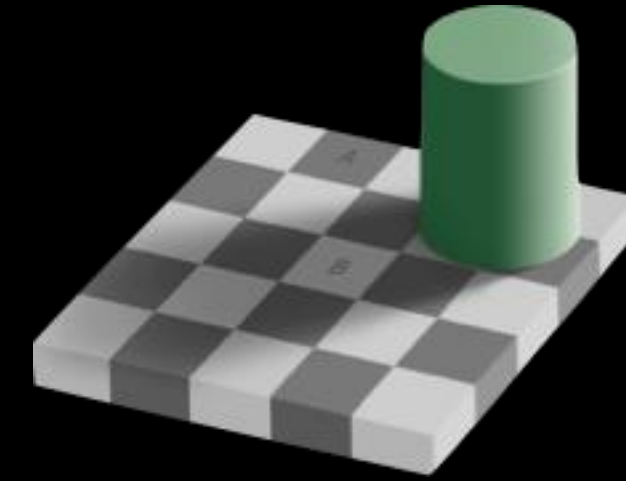
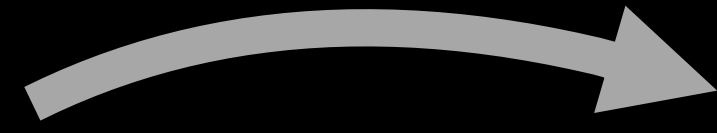


Artistic Creation
& Mastery

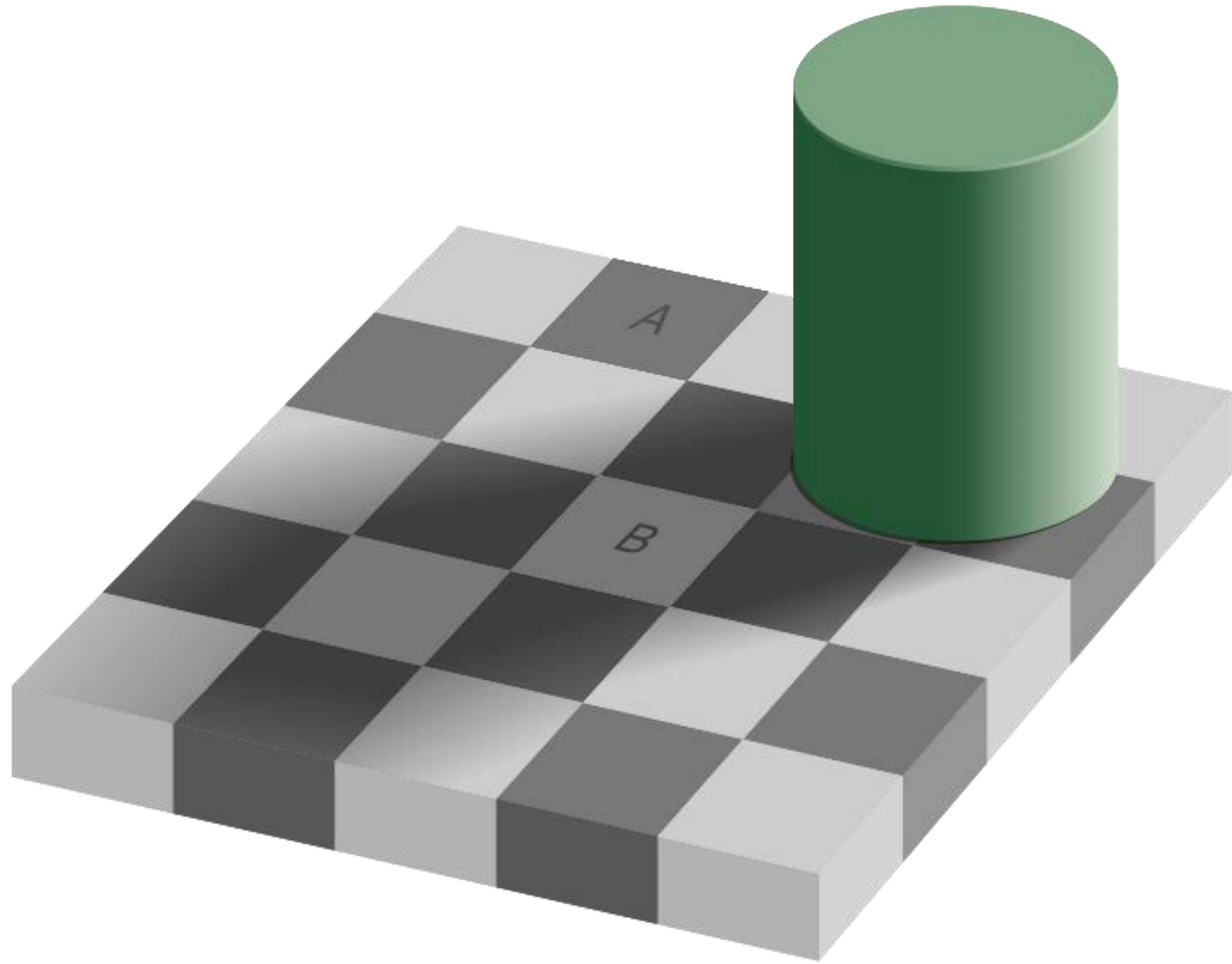


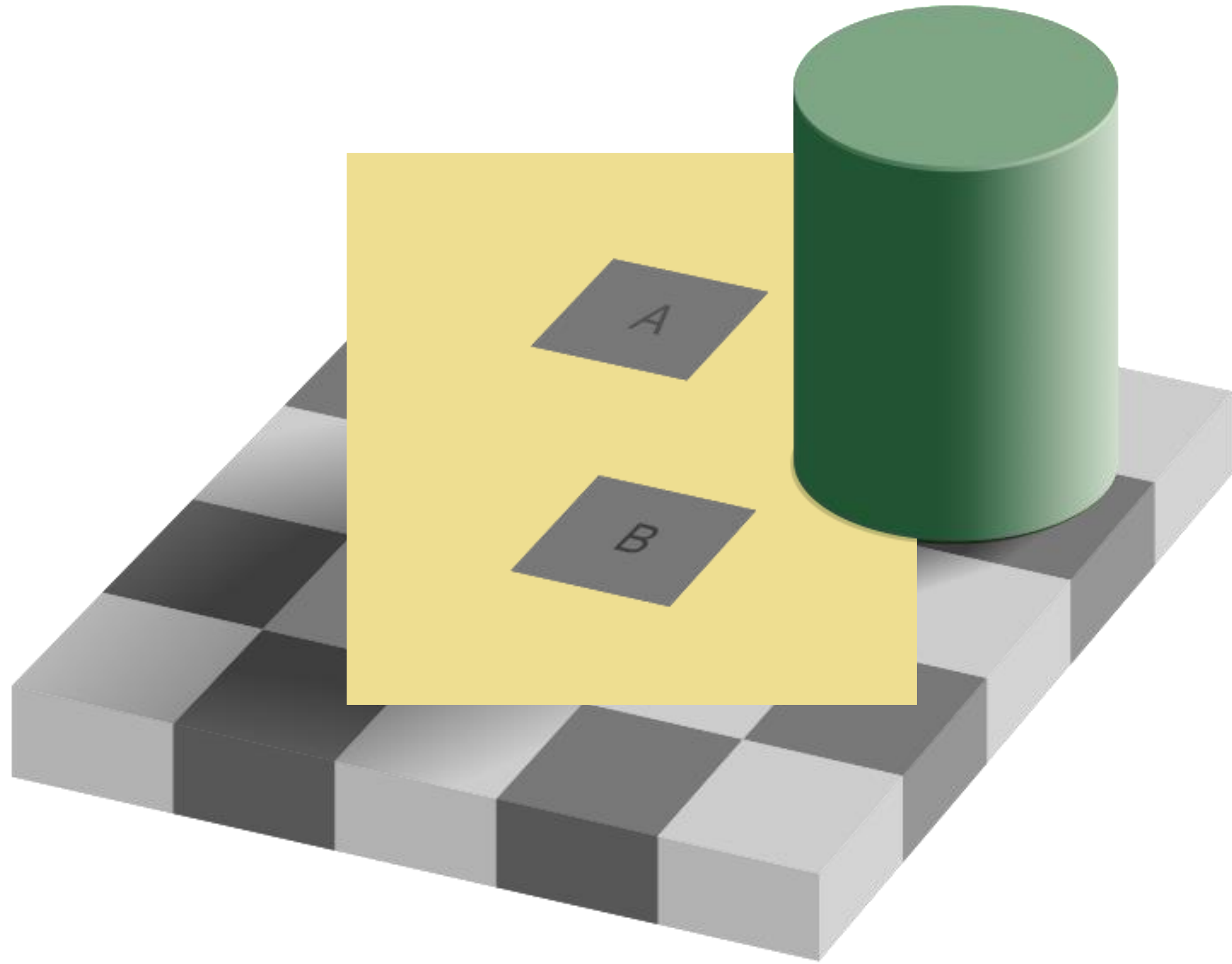


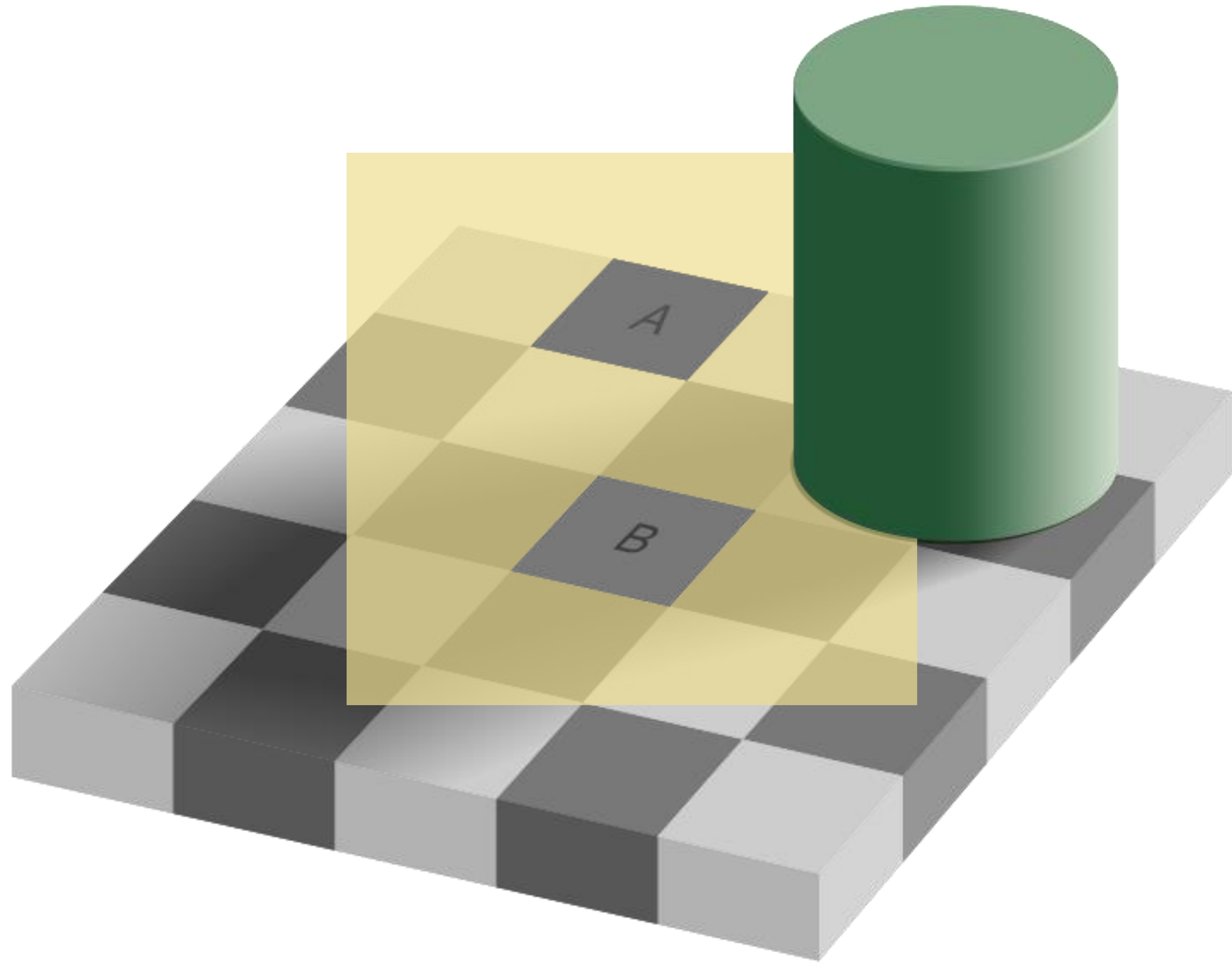
Artistic Creation
& Mastery

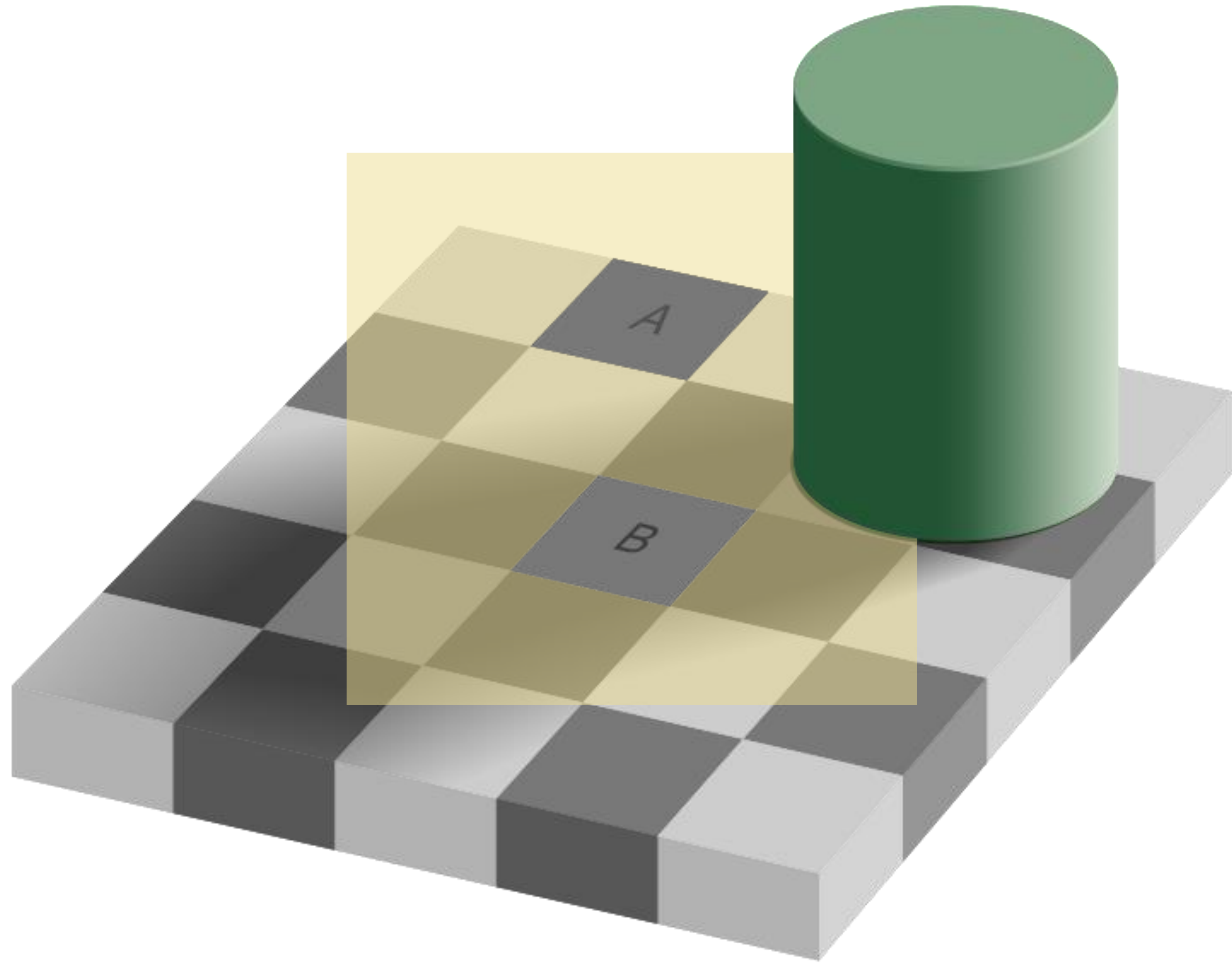


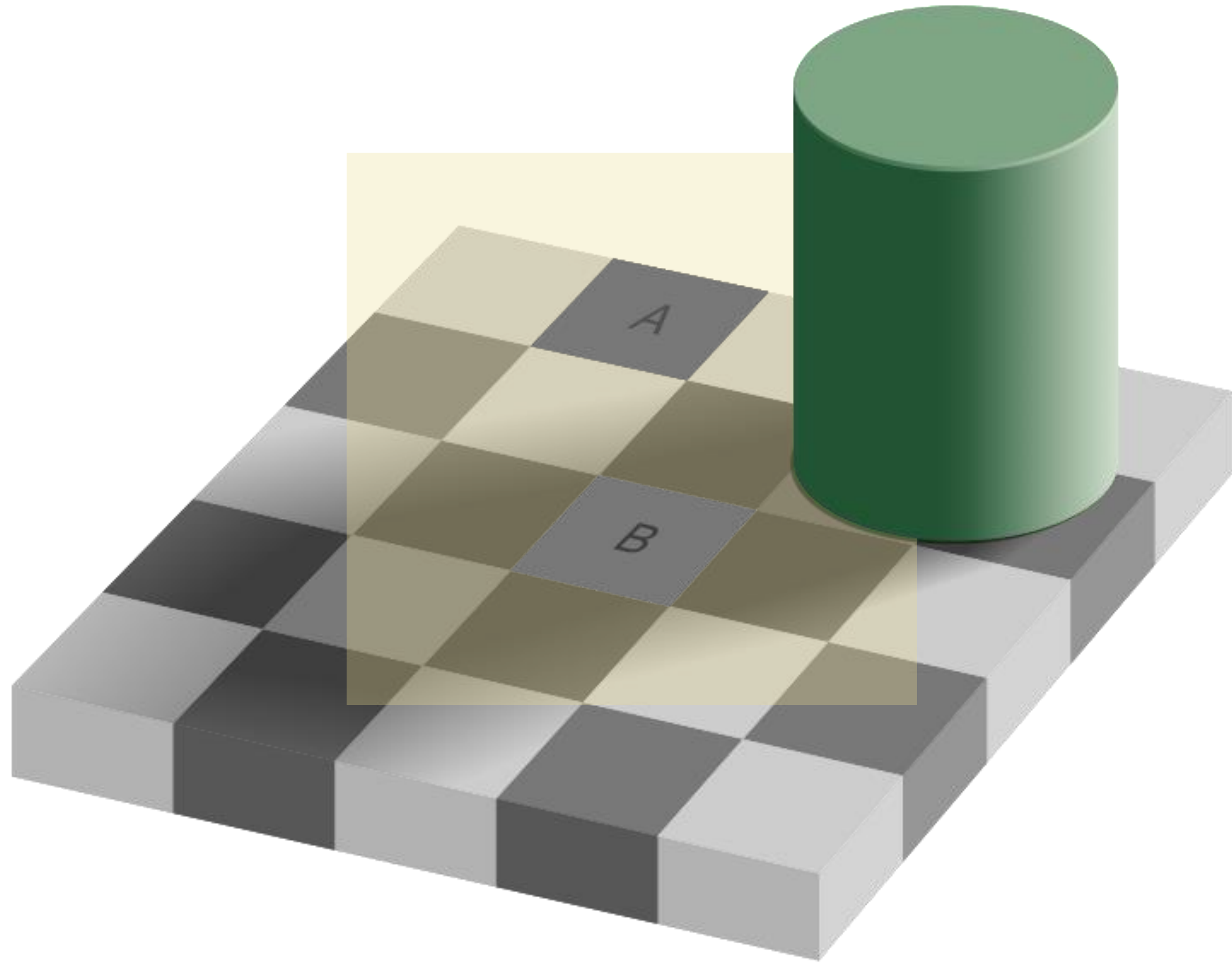
Theoretical Description
of Underlying Principles

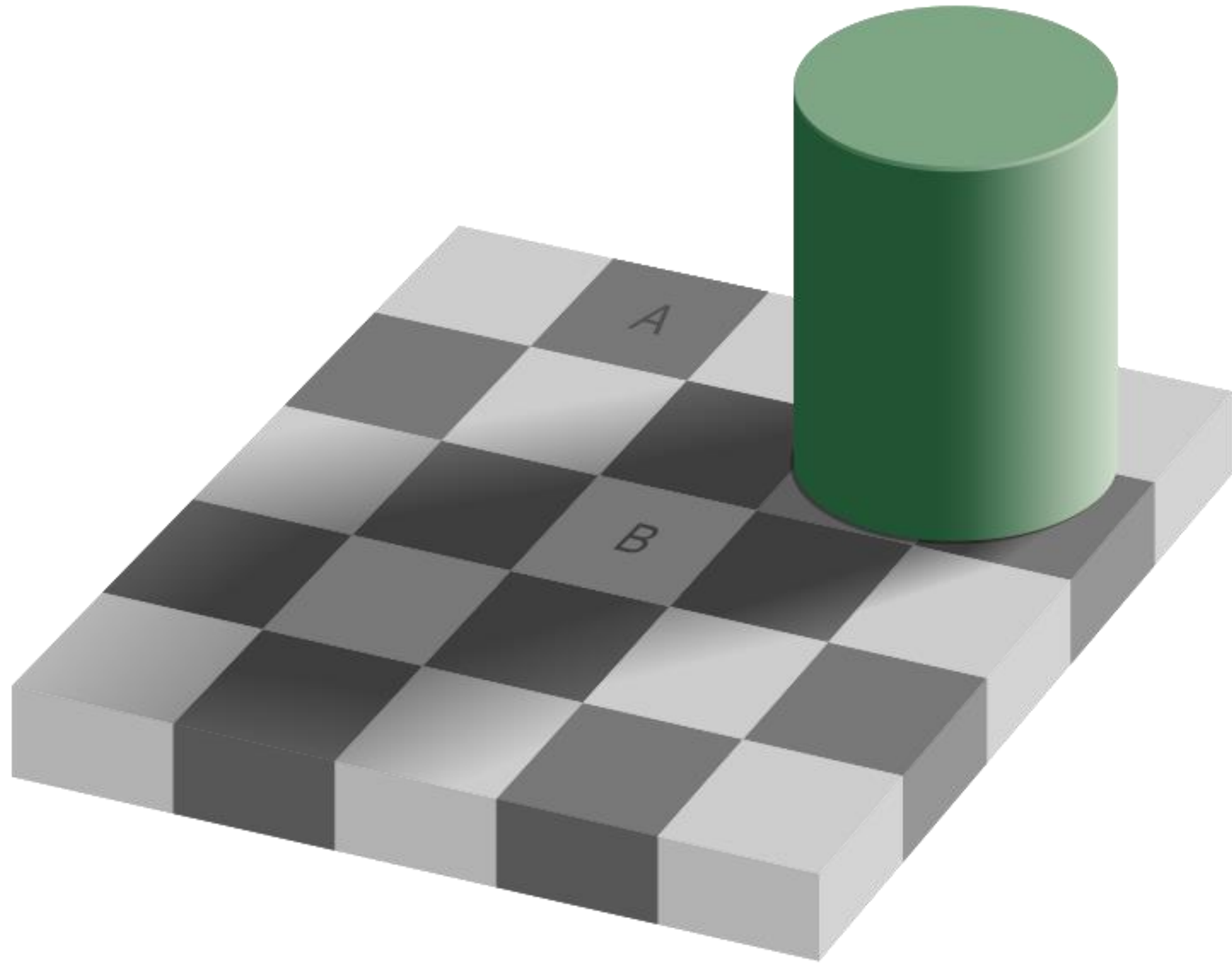




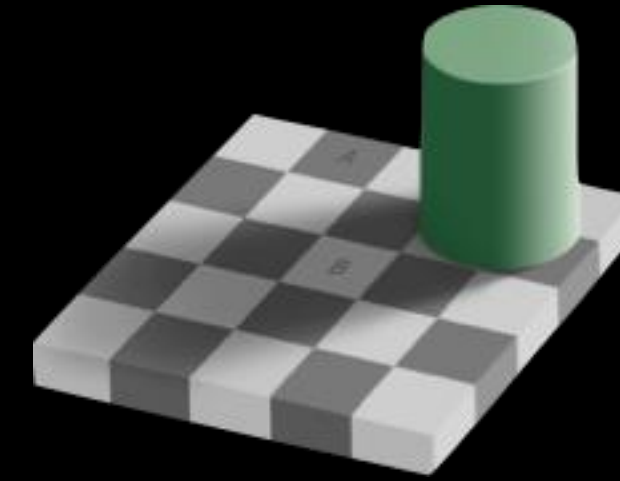
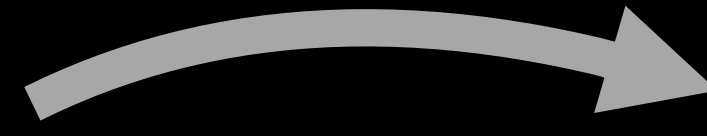








Artistic Creation
& Mastery

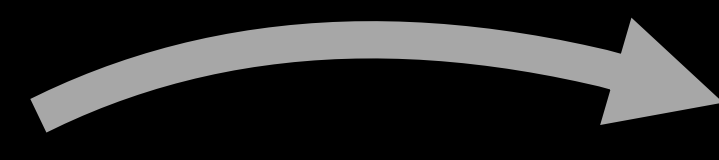


Theoretical Description
of Underlying Principles

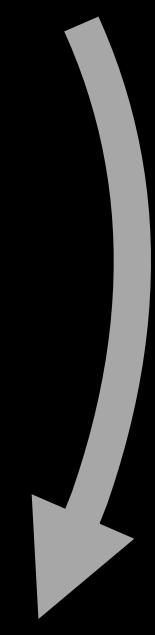
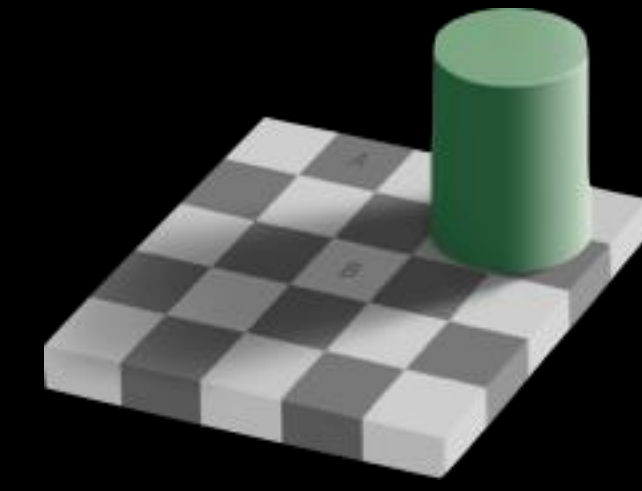


Quantification and
Computational
Biological Model of
Underlying Principles

Artistic Creation
& Mastery



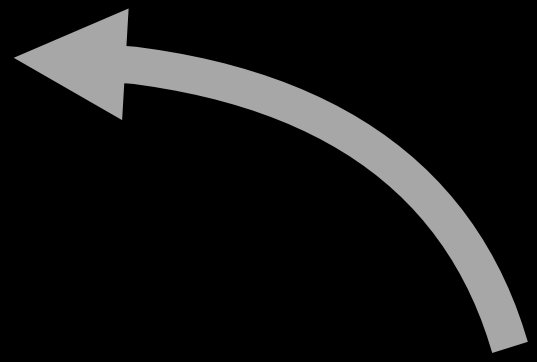
Theoretical Description
of Underlying Principles



Quantification and
Computational
Biological Model of
Underlying Principles



Standards, Technological
Development & Tools to
Facilitate New Artistic
Creation



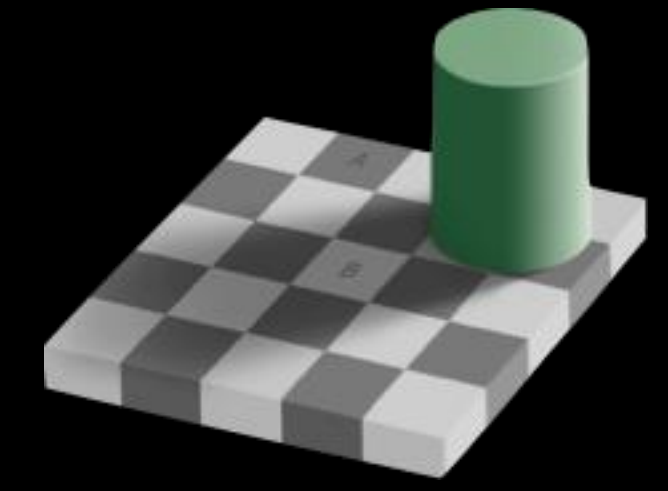




Artistic Creation
& Mastery



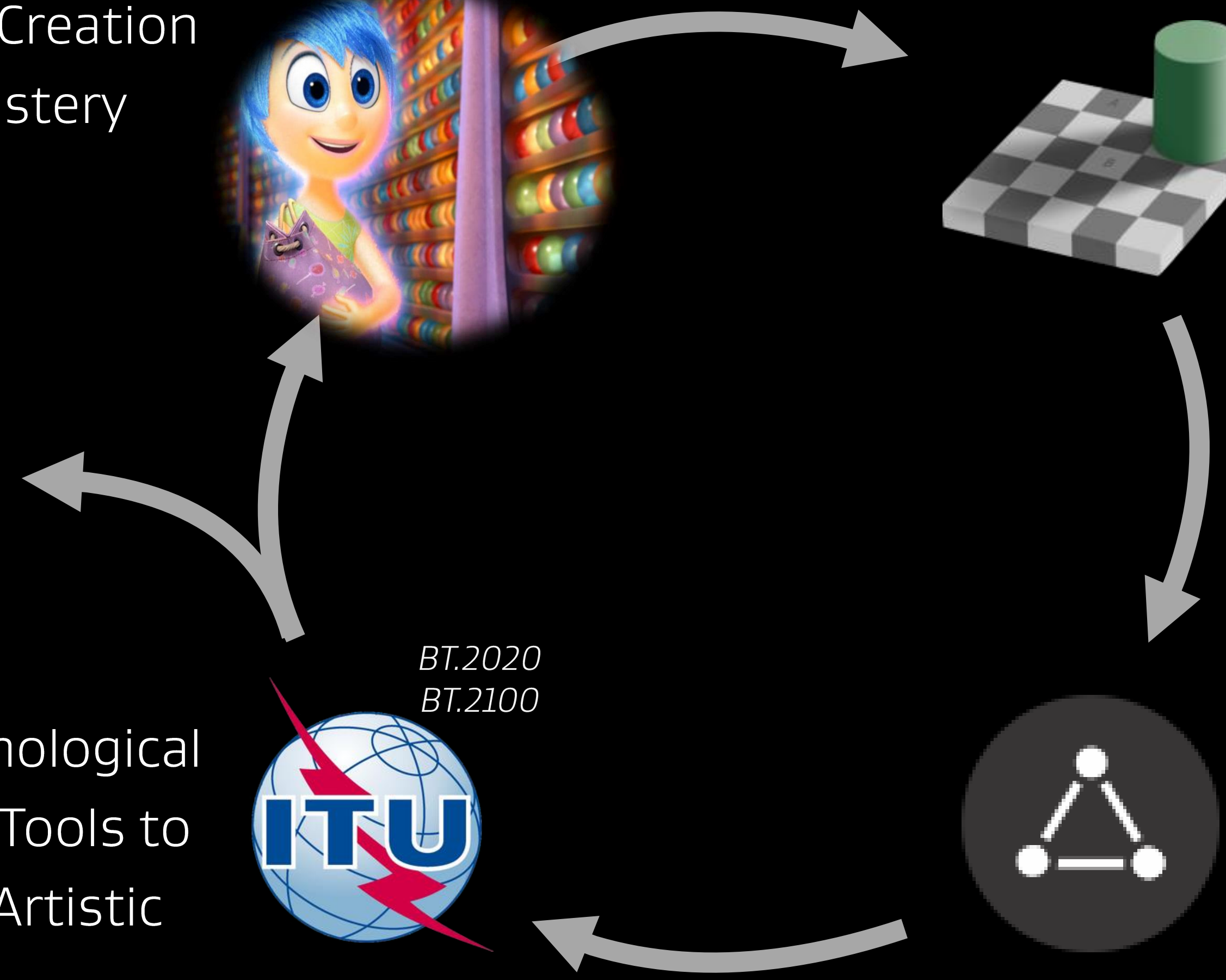
Theoretical Description
of Underlying Principles



Standards, Technological
Development & Tools to
Facilitate New Artistic
Creation



Quantification and
Computational
Biological Model of
Underlying Principles





Are we ready for our new creators?



A group of diverse young people, including a woman in a red sweater in the foreground and a man in a blue shirt behind her, are smiling and looking upwards. The image is overlaid with a digital grid and various data visualization elements like bar charts and lines. The overall tone is optimistic and futuristic.

Are we ready for our new creators?

How should our technology respond?

